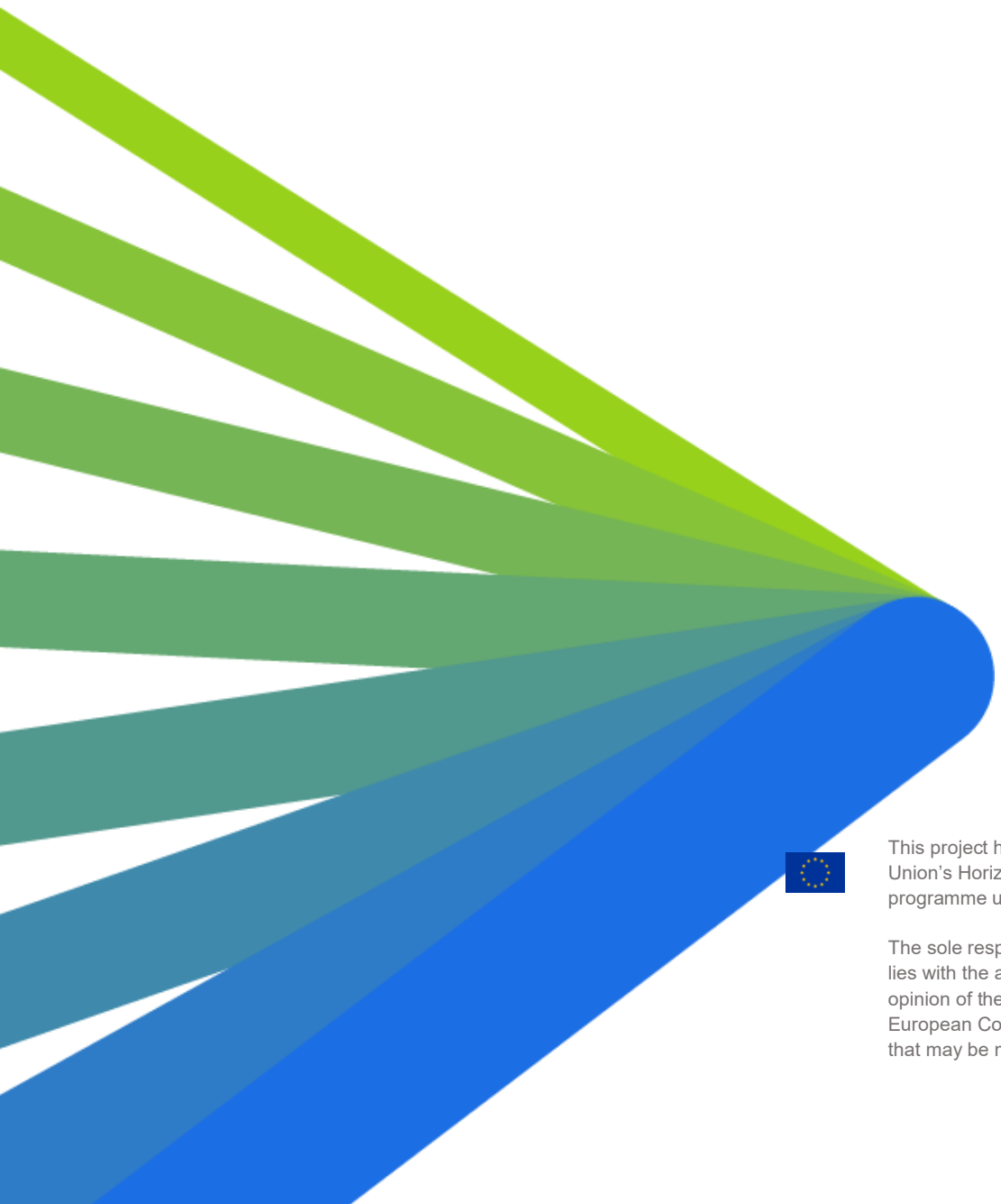
STREnGth_M
Strengthening EU
Road Transport R&I

Deliverable 4.1

Sustainable Mobility Tracker



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101096253.

Summary sheet

Deliverable number	D4.1
Deliverable title	Sustainable Mobility Tracker
Deliverable version	Version 1.0
Work Package number	WP4
Work Package title	Member States and international alignment
Due date of delivery	30/11/2025
Actual date of delivery	30/11/2025
Dissemination level	Public
Type	Document, report
Contributor(s)	Oliver Lah, Edmund Teko, Kathleen Dementera, UEMI with inputs from Lewis Fulton, Vera-Marie Andrieu and Alvin Mejia Máté Csukás, Harm Weken (FIER)
Reviewer(s)	Verena Wagenhofer, Clara Horvath – AVL-List
Project name	Stimulating road Transport Research in Europe and around the Globe for sustainable Mobility
Project acronym	STREnGth_M
Project starting date	1 February 2023
Project duration	36 Months

List of abbreviations and acronyms

Acronym	Meaning
2Zero	Towards Zero Emissions (co-programmed partnership)
ADAS	Advanced Driver Assistance Systems
AV	Autonomous Vehicle
CCAM	Connected, Cooperative and Automated Mobility
CEDR	Conference of European Directors of Roads
CINEA	European Climate, Infrastructure and Environment Executive Agency
CSA	Coordination and Support Action
DoA	Description of Action (STREnGth_M Grant Agreement)
EC	European Commission
EDIH	European Digital Innovation Hubs
EMDS	European Mobility Data Space
ERTRAC	European Road Transport Research Advisory Council
EU	European Union
EV	Electric Vehicle
HDV	Heavy Duty Vehicle
LCA	Life-Cycle Assessment
MaaS	Mobility as a Service
R&I	Research and Innovation
RTR	Road Transport Research
SDGs	Sustainable Development Goals
SRIA	Strategic Research and Innovation Agenda
UN	United Nations
V2X	Vehicle-to-Everything

Table of contents

1 Introduction 6
1.1 STREnGth_M project overview 6
1.2 STREnGth_M WP4, task description and objectives of this report 6
2 STREnGth_M Deliverable D4.1 – Sustainable Mobility Tracker ..7
2.1 Executive Summary 7
2.2 Introduction and Context 8
2.3 Methodology and Conceptual Framework 9
2.4 Dashboard Development and Implementation 14
2.4.1 Global Tracker Dashboard (Prototype Design) 14
2.4.2 Zero Emissions Mobility Observatory (ZEMO) Latin America: Development, Implementation and Analytical Findings 17
2.5 Link to Applied Research and Capacity Building 56
2.6 Cross-Cutting Themes and Innovations 58
2.7 Key Findings and Policy Relevance 62
2.8 Conclusion and Way Forward 66
3 References 72

List of tables

Table 1: 2Zero projects by cluster and national participation (count of partners) 60
Table 2: CCAM projects under Horizon Europe: Demonstration and validation sites by country 62

List of figures

Figure 1: German DkV programme (Digitalisation of municipal transport systems): Split of projects by theme 31
Figure 2: German Erneuerbar Mobil programme (Renewable Mobil): Split of projects by theme 33
Figure 3: Ireland: Split of identified current national RTR projects by theme 38
Figure 4: Sweden: Approximate thematic split of FFI projects (Strategic Vehicle Research and Innovation) 53
Figure 5: EU funding per Member State for Horizon 2020, Smart, green and integrated transport (Calls with deadlines in 2020 and 2021 only) 56
Figure 6: EU funding per Member State for Horizon Europe Cluster 5 (Destinations D5-01, D6-01, D6-02) and Cities Mission 57

Figure 7: EU funding per 100,000 inhabitants by Member State for Horizon 2020, Smart, green and integrated transport (2020 and 2021 Calls) and Horizon Europe Cluster 5 (selected calls)/Cities Mission 58
Figure 8: Participation in 2Zero projects by country (count of number of projects) 59

1 Introduction

1.1 STREnGth_M project overview

STREnGth_M (Stimulating road Transport Research in Europe and around the Globe for sustainable Mobility) is an EU-funded Coordination and Support Action contributing to the planning of research and innovation in Europe by:

- Identifying future research needs in the field of road transport;
- Updating and supporting the coordination of strategic research agendas and roadmaps in the field; and
- Facilitating continuous exchange between road transport research related Horizon Europe partnerships and platforms.

Furthermore, it analyses research, innovation and cooperation capacities in EU Member States, explores funding instruments on national and regional levels and assesses the potentials of national and regional roadmaps.

In particular, STREnGth_M plays a key role in supporting ERTRAC, the European Road Transport Research Advisory Council, in terms of strategic support and dissemination, as well as liaising with other key European partnerships and technology platforms.

1.2 STREnGth_M WP4, task description and objectives of this report

Work Package 4 analyses global progress in sustainable mobility and identifies synergies between European, national and regional programmes in emerging markets. It develops regional innovation maps and national deep-dives for Africa, Asia and Latin America, linking technology, policy, business models and capacity needs to concrete cooperation opportunities. Through feasibility assessments, collaboration maps and an international cooperation task-force concept, WP4 connects local Living Lab experiences with European R&I and development programming, generating practical pathways for investment, skills development and policy reform.

The Sustainable Mobility Tracker (D4.1) consolidates and extends existing indices and tracking initiatives into a coherent framework for monitoring global e-mobility and sustainable transport progress. Building on EAFO data and a pilot for Latin America, and in collaboration with UC Davis and the Asia Transport Outlook, the tracker integrates technology deployment, policy measures, infrastructure readiness and equity dimensions. It serves as an analytical backbone for WP4, informing regional innovation maps, feasibility assessments and cooperation roadmaps, and generating knowledge products and think pieces that support evidence-based decision-making in emerging economies.

2 STREnGth_M Deliverable D4.1 – Sustainable Mobility Tracker

2.1 Executive Summary

Sustainable transport is essential for achieving global climate and development goals, yet there is currently no unified system to monitor progress in this sector . The Sustainable Mobility Tracker addresses this gap by providing a harmonized framework to track transport sustainability across countries. It combines multiple dimensions – from climate mitigation and air quality to accessibility, equity, safety, affordability, resilience, and innovation – into a comprehensive global tracking tool. Aligned with the newly declared *UN Decade of Sustainable Transport (2026–2035)* and the Sustainable Development Goals (SDGs), the tracker supports international commitments like the Paris Agreement by offering clear metrics to gauge progress . This report presents the conceptual foundation for the tracker and a pilot implementation focusing on Latin America.

The tracker's design builds on prior research and tools, notably the Transport Decarbonisation Index (TDI), while expanding beyond decarbonisation to encompass broader sustainability objectives . It employs an open, collaborative approach, leveraging data from leading sources (e.g. IEA, World Bank, regional development banks) and integrating quantitative indicators with qualitative policy assessments. A prototype global dashboard has been developed, and a regional pilot in Latin America (with case studies in Argentina and Ecuador) demonstrates the tracker in action. Initial findings highlight that no country has yet achieved "sustainable mobility" in all aspects , underscoring the need for this tool. The tracker reveals performance patterns and gaps – for example, a country excelling in affordable transport but lagging in clean energy – to inform balanced policy decisions . By making such insights publicly accessible, the Sustainable Mobility Tracker is poised to become an accountability instrument and a catalyst for action during the Transport Decade. It will help policymakers, international agencies, and civil society to benchmark progress, identify priority areas, and mobilize support for sustainable mobility at global and regional levels. The pilot in Latin America provides a template for rolling out the tracker in other regions, and a phased plan is outlined to scale the initiative worldwide through 2035. Together, these efforts will enable data-driven decision-making and strengthen alignment of transport policies with climate and development targets.

2.2 Introduction and Context

Transport sits at the nexus of urgent climate, equity, and development challenges. It accounts for a quarter of global energy-related greenhouse emissions and is a leading source of urban air pollution . Achieving the Paris Agreement's climate goals and multiple Sustainable Development Goals (SDGs) – such as SDG 11.2 on accessible, safe, sustainable transport for all and SDG 3.6 on halving road fatalities – will require a profound transformation of mobility systems. Recognizing this, the United Nations General Assembly in 2023 declared 2026–2035 as the *Decade of Sustainable Transport*, signaling a worldwide commitment to accelerate action in the transport sector . This creates both an imperative and an opportunity to unify global efforts around sustainable mobility.

The challenge: unlike sectors such as energy or health, transport currently lacks a harmonized global system to monitor progress and hold stakeholders accountable . Data on transport sustainability is fragmented across various initiatives – for instance, different organizations track fuel economy, public transport access, road safety, or emissions, each in isolation. The absence of an integrated tracker means we have an incomplete picture of how countries are performing in transport, which in turn impedes our ability to measure advancements, identify gaps, and direct resources effectively . In short, we cannot manage what we do not measure.

Towards a solution: The Sustainable Mobility Tracker is proposed as a response to this gap. It is a joint initiative by the Urban Electric Mobility Initiative (UEMI) and the University of California, Davis (UC Davis), developed in the spirit of global collaboration . The tracker aims to be an open and authoritative framework for country-level and global tracking of sustainable, inclusive, low-carbon transport, functioning as a "common scoreboard" for the Decade of Sustainable Transport. By consolidating data and indicators into one platform, it will enable countries and stakeholders to readily see where they stand and how they progress over time on key mobility metrics. Importantly, the tracker is being designed to align with and support major international processes and commitments:

- UN Decade of Sustainable Transport (2026–2035) – The tracker will serve as a dedicated monitoring framework for this decade, helping to benchmark progress and foster accountability in meeting the Decade's vision . It will effectively be a tool to measure whether the world is moving in the right direction on sustainable transport during this ten-year push.
- Sustainable Development Goals (SDGs) – The framework explicitly links to transport-related SDG targets such as SDG 11.2 (affordable, accessible transport for all by 2030) and SDG 9.1 (sustainable infrastructure for economic development), as well as supporting broader goals like SDG 13 on climate action . By tracking relevant indicators (e.g. access to public transport, road safety, emissions), the tracker will provide data to assess progress on these targets. It will also complement the UN's SDG monitoring by offering a more detailed transport-specific lens.
- Paris Agreement and Climate Action – Transport is one of the harder-to-abate sectors for greenhouse gas emissions. The tracker will help countries gauge how their transport emissions and policies align with their Nationally Determined

Contributions (NDCs) under the Paris Agreement and with a net-zero by 2050 trajectory . Insights from the tracker can feed into the Paris Agreement's Global Stocktake, highlighting gaps between current trends and the emissions reductions required to stay within 1.5–2°C warming . In essence, it will translate high-level climate goals into measurable transport-sector benchmarks.

Overall, the Sustainable Mobility Tracker is conceived as a globally harmonized, multi-dimensional monitoring tool that will guide policy and investment. It puts a spotlight on both outcomes (e.g. emission levels, access rates) and actions (policies, investments), thereby connecting what is happening with what is being done about it. This approach resonates with calls from the international community – including UN agencies, development banks, and initiatives like Sustainable Mobility for All (SuM4All) – for better data and tracking to elevate transport in global development and climate agendas . By providing credible data and a shared framework, the tracker will facilitate informed dialogue, peer learning, and greater accountability among countries and stakeholders during the Transport Decade and beyond.

2.3 Methodology and Conceptual Framework

Building on the Transport Decarbonisation Index (TDI): The conceptual foundation of the tracker draws on lessons from the *Transport Decarbonisation Index* pilot. The TDI, developed in a recent project, is a diagnostic composite index that helped low- and middle-income countries assess their transport systems' readiness for decarbonisation . It compiled dozens of indicators across multiple categories (e.g. passenger transport, freight, vehicles, energy, finance) and generated composite scores to benchmark countries . Piloted in 12 countries across Africa and South Asia, the TDI demonstrated the value of an index approach in revealing strengths and weaknesses of national transport systems . For example, it highlighted cases where per capita transport emissions were relatively low but public transport availability was poor, or where policy and financing gaps were hindering progress . Crucially, the TDI pilot also exposed significant data gaps – especially on aspects like freight activity, transport equity, and informal transport – indicating that a broader perspective and better data integration are needed for truly sustainable mobility tracking .

Expanding to a holistic sustainability framework: Building on TDI's groundwork, the Sustainable Mobility Tracker broadens the scope beyond decarbonisation to encompass multiple dimensions of sustainable mobility. Climate change mitigation remains a core pillar, but the tracker recognizes that sustainability in transport is multi-faceted, involving social, economic, and resilience factors alongside environmental ones . After extensive literature review and expert consultation, we have identified seven key dimensions (one environmental and six additional) that structure the tracker's framework:

- Climate & Energy: Reducing transport's carbon footprint and energy intensity. This includes indicators like greenhouse gas (GHG) emissions from transport per capita, the share of renewable energy in transport, fuel economy of vehicles, and uptake of electric vehicles (EVs). *Rationale:* Aligns with Paris Agreement

goals and SDG 13 (climate action). Data for this dimension will draw on sources such as the International Energy Agency (IEA) Mobility Model for emissions and energy use, and the IEA's Global EV Outlook for EV adoption metrics .

- Accessibility: Ensuring people's ability to reach jobs, services, and opportunities. Key metrics include access to public transport (e.g. % of urban population living within 500 meters of frequent transit), average travel time to work, and rural accessibility (the Rural Access Index measuring the share of rural residents with access to an all-weather road) . *Rationale:* Reflects SDG 11.2 (inclusive transport for all) and equity of service provision across urban–rural contexts. Data sources include the World Bank's Rural Access Index database and national urban transport surveys; regional initiatives like the Asian Transport Outlook (which compiles transport access data for Asia-Pacific countries) will be integrated to enrich this dimension .
- Equity & Gender: Promoting fair and inclusive transport for all demographics. Indicators capture how mobility benefits and burdens are distributed – for example, the gender gap in access to mobility (percentage of women vs. men who have access to personal or public transport means) , affordability for low-income groups (discussed below), the proportion of transport infrastructure that is accessible to persons with disabilities, and personal security perceptions (such as % of women who feel safe using public transport at night). *Rationale:* Answers the UN's call for people-centered transport that "leaves no one behind" . This dimension ensures the tracker flags issues like whether women and vulnerable groups have adequate and safe mobility options . Data here is often sparse; the tracker will use household travel surveys, academic studies, and targeted datasets (e.g. UN Habitat or UN Women studies on gender and transport) where available, and encourage countries to collect disaggregated data on transport use.
- Safety: Enhancing the safety of transport systems, with a focus on reducing road traffic injuries and fatalities. Key indicators include the annual number of road deaths per 100,000 population (aligned with SDG target 3.6 to halve road deaths by 2030), serious injuries per capita, and the existence of road safety strategies (e.g. a Vision Zero policy or equivalent) . Other modes (rail, aviation) can be included as relevant. *Rationale:* A sustainable mobility system must also be a safe system – safety is explicitly recognized in global agendas (the UN General Assembly has urged integrating road safety into the 2030 Agenda) . Data will come from the World Health Organization (WHO) Global Status Reports on Road Safety and the World Bank's Global Road Safety Facility (which provides harmonized fatality data) , as well as national safety databases. By tracking safety outcomes and the presence of safety interventions (like seat-belt laws, helmet laws, etc.), the tracker links outcomes with policy actions.
- Affordability: Assessing the financial burden of transport on households and the affordability of mobility options. Example indicators include the share of monthly household income spent on transport by the poorest 40% of the population, public transport fare levels relative to income (e.g. cost of a monthly transit pass as a percentage of average wages), and fuel prices relative to GDP per capita . *Rationale:* Affordable mobility is crucial for equity and access – if transport is too costly, it restricts access to opportunities for low-income groups . This dimension also considers whether policies are in place to keep transport affordable (such as subsidized fares, fuel subsidies or their redirection,

distance-based tariffs, etc.). Data sources include household expenditure surveys for mode spending shares, city-level fare indexes, and international databases on fuel prices. For instance, the World Bank and IMF track fuel price reforms, and UITP publishes public transport affordability metrics for select cities.

- Resilience: Evaluating how well transport systems can withstand and recover from shocks, including climate-related events (floods, storms, heatwaves), pandemics, and economic disruptions. Indicators might cover the existence of climate adaptation plans for the transport sector, the vulnerability of infrastructure (e.g. percentage of transport network in flood-prone areas that is climate-proofed), average days of major transport disruption per year due to extreme events, and emergency preparedness/contingency plans for transport . *Rationale:* With climate change and other crises, resilience is a core aspect of sustainability – highlighted as a priority in the Decade of Sustainable Transport . Measuring resilience encourages investments in robust infrastructure and adaptive planning. Data comes from sources like national disaster risk assessments, climate risk indexes, and reports to the UNFCCC (many countries report transport adaptation measures). If direct metrics are unavailable, qualitative proxies (such as a yes/no on whether a country has a resilient transport strategy) will be used initially.
- Innovation: Gauging the uptake of innovative solutions and technologies in mobility. This includes technological innovation (e.g. electric or alternative-fuel vehicle adoption rates, density of EV charging infrastructure , average fuel efficiency improvements, deployment of new mobility technologies like hydrogen or autonomous vehicles), digital innovation (such as the presence of Mobility-as-a-Service platforms, open data portals for transport, use of real-time data in traffic management), and policy innovation (e.g. pilot programs for new mobility solutions, innovative financing mechanisms, regulatory sandboxes for transport tech). *Rationale:* Innovation is crucial for accelerating decarbonisation and improving system efficiency, especially in the context of rapid urbanization and technological change . Tracking innovation helps identify leading-edge practices and diffusion of new ideas. Data sources include specialized observatories like the European Alternative Fuels Observatory (for EV and charging stats in Europe) – with plans to collaborate with similar initiatives in other regions – as well as databases on startups and patents (to capture the emergence of mobility startups per million population, for instance), and qualitative tracking of pilot projects in each country (from news and government reports).

To illustrate how these dimensions translate into measurable indicators, Table 1 presents a summary of the core dimensions alongside sample indicators and typical data sources for each. This framework was informed by a broad mapping of existing transport indices and data initiatives , ensuring we build on global best practices and fill recognized gaps.

Table 1: Sustainable Mobility Tracker – Dimensions, Example Indicators, and Data Sources

Dimension	Example Indicators	Primary Data Sources
Climate & Energy	- Transport GHG emissions per capita- EV share in new vehicle sales (%)- Renewable energy in transport (%)	IEA Mobility Model, IEA Global EV Outlook, World Bank (WDI) emissions data
Accessibility	- Urban population within 500m of public transport (%)- Average commute time (minutes)- Rural Access Index (% rural pop with road access)	World Bank (Rural Access Index), National urban transit surveys, ADB Asian Transport Outlook (for APAC)
Equity & Gender	- Gender gap in access to transport (% women vs men with access)- Presence of subsidized transit fares for low-income groups (Y/N)- Perception of safety for women on public transport (% reporting safe)	National household travel surveys and gender studies, UN Habitat/UN Women data, urban safety audits
Safety	- Road traffic fatalities per 100,000 pop.- Serious injuries per 100,000 pop.- Existence of Vision Zero or road safety strategy (Y/N)	WHO Global Status Report on Road Safety, World Bank GRSF database, National transport safety agencies
Affordability	- % of income spent on transport by bottom 40% households- Public transport fare as % of average wage- Gasoline price per liter relative to GDP per capita	Household expenditure surveys, National statistics, International fuel price databases (IMF, IEA)
Resilience	- Annual days of transport disruption due to disasters- % transport infrastructure climate-proofed (in vulnerable zones)- Existence of emergency transport plan (Y/N)	UNFCCC National communications, Disaster risk databases, National transport ministries reports
Innovation	- Electric/alternative-fuel vehicle stock (% of fleet)- Mobility startups per 1M people- Open transport data portal available (Y/N)- Autonomous vehicle pilot projects (Y/N)	EAFO (Europe EV data) and regional EV databases, Startup and tech indices, Government innovation reports, ITS agencies

Sources: UEMI–UC Davis joint vision for a Sustainable Mobility Tracker , with data sources from World Bank, IEA, regional development banks and others as noted.

This multi-dimensional approach ensures that the tracker transcends a narrow climate lens, capturing the full breadth of what “sustainable mobility” entails . Notably, these dimensions closely align with the four objectives defined by the Sustainable Mobility for All (SuM4All) Global Tracking Framework – Universal Access, Efficiency, Safety, Green Mobility – but with added emphasis on equity, affordability, and resilience to reflect emerging priorities . By covering these areas, the tracker echoes the priorities identified by global stakeholders – from zero-emission solutions and gender inclusivity

(highlighted by UN-Habitat and UNEP) to resilient infrastructure and affordability (emphasized by the World Bank) .

Incorporating these dimensions also addresses the data gaps flagged by earlier efforts like the TDI. For instance, TDI pilots found very limited data on informal transport, gender, and freight in many developing countries . By making such topics explicit parts of our framework, the tracker creates an incentive to improve data collection in these areas . For example, if a country lacks data on informal transport usage, the tracker will still include a placeholder or proxy (such as existence of informal transport integration in plans), thereby signaling the importance of that data. Over time, we anticipate this will encourage countries and development partners to invest in better surveys and data systems – such as conducting household travel surveys to capture gender-differentiated travel patterns, or enhancing road crash data systems – so that all dimensions can be quantified with higher accuracy .

Indicator selection and composite index methodology: The selection of indicators for each dimension follows established best practices for developing composite indices. The project has benefited from academic research on indicator development, which outlined principles like SMART criteria (Specific, Measurable, Achievable, Relevant, Time-bound) and quality filters (relevance, soundness, timeliness, accessibility, comparability) in choosing indicators . Each potential indicator is evaluated for its robustness and availability across countries. As a rule of thumb, we aim to have at least 3–5 indicators per dimension to adequately capture that aspect of sustainability . Data harmonization is a critical step – given that sources vary, we establish common definitions and units to ensure comparability (leveraging processes similar to the Global Tracking Framework for SDGs where multiple agencies agree on metadata standards) .

Drawing on the TDI experience, the tracker will employ scoring and normalization techniques to enable aggregation of indicators into dimension sub-indices and potentially an overall index . For example, within the Accessibility dimension, indicators like urban transit access and rural access can be combined (with appropriate weighting) to yield an “access score” for each country. A 0–100 scoring scale or a tiered rating (e.g. gold/silver/bronze) may be used for intuitive communication of results . However, we are mindful to maintain transparency in how scores are calculated – any composite index will be accompanied by clear documentation of normalization, weighting, and aggregation methods, potentially drawing on methodologies of well-known indices (such as the SDG Index or WEF Global Competitiveness Index) . Policymakers appreciate headline indices for their simplicity , but the rich underlying data will always be accessible for nuance. In sum, the methodology balances quantitative rigor (ensuring data quality and appropriate index construction) with practical usability (delivering clear messages about where each country stands and what needs improvement).

2.4 Dashboard Development and Implementation

2.4.1 Global Tracker Dashboard (Prototype Design)

The Sustainable Mobility Tracker is being implemented as an interactive dashboard and data platform that allows users to explore country performance across all the sustainability dimensions. The global tracker dashboard is still in prototype form, under active development, but its design incorporates several key features and methodological pillars:

- Integrated data platform: The dashboard aggregates data from numerous sources into a cohesive system. Rather than reinventing the wheel, it leverages existing databases and models – combining them in an open "system of systems" . For example, it pulls in baseline energy and emissions figures from the IEA Mobility Model to populate the Climate dimension , uses the World Bank's and regional development banks' indicators for Accessibility and Safety (such as the Rural Access Index and road safety stats) , and incorporates specialized datasets like the European Alternative Fuels Observatory for EV adoption in the Innovation dimension . By integrating these disparate datasets, the platform ensures consistency and broad coverage: as of the prototype, we have compiled data for an initial set of ~20 countries to test the framework, with automated pipelines being set up for sources like IEA, ADB, and others in preparation for scaling up . All data in the platform is being organized with open metadata, and the aim is to provide public access to the underlying data through downloads or APIs, in line with the project's open-data ethos .
- Four Pillar Methodology: Beyond the data layers, the tracker's implementation is structured around *four methodological pillars* that provide a 360° view of progress . These pillars ensure the dashboard is not just a collection of numbers, but a comprehensive tool linking outcomes with actions and forward-looking analysis :
    1. Quantitative Indicator Tracking (Pillar 1) – This is the backbone, covering the *"What is happening?"* through hard metrics and indicators across all dimensions . The dashboard presents these in the form of country scorecards, time-series charts, and heatmaps. Users can see, for example, a country's score or rating on Accessibility or Safety and compare it to regional or income group averages. The prototype includes visualization like interactive maps of emissions per capita, bar charts of modal shares, and trend lines for fatalities, etc. The indicator data is updated on an annual cycle (with some high-frequency data updated more often if available) to provide up-to-date tracking . Benchmarking features allow identifying leaders and laggards at a glance (e.g. highlighting top 10 and bottom 10 countries on each dimension).
    2. Qualitative Policy Assessment (Pillar 2) – The dashboard also evaluates the *"What is being done?"* by cataloguing policies and measures each country has in place . This pillar introduces a qualitative scoring of policy frameworks: for instance, the prototype includes a checklist of key sustainable mobility policies (electric mobility targets, fuel economy standards, national urban transport plans, public transport investment programs, road safety laws, etc.) with an assessment of their status and

ambition in each country . In the dashboard, this appears as a “policy readiness” score or a traffic-light indicator next to the outcome metrics – e.g., a country might have a red mark on clean transport policies if it lacks EV incentives or fuel economy regulations, even if its current emissions are low. The information for this pillar is gathered from sources like government reports, international databases, and expert input. By integrating policy data, the tracker dashboard lets users drill down from outcomes to the underlying policy drivers, enabling an understanding of *why* a country is performing a certain way and whether it is on track to improve . In the prototype, a user can click on a country’s safety score and see a note like “Red: No national road safety strategy; speed limit law only partial” – highlighting gaps that need addressing.

3. Scenario Analysis & Trajectories (Pillar 3) – To address *“Where are things heading?”*, the tracker includes a forward-looking component . Although still being refined, the concept is to incorporate scenario modeling for each country or region: for example, the dashboard can display a Business-as-Usual (BAU) trajectory vs. a Sustainable scenario for transport CO_2 emissions or mode share to 2030 . In the prototype, we have begun integrating scenario data from IEA and ITF – such as the IEA’s 2030 EV adoption projections and the ITF’s global transport outlook – to illustrate the gap between current trends and where they should be to meet global targets . For instance, a country page could show: “At current policies, transport emissions in 2030 will be X million tons, which is 20% above the level needed for a 1.5°C pathway” . Visually, this is shown via line graphs on the dashboard with two curves (current trajectory vs. required trajectory). The scenario pillar adds strategic context, highlighting the ambition gap and helping policymakers see the scale of change required. It effectively links short-term performance with long-term goals, answering whether a country is on course to meet 2030/2035 targets or if increased action is necessary .
4. Implementation & Action Tracking (Pillar 4) – Lastly, the tracker monitors *“What’s happening on the ground?”* in terms of real project implementation and tangible changes . This recognizes that having policies (pillar 2) is not enough – we must track execution. In the dashboard, this can be represented by indicators like infrastructure deployment (e.g. kilometers of BRT or metro actually built and operational, vs. planned) , vehicle deployment (e.g. number of electric buses in service), or qualitative case studies of pilot projects. The prototype includes a feature for “case study spotlights” – essentially short narrative boxes that highlight notable examples or pilot initiatives in each country . For instance, if Argentina rolled out a new bike-sharing program in several cities during the pilot phase, the dashboard can display a spotlight describing that initiative, including early results (e.g. ridership numbers, initial mode shift) and linking them to relevant indicator changes . This makes the data more tangible and action-oriented, moving beyond pure numbers to stories of change . By regularly updating these action indicators, the dashboard provides a feedback loop to see if on-the-ground efforts are materializing and contributing to progress . In effect, Pillar 4 turns the tracker into a living “action tracker,” ensuring the

Decade of Action is captured in real-world developments, not just in policy documents .

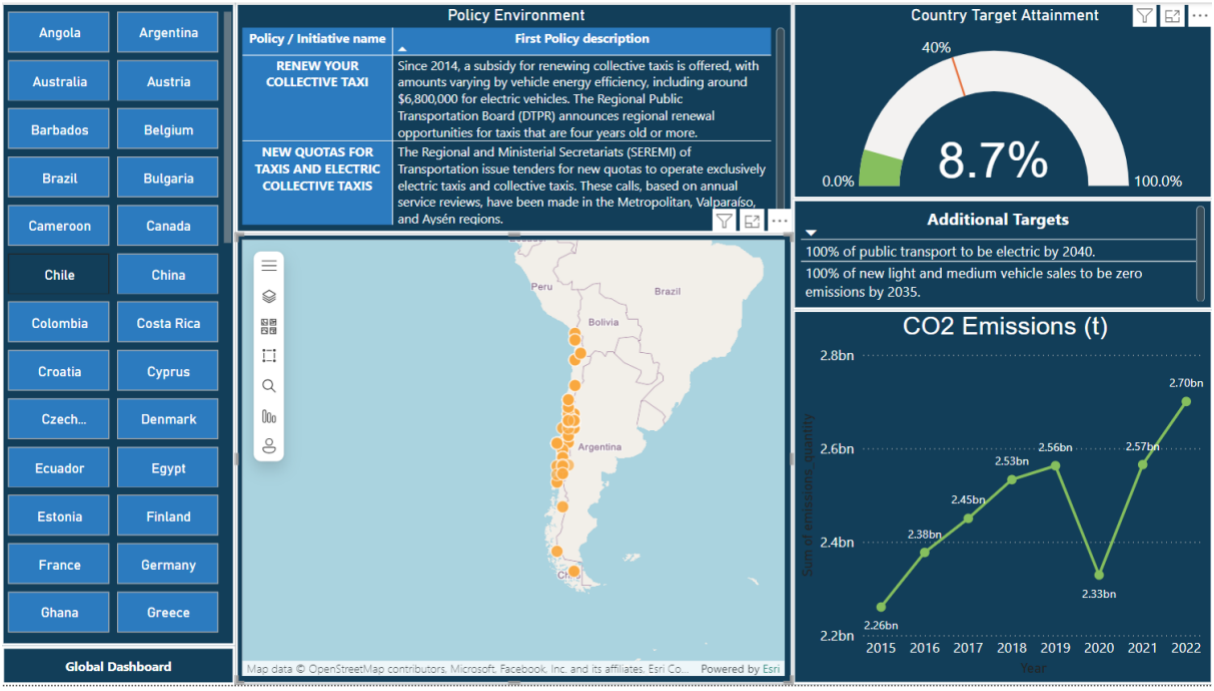


Figure 1 Global Dashboard Prototype (FIER, 2025)

Through these four pillars, the global tracker dashboard offers a comprehensive and dynamic interface. A user (say, a transport ministry official or an NGO advocate) can navigate from a high-level view – like a global map of overall sustainability scores – down to detailed country profiles that integrate all pillars. For example, a country profile might summarize quantitative scores (Pillar 1), then list key policies in place or missing (Pillar 2), show a chart of emissions trajectory vs. target (Pillar 3), and highlight recent projects or investments (Pillar 4) . This integrated narrative connects the dots between inputs, actions, and outcomes, helping stakeholders understand how, for instance, strong policies and investments (or their absence) are impacting the observed results . It also enables peer comparisons: countries can learn what mix of measures high-performing peers are implementing, and donors can see which countries are taking action versus which need a push .

The prototype dashboard is currently being tested internally with data for the pilot countries and a handful of others. Methodological validation is ongoing – for instance, fine-tuning the weighting of indicators in composite scores and ensuring the qualitative scoring is consistent via expert review. As the tracker evolves, all code and methodologies will be made open-source (e.g. on GitHub) to invite peer review and contributions . This transparency will build trust in the tool and enable external developers to create their own analyses or visualizations from the tracker's data. Ultimately, the global tracker dashboard is envisioned to be online and publicly accessible as a global public good, allowing anyone – from government officials to researchers to citizens – to explore the state of sustainable mobility and prompting a more data-driven dialogue on transport progress.

2.4.2 Zero Emissions Mobility Observatory (ZEMO) Latin America: Development, Implementation and Analytical Findings

Introduction and Rationale for ZEMO

Climate imperatives and technological advances are propelling a worldwide transition towards zero-emission transportation. In Latin America, governments are increasingly recognizing the need to adopt electric mobility solutions – including battery-electric cars, buses, and other vehicles – to meet environmental targets and modernize urban transport. However, a persistent barrier in the region has been the lack of centralized, reliable data and comparative insights to inform policy and investment decisions. Until now, Latin American countries largely developed e-mobility policies in isolation, with limited opportunities to benchmark progress against peers or learn from neighboring experiences. This fragmented approach often left policymakers dependent on information provided by industry stakeholders or ad-hoc national studies, resulting in uneven progress and missed opportunities for regional coordination.

The success of the European Alternative Fuels Observatory (EAFO) in Europe provided a compelling inspiration to address this gap. EAFO demonstrated that a multi-country observatory can significantly enhance policy learning by enabling cross-country comparisons on key metrics such as EV adoption rates, charging infrastructure deployment, and regulatory measures. European policymakers have benefited from seeing how others perform – gaining practical insights into which strategies work and which challenges are common – thereby accelerating the collective transition across EU member states. Recognizing this model, Latin American stakeholders and international partners saw the potential for a similar observatory in the Latin America region to catalyze progress.

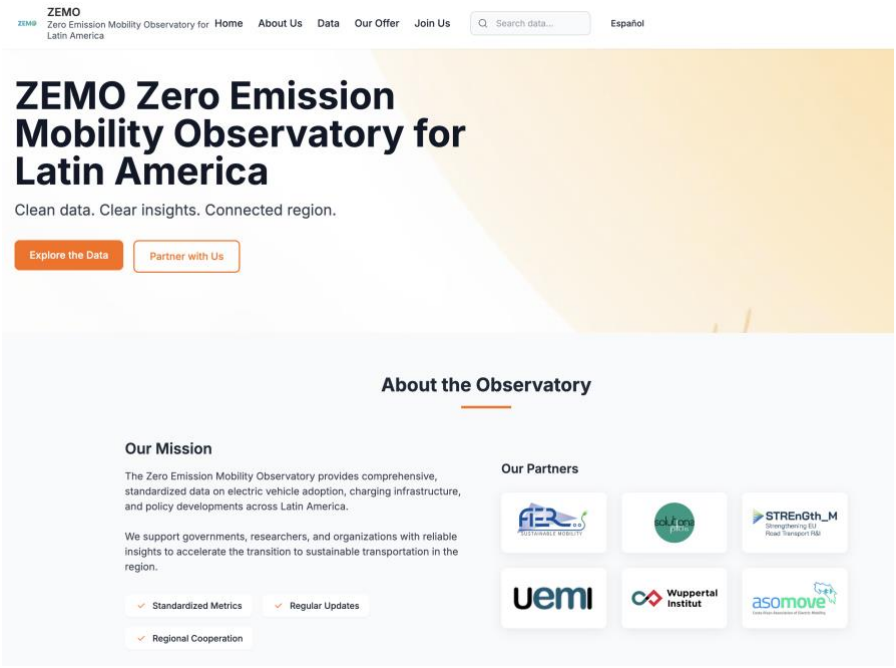


Figure 2: Landing Page of ZEMO (FIER, 2025)

Zero Emissions Mobility Observatory (ZEMO) Latin America was conceived to fulfill this need. It is designed as a neutral, knowledge-driven platform dedicated to zero-emission mobility and electric road transport in the Latin American context. The rationale for ZEMO is grounded in the idea that transparency and shared learning can be powerful drivers of change. By gathering data from across the region and presenting it in a standardized, easily accessible format, the observatory allows countries to identify regional trends, spot leadership examples, and objectively assess where they stand in the transition. For example, a policymaker in one country can use ZEMO to see how a comparable country has achieved higher electric bus uptake or deployed more charging stations, prompting consideration of similar measures locally.

Moreover, ZEMO's focus on zero-emission mobility (primarily battery electric vehicles and related technologies) aligns with the pressing climate and air quality goals of the region. Latin American cities suffer from some of the world's worst urban air pollution, and transport emissions are a major contributor. By emphasizing vehicles that completely eliminate tailpipe emissions, ZEMO underscores the region's commitment to leapfrog to truly clean mobility solutions (in contrast to incremental steps like hybrids or alternative fossil fuels). This clear focus also resonates with global climate commitments: many Latin American countries have included transport electrification in their Nationally Determined Contributions (NDCs) under the Paris Agreement. An observatory that tracks progress on zero-emission vehicles provides a concrete tool to measure and encourage fulfillment of those international pledges.

In summary, the rationale for establishing ZEMO Latin America is threefold: (1) to provide a trusted, comprehensive data repository on e-mobility for the region, (2) to enable comparative analysis and peer learning that can strengthen national policies and initiatives, and (3) to accelerate the transition to zero-emission transport by shining a spotlight on both successes and gaps. This initiative fills a critical void in Latin America's e-mobility landscape, supporting a shift from fragmented, country-by-country efforts to a more coordinated regional approach that can deliver faster and more cost-effective emissions reductions.

Strategic Objectives and Added Value

Strategic Objectives of ZEMO Latin America: The observatory was developed with clear strategic objectives that guide its activities and offerings. These objectives include:

- Provide Comprehensive Data for Decision-Making: Assemble and maintain a comprehensive database of zero-emission mobility indicators (e.g. EV sales and fleet size, charging infrastructure, policy measures) across Latin American countries. By ensuring data are up-to-date, accurate, and standardized, ZEMO aims to become the go-to reference that supports evidence-based decision-making for policymakers and planners.
- Facilitate Benchmarking and Policy Learning: Enable comparative benchmarking between countries on key performance metrics. By presenting indicators side by side, the observatory helps identify leaders and laggards in various aspects of e-mobility (for instance, one country's high EV uptake or another's extensive charger network). This fosters policy learning, as countries

can investigate the drivers behind strong performances and adapt successful approaches within their own context.

- Accelerate Regional Cooperation: Serve as a platform to foster regional cooperation and dialogue on sustainable transport. ZEMO brings together data and stakeholders from across Latin America, thereby encouraging collaboration among governments, industry, and civil society. A shared evidence base helps build a common understanding of challenges and opportunities, which is essential for coordinated initiatives (such as harmonizing charging standards or developing regional investment programs).
- Support Market Growth and Technology Adoption: By increasing visibility of market trends and progress, ZEMO indirectly supports the growth of the EV market and uptake of clean technology. Transparent data on sales, infrastructure, and policies can boost confidence among investors and consumers. For example, seeing a steady rise in EV adoption and government incentives across the region can signal to automakers and charging providers that Latin America is an attractive emerging market, thus drawing in more products and services.
- Align with Climate and Sustainability Goals: Ensure that the development of e-mobility in Latin America is tracked in relation to national and global climate targets. One objective of ZEMO is to link transport electrification progress with broader goals such as emissions reduction commitments, improved air quality, and renewable energy integration. The observatory therefore highlights indicators like CO_2 savings from EV uptake or the share of renewables in electricity (where relevant), reinforcing the message that zero-emission transport is a key component of sustainable development strategies.

Added Value and Uniqueness: In delivering on these objectives, ZEMO Latin America offers significant added value that sets it apart from other information sources or initiatives:

- Neutral and Public-Oriented Approach: ZEMO is established as a non-commercial, public-good platform. Unlike industry reports or private data services, it does not serve any commercial interest and is driven by the needs of the public sector and society. This neutrality bolsters trust – stakeholders can rely on the observatory's insights as unbiased and aimed at the common good. The platform is freely accessible, ensuring that even smaller municipalities, researchers, or NGOs can benefit from the data without barriers.
- Standardized Metrics and Methodology: A core value of ZEMO is the standardization of data across countries. The observatory implements common definitions and methodologies (in line with EAFO's approach) so that all indicators are directly comparable. This harmonization is a unique offering in a region where data have historically been apples-and-oranges between countries. For example, ZEMO ensures that an "electric vehicle" count means the same thing (e.g. including battery electric, possibly plug-in hybrids, and excluding conventional hybrids) everywhere, and that a "public charging point" is counted with consistent criteria. Such consistency increases the reliability of any comparisons or aggregated regional figures.
- Regional Coverage and Scale: ZEMO Latin America's scope – covering nearly the entire region – provides a scale of analysis that individual national efforts

cannot achieve. By aggregating data from multiple countries, ZEMO can highlight regional totals and averages, offering insight into Latin America's position globally (e.g. share of global EV fleet, regional growth rate) and internally (e.g. how the sum of Latin American EVs compares to other world regions). This big-picture view is valuable for international discussions and for attracting global support or investment to the region. The fact that the platform achieves 97%+ coverage of the regional market attests to its breadth.

- Integrated Platform with Multiple Functions: ZEMO is more than a static report or database – it is an interactive platform with varied functionalities (data dashboard, country profiles, policy library, etc. as detailed later). This integration means users can find both quantitative data and qualitative context in one place. For instance, a user can check a country's EV per capita figure and immediately also see a summary of that country's EV policies and targets. The added value here is in providing contextualized insights, combining numbers with narrative analysis. It saves stakeholders time and provides a more holistic understanding of each market.
- Community and Capacity Building: Through its "Join Our Initiative" and stakeholder engagement features, ZEMO adds value by cultivating a community of practice around e-mobility data. It's not just a one-way data repository; it actively invites government agencies, industry partners, and researchers to contribute data and share findings. This collaborative model helps build local capacity for data collection and analysis. Countries that engage with ZEMO may improve their own data systems and gain expertise by interacting with the platform's analytical tools and with peers through workshops. The observatory thus acts as a catalyst for a knowledgeable, interconnected stakeholder network in Latin America's e-mobility sector.

In essence, ZEMO Latin America's strategic objectives drive it to be a catalyst for informed action in the zero-emission mobility arena, while its added value ensures that it remains a trusted, widely-used resource that complements and strengthens existing efforts. By offering an impartial, comprehensive, and user-centric observatory, ZEMO fills a vital niche in Latin America's sustainable transport landscape – one that accelerates progress through knowledge sharing and collaborative insight.

Development Process and Link to STREnGTh_M

The development of the ZEMO Latin America observatory has been a multi-phase journey, closely intertwined with international cooperation initiatives and the objectives of the STREnGTh_M project. This section outlines the process from concept to semi-operational platform, highlighting how ZEMO was built, who was involved, and how it connects to the broader STREnGTh_M framework.

Initial Concept and Foundations: The concept of a Latin American e-mobility observatory emerged from the recognition of data and knowledge gaps in the region. Early groundwork was laid during the EU-funded SOLUTIONSPlus project (2020–2023), which focused on innovative e-mobility pilots around the world. Within that project, preliminary efforts were made to gather EV and charging data in select Latin American cities and countries, and a vision took shape for scaling this into a comprehensive regional observatory. By the end of SOLUTIONSPlus, a basic

prototype of a data platform had been formulated, and key partnerships were established – notably with FIER Sustainable Mobility (a technical lead that also manages EAFO in Europe) and regional actors like the Urban Electric Mobility Initiative (UEMI) and national EV associations. These early efforts provided proof of concept and a repository of initial data, essentially seeding ZEMO's development.

Role of STREnGTh_M: The Horizon Europe STREnGTh_M project (2023–2026) provided the necessary catalyst and resources to fully develop and launch ZEMO Latin America. STREnGTh_M, as a coordination and support action, aims to stimulate road transport research and innovation globally, and one of its focus areas is knowledge exchange on electro-mobility. Within this mandate, STREnGTh_M Work Package 4 (WP4) took up ZEMO as a key demonstrator for the Latin American region. The project consortium allocated expertise (data analysts, IT developers, policy experts) and funding to transform the initial concept into an operational platform. Over 2024 and 2025, under STREnGTh_M's umbrella, the ZEMO team worked on data collection expansion, platform development, and stakeholder engagement, ensuring that the observatory would meet both European Commission standards and local expectations.

Development Process: The creation of ZEMO involved several interrelated streams of work:

- Data Collection and Harmonization: The team embarked on an ambitious data collection campaign, reaching out to national transport ministries, vehicle registration authorities, and industry groups across Latin America. Using a standardized template (influenced by EAFO's data structure), historical and current data on EV registrations, fleet composition, and charging points were gathered. In cases where official data were sparse, the team partnered with local automotive associations or research institutions to obtain estimates and fill gaps. All incoming data underwent a rigorous harmonization process – cleaning and aligning to common definitions. This effort was intensive, given variations in how countries record categories (for example, one country might classify a plug-in hybrid as "electric" while another might not). By mid-2024, ZEMO had compiled a robust dataset covering most major countries in the region, enabling initial analytics to be performed.
- Platform Design and IT Development: In parallel, software developers and UX designers – coordinated by the technical partners in STREnGTh_M – built the online platform infrastructure. The design philosophy was to create an intuitive, interactive portal accessible to both experts and non-specialists. The team utilized modern web technologies to implement interactive charts, maps, and comparison tools. Bilingual support (Spanish and English) was integrated from the start to ensure usability across Latin America. By late 2024, a beta version of the ZEMO Data Dashboard was ready, allowing internal testing of functionalities such as filtering data by country or vehicle type, generating country profile pages, and retrieving policy documents. Feedback was gathered from a small group of stakeholders during this beta phase, leading to iterative improvements in both content and interface.
- Stakeholder Collaboration: Throughout development, close collaboration with stakeholders was maintained to guide the observatory's focus and ensure relevance. STREnGTh_M facilitated a series of regional workshops and

consultations in which representatives from Latin American transport ministries, city authorities, and key experts were invited to review the evolving platform. These sessions (conducted virtually and in person) provided valuable insights – for instance, stakeholders emphasized the need for including electric buses and two-wheeler data due to their importance in Latin cities, and they highlighted the benefit of a policy repository alongside numeric data. The development team incorporated this feedback, expanding the data model and adding a Policy Database section to ZEMO. The stakeholder engagement also helped in trust-building: countries became more willing to share data once they felt a sense of co-ownership in the observatory.

- Alignment with EAFO Methodology: From the outset, a guiding principle was to align ZEMO's methodology with the well-established EAFO (European Alternative Fuels Observatory) framework, while making necessary regional adaptations. This meant that the team frequently consulted EAFO's data definitions, indicators, and even code frameworks. For example, EAFO's categorization of vehicles (M1 passenger cars, N1 light commercial, M2/M3 buses, etc.) was adopted to classify Latin American vehicle data. Likewise, EAFO's methodology for counting charging infrastructure (distinguishing normal vs. fast chargers, public vs. private) influenced ZEMO's approach. However, adapting to Latin American realities required flexibility: unlike the EU, Latin America does not have a unified statistical system for vehicle registrations, so ZEMO had to accommodate a patchwork of sources. The team devised a methodology document explicitly noting where EAFO alignment is achieved and where bespoke solutions were used. For instance, annual vs. monthly data: EAFO often has quarterly updates from EU member states, but some Latin countries only release data annually, so ZEMO's data model had to handle mixed frequencies gracefully. Despite such differences, the overarching alignment ensures that the indicators produced by ZEMO are conceptually comparable to those in EAFO, laying the groundwork for potential cross-region comparisons in the future.

Connection to STREnGTh_M Objectives: The implementation of ZEMO under STREnGTh_M was not only about creating a tool for Latin America, but also about fulfilling the broader objectives of the project. STREnGTh_M's mission includes strengthening international networks and sharing European knowledge to accelerate global sustainable mobility. By developing ZEMO, STREnGTh_M demonstrated a tangible example of technology and knowledge transfer – taking a successful European concept (the observatory model) and tailoring it to a new regional context. The project facilitated this transfer through funding, expertise, and by convening the right partners (the consortium included European and Latin American organizations working hand-in-hand). ZEMO was showcased within STREnGTh_M as a flagship outcome, for instance during Multiplier Group meetings (gatherings of global transport experts advising the project). In these forums, the ZEMO platform was presented as part of the global progress on e-mobility data tracking, illustrating how STREnGTh_M is contributing not just to planning and research agendas, but also delivering concrete tools that will outlast the project itself.

Launch and Semi-Operational Status: By mid-2025, ZEMO Latin America transitioned from development to a semi-operational launch phase. The platform was made publicly

accessible via a dedicated website (with the domain zemo-la.com), and an official announcement was coordinated through STREnGTh_M channels and regional partners. At launch, ZEMO featured core datasets and baseline analytics for around 18 countries. It was termed “semi-operational” to indicate that, while the platform was live and populated with extensive data, it was still undergoing refinements and expected to evolve with additional features. Users could explore the dashboard, but some planned functionalities (such as automated data updates or more sophisticated analytics) were scheduled for completion in the coming months. This phased launch allowed for gathering real-world user feedback while ensuring the data already available could start delivering value immediately.

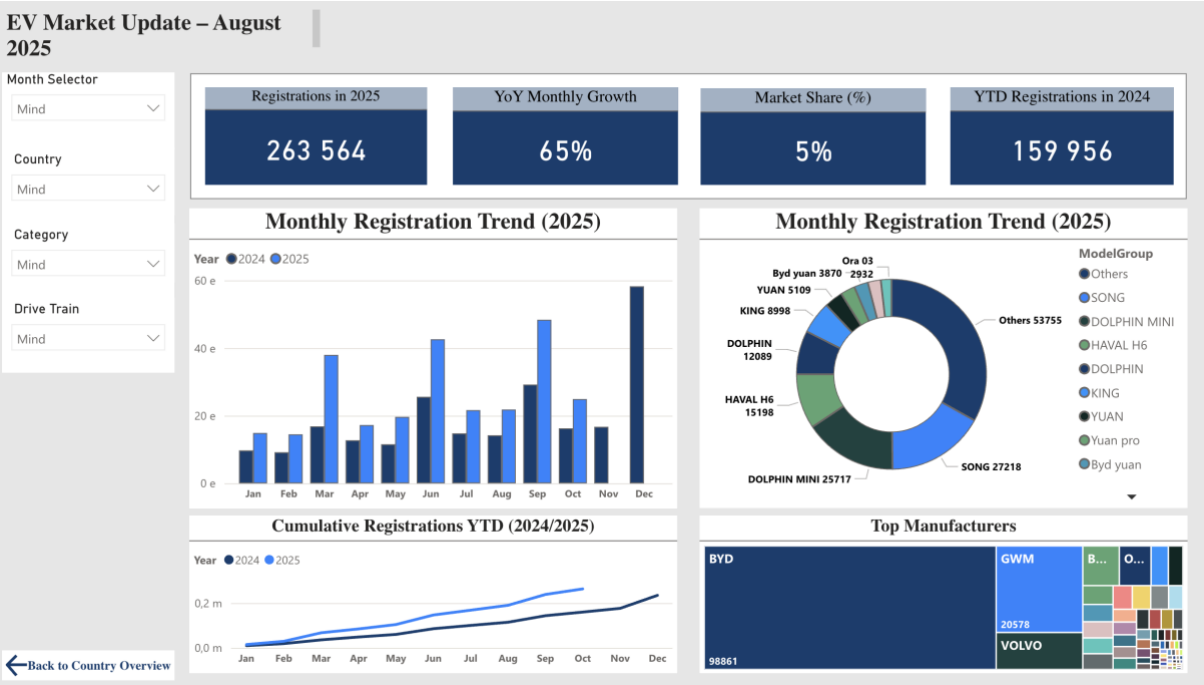


Figure 3 ZEMO Latin America Data Dashboard interface (FIER, 2025)

Following the launch, the development team (with STREnGTh_M oversight) shifted focus to maintenance and incremental improvements. Regular update cycles were put in place to incorporate new data as it became available (e.g., adding Q3 and Q4 2025 EV sales figures when released). Work also continued on back-end integration – for instance, exploring whether ZEMO could directly interface with certain national databases for automatic data feeds in the future. Meanwhile, STREnGTh_M deliverable D4.1 (this chapter) serves to document the process and initial outcomes of ZEMO, providing a formal record to the European Commission of how the platform was developed and how it contributes to the project’s aims.

In summary, the development of ZEMO Latin America was a collaborative, stepwise process, nurtured through international support and regional partnership. The link to STREnGTh_M was instrumental: it provided not just funding, but also the strategic context to ensure ZEMO is aligned with global sustainable mobility objectives. As a result, ZEMO stands as a legacy of STREnGTh_M’s efforts, exemplifying how Horizon Europe projects can deliver practical tools that empower regions outside Europe to advance their own clean mobility transitions.

Methodology and Data Model

A robust and transparent methodology underpins ZEMO Latin America, ensuring that the data collected are reliable and the indicators produced are meaningful for analysis. This section details the methodological approach and data model used by ZEMO, highlighting how data are sourced, organized, and standardized. It also emphasizes the alignment with the European EAFO methodology and the adaptations made for Latin America's context.

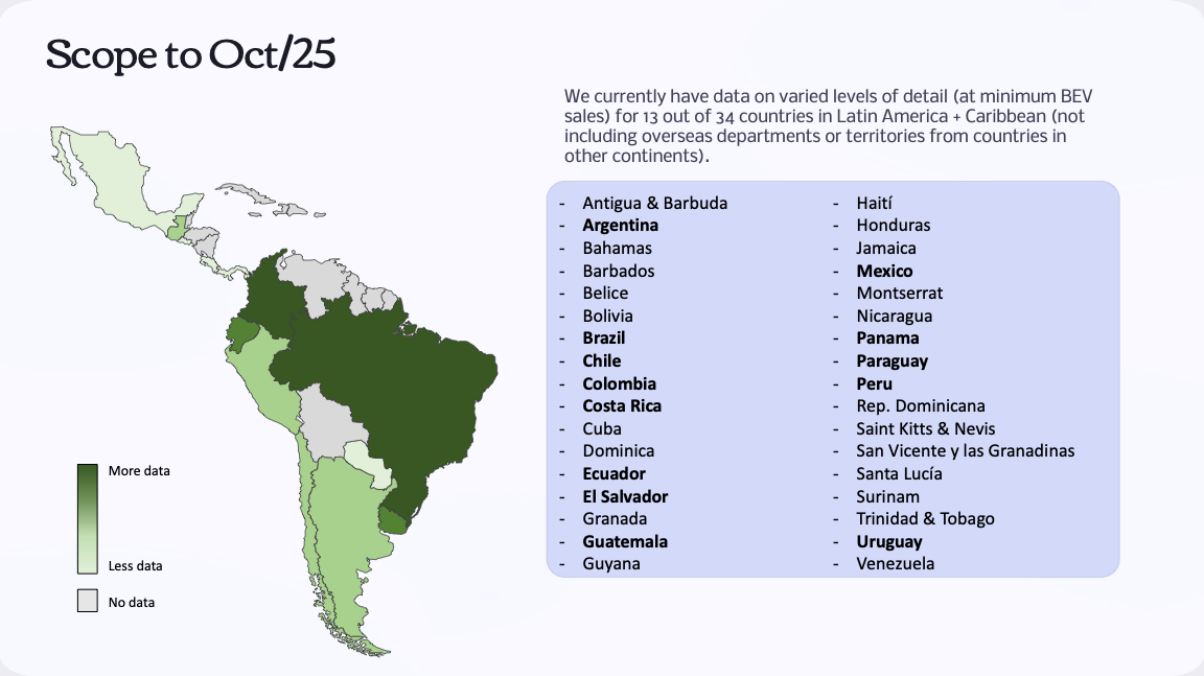


Figure 4 Data Coverage of ZEMO (FIER, 2025)

Data Scope and Sources: ZEMO focuses on key domains of zero-emission mobility data: (1) Electric vehicle fleet and new registrations, (2) Charging infrastructure, and (3) Policy frameworks. For each domain, specific indicators were defined. For vehicles, indicators include the total number of electric vehicles in use (fleet size), number of new electric vehicle registrations per period, and breakdowns by vehicle category and technology type. For charging, indicators include the number of public charging points (standard and fast chargers), and where possible, private/home charger estimates. Policy indicators cover the presence of incentives (financial or non-financial), targets (e.g. EV adoption targets, fossil-fuel vehicle phase-out dates), and regulatory measures (fuel economy standards, etc.).

Data for these indicators were gathered from nationally recognized sources to ensure credibility. For instance, new EV registration figures were obtained primarily from official government agencies such as national vehicle registries or transport ministries when available. In countries where such data was not routinely published, ZEMO partnered with national electric mobility associations or automobile manufacturers' associations (which often track sales of EVs among their members). The observatory also tapped into international datasets for cross-validation – for example, using figures from the International Energy Agency or the Latin American Energy Organization

(OLADE) as reference points to sanity-check the national data. Charging infrastructure data was typically sourced from national energy agencies or, in some cases, from operator associations (some countries have databases of charging station locations maintained by energy regulators or EV user groups). Policy information was collected via desk research and direct consultation with local experts, compiling laws, decrees, and published policy plans into a structured database.

Standardization and Data Model Design: Given the heterogeneous nature of sources, a major methodological task was to standardize the data. ZEMO's data model is structured around several key dimensions: Country, Time period, Vehicle category, Drive train type, and Metric. Each data point in the EV domain, for example, is identified by country (e.g. Mexico), time (e.g. year or quarter), vehicle category (e.g. M1 – passenger cars, N1 – light commercial vehicles, M2/M3 – buses/coaches, N2/N3 – heavy trucks, etc.), drive train (e.g. Battery Electric Vehicle – BEV, Plug-in Hybrid Electric Vehicle – PHEV, Fuel Cell Electric Vehicle – if any), and the metric (e.g. number of new registrations, or fleet in use). Organizing data this way allows for flexible querying – a user can filter the database to see, for instance, "2025 new BEV passenger cars in Brazil" or "total electric buses in Latin America cumulative to date".

To populate this model, raw data from sources were transformed to fit these categories. A common challenge was that not all countries report data in the desired breakdown. Some provided only total EV numbers without distinguishing types, or only annual aggregates. The ZEMO methodology addressed this by applying assumptions and interpolation carefully documented in the metadata. For example, if a country reports a yearly total of electric cars sold, ZEMO would distribute those across months if monthly granularity was needed for the dashboard (assuming a uniform distribution or using known quarterly patterns). All such assumptions are transparently noted in the platform's methodology notes. In terms of vehicle types, if data lumped BEVs and PHEVs together, ZEMO sought additional info (like import data or manufacturer data) to estimate the split, ensuring that the observatory highlights truly zero-emission vehicles (BEVs) distinctly from plug-in hybrids wherever possible.

Alignment with EAFO's definitions was maintained: the vehicle category codes (M1, N1, etc.) mirror the European system, and ZEMO adopted EAFO's practice of counting only road vehicles (excluding e.g. trolleybuses or off-road equipment). "Electric vehicles" in ZEMO generally refers to vehicles with the ability to drive solely on electric power – which includes BEVs and PHEVs for data comprehensiveness, although the platform's analysis emphasizes BEVs as the pure zero-emission subset. Fuel-cell vehicles are included in definition but currently their numbers in Latin America are negligible or zero, given the nascent state of hydrogen mobility in the region. Hybrid vehicles without external charging (HEVs) are not counted as "zero-emission" and thus excluded.

For charging infrastructure, a similar model was used: data points are characterized by country, time, charger type (e.g. normal AC charger vs. DC fast charger), and metric (number of chargers or charging outlets). ZEMO follows common definitions where a "charging point" typically refers to a single connector that can charge one vehicle, and multi-outlet charging stations count as multiple points if they can serve multiple cars simultaneously. If data sources reported only number of stations, ZEMO made

approximations to estimate charging points (e.g. assuming an average number of connectors per station, based on known installations).

Data Update Frequency: One methodological consideration is how frequently to update the observatory's data. Given the varying release schedules of sources, ZEMO adopts a mixed update frequency. Vehicle registration data is updated quarterly for most countries, aligning with many governments' practice of releasing quarterly statistics (or aggregated when only annual data exist, the update is done once per year). Charging infrastructure data is updated bi-annually (twice a year) because infrastructure grows at a steadier pace and new surveys are typically done yearly or semi-annually. Policy information is updated on a rolling basis – whenever a country enacts a new policy or revises incentives, the ZEMO team adds or updates the entry as soon as it's verified, ensuring the policy database is as current as possible.

All data in ZEMO's back-end are timestamped with their last update and source attribution (for internal records). This is important for transparency: although the platform's front-end doesn't show detailed citations, the deliverable and documentation list sources for each country (e.g., "Ministry of Energy, Chile – EV stock 2022" etc.). Users interested in source details can refer to ZEMO's methodological annex or contact the team.

Quality Control and Validation: ZEMO implements a multi-step quality control process. First, data collected from primary sources are cross-validated with secondary references. For instance, if Argentina's automobile association provides EV sales numbers, those figures might be cross-checked against import statistics or against global datasets (to ensure they are in a plausible range). Any discrepancies are resolved by reaching back to data providers for clarification. Second, once in the database, automated scripts check for outliers or inconsistencies (such as negative growth, sudden jumps that aren't explained by known events). When such anomalies are detected (e.g., a country's EV count drops from one year to the next, which could indicate a data issue), the team investigates – often these turn out to be re-classifications or corrections by sources, which are then annotated. Third, before any major publication or release (for example, an annual report generated from ZEMO data), an expert review is conducted. In STREnGTh_M's context, project partners from both Europe and Latin America reviewed country data sheets to catch any apparent errors or omissions based on their local knowledge. This peer review adds an extra layer of confidence in the figures disseminated.

Methodological Adaptations to Latin America: While ZEMO leans on EAFO's methodology, certain adaptations were essential to suit Latin American data realities:

- Handling Data Gaps: Not all Latin American countries have complete data series for EVs. Some markets are very new or data collection started only recently. ZEMO's approach is to include all available data points even if a time series is incomplete, rather than exclude a country entirely. For example, if Paraguay only has data from 2018 onwards (when EV incentives were introduced), ZEMO shows Paraguay's data starting 2018 and leaves earlier years blank, with a note explaining the start of data collection. This ensures that each country's progress is shown from the point it effectively began. It's an

inclusive approach that sacrifices a uniform timeline for comprehensiveness of country coverage.

- Localized Indicators: In addition to core indicators, ZEMO introduced a few localized metrics reflecting Latin American context. One such metric is “EVs per 100,000 inhabitants,” recognizing that in a region with wide population disparities, per capita measures can be insightful (Uruguay, for instance, might rank higher on per capita adoption than absolute numbers). Another is “Renewable Energy Share of Grid (%)” to contextualize how clean the electricity is in each country – since an EV in Costa Rica (with ~98% renewable electricity) effectively yields greater emissions reduction benefits than an EV in a country with a coal-heavy grid. Including this energy context was deemed important by stakeholders and is less of a focus in EAFO (given Europe’s integrated grid context). ZEMO thus combines transport data with energy data in some analytics to tailor insights for the region (e.g., highlighting that countries with high renewables stand to maximize the climate benefits of EVs immediately).
- Language and Accessibility: Methodologically, presenting data in Spanish (and Portuguese for Brazil, where possible) is an adaptation to ensure local usability. This goes beyond just translating interface labels; it means the methodology itself had to account for different units or terms. For instance, some sources report energy in “barrels of oil equivalent” or use local currency for EV prices in policy tracking – ZEMO converts and standardizes units (to kWh, USD, etc.) but also ensures that the platform can display information in the language/format familiar to local users (like using commas vs decimal points in numbers depending on locale).

Figure 5 EV adoption (market share %) by country, Q3 2025

The resulting data model powering ZEMO is both rigorous and flexible. It provides a harmonized view of Latin America's zero-emission mobility landscape while allowing users to drill down into country-specific details. By carefully marrying EAFO's structured approach with adaptations for data availability and local relevance, ZEMO's methodology ensures that insights drawn from the platform are accurate and policy-relevant. This methodological diligence is crucial, as the credibility of an observatory rests on the trust that its numbers and comparisons are sound. As ZEMO moves forward, the methodology will continue to evolve – for instance, considering inclusion of new data types (like EV battery recycling rates or grid impacts) – but always with a commitment to transparency and alignment with international best practices.

Platform Features and Functionalities

The ZEMO Latin America platform is designed as a user-friendly, feature-rich digital observatory that allows stakeholders to easily access and interpret data on zero-emission mobility. This section provides an overview of the main features and functionalities of the platform, illustrating how each component serves the

observatory's objectives. (Visual examples of these features will be included as figures in the final document to guide readers through the interface and capabilities.)

Interactive Data Dashboard: At the heart of ZEMO is the Data Dashboard, an interactive tool that visualizes key trends in EV adoption and infrastructure. Users can navigate through a range of charts and graphs displaying data such as cumulative EV fleet growth over time, monthly or annual new EV registrations, and charging point installations. The dashboard offers filters that enable customization – for example, a user can select specific countries or a subgroup (like "Andean countries" or "Central America") to compare their trajectories, or filter by vehicle category (to contrast, say, passenger car uptake versus bus uptake). The visuals are dynamic: hovering over data points reveals exact values, and charts can be toggled between absolute numbers and relative metrics (like percentage growth or per capita values). The design ensures that complex data is presented in a clear, digestible format for quick insight. For instance, a line chart might show the steep rise in EV stock for the region as a whole, with separate lines for top countries, highlighting divergence or convergence among them.

Country Profiles: For users interested in a deep dive into a single country, ZEMO provides dedicated Country Profile pages. Each country profile is essentially a summary dashboard and fact-sheet for that nation's zero-emission mobility status. It typically includes a brief narrative overview (covering context like the country's targets and market status), along with key statistics: total EVs in the country, EVs as a percentage of all vehicles or new sales, number of public chargers, EVs per charging point, and so on. These profiles feature charts specific to the country – such as a breakdown of its EV fleet by vehicle type, or a timeline of policy milestones in that country. They also list important national policy measures (e.g. tax incentives, subsidy programs, fuel economy standards) in a concise bullet form. The country profiles serve policymakers and analysts who want a one-stop snapshot for a particular context. They are also useful in presentations or reports; for example, a ministry official in one country might use their profile from ZEMO to illustrate their progress in a regional meeting.

Policy Database and Incentives Map: An important non-numerical feature of ZEMO is its Policy Database. This section is essentially a library of e-mobility policies across Latin America, catalogued in a searchable and comparable way. Users can query the database to see, for instance, all countries that offer purchase subsidies for EVs, or to list the import tax rates for EVs by country. Each entry in the policy database includes a policy title, type (e.g. financial incentive, regulatory measure, target/mandate, etc.), a brief description, the responsible authority, and the date of enactment or period of validity. To enhance usability, ZEMO offers a visual "Incentives Map" – a map of Latin America highlighting each country, where a user can click on a country to see a summary of active incentives and policies there. This map is color-coded based on an index (for example, a "Policy Support Score" that quantifies how comprehensive a country's policy framework is, taking into account number and strength of measures). Though qualitative, this feature quickly communicates where policy environments are most supportive or where gaps exist, complementing the quantitative data on vehicles and infrastructure.

Analytical Reports and Insights: In addition to real-time data access, ZEMO provides curated analytical reports and written insights to help interpret the trends. One feature

is an Annual Regional Report – a downloadable report (PDF) generated each year summarizing the state of zero-emission mobility in Latin America for that year. The report includes narrative analysis, comparative rankings (e.g., which countries saw the fastest growth, which have the highest charging density), and contextual commentary on factors affecting the trends (like economic conditions, new model launches, or international agreements). These reports are intended for a broad audience, including policymakers who may prefer a concise document or stakeholders who want a high-level takeaway without navigating the dashboard. Additionally, the platform's Insights section periodically publishes short articles or blog-style entries on topical issues (for example, "Snapshot: Q3 2025 EV Sales in the Top 5 Markets" or "Feature: How Chile Became a Leader in E-bus Adoption"). These pieces leverage ZEMO data but present it in a narrative form, often linking with current events (such as a newly announced policy or a notable investment in charging infrastructure).

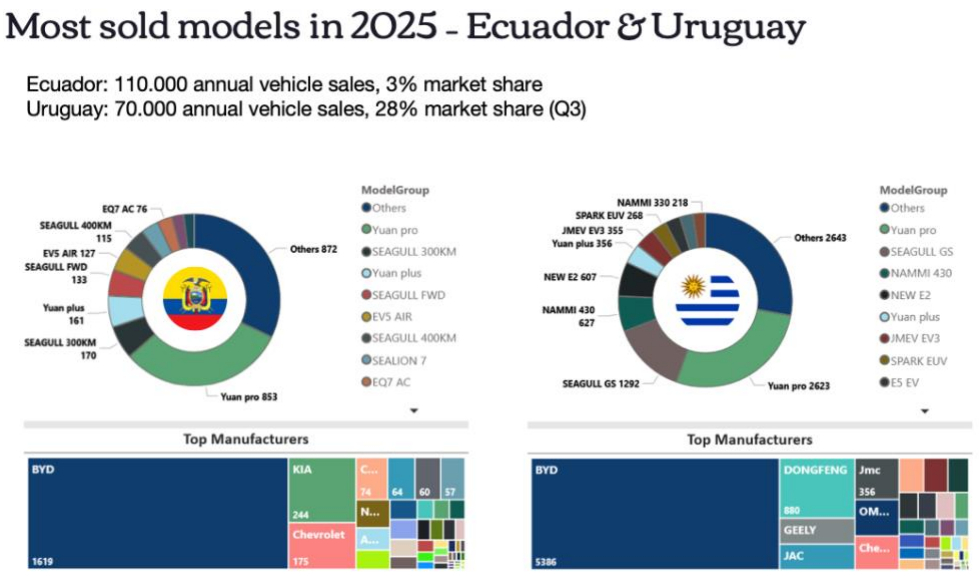


Figure 6 Country comparison tool in ZEMO (FIER, 2025)

Comparison and Benchmarking Tools: A core functionality that aligns with ZEMO's objective of facilitating benchmarking is the Country Comparison tool. This allows users to select multiple countries and multiple indicators and view them in comparative charts or tables. For example, one can easily create a bar chart of EV penetration (EVs as a percentage of new vehicle sales) for all Latin American countries for the latest year to see the ranking. Or generate a table comparing the number of public chargers per 100 km of road network in each country. The tool also can produce region totals or averages for reference. There are options to normalize data (per capita, per GDP, etc.) for a fairer comparison between large and small countries. These comparison outputs are especially useful for regional organizations or researchers conducting analyses across countries. To support further analysis, ZEMO even allows exporting data from these comparisons in common formats (CSV, Excel), respecting open data principles so that users can perform their own offline analysis if needed.

User Engagement Features: Recognizing that an observatory's value grows with its community, ZEMO includes features to engage users and encourage data exchange.

One such feature is the “Partner with Us” portal, where organizations can sign up to contribute data or collaborate. Through a form on the site, a local agency or company can indicate interest in providing data or case studies, which the ZEMO team will follow up on. Another feature is the Newsletter Subscription, by which users can receive periodic updates and highlights from the observatory (for example, an email digest of the latest trends or new content added). The platform also lists upcoming Events & Webinars (with links to register) that are organized as part of the ZEMO initiative – these events often revolve around capacity building or thematic deep dives (e.g., a webinar on “EV Charging Policies: Lessons from Latin America and Europe” featuring experts from both regions).

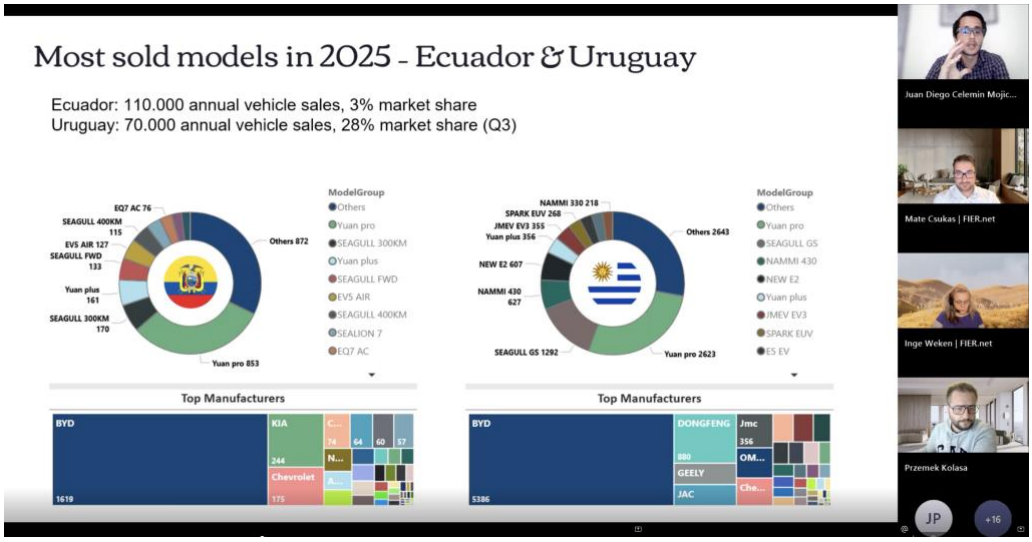


Figure 7 Snapshot of the ZEMO webinar held in November 2025 (FIER, 2025)

Multilingual Interface: To accommodate its audience, the platform is bilingual. Users can toggle between English and Spanish interfaces (with Portuguese content available for Brazil-related sections as needed). This functionality ensures the accessibility of information to local practitioners (who may be more comfortable in Spanish or Portuguese) while also allowing international observers and project partners (often using English) to navigate the platform. All static content and data labels have been carefully translated, and even dynamic data (like country names or policy descriptions) are presented in local language context where relevant (for example, a policy title might be shown in Spanish with an English translation in parentheses).

Mobile Responsiveness: The ZEMO website is built to be responsive to different devices. Many users, especially in some Latin American countries, might access information on tablets or smartphones. The design ensures that charts and maps reflow properly on smaller screens, with a simplified menu for navigation. While the full analytical experience is best on a desktop (given the complexity of some visualizations), the mobile-friendly design means that a quick check of a stat or reading an insight article can be done on the go, further broadening the platform’s reach and utility.

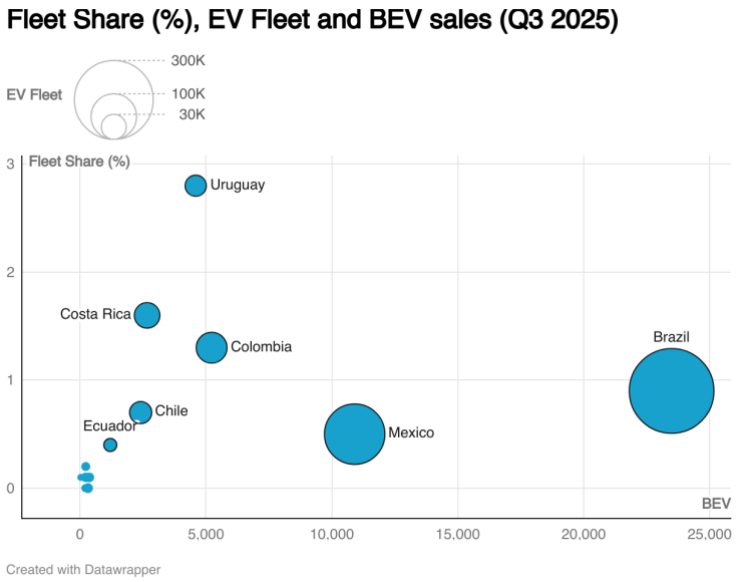


Figure 8 Example of country comparison chart – EV Fleet vs. Sales across select countries (FIER, 2025)

In summary, ZEMO Latin America's platform is a comprehensive toolset that goes beyond just listing numbers. Its features are deliberately crafted to enable exploration, comparison, and interpretation of data, catering to different user needs – whether one is a policymaker needing a country brief, a researcher looking for raw data, or an advocate seeking compelling visuals to raise awareness. By combining interactive dashboards, informative profiles, a rich policy library, and engagement utilities, ZEMO ensures that the data it holds can effectively inform and inspire action. Each functionality reinforces the others: data leads to questions, comparison provides context, context is enriched by policy info, and all of it is packaged in accessible formats. This cohesive user experience is vital for achieving the observatory's mission of being a catalyst for knowledge-driven progress in zero-emission mobility.

Regional Scope, Coverage, and Country Insights

ZEMO Latin America was designed to encompass a broad regional scope, ensuring that its insights reflect the diverse realities of the entire Latin American subcontinent. This section describes the geographic coverage of the observatory, the extent of data included, and highlights notable country-specific insights that have emerged from the analysis. By covering a wide scope, ZEMO enables both regional overviews and granular country-level understanding.

Geographic Coverage: The observatory's initial implementation covers Latin America in a comprehensive sense – from Mexico in North America, through Central America and the Caribbean (select countries), down to the southern cone of South America. In total, data from 18 countries are actively tracked in the current ZEMO platform. These include all the major economies and vehicle markets such as Brazil, Mexico, Argentina, Colombia, Chile, and Peru, as well as medium and smaller countries like Ecuador, Bolivia, Paraguay, Uruguay, Costa Rica, Panama, Guatemala, and Dominican Republic, among others. Together, these countries account for about 97.36% of the region's automotive market by total vehicle fleet and population, providing near-

complete coverage of Latin America's zero-emission mobility landscape. The remaining few percent corresponds to a handful of very small island nations or territories where data collection is still in progress or where EV uptake is currently negligible (and integration into ZEMO is planned in future phases).

It is important to note that Latin America is defined here primarily in terms of Spanish and Portuguese-speaking countries of the Americas. Some Caribbean nations (particularly those culturally and economically linked with Latin America) are included when data is available – for instance, the Dominican Republic is covered due to its significant size, whereas many smaller Caribbean island states are not yet in the database. The decision on scope was pragmatic: start with countries where data could be obtained and which together form a critical mass of the market, then expand outward. The future roadmap does include broadening to full Latin America and the Caribbean (LAC) coverage, working with regional bodies like OLADE and the Inter-American Development Bank to incorporate missing data.

Regional Aggregation and Overview: With this wide coverage, ZEMO is able to produce meaningful regional aggregate indicators. For example, the platform can sum up total EVs across Latin America, giving a regional fleet size that stakeholders can compare with other world regions. As mentioned in the executive summary, at the end of 2024 the region's aggregate light-duty EV fleet was around 444,000 vehicles. By mid-2025, this number has continued to rise, putting Latin America on track to surpass half a million EVs in circulation by the end of 2025. In terms of regional market share, EVs still represent a small fraction of total vehicles – roughly 0.3% of all light vehicles in use in Latin America by 2025 are electric, and around 2–3% of new light-duty vehicle sales in 2025 are estimated to be electric (this is a regional average; specific countries exceed this). These figures highlight that while growth rates are high, the transition is at an early stage relative to more mature markets like Europe, which is exactly why the observatory's role is crucial now to monitor and encourage progress.

Country Insights and Comparisons: Within the broad region, there is significant heterogeneity in zero-emission mobility progress. ZEMO's data reveal distinct clusters and standout cases:

- Brazil: As the largest country and economy in Latin America, Brazil dominates in absolute numbers. It accounts for over 50% of the region's EV fleet. By end-2024, Brazil had approximately 237,000 electric cars and light vehicles, reflecting rapid growth especially in the last two years. Brazil's EV market has been buoyed by factors like a growing availability of models (especially imports from Asia) and emerging local manufacturing of electric buses and light vehicles. While Brazil's EVs per capita still trail some smaller countries, its policy environment (including tax incentives and a new program to encourage domestic EV production) suggests continued strong growth. However, Brazil also faces challenges such as a need to expand charging infrastructure beyond its south-central corridor; currently, it holds a majority of the region's chargers, but those are concentrated in certain states.
- Mexico: Mexico is the second-largest EV market in the region with around 95,000 EVs (by end-2024) and growing. Mexico's transition has been somewhat slower in percentage terms, partly due to an initially limited policy push and the

high cost of EVs in the local market. However, recent developments – including the introduction of more affordable models and government signals toward electrification (like fuel efficiency standards and pilot programs for electric buses in Mexico City) – have accelerated uptake. Mexico also has a unique role as a manufacturing hub: several global automakers have announced EV production lines in Mexico, which may boost local availability in coming years. ZEMO's country data for Mexico show a notable jump in EV sales in 2025, indicating that the market is picking up momentum. One insight is that Mexico's proximity to the US and alignment with North American standards might influence its EV infrastructure roll-out (e.g., adoption of certain charging connector standards).

- Chile: Chile stands out as an early adopter and policy leader relative to its size. It has one of the highest EV per capita rates in South America and is especially notable for electrifying public transport. By 2025, Chile had deployed several hundred electric buses (particularly in Santiago's transit system), and it leads in setting ambitious targets (Chile's government has stated goals like 100% electric public transport by 2040 and phasing out conventional car sales by 2035). ZEMO data shows Chile's EV market share in new sales is among the top in the region, and the country has a healthy ratio of chargers to EVs thanks to proactive infrastructure programs. An insight from Chile's profile is how stable, supportive policies (like consistent import tax exemptions and a national electromobility strategy) can create a conducive environment for adoption even if the market is not the largest.
- Colombia: Colombia is another key market, distinguished by a strong uptake of electric buses and taxis through targeted initiatives. By 2025, Colombia has one of the largest fleets of electric buses in the region (particularly in Bogotá, which has integrated thousands of e-buses in its public transit). In the private vehicle segment, Colombia's EV growth is steady, aided by exemptions on value-added tax and circulation restrictions (electric cars are exempt from Bogotá's "pico y placa" driving restrictions). ZEMO highlights that Colombia's case demonstrates the impact of city-led action: municipal-level efforts (e.g., Bogotá, Medellín) have driven much of the progress, which is a slightly different dynamic from top-down national policy seen in other countries.
- Costa Rica and Uruguay: Both of these smaller countries punch above their weight in EV adoption. Costa Rica has been a regional environmental leader and was one of the first to enact comprehensive e-mobility legislation, aiming for a decarbonized transport sector by 2050. It offers financial incentives and has high public awareness of electric vehicles. Though its absolute numbers are modest (in the tens of thousands of EVs), Costa Rica's EVs per capita and EV share of new sales are among the highest in Latin America. Uruguay similarly has capitalized on its nearly 100% renewable electricity and favorable import policies to encourage EVs; it has a growing fleet especially of electric utility vehicles and some buses. ZEMO data for Uruguay shows an interesting trend: despite a small population, Uruguay's consistent policy (including government fleet electrification) has led to a steady climb in EV adoption, making it a case study in how even a small market can lead in certain metrics.
- Others: Countries like Argentina and Peru are in earlier stages. Argentina, for instance, only recently began seeing noteworthy EV numbers, hampered initially by economic difficulties and lack of incentives (although it has significant potential due to a large auto market and lithium resources for batteries). Peru

similarly is just starting to explore electrification, with a few hundred EVs and a focus on electrifying its public transport and two-wheeler segments. Panama and Dominican Republic have become interesting small markets, often serving as entry points in Central America and the Caribbean; Panama's Canal-related emissions goals and Dominican Republic's energy policies have spurred initial EV policies.

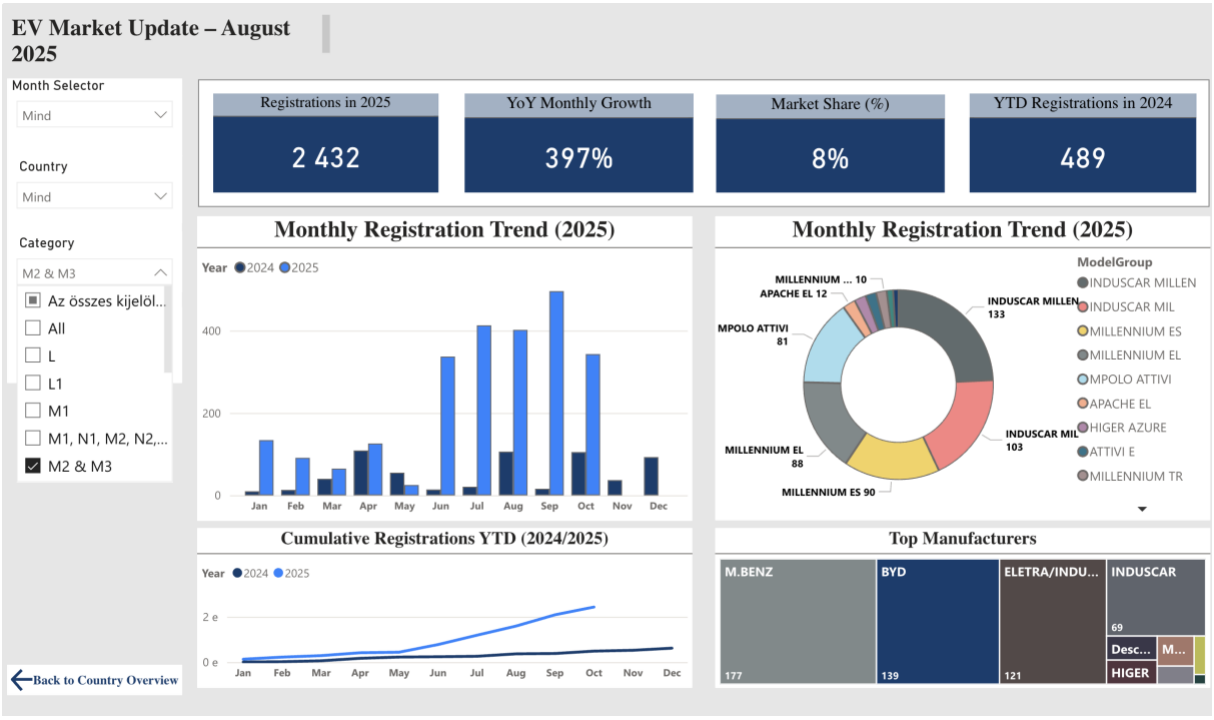


Figure 9 Electric bus sales and fleet size in selected countries (Latin America, 2025)

The ability of ZEMO to draw out these country insights side-by-side is one of its strengths. For instance, using the platform, one can quickly see the contrast between a country like Guatemala (where EV adoption is nascent but growing thanks to used import of EVs and solar charging projects) and a neighbor like Panama (which has more aggressive policy incentives and thus a higher uptake). These comparisons reveal that there is no one-size-fits-all narrative; rather, each country has a unique combination of drivers and barriers.

However, certain regional patterns do emerge from the aggregated data: EV adoption often correlates with higher income levels and government support, public transport electrification is advancing fastest where there is strong city leadership or international financing (e.g., development banks funding e-bus fleets in Colombia, Chile), and the diffusion of charging infrastructure tends to lag vehicle adoption outside of the top countries, indicating a potential bottleneck to address.

By capturing such a wide regional scope and enabling these insights, ZEMO Latin America proves its value in not only painting the big picture but also helping drill into specific stories. This dual perspective — macro-regional and micro-country — allows stakeholders to contextualize their own country's progress within the wider region. A country ministry, for example, can use ZEMO to show domestic progress and also

highlight, “look at how our neighbors are doing; maybe we can learn from X country’s policy or avoid Y country’s pitfalls.” In essence, the observatory’s coverage equips Latin America with a mirror to self-reflect at both national and regional levels, fostering a healthy competitive spirit and mutual learning in the pursuit of zero-emission mobility.

Charging Infrastructure and Best Practices Transfer

A well-developed charging infrastructure is a critical enabler for the mass adoption of electric vehicles. This section examines the status of charging infrastructure in Latin America as captured by ZEMO and discusses how the observatory is facilitating the transfer of best practices related to infrastructure development and broader e-mobility strategies. By highlighting what works in some contexts and sharing that knowledge, ZEMO contributes to elevating the entire region’s readiness for electric mobility.

Current Status of Charging Infrastructure: As of 2025, Latin America’s charging infrastructure is expanding, but unevenly and overall still at an early stage compared to the needs of a growing EV fleet. ZEMO data indicates that there are about 20,000 public charging points across the region (this includes both standard AC chargers and DC fast chargers). The majority of these installations are concentrated in a few countries: Brazil, Mexico, and Chile together account for roughly 90% of all public chargers in Latin America. For context, Brazil alone has thousands of charging points, many of which are in its southeastern corridor (São Paulo, Rio de Janeiro, etc.), often installed by utilities and private charging networks. Mexico’s chargers are likewise concentrated in urban centers like Mexico City, Monterrey, and along some highway corridors. Chile has a relatively dense network in its central region, thanks in part to government programs encouraging private sector roll-out and requiring new buildings to be charger-ready.

Outside of these leaders, charging networks in other countries remain small but are growing. Colombia, for example, has been rapidly installing fast chargers along the main logistics corridors as part of its national electric mobility strategy – focusing on enabling inter-city travel for EVs and electrified freight routes. Smaller countries like Costa Rica and Uruguay have also achieved decent coverage relative to their size (Costa Rica has a notable presence of fast chargers along its spine and at tourist destinations, aligning with its eco-tourism and green image; Uruguay has leveraged its state electricity company to deploy chargers even beyond the capital). On the other hand, countries like Peru, Paraguay, and Bolivia are just beginning to introduce public chargers, often as pilot projects in capital cities.

An important insight from ZEMO’s infrastructure data is the metric of charger-to-EV ratio. It varies widely: some countries have a high number of chargers relative to their EV count (for instance, Panama and Jamaica, as noted in recent analyses, have quite high ratios, possibly because they installed a baseline network ahead of demand), whereas others like Colombia or Uruguay have a lower ratio, meaning their EV fleets have grown faster than charger deployment, potentially signalling a need to catch up on infrastructure. The region’s average stands at roughly 1 public charger per 25 EVs (or 4 per 100 EVs) by 2024, but this average hides the distribution extremes.

Best Practices in Infrastructure Deployment: Through workshops and data comparisons, ZEMO has helped identify emerging best practices in charging infrastructure deployment in Latin America:

- Public-Private Partnerships (PPP): One successful model has been the use of PPPs to expand charging networks. For example, Chile's government partnered with private charging providers by offering co-funding and streamlined permits for stations, resulting in a rapid increase in chargers in key locations. Similarly, Costa Rica's utility ICE worked with private companies to create a national charging network, sharing costs and operational responsibilities. ZEMO's case studies highlight these models so other countries can consider adopting similar approaches.
- National Infrastructure Plans: Having a national master plan or roadmap for charging infrastructure is proving effective. Colombia's experience is illustrative: the government issued a nationwide plan that set targets for the number of fast chargers on principal highways and mandated certain infrastructure for new buildings. This top-down planning gave clarity to investors and ensured coverage beyond just the capital city. ZEMO's policy database references such plans (e.g., Panama's EV infrastructure roadmap, or Brazil's resolution on developing charging corridors) as examples that can be emulated.
- Grid and Standards Readiness: A technical best practice is ensuring electric grid readiness and standardization for chargers. Brazil and Argentina have been working on standards for connector types and communication protocols, often aligning with international standards (Combo/CCS, CHAdeMO, etc.). The observatory has shared findings on how adopting global standards (instead of region-specific ones) can attract international charger manufacturers and carmakers – lowering costs and ensuring Latin American EV users can benefit from global technology developments. ZEMO-organized webinars have brought experts from Europe (where common standards are enforced by the EU's Alternative Fuels Infrastructure Directive) to speak with Latin American stakeholders about regulations for interoperability and safety of charging.
- Integration with Renewable Energy: Given many Latin American countries have clean grids, integrating charging infrastructure with renewable energy sources is a best practice being pursued. For instance, in places like Costa Rica and parts of Brazil, there's emphasis on solar-powered charging stations or ensuring that EV charging load is matched with surplus hydro or wind capacity. ZEMO's analytical insights have pointed out examples like a solar EV charging corridor in northern Chile or pilot projects in the Dominican Republic coupling solar panels with EV chargers, underlining the dual benefit of supporting grid resiliency and reducing charging costs.

Knowledge Transfer via ZEMO: One of ZEMO's roles is to act as a conduit for sharing these best practices. It does so in several ways:

- Documentation and Case Studies: Within the platform and associated reports, ZEMO includes short case studies or spotlight sections on successful infrastructure initiatives. For example, a ZEMO insight might detail "How City X implemented a fast-charger network in 12 months – and lessons learned," covering factors like stakeholder coordination, regulatory support, and

financing. These are disseminated so that other cities or countries can draw parallels.

- Peer Learning Events: ZEMO and the STREnGTh_M project have convened peer learning sessions specifically on charging infrastructure. These events often feature speakers from one Latin American country that has progressed in an area, along with a European perspective. For instance, an event might pair a representative from The Netherlands (which has one of the world's densest charging networks) with a representative from Chile, to discuss how to scale up charging points, involve local municipalities, and incentivize private investment. By facilitating such exchanges, ZEMO helps transfer know-how directly from those with hands-on experience to those looking to implement similar solutions.
- Benchmarking and Targets: ZEMO's comparative data serve as a subtle but effective tool for knowledge transfer. When a country sees itself lagging in a certain indicator, it naturally spurs questions: "What are others doing differently?" For example, if Country A notices that Country B has twice as many chargers per capita, it may lead them to inquire into Country B's policies – which ZEMO likely has documented. This way, the data itself motivates a search for best practices, which the observatory can then facilitate through its policy info or expert network. Over time, this benchmarking can even inspire friendly competition, with countries striving to outdo each other in positive metrics like charger rollout.

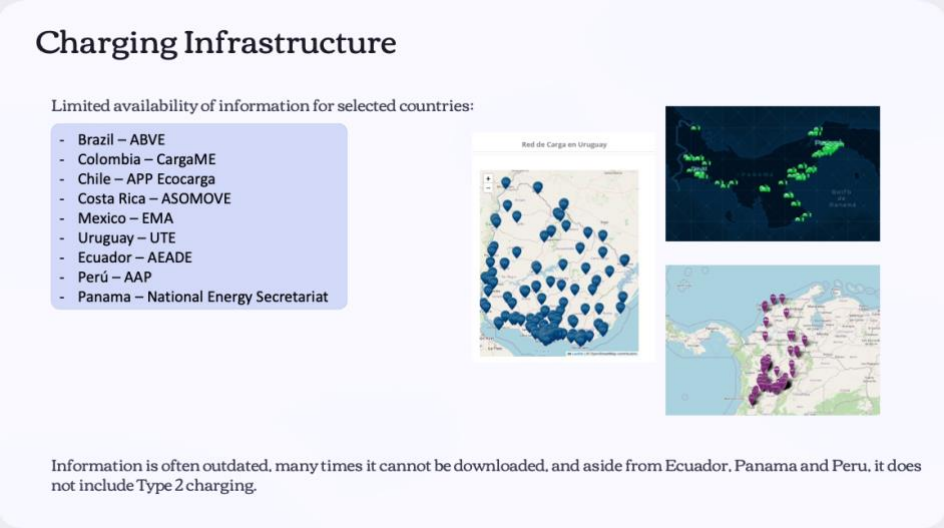


Figure 10 Distribution of public charging points by country (Latin America, 2024)

Challenges in Infrastructure Development: The section would be remiss not to note the challenges identified through ZEMO's monitoring of charging infrastructure. A common issue is the high upfront cost of installing chargers, especially DC fast chargers, which can be a barrier in developing economies without subsidies or external support. Additionally, bureaucratic hurdles (like lengthy permitting processes for grid connections) slow down deployment in several countries. ZEMO's lessons learned (addressed in the next section) will note these challenges and the strategies to overcome them. Another challenge is ensuring equitable distribution: many countries see a bias where chargers are deployed primarily in wealthier areas or capital cities, leaving gaps in coverage. Highlighting this pattern via maps and data, ZEMO provides

the evidence base for policymakers to recognize and address the infrastructure divide early on.

In conclusion, ZEMO Latin America not only tracks the what of charging infrastructure (the numbers and locations) but also delves into the how and why certain infrastructure strategies succeed. Through shining a light on best practices and fostering exchange of experiences, the observatory plays a supportive role in helping Latin American countries build out the charging networks required for a zero-emission future. As EV adoption continues to grow, this function of knowledge transfer around infrastructure will become increasingly important, ensuring that the availability of chargers keeps pace with the needs of EV users across the region.

Stakeholder Engagement and Capacity Building Activities

The success of the ZEMO Latin America observatory is not just a function of data and technology, but also of the people and organizations involved. A deliberate focus on stakeholder engagement and capacity building has been at the core of ZEMO's implementation strategy, recognizing that an observatory must be embedded in a community of users and contributors to remain sustainable and impactful. This section outlines the key stakeholder engagement efforts and capacity building activities carried out as part of ZEMO's rollout, and how these activities are strengthening the ecosystem for zero-emission mobility in Latin America.

Building a Network of Contributors: Early in the development of ZEMO, a network of national focal points was established. These focal points are individuals or teams in each participating country who act as liaisons for data and policy information. Often, they come from agencies like a Ministry of Energy or Transport, or from a national sustainable transport association. STREnGTh_M partners helped identify and recruit these focal points, leveraging existing contacts and regional forums. Through regular communication (emails, virtual meetings), the ZEMO team engaged these contributors to gather data, validate findings, and update on local developments. This network has grown to over 20 participating institutions, forming the backbone of ZEMO's data-sharing mechanism. Engaging these stakeholders not only provided data for the observatory but also built local buy-in – the focal points became champions of the observatory within their own countries, advocating for its use and continuity.

Workshops and Webinars: A series of capacity-building workshops have been integral to ZEMO's stakeholder engagement. In 2024 and 2025, multiple virtual webinars and a few in-person regional workshops were conducted. These sessions served dual purposes: training and consultation. For instance, an early webinar introduced the concept of EAFO and how ZEMO would mirror it; it walked participants through the types of data needed and the benefits of participation. Later workshops were more hands-on, effectively training attendees on how to use the ZEMO platform – how to navigate the dashboard, interpret graphs, and extract policy insights. One notable event was a regional training workshop in Bogotá in mid-2025, organized with support from UEMI and the Colombian government: representatives from a dozen Latin American countries' energy/transport departments attended. They received training on data analysis techniques using ZEMO and shared their experiences in policy implementation. These interactions improved user familiarity with the tool and also

allowed the ZEMO team to receive feedback on user needs, which fed into platform improvements.

Community of Practice and Knowledge Exchange: ZEMO, under STREnGTh_M's guidance, has fostered a community of practice around e-mobility data. Beyond formal workshops, a moderated online forum or mailing list was established where stakeholders can ask questions and share updates. This became especially useful for peer-to-peer exchanges – for example, a question like "Has anyone developed a template for EV registration data collection from dealerships?" might prompt another participant to share a template or method they use. The STREnGTh_M multiplier group also provided a channel for bringing in global experts to the conversation, enriching the community of practice with perspectives from Europe, Asia, and Africa (some members of the multiplier group include experts who could speak to how observatories or data portals work elsewhere, thus broadening the knowledge base for ZEMO's community).

Promotion and Awareness-Raising: Effective engagement also required promoting the observatory's existence and value to a broader audience. ZEMO participated in or was featured at various conferences and events. For example, at the Latin American Sustainable Transport Forum (a yearly high-profile event), ZEMO was presented in a dedicated session, garnering interest from city mayors and private sector attendees. STREnGTh_M's dissemination channels (like press releases via ERTICO and articles on partner websites) highlighted ZEMO's launch, which attracted media coverage in specialized outlets. The communication emphasized how local stakeholders – be it a policy maker or an EV enthusiast – could benefit from the platform, thus encouraging uptake. The observatory's team also actively engaged on social media (via project partners) to share quick facts or infographics derived from ZEMO data, thereby raising awareness and driving curious users to explore the site.

Local Capacity Enhancement: One of the more indirect but significant outcomes of ZEMO's engagement activities has been the strengthening of local capacity for data management. By working closely with countries to collect and report data, the observatory effectively provided on-the-job training to local officials in data collection methodologies and the importance of data-driven policy. In some instances, countries established or improved their own internal tracking systems as a result. For example, a transport ministry that previously did not segregate EV registrations in their database started doing so in order to regularly feed ZEMO with data – a capacity gain that will benefit them beyond the project. Moreover, in a few cases ZEMO facilitated technical assistance: e.g., sending experts to help a country design an EV registry or advising how to survey charging infrastructure nationwide. These targeted capacity-building efforts ensure that improvements in data quality and availability are sustained at the national level.

Stakeholder Diversity: ZEMO's engagement has not been limited to government actors. Recognizing that the EV ecosystem includes industry and civil society, the observatory invited a range of stakeholders to be part of the journey:

- Industry Partners: Companies in the automotive and energy sectors were approached, some of whom contributed data (such as aggregated anonymous

data on EV sales or charger usage patterns) and insights. In return, they gained access to the observatory's analytic outputs that could help in market analysis. Industry roundtables were held to discuss how ZEMO data might inform infrastructure planning or highlight market opportunities (for instance, identifying countries with untapped potential for certain EV segments).

- Academia and Researchers: The research community was engaged through academic workshops. Researchers were encouraged to use ZEMO data for studies, and some were involved in refining methodologies (for example, universities helped in modeling projections for EV growth scenarios). This not only expands ZEMO's analytical depth but also trains the next generation of experts in the region on using real-world data.
- NGOs and Public: Environmental NGOs and consumer associations interested in clean transport were included in outreach events, as they can amplify the findings from ZEMO in their advocacy. The general public, especially EV owners and enthusiasts, were targeted via simpler communications – e.g., "Did you know?" style infographics from ZEMO data shared on social media – to build a broader public support for EV policies.

Feedback Mechanisms: An engaged stakeholder base also means active feedback. ZEMO established feedback channels like surveys and direct contact options on the platform. Users have been able to submit suggestions (for instance, someone might suggest "It would be useful to see data on electric motorcycles, since in my country those are becoming popular"). The team takes such feedback into account for future data inclusion and feature updates. This iterative loop ensures the observatory remains responsive to user needs and stays relevant.

In conclusion, the stakeholder engagement and capacity building around ZEMO Latin America have transformed the observatory from just a data platform into a collaborative initiative owned by a community. By investing in relationships, knowledge sharing, and skills development, the project has increased the likelihood that ZEMO will be maintained and utilized well into the future. The more stakeholders see their input valued and their capabilities enhanced, the more they will champion the observatory's continuation and use its insights in their day-to-day work. This human and institutional dimension, nurtured through STREnGTh_M's efforts, is thus a vital pillar of ZEMO's sustainability and impact.

Initial Analytical Findings (Market Trends, Policy Status, Technology Adoption)

With ZEMO Latin America collecting and analyzing data across the region, a number of initial analytical findings have emerged. These findings shed light on market trends, policy status, and technology adoption patterns in the Latin American e-mobility landscape. This section presents a summary of these insights, providing an evidence-based narrative of where the region stands and where it is heading in the transition to zero-emission mobility.

Market Trends: The data confirms that Latin America's electric vehicle market, while starting from a relatively low baseline, is experiencing rapid growth. Key market trends include:

- Exponential EV Growth: As noted earlier, the total electric light-duty vehicle fleet in Latin America nearly tripled in the year 2024 alone. This is an extraordinary growth rate, making Latin America one of the fastest growing regions globally in percentage terms, albeit from a small base. A closer look at quarterly data reveals that momentum accelerated in the second half of 2024 and into 2025 – likely due to a combination of more model availability (many new EV models were introduced in late 2023/2024, particularly affordable ones from Chinese manufacturers) and heightened policy support post-pandemic as countries incorporated green recovery measures.
- Dominance of Light-Duty Vehicles but Diversification Beginning: The majority of EVs in the region are still passenger cars (M1 category), which is typical of the early market where individual car owners and fleet operators adopt electric sedans and SUVs. However, there's a clear uptick in other segments. Electric buses (M2/M3) saw significant additions, especially through fleet procurements in cities. By end-2024, Latin America had the largest e-bus fleet outside China, with Santiago, Bogotá, and São Paulo as major contributors. Electric two-wheelers and micro-mobility are also emerging in data – countries like Brazil and Colombia have begun to see electric motorcycles and scooters entering the market, used for delivery services and personal mobility; although ZEMO's initial data collection focused on four-wheel vehicles, plans are underway to incorporate two-wheeler statistics due to their growing importance.
- Foreign vs. Domestic Vehicle Supply: A notable trend is the role of imports in EV supply. A large portion of EVs being sold in Latin America are imported fully-built units, with China being a leading source. The data aligns with reports that Chinese brands (BYD, Geely, SAIC's MG, etc.) have gained substantial market share in countries like Brazil, Mexico, and Colombia because they offer competitively priced EV models. On the other hand, local manufacturing is nascent; only a few EV models are assembled in the region (some electric buses in Brazil and Argentina, a small number of cars in Mexico for export). This underscores a trend where Latin America currently relies on global EV markets for its transition, which has implications for trade policy and local industry development.

Figure 11 Sales and market share comparison (FIER, 2025)

- Market Share and Projections: EVs still constitute a small fraction of new vehicle sales overall (regional average in 2024 was about 1.5%, projected to reach around 3% in 2025). However, in certain niches and cities, the market share is much higher. For instance, in Costa Rica, one out of ten new cars sold in late 2025 was electric, a sign of what early market saturation could look like. ZEMO's modeling suggests that if current growth rates continue, by 2030 EVs could make up between 15-20% of new sales region-wide, which would align Latin America with global trends (given IEA's Outlook expects roughly 30% of new sales worldwide by 2030 in an aggressive scenario). However, these projections are highly dependent on continued policy support and cost declines.

Policy Status and Landscape: ZEMO's comprehensive policy database has enabled an analysis of the policy environment across the region, revealing the following:

- Widespread but Uneven Incentives: Nearly all the countries covered have at least one policy incentive to promote EV adoption, indicating broad recognition of e-mobility's importance. The most common measures are fiscal incentives: import duty exemptions or reductions for EVs (seen in e.g. Paraguay, Uruguay, and others), VAT or sales tax exemptions (Colombia exempts EVs from VAT, significantly lowering purchase cost), and reduced vehicle registration fees. Additionally, some countries offer income tax credits or cash subsidies (for example, not widespread, but a program in Chile provided direct subsidies for taxi electrification). However, the generosity and consistency of these incentives vary, which is reflected in varying adoption rates. Countries with stronger or multiple incentives (like Costa Rica, Colombia) have generally seen faster EV uptake than those with minimal incentives (like Argentina, which until recently had no national financial incentive beyond import duty variation).
- Non-financial incentives: The policy review shows that many Latin American cities and countries use non-monetary incentives such as license plate privileges (exempting EVs from driving restrictions that many congested cities impose on polluting vehicles), free or preferred parking for EVs, and permission for EVs to use bus or high-occupancy vehicle lanes. These have proven popular in urban areas to encourage early adopters. For instance, Mexico City allows electric and hybrid cars to be exempt from its "Hoy No Circula" program (no-drive days based on plate numbers), which has been a selling point for EVs there.
- Vehicle Import/Production Policies: On the regulatory side, a few countries are moving toward mandates or targets. Fuel economy and emissions standards are emerging: Brazil and Mexico are adopting tighter standards akin to those in the US/EU, which indirectly push automakers toward EVs in the long term. Zero-emission vehicle targets exist in some national strategies (e.g., Chile's target for 100% electric new public transport vehicles by 2035 and all new light vehicles by 2035, Costa Rica's decarbonization plan targeting 2050 full electrification). No Latin American country yet has a legislated ban on internal combustion engine (ICE) vehicle sales like some European countries do, but the strategy documents signal intent and are being watched as potential future regulations.
- Infrastructure and Support Policies: Many policies directly address charging infrastructure and user support. For example, several countries have mandates for new buildings to be EV-ready (Brazil's building code changes, some

Argentine cities' ordinances). Others offer subsidies or tax breaks for charging equipment import and installation. Additionally, a number of national development banks or green funds have launched financing lines for electric bus purchases or for companies to electrify fleets (e.g., BNDES in Brazil financing e-bus manufacturing, CABEI in Central America offering loans for EV projects). ZEMO's policy analysis indicates that where these financial instruments are active, they correlate with uptake in those segments (the spike in e-bus adoption in Colombia and Chile was tied to innovative financing models partly supported by such institutions).

- Regional Collaboration: Through the observatory's vantage point, one can also see a budding trend of regional cooperation on policy. For instance, Latin American countries have formed knowledge-sharing groups under organizations like the Electric Mobility Latin America Platform (a coalition under UNEP) and through MOUs (Memoranda of Understanding) like the "Driving Change Together" declaration some signed at climate summits. While these are not policies per se, they reflect political commitment. ZEMO's role in these has been to provide data that feed into regional progress reports, thereby linking policy commitments with actual data on outcomes.

Technology Adoption and Consumer Behavior: Beyond counts of vehicles and chargers, ZEMO's insights and stakeholder feedback give a sense of how technology adoption is unfolding:

- Consumer Preferences: Latin American consumers show similar concerns as elsewhere regarding EV adoption: upfront cost, range anxiety, and lack of infrastructure are cited as barriers. However, anecdotal evidence collected alongside data suggests perception is changing. EV models that fit local needs (for example, small city cars with moderate range but much lower cost) have sold well when available. The popularity of electric two-wheelers in some areas indicates consumers are willing to adopt electric mobility if it's affordable and practical for daily use (electric motorcycles in Colombia for delivery services are a case in point, driven by cost savings on fuel).
- Fleet and Commercial Adoption: There's a notable trend of fleet adoption – taxi operators, ride-hailing drivers, delivery companies, and bus operators are moving to electric in growing numbers, often supported by pilot programs or corporate sustainability goals. These fleet moves are important because they tend to utilize vehicles more intensively (achieving higher emission reductions per vehicle) and also because they raise public visibility of EVs. ZEMO's data on fleet programs (like number of electric taxis in a city, or logistics companies running electric vans) is limited at this initial stage but is a planned area for expansion as more information becomes available.
- Energy Integration: From the technology standpoint, Latin America's high renewable energy mix (over 60% of its electricity on average is from renewables, one of the highest in the world) means EV adoption directly ties into decarbonization more effectively. Some countries are exploring smart charging and vehicle-to-grid technologies, albeit in pilot stages. For example, Brazil and Chile have pilot projects for vehicle-to-grid (V2G) where parked EVs can feedback energy to support the grid. These remain experimental, but ZEMO's inclusion of renewable context in its analysis highlights how the

synergy between clean transport and clean energy is a key theme for the region. In terms of technology, Latin America might skip some transitional steps (like widespread plug-in hybrids) and leap to full electrification in synergy with renewable energy expansion.

- Challenges Observed: Initial findings also underscore challenges: high purchase price of EVs remains the number one barrier in many countries due to lower average incomes and the smaller scale of markets (which limits economy of scale benefits). Charging accessibility in multi-unit housing and public spaces is another issue, as many Latin Americans live in apartment buildings not originally equipped for EV charging. Some countries are dealing with lack of awareness or misinformation about EVs (e.g., concerns about performance or maintenance). The ZEMO project, through its outreach, noted that education campaigns and clear information can help overcome these—some countries have launched public awareness programs (like test-drive events, informational websites, etc.), which are catalogued in the policy measures.

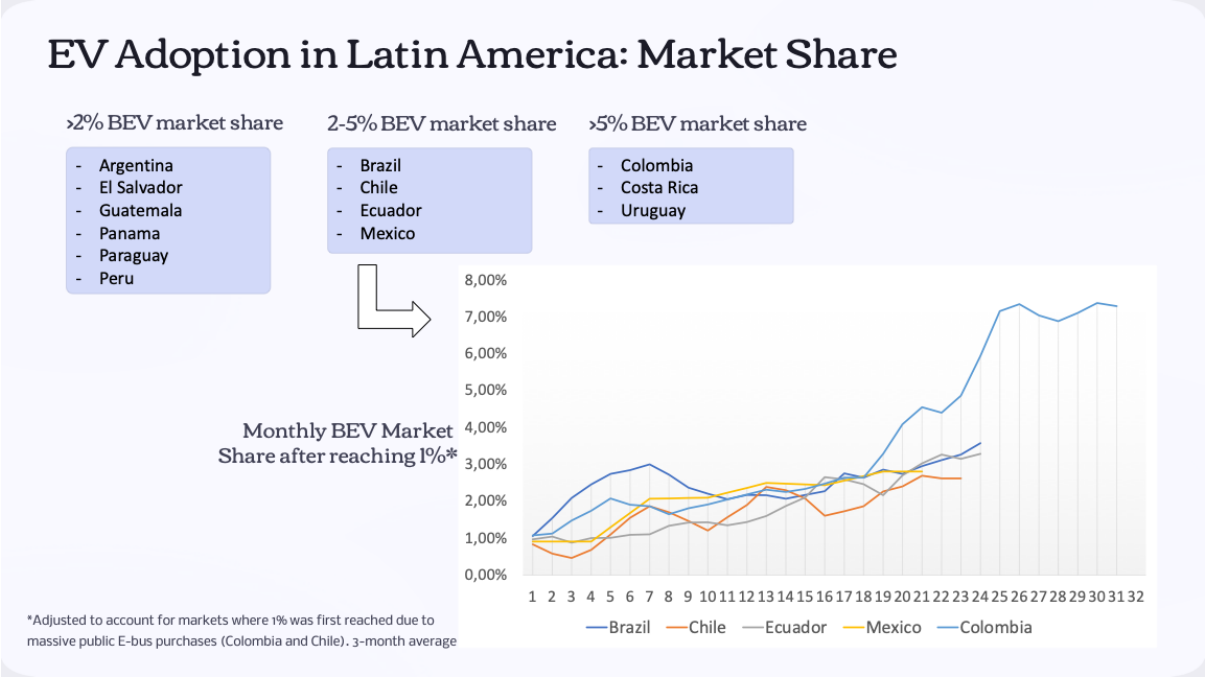


Figure 12 EV market share of new vehicle sales in select countries

In summary, the initial analytical findings from ZEMO Latin America paint a picture of a region on the cusp of a larger transformation:

- On one hand, growth is strong and the commitment to electrification is evident across policies and market uptake. Latin America is beginning to close the gap with more advanced EV markets in terms of year-on-year growth rates.
- On the other hand, the absolute levels of adoption are still low, indicating a vast room (and need) for expansion. The progress is also uneven; a few frontrunners are carrying much of the weight in statistics.
- Policies are proliferating, but their impact is directly tied to how robust and well-implemented they are – early evidence suggests that comprehensive strategies

(mixing financial, regulatory, and infrastructure measures) yield better outcomes.
- Finally, technology adoption trends hint that Latin America could leverage its unique strengths (like clean energy and high urbanization) to accelerate e-mobility, but only if challenges of cost and infrastructure are adeptly managed.

These findings provide a baseline for stakeholders: they highlight successes to reinforce (for example, continue supporting what's working in places like Colombia's bus electrification or Costa Rica's incentives) and pinpoint areas needing attention (like scaling up charging in lagging countries or improving incentive frameworks where adoption is slow). As more data accumulates, ZEMO will continue to refine these insights, helping ensure that policymaking and investments in the coming years are guided by an up-to-date understanding of trends.

Challenges and Lessons Learned

Implementing a regional observatory like ZEMO Latin America and gleaning insights from its early operation has not been without challenges. Along the way, the team encountered technical, organizational, and contextual hurdles. However, each challenge also yielded valuable lessons, which will guide future improvements of ZEMO and offer learning points for similar initiatives. This section outlines the major challenges faced and the lessons learned from each.

Challenges:

- Data Gaps and Inconsistencies: One of the foremost challenges was dealing with incomplete or inconsistent data from various countries. Some countries lacked historical data or did not track certain metrics (for example, exact counts of electric motorcycles or private charging units). Others provided data in formats that were hard to integrate (like cumulative totals without breakdowns, or data that combined hybrid and electric vehicles without distinction). This made it difficult to create a fully harmonized dataset. In a few cases, data would arrive late or not at all due to capacity issues at the source agencies. These gaps meant that for some indicators, ZEMO couldn't present a full region-wide picture initially.
- Resource Constraints: As a largely non-commercial initiative, ZEMO operated under tight resource conditions. There was a limited budget for data collection and platform development, meaning the team had to be strategic about where to allocate effort. Hiring full-time analysts in each country was not feasible; instead, the project relied on part-time contributions and goodwill of partners. This constraint sometimes slowed progress or limited the breadth of what could be immediately achieved (for example, a desired feature like real-time API integration with a country's open data portal had to be put on hold due to lack of resources to develop and maintain it).
- Technical Integration and Maintenance: Developing an interactive platform that aggregates data from multiple sources introduced technical complexity. Ensuring the platform's reliability and performance was challenging, especially as more data was added. There were instances of downtime or slow load times when heavy queries were run, pointing to scalability issues to address.

Integrating bilingual content also meant managing two versions of textual content for every page, doubling some of the content management effort. Additionally, maintaining data security and integrity (to avoid unauthorized data manipulation) required robust backend measures.

- Engaging Stakeholders Consistently: While many stakeholders were enthusiastic, keeping them consistently engaged over the project duration was a challenge. People change roles, priorities shift, and without a formal obligation, some focal points became less responsive over time. This risked data flows and the currency of information. Also, the range of countries means different levels of engagement – some governments fully onboard, others more passive – making the observatory's progress somewhat uneven across the region.
- Ensuring Policy Impact: Another challenge, more outcome-oriented, was ensuring that the existence of ZEMO actually translated into policy impact. Having data available doesn't automatically mean it will be used in decision-making. The team had to consider how to package insights in a way that busy policymakers would notice and trust. In the early phase, it wasn't always clear that data visualizations alone were influencing policy adjustments, indicating a need to strengthen advocacy and communication around the findings.
- Sustainability and Future Uncertainty: From day one, a looming challenge was how to sustain the observatory beyond the STREnGTh_M project's timeframe. Long-term financial and institutional sustainability needed to be addressed. Questions like who will host and fund the platform post-2026, how to keep data current without dedicated project funds, and who will own the governance of ZEMO remained partially unresolved in the initial phase. Without clarity on these, there's a risk that the platform could stagnate after the project ends.

Lessons Learned:

- Importance of Standardization (and Flexibility): A key lesson was the value of having a standardized framework (from EAFO) to structure data collection, combined with a flexible approach to accommodate what's available. The EAFO template gave clear guidance on what to collect, preventing scope drift. But equally, the team learned to be pragmatic – if a piece of data was unattainable, it's better to capture what can be and annotate the rest. For example, even if monthly data couldn't be collected, annual data was used and clearly flagged. This flexibility ensured that progress could be made without abandoning standardization goals.
- Local Partnerships are Crucial: The experience underscored that having local partners or champions in each country is indispensable. Whenever a country had a strong local partner (like an active NGO or a government champion for e-mobility), data collection and engagement were far more successful. Conversely, countries without a local champion lagged in providing data or using the platform. This taught the project that investing time in cultivating local ownership – possibly formalizing roles through MoUs or collaborative agreements – is worth the effort. It also suggests that future expansions (to remaining countries or new data types) should first identify and empower a local entity to lead the charge.

- Capacity Building Yields Data Benefits: One encouraging lesson was that capacity building pays off in improved data quality. In countries where ZEMO conducted training on data collection or collaborated to improve data systems, subsequent data submissions were more complete and timely. This virtuous cycle indicates that continuing to provide technical assistance and training can gradually reduce data gaps. It's not just altruistic capacity building; it directly benefits the observatory's completeness and accuracy. Thus, any observatory initiative should incorporate a capacity-building component as a core strategy, not an afterthought.
- User-Centric Design and Iteration: On the technical side, the iterative feedback loop with users was critical. The team learned that early user testing and continuous feedback led to significant improvements in the platform's usability. For example, initial feedback that the dashboard was "overwhelming" to first-time users resulted in adding a guided tour feature and simplifying the default view to a few key indicators. The lesson is that designing for the end-user (not just data experts) and being willing to adapt the interface and features according to user behavior is vital for adoption. Similarly, producing content in local languages and using intuitive visualizations made the platform more accessible – a reminder that technology projects in diverse regions must account for cultural and language nuances from the start.
- Communication and Advocacy Matter: The project learned that data needs a narrative to drive change. Simply publishing numbers isn't enough; contextualizing and actively communicating them is necessary to get attention. When ZEMO started releasing short briefs highlighting interesting findings (like "EV sales tripled – what's driving it?"), it garnered far more interest from officials and media than just the raw data release. This taught the team to embrace a role not just as data stewards but also as storytellers and advocates for zero-emission mobility, using the evidence as the backbone of those stories. For future operations, dedicating effort to communication (infographics, policy briefs, presentations at key meetings) is as important as the database itself.
- Strategic Alignment with Regional Agendas: A lesson on ensuring impact is to align the observatory's outputs with ongoing policy processes and regional agendas. For instance, feeding ZEMO insights into the timing of when countries update their NDCs (climate commitments) or when development banks consider funding e-mobility programs proved effective. It aligns the observatory with decision cycles and increases its relevance. Recognizing this, future strategy will involve proactively targeting such opportunities – essentially asking, "What upcoming decision or event would benefit from our data?" and then preparing a tailored analysis for it. This ensures ZEMO remains policy-relevant and not just an academic exercise.
- Governance and Sustainability Planning Early: On the challenge of sustainability, the lesson drawn is to plan governance and funding models early. By the time ZEMO was operational, it became urgent to decide its future, which is a discussion that ideally should have started even at design phase. The team now appreciates that possibilities like hosting the observatory under a regional institution (e.g., a Latin American energy or transport observatory umbrella) or setting up a multi-country foundation should be explored well in advance. Early engagement with potential long-term hosts or sponsors (like regional

development banks or multilateral organizations) is key. The lesson is that technical success must be matched with an institutional home to endure.

Addressing Challenges Moving Forward: The combination of challenges and lessons is feeding directly into an improvement plan. Data gaps are being addressed by doubling down on capacity building and outreach to lagging countries (lesson: local partnerships). Resource constraints are mitigated by seeking co-funding opportunities; for example, after demonstrating ZEMO's value, the team approached regional bodies and private foundations for support, and initial responses are positive (lesson: advocacy and alignment with agendas can unlock new support). Technical scalability issues are being resolved by optimizing the platform and considering cloud resources (potentially via in-kind contributions from tech partners). For stakeholder engagement consistency, formalizing the network through a "steering committee" of country representatives is being considered – so members have a sense of duty and recognition (lesson: governance planning). Ensuring policy impact will continue to rely on communication and aligning outputs with policy windows, as noted.

Contribution to STREnGTh_M Objectives and Global Alignment

The development and launch of the ZEMO Latin America observatory under the STREnGTh_M project represent more than just a standalone tool – they contribute meaningfully to the broader objectives of STREnGTh_M and resonate with global efforts towards sustainable mobility. This section elucidates how ZEMO aligns with and advances STREnGTh_M's goals, and how it is positioned within the global context of zero-emission transport initiatives.

Advancing STREnGTh_M Goals: STREnGTh_M (Stimulating Road Transport Research in Europe and around the Globe for Sustainable Mobility) has a multifaceted mission aimed at bridging research and innovation between Europe and other regions. One key objective is to enhance international collaboration and knowledge exchange in areas critical to decarbonizing transport. ZEMO Latin America is a concrete embodiment of this objective: it takes a concept proven in Europe (the observatory model for alternative fuels) and extends it to Latin America, thereby directly facilitating a transfer of know-how. In doing so, it strengthens the ties between European and Latin American stakeholders. European expertise (methodologies, technology from EAFO) was shared and adapted, while Latin American context and innovations (like bus electrification models, or incentive schemes) are now documented in a way that can inform European and global thinking. This two-way exchange exemplifies STREnGTh_M's role as a catalyst for globalizing innovation benefits.

Additionally, STREnGTh_M's focus includes mapping global research and identifying best practices worldwide. ZEMO contributes here by cataloguing Latin American best practices in e-mobility and feeding them into the project's knowledge base. For instance, ZEMO's findings on how certain Latin cities successfully rolled out e-buses become case studies that STREnGTh_M can highlight in its broader deliverables or events, enriching the global perspective with non-European experiences. Without ZEMO, many of these insights would remain scattered or anecdotal; the observatory aggregates and validates them, giving STREnGTh_M robust material to work with.

Moreover, STREnGTh_M aims to support the planning of future research and innovation actions. The analytics from ZEMO can help identify gaps and opportunities for future research or pilot projects in Latin America. For example, if data shows a lack of EV adoption in certain segments (like heavy-duty trucks), STREnGTh_M can flag that as an area where international collaboration or targeted research might be needed (perhaps an EU-Latin America project on electric trucking could be proposed). In that sense, ZEMO informs the strategic direction of cooperation by highlighting on-the-ground realities.

Integration into STREnGTh_M Activities: Throughout STREnGTh_M's implementation, ZEMO has been integrated into various activities:

- It was presented in Multiplier Group meetings as mentioned earlier, which helped solicit expert feedback and increase its visibility among international stakeholders.
- It features in STREnGTh_M's dissemination outputs, such as newsletters and on the project website, as a success story, thereby demonstrating the project's tangible outputs.
- STREnGTh_M's network helped bring in additional partnerships for ZEMO (for instance, connecting with African or Asian counterparts interested in similar observatories).
- The observatory's approach is likely to be referenced in STREnGTh_M's final recommendations to the European Commission on how Europe can continue to engage with global sustainable mobility efforts.

In summary, ZEMO contributes to STREnGTh_M by being a flagship pilot of how Europe's experience can be leveraged to create lasting tools in other regions, fulfilling the project's ethos of global outreach and collaboration.

Global Alignment and Significance: Beyond the STREnGTh_M framework, ZEMO Latin America aligns with and supports global initiatives and targets:

- Paris Agreement and National Commitments: By monitoring the transition to zero-emission vehicles, ZEMO provides a mechanism to track progress against climate targets related to transport. Many countries in Latin America cite transport electrification in their NDCs (Nationally Determined Contributions). ZEMO's data can be used to transparently report on NDC implementation for the transport sector. This adds credibility and accountability at the international level – for instance, at UN climate conferences, Latin American countries can reference ZEMO data to show what has been achieved and identify areas needing support.
- Global Climate and Clean Air Coalitions: ZEMO's focus on zero tailpipe emissions aligns with global efforts like the Climate and Clean Air Coalition (CCAC) which looks to reduce short-lived climate pollutants (including from transport) and initiatives like the Zero Emission Vehicle (ZEV) Declaration launched at COP26 (which many countries endorsed, aiming for all sales of new cars and vans to be zero-emission by 2040 globally, and by 2035 in leading markets). Latin American representation in these coalitions is strengthened by having concrete data – ZEMO provides that backbone, ensuring participation is

not just declarative but measurable. It also means Latin America can better coordinate with regions like Europe and North America that are part of the same global push by sharing data and strategies.

- Sustainable Development Goals (SDGs): The observatory indirectly supports several SDGs, particularly SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action). By focusing on sustainable transport data, it helps cities and countries evaluate progress on cleaner transport (SDG 11's urban air quality and mobility targets) and contributes to climate action tracking (SDG 13). Additionally, elements like capacity building support SDG 17 (Partnerships for the Goals), as ZEMO is essentially an international partnership delivering shared knowledge.
- Alignment with Other Observatories and Data Platforms: Globally, there are a few analogous platforms and data initiatives (for example, IEA's Global EV Outlook data, the Global EV Data Explorer, and regional observatories in development for other continents). ZEMO Latin America is part of this emerging ecosystem of data sharing. It aligns methodologically where possible (like adopting definitions consistent with IEA/EAFO, contributing data to global databases). In fact, ZEMO has been recognized by international agencies as a valuable regional node – for example, UN Environment and regional development banks have cited ZEMO as a model that could be replicated in Africa or Asia. Its alignment with EAFO means that in the future, a global network of observatories could be formed, where data from Europe (EAFO), Latin America (ZEMO), and potentially other regions are interlinked. STREnGTh_M has discussed this concept, and ZEMO serves as proof that it's feasible and useful.
- Encouraging Global Industry Participation: By providing transparent market data, ZEMO also aligns with the interests of global industry and investors who are looking for signals in emerging markets. It complements global market reports by adding granularity for Latin America. For example, a global EV manufacturer can consult ZEMO to refine their strategy for entering certain Latin markets, aligning their global business decisions with where the demand and policy support are greatest. This has a positive feedback on global EV deployment – manufacturers and charging companies may be more inclined to invest in a region if they have credible data suggesting a growth trajectory, which ZEMO provides.

Policy Coherence and International Support: The presence of ZEMO can help international organizations tailor their support to Latin America. For instance:

- The World Bank or Inter-American Development Bank might use ZEMO data to identify which countries are ready for large-scale EV financing projects.
- The International Energy Agency could incorporate Latin American trends more thoroughly in their Global EV Outlook by leveraging ZEMO as a data source.
- Bilateral cooperation (e.g., EU-Latin America dialogues on transport decarbonization) is strengthened because ZEMO gives a common reference point – European and Latin American counterparts can sit at the table with the same set of facts in front of them.

In conclusion, ZEMO Latin America, as realized through STREnGTh_M, serves a dual purpose: it fulfills the project's aims of sharing and enhancing knowledge beyond Europe, and it seamlessly fits into the global puzzle of efforts working towards a zero-emission transport future. It elevates Latin America's visibility in that global context by providing solid data and examples, thus ensuring the region's progress is recognized and supported. Conversely, it allows Latin America to benefit more from global trends, by being able to speak the same "data language" as others. This harmonization and collaboration across borders exemplify the spirit of STREnGTh_M and the Horizon Europe philosophy of tackling global challenges together. ZEMO's contribution is therefore not only regional but truly global in its impact.

Future Roadmap

Having established ZEMO Latin America as a semi-operational observatory with a strong foundation, it is crucial to look ahead at how the platform and initiative will evolve in the coming years. The future roadmap for ZEMO focuses on scaling up its capabilities, ensuring its sustainability, and maximizing its impact on the region's e-mobility transition. This section outlines the planned next steps and long-term vision for ZEMO beyond the scope of the current project deliverable.

Full Operationalization and Platform Enhancement (2026-2027): In the immediate post-project phase, the priority is to transition ZEMO from "semi-operational" to fully operational. This includes:

- Completing Feature Roll-out: A few advanced features that are in development will be launched, such as automated data feeds for countries that have open data portals, more sophisticated analytics (e.g., a tool for scenario modeling where users can adjust assumptions like EV growth rate or policy effects to see potential future states), and a more interactive map interface for spatial analysis of infrastructure.
- Incorporation of Additional Data: Plans are in place to expand ZEMO's data scope. This includes integrating electric two-wheeler and three-wheeler data, which in some Latin American cities (especially for motorcycles and tuk-tuk style vehicles) could be significant. Another addition will be data on heavy-duty electric vehicles (like trucks) as those start to appear, and possibly data on hydrogen fuel cell vehicles and infrastructure if any pilot programs emerge in the region (some countries are exploring hydrogen buses and trucks). By broadening the dataset, ZEMO will maintain its relevance as the market evolves.
- User Experience Improvements: Based on ongoing feedback, iterative improvements to the user interface will continue. This may involve developing a mobile app or a lightweight version of the dashboard for even easier access, as well as translating materials into Portuguese (fully) and possibly French for parts of the Caribbean, to cover all major languages in the region.

Sustainable Governance Structure: A major element of the roadmap is establishing a governance and ownership model for ZEMO that anchors it in the region and secures its longevity. The envisioned model is to create a consortium or foundation composed of key regional stakeholders:

- This could take the form of a Latin America E-Mobility Observatory Association where member countries (through their ministries or agencies) formally participate. Each member might contribute a nominal fee or in-kind support (such as dedicating a staff member as data liaison) to maintain the observatory.
- Alternatively, hosting ZEMO under the umbrella of a respected regional institution is being explored. Candidates include organizations like OLADE (Latin American Energy Organization) or CAF (Development Bank of Latin America), which have mandates aligned with sustainable energy and transport. Early talks, facilitated by STREnGTh_M partners, have indicated interest from these bodies in integrating ZEMO into their activities. By 2026, the goal is to finalize such an institutional home and sign an agreement that ensures ZEMO's data and platform will be maintained and updated as part of that host's program.
- Along with institutional anchoring, a governing board or advisory committee will be formalized. This body would consist of representatives from participating countries, key partners, and possibly international advisors (including someone from EAFO/Europe to maintain cross-regional linkages). The board would guide ZEMO's strategic direction, approve annual work plans, and oversee quality control.

Financial Sustainability: Hand in hand with governance is establishing a sustainable financing mechanism. Several avenues are planned:

- Membership Contributions: If a consortium model is followed, member countries or institutions would contribute annually. Keeping contributions modest and tiered by country size could ensure affordability while providing basic funds for a small secretariat and platform upkeep.
- Project Funding: Continuously seeking project-based funding from international sources (e.g., new Horizon Europe projects, GEF, Green Climate Fund, or regional programs) will supplement finances. ZEMO could become part of future technical assistance projects, where its maintenance is an activity funded by donors who see value in the data for guiding investments.
- Service Partnerships: While ZEMO remains non-commercial, there is potential for partnerships with the private sector for specific non-intrusive sponsorships (for example, an automaker or energy company might sponsor an annual report in exchange for a mention, without influencing content). Also, tailored analytical services could be provided to governments or banks (like a deep-dive report on a specific country) on a cost-recovery basis.
- A clear budget and resource plan will be drafted and agreed upon by late 2025, detailing how core operations (data updates, hosting, user support) are funded for at least the next 3-5 years.

Regional Expansion and Integration: The roadmap looks to expand ZEMO's reach both within and beyond the current region:

- Completing Regional Coverage: Efforts will be made to bring the remaining few Latin American and Caribbean countries into the fold. This means establishing data channels and profiles for nations not yet covered (including smaller Caribbean states if possible, and outliers like perhaps Cuba if data access improves). Even if EV numbers are small in these places, inclusion ensures a

truly comprehensive observatory and may encourage those nations to start tracking and promoting EVs.

- Integration with Other Regions: Inspired by ZEMO's success, there are already dialogues about creating similar observatories in Africa and Asia (possibly under the STREnGTh_M network or other collaborations). The future vision includes linking these platforms – for example, having a common interface or at least harmonized indicators so that one could eventually navigate from Latin America's data to, say, an Africa Observatory's data. While those initiatives are separate, ZEMO can play a mentoring role, sharing experiences with teams in other regions. If multiple observatories come online, an eventual Global Electric Mobility Observatory Alliance could be formed, which coordinates data standards and shares technical solutions. ZEMO is positioned to be a pioneering member of such an alliance, thereby keeping Latin America at the table in global discussions on EV data.
- Global Data Contribution: In line with integration, ZEMO aims to feed its data into global databases more systematically. By adhering to open data principles, ZEMO can allow global platforms (like IEA's data portal or UNEP's Global Electric Mobility Programme) to pull Latin America data directly, raising the region's profile. The roadmap includes developing APIs or data sharing agreements to facilitate this automatic exchange by 2026.

Enhanced Analytical Capabilities: As more data is collected over years, ZEMO will shift from just reporting historical data to also providing forward-looking analysis and deeper insights:

- Trend Analysis and Forecasts: The team plans to collaborate with modeling experts to use ZEMO data as a baseline for scenario modeling up to 2030 or 2050. This could result in an interactive "what-if" tool or periodic forecast reports that project EV adoption trajectories under various policy scenarios (e.g., "if every country adopted the incentives of the current best-in-class, EV share by 2030 could be X%").
- Impact Analysis: Leveraging data on emissions and energy, ZEMO can begin to calculate impacts – such as GHG emissions avoided so far due to EV uptake in Latin America, or oil import reductions achieved. Quantifying these impacts will strengthen the case for e-mobility in economic and environmental terms. By 2027, ZEMO might release a comprehensive "State of E-Mobility and Impacts in Latin America" report incorporating such analysis.
- Deeper Policy Research: With its trove of policy data, ZEMO can partner with academic or policy research institutions to conduct deeper studies: for instance, examining the effectiveness of certain incentive types by correlating them with uptake patterns, or studying socio-economic aspects like EV adoption in relation to income levels or urbanization. These studies would add qualitative depth to the quantitative data.

Continuous Stakeholder Engagement: The future roadmap ensures that stakeholder engagement remains active:

- Annual or biannual Regional E-Mobility Observatory Forums could be convened, where country representatives and stakeholders meet (virtually or in-

person) to exchange experiences, review the latest data, and renew commitments. These forums can be aligned with larger events (like LATAM mobility summits) to ensure high participation.
- Capacity Building 2.0: Going forward, training will not just cover using the platform, but also aiding countries in policy planning using data. For example, a workshop might train officials on how to use ZEMO's comparison data to justify a new incentive or to design a national EV roadmap with realistic targets gleaned from others' experiences.
- Public Outreach and Education: ZEMO will amplify efforts to educate the general public and special user groups (like journalists or educators). The idea is to produce easy-to-understand materials (infographics, perhaps an "EV in Latin America dashboard for schools") to spread awareness. The more the data is cited in media and public discourse, the more it supports a virtuous cycle of support for e-mobility.

Adaptation to Emerging Trends: The world of mobility is quickly evolving, and ZEMO's roadmap is flexible to adapt to new trends:

- If new technologies (like hydrogen fuel cell vehicles, or advanced battery swapping for two-wheelers) become relevant in Latin America, ZEMO will incorporate those into its scope.
- The observatory will also watch for and integrate with the shift towards mobility-as-a-service (MaaS) data, should that become a factor in electrification (e.g., tracking electrification of ride-hailing fleets or car-sharing pools).
- As data science advances, ZEMO will consider using more automated data collection methods, like scraping EV registration data where available, or using big data (e.g., data from connected vehicles or charging networks) if privacy and partnerships allow, to complement official statistics.

Long-Term Vision: In the long term, the vision is for ZEMO Latin America to be a permanent institution that is the authoritative reference for zero-emission mobility in the region. Much like how EAFO became an expected reference in Europe, ZEMO aims to be ingrained in Latin America's policymaking fabric. By 2030, one could imagine:

- Every major policy document or investment proposal in the region referencing ZEMO's figures for context.
- Latin America showing unified progress at international forums using ZEMO's consolidated data.
- The observatory expanding into a broader sustainability transport observatory (for example, could it later include data on other modes like rail electrification or even non-transport segments like stationary fuel cells? Possibly if it serves regional strategy).
- A new generation of data-savvy policymakers and analysts in Latin America who grew into their roles with ZEMO as an everyday tool, thus reinforcing data-driven governance.

The roadmap is undoubtedly ambitious, and achieving it will require continued collaboration, funding, and adaptability. However, the strong start under

STREnGTh_M and the momentum built in the initial phase give confidence that these future steps are attainable. The iterative approach – building on what works and addressing lessons learned – will guide the evolution. The future of ZEMO is envisioned not just as a website or a database, but as a living, evolving instrument of change, championed by Latin America for Latin America, with continued support and solidarity from international partners.

2.5 Link to Applied Research and Capacity Building

A key feature of the Sustainable Mobility Tracker's development has been the close integration of academic research with practical implementation, as well as a focus on building capacity through student and expert involvement. The project has leveraged insights from a recent Master's thesis research and the collaborative platform of the Urban Living Lab Center (ULLC) to ground the tracker in rigorous analysis while training new talent in the field.

This Master's thesis, completed at the Technical University of Berlin in early 2024, was explicitly aligned with the goals of the tracker. Conducted under the framework of the ULLC (a UN-Habitat collaboration center aimed at transformative urban sustainability solutions), the research set out to develop a conceptual framework for a composite indicator to measure progress toward net-zero transport in low- and middle-income countries . In effect, it asked very similar questions to those of this project: *What should a holistic sustainable mobility index include? Which dimensions and indicators are crucial? What open data sources are available for these indicators?* . By design, the thesis work was *"deliberately aligned with the objectives"* of ongoing decarbonisation indicator projects and with STREnGth_M's vision of a global tracker . This deliberate alignment created a two-way learning channel: academic research informed the project's methodology, and the project's needs shaped some of the research focus.

Contributions of the Master's research to the tracker: The student researcher performed an extensive review of existing sustainability indices and transport indicator sets – mapping over 230 potential indicators from initiatives around the world (e.g. SuM4All, SLoCaT's transport outlook, city sustainability indices) . This mapping directly fed into the selection of the tracker's indicator list, ensuring that our framework captured the best and most feasible measures identified by prior efforts. For example, the inclusion of indicators like the Rural Access Index and fuel economy was informed by this review, as they appeared in multiple reputable sources and met selection criteria. The thesis also examined methodological best practices for composite indices (drawing on guidance from the OECD/JRC handbook by Nardo et al. and others), which reinforced the importance of transparency, normalization, and validation in our approach . These principles have been baked into the tracker's methodology – for instance, we adopted a recommended practice of using at least 3–5 indicators per dimension to balance robustness and nuance , and we plan to follow a rigorous validation process (including sensitivity analysis) before finalizing any composite scoring, as suggested by the research.

Notably, the thesis developed an exploratory composite index (focused on South Asia and Africa) as a case study, which tested different weighting and aggregation methods for transport sustainability indicators . The results and reflections from that exploratory

index have provided valuable guidance. They highlighted, for instance, how different weighting schemes (equal weighting vs. expert-weighting) can change country rankings, underscoring the need for stakeholder consultation in deciding weights. The academic work also piloted the use of open data sources – such as World Bank and IEA datasets – to construct the index, effectively doing a dry run of data gathering. Challenges encountered (like missing data points or inconsistent year coverage) were documented and have informed our data integration strategy in the tracker (e.g. prompting us to include data interpolation for missing years, and to clearly flag data quality issues in the dashboard).

Furthermore, parts of the thesis research are contributing to scholarly outputs (Mejia et al. 2024 and Andrieu et al. 2024, in preparation) and will be published, which means the tracker's conceptual underpinnings are being vetted and disseminated within the scientific community . This connection to peer-reviewed research adds credibility to the tracker and ensures it stays aligned with the state-of-the-art in transport sustainability assessment.

ULLC's change-maker approach – embedding students in real projects: The Urban Living Lab Center (ULLC) provided the ideal bridge between academia and practice. As a collaboration hub backed by UN-Habitat, ULLC's mission is to bring together research and implementation, often by involving students and young professionals in on-the-ground projects . This tracker initiative exemplifies that approach. The Master's student was effectively embedded in the STREnGth_M project team, participating in meetings and aligning her research tasks with project milestones. This had mutual benefits: the student gained hands-on experience and a chance to apply her academic skills to a live policy challenge, while the project gained a dedicated resource to dive deep into methodological questions and data analysis. It's a model of capacity building wherein a student becomes a *"change-maker"* contributing to systemic transformation (in this case, how we measure and manage sustainable mobility).

Throughout the process, there was a focus on mentorship and knowledge exchange. Project supervisors from UEMI, UC Davis, and TU Berlin (including experts who themselves bridge academic and practitioner roles) guided the research, ensuring it remained policy-relevant. Conversely, the student's work introduced fresh perspectives and up-to-date literature to the team, such as novel indicators (e.g. emerging metrics on electric 2-wheeler uptake or logistics efficiency) and critical viewpoints on index design (cautioning against oversimplification, for example). As the student's thesis is completed, its findings are being integrated: she produced a "framework blueprint" and a list of recommended indicators with data source mappings, which are directly informing deliverable D4.1 (this report) and the tracker implementation. In fact, sections of this report draw on the thesis's insights on indicator selection and the mapping of existing initiatives .

Additionally, the project-embedded research provided an opportunity to test educational tools: for instance, the student helped run a workshop (under ULLC auspices) with other students to brainstorm user-interface ideas for the dashboard. This not only generated creative inputs but also trained a small cohort of students on sustainable transport indicators, extending capacity building beyond the immediate

thesis. It exemplifies how ULLC leverages academic projects to build wider awareness and skills among young professionals.

Academic-practitioner synergy in validation: As the tracker moves into implementation, the academic link is also continuing in the form of validation and peer review. The research findings on what a “holistic tracker” could look like are being validated against real-world data through the pilot (as discussed in the Latin America section). Conversely, the pilot results and iterative improvements will circle back into academic analysis (the student and supervisors plan to co-author a paper on the pilot outcomes and methodology). This synergy ensures that the tracker is not just a consultancy-style product, but a well-founded framework that can stand up to scrutiny. It also means the tool will remain adaptive and incorporate new knowledge; for example, as academic research produces new indicators (say, a new index of e-mobility readiness or a refined measure of transit quality), the tracker can incorporate those, keeping it on the cutting edge.

In summary, the integration of the Master’s thesis and the ULLC approach has strengthened both the process and outcomes of the Sustainable Mobility Tracker. It provided methodological rigor, innovation, and capacity building. By embedding a young researcher in the project, STREnGth_M not only advanced the development of the tracker but also contributed to training the next generation of experts who will carry this work forward. This approach has been recognized as a best practice in the project’s outreach, highlighting how academic collaboration can amplify impact in EU projects. Going forward, we plan to continue engaging students and researchers through ULLC and similar platforms for subsequent phases (for instance, involving universities in Africa and Asia as we expand regionally, thereby replicating this co-creation and learning model).

2.6 Cross-Cutting Themes and Innovations

In designing the Sustainable Mobility Tracker, several cross-cutting themes have been carefully considered to ensure the framework is comprehensive and forward-looking. These themes include the tracking of electric mobility (e-mobility) trends, integration of air quality and environmental health metrics, emphasis on road safety, inclusion of informal transport data, and the adoption of innovative metrics, data partnerships, and visualization techniques. Each of these cuts across multiple dimensions of the tracker and is integral to capturing the full picture of sustainable mobility.

Electric Mobility (E-mobility): Accelerating electrification of transport is a cornerstone strategy for decarbonisation globally. Reflecting this, tracking the progress of electric mobility is a core objective of the STREnGth_M project and is woven throughout the tracker’s framework. The Climate & Energy dimension directly measures e-mobility uptake with indicators like the EV share of new vehicle sales and electric vehicle stock per capita . In addition, the Innovation dimension delves into supporting factors for e-mobility – for example, availability of charging infrastructure (public chargers per

100,000 population) and existence of EV-friendly policies (like purchase incentives or EV mandates) . By including these indicators, the tracker will highlight which countries are leading or lagging in the transition to electric vehicles. Data for e-mobility indicators come from cutting-edge sources: the International Energy Agency's Global EV Outlook provides annual data on EV sales and fleet by country, while regional observatories such as Europe's EAFO (European Alternative Fuels Observatory) offer detailed statistics on chargers and alternative fuel infrastructure . We plan to replicate such data collection in other regions (through partnerships with entities like the IDB in Latin America or UNEP's e-mobility programs, which produce country fact sheets on EV adoption). By consistently tracking e-mobility, the tracker will provide insight into the global electric transition – for instance, identifying if the growth of EVs is on pace with climate goals, and how quickly different regions are phasing out internal combustion engines. This information is valuable for policymakers and industry alike, informing where to focus investments in charging infrastructure or where additional policy support is needed to boost adoption.

Air Quality and Environmental Health: Sustainable mobility is not only about carbon emissions; it's also about reducing harmful local pollutants (like particulate matter and NOx) to improve public health. Therefore, the tracker incorporates air quality metrics as part of the broader environmental picture. Within the Climate & Energy (or "Green Mobility") dimension, we include an indicator for urban air pollution attributable to transport – such as urban PM_2.5 concentration or NO_2 levels – to capture the co-benefits of cleaner transport . Additionally, Pillar 1 (quantitative tracking) explicitly lists *air pollution levels* as one of the outcomes to be monitored alongside GHG emissions and modal shares . We recognize that data on air quality is often collected by environment agencies, so the tracker will integrate with those sources (e.g. WHO's urban ambient air pollution database, or satellite-derived pollution datasets). By doing so, the tracker can show, for example, whether cities in a country are experiencing improved air quality as vehicle emissions standards tighten or as electric vehicles replace diesel vehicles. This is particularly relevant to Latin America and Asia where urban air pollution is a major concern. Including air quality data also helps break silos between transport and health sectors: it communicates the immediate health impact of sustainable transport policies (like mode shift or electrification) in addition to long-term climate impact. In the dashboard, we plan to visualize this through indicators like "premature deaths from air pollution per 100,000 (transport-attributable)" or simpler proxy indicators (e.g. average PM_2.5 in capital cities). This adds a human-centric metric to the tracker, reinforcing why sustainable mobility matters for everyday lives.

Road Safety: As a cross-cutting theme, road safety has its own dimension (Safety) but it also relates to equity (vulnerable users at risk) and accessibility (safe access). The tracker treats road safety as a paramount issue: not only does it track outcomes (fatality and injury rates, as mentioned in the Safety dimension), but it also tracks the presence of safety interventions. For instance, under the Policy Assessment pillar, the tracker checks for key road safety policies in each country – such as whether there are strong drink-driving laws, helmet laws for two-wheelers, seatbelt requirements, speed management policies, etc. If a country has high road fatalities but no robust road safety action plan, the tracker's qualitative assessment will flag that gap with a red indicator .

This integration of qualitative and quantitative safety information allows the tracker to function as a tool supporting the Decade of Action for Road Safety (2021–2030, as proclaimed by the UN). It aligns with global targets to reduce traffic deaths and complements existing monitoring by WHO. Moreover, because road safety intersects with other themes – for example, promoting active mobility (walking, cycling) requires safe infrastructure – the tracker's multi-dimensional nature helps ensure these linkages are seen. A country might, for instance, have a high share of walking (good for accessibility and climate) but if pedestrian fatalities are also high, the tracker will highlight the need for safer streets. By presenting such nuanced stories, the tracker encourages holistic solutions (like designing for both low emissions and safety). Data partnerships in this area include leveraging the World Bank's Global Road Safety Facility data and the International Road Traffic Data (IRTAD) from OECD for consistency .

Informal Transport and Inclusivity: In many regions, especially developing countries, informal transport (e.g. minibuses, jitneys, motorcycle taxis) plays a significant role in mobility but is often underreported. The Sustainable Mobility Tracker explicitly acknowledges and attempts to measure informal transport where applicable. Within the Accessibility and Equity dimensions, informal transport features in indicators such as the mode share of informal/paratransit services and the existence of integration policies for informal operators (e.g. programs to formalize or improve minibuses). The impetus for this comes from the data gap identified in the TDI pilot – informal transport data was scarce . Rather than ignoring it, our framework calls it out: by having a placeholder for informal transport usage, we signal to countries and researchers that this is an important component of mobility that needs attention . In the Latin American pilot, for example, we included an estimate that in some cities over 30% of public transport trips are via informal minibuses, highlighting a major facet of accessibility in those contexts. The tracker also links informal transport to social equity: informal services often cater to low-income communities or areas unserved by formal transit, so tracking them gives insight into how well the mobility needs of all segments are met. One cross-cutting insight is that improvements in data collection on informal transport should be a priority – the tracker can act as a catalyst by essentially "demanding" that data. In practical terms, we will engage with local partners and potentially crowd-sourced data efforts (many cities are now using mobile apps or GPS data to map informal transit routes) to feed into the tracker. Over time, as data improves, the tracker will be updated to incorporate more accurate and granular informal transport metrics. Until then, even a qualitative indicator (like "Presence of mapped informal transit routes: low/medium/high") is included to ensure this critical part of the transport ecosystem is visible.

Innovative Metrics and Data Visualization: The Sustainable Mobility Tracker is not static; it embraces innovative metrics that capture emerging trends in transport and utilizes modern data visualization to communicate insights effectively. On the metrics side, as mentioned in the Innovation dimension, we go beyond traditional indicators by including measures like the number of mobility startups (to gauge the vibrancy of the mobility innovation ecosystem) or whether a country has open data portals for transport . These kinds of indicators are relatively new in transport assessment and reflect the digital transformation of mobility. Similarly, the tracker considers "soft" metrics like user satisfaction or accessibility for disabled persons if reliable data can

be found, as these speak to the quality dimension of sustainability. By experimenting with such indicators in the pilot phase, we are testing their usefulness and availability. For example, we attempted to use app-based traffic speed data to create an indicator for congestion levels (as a proxy for efficiency), which could be an interesting complement to more formal data. Not all experimental metrics will be retained, but the process ensures the tracker remains innovative and can incorporate new data sources (like big data from mobile phones or IoT sensors) as they become available.

Data partnerships underpin a lot of this innovation. We are collaborating with organizations that specialize in transport data analytics. For instance, the project is exploring links with the International Transport Forum (ITF) for advanced scenario data and with tech companies for data on shared mobility usage. The open-data ethos of the tracker (publishing an API and using open-source tools) is also attracting interest from the developer community, which could lead to creative extensions – e.g., independent developers might build localized mobility apps off our data, or integrate the tracker's indicators into other platforms . By fostering a community around the data, we hope to stimulate continuous innovation and improvement in both metrics and their applications.

On the visualization front, the tracker is committed to presenting information in clear, engaging ways that cater to different audiences. Rather than dense spreadsheets, the dashboard uses interactive charts, maps, and story boxes. For example, a world map with selectable layers allows a user to see the geographic distribution of a particular indicator (say, transport emissions per capita), and then switch to another layer (like EV adoption) to visually compare patterns. Country scorecards use simple gauges or bar graphs to show performance on each dimension, and color-coding (red/yellow/green) to indicate relative status or progress. We also include trend graphs for time-series data, which are crucial for showing whether a country is improving or backsliding. Another innovative element is the use of case study narratives embedded in the dashboard (as discussed under Pillar 4): these appear as pop-up panels or sidebars that tell a brief story – for instance, "Spotlight: Mexico City's Electric Bus Fleet Expansion" detailing how many e-buses were introduced and linking that to the country's improvement in the emissions indicator. This narrative approach humanizes the data and can be more compelling for policymakers, as it connects numbers to real-world actions and outcomes .

To ensure readability and accessibility, especially for a public dashboard, we follow data visualization best practices: tooltips explain indicators when you hover over them, users can toggle between languages (important in cross-regional use), and all charts have proper labels and source attributions. We also plan to incorporate benchmarking tools where a user can select a country and compare it against a custom peer group (region, income level, etc.), generating comparison charts on the fly. For more advanced users, the platform's openness means they can download the data and create their own visualizations or analyses.

These cross-cutting themes and innovations ensure that the Sustainable Mobility Tracker is comprehensive and contemporary. By tracking e-mobility and air quality, it aligns with both climate and health imperatives. By emphasizing safety and informal transport, it grounds the framework in social reality and equity. And by adopting new

metrics and modern visualization, it stays relevant in an age of data abundance and digital engagement. Together, these elements make the tracker a robust, inclusive, and user-friendly tool that can serve diverse stakeholders – from government ministers scanning an index, to city planners looking at detailed data, to citizens and activists seeking accountability on specific issues like air pollution or road safety.

2.7 Key Findings and Policy Relevance

Although the Sustainable Mobility Tracker is in its pilot stage, some initial findings and trends have begun to emerge from the data gathered and analyses conducted. These early insights illustrate the tracker's value in diagnosing the state of mobility and highlight areas of focus for policymakers. Moreover, the development process itself – compiling global and regional data – has underscored critical data gaps that need to be addressed. Overall, the findings reinforce the relevance of the tracker as a decision-support and advocacy tool for a range of policy stakeholders.

Global trends and patterns: A headline finding from reviewing international transport data is that no country in the world has yet achieved "sustainable mobility" in an all-round sense . This mirrors the conclusion of the SuM4All Global Mobility Report 2017/2022, which found that while countries often excel in one or two areas, none performs strongly across all the key goals . Our multi-dimensional assessment concurs: for instance, some high-income countries lead in Green Mobility (low emissions per capita, high EV uptake) but simultaneously struggle with Accessibility (due to car-dependent sprawl or high transport costs). Conversely, some lower-income countries have low per-capita emissions (simply because of lower motorization) but face huge challenges in safety and access. This underscores that sustainable mobility is a multi-faceted challenge – progress is uneven and trade-offs are evident. The tracker makes these trade-offs visible. In our pilot data, we saw examples like *Country A* (illustrative): it ranked high on Affordability (low transit fares, low fuel costs) and Accessibility (most people live in compact cities with transit), but low on Climate (due to an aging, polluting vehicle fleet) and Safety (high road deaths). Meanwhile, *Country B* had the opposite: good climate metrics (clean energy, efficient cars) but poor affordability (expensive transit, high household transport spending). These kinds of patterns validate the need for a comprehensive tracker – policymakers require this nuanced picture to avoid complacency from doing well in one area while neglecting others .

Regional insights (Latin America case): From the Latin American prototype, a few regional observations stand out. Latin America's large cities generally provide relatively good mass transit coverage (many have metro or BRT systems), so urban accessibility scores tend to be decent in those countries. However, rural accessibility lags – e.g., countries like Ecuador have significant portions of rural population without reliable road access, dragging down their overall Accessibility score. The tracker data highlight this urban-rural divide, which is a policy concern for inclusive development. On safety, the region unfortunately has high traffic fatality rates, especially involving pedestrians and

motorcyclists. Our initial safety indicators show that most Latin American countries are not on track to meet the SDG 3.6 target. This finding aligns with WHO reports and suggests urgent need for improved road safety policies; the tracker's policy assessment further revealed that some countries still lack comprehensive road safety strategies despite the high toll, an actionable gap for policymakers to address. In terms of emissions and energy, Latin American transport emissions per capita are moderate (lower than OECD averages), helped by historically higher use of public transport and relatively newer vehicle fleets in some countries. But trends like rapid motorization and urban sprawl risk worsening emissions; the tracker's scenario analysis for, say, Argentina shows that without new policies, transport CO_2 could rise substantially by 2030, missing the trajectory required for climate goals – information that can inform those countries' climate action plans.

One positive trend is the nascent but growing electromobility movement in the region: the tracker's innovation indicators picked up that countries like Chile, Colombia, and Mexico (beyond our two pilot countries) have been deploying electric buses and developing EV strategies. This suggests momentum that the tracker can help monitor and encourage (by showcasing these leaders). However, the overall EV share in Latin America remains very low, indicating significant room (and necessity) for acceleration – a point that development banks and governments can take from our data to justify more aggressive EV initiatives.

Data gaps and capacity issues: In assembling the tracker data, we encountered several gaps which are findings in themselves about where global transport data is lacking. Some of these include:

- Gender-disaggregated data: Very few countries systematically collect data on women's mobility patterns or on how safe women feel using transport. This made populating the equity indicators challenging and often we had to rely on one-off studies. The tracker thus flags a need for routine gender-inclusive transport surveys – a point that can inform agencies like UN Women or national statistical offices. It also means for now the tracker might use proxy indicators (like existence of a policy on gender and transport) as a stop-gap.
- Informal transport usage: As expected, data on informal transport is sparse. Even basic figures like how many minibuses operate in a city or what share of commuters use them are often unknown. Our attempt to include these in the pilot was an exercise in triangulation (combining local expert input and small studies). This gap is a significant barrier to fully understanding access in many cities across Africa, Asia, and LAC. Identifying this in the tracker provides evidence to support initiatives that aim to map and integrate informal transport (such as digital mapping projects in various cities).
- Resilience metrics: Data on transport network resilience (e.g. climate-proofing of infrastructure, disruption durations) is not systematically collected in transport databases. We had to draw from climate adaptation reports and, in some cases, general resilience indices that are not transport-specific. This indicates that transport agencies need to start monitoring resilience indicators as climate change impacts grow. It also suggests that our tracker's Resilience dimension may rely more on qualitative assessments initially (like whether a climate adaptation plan exists) and gradually evolve as quantitative data improves. The

gap itself sends a message – if countries see they cannot fill in much for the resilience indicators, it may prompt them to establish monitoring in this area.

- Freight and logistics: Much of our discussion has focused on passenger mobility, but sustainable transport also involves freight (trucks, delivery, etc.). The pilot revealed that data on freight efficiency (like average truck fuel efficiency, or logistics performance at borders) exists for some countries (often via the World Bank's Logistics Performance Index and other sources) but is not universally available year-to-year. We did incorporate freight emissions in the climate data, but other freight indicators may need strengthening. This is a note for policy stakeholders in trade and industry ministries: improving freight data and efficiency should be part of the sustainable mobility agenda (for instance, to reduce supply chain emissions and costs).

Despite these gaps, the process of building the tracker has aggregated one of the most comprehensive transport datasets to date for the pilot countries, pulling together information that is often siloed. Simply compiling this has value – it gives country officials a more unified view of their transport system's performance. In the case of Argentina and Ecuador, stakeholders commented that seeing all this data side by side (emissions, access, safety, etc.) was enlightening and not something they typically have access to in one report. This suggests the tracker could effectively serve as a *one-stop reference* for transport statistics and policy status.

Policy relevance and stakeholder uptake: The Sustainable Mobility Tracker is designed to inform and influence a range of policy processes and actors:

- National Governments: For transport ministries and planning agencies, the tracker provides a clear baseline and helps identify priority areas. A transport minister can use the country scorecard to celebrate successes (say, high transit access in cities) and acknowledge weaknesses (e.g. poor road safety) in a factual way, setting the stage for targeted policy or budget allocations. The comparative aspect (seeing how peer countries are doing) can spur healthy competition or emulation of best practices. Importantly, as countries update their Nationally Determined Contributions (NDCs) or development plans, the tracker offers data to align those plans with reality – e.g. if an NDC calls for a certain transport emissions reduction by 2030, the tracker's scenario gap analysis will show whether current policies suffice or more measures are needed. This directly feeds into evidence-based policy-making.
- International organizations and processes: The tracker's outputs have been crafted to be relevant for global monitoring frameworks. As noted, by 2030 we plan to deliver a special report feeding into the SDG review, and by 2028-2030, inputs to the UNFCCC Global Stocktake . Even in this pilot stage, one can see how that would work: for instance, using our data, we can contribute to SDG 11.2 monitoring by providing an update on how many countries are increasing the proportion of population with convenient public transport access. Likewise, for the Global Stocktake (which assesses collective progress towards the Paris goals), our findings such as "X% of countries are off-track in bending the curve of transport emissions" or "only Y out of Z countries have implemented comprehensive e-mobility policies" are exactly the kind of information that can highlight gaps in the climate action arena. By framing the tracker explicitly to

support these processes, we ensure its relevance to UN bodies, development banks, and global initiatives. This alignment has been a selling point in discussions with stakeholders; for example, UN DESA and Multilateral Development Banks are interested in the tracker as a means to unify their transport indicators and avoid duplication in reporting.

- City and local authorities: While the tracker is at country level, it has implications for cities (since urban areas drive many indicators like congestion, air quality, etc.). The initial results emphasize the need for vertical integration of efforts. For example, a country's performance on accessibility might largely depend on the success of its major cities' transit systems. City officials can use the national tracker data to argue for more support or funding from national governments, or to see how their city might compare to national averages or other cities (in future, a city-level extension of the tracker could be conceived). The presence of indicators like "km of BRT" or "public transport ridership" in national profiles already nudges national policymakers to pay attention to urban mobility investment.
- Civil society and advocacy groups: The tracker is equally a transparency and advocacy tool. By putting data in the public domain in an accessible format, it empowers NGOs, researchers, and media to hold governments accountable. For instance, an NGO focusing on road safety could use the tracker's findings to spotlight that their country is far from the 2030 target and lobby for stronger traffic safety laws. Environmental groups can point to the transport emissions trajectory and push for policies like fuel economy standards or EV incentives where the data shows shortfalls. Because the tracker is updated regularly, it can be used to monitor whether announced policies are having effect – a kind of scorecard for promises made (policy input) versus outcomes achieved. This dynamic can create external pressure for sustained progress, aligning with the tracker's objective to enable advocacy through transparency .
- Development finance institutions and donors: One particularly actionable use of the tracker is to guide international support. Initial insights from our data suggest clear priorities: for example, countries with low scores in certain dimensions often correlate with where external assistance could have high impact (e.g., a country with very low accessibility might benefit from development bank financing for mass transit or rural roads; a country lagging in innovation might need technical assistance on EV policy). The tracker can help direct investment to gaps in a strategic way. As envisioned, development banks and climate finance entities can use the tracker data to identify the most critical needs and justify funding proposals. In fact, as part of STREnGth_M's outreach, we have discussed with multilateral banks how the tracker could inform their operations – akin to how the WEF Global Competitiveness Index is used in economic policy, this tracker could influence transport project pipelines. By highlighting, for instance, that *Country C* lacks any BRT systems while peers have several, the data can bolster the case for investing in a BRT in *Country C*. Or showing that *Country D* has among the highest transport injury rates could rally donor support for road safety programs there. The phased results from the tracker will also allow tracking whether aid and investments are yielding improvements, thus informing the effectiveness of interventions. This approach of tying financing to data-driven needs is explicitly noted in our long-term plan , and

initial dialogues with funders indicate strong interest in such an evidence-based allocation tool.

To summarize, the key message from initial findings is two-fold: (1) virtually all countries have significant room for improvement in one aspect or another of sustainable mobility – no one can be complacent, and (2) the data and patterns revealed by the tracker provide concrete guidance on *where* and *what* to improve. Whether it's prioritizing road safety, accelerating e-mobility, expanding transit, or collecting better data, the tracker shines a light on the critical issues. This directly supports policy formulation by identifying gaps ("what gets measured gets managed"). It also supports international processes by offering a mechanism to track collective progress in transport, which has long been a blind spot in global sustainability reporting.

Early results reinforce the *policy relevance* of the Sustainable Mobility Tracker: it brings clarity to complex, multi-dimensional problems and helps stakeholders at all levels – global, national, local – to align their efforts. As more data comes in and coverage expands, these insights will become richer. The true value of the tracker will be realized when these findings translate into action: safer roads, cleaner vehicles, more accessible transit, and ultimately, transport systems that underpin both a healthy planet and thriving communities. The engagement and interest from policymakers and practitioners so far indicate that the tracker is hitting a timely need and will be a useful instrument in the toolkit for sustainable transport transformation.

2.8 Conclusion and Way Forward

The development of the Sustainable Mobility Tracker, as detailed in this report, marks an important first step toward a globally harmonized system for tracking sustainable transport. Deliverable D4.1 has presented the conceptual foundation and demonstrated a pilot implementation, confirming both the feasibility and the value of such a tracker. Looking ahead, a clear phased implementation strategy is in place to expand and refine the tracker, ensuring it achieves its long-term vision of supporting the UN Decade of Sustainable Transport and beyond. In this concluding section, we outline the next steps, opportunities for broader regional rollouts, and how the tracker will be embedded in international processes moving forward.

Phased Implementation Plan: Achieving a fully-fledged global tracker will be a journey accomplished in stages . We have planned a four-phase roadmap:

- Phase 1 – Pilot Initiatives (current, 2024–2025): This phase covers the work done so far in Latin America (Argentina and Ecuador pilot) and possibly a couple of additional pilots. The goals are to test the framework on a manageable scale, get feedback, and make necessary adjustments . Deliverable D4.1 itself is a product of Phase 1. By the end of this phase (circa end of 2025), we will have a refined indicator set, a prototype dashboard, and documented lessons learned (such as how to handle data gaps and what training local teams need). The

success of Phase 1 – evidenced by the functional Latin America dashboard and stakeholder interest – provides a strong springboard for expansion.

- Phase 2 – Regional Expansion (2026–2028): In this phase, the tracker will scale up to cover more countries and additional regions . We aim to target on the order of 8–10 additional countries in Latin America (to build on the momentum there) and simultaneously initiate pilots in Africa and Asia . This could include countries of varying profiles – from large emerging economies (e.g. South Africa, India, Brazil) to smaller developing states – to test the tracker's adaptability. Phase 2 is also about building regional partnerships: collaborating with bodies like the African Union/UNECA, ASEAN or UN-ESCAP, and entities such as development banks or regional observatories, which can champion the tracker in their contexts . We will modularize tasks: one focus will be on improving the data platform (developing automated data pipelines and a more robust database to handle the influx of data), another on indicator refinement (perhaps setting up working groups for each dimension to refine methodologies), and another on scenario modeling enhancements . By the end of 2028, our goal is to have a beta global tracker platform online, with a user-friendly interface and data for at least 20+ countries spanning multiple regions . Achieving this will likely require additional funding and a broadened consortium – we anticipate bringing in new partners (for example, SLoCaT, Wuppertal Institute, ITF, etc., as mentioned) who bring regional expertise or technical skills . The groundwork laid in Phase 1 will help in fundraising; we can now show a working prototype to potential sponsors and clearly articulate the needs and benefits.
- Phase 3 – Global Roll-out and Consolidation (2029–2031): In Phase 3, the aim is to reach near-global coverage. We target including all G20 countries and the majority of other countries by around 2030 . This means the tracker would encompass both developed and developing nations, creating a truly global benchmark system. Key activities in this phase include consolidating data feeds (ensuring data quality and compatibility as the dataset grows) and establishing a more formal governance structure for the tracker . We anticipate setting up a steering committee or advisory board with representatives from key international agencies, development banks, academia, and civil society to oversee the tracker's credibility and continuity as a global public good . Technically, the platform will be upgraded to a more sophisticated, fully interactive site with features like country comparison tools, downloadable country fact sheets, and possibly integration into UN's existing data portals (for example, linking our indicators to the UN SDG Global Database) . By aligning our timeline with major milestones – 2030 in particular, which is the target year for many SDGs – Phase 3 will produce outputs timed for maximum policy impact. For instance, a Global Sustainable Mobility Report 2030 could be issued, synthesizing tracker findings to inform the final review of the 2030 Agenda . Similarly, as the Paris Agreement's Global Stocktake becomes periodic, the tracker can feed into those cycles with transport-specific analysis. Another focus in Phase 3 is to foster an open-data ecosystem around the tracker . We will encourage countries to start contributing data directly through capacity building – possibly by training national statistical offices to update certain indicators – and host hackathons or data challenges to engage the wider community in using tracker data for insights and solutions . We also plan to

implement multi-language support and broad dissemination so that the tracker is accessible to a global audience.

- Phase 4 – Maturity and Decade Conclusion (2032–2035): In this final phase, the tracker should become fully institutionalized and self-sustaining. By 2035 (the end of the UN Transport Decade), the tracker should be operationalized as an ongoing monitoring system, delivering annual or even continuous updates for all countries . We'll perform a retrospective analysis of the 2025–2035 decade: did we collectively achieve the visions set out at the start? This would likely culminate in a *2035 Global State of Sustainable Transport* report (potentially under UN auspices) that uses tracker data to evaluate the decade's progress . During Phase 4, we also plan the transition of the tracker to a permanent institutional home or coalition for continuity beyond the project's life . This could be, for example, a UN-hosted platform or a consortium of organizations taking ownership (with UEMI and UC Davis continuing as key technical partners) . By then, the hope is that the tracker's value is well recognized and it could be maintained through a dedicated program or funding line (similar to how the Climate Action Tracker or certain SDG tracking tools are sustained). Phase 4 is also about mainstreaming use: ensuring that governments and agencies routinely use tracker insights in policy-making and that, for instance, multilateral development banks reference tracker data when planning their lending strategies . We also anticipate broadening the scope if needed – adding new dimensions or indicators if the landscape evolves (for instance, if by 2032 issues like noise pollution or supply chain emissions become critical, we might integrate those) . The tracker's design is flexible to accommodate emerging aspects of sustainable transport. Finally, Phase 4 will involve charting a course beyond 2035, linking to the next horizon (e.g. 2050 net-zero goals) to ensure momentum is not lost after the Decade of Sustainable Transport .

This phased approach embodies *learning-by-doing* and scalability . By starting small and focused (Phase 1), we tested and iterated; by Phase 2 we expand with lessons in hand; by Phase 3 we integrate globally with strong governance; and by Phase 4 we solidify and embed the tracker in the international system. Each phase builds on the previous – much like pilots leading to policies, our pilot leads to a global instrument.

Opportunities for wider regional rollouts: Beyond Latin America, we see strong potential to replicate and tailor the tracker in other regions as part of Phase 2 and 3:

- In Africa, where data gaps are often widest, the tracker can be combined with capacity building. Working with the African Union's recently established African Transport Observatory or UNECA could allow us to align with African priorities (like improving rural connectivity and road safety, which are high on the agenda). There's also synergy with initiatives like the Asian Transport Outlook (ATO) but for Africa – currently lacking – which the tracker could help catalyze by focusing attention on African transport data needs. We have partners via STREnGth_M (e.g. in South Africa, Tanzania, etc.) interested in piloting the approach.
- In Asia, especially South and Southeast Asia, many countries are rapidly motorizing and urbanizing, making sustainable mobility critical. Organizations

like UN-ESCAP and ASEAN have expressed interest in indicator frameworks. The tracker could support ASEAN's transport strategy monitoring, for example. Tapping into the Asian Development Bank's Asian Transport Outlook data (as we plan) will give a head start. Possibly, we might do a sub-regional pilot in, say, Southeast Asia to demonstrate usefulness, similar to how we did Latin America. The diversity in Asia (from high-income Singapore to low-income Nepal) will test the tracker's adaptability – which is good to do sooner than later.

- In Europe, although Europe already has many data systems, there is room to use the tracker as a bridge to other regions. European countries could serve as benchmarks and also benefit from the multi-dimensional view (for instance, Europe has good climate and safety data, but the tracker might highlight equity or affordability issues even there). Given STREnGth_M's Horizon Europe context, showcasing how Europe compares globally on sustainable mobility could be an interesting outcome, feeding into European policy reflections and Green Deal targets. Additionally, including Europe ensures the tracker isn't seen as only for developing countries but truly global.

By engaging regional bodies and tailoring outputs (e.g. maybe producing regional reports or hosting regional dashboard portals), we increase buy-in. Each region might have unique indicators to add (for instance, Latin America might include an indicator on urban air quality since pollution is a big issue, whereas Asia might stress two-wheeler electrification). The core framework remains constant but with room for regional customization.

Informing UN and climate processes: As a capstone to its relevance, the Sustainable Mobility Tracker is poised to inform and be integrated with key global processes:

- United Nations High-Level Political Forum (HLPF) and SDG Monitoring: Transport cuts across many SDGs but is not comprehensively tracked in the SDG indicator framework. Our tracker can fill this gap by providing an organized set of transport sustainability indicators that can be reported alongside SDG progress. We will coordinate with UN agencies (like UN-DESA's statistics division, which oversees SDG data) to see how the tracker's data could complement official SDG indicators (for example, feeding into SDG 11.2 on access to transit, or providing context for SDG 3.6 on road safety beyond the single fatality indicator). By 2030, as mentioned, we aim to have a synthesis that can be presented at the HLPF to show how far transport has come in supporting the 2030 Agenda. The Decade of Action on Sustainable Transport declared by the UN will also likely have periodic reviews – our tracker is a natural monitoring tool for those. We anticipate that by mid-decade (2025 or 2026) when the Decade is launching, we can formally offer this tracker to the UN as a recommended mechanism for tracking progress, potentially getting an endorsement or at least recognition which would help its adoption.
- UNFCCC and Climate Action: In the climate realm, there's increasing recognition that sectoral tracking (beyond aggregate emissions) is needed for the Global Stocktake and for raising ambition. We will liaise with the UNFCCC's MPGCA (Marrakech Partnership) transport initiatives, and groups like SLoCaT which input to climate negotiations on transport, to ensure our tracker aligns with their needs. For instance, the Global Stocktake in 2028 will look at what's

needed by sectors – our data could provide a clear picture of whether transport emissions trajectory is aligned with well-below 2°C or not, and what policy gaps exist globally (like how many countries have phased out fossil fuel vehicle sales, etc.). This can feed into the "opportunities" discussions in climate negotiations, giving negotiators concrete evidence to push for stronger transport actions in the next round of NDCs. We may also coordinate with the Climate Action Tracker consortium to integrate our transport-specific analysis with their economy-wide assessments.

- Multilateral Development Bank coordination: Many MDBs (World Bank, regional banks) are part of SuM4All and are seeking common indicators to track progress of their transport portfolio impacts. The tracker can serve as that common reference. We foresee our data being used in MDB reports or country diagnostics – e.g., an IDB urban mobility initiative can use the country profile from our tracker as the baseline in project documents. This harmonization is beneficial for reducing reporting burdens and aligning goals. Additionally, it can inform the MDB's joint transport commitment under the Paris Agreement (they pledged to help decarbonize transport; we'll show where countries stand and where investment is most needed).
- Periodic publications and public communication: We will produce regular "Mobility Tracker Reports" (perhaps annually or biennially). These reports, akin to a Global Mobility Report but incorporating our updated findings, will keep the issue in the spotlight. They can be launched at events like the UN Global Sustainable Transport Conference (if held again), COP climate conferences, or regional transport forums. The narrative from these reports – such as *"Global transport emissions off track – only 5 out of 50 countries have policies aligned with 1.5°C"* or *"Road safety improving in high-income countries, stagnating elsewhere"* – can grab media headlines and inform public discourse, creating a sense of urgency or highlighting success stories. The fact that we will have data-driven evidence lends weight to these messages.

Sustainability and ownership: To ensure the tracker's longevity, we will be developing a sustainability plan (in the business sense) during Phases 2 and 3. This includes identifying a host (or a networked ownership model) and funding streams. One idea is to integrate it into an existing observatory or partnership (like SuM4All, which is a consortium that might adopt the tracker as one of its pillars). Alternatively, a new coalition could be formed. By Phase 4, as noted, the aim is that the tracker is *the* authoritative source on transport sustainability, possibly even mandated or recognized formally by the UN General Assembly in a resolution (dream scenario, but not impossible given the precedent of UNGA pushing for better transport data).

We will also continue strengthening the community around the tracker – experts, country focal points, partner institutions – so that it becomes a collective effort. The Multiplier Group concept from STREnGth_M (bringing together global stakeholders) can be repurposed to support the tracker's dissemination and use .

It is important to stress a forward-looking perspective: The Sustainable Mobility Tracker is not an end in itself, but a means to drive real change. Its ultimate success will be

measured not just by the comprehensiveness of its data, but by how effectively that data spurs improvements on the ground – cleaner air, safer roads, accessible transport for all, and reduced carbon emissions. The coming years will be critical. With the tracker now conceptualized and piloted, the focus shifts to implementation at scale. We are optimistic that, with the continued support of the STREnGth_M consortium, partners, and the wider transport community, the tracker will become an indispensable tool by which the global community navigates the path to truly sustainable mobility by 2030, 2035, and beyond.

…

:

3 References

1. Andrieu, V. M., Mejia, A., Kodukula, S., Gota, S., & Lah, O. (2024, April). Tracking Progress towards Net Zero Mobility: A Concept for a Mobility Transition Index. In Transport Research Arena Conference (pp. 87-93). Cham: Springer Nature Switzerland.
2. 2Zero (including EGVIAfor2Zero), website accessed 2024: https://www.2zeroemission.eu/
3. ERTRAC – Working Groups, website accessed 2024: https://www.ertrac.org/ertrac-working-groups/
4. EU - CORDIS, website accessed 2024: https://cordis.europa.eu
5. Mejia, A., Gota, S., & Lah, O. (2024, April). E-mobility Policy Tracker: Understanding the Progress and Gaps in Electric Mobility Policy Measures in Developing Countries. In Transport Research Arena Conference (pp. 708-713). Cham: Springer Nature Switzerland.