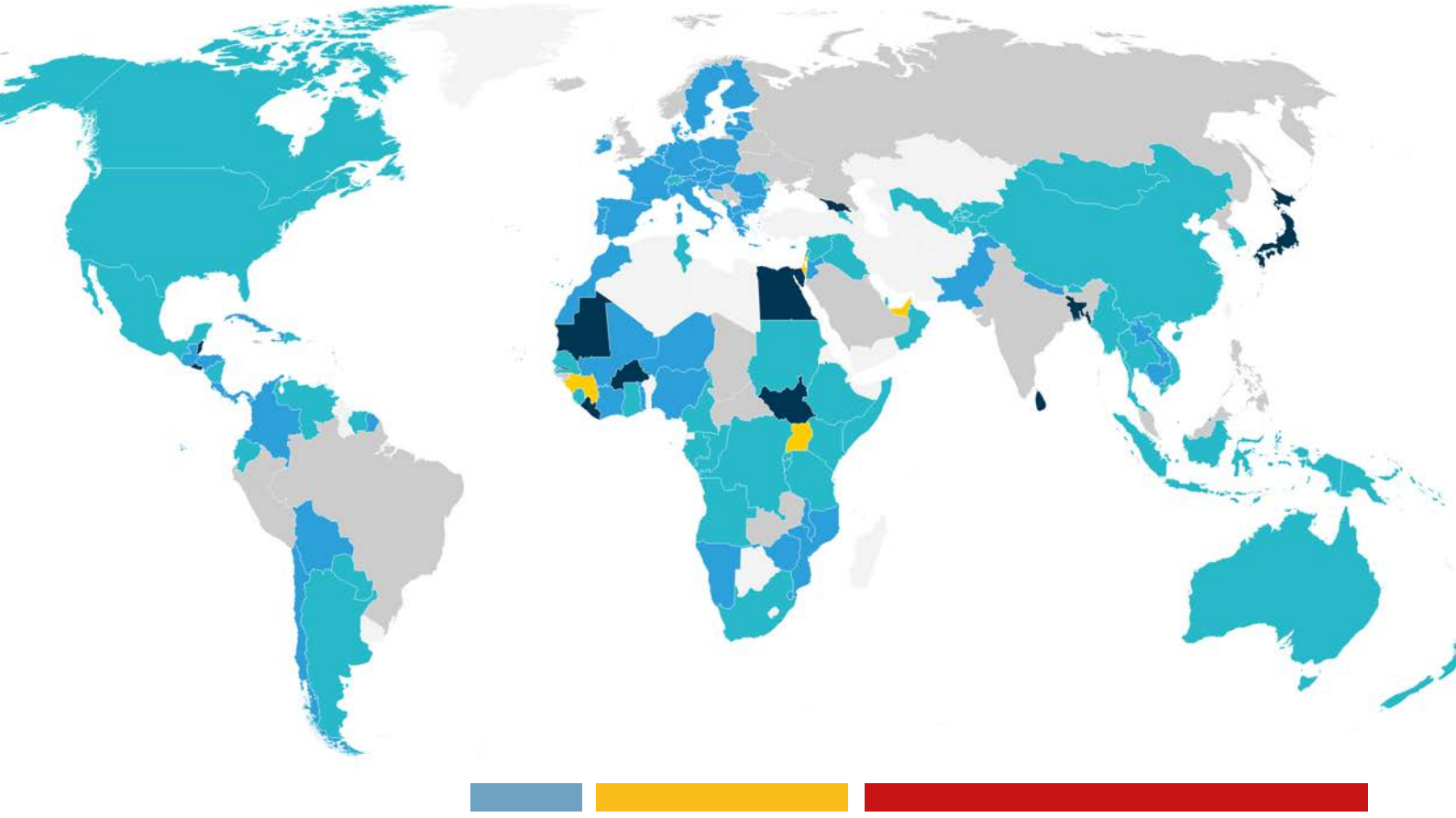
SLOCAT
Partnership on Sustainable, Low Carbon Transport

Climate Strategies for Transport: An Analysis of Nationally Determined Contributions and Long-Term Strategies



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About the report

This Report analyses trends in the transport decarbonisation ambition, targets and actions in the climate strategies submitted by countries in the framework of the Paris Agreement. Specifically, the analysis focuses on Long-Term Strategies (LTS) starting from 2016 and on Nationally Determined Contributions (NDCs) starting from 2019. On the basis of the analysis, the report seeks to establish to what extent climate action in transport by countries is on track to deliver on the Paris Agreement goal of limiting global warming below 1.5 °C. The Report also identifies gaps and shortcomings in the transport dimension of these national climate strategies; while it provides recommendations on how to enhance it. This October 2022 Update assesses the impact of NDCs with targets related to mitigating transport greenhouse gas emission on the overall trajectory of transport emissions. Findings show that, if the targets were to be met, the growth of transport emissions would only be slowed down but not put on the radical contention path that is required to support the goal of limiting global warming below 1.5 °C.

Available at

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Executive Summary

Introduction

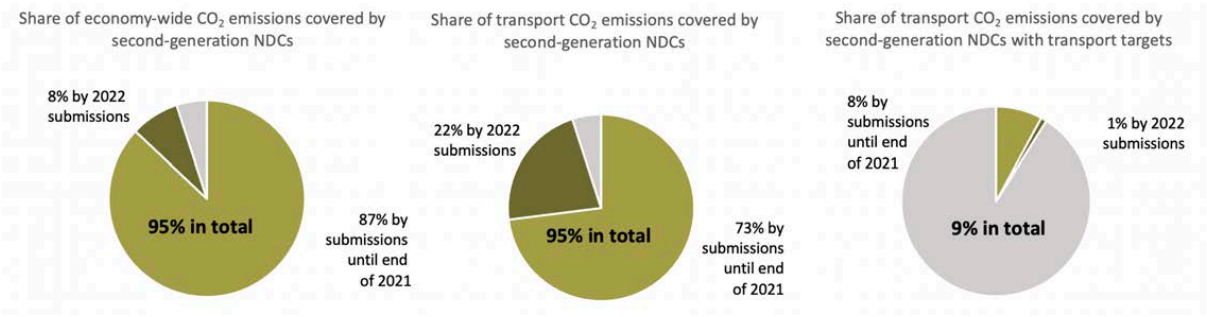
This analysis aims to support a better understanding of the level of transport decarbonisation ambition and supporting plans in long-term strategies (LTS) and second-generation Nationally Determined Contributions (NDCs) by examining the commitments and goals countries are setting to decarbonise the sector.

It focuses on LTS submitted between 2016 and 2022 and second-generation NDCs (covering both second NDCs, updated NDCs and newly submitted first NDCs) submitted to the UNFCCC between 2019 and 2022.

Overview and scope

Second-generation Nationally Determined Contributions

There are 15 second NDCs and 125 updated NDCs representing 166 countries as of 15 September 2022. The EU submitted an updated NDC on behalf of the 27 members of the EU. Countries with second-generation NDCs represent 95% of total transport CO_2 emissions (excluding international aviation and shipping).



Nearly all European and North American countries submitted second-generation NDCs, while around 80% of countries in other regions have done so. Climate strategies by low- and middle-income countries are important as future transport demand growth is projected to occur mainly in these country income groups. NDCs are also an opportunity to express the need for international support in regards to climate action. It is therefore welcomed to see more low-income countries submitting second-generation NDCs since the 2021 UN Climate Change Conference COP26 .

Long-Term Strategies

Through 15 September 2022, 51 countries plus the EU have submitted LTS. 18 individual EU member countries also submitted their respective LTS, resulting in a majority of LTS (51% of all submissions) coming from Europe. Since COP26, there have been 6 new submissions (**Cambodia, Lithuania, Morocco, Nigeria, Russia** and **Uruguay**). The **United Kingdom** and the **US** are the only countries that submitted a second version of their LTS. There have been no LTS submissions from low-income countries.

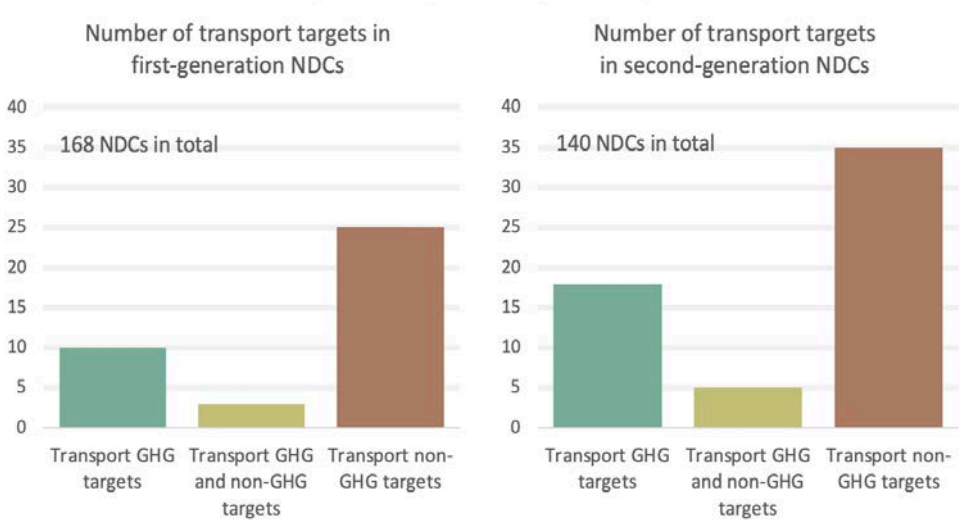
State of climate action for transport in 2022

Based on available info as of 15 September 2022

Progress on targets, yet more ambition is needed to maximise sustainability impacts.

Key insight: Progress has been achieved as more countries than in the first generation of NDCs embrace GHG mitigation targets for transport. However, the pledged targets are far away from being enough to put the world on a path to achieve the Paris Agreement goals.

Countries have made clear progress in developing long-term climate visions, with a growing number committing to long-term net-zero targets. 85 countries have submitted economy-wide net-zero targets in LTS, second-generation NDCs, or other policy documents.



41% of second-generation NDCs contain transport targets (either transport GHG mitigation targets and/or non-GHG targets for transport).

23 out of 140 second-generation NDCs have a transport GHG mitigation target, representing 16% of all second-generation NDCs. 13 of these targets are unconditional. 5 countries outlined conditional targets for transport GHG emission mitigation. The remaining 5 countries have a combination of unconditional and conditional targets. Nearly all of them have a target year of 2030.

In addition, 107 non-GHG transport targets have been identified in second-generation NDCs (a NDC can include several non-GHG mitigation targets). The percentage of targets about mode share was significantly reduced between the first and second generation of NDCs. The most frequent non-GHG target related to zero emission vehicles, followed by vehicle efficiency targets.

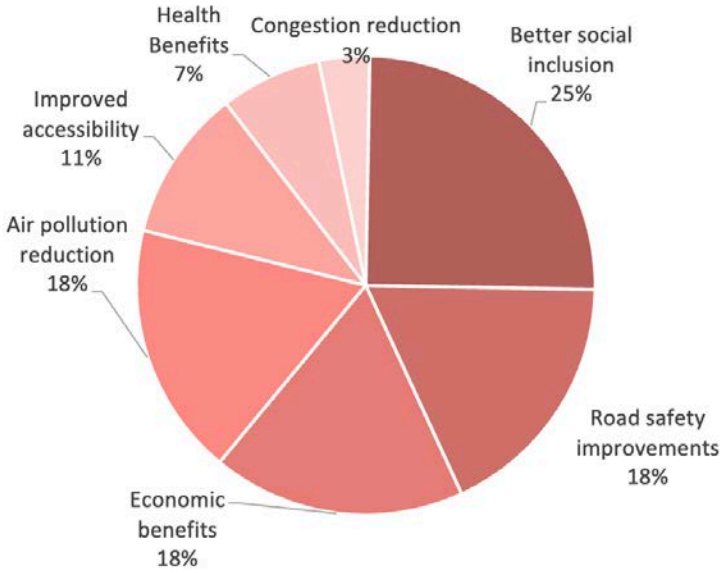
Targets in Long-Term Strategies

10 countries (**Belgium, Germany, Japan, New Zealand, Portugal, Slovenia, Spain, Sweden, Switzerland** and **United Kingdom**) outline transport targets in their LTS (representing 22% of submitted LTS). In contrast to second-generation NDCs' target year of 2030 , LTS usually have a target year of 2050.

Maximising impacts

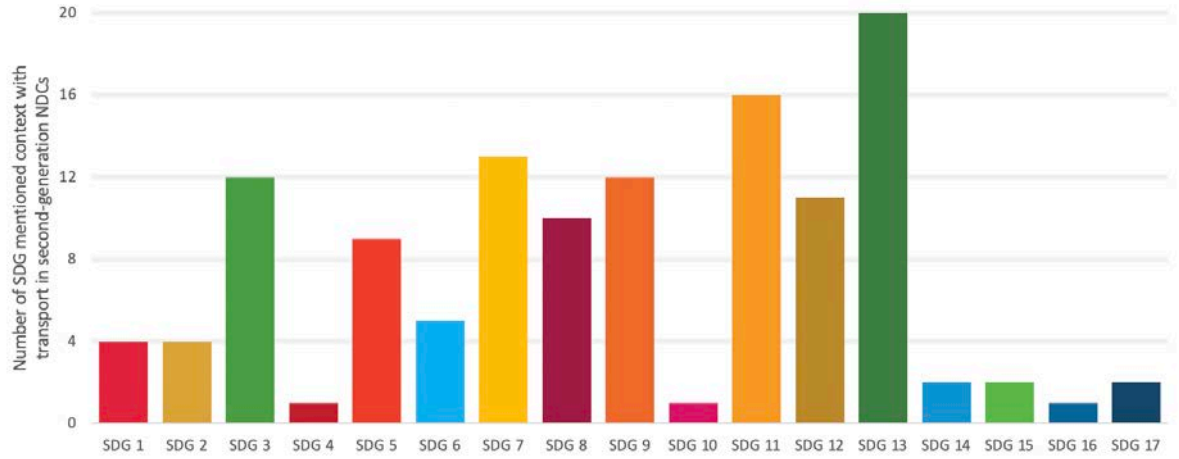
Key insight: Transport climate actions are not being developed in the context of transport's impact on the wider sustainable development agenda, and are therefore missing an opportunity to enable and accelerate a wider transformation.

The few second-generation NDCs which reference these wider benefits mainly focus on better social inclusion and road safety improvements.



21 second-generation NDCs link transport to specific Sustainable Development Goals (SDGs). The most often cited SDGs are: SDG 13 (Climate Action), SDG 11 (Sustainable Cities and Communities) and SDG 7 (Affordable and Clean Energy).

SDGs mentioned in the context of transport in second-generation NDCs



The few second-generation NDCs which reference these wider benefits mainly focus on better social inclusion and road safety improvements.

Actions to mitigate transport emissions are insufficient to reach Paris Agreement goals

Key insight: Climate strategies embrace a wider portfolio of transport mitigation actions than first-generation NDCs, but the mitigation actions continue to lean towards system efficiency improvements over transformation.

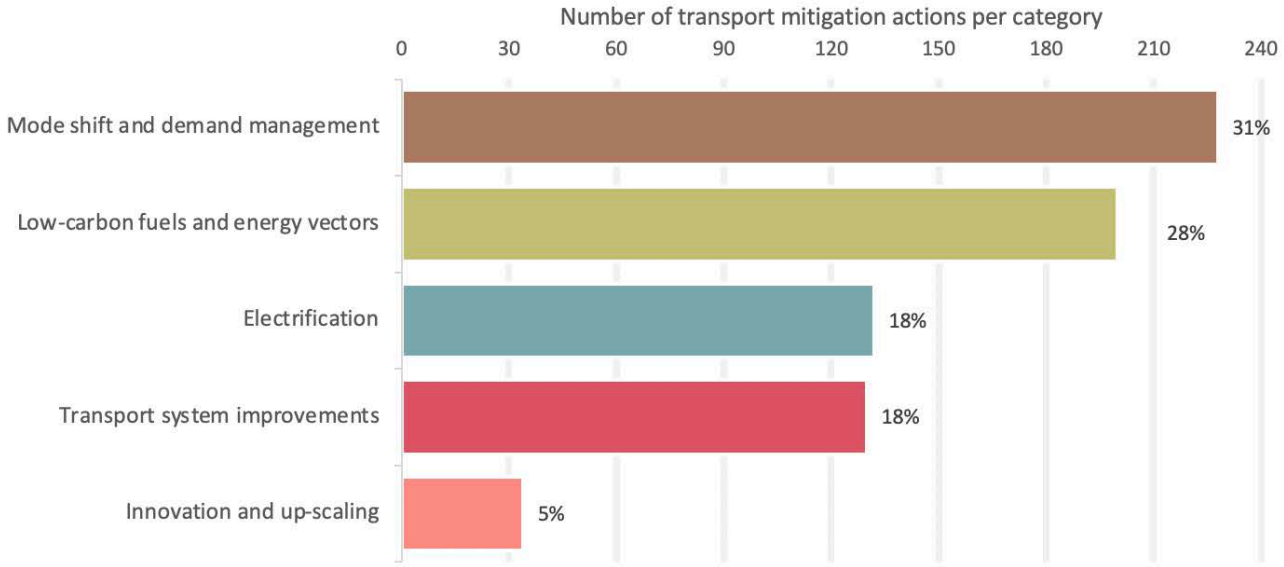
The second generation of NDCs include on average more transport mitigation and adaptation actions than the first generation. There are nearly twice as many transport mitigation actions featured in each second-generation NDC compared to first-generation NDCs. On average, there are:

2.7
Transport mitigation actions per first-generation NDC

5.2
Transport mitigation actions per second-generation NDC

20
Transport mitigation actions per LTS

In second-generation NDCs, there has been a clear shift away from actions related to public transport and towards e-mobility measures and targets.



An issue that continues from the first generation of NDCs is that many actions and measures have vague descriptions.

Transport adaptation targets and actions are still limited

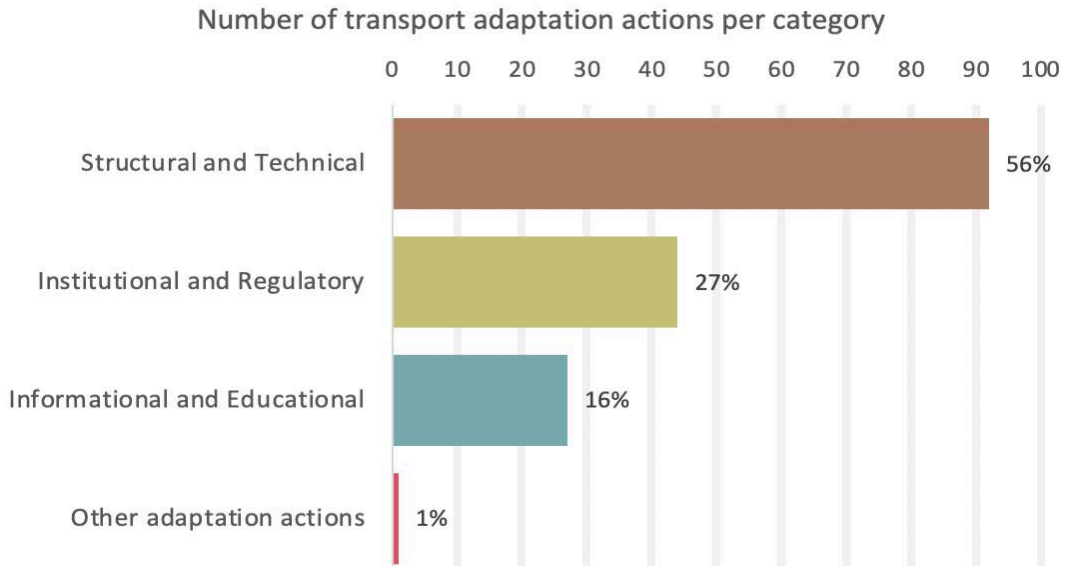
Key Insight: Adaptation in the transport sector has been largely limited to infrastructure resilience. More efforts are needed to strengthen transport adaptation and institutional capacity.

Similar to mitigation, there are more transport adaptation actions featured in second-generation NDCs compared to first-generation NDCs. On average, there are:

0.4
transport adaptation actions per first-generation NDC

1.2
transport adaptation actions per second-generation NDC

Only 6 second-generation NDCs (**Antigua and Barbuda, Burundi, Cambodia, Kenya, Liberia,** and **Papua New Guinea**) have transport adaptation targets. They include targets to climate-proof infrastructure and develop public transport and active mobility systems in support of more robust and resilient transport systems.

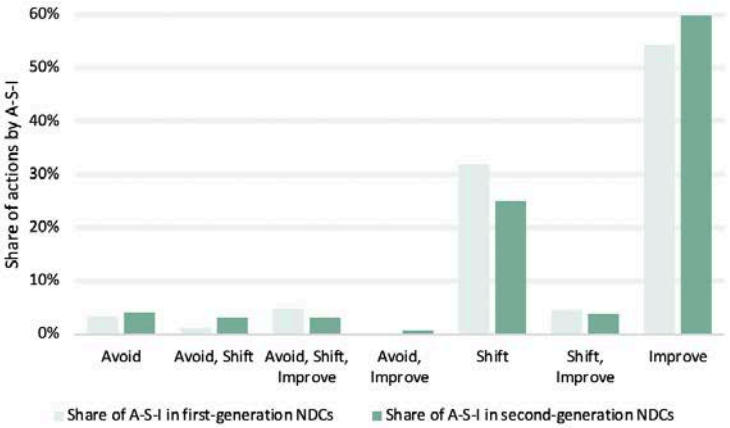


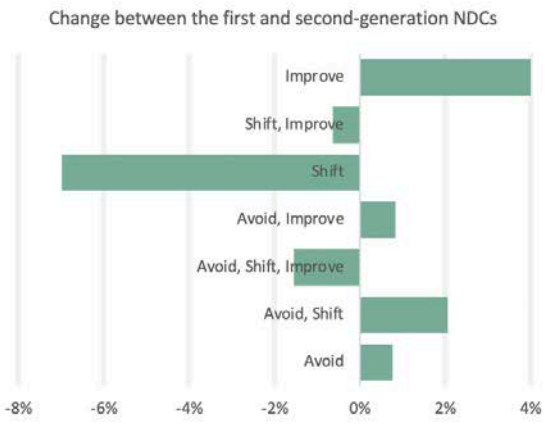
The adaptation content is very general and the majority is limited to road infrastructure resilience. Actions on transport adaptation rarely specify the type of transport activity they aim to address (i.e. passenger or freight).

57 second-generation NDCs (40% of all NDCs) include transport adaptation actions, a significant improvement over the first-generation NDCs where transport adaptation was covered in just 22%.

The full potential of Avoid and Shift benefits is not maximised; the focus on Improve prevails

Key Insight: The full potential of inclusion of Avoid and Shift actions has not yet been reached. Improve actions dominate in the second-generation NDCs and LTS.





Good examples:
Sri Lanka's updated NDC with comprehensive, well-balanced measures.

Singapore's LTS with clear linkages between urban planning and transport.

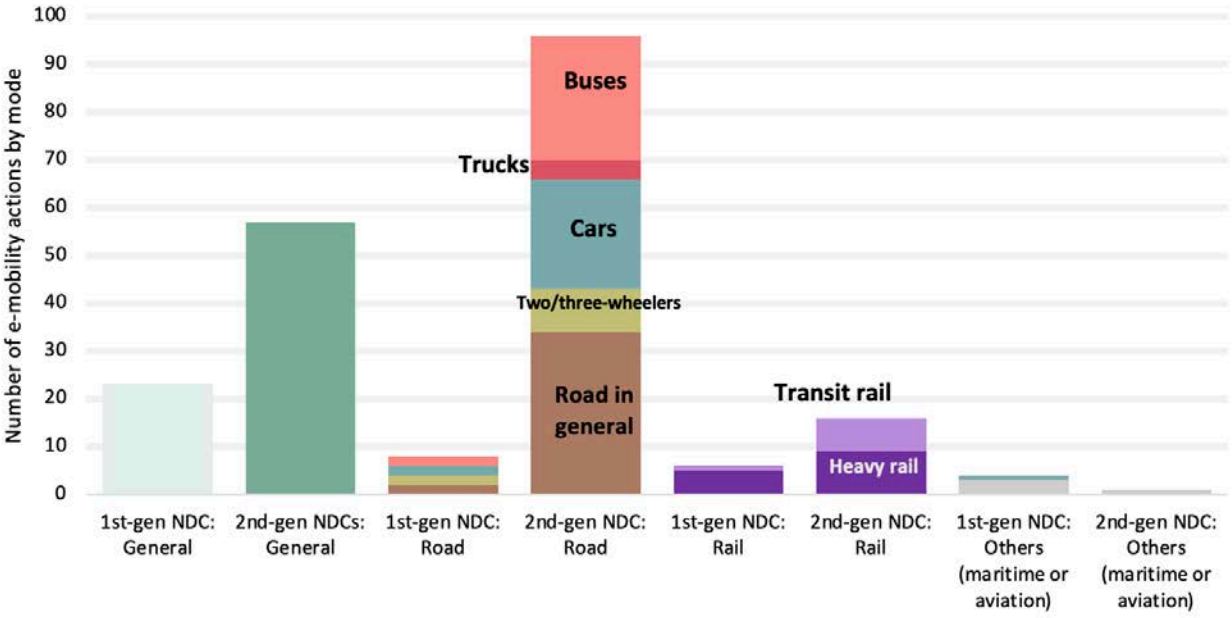
Learn more about the Avoid-Shift-Improve Framework here: www.slocat.net/asi/

Electrification takes pole position

Key insight: New climate strategies feature a strong focus on electrification of road transport across vehicle types.

Electric mobility (e-mobility) is the most common category of measures in second-generation NDCs. 74 second-generation NDCs (52%) include e-mobility-related actions, representing 19% of all actions.

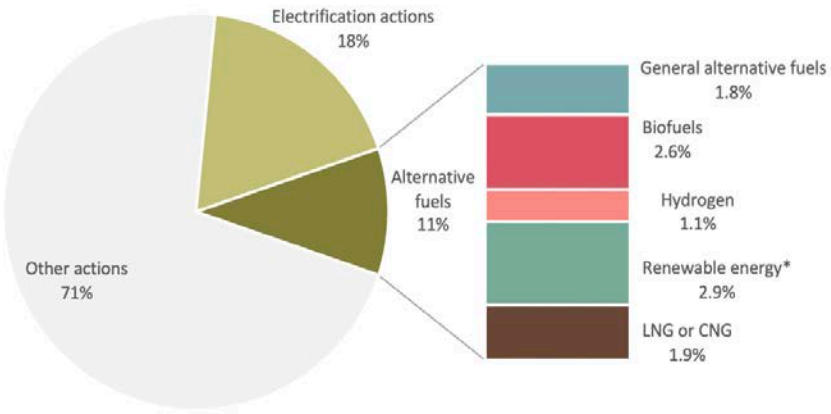
38 non-GHG transport targets in second-generation NDCs relate to vehicle electrification, and all are from middle and high-income countries.



Phase-out of fossil fuels is missing in action

Key insight: The impact of electrification on decarbonisation efforts could be significantly enhanced with more widespread use of renewable energy.

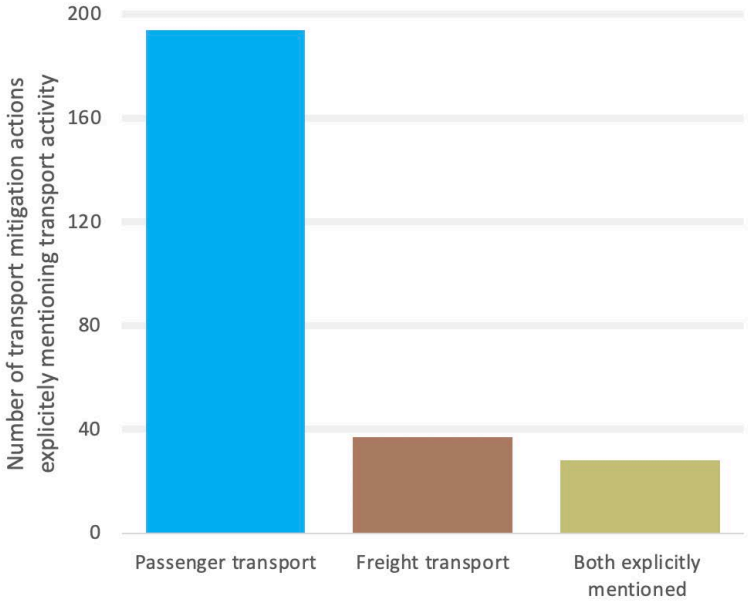
17 second-generation NDCs provide clear linkages between the electrification of transport and the use of renewable energy. The use of alternative fuels (not just limited to fuels from renewable sources) to lower transport emissions has been mentioned in 11% of transport mitigation actions in second-generation NDCs.



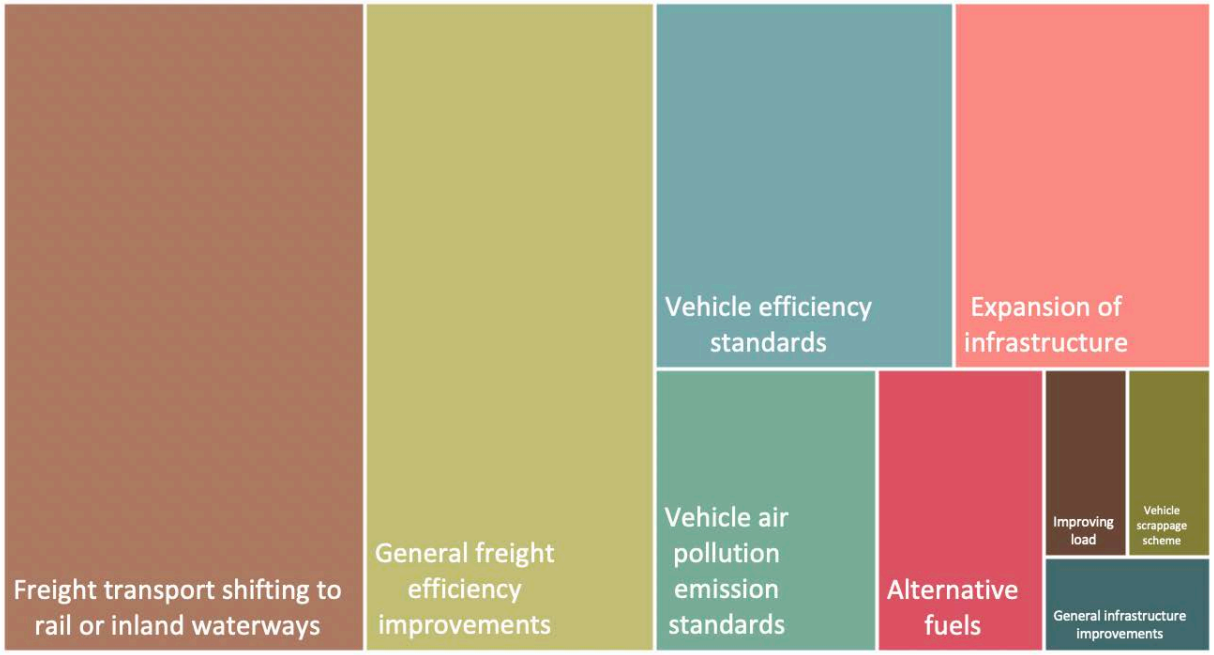
* It may include electricity through renewable energy or general references to renewable energy in transport.

Freight emissions growth continues unabated

Key Insight: Freight remains overlooked in NDC measures despite the sector's large contributions to GHG emissions. Action on freight is urgent due to rapidly rising demand and emissions. Only a few second-generation NDCs embrace a shift of road freight to rail and improvements of logistics.



The large majority of actions in second-generation NDCs do not specify which transport activity type they will apply to.



The most popular freight actions in second-generation NDCs include: shifting from road transport to rail or inland waterways (15 actions), freight efficiency improvements (12 actions) and vehicle-focused improvements (7 actions).

National frameworks to support sustainable urban mobility are absent in climate strategies

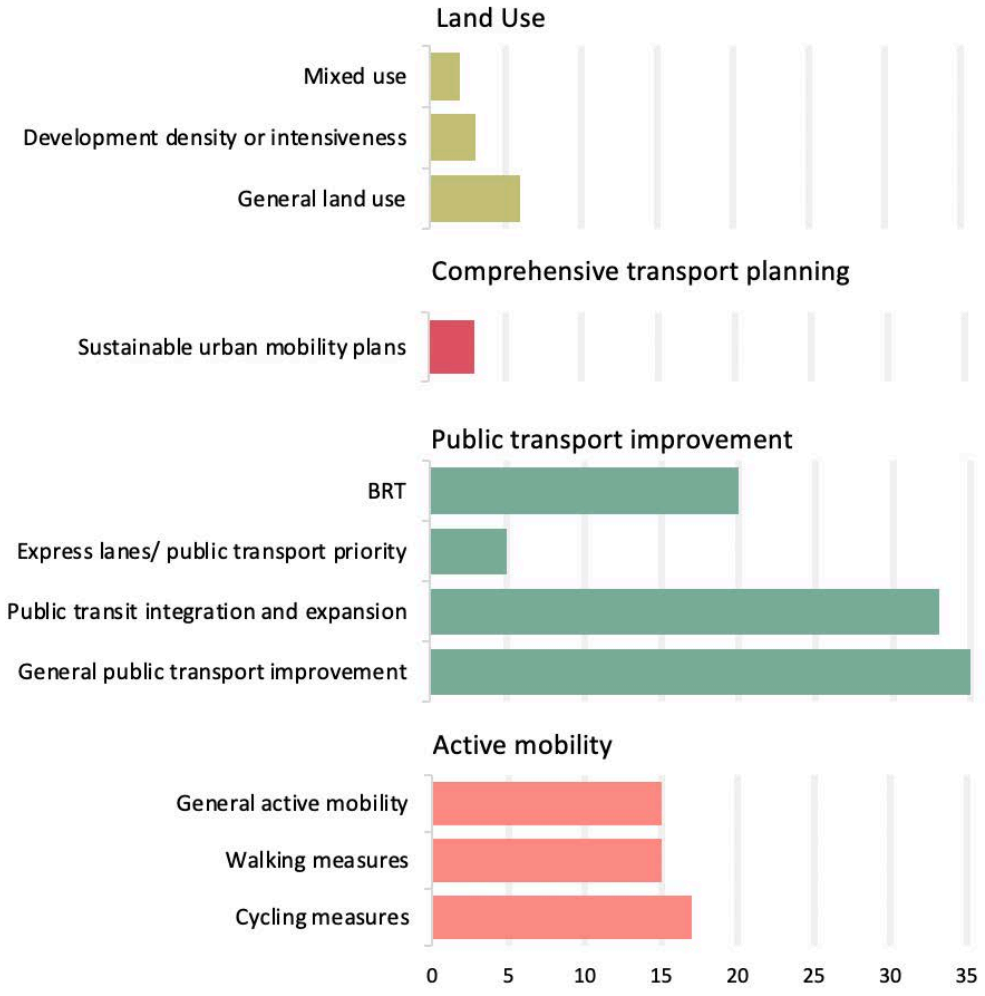
Key Insight: Achieving the NDCs will require climate action in cities, but NDCs lack national frameworks to support local action.

NDCs focus on climate action at the national level, but as urban transport is responsible for 60% of transport emissions, it is essential that cities are considered and supported in decarbonisation efforts. However, second-generation NDCs do not consider supporting frameworks for urban mobility.

Good example:
Canada to provide permanent funding of CAD 3 billion per year for investments in public transport and active mobility from 2026 to 2027.

Urban-level actions

Of the second-generation NDCs that include specific references to the geographic scope of measures, 19% (over 130 actions) mention urban transport.



Sustainable urban mobility plans (SUMPs) are an important enabler of sustainable mobility in cities. However, only three countries have included SUMPs in their second-generation NDCs (**Barbados, Guinea** and **Panama**).

The process to implement commitments has been strengthened

Governance and implementation

Key insight: The few NDCs with details on governance show that more engagement has been done than ever before including through stakeholder consultations and the involvement of multiple ministries.

In several second-generation NDCs references to national transport strategies have been included: **Rwanda** mentions its Transport Sector Strategic Plan, **South Africa** refers to its Green Transport Strategy, **Thailand** mentions its Environmentally Sustainable Transport System Plan 2013-2030, and the **United Kingdom** mentions its Transport Decarbonisation Plan.

Financing sustainable transport

35 second-generation NDCs outline how much investment is needed to support sustainable transport actions. For example, **Bangladesh** estimates that its transport mitigation actions will require over USD 124 billion until 2030. Out of this, the country notes that 88% will need to be provided through international support.

Attention to aviation and shipping emissions remains insufficient

Key insight: There is a notable lack of coherence between domestic and international commitments to decarbonise aviation and shipping. Only a few countries have expressed their intention to increase their engagement in global agreements on aviation and shipping.

Only 16 second-generation NDCs include plans to reduce emissions related to domestic aviation and maritime transport. A good example is **Fiji**, which has a target of reducing domestic maritime shipping CO_2 emissions 40% below BAU by 2030.

In addition, only a few countries have expressed their intention to increase their engagement in global agreements on aviation and shipping: The LTS by the **EU, Luxembourg, Singapore** and the **United Kingdom** have, for example, pointed out that efforts to minimise their aviation and shipping emissions will be addressed through their active participation in International Civil Aviation Organization and International Maritime Organization.

The information featured in the executive summary and the full analysis is based on data in the Tracker of Climate Strategies for Transport, a database on ambition, targets and policies in NDCs and LTS of the Paris Agreement, jointly developed by GIZ and SLOCAT and launched in May 2021.

Recommended reads:

- SLOCAT Partnership's NDCs Offering Opportunities for Ambitious Climate Action report of 2016
- GIZ's 2017 Transport in NDCs report
- GIZ's Six Action Recommendations to enhance climate ambition in transport
- SLOCAT's Ten Recommendations to raise ambition for transport in NDCs
- Preliminary analysis released in January 2021
- An updated summary of May 2021

Photo by Mauro Mora on Unsplash

1. Introduction

1.1. Context

To achieve the goals of the Paris Agreement on Climate Change, the transport sector must accelerate climate action immediately. Under the Agreement, Parties to the UN Framework Convention on Climate Change (UNFCCC) are required to submit Nationally Determined Contributions (NDCs), or frameworks and strategies outlining their specific targets and actions to reduce emissions. NDCs communicate planned mitigation and adaptation actions by countries, including plans to achieve resilient, low carbon transport systems.

NDCs are submitted in a five-year cycle, with the first generation of NDCs submitted in 2015 and subsequent generations submitted every five years thereafter. The NDC process is supported by a set of Global Stocktakes to assess progress towards implementation of the Paris Agreement, with the first one scheduled to take place in 2023 (and subsequently every five years thereafter).

Parties to the UNFCCC were requested to submit second-generation NDCs by the end of 2020. However, due to the COVID-19 pandemic, and mindful of countries' needs to focus on pandemic-related emergencies, the UNFCCC extended the timeline for Parties to submit second-generation NDCs until 9-12 months before the UN Climate Change Conference COP26, which was postponed to November 2021. At COP26, the Glasgow Climate Pact requested Parties to revisit and strengthen the 2030 targets in their NDCs by the end of 2022.[1]

To complement the NDCs, the Paris Agreement invites (but does not require) countries to formulate and communicate Long-term Strategies (or long-term low greenhouse gas emission development strategies) (LTS), to help establish low carbon trajectories to 2050. The LTS have no clear submission cycle but countries can update submissions. While the second-generation NDCs cover climate action up to 2030, the LTS have actions up to 2050.

NDCs and LTS are not binding documents and are primarily developed by the environment ministry of each country. There might be challenges regarding policy coherence among different national policy and strategy frameworks. For better horizontal coordination, transport ministries should be engaged and climate action plans mainstreamed within transport strategies. The climate strategies should improve over time and move the world towards a pathway in line with the Paris Agreement targets. In the next few years, countries will start to implement the Enhanced Transparency Framework which improves the measurement, verification and reporting requirements under the UNFCCC. Together with the NDCs, this reporting mechanism will be an important tool to inform the first Global Stocktake and to further cross-fertilise climate ambition.

1.2. About this analysis

The information featured in this analysis is based on data in the Tracker of Climate Strategies for Transport, a database on ambition, targets and policies in NDCs and LTS of the Paris Agreement, jointly developed by the Advancing Transport Climate Strategies in Rapidly Motorising Countries (TraCS) project by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and SLOCAT Secretariat. The tracker and the underlying database are a joint effort by GIZ and

[1] UNFCCC (2021), Decision -/CMA.3, Glasgow Climate Pact, https://unfccc.int/sites/default/files/resource/cma3_auv_2_cover%2520decision.pdf

SLOCAT. This report and the executive summary are authored by the SLOCAT Secretariat with inputs from GIZ. Along with this report, a presentation was developed by GIZ summarising the key insights from the LTS and second-generation NDCs. If you wish to do your own research, an Excel file with all data and analysis is being released alongside the Tracker of Climate Strategies for Transport.

This analysis aims to support a better understanding of the level of transport decarbonisation ambition and supporting plans in LTS and second-generation NDCs by examining the commitments and goals countries are setting to decarbonise the sector. It focuses on second-generation NDCs (covering both second NDCs, updated NDCs and newly submitted first NDCs) submitted to the UNFCCC between 2019 and 2022 and LTS submitted between 2016 and 2022.

We recommend reading about transport in the first generation of NDCs in SLOCAT Partnership's NDCs Offering Opportunities for Ambitious Climate Action report of 2016 and GIZ's 2017 Transport in NDCs report. In addition, GIZ's Six Action Recommendations to enhance climate ambition in transport and the Ten Recommendations to raise ambition for transport in NDCs by the SLOCAT Partnership provide additional context on transport actions related to climate goals. A preliminary analysis of the second generation of NDCs was released in January 2021 as well as an updated summary in May 2021. This Report is an updated version of the SLOCAT analysis released in October 2021 and subsequently updated in December 2021.

In 2022, SLOCAT released several knowledge products around the second-generation NDCs and LTS (shown in the chronological order or release):

Regional infographics on NDCs and Long-Term Strategies

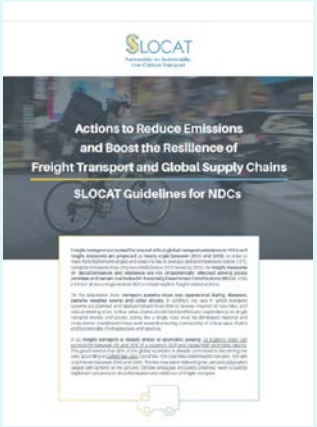
These infographics, jointly prepared by SLOCAT and GIZ, share valuable insights, trends and best practices for each region. The largest share of transport GHG emission targets in second-generation NDCs can be found in NDCs of African countries. Asian NDCs present a stronger focus on transport electrification than any other region:66% of NDCs in Asia included actions on electrification compared to the global average of 53%. NDCs in LAC present the strongest linkages to renewable energy in transport, with nearly 12% of actions associated to alternative fuels. While African NDCs have a stronger focus on transport adaptation than any other region, 30% of MENA NDCs also cover this topic, with a strong focus on road infrastructure resilience.

Analysis of climate strategies and policy coherence in Latin America and the Caribbean

This report analyses the alignment between the climate commitments by the countries in LAC and the implementation through transport planning tools at the national and subnational level. The purpose is to identify whether climate commitments are effectively being reflected in the daily actions of national and subnational governments.

The NDCs Hall of Fame by SLOCAT

The NDCs Hall of Fame by SLOCAT puts the spotlight on the major transport strengths and issues in the second generation of NDCs submitted until 1 May 2022 by countries in the framework of the Paris Agreement on Climate Change. This analysis illustrates how countries can enhance the transport dimension of their NDCs and hence enable passenger and freight transport systems for equitable, decarbonised, resilient pathways. For each of these dimensions the Good, the Bad and the Ugly of NDCs are outlined. The NDCs Hall of Fame by SLOCAT concludes with awards to the best NDCs in terms of transport ambition and action. The NDCs of Colombia, Guinea, Seychelles and Sri Lanka receive 4 stars as the best-performing in support of sustainable, low carbon transport.



Actions to reduce emissions and boost the resilience of freight transport and global supply chains: SLOCAT guidelines for NDCs

To secure their place in the future net zero economy, countries can use their NDCs to set their freight transport and logistics systems on track to become net zero and resilient. These guidelines by SLOCAT highlight key elements of a NDC that enables impactful decarbonisation and resilience of freight transport and global supply chains include.

Assessment methodology

The database assesses transport-relevant content of NDCs and LTS (referred to in this analysis as "climate strategies") structured by targets, mitigation actions, adaptation actions, governance, implementation, benefits and investment. In total, there are 141 parameters used to capture transport-relevant aspects of each climate strategy. The analysis shows results for the parameters and topics where sufficient data has been generated. It features a mix of quantitative and qualitative approaches depending on the aspect. In general, climate strategies are assessed collectively. Individual documents are only featured as good practices and case studies. The analysis may highlight particular income groups or regions if specific aspects are noteworthy.

NDCs and LTS are assessed using the same method, even though these two types of climate strategies differ in their overall nature. The report looks at NDCs and LTS submitted through 15 September 2022. The analysis provides more insights from second-generation NDCs than from LTS due to the fact that only 51 LTS were submitted through 15 September 2022, making it more difficult to identify global trends in LTS compared to trends in the 140 most recent second-generation NDCs that were submitted. Where relevant, comparisons to first-generation NDCs have been made. Data from previous studies allows us to compare targets and mitigation and adaptation actions covered in first-generation NDCs.

"Most recent second-generation NDCs" means that the analysis focuses on the most recent submission by a country (e.g. **Australia, Japan,** etc.). When multiple revised submissions of a second-generation NDC exist, only the most recent submission is considered for the analysis. Where relevant, comparisons to first-generation NDCs have been made. Data from previous studies allows us to compare targets and mitigation and adaptation actions covered in first-generation NDCs.

In several NDCs, countries expressed planned contributions only as targets. This was the case for **Albania, Antigua and Barbuda, Bolivia, Costa Rica, Eswatini, Honduras, Israel, Mali, Namibia, Nepal** and **Zimbabwe**. In the case of **Uganda**, every activity consisted of a clear target as well as accompanying activities. Their activities are included as both targets (often non-GHG targets) and actions in the database. The report does not distinguish between Parties and countries. Both expressions are used.

Limitations of the analysis

The analysis only looks at information included in LTS and second-generation NDCs. A country may not necessarily reflect all planned transport climate actions and targets in detail in its NDC or LTS. Many countries have additional national strategies on transport that include additional or more specific actions and targets on how to develop transport and reduce emissions. Thus, the information in this analysis reflects only the content stated in the NDCs and LTS as submitted to the UNFCCC. NDCs and LTS are mainly mechanisms to communicate mitigation ambition, thus the analysis might not represent a complete picture on adaptation. More information on adaptation by developing countries will be featured in their National Adaptation Plan submitted to the UNFCCC.

The assessment of transport has been guided by well-defined parameters and shared publicly in the glossary.[2] The parameters intend to capture all relevant aspects for sustainable transport. However, there may still be some relevant aspects that did not fit into any parameter, and were therefore not included in the analysis. The assessment of the content provided in the climate strategies may have slight inconsistencies. Every data collector was instructed to use the glossary to judge where the content fits best. A quality check of the content was conducted to avoid major inconsistencies between data collectors. In the case of overlaps between several parameters, the action or measure was reflected in all relevant parameters.

NDCs and LTS have been submitted in English, Spanish and French. When necessary, the data collectors used automatic translation software which may have caused some errors. If a country submitted an official English translation, then the English translation was consulted.

The report does not intend to single out individual countries for a lack of transport ambition. It is a trend analysis of how to improve collectively on the progress achieved since the first generation of NDCs. The analysis does not capture other sectors nor allow for a comparative analysis with other sectors.

1.3. Overview and scope

The analysis focuses on LTS submitted between 2016 and 2022 and second-generation NDCs (covering both second NDCs, updated NDCs and newly submitted first NDCs)[3] submitted to the UNFCCC between 2019 and 2022 as of 15 September 2022.

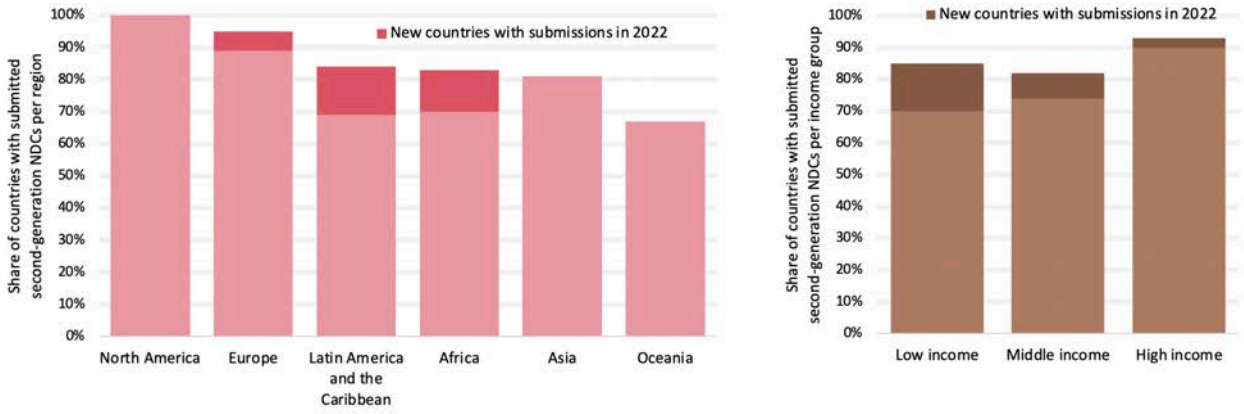
There are 15 second NDCs and 125 updated NDCs representing 166 countries. In 2022, 2 new second-generation NDCs and 13 updated NDCs were submitted. In addition, 14 NDCs were revisited in 2022 and newer versions have been submitted. The new submissions mainly come from countries in Africa and LAC. The revised NDCs did not make significant changes to their transport content. The focus of the revisions was mostly on enhancing the economy-wide GHG mitigation target. The following sections highlight any shifts or changes for specific analysis themes through the submissions in 2022.

32% of NDC submissions are from Africa, 28% from Asia and 20% from Latin America and the Caribbean (LAC). The EU submitted an updated NDC on behalf of the 27 members of the EU Countries from LAC were among the first to submit second-generation NDCs. Nearly all European and North American countries submitted second-generation NDCs, while over two thirds of countries in other regions have done so. 93% of high-income countries and 83% of low- and middle-income countries submitted second-generation NDCs. In 2022, a higher share of low-income countries than middle-income countries have submitted second-generation NDCs (see Figure (Fig.) 1) Climate strategies by low- and middle-income countries are important as future transport demand growth is projected to occur mainly in these country income groups. NDCs are also an opportunity to express the need for international support in regards to climate action. It is therefore welcomed to see more low-income countries submitting second-generation NDCs since the 2021 UN Climate Change Conference COP26.

[2] GIZ and SLOCAT (2021), Glossary, Tracker of Climate Strategies for Transport, available at: https://changing-transport.org/glossary/

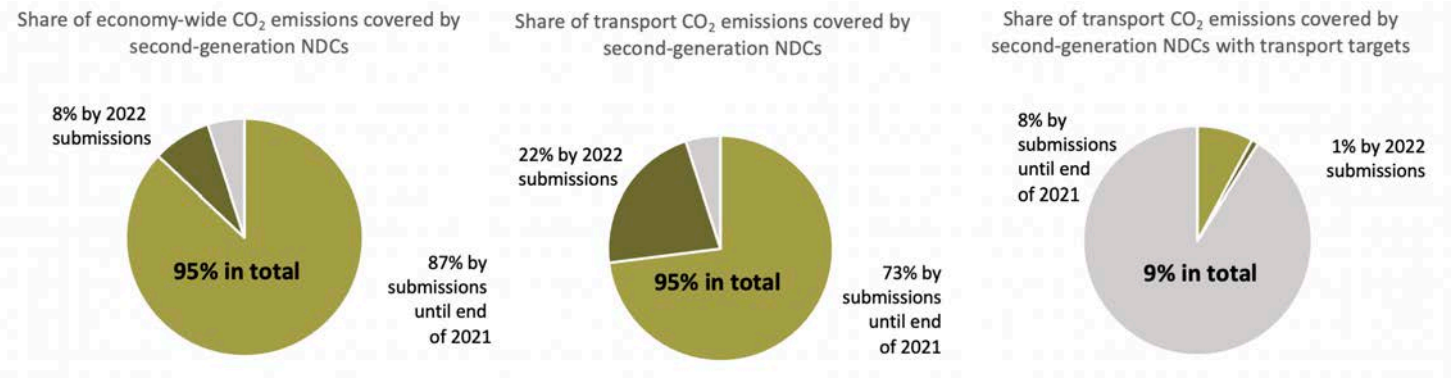
[3] A few countries did not officially convert their INDC into their first NDC. These countries have now submitted their official first NDC. For the purpose of this analysis we treat newly submitted NDCs as updated NDCs and the INDC as 1st NDC. This applies to: Ecuador, The Philippines, Senegal and Syria.

Fig. 1: Share of countries with submitted second-generation NDCs per region and income group



Countries with second-generation NDCs represent 95% of total CO_2 emissions and 95% of total transport CO_2 emissions (excl. international aviation and shipping) (see Fig. 2). **The second-generation NDC submitted in 2022 fill significant gaps in transport CO_2 emission coverage. From 73% coverage by the end of 2021, as of 15 September 2022 nearly all transport CO_2 emissions are covered. India's Updated NDC in August 2022 contributed significantly to this increase.** Countries with second-generation NDCs featuring transport targets represent yet only 9% of total transport CO_2 emissions. The new submissions of 2022 added 1% to this parameter.[4]

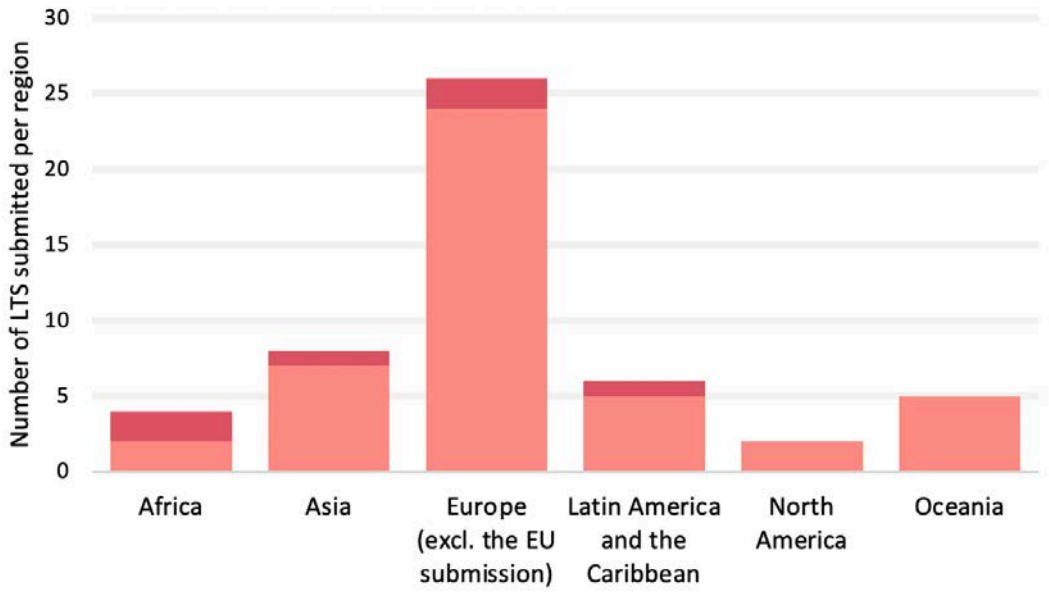
Fig. 2: Coverage of CO_2 emissions by second-generation NDCs



[4] SLOCAT calculations based on Crippa, M. et al. (2022), CO2 emissions of all world countries - 2022 Report, doi:10.2760/730164, https://edgar.jrc.ec.europa.eu/report_2022

Through 15 September 2022, 51 countries plus the EU had submitted LTS. Since COP26, there have been 6 new submissions (**Cambodia, Lithuania, Morocco, Nigeria, Russia** and **Uruguay**). The **United Kingdom** and the **US** are the only countries that submitted a second version of their LTS. 18 individual EU member countries also submitted their respective LTS, resulting in a majority of LTS (51% of all submissions) coming from **Europe** (see Fig. 3). The LTS cover 74% of total CO_2 emissions and 72% of transport CO_2 emissions (excl. international aviation and shipping).[5]

Fig. 3: LTS submitted by region



37% of submissions are from middle-income countries and 63% from high-income countries. **Thus far, there have been no LTS submissions from low-income countries, indicating that these countries may benefit from enhanced international cooperation and support to develop LTS.**

[5] SLOCAT calculations based on Crippa, M. et al. (2022), CO2 emissions of all world countries - 2022 Report, doi:10.2760/730164, https://edgar.jrc.ec.europa.eu/report_2022

2. State of climate action for transport in 2022

2.1. Progress on targets, yet more ambition is needed to maximise sustainability impacts

Key insight: Progress has been achieved as more countries embrace GHG mitigation targets for transport but it is far from enough to put the world on a path to achieve the Paris Agreement goals.

Long-term net-zero targets

Countries have made clear progress in developing long-term climate visions, with a growing number committing to long-term net-zero targets. 85 countries have submitted economy-wide net-zero targets in LTS, second-generation NDCs, or other policy documents. These cover 73% of global transport emissions. Most set the target year of 2050 to reach net-zero emissions.[6]

In addition, 38 second-generation NDCs make general references to long-term strategies (either pointing directly to LTS or mentioning 2050 ambitions). The new submissions by India and Sri Lanka are included in this count.

As of 15 September 2022, every country that submitted a LTS also provided a second-generation NDC. For example, Indonesia submitted their LTS in parallel to the NDC. Marshall Islands attached their LTS to their NDC. However, as the next section shows, the transport GHG mitigation targets expressed in the second-generation NDCs are not aligned with the overall ambition to achieve decarbonisation by mid-century. The medium-term actions outlined are not sufficient to fully support long-term net-zero targets.

Transport greenhouse gas emissions mitigation targets

The most essential element of a climate strategy is whether or not countries have set specific greenhouse gas emissions (GHG) emission targets for the transport sector. These transport GHG mitigation targets may be supported through additional targets and further maximised by linking the NDC to sustainable development agendas, long-term visions and economic and social benefits.

23 second-generation NDCs have a transport GHG mitigation target. 5 new NDCs (submitted by Dominica, Egypt, El Salvador, Uganda and the United Arab Emirates) joined this list in 2022. These 23 countries represent 16% of all second-generation NDCs (see Fig. 4 and Table 1). 13 of these targets are unconditional. 5 countries outlined conditional targets for transport GHG emission mitigation, the remaining 5 countries have a combination of unconditional and conditional targets. Nearly all of them have a target year of 2030.

[6] ClimateWatch (2022), Net-Zero Tracker, https://www.climatewatchdata.org/net-zero-tracker

Fig. 4: Second-Generation NDCs with transport targets

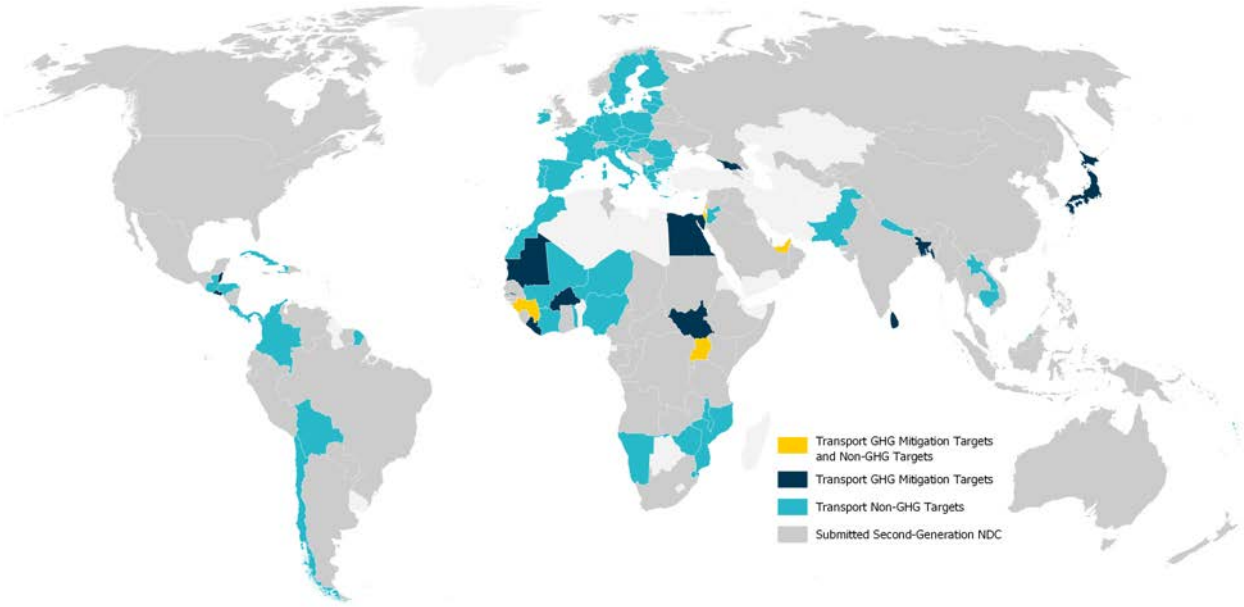


Table 1: Second-generation NDCs with transport GHG emission mitigation targets

Country	Transport GHG emission mitigation target	Type of target
Andorra	Reduce road transport CO_2 emissions 50% by 2030	Unconditional
Bangladesh	Reduce transport CO_2 emissions 9.3% (to 32.89 Mt CO_{2eq}) below BAU by 2030 (unconditional contribution) or in total 27% (to 26.56 Mt CO_{2eq}) below BAU by 2030 (conditional contribution)	Unconditional and conditional
Belize	Avoid 117 KtCO_{2eq}/year from the transport sector by 2030 through a 15% reduction in conventional transportation fuel use by 2030 and achieve 15% efficiency per passenger- and tonne-kilometre through appropriate policies and investments	Unconditional
Burkina Faso	Limit the increase of GHG emissions in transport to 1210 Gg CO_{2eq} by 2025, 3563 Gg CO_{2eq} by 2030 and 8265 Gg CO_{2eq} by 2050 (unconditional contribution), further limit to 267 Gg CO_{2eq} in 2025, 867 Gg CO_{2eq} in 2030 and 4153 Gg CO_{2eq} in 2050 (conditional contribution)	Unconditional and conditional
Dominica	Reduce transport CO_2 emissions by 20% by 2030 compared to 2014 levels and reduce shipping emissions by 100% by 2030	Unconditional
Egypt	Reduce transport CO_2 emissions by 7% transport sector, BAU GHG emissions by 2030 = 124,360 Gg CO_{2eq}, mitigation target by 2030 = 8,960 Gg CO_{2eq}, GHG reduction % compared to BAU in 2030 = 7%	Unconditional
El Salvador	Reduce transport CO_2 emissions by 334 kt CO_{2eq} compared to BAU by 2030	Unconditional
Fiji	Reduce domestic maritime shipping CO_2 emissions 40% below BAU by 2030	Unconditional
Gambia	Reduce transport CO_2 emissions 22.2% below BAU by 2030	Conditional

Georgia	Reduce transport CO_2 emissions 15% below BAU by 2030	Unconditional
Grenada	Reduce transport CO_2 emissions 20% below 2010 levels by 2025, with further reductions by 2030 (continuation from first NDC)	Conditional
Guinea	Reduce transport CO_2 emissions by 2300 $ktCO_2$ per year compared to BAU by 2030 (unconditional) and up to 2600 $ktCO_2$ per year compared to unconditional scenario (conditional contribution)	Unconditional and conditional
Israel	Limit the increase in transport GHG emissions to 3.3% compared to 2015 levels by 2030 and reduce transport GHG emissions by 2050 by at least 96% compared to 2015	Unconditional
Japan	Reduce transport CO_2 emissions 27% below 2013 levels by 2030, to reach 163 million tonnes of CO_2 or less (continuation from first NDC)	Unconditional
Liberia	Reduce transport CO_2 emissions 15.1% below BAU by 2030	Conditional
Mauritania	Avoid 92.65 Gg CO_{2eq} transport GHG emissions between 2021-2030 (5.21% unconditional)	Unconditional and conditional
Mauritius	Reduce transport CO_2 emissions by 129 $ktCO_{2eq}$ until 2030	Unconditional
Seychelles	Reduce transport CO_2 emissions 30% below BAU by 2030 (focus on gasoline vehicles)	Conditional
Samoa	Reduce GHG emissions of land transport by 5.2 Gg CO_{2eq} and maritime transport by 3 Gg CO_{2eq}	Unconditional
South Sudan	Reduce transport CO_2 emissions 44% below BAU by 2030	Unconditional
Sri Lanka	Reduce transport CO_2 emissions 4% below BAU by 2030 (1% unconditional, 3% conditional)	Unconditional and conditional
Uganda	Reduce transport CO_2 emissions 29% below BAU by 2030 (target would be 6.8 Mt CO_{2eq} compared to BAU of 9.6 Mt CO_{2eq})	Conditional
United Arab Emirates	Reduce transport emissions 14% below BAU by 2030 (primarily due to enhanced vehicle standards in road transport)	Unconditional

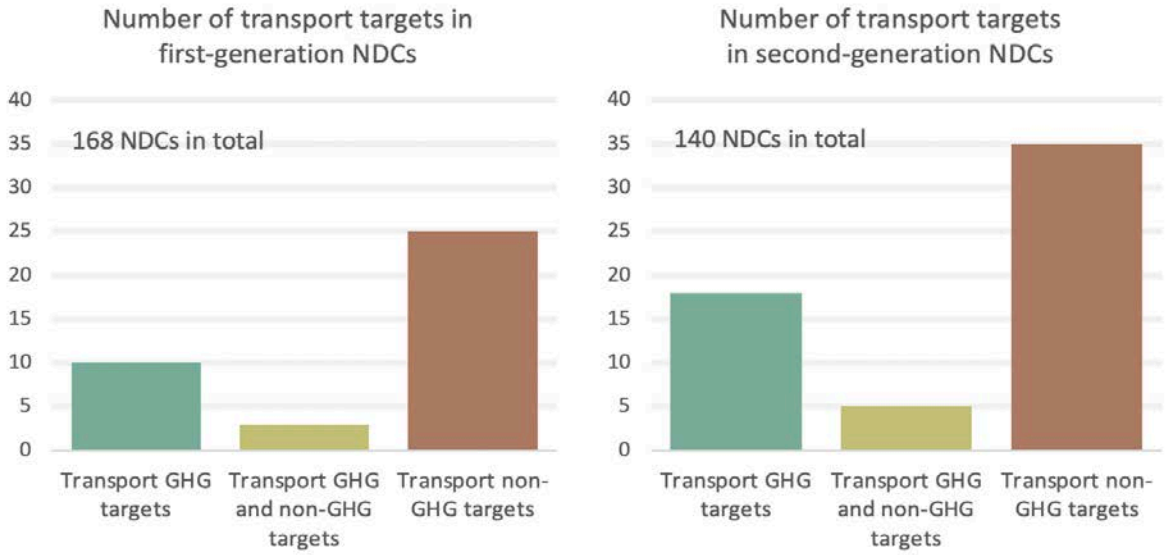
The transport GHG mitigation targets come primarily from middle- and high-income countries. Among the 23 second-generation NDCs with transport GHG mitigation targets, 6 are from low-income countries (**Burkina Faso, Gambia, Guinea, Liberia, South Sudan** and **Uganda**).

Other key observations include:

- **Japan** as the only member of the G20 with a transport GHG mitigation target. As of 15 September 2022, the **United Arab Emirates** is another major transport emitter that outlines a transport GHG mitigation target.
- **Israel** submitted the only NDC with both a 2030 and 2050 transport target.
- In 3 cases the transport emission mitigation target is restricted to a specific subsector (e.g. road transport for **Andorra**, maritime transport for **Fiji**, land and maritime transport for **Samoa**).

41% of second-generation NDCs (in total 58) contain transport targets (either transport GHG mitigation targets and/or non-GHG targets for transport). In the first generation, only 21% included any kind of transport target (Fig. 5). In comparison, only 13 NDCs from the first generation (8%) had transport mitigation targets. Countries like **Grenada** and **Japan** reiterated their target from their first-generation NDCs, while **Bangladesh, Burkina Faso** and **Dominica** revised their transport GHG mitigation targets.

Fig. 5: Progress of targets from first to second generation



Quantifying the transport GHG mitigation targets

In this October 2022 Update of this Analysis Report, the transport GHG mitigation targets of the 23 second-generation NDCs are projected in relation to their impact on the overall national trajectories of transport GHG emissions. The trajectories of national transport targets are compared to the projected BAU scenarios in order to assess how the trajectory shifts. The emission projections are based on several assumptions and limitations (see below). Therefore these findings should only be seen as rough estimates.

Assumptions on which the analysis is based:

- The NDCs are accurate in the data they provide. The primary source for historic and projected emissions is the NDC. If the data is not indicated in the NDC, then historic emission data from EDGAR[8] for the 2015-2020 period and 2030 business-as-usual values from SLOCAT's transport projections[9] are used. For the individual years from 2021 to 2030, a constant emission development until 2030 (BAU and NDC target) is assumed.
- The emission projections only consider the NDC targets and no other policies. Transport emission will be tackled by the NDC.
- It is assumed that the country will achieve the emission reductions pledged in the targets included in the second-generation NDC.

[8] TBA

[9] Gota, S., Huizenga, C., Peet, K. Medimorec, N. and S. Bakker (2019), Decarbonising transport to achieve Paris Agreement targets. Energy Efficiency 12, 363–386. https://doi.org/10.1007/s12053-018-9671-3

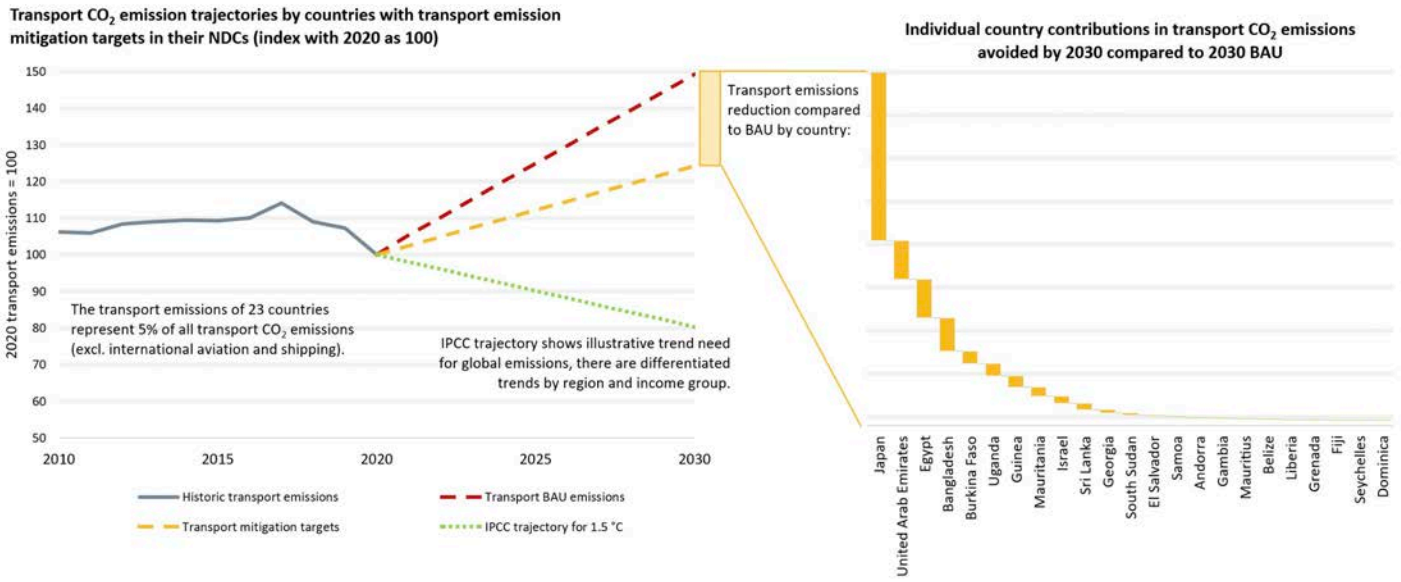
The limitations to the quantification shed interesting findings about the overall asymmetric quality of NDCs as framework strategies as a sound basis from which to derive monitoring and analysis on GHG emissions reductions:

- In many cases, the targets expressed in the NDCs are not clearly stated. There are cases in which a target mixes overall transport and its subsectors (such as road transport). Transport subsectors are ignored in this assessment due to lack of recent CO_2 emission data by subsector (most recent available data is 2018).
- The NDCs with transport GHG mitigation targets are not the only NDCs with an impact on transport emissions. A NDC with transport actions can lead to significant emission trajectory impacts. However, because it is not possible to quantify actions, targets are taken as the main orientation point.
- The scope of this exercise covers only NDCS that feature a transport GHG mitigation target. It covers 5% of transport CO_2 emissions (excluding international aviation and shipping). Other countries with economy-wide emission targets will also have an impact on transport emissions, but it is not accounted for in this exercise as modelling is out of scope of this Report.
- Due to constraints in data availability, the quantification ignores differences between CO_{2eq} and CO_2. It is acknowledged that this is not the most rigorous way to handle emissions data. However, CO_2 is the most significant GHG caused by the transport sector (except in the case of aviation). The emission pathways are indexed with 2020 as 100.

Overall this assessment shall be taken with caution. The key findings of the quantification are (see Fig. 6):

- The transport GHG emissions of these countries are expected to grow by 50% until 2030 in BAU (red dotted line), and their transport GHG targets pledged, if met, will only bring the growth down to 25% (yellow dotted line).
- The 23 NDCs with transport GHG mitigation targets, even if met, will still result in absolute growth of transport emissions. In many cases, transport CO_2 reduction targets are relative to BAU scenarios which actually still implies absolute transport emission growth. Therefore the growth in transport emissions will be only slowed down.
- It stands in stark contrast with the Intergovernmental Panel on Climate Change (IPCC)'s trajectory for 1.5 °C (green dotted line), again with a linear decrease and thus, in a more simplified manner than what the IPCC report shows. It is also important to acknowledge that there are differentiated trends by region and income group.

Fig. 6: Transport CO_2 emissions trajectories for NDCs with transport GHG mitigation targets



The right side of Fig. 6 outlines the individual country contributions. If the pledged targets are met, **Japan** will significantly contribute to the emission slow-down, by accounting for almost half of all avoided emissions. The NDCs by the **United Arab Emirates, Egypt** and **Bangladesh** will also have significant contributions if the pledged targets are met.

The recent Sixth Assessment Report by the IPCC urges for absolute transport emissions to fall by 59% by 2050 relative to 2020 emissions in order to support the goal of limiting global warming below 1.5 °C.

The difficulty to conduct such an exercise shows that the content of NDCs can be extremely vague and therefore not constitute a sound basis from which to derive monitoring and analysis on GHG emissions reductions. As found in other sections of this analysis report, actions outlined in NDCs equally suffer from this vagueness. Overall this reality begs to ask to what extent do NDCs in their current asymmetric shape contribute to the Global Stocktake process and the sound monitoring of progress on GHG emissions reductions.

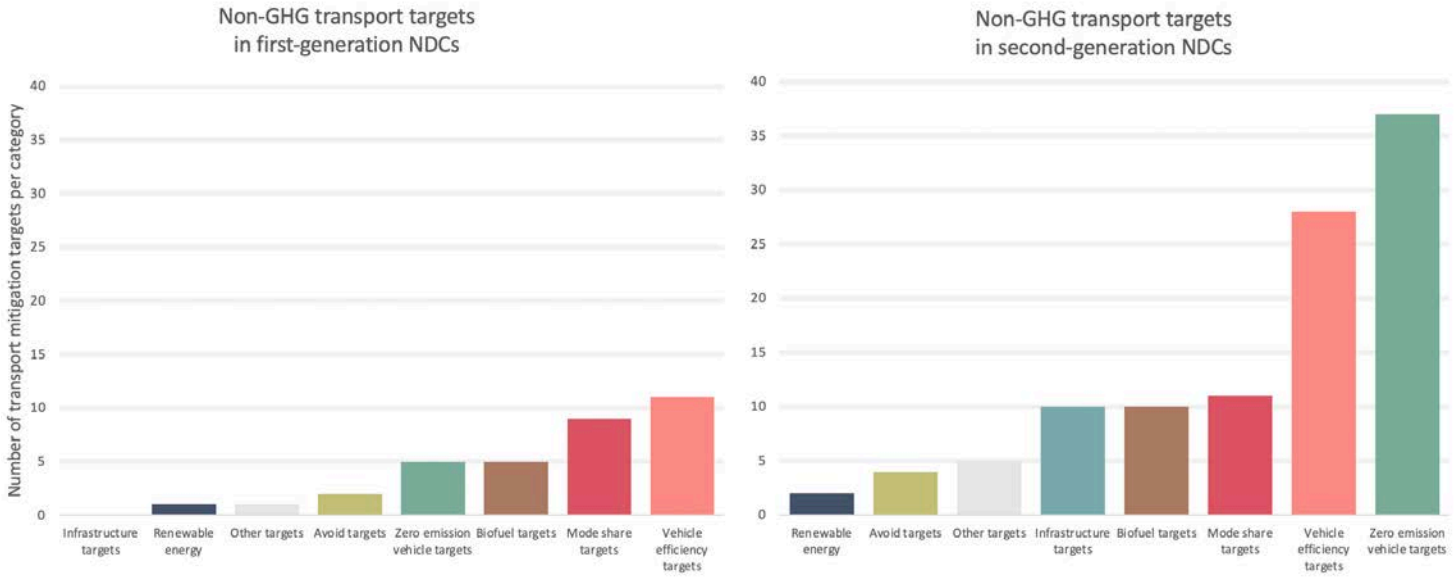
Targets not related to transport green-house gas emissions: Non-transport targets

In addition, many NDCs set targets related to but not directly referring to transport GHG emissions mitigation. These have been classified as targets under the categories: avoid additional motorised transport, biofuels, mode share, infrastructure, renewable energy in transport, vehicle efficiency and zero emission vehicles.

Overall, 107 non-GHG transport targets have been identified in second-generation NDCs (an NDC can include several non-GHG mitigation targets). The most frequent non-GHG target was for zero emission vehicles (35%), followed by vehicle efficiency targets (26%), mode share targets (10%), biofuel targets (9%), infrastructure targets (9%), other targets (5%), avoid targets (4%) and renewable energy targets (2%).

Here we can see a large change compared to the first-generation NDCs where non-GHG targets were more evenly balanced and zero emission vehicles were the third-most frequent non-GHG target together with biofuels representing only 14% (Fig. 7). The percentage of mode share targets reduced significantly between the first and second generation of NDCs, an insight which is reflected in transport mitigation actions as well.

Fig. 7: Non-GHG targets by category

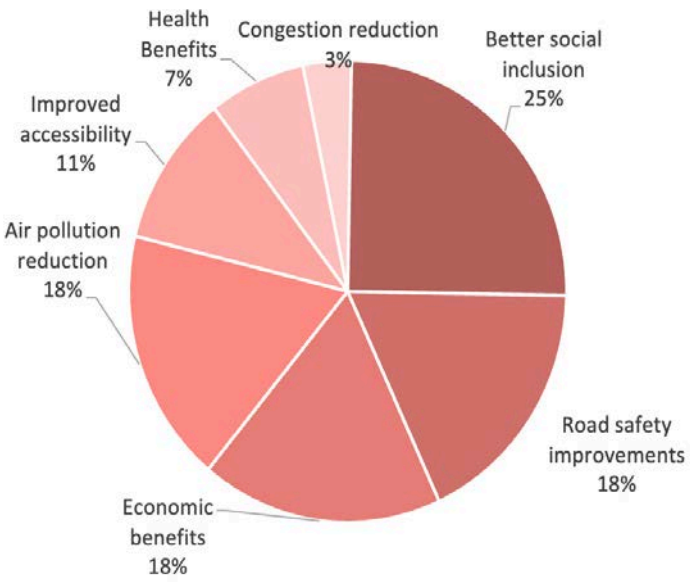


Maximising impacts

Key insight: Transport climate actions are not being developed in the context of transport's impact on the wider sustainable development agenda, and are therefore missing an opportunity to enable and accelerate a wider transformation.

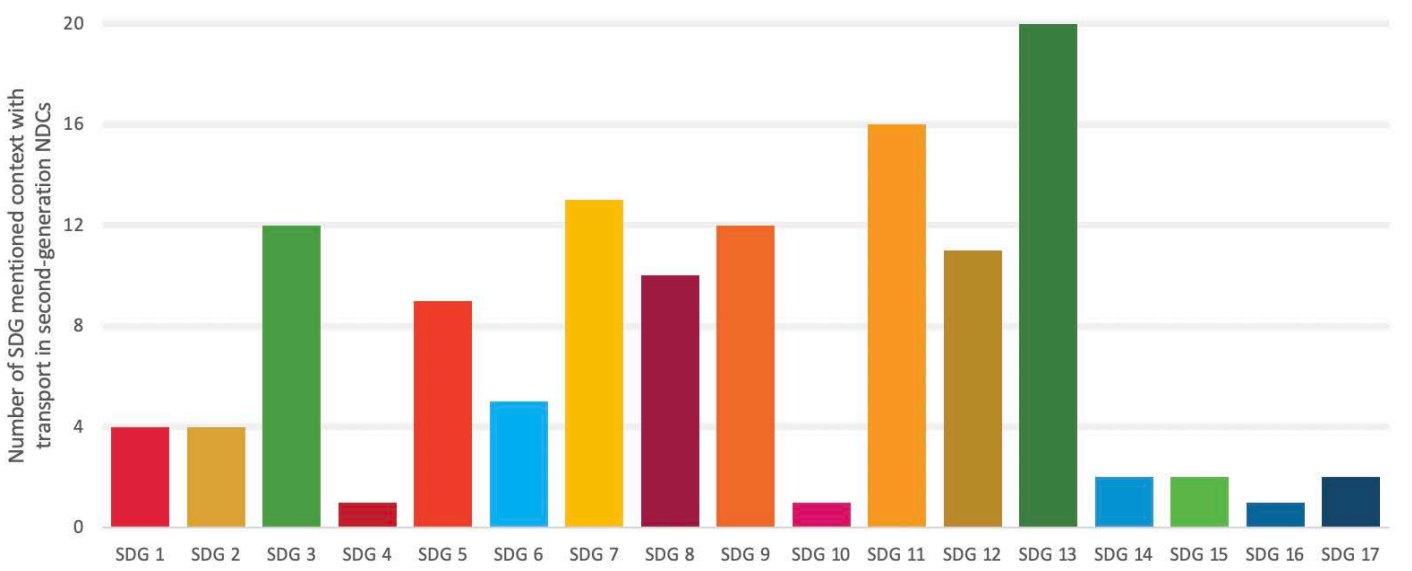
The Tracker of Climate Strategies for Transport captures all references made to the Sustainable Development Goals (SDGs) and wider development benefits (air pollution reduction, congestion reduction, better social inclusion, health benefits, improved accessibility, road safety improvements) in the context of transport in the LTS and second-generation NDCs. The few second-generation NDCs which reference these wider benefits mainly focus on better social inclusion and road safety improvements (Fig. 8). No additional benefits in the context of transport are mentioned by any of the 2022 submissions. This reinforces the lack of awareness of the wider development benefits of transport.

Fig. 8: Benefits mentioned in second-generation NDCs



21 second-generation NDCs link transport to specific SDGs. SDG 13 (Climate Action) is most often cited, followed by SDG 11 (Sustainable Cities and Communities) and SDG 7 (Affordable and Clean Energy), indicating the strong interplay between low-carbon and clean and sustainable transport (Fig. 9).

Fig. 9: SDGs mentioned in the context of transport in second-generation NDCs



Transport greenhouse gas emissions mitigation targets in Long-term Strategies

11 countries outline transport targets in their LTS (representing 21% of submitted LTS) (Table 2). In contrast to second-generation NDCs, LTS usually have a target year of 2050 (with a few exceptions aiming for 2030). Except for **Japan** and **New Zealand**, all of the LTS with transport GHG mitigation targets are from European countries. **Lithuania**'s LTS is the only 2022 submission with a transport GHG mitigation target including over a dozen non-GHG transport targets on electrification, energy efficiency, public transport expansion and active mobility .

Table 2: LTS transport targets

LTS	Transport GHG emissions mitigation targets
Belgium	Expected reduction in transport sector (both passenger and freight transport) to zero emissions by 2050
Germany	Reduce transport CO_{2eq} emission 40 to 42% compared to 1990 levels by 2030 (reduction of around 95 to 98 million tonnes CO_{2eq})
Japan	Reduce transport GHG emissions 80% per vehicle compared to 2010 by 2050
Lithuania	Reduce transport GHG emissions at least 14 % compared to 2005 levels by 2030 and by 90% compared to 1990 levels by 2050
New Zealand	Reduce transport emissions to net zero by 2050
Portugal	Reduce transport CO_2 emissions potentially 43-46% by 2030, 84-85% by 2040 and 98% by 2050 (compared to 2005 levels)
Slovenia	Reduce transport CO_2 emissions 90 to 99% by 2050 in comparison to 2005 levels

Spain	Reduce transport CO_2 emissions 30% below BAU by 2030
Sweden	Reduce domestic transport CO_2 emissions (excluding domestic aviation) 70% below 2010 levels by 2030
Switzerland	Intend to reach zero GHG emissions by domestic land transport in 2050 with few exceptions. International aviation should be net-zero by 2050 as far as possible.
United Kingdom	Achieve net zero emissions for aviation and shipping by 2050

2.2. Actions to mitigate transport emissions are insufficient to reach Paris Agreement goals

Key insight: Climate strategies are embracing a wider portfolio of transport mitigation actions, but continue to lean towards system efficiency improvements over transformation.

The database includes over 680 transport mitigation actions in LTS and over 724 actions from second-generation NDCs. Every action has been assessed according to the transport mode, activity (passenger and/or freight transport), geography (urban and/or rural transport) and association to Avoid, Shift and/or Improve (see explanation in 2.4) as referenced in the particular climate strategy.

The second generation of NDCs include on average more transport mitigation and adaptation actions than the first generation. There are nearly twice as many transport mitigation actions featured in each second-generation NDC compared to first-generation NDCs. On average, there are:

2.7
Transport mitigation actions per first-generation NDC

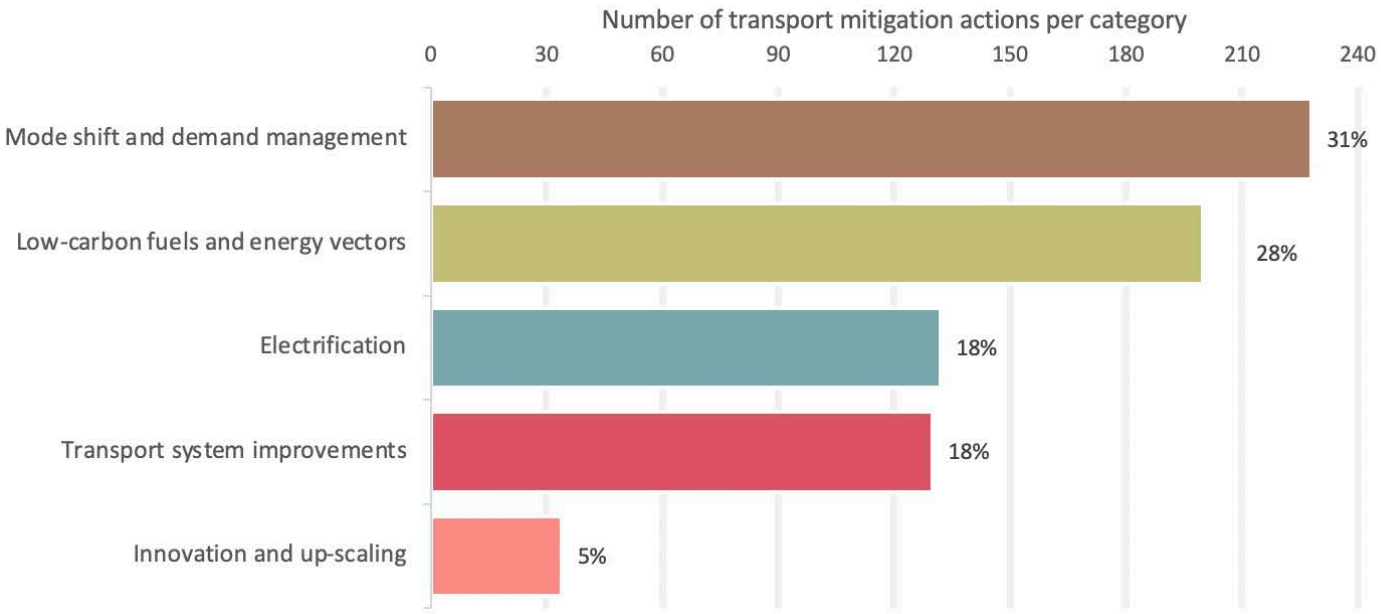
5.2
Transport mitigation actions per second-generation NDC

20
Transport mitigation actions per LTS

In the first-generation NDCs, 66% feature transport among their climate mitigation actions, which increased to 78% in second-generation NDCs. The transport mitigation actions are grouped in subcategories and further summarised in categories. The categories are aligned to ITF's Transport Climate Action Directory and include:[10] mode shift and demand management (31% of all mitigation actions in second-generation NDCs), low-carbon fuels and energy vectors (28%), electrification (18%), transport system improvements (18%) and innovation and up-scaling (5%) (Fig. 10).

[10] OECD/ITF (2021), Transport Climate Action Directory, available at: https://www.itf-oecd.org/tcad

Fig. 10: Transport mitigation actions by category



The actions are represented through the following categories and subcategories (in order of the most commonly included category) (see Fig. 11):

Mode shift and demand management:

- Transport demand management (11%)
- Economic instruments (13%)
- Public transport improvement (45%)
- Active mobility (22%)
- Digital solutions (10%)

Transport system improvements:

- Comprehensive transport planning (18%)
- Land use (8%)
- Improve infrastructure (44%)
- Freight efficiency improvements (21%)
- Education and behavioral change (9%)

Low-carbon fuels and energy vectors:

- Vehicle improvements (60%)
- Alternative fuels (38%)
- Labels (2%)

The category electrification (third-largest category) only has one category on electric mobility (largest category among all mitigation categories). Aviation and shipping improvements are covered in the category innovation and up-scaling. The distribution of actions throughout the categories does not change in any way through the 2022 submissions.

Fig. 11: Detailed distribution of transport mitigation measures by category (outer circle) and subcategory (coloured bubble)

In the first generation of NDCs, the most popular categories of measures were vehicle improvements, public transport improvements, infrastructure improvements and alternative fuels. E-mobility was the fifth-most mentioned category in first-generation NDCs. In second-generation NDCs, there has been a clear shift away from actions related to public transport and towards e-mobility actions and targets.

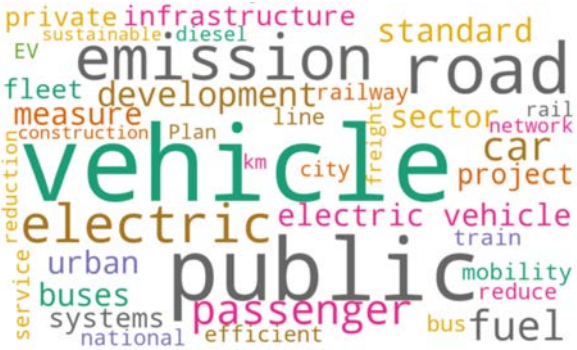
An issue that continues from the first generation of NDCs is that many actions have vague descriptions. Both generations of NDCs primarily contain statements of intent that do not specify how specific actions will be implemented, by whom, how much they will cost, and how they will be financed.

Figure 12 uses word clouds to highlight the most common words used in transport mitigation actions.[11] The following figures show the mitigation actions for the first (left) and the second generation of NDCs (right). The font size reflects how often a word has been mentioned. Electric (vehicle) and passenger (transport) increased significantly in frequency. This further confirms that the focus of transport in NDCs has shifted to electric vehicles.

Fig. 12: Word clouds on the most common transport mitigation actions

First-generation NDCs

Second-generation NDCs



2.3. Transport adaptation targets and actions are still limited

Key Insight: Adaptation in the transport sector has been largely limited to infrastructure resilience. More efforts are needed to strengthen transport adaptation and institutional capacity.

Overall, second-generation NDCs have strengthened content on adaptation to climate change, with the issue being covered in nearly every NDC. In a few cases, the NDC only briefly describes an updated economy-wide mitigation target and then focuses primarily on adaptation. According to an analysis from the UNFCCC, transport is the second least-mentioned sector within adaptation content in second-generation NDCs.[12]

Similar to mitigation, there are more transport adaptation actions featured in second-generation NDCs compared to first-generation NDCs. On average, there are:

0.4
transport adaptation actions per first-generation NDC

1.2
transport adaptation actions per second-generation NDC

57 second-generation NDCs (40% of all NDCs) include transport adaptation actions, a significant improvement over the first-generation NDCs where transport adaptation was covered in just 22%. Over two thirds of low-income countries contain transport sector adaptation measures in their NDCs. As low-income countries have low transport emission baselines and may suffer greater from the impacts of climate change, the topic of adaptation is more urgent than in middle- and high-income countries. 30% of high-income countries have actions related to adaptation in the transport sector.

9 LTS (**Austria, Cambodia, Colombia, Fiji, Japan, Lithuania, Malta, Singapore** and **Tonga**) are the only countries to discuss the topic of transport adaptation in their LTS. Just 35 transport adaptation actions were included in these LTS, while there are around 164 actions in second-generation NDCs.

Only 6 second-generation NDCs have transport adaptation targets (Table 3). They include targets to climate-proof infrastructure and develop public transport and active mobility systems in support of more robust and resilient transport systems. As of 15 September 2022, no new or revised submissions feature transport adaptation targets.

Table 3: Transport adaptation targets

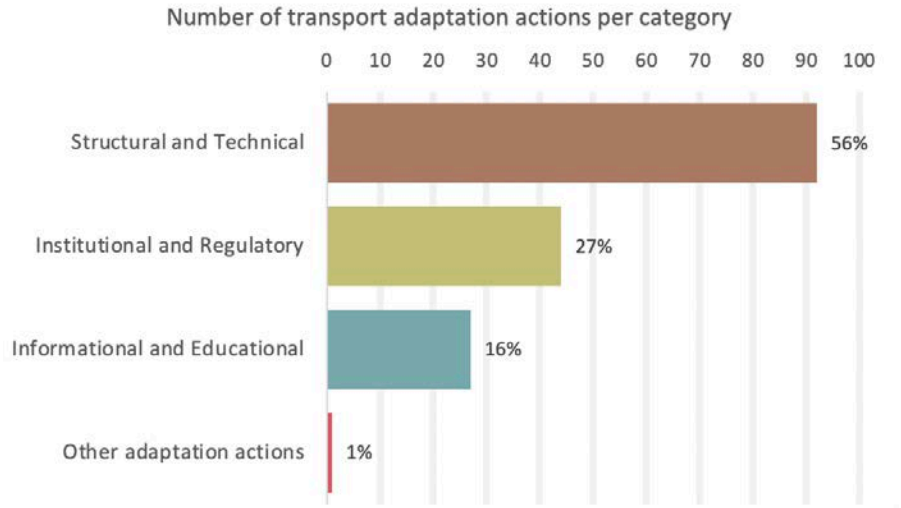
Country	Transport adaptation target
Antigua and Barbuda	Ensure all waterways are protected to reduce the risks of flooding and health impacts by 2030.
Burundi	Build 7.5 km (unconditional) or 42.5 km (conditional) of exclusive infrastructure for active mobility and 3 modern ports with 6 ships to be acquired for Lake Tanganyika (conditional)
Cambodia	Establish a guidebook with design standards for climate-proof roads by 2022, a monitoring and evaluation framework for such roads by 2023 and ensure that road construction and repair follows these standards by 2030.
Kenya	Promote the use of appropriate designs and building materials to enhance resilience of at least 4,500 km of roads.
Liberia	Implement infrastructure that fosters the development of a bus public transport network for Monrovia and ensures low-income groups to reach jobs, education and healthcare services through improved access to economic and social opportunities.
Papua New Guinea	Build and rehabilitate USD 1.2 billion (PGK 4.2 billion) value of transport (air, sea, and land) infrastructure and assets according to climate-resilient codes and standards.

[11] This analysis is the automated result of a script running through all NDCs. It might miss connected expressions (such as public transport, active mobility etc.). It shows the 40 most frequent words. The colours do not have any meaning. The word cloud has been filtered for common stop words and expressions that are not of value for this assessment. "Transport/transportation" has been removed as well.

[12] UNFCCC (2021), NDC Synthesis Report, available at: https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs/ndc-synthesis-report

Transport adaptation actions were captured in the following categories: structural and technical (56% of measures belong to this category), institutional and regulatory (27%), informational and educational (16%), and other adaptation actions (less than 1%) (Fig. 13).

Fig. 13: Transport adaptation actions by category



The adaptation content is very general and the majority is limited to road infrastructure resilience. 54% of all actions are on structural and technical adaptation. Actions on transport adaptation rarely specify the type of transport activity they aim to address (i.e. passenger or freight).

There are only two adaptation actions on active mobility. **Burundi** mentions that the country will build active mobility infrastructure, at least 7.5 km (unconditional) or up to 42.5 km (conditional) in Bujumbura within their section on adaptation. **Ethiopia** intends to build infrastructure for active mobility to ensure resilience through enhanced access to mobility.

Transport adaptation actions were captured in the following categories (sorted by most common category) (also see Fig. 14):

Structural and technical adaptation:

- Transport infrastructure resilience (62%)
- Transport system adaptation (12%)
- Repair & maintenance (4%)
- Risk assessment (15%)
- Resilient transport technologies (7%)

Informational and educational measures:

- Monitoring (19%)
- Information system (19%)
- Early warning systems (19%)
- Emergency and disaster plan (7%)
- Education and training (37%)

Institutional and regulatory:

- Transport planning (43%)
- Relocation (2%)
- Redundancy (2%)
- Abandonment, disinvestment or avoidance (2%)
- Transport laws, regulations and programmes (7%)
- Design standards and updates (43%)

The assessment shows that transport adaptation measures focus largely on infrastructure resilience rather than more comprehensive transport adaptation planning. 2022 submissions as of 15 September 2022 continue the trend of previous submissions with a consistent focus on infrastructure resilience.

Fig. 14: Detailed distribution of transport adaptation actions by category (outer circle) and measure (colored bubble)

Summarising the transport adaptation actions in a word cloud, it shows that infrastructure, road, and resilient were the most commonly used words (Fig. 15). Adaptation was used less frequently than resilient (and resilience) and there are many expressions related to building, construction and development.

Fig. 15: Word cloud on the most common transport adaptation actions

2.4. The full potential of Avoid and Shift benefits are not maximised; the focus on Improve prevails

Key Insight: Full potential of inclusion of Avoid and Shift actions has not yet been reached. Improve actions dominate in theLTS and second-generation NDCs.

The Avoid-Shift-Improve (A-S-I) framework[13] classifies different measures used to achieve sustainable, low carbon transport through the following three categories (following a hierarchy with *Avoid* measures which should be implemented first, followed by *Shift*, and then *Improve*):

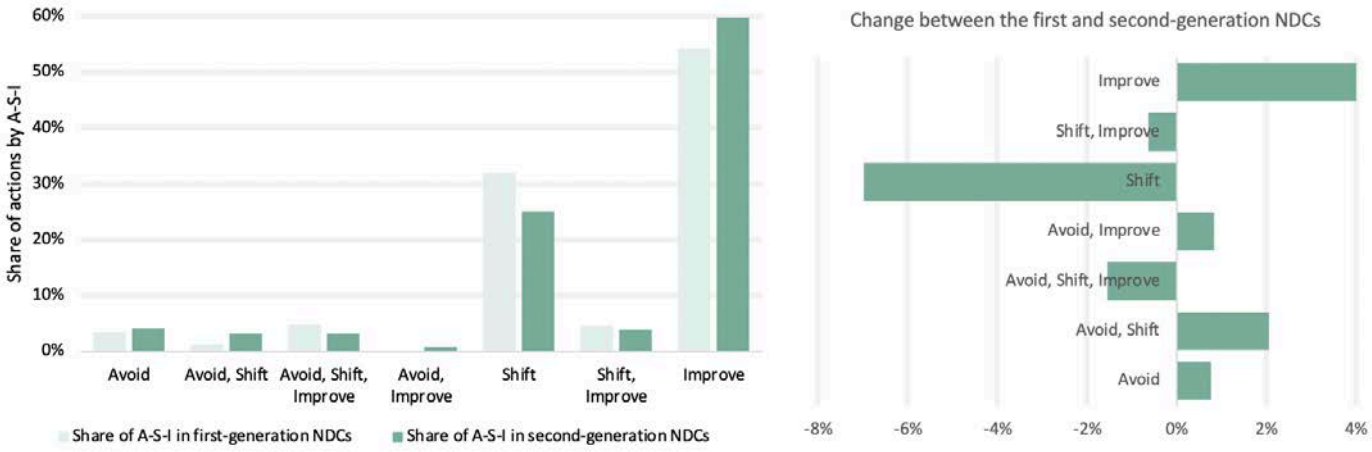
- Avoiding unnecessary motorised trips based on proximity and accessibility.
- Shifting to less carbon-intensive modes – that is, from private vehicles to public transport, shared mobility, walking and cycling, water-based freight, electrified road-rail freight, and cargo bikes for last-mile deliveries, among others.
- Improving vehicle design, energy efficiency and clean energy sources for different types of freight and passenger vehicles.

Applying A-S-I through integrated, inter-modal and balanced approaches is critical to unleashing the full benefits of sustainable, low carbon transport. The A-S-I framework has been central to sustainable, low carbon transport for more than a decade. Growing evidence shows that *Avoid* and *Shift* strategies can account for 40-60% of transport emission reductions, at lower costs than Improve strategies.

Avoid only represents 4% of transport mitigation actions, while *Shift* has a 25% share in second-generation NDCs. The large majority of actions are, however, associated with *Improve* (60%). Other actions have a combination of the three aspects. There is a lack of balanced approaches between *Avoid, Shift* and *Improve* in the second-generation NDCs.

The imbalance across A-S-I measures increased compared to the first-generation NDCs, where *Avoid, Shift* and *Improve* represent 3%, 32% and 54% respectively. Shift measures have significantly lost importance (by -7%) (Fig. 16). While in the first-generation NDCs measures on public transport (a representative *Shift* measure) were the most common actions, the second-generation NDCs now include more e-mobility measures (an *Improve* measure).

Fig. 16: Mitigation actions according to Avoid, Shift and Improve

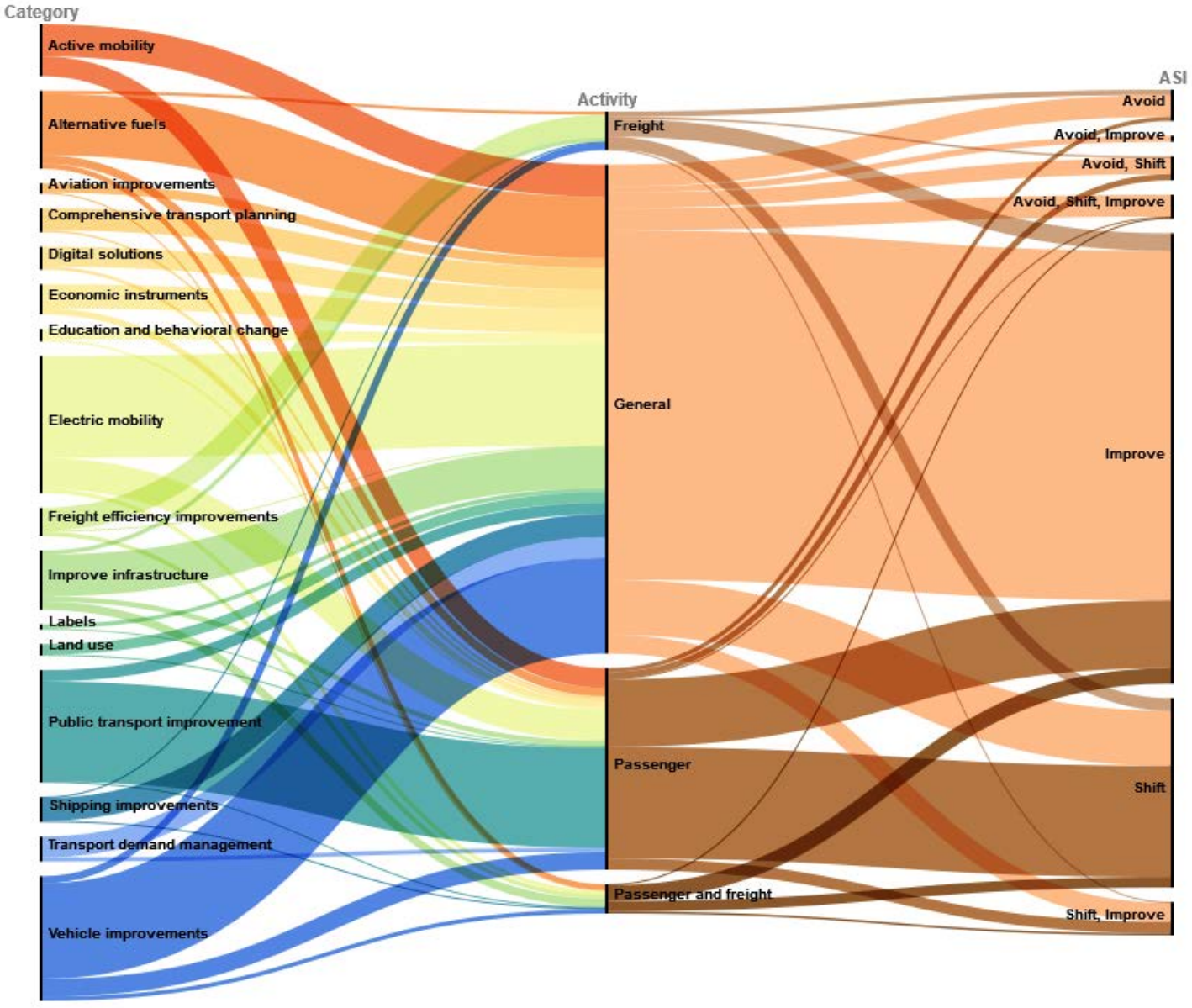


[13] SLOCAT (2021), Avoid-Shift-Improve Refocusing Strategy, available at: https://slocat.net/asi/

95% of second-generation NDCs with transport actions have at least one action focusing exclusively on improving energy efficiency or shifting to low-carbon fuels. 65% of NDCs with transport actions have at least one action focusing on shifting transport to more efficient or non-motorised modes.

Actions have been categorised as *Avoid, Shift* and/or *Improve* (A-S-I) based on the context within the NDC. Fig. 17 shows how different actions in the second-generation NDCs are distributed among passenger, freight or general activity as well as their categorisation under A-S-I. The figure shows that passenger transport actions are strongly associated with *Shift.* Freight actions are distributed between *Shift* and *Improve*. While the majority of e-mobility actions are associated with *Improve* measures, several of these actions also support public transport and can be categorised as both *Shift* and *Improve* measures. The reason for this is due to the improvements in service quality related to electrification of the bus fleet, which leads to more people shifting towards the use of buses over private vehicles. New 2022 submissions as of 15 September 2022 do not lead to any significant changes to the Sankey diagram on A-S-I.

Fig. 17: Sankey diagram to understand the context of A-S-I



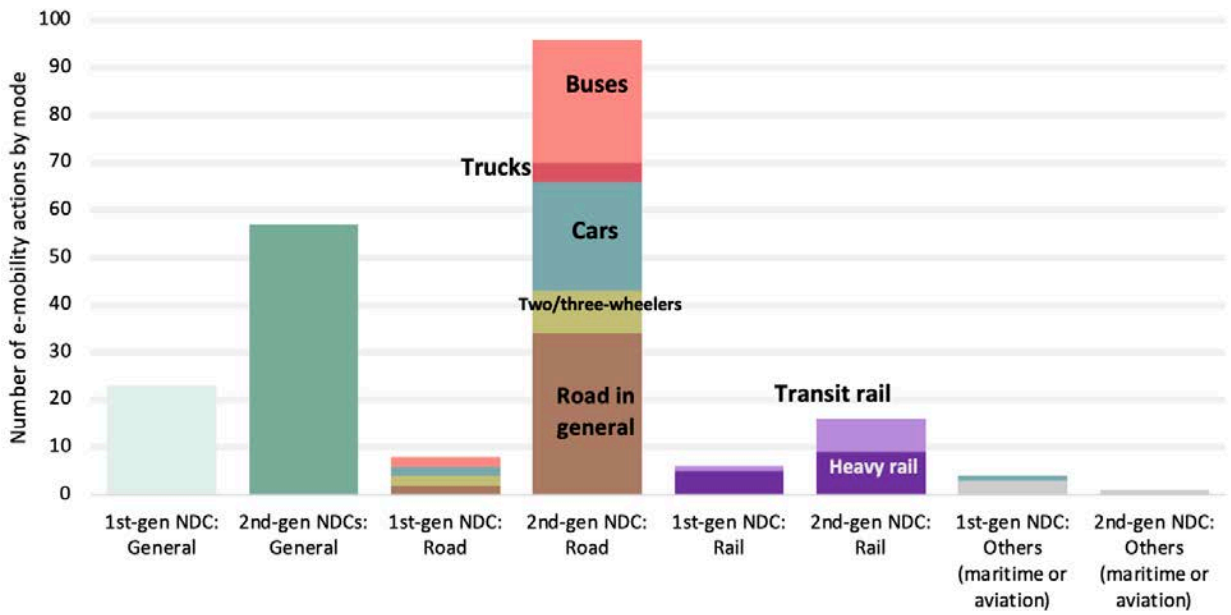
Sri Lanka's updated NDC	Singapore's LTS with strong linkages between transport and land use planning
It contains a balanced mix of 35 measures in the transport sector which cover all areas, including: • Reducing commuting and travel times • Parking management • Enhancing public transport • Enhancing pedestrian walkways • Promoting cycling • Shifting freight to rail • Promoting sea transport along with measures to improve efficiency and promote electrification	• Establish active mobility, public and shared mobility as preferred way of travel • Develop 20-minute cities supporting walking, cycling, riding and 40-minute cities (mostly for commuting) with public transport • Expand active mobility network • Expand and improve mass public transport and shared transport • Promote zero-emission vehicles and phase out sales of internal combustion engine vehicles by 2040 • Increase energy efficiency at airports and ports

2.5. Electrification takes pole position

Key insight: New climate strategies feature a strong focus on electrification of road transport across vehicle types.

Electric mobility (e-mobility) is the most common subcategory in second-generation NDCs. 74 second-generation NDCs (52%) include e-mobility-related actions, representing 18% of all actions. With the new submissions as of 15 September 2022, the share of actions decreased from 24% to 18% as the new NDCs feature a more diverse set of actions. The large majority of all second-generation NDCs refer to e-mobility in general terms or only refer to road transport without specifying a specific road transport mode (cars, buses, two/three-wheelers and trucks) (Fig. 18). Among the measures which explicitly mention a transport mode, the electrification of buses is highly favoured, followed by cars, two/three-wheelers and rail.

Fig. 18: Transport modes covered by e-mobility actions



Electrification targets

38 non-GHG transport targets in second-generation NDCs relate to vehicle electrification, and the majority are from middle and high-income countries (in some cases, there are multiple targets by the same country). They represent by far the largest number of non-GHG transport targets. These targets aim to phase out the sale of vehicles with internal combustion engines using sales bans or import restrictions. For example, Brunei Darussalam aims to reach a 60% share of electric vehicles in total vehicle sales by 2035. Togo and Uganda are the two only low-income countries with such targets. Togo aims to have 3% of vehicle sales to be electric by 2025. Uganda plans to introduce 200 electric buses in the Greater Kampala Metropolitan Area.

The Annex shows the variation in countries' vehicle electrification targets. Notably, many countries in LAC (Antigua and Barbuda, Barbados, Bolivia, Chile, Colombia, Costa Rica, Dominica and Panama) include e-mobility targets in their second-generation NDCs. Panama envisions that by 2030, electric vehicles will represent 10% of commercial vehicles, 25% of personal vehicles, 20% of public transport and 30% of government fleets.

Fossil fuel vehicle phase-out

While in recent years many countries announced the sales ban of new diesel and gasoline vehicles, only a few second-generation NDCs (Antigua and Barbuda, Cabo Verde, Canada and Singapore) include such visions. One of these countries is Cabo Verde, which aims to fully replace all diesel and gasoline vehicles through electric vehicles by 2050. Antigua and Barbuda has set a target for new vehicle sales to consist only of electric vehicles by 2030.

In LTS, fossil fuel phase-out is being envisioned by Denmark, France, Singapore and the United Kingdom. The LTS by the United Kingdom includes a target to end sales of fossil fuel-powered cars and vans by 2040, but the revised second-generation NDC by the United Kingdom brought the target forward to 2030

2.6. Phase-out of fossil fuels is missing in action

Renewable energy

Key insight: The impact of electrification on decarbonisation efforts could be significantly enhanced with more widespread use of renewable energy.

Actions on the use of renewable energy in transport

Based on the current prevalence of e-mobility actions and targets in climate strategies, the increased use of renewable energy to power electrification will be essential to the decarbonisation of road transport. 17 second-generation NDCs provide clear linkages between the electrification of transport and the use of renewable energy. In 2022, the NDCs by Dominica, Egypt and Gabon strengthened this linkage. Antigua and Barbuda intends to use finance instruments to establish a fossil fuel-free energy system, which extends to the transport sector, starting with public buses and passenger vehicles. Looking at more long-term planning, half of all LTS link transport to renewable energy use.

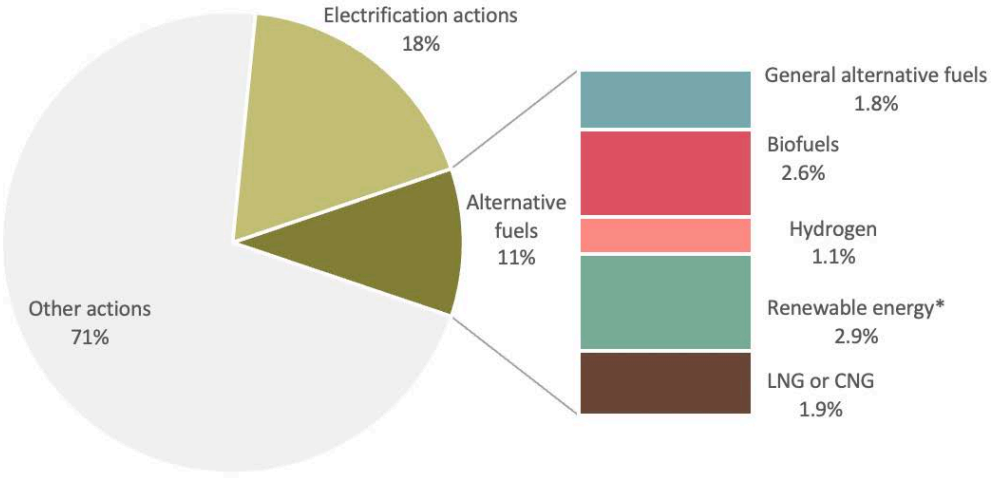
The use of alternative fuels (not just limited to fuels from renewable sources) to lower transport emissions has been mentioned in 11% of transport mitigation actions in second-generation NDCs. The majority of actions in this category focus on biofuels, followed by renewable energy (either mentioning electricity provided through

renewables or including general references to renewables in transport). Among the new NDCs as of 15 September 2022 there are many references to renewable energy for transport, however this does not result in an increase in the share of alternative fuels.

Hydrogen

Eight second-generation NDCs include plans for the use of hydrogen power for transport. Most countries do not specify if the hydrogen is produced from renewable energy sources, except for **Chile** and **Namibia**, who explicitly link the production of hydrogen to renewable energy sources. **Chile** sees hydrogen as important for freight transport. In **Namibia**, hydrogen is intended to replace diesel and seen as crucial for reaching carbon neutrality.

Fig. 19: Alternative fuels and e-mobility compared to other actions



*** It may include electricity through renewable energy or general references to renewable energy in transport.**

Fossil fuel subsidies

Key insight: NDCs neglect commitments and plans to phase out fossil fuel subsidies and shift money to finance the transition to sustainable, low carbon transport.

The second-generation NDCs largely neglect the inclusion of targets and plans to phase out fossil fuel subsidies. The only two NDCs with such plans are **Switzerland** in the context of the Friends of Fossil Fuel Subsidies Reform and **United Arab Emirates**' fuel pricing reform to increase fuel prices to international standards, which is the same reform mentioned in the **United Arab Emirates**' first NDC. In the first-generation NDCs **India** and **Nigeria** also included intentions to reduce fossil fuel subsidies. As this activity requires a long-term approach, some countries (**Austria, Germany, Mexico** and **Sweden**) are including plans to reduce fossil fuel subsidies in their LTS.

2.7. Freight emissions growth continues unabated

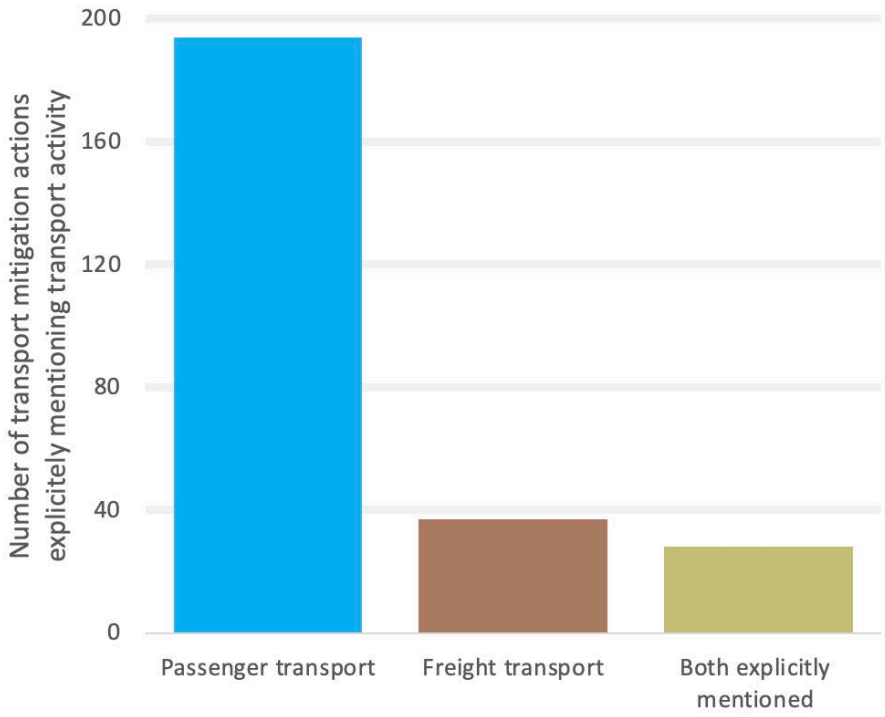
Key Insight: Freight remains overlooked in NDC measures despite the sector's large contributions to GHG emissions. Action on freight is urgent due to rapidly rising demand and emissions. Only a few second-generation NDCs embrace a shift of road freight to rail and improvements of logistics.

The freight sector is widely seen as the most challenging transport segment to decarbonise, due in part to a lack of comprehensive policies and mature technology options. Freight represents 40% of transport emissions and freight activity is expected to increase 225% until 2050.[14]

The Tracker of Climate Strategies for Transport captures when transport activity type (passenger, freight or combination of passenger and freight) is explicitly mentioned in mitigation and adaptation actions. **The large majority of actions in second-generation NDCs do not specify which transport activity type they will apply to. Of the mitigation actions that do explicitly mention transport activity type, only 17% refer to freight transport while 73% mention passenger transport (Fig. 20).** The remaining 10% include a combination of passenger and freight transport improvements. This follows similar patterns to the first generation of NDCs, where passenger transport was specified in 78% of actions (that specified transport activity type). In LTS, the ratio between freight (36%) and passenger (55%) is slightly better.

This may be the result of freight transport continuing to be overlooked in climate action or countries being less aware of solutions to reduce freight emissions. Either way, future activities around climate change and sustainable transport must include significantly more activities to decarbonise freight transport.

Fig. 20: Second-generation NDCs transport mitigation actions mentioning passenger and/ or freight transport



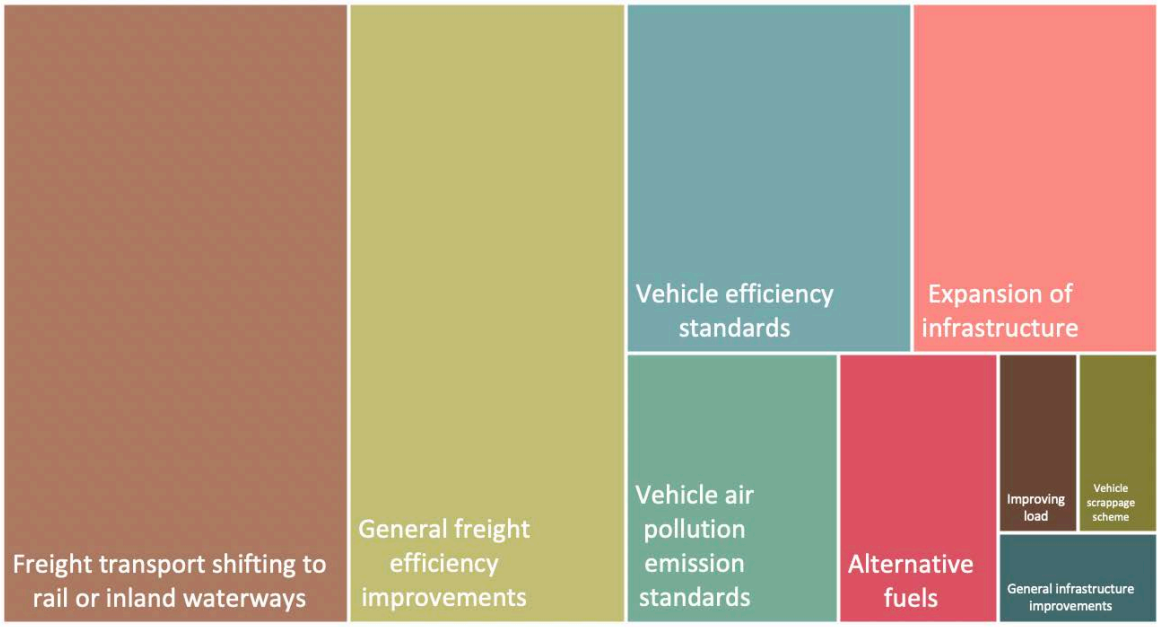
[14] SLOCAT (2021), Tracking Trends in a Time of Change: The Need for Radical Action Towards Sustainable Transport Decarbonisation, Transport and Climate Change Global Status Report – 2nd edition, available at: www.tcc-gsr.com

There is not a single second-generation NDC that mentions transport adaptation actions specifically for the freight sector or passenger transport. As the frequency of extreme weather events continues to increase, global supply chains are at increased risk for disruptions. However, none of the climate strategies include plans to address this significant threat.

Freight actions

The most popular freight actions in second-generation NDCs include: shifting from road transport to rail or inland waterways (14 actions), freight efficiency improvements (12 actions) and vehicle-focused improvements (7 actions) (Fig. 21).

Fig. 21: Freight measures in second-generation NDCs



Only 3% of mitigation actions (18 NDCs) address rail infrastructure expansion or improvement for freight. A good example is the **United Arab Emirates** which plans to build the 1,200 km-long Etihad Rail network. The first stage of 264 km has been operational for freight since January 2016. A single train journey replaces approximately 300 trucks from the road, reducing CO_2 emissions by 70-80%, according to **United Arab Emirates**' second NDC. However, in absolute numbers, there are more freight actions in the 126 second-generation NDCs than in the 168 first-generation NDCs, indicating a slow tendency towards increased ambition to decarbonise freight.

2.8. National frameworks to support sustainable urban mobility are absent in climate strategies

Key Insight: Achieving the NDCs will require climate action in cities, but NDCs lack national frameworks to support local action.

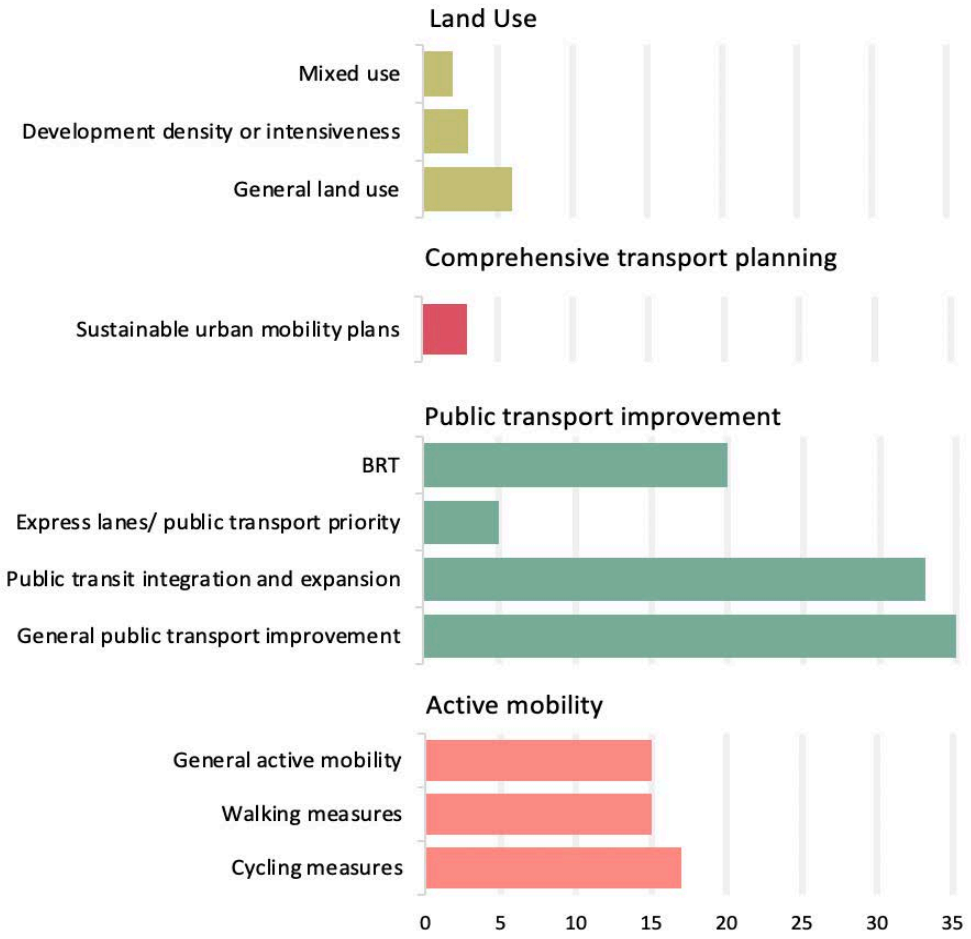
NDCs focus on climate action at the national level, but as urban transport is responsible for 60% of transport emissions, it is essential that cities are considered and supported in decarbonisation efforts.[15] However, second-generation NDCs do not consider supporting frameworks for urban mobility. The only exception is **Canada**, where a permanent funding of CAD 3 billion per year is planned for investments in public transport and active mobility from 2026-27.

Urban-level actions

Of the second-generation NDCs that include specific references to the geographic scope of measures, 19% (over 130 actions) mention urban transport and just 2% mention rural transport and intercity transport. The large majority of measures, however, more generally cover national transport.

A unique characteristic of these urban actions is that the majority focus on *Avoid* and *Shift* measures. 31 actions are linked to *Avoid* or a combination of *Avoid* and *Shift* and/or *Improve*. 75 actions are associated with *Shift*. In addition, there are several measures exclusively applicable to urban mobility including land use (7% of relevant urban transport-related actions), comprehensive transport planning (2%), public transport improvements (62%) and active mobility (29%) (Fig. 22).

Fig. 22: Urban transport-related actions in second-generation NDCs



The LTS of **France, Lithuania, the Marshall Islands, Luxembourg, Mexico, Norway, Slovakia, Slovenia** and **Tonga** reference how more efficient land use and urban planning can lead to significant reductions in motorised trips.

[15] OECD/ITF (2021), ITF Transport Outlook 2021, available at: www.itf-oecd.org/itf-transport-outlook-2021

Sustainable Urban Mobility Plans

Sustainable urban mobility plans (SUMPs) are an important enabler of sustainable mobility in cities. However, only one country, **Sri Lanka**, mentioned this tool in their first generation NDC, and only three countries so far have included it in their second-generation NDCs (**Barbados, Guinea** and **Panama**). **Guinea**'s second-generation NDC refers to Conakry's SUMP that covers a BRT system and train services to reduce CO_2 emissions and improve the living conditions of citizens. In LTS, **Guatemala, Norway, Slovakia** and **Sweden** include specific references to SUMPs.

Case study: Barbados's SUMP - Updated NDC

In the context of clean mobility, **Barbados**' updated NDC refers to the SUMP for the Greater Bridgetown Area and its urban corridor. This SUMP aims to:

- Upgrade the public transport system through fleet renovation, payment systems, tracking systems and demand management,
- Introduce bicycle lanes and connected sidewalks
- Realise accessibility measures, and
- Implement parking management policies.

At the national level, national urban mobility policy or investment programmes (NUMPs) are action-oriented strategic frameworks for urban mobility developed by national governments to improve the capacity of cities to plan, finance, and implement projects and measures that support sustainable mobility. While NUMPs are an important tool to help drive and coordinate local and national actions towards sustainable mobility, thus far, no NDC has included references to a NUMP.[16]

2.9. The process to implement commitments has been strengthened

Governance and implementation

Key insight: The few NDCs with details on governance show that more engagement has been done than ever before including through stakeholder consultations and the involvement of multiple ministries.

The first generation of NDCs left the impression that many countries quickly drafted climate strategies and ignored consulting stakeholders. **The second-generation of NDCs makes use of a more process-oriented approach. More efforts have been made to outline contributions by various stakeholders (ministries beyond the environment ministry, representatives from civil society etc.).** A few NDCs mention dialogues and workshops to ensure buy-in from key transport actors. At least 12 second-generation NDCs clearly mention the direct involvement of relevant transport stakeholders – usually the Ministry of Transport – in the development of the NDC, although more may

[16] MobiliseYourCity (2021), National Urban Mobility Policies and Investment Programmes (NUMP) - Guidelines, available at: https://www.mobiliseyourcity.net/national-urban-mobility-policies-and-investment-programmes-nump-guidelines

be involved through general inter-institutional arrangements. **Australia** established a Technology Investment Advisory Council with representatives from business, investors, and researchers to identify priorities. **Barbados** mentions two rounds of dialogues with over 100 participants. Efforts towards improved vertical integration between ministries were made by **Singapore** through its Inter-Ministerial Committee on Climate Change.

In several second-generation NDCs references to national transport strategies have been included: **Rwanda** mentions its Transport Sector Strategic Plan, **South Africa** refers to its Green Transport Strategy, **Thailand** mentions its Environmentally Sustainable Transport System Plan 2013-2030, and the **United Kingdom** mentions its Transport Decarbonisation Plan. Among 2022 submissions as of 15 September 2022, **Dominica**, for example, mentions the Low-Carbon Transport Dominica Project.

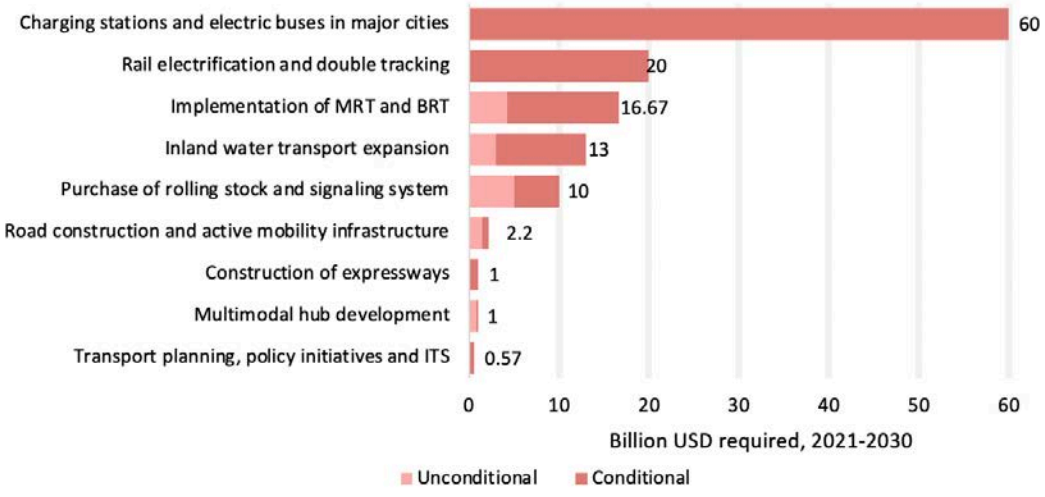
However, very few NDCs mention explicitly what kind of support they need to implement transport decarbonisation actions. Capacity building needs are mentioned by the **Dominican Republic, Rwanda, Sierra Leone, Suriname** and **Tonga**. Technology transfer needs have been highlighted by **Gambia, Sierra Leone, South Sudan, Tonga, Togo** and **Tunisia**. In the case of **Tonga**, its submission mentions that a transport GHG mitigation target is missing due to a lack of viable alternatives for fossil fuels in transport. It clearly shows that widespread awareness of viable solutions is currently lacking.

Financing sustainable transport

Financing for sustainable transport is a major need expressed in second-generation NDCs. Overall, achieving a low carbon transport pathway requires global investments of USD 2.7 trillion per year from 2016 to 2030, with 60-70% of these investments in emerging economies.[17] 35 second-generation NDCs outline how much investment is needed to support sustainable transport actions. For example, **Bangladesh** estimates that its transport mitigation actions will require over USD 124 billion until 2030. Out of this, the country notes that 88% will need to be provided through international support.

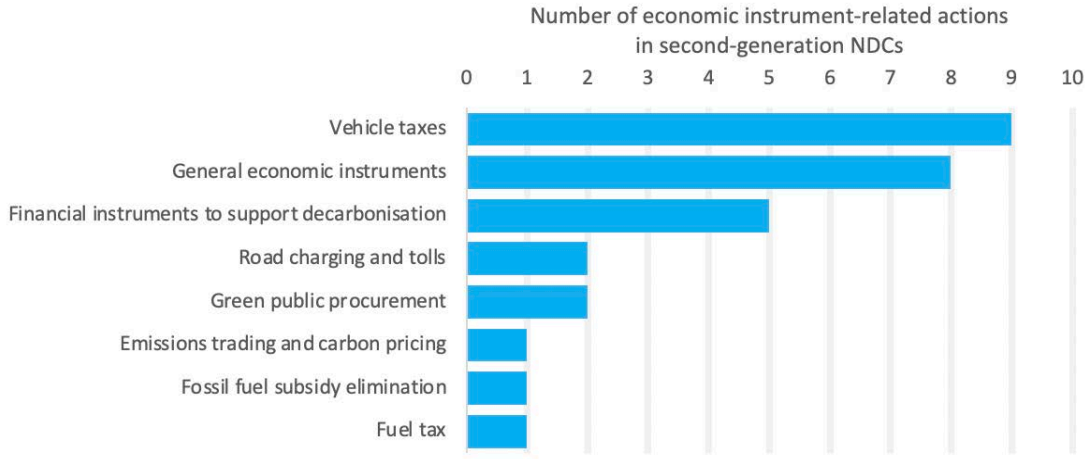
References to economic instruments that can enable new financing streams for sustainable transport are also included in a few second-generation NDCs. The use of vehicle taxes aimed at reducing polluting vehicles was the most common economic instrument (Fig. 24). However, overall, very few NDCS consider economic instruments for sustainable transport.

Fig. 23: Investment requirements for transport mitigation actions in Bangladesh's second NDC



[17] SLOCAT (2021), Tracking Trends in a Time of Change: The Need for Radical Action Towards Sustainable Transport Decarbonisation, Transport and Climate Change Global Status Report – 2nd edition, available at: www.tcc-gsr.com

Fig. 24: Economic instruments in support of transport decarbonisation



COVID-19 pandemic and green equitable recovery

Second-generation NDCs have been submitted during the global COVID-19 pandemic, and 31 NDCs reference the additional challenges the pandemic is causing. However, only two NDCs see pandemic recovery as an opportunity to 'build back better' and support the implementation of climate goals.

2.10. Attention to aviation and shipping emissions remains insufficient

Key insight: There is a notable lack of coherence between domestic and international commitments to decarbonise aviation and shipping. Only a few countries have expressed their intention to increase their engagement in global agreements on aviation and shipping.

Only 16 second-generation NDCs include plans to reduce emissions related to domestic aviation and maritime transport. A good example is **Fiji**, which has a target of reducing domestic maritime shipping CO_2 emissions 40% below BAU by 2030.

In addition, only a few countries have expressed their intention to increase their engagement in global agreements on aviation and shipping: The LTS by the **EU, Luxembourg, Russia, Singapore** and the **United Kingdom** have, for example, pointed out that efforts to minimise their aviation and shipping emissions will be addressed through their active participation in International Civil Aviation Organization (ICAO) and International Maritime Organization (IMO). **Cabo Verde**'s second-generation NDC highlights the need to decarbonise maritime transport through engagement with the IMO. **Myanmar** also mentions its intentions to increase engagement with ICAO's Carbon Offsetting and Reduction Scheme in International Aviation. In October 2022, ICAO member states adopted a new, collective long-term global aspirational goal of net-zero carbon emissions by 2050.[18] It has received criticism as highly insufficient due to a lack of non-CO_2 targets, interim targets and binding commitments.[19]

[18] ICAO (2022), States adopt net-zero 2050 global aspirational goal for international flight operations, https://www.icao.int/Newsroom/Pages/States-adopts-netzero-2050-aspirational-goal-for-international-flight-operations.aspx

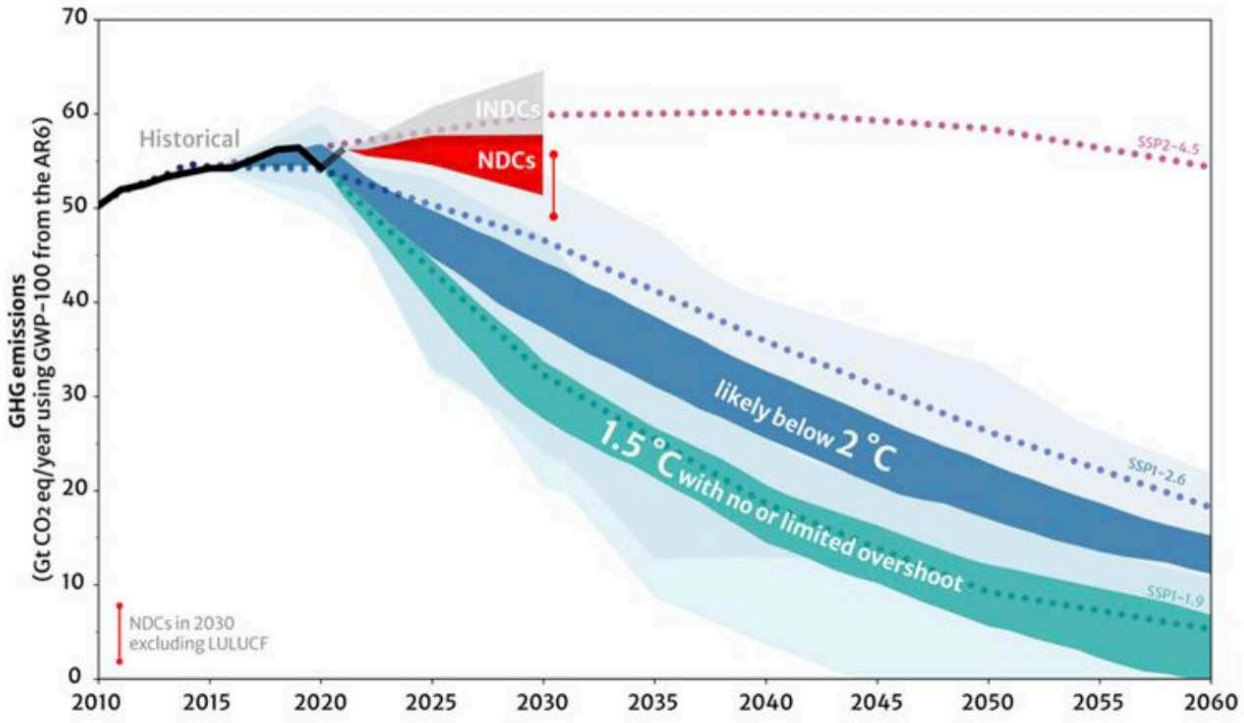
[19] Stay Grounded (2022), Climate activists announce international protests as UN aviation agency adopts insufficient climate target, https://stay-grounded.org/climate-activists-announce-international-protests-as-un-aviation-agency-adopts-insufficient-climate-target/

3. Conclusions

Second-generation NDCs will lead to a global warming level of 2.5°C. *Overall, second-generation NDCs reflect increased ambition on sustainable, low carbon transport. However, compared to the level of ambition that the Intergovernmental Panel on Climate Change reports will be required to meet the goals of the Paris Agreement, the current level of global ambition to decarbonise the sector is far from sufficient. The UNFCCC synthesis report[21] found that not only is the level of ambition in second-generation NDCs insufficient to achieve the goals of the Paris Agreement, it will, in fact, imply a further increase of GHG emissions of around 11% by 2030 (see Fig. 25). The data includes NDCs as of 23 September 2022, and it indicates that the NDCs might result in a temperature increase of 2.5 °C (range of 2.1 to 2.9 °C).*

As the window to limit global warming to below 1.5 °C closes, the world is facing increased urgency for not only greater ambition, but immediate action towards decarbonisation in order to reach zero emissions by mid-century. Trends and insights from the transport content of LTS and second-generation NDCs (summarised in the following box) can and should be utilised to identify and help fill critical gaps in global transport decarbonisation efforts, including during the upcoming COP26 and Global Stocktake.

Fig. 25: Comparison of global GHG emission scenarios required to limit global warming with global emissions according to NDCs



[21] UNFCCC (2021), NDC Synthesis Report, available at: https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs/ndc-synthesis-report

In addition, the SLOCAT Partnership and GIZ have compiled **recommendations to raise ambition for transport in NDCs to align transport with the Paris Agreement and the 2030 Agenda for Sustainable Development.** These recommendations include practical steps to ensure that the way that climate strategies are developed and implemented maximises climate action in transport.

Climate strategies are embracing a wider portfolio of transport mitigation actions, but they continue to favour improving the efficiency of current systems over the more transformative measures needed to reach zero emissions. For example, there has been a clear shift away from public transport-related measures and towards more measures related to e-mobility. Another issue that remains from the first-generation of NDCs is that many measures and actions lack specific details around implementation and are often quite vague in their descriptions. Many are simply statements of intent that do not specify how they will be achieved. More focus, therefore, should be put on making climate strategies more specific and actionable.

Transport GHG mitigation targets must mitigate emission levels in order to support the goal of limiting global warming below 1.5 °C. Having more NDCs that include a transport GHG mitigation target is a good step but the current targets are not ambitious enough. A bigger number of major transport emitters (i.e. high-income countries) should outline such targets and pursue higher efforts. The growth of transport emissions would only be slowed down by the NDCs with transport GHG mitigation targets but not put on the radical contention path that is required to support the goal of limiting global warming below 1.5 °C.

Governance structures are more sophisticated in the most recently submitted climate strategies, referencing the engagement of more stakeholders and often clarifying the responsibilities of transport ministries. Yet, there is still significant room for improvement.

The implementation of transport climate strategies, for example, is largely dependent on action at the local level. However, NDCs do not include enabling frameworks and policies to support cities in improving the sustainability of urban mobility. Funding to cities to support sustainable urban mobility measures and the involvement of stakeholders from the local level in the development of climate strategies will be critical to the successful implementation of ambition on sustainable urban transport.

***Avoid-Shift-Improve* actions in second-generation NDCs continue to be biased towards Improve.** Electrification (an Improve measure) became the most popular transport mitigation action, specifically the electrification of buses and cars. In order to decarbonise the transport sector, it will therefore be essential to ensure that electric transport is powered with renewable energy. Actions that can help support the avoidance of unnecessary polluting transport, such as the phase-out of fossil fuel subsidies, are largely absent in NDCs and LTS, thus hindering the overall transition to sustainable, low carbon transport.

Less low-income countries have submitted LTS than middle- and high-income countries. Many low-income countries submitted their second-generation NDCs late in the process. This may indicate a lack of capacity of low-income countries to engage in international climate processes and develop climate commitments. However, with future transport demand growth projected to occur mainly in low- and middle-income countries, it is crucial that these countries embrace sustainable, low carbon transport in their short, medium and long-term planning efforts. NDCs and LTS are also an important opportunity for countries to express their need for international support, so it is especially important for low-income countries to engage in the process.

NDCs and LTS don't make connections between transport and the wider sustainable development agenda. The transition to sustainable transport has many benefits beyond the reduction of GHG emissions. To accelerate impact, NDCs and LTS should explicitly connect climate actions for transport to the overall achievement of more sustainable development.

While climate adaptation has received greater attention in second-generation NDCs, **adaptation measures for the transport sector are limited and focus largely on infrastructure resilience**. More efforts are needed to include these important measures and supporting institutional frameworks in climate strategies.

Second-generation NDCs fail to include measures to decarbonise and ensure the resiliency of freight transport. Given the freight sector's significant contributions to GHG emissions as well as its underlying vulnerabilities (highlighted by the COVID-19 pandemic), there is a clear need to scale up the dissemination of solutions to decarbonise and adapt the freight sector and ensure it receives more attention in climate strategies.

Second-generation NDCs miss the opportunity to accelerate engagement in **global agreements to reduce emissions from aviation and shipping** and fail to include measures to support the implementation of such agreements.

Annex

E-mobility targets in second-generation Nationally Determined Contributions

Country	E-mobility-related target
Antigua and Barbuda	100% all new vehicle sales to be electric vehicles by 2030; import of internal combustion engine vehicles from 2030 (initial start in 2025); 100% of government vehicles will be electric by 2035
Barbados	100% electric or alternatively-fueled vehicles in the passenger fleet
Brunei Darussalam	60% of sold vehicles to be electric by 2035
Cabo Verde	25% of sold land transport vehicles to be electric by 2030, supported through strong renewable energy linkages
Chile	100% taxis, public transportation and 58% private vehicles to be electrified by 2050; 71% of freight transport powered by hydrogen in 2050
Colombia	600,000 vehicles to be electrified (public transport, taxi, passenger cars, light trucks and government vehicles)
Costa Rica	By 2030, at least 8% of the public transport fleet and light vehicles (private and government-owned) will be zero emission
Côte D'Ivoire	10% of vehicles to be electric by 2030 (unconditional), or 25% by 2030 (conditional)
Dominica	Last fossil fuel passenger car to be sold by 2035 to 2050
Israel	As of 2026, all new municipal buses purchased will be clean vehicles
Lao People's Democratic Republic	30% electric vehicles penetration for 2-wheelers and passengers' cars
Monaco	Public transport will be zero-emission by 2030
Namibia	10,000 electric vehicles to be in use
Nepal	25% of sold vehicles (passenger cars and two-wheelers) and 20% of public transport (excl. rickshaws and tempos) to be electric by 2025; 90% of sold vehicles (passenger cars and two-wheelers) and 60% of public transport (excl. rickshaws and tempos) to be electric by 230; by 2030, 200 km of the electric rail to be implemented
Pakistan	By 2030, 30 % of all new vehicles sold in Pakistan will be electric (30% shift to electric passenger vehicles and 50% shift to electric two/three wheelers and buses; by 2040, 90% shift to electric passenger vehicles and 90% shift to electric two/three wheelers and buses)
Panama	By 2030, 10% of commercial vehicles, 25% of personal vehicles, 20% of public transport and 30% of government fleets to be electric
Republic of Korea	3 million electric vehicles and 850,000 hydrogen vehicles on the roads by 2030

Saint Kitts and Nevis	Increase the share of electric vehicles in the vehicle fleet to at least 2%
Seychelles	30% of vehicles by large tourism businesses and 20% of small to medium-size tourism businesses to be electric
Togo	3% of sold new vehicles to be electric by 2025
Uganda	Introduce at least 200 electric buses in Greater Kampala Metropolitan Authority by 2030
United Arab Emirates	2% of Dubai's road fleet to be electric or hybrid cars by 2030; 30% of Dubai's government-procured vehicles to be electric or hybrid by 2030
Vanuatu	By 2030, 10% of public buses, 10% of the government fleet and 1,000 electric two- and three-wheelers to be electric

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