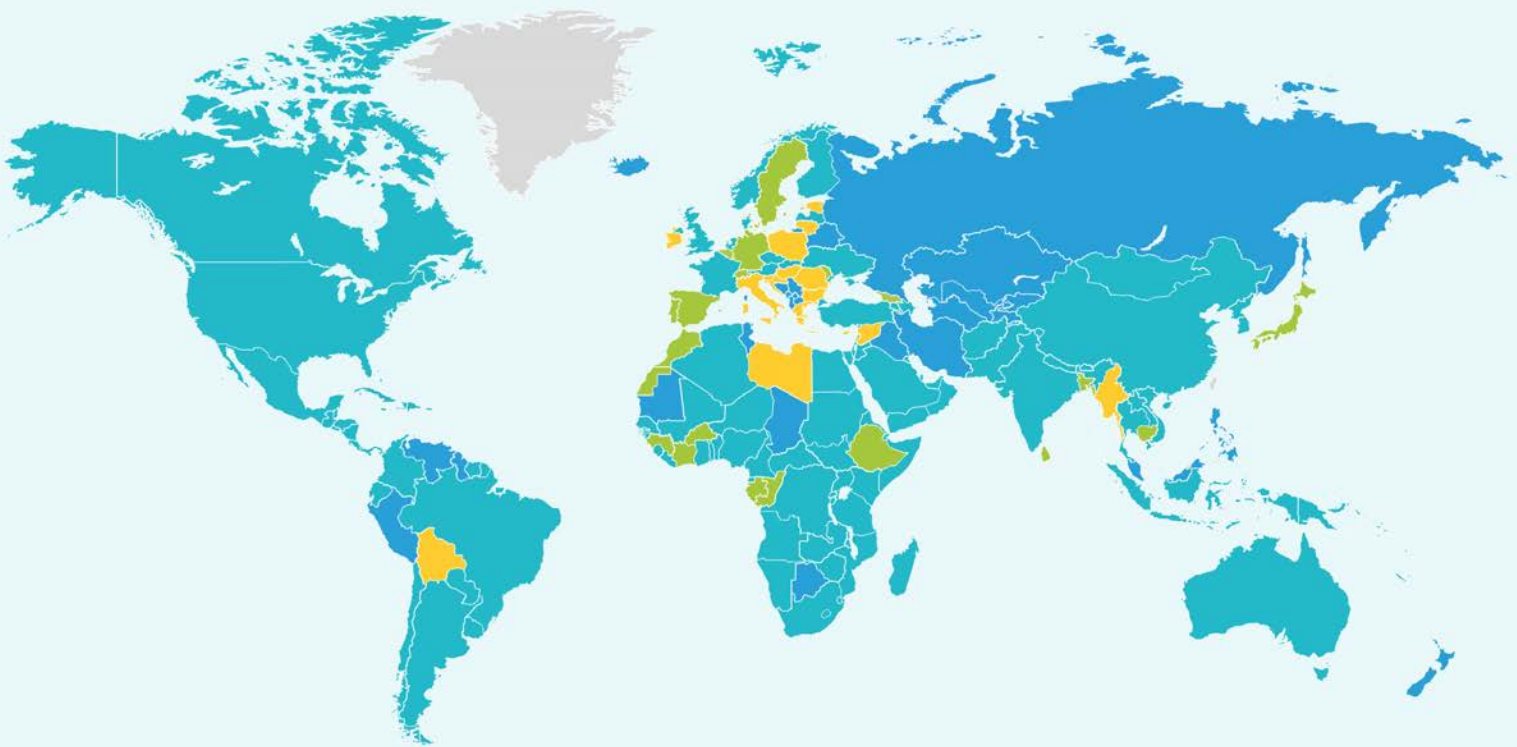




Partnership on Sustainable,
Low Carbon Transport

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.

Available at

www.slocat.net/ndcs

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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.

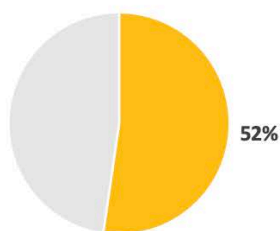
It focuses on LTS submitted between 2016 and 2021 and second-generation NDCs (covering both second NDCs, updated NDCs and newly submitted first NDCs) submitted to the UNFCCC between 2019 and 2021.

Overview and scope

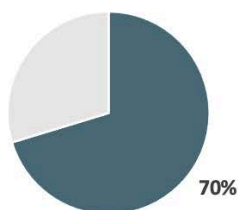
Second-generation Nationally Determined Contributions

There are 13 second NDCs and 103 updated NDCs representing 143 countries as of 12 October 2021. The EU submitted an updated NDC on behalf of the 27 members of the EU. Countries with second-generation NDCs represent 70% of total transport CO₂ emissions (excluding international aviation and shipping).

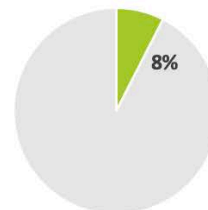
Share of economy-wide CO₂ emissions covered by second-generation NDCs



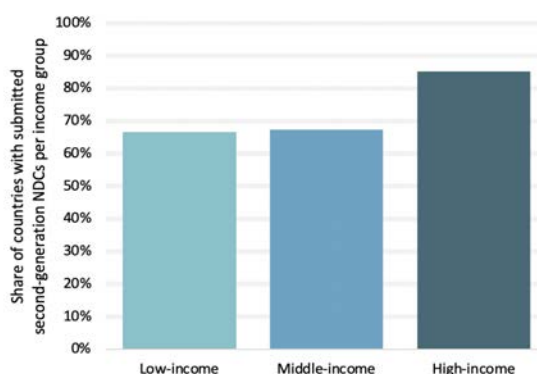
Share of transport CO₂ emissions covered by second-generation NDCs



Share of transport CO₂ emissions covered by second-generation NDCs with transport targets



Nearly all European and North American countries submitted second-generation NDCs, while two thirds of countries in other regions have done so. The NDCs are an opportunity to express the need for international support in regards to climate action, thus more low-income countries could benefit from submitting updated NDCs to increase their chances of accessing international financing. 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.



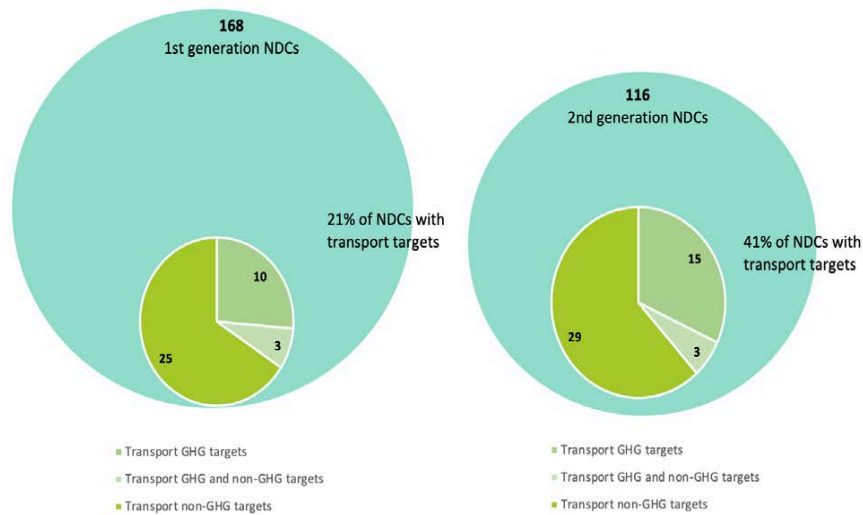
Long-Term Strategies

Through 12 October 2021 32 countries plus the EU have submitted LTS. 15 individual EU member countries also submitted their respective LTS, resulting in a majority of LTS (61% of all submissions) coming from Europe. The LTS cover 35% of total CO₂ emissions and 51% of transport CO₂ emissions (excluding international aviation and shipping). There have been no LTS submissions from low-income countries.

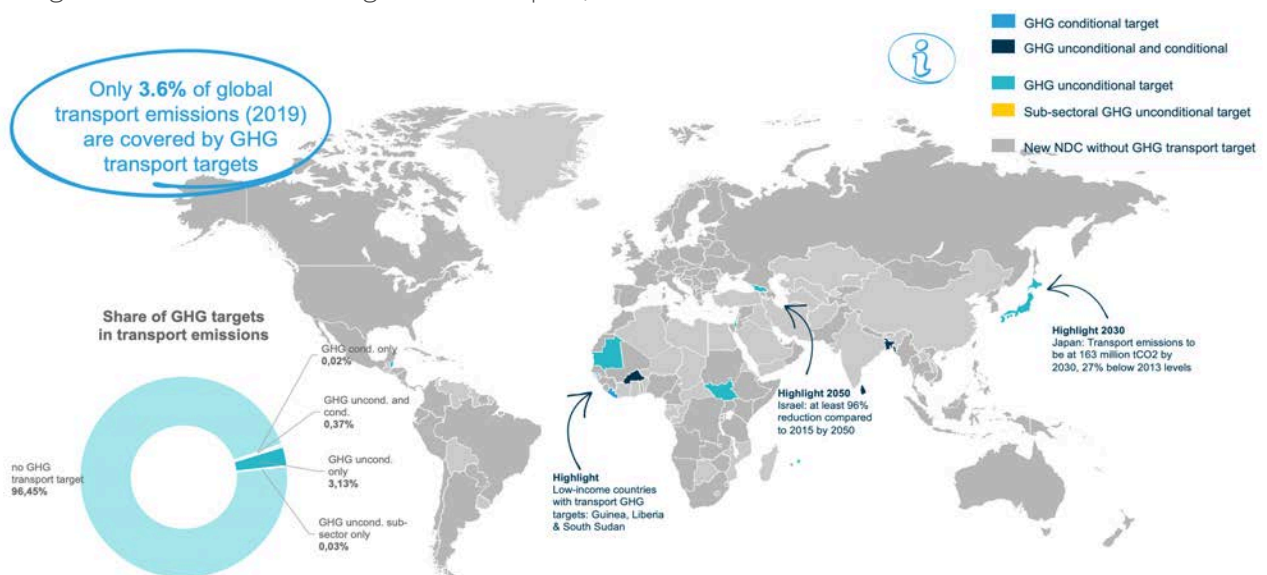
State of climate action for transport in 2021

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.

Countries have made clear progress in developing long-term climate visions, with a growing number committing to long-term net-zero targets. 30 countries have submitted economy-wide net-zero targets in LTS, second-generation NDCs, or both.

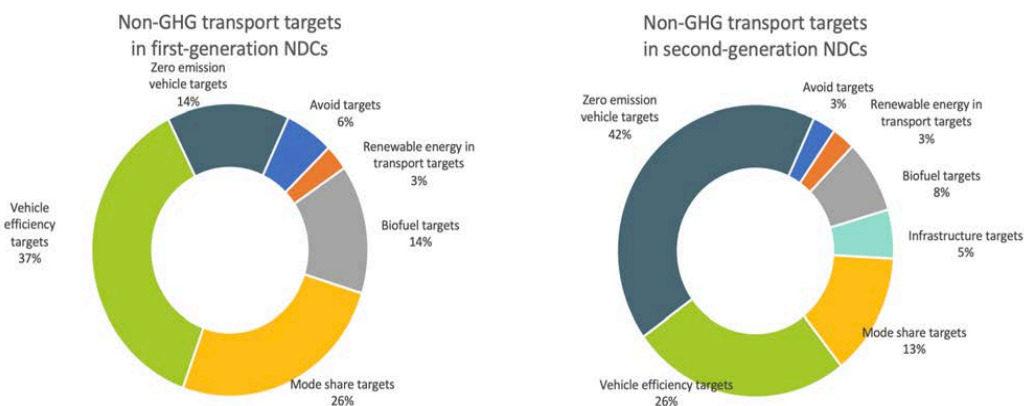


41% of second-generation NDCs contain transport targets (either transport GHG mitigation targets and/or non-GHG targets for transport).



18 second-generation NDCs have a transport GHG mitigation target, representing 14% of all second-generation NDCs. 11 of these targets are unconditional. 4 countries outlined conditional targets for transport GHG emission mitigation, the remaining 3 countries have a combination of unconditional and conditional targets. Nearly all of them have a target year of 2030.

In addition, 74 non-GHG transport targets have been identified in second-generation NDCs (a NDC can include several non-GHG mitigation targets). The percentage of mode share targets reduced significantly between the first and second generation of NDCs. The most frequent non-GHG target was for zero emission vehicles, followed by vehicle efficiency targets. The percentage of mode share targets reduced significantly between the first and second generation of NDCs.



Targets in Long-Term Strategies

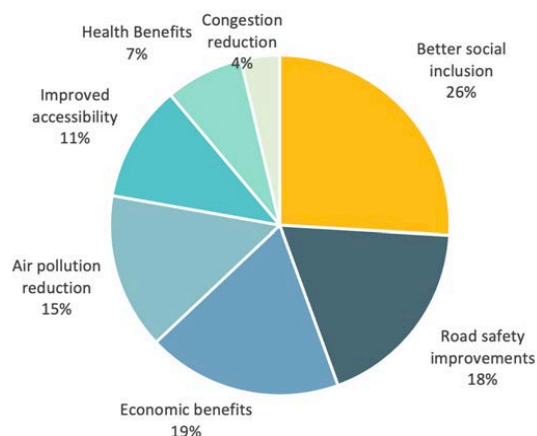
8 countries (Belgium, Germany, Japan, Portugal, Slovenia, Spain, Sweden and Switzerland) outline transport targets in their LTS (representing 24% of submitted LTS). In contrast to second-generation NDCs, LTS usually have a target year of 2050.

Maximising impacts

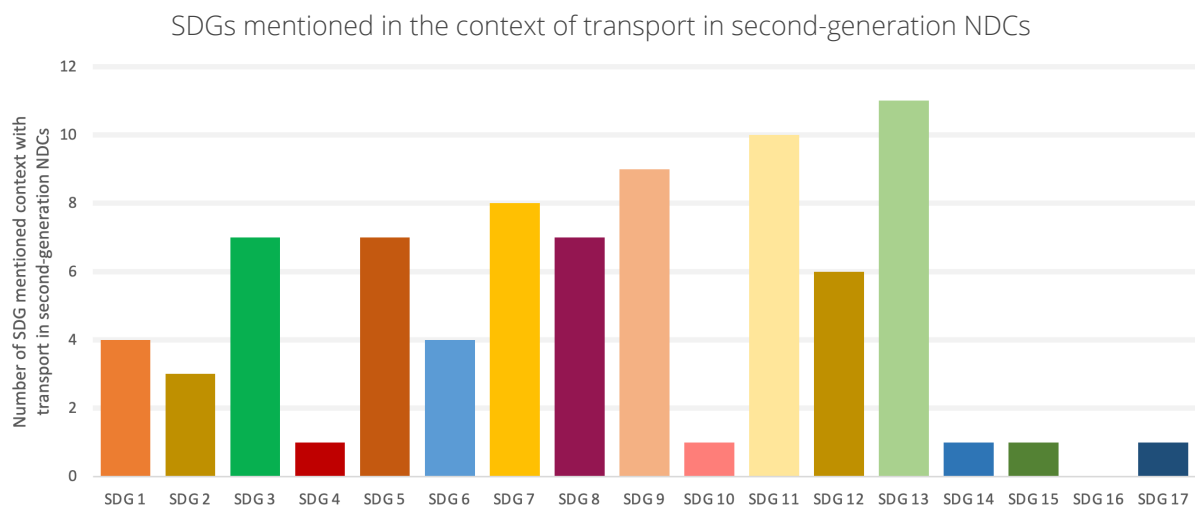
Key insight: Transport climate actions are not being developed in the context of transport’s impact on the wider sustainable development agenda, and are therefore missing an opportunity to enable and accelerate a wider transformation.

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

Benefits mentioned in second-generation NDCs



16 second-generation NDCs link transport to specific SDGs. The most often cited SDGs: SDG 13 (Climate Action), SDG 11 (Sustainable Cities and Communities) and SDG 9 (Industry, Innovation and Infrastructure).



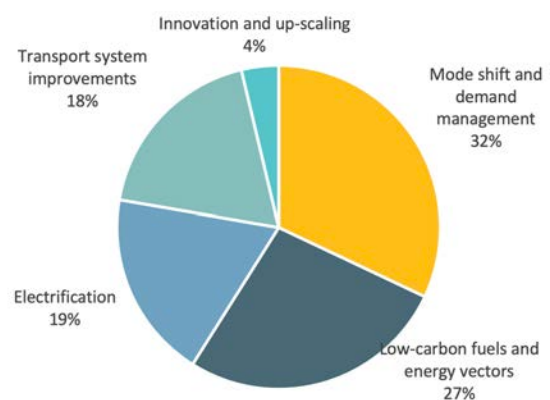
Actions to mitigate transport emissions are insufficient to reach Paris Agreement goals

Key insight: Climate strategies embrace a wider portfolio of transport mitigation actions 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	4.9	20
Transport mitigation measures per first-generation NDC	Transport mitigation measures per second-generation NDC	Transport mitigation measures per LTS

Transport mitigation actions by category



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

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 measures per first-generation NDC

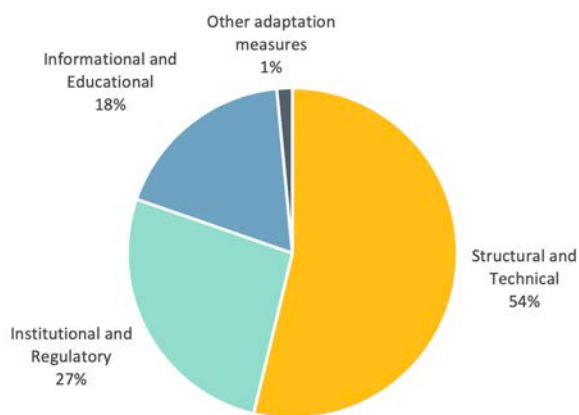
1.1
transport adaptation measures per second-generation NDC

Only 6 second-generation NDCs (Antigua and Barbuda, Burundi, Cambodia, Kenya, Liberia, 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.

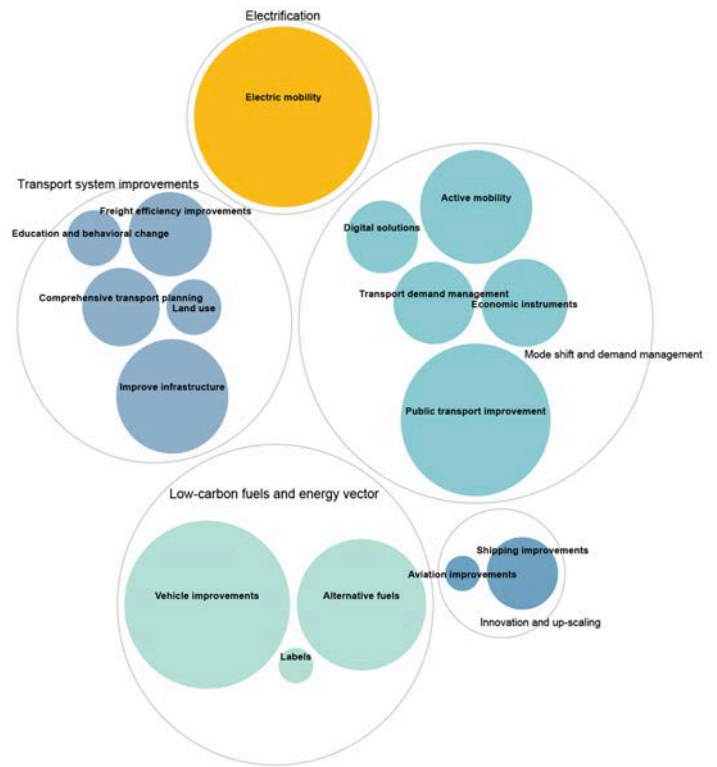
The adaptation content is very general and the majority is limited to road infrastructure resilience. Actions on transport adaptation rarely specify the type of transport activity they aim to address (i.e., passenger or freight).

48 second-generation NDCs (41% of all NDCs) include transport adaptation measures, a significant improvement over the first-generation NDCs where transport adaptation was covered in just 22%.

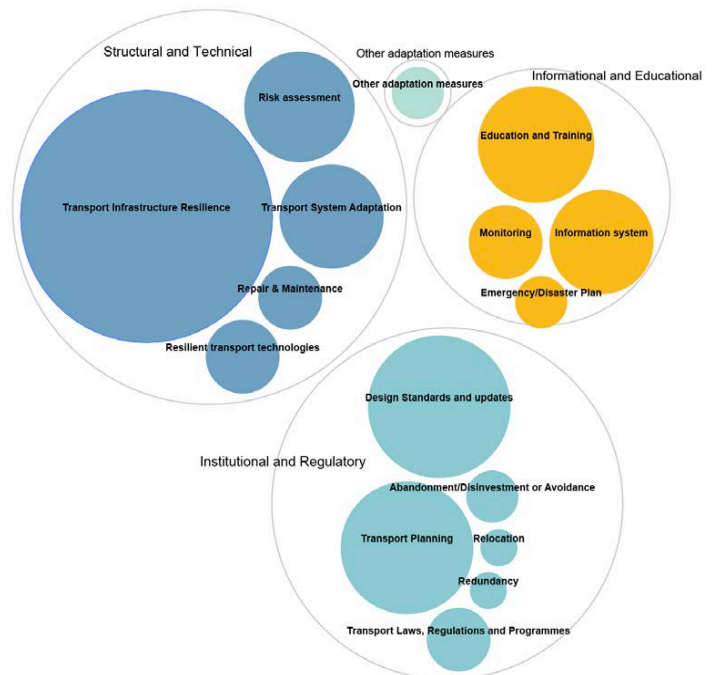
Transport adaptation actions by category



Detailed distribution of transport mitigation measures by category (outer circle) and subcategory (colored circles)

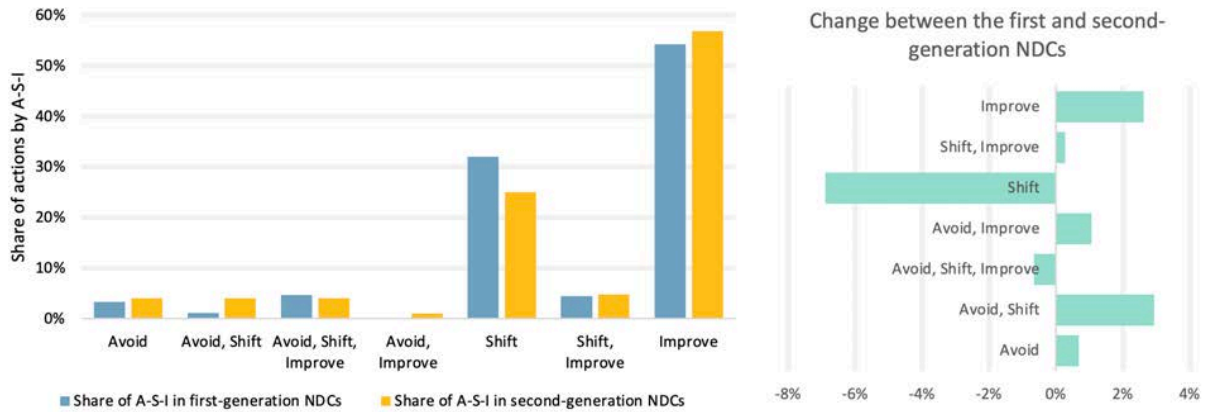


Detailed distribution of transport adaptation actions by category (outer circle) and measure (colored circles)



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 the second-generation NDCs and LTS.



Good examples:

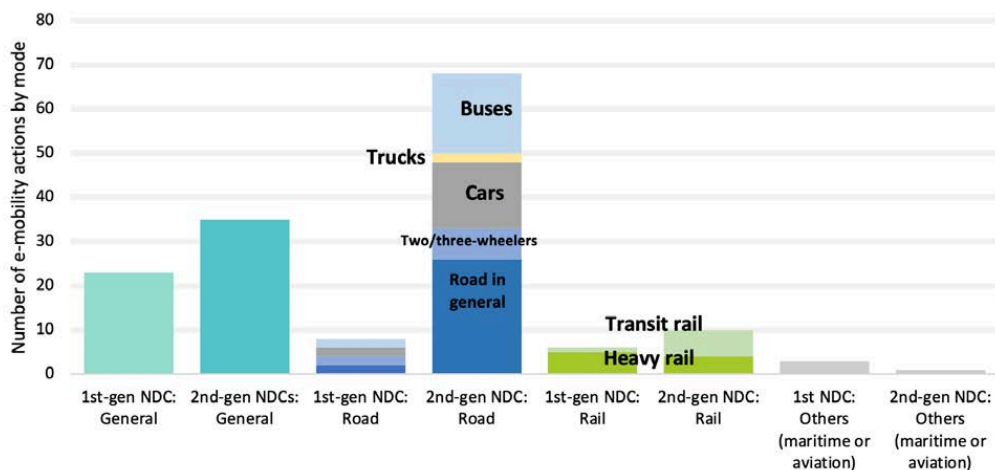
Sri Lanka's updated NDC with comprehensive, well-balanced measures.

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

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

Electrification takes pole position

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



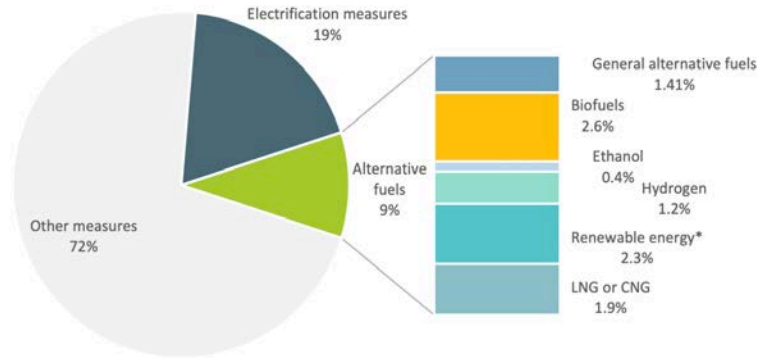
Electric mobility (e-mobility) is the most common category of measures in second-generation NDCs. 60 second-generation NDCs (52%) include e-mobility-related actions, representing 19% of all actions.

31 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.

13 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 9% of transport mitigation actions in second-generation NDCs.



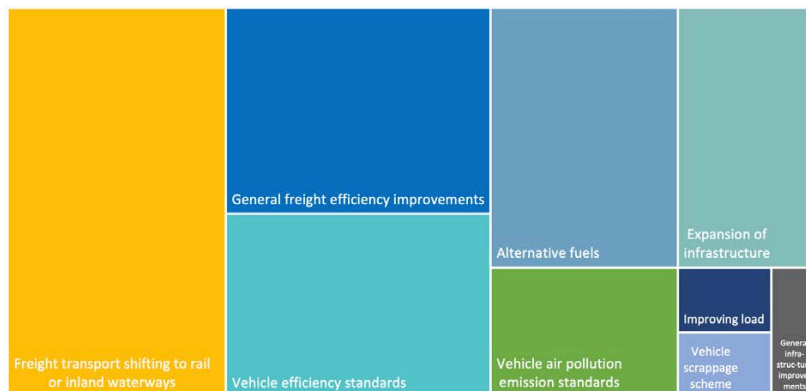
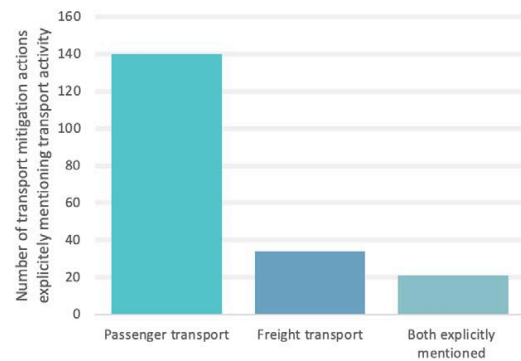
* It may include electricity through renewable energy or general references to renewable energy in transport.

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 (14 actions), freight efficiency improvements (9 actions) and vehicle-focused improvements (8 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 2026-27.

Urban-level actions

Of the second-generation NDCs that include specific references to the geographic scope of measures, 19% (over 100 actions) mention urban transport. Sustainable urban mobility plans (SUMP) are an important enabler of sustainable mobility in cities. However, only three countries have included it in their second-generation NDCs (Barbados, Guinea and Panama).

The process to implement commitments has been strengthened

Governance and implementation

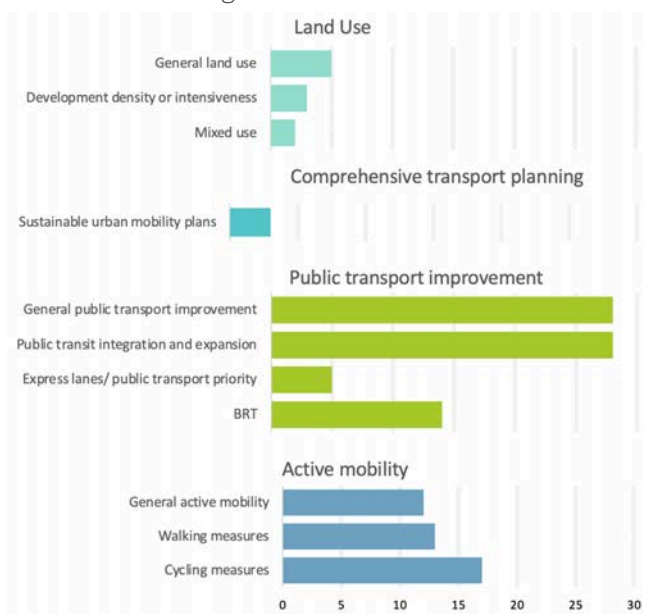
Key insight: The few NDCs with details on governance show that more engagement has been done than ever before including through stakeholder consultations and the involvement of multiple ministries.

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.

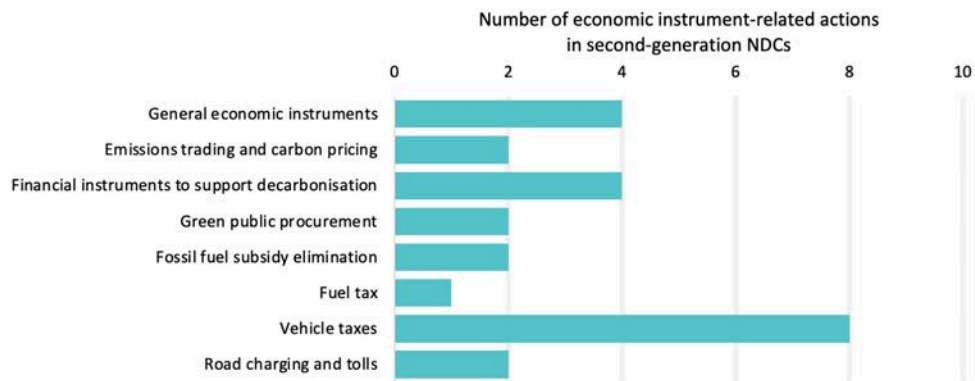
Financing sustainable transport

28 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.

Urban transport-related actions in second-generation NDCs



Economic instruments in support of transport decarbonisation



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 15 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 CO₂ 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 and Singapore 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

Conclusion



Climate strategies are embracing a wider portfolio of transport mitigation actions, but they continue to favor improving the efficiency of current systems over the more transformative measures needed to reach zero emissions.



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.



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.



Less low-income countries have submitted LTS and second-generation NDCs compared to middle- and high-income countries.



NDCs and LTS don't make connections between transport and the wider sustainable development agenda.



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.



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.



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.

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

This report and the executive summary are authored by the SLOCAT Secretariat with inputs from GIZ. 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. GIZ has also summarised 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 was 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 2021 and LTS submitted between 2016 and 2021.

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.

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, the 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 were 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 12 October 2021. The analysis provides more insights from second-generation NDCs than from LTS due to the fact that only 33 LTS were submitted through October 2021, making it more difficult to identify global trends in LTS compared to trends in the 116 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 measures covered in first-generation NDCs.

In several NDCs, countries expressed planned contributions only as targets. This was the case for Albania, Antigua and Barbuda, Costa Rica, Eswatini, Honduras, Israel, Mali, Namibia, Nepal and Zimbabwe. Their activities were 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 its National Adaptation Plan submitted to the UNFCCC.

The assessment of transport has been guided by well-defined parameters and shared publicly in the glossary.¹ 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 collectively improve 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 2021 and second-generation NDCs (covering both second NDCs, updated NDCs and newly submitted first NDCs)² submitted to the UNFCCC between 2019 and 2021.

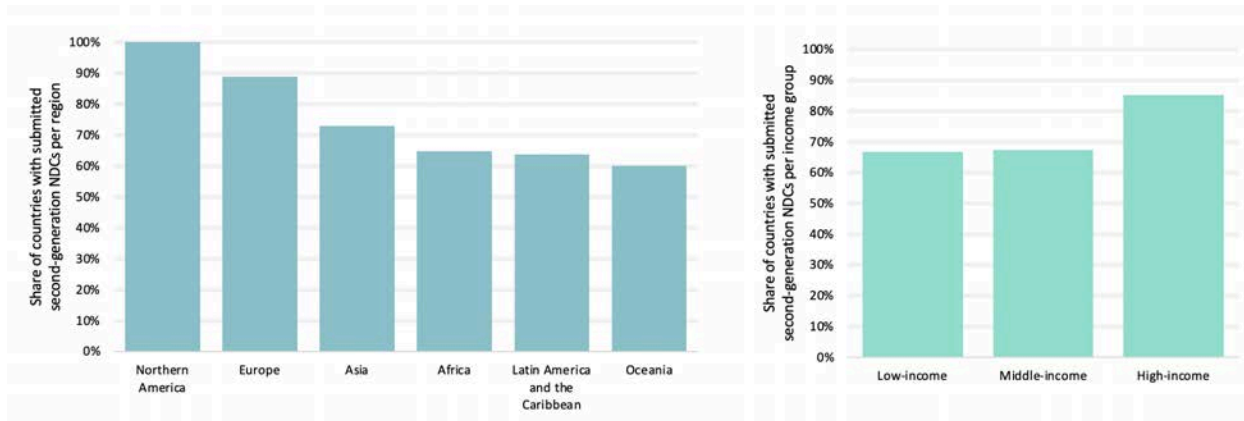
There are 13 second NDCs and 103 updated NDCs representing 143 countries. The EU submitted an updated NDC on behalf of the 27 members of the EU. 34% of submissions are from Europe, 30% from Asia, 30% from Africa, and 18% from Latin America and the Caribbean (LAC). Countries from LAC were among the first to submit second-generation NDCs. Nearly all European and North American countries submitted second-generation NDCs, while two thirds of countries in other regions have done so. 85% of high-income countries and two thirds of low- and middle-income countries submitted second-generation NDCs (see Figure (Fig.) 1).

The NDCs are an opportunity to express the need for international support in regards to climate action, thus more low-income countries could benefit from submitting updated NDCs to increase their chances of accessing international financing. 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.

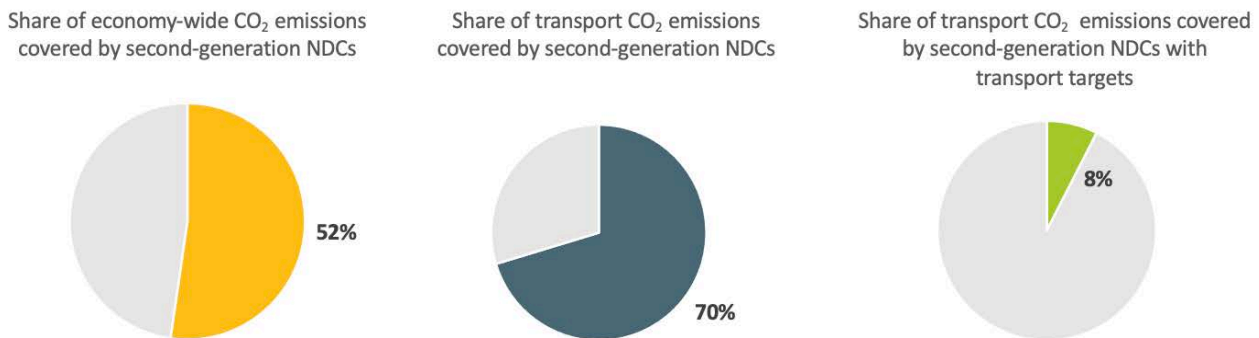
¹ GIZ and SLOCAT (2021), Glossary, Tracker of Climate Strategies for Transport, available at: <https://changing-transport.org/glossary/>

² 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 52% of total CO₂ emissions and 70% of total transport CO₂ emissions (excl. international aviation and shipping) (see Fig. 2). The countries with second-generation NDCs featuring transport targets represent only 8% of total transport CO₂ emissions.³ No second-generation NDCs have been submitted by the major emitters China and India.

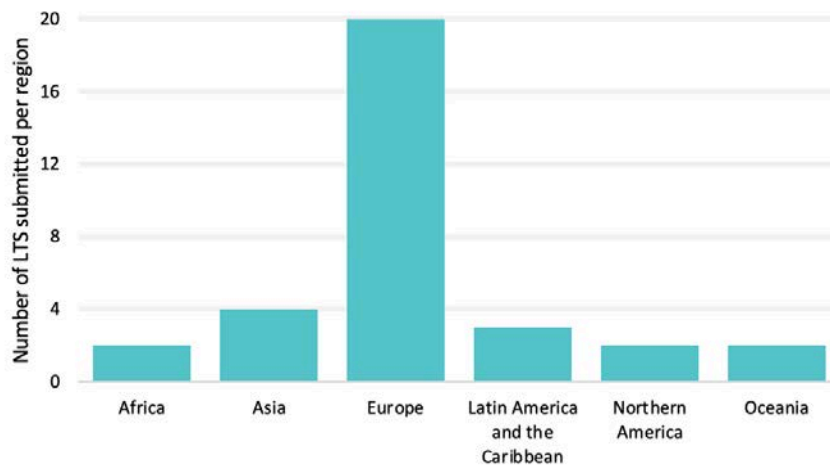
Fig. 2: Coverage of CO₂ emissions by second-generation NDCs

In many cases the transport CO₂ reduction targets are based on BAU scenarios or only for a subsector which might still imply transport emission growth.

Through 12 October 2021 32 countries plus the EU have submitted LTS. 15 individual EU member countries also submitted their respective LTS, resulting in a majority of LTS (61% of all submissions) coming from Europe (see Fig. 3). The LTS cover 35% of total CO₂ emissions and 51% of transport CO₂ emissions (excl. international aviation and shipping).³

³ SLOCAT calculations based on M. Crippa et al. (2020), Fossil CO₂ Emissions of All World Countries, JRC Science for Policy Report, Publications Office of the European Union, Luxembourg, available at: <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/fossil-co2-emissions-all-world-countries-2020-report>

Fig. 3: LTS submitted by region



28% of submissions are from middle-income countries and 72% 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.



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2. State of climate action for transport in 2021

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. 30 countries have submitted economy-wide net-zero targets in LTS, second-generation NDCs, or both. These cover 22% of global transport emissions. Most set the target year of 2050 to reach net-zero emissions.

In addition, 33 second-generation NDCs make general references to long-term strategies (either pointing directly to LTS or mentioning 2050 ambitions). Every country that submitted a LTS also provided a second-generation NDC except Benin and Guatemala. 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.

18 second-generation NDCs have a transport GHG mitigation target, representing 14% of all second-generation NDCs (see Fig. 4 and Table 1). 11 of these targets are unconditional. 4 countries outlined conditional targets for transport GHG emission mitigation, the remaining 3 countries have a combination of unconditional and conditional targets. Nearly all of them have a target year of 2030.

Fig. 4: NDCs with transport GHG mitigation targets

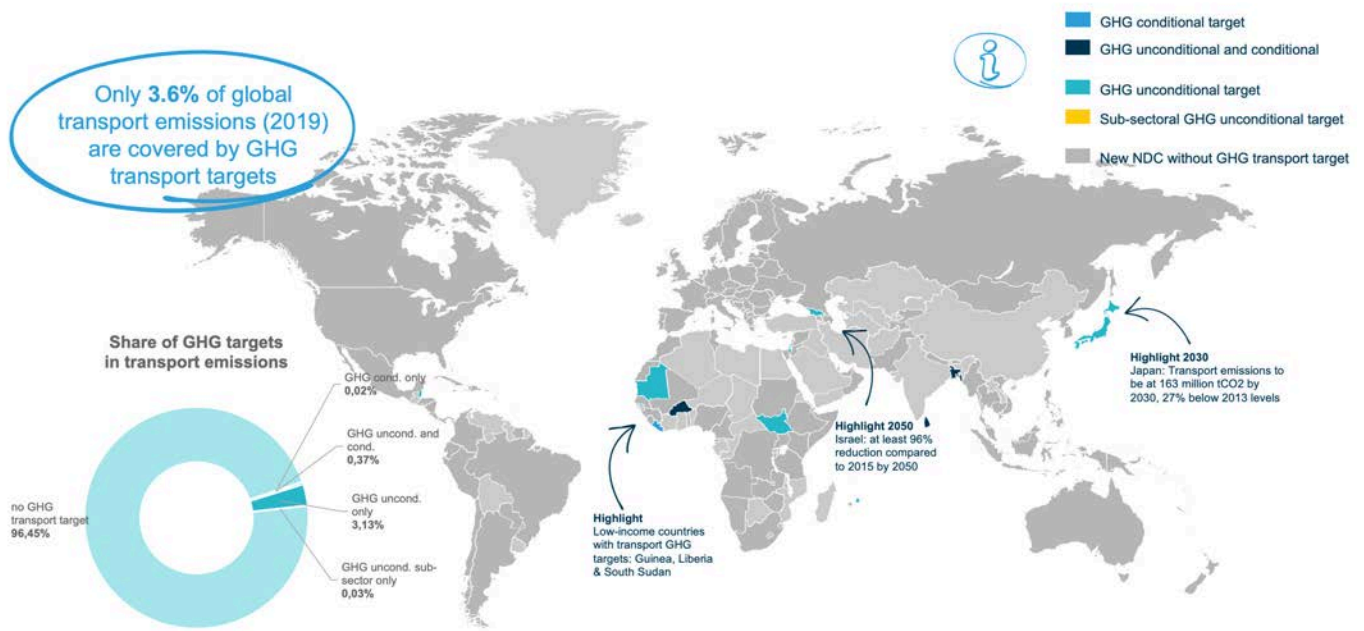


Table 1: Second-generation NDCs with transport GHG emission mitigation targets

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 ₂ eq) below BAU by 2030 (unconditional contribution) or in total 27% (to 26.56 Mt CO ₂ eq) below BAU by 2030 (conditional contribution)	Unconditional and conditional
Belize	Avoid 117 KtCO ₂ e/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 ₂ eq by 2025, 3563 Gg CO ₂ eq by 2030 and 8265 Gg CO ₂ eq by 2050 (unconditional contribution), further limit to 267 Gg CO ₂ eq in 2025, 867 Gg CO ₂ eq in 2030 and 4153 Gg CO ₂ eq in 2050 (conditional contribution)	Unconditional and conditional
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 BAU 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 ₂ eq transport GHG emissions between 2021-2030 (5.21% unconditional)	Unconditional and conditional
Mauritius	Reduce transport CO ₂ emissions by 129 ktCO ₂ eq 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 ₂ eq and maritime transport by 3 Gg CO ₂ eq	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

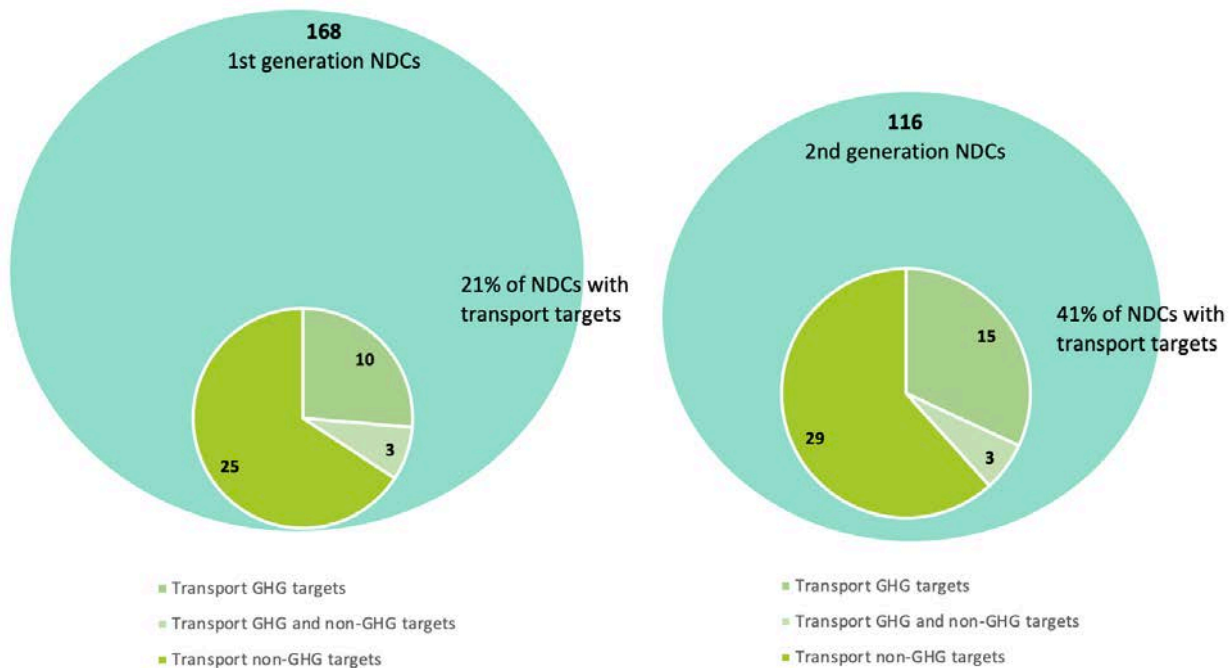
The transport GHG mitigation targets come primarily from middle- and high income countries. Among the 18 second-generation NDCs with transport GHG mitigation targets, 5 are from low-income countries (Burkina Faso, Gambia, Guinea, Liberia and South Sudan). A few other key observations:

- Japan is the only member of the G20 with a transport GHG mitigation target.
- Israel submitted the only NDC with both a 2030 and 2050 transport target.
- In 4 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 and gasoline vehicles for Seychelles).
- Second-generation NDCs with a transport GHG mitigation target for the whole transport sector account for just 3.6% of global transport CO₂ emissions (excl. international aviation and shipping).⁴

⁴ SLOCAT calculations based on M. Crippa et al. (2020), Fossil CO₂ Emissions of All World Countries, JRC Science for Policy Report, Publications Office of the European Union, Luxembourg, available at: <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/fossil-co2-emissions-all-world-countries-2020-report>

41% of second-generation NDCs 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, such as Grenada, Japan reiterated their target from their first-generation NDCs and Bangladesh and Burkina Faso revised their transport GHG mitigation targets.

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

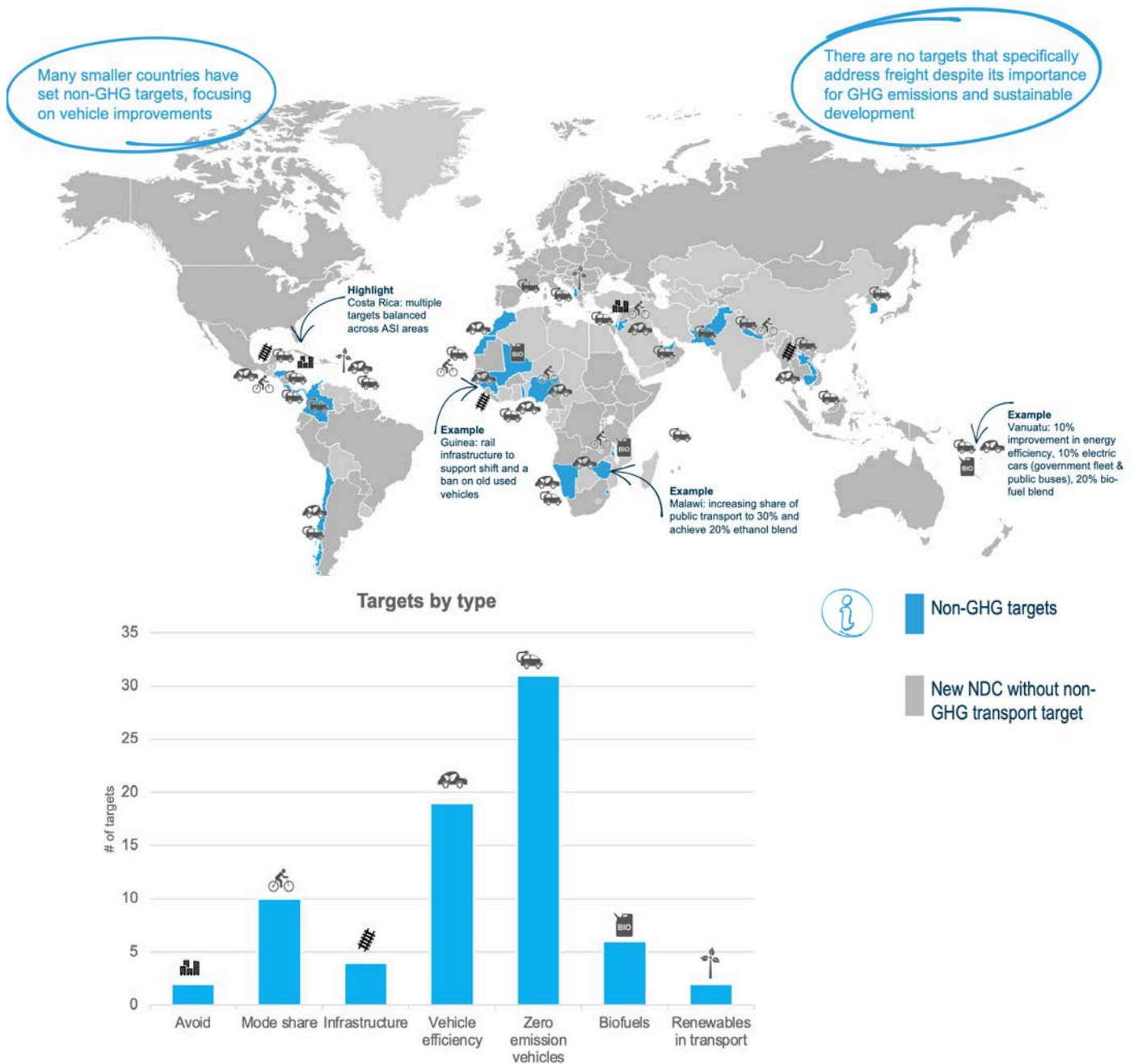


Targets not related to transport green-house gas emissions: Non-transport targets

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.

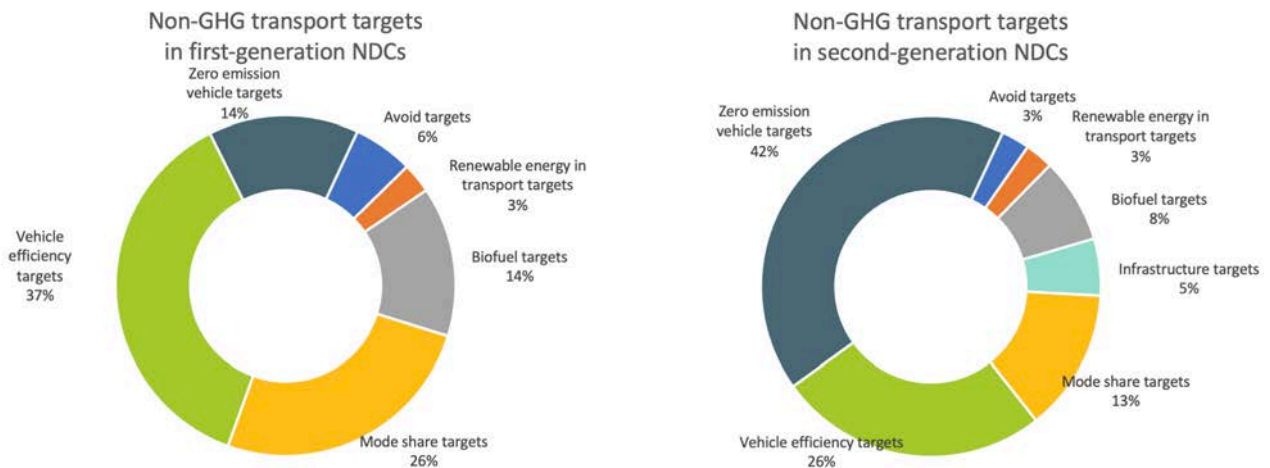
Overall, 74 non-GHG transport targets have been identified in second-generation NDCs (an NDC can include several non-GHG mitigation targets). The most frequent non-GHG target was for zero emission vehicles (42%), followed by vehicle efficiency targets (26%), mode share targets (13%), biofuel targets (8%), infrastructure targets (5%), renewable energy targets (3%) and avoid targets (3%).

Fig. 6: Map of non-GHG transport targets



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%. 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).

16 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 9 (Industry, Innovation and Infrastructure), indicating the strong interplay between low-carbon and safe and sustainable transport (Fig. 9).

Fig. 8: Benefits mentioned in second-generation NDCs

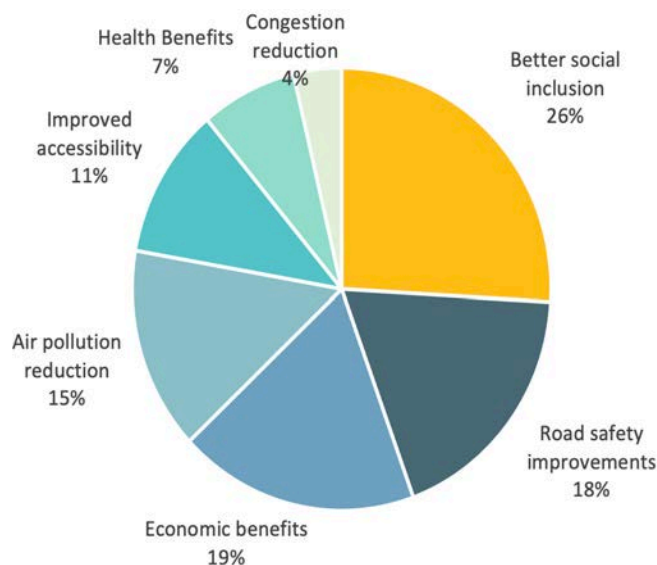
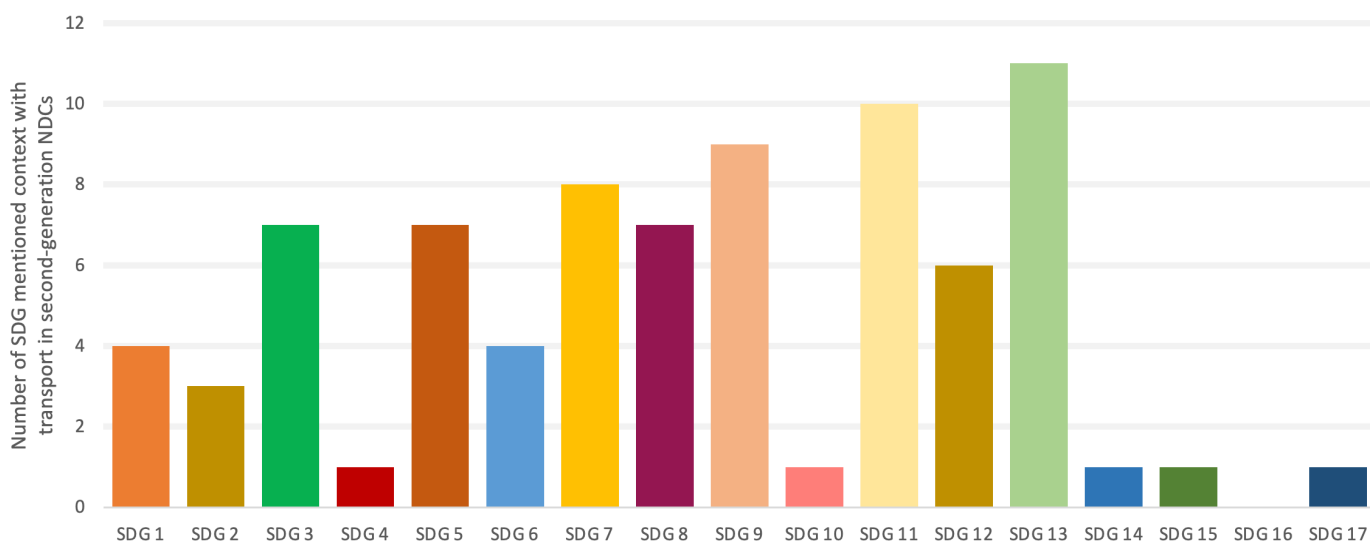


Fig. 9: SDGs mentioned in the context of transport in second-generation NDCs



Transport greenhouse gas emissions mitigation targets in Long-term Strategies

Eight countries outline transport targets in their LTS (representing 24% 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, all of the LTS with transport GHG mitigation targets are from European countries.

Table 2: LTS transport targets

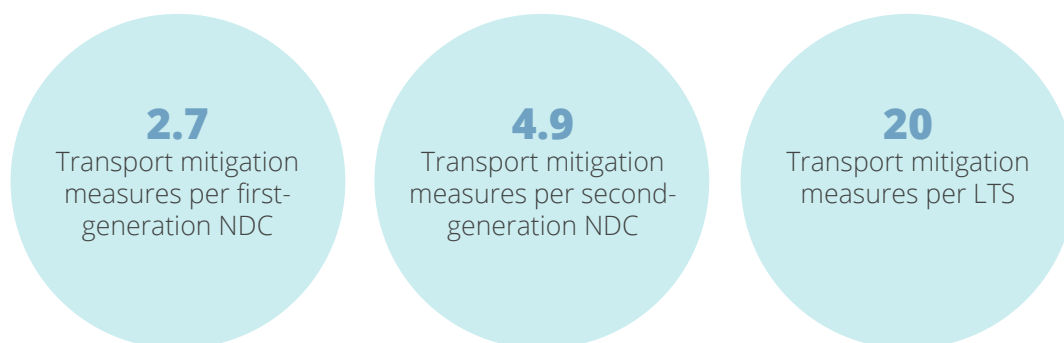
LTS	Transport GHG emissions mitigation targets
Belgium	Expected reduction in transport sector (both passenger and freight transport) to zero emissions by 2050
Germany	Reduce transport CO ₂ eq emission 40 to 42% compared to 1990 levels by 2030 (reduction of around 95 to 98 million tonnes CO ₂ eq)
Japan	Reduce transport GHG emissions 80% per vehicle compared to 2010 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.

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.

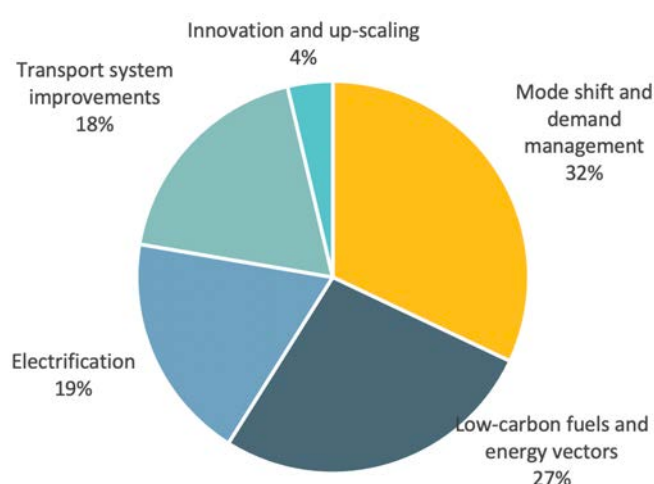
The database includes 670 transport mitigation actions in LTS and over 560 actions from second-generation NDCs. Every action has been assessed according to the transport mode, activity (passenger and/or freight transport), geography (urban and/or rural transport) and association to Avoid, Shift and/or Improve (see explanation in 2.d) 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...



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:⁵ mode shift and demand management (32% of all mitigation actions in second-generation NDCs), low-carbon fuels and energy vectors (27%), electrification (19%), transport system improvements (18%) and innovation and up-scaling (4%) (Fig. 10).

Fig. 10: Transport mitigation actions by category



⁵ OECD/ITF (2021), Transport Climate Action Directory, available at: www.itf-oecd.org/tcad

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

Mode shift and demand management:

- transport demand management (12%)
- economic instruments (14%)
- public transport improvement (42%)
- active mobility (23%)
- digital solutions (9%)

Transport system improvements:

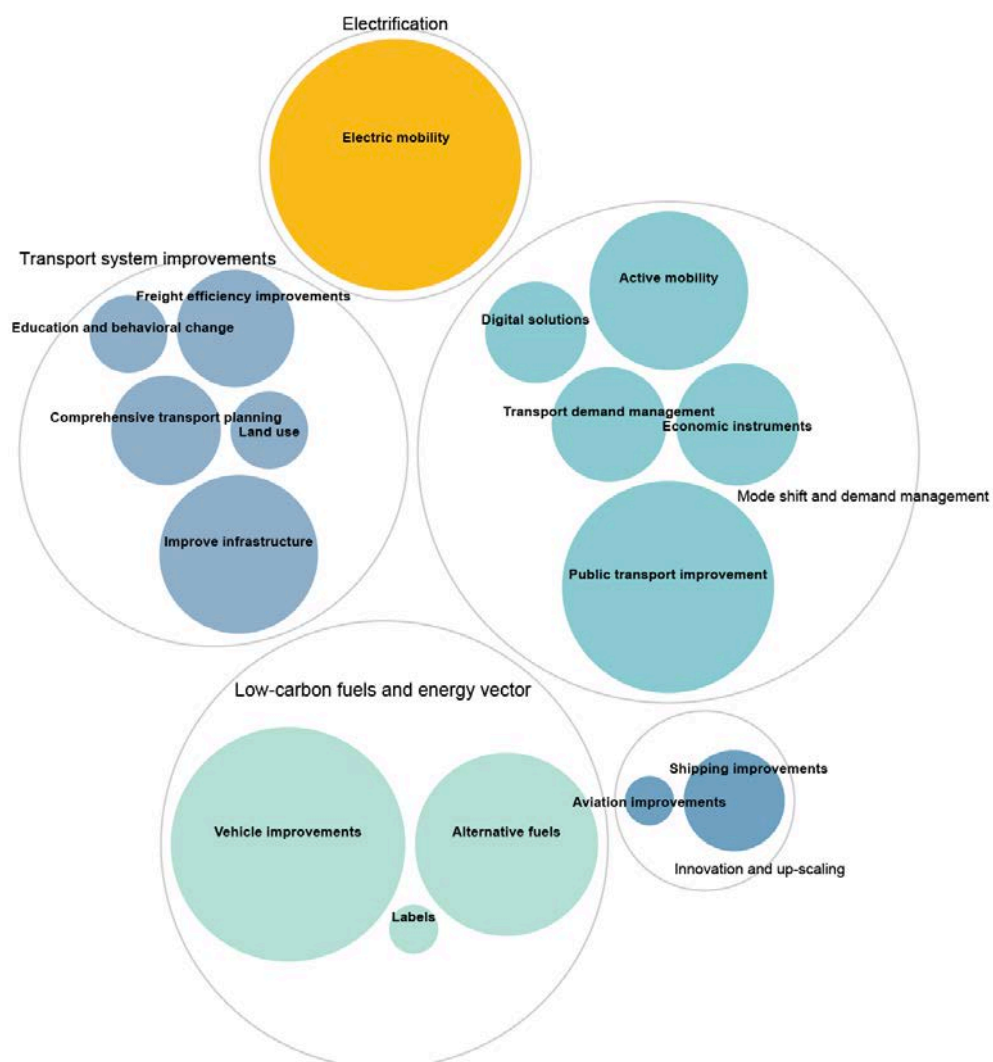
- comprehensive transport planning (19%)
- land use (10%)
- improve infrastructure (40%)
- freight efficiency improvements (22%)
- education and behavioral change (9%)

Low-carbon fuels and energy vectors:

- vehicle improvements (61%)
- alternative fuels (37%)
- labels (2%)

The category electrification (fourth-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.

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

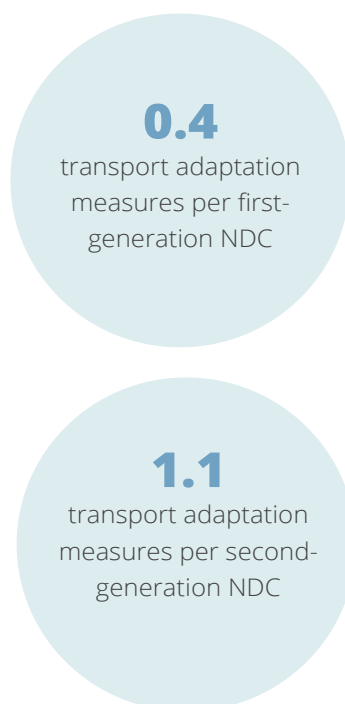


2.3. Transport adaptation targets and actions are still limited

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.⁷

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



48 second-generation NDCs (41% of all NDCs) include transport adaptation measures, 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. 27% of high-income countries have measures related to adaptation in the transport sector.

Austria, Fiji and Singapore are the only countries to discuss the topic of transport adaptation in their LTS. Just 12 transport adaptation actions were included in these LTS, while there are around 130 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.

⁷ 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>

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.

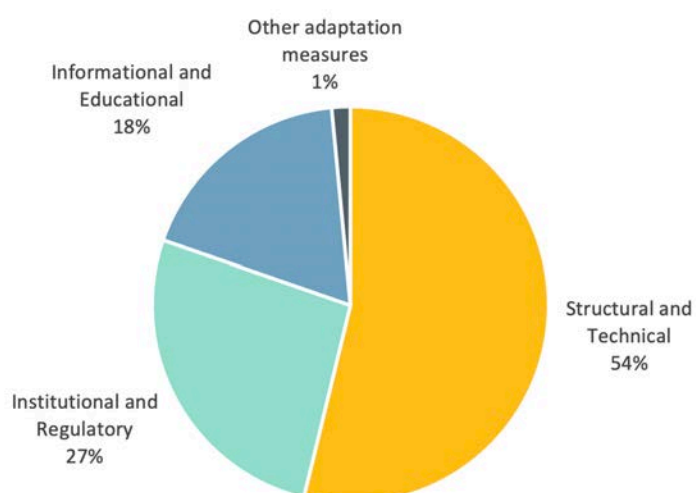
Transport adaptation actions were captured in the following categories: structural and technical (54% of measures belong to this category), institutional and regulatory (27%), informational and educational (18%), and other adaptation measures (1%) (Fig. 13).

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). 21 actions mention both passenger and freight transport explicitly while the other 132 measures are general. The same issue exists for other transport modes: Road transport is the only transport mode explicitly mentioned in transport adaptation measures.

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.

Fig. 13: Transport adaptation measures by category



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

Structural and technical adaptation:

- transport infrastructure resilience (66%)
- transport system adaptation (11%)
- repair & maintenance (4%)
- risk assessment (13%)

Institutional and regulatory:

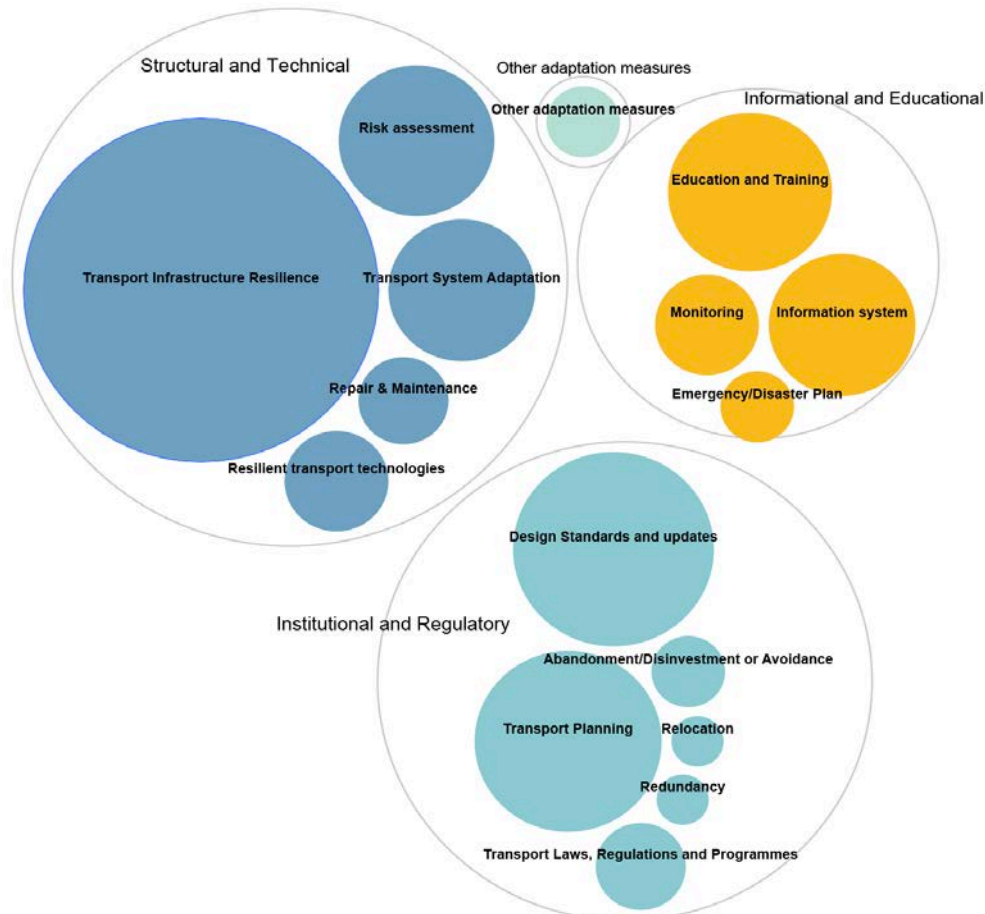
- transport planning (37%)
- relocation (3%)
- redundancy (3%)
- abandonment, disinvestment or avoidance (6%)
- transport laws, regulations and programmes (8%)
- design standards and updates (43%)

Informational and educational measures:

- monitoring (17%)
- information system (33%)
- emergency and disaster plan (8%)
- education and training (42%)

The assessment shows that transport adaptation measures focus largely on infrastructure resilience rather than more comprehensive transport adaptation planning.

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 the LTS and second-generation NDCs.

The Avoid-Shift-Improve (A-S-I) framework⁸ 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.

⁸ SLOCAT (2021), Avoid-Shift-Improve Refocusing Strategy, available at: <https://slocat.net/asi/>

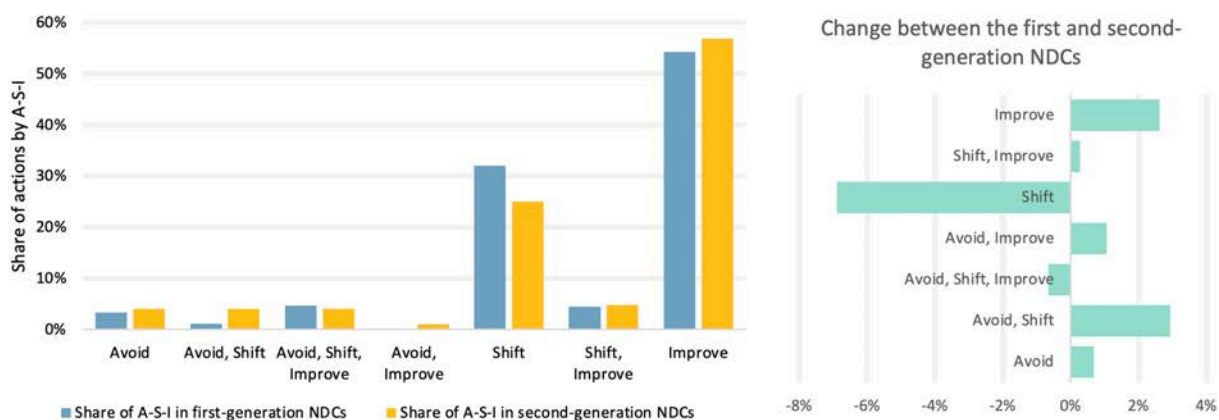
Avoid only represents 4% of transport mitigation actions, while Shift has a 25% share in second-generation NDCs. The large majority of actions are, however, associated with Improve (57%). Other actions have a combination of the three aspects. There is a lack of balanced approaches between Avoid, Shift 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).

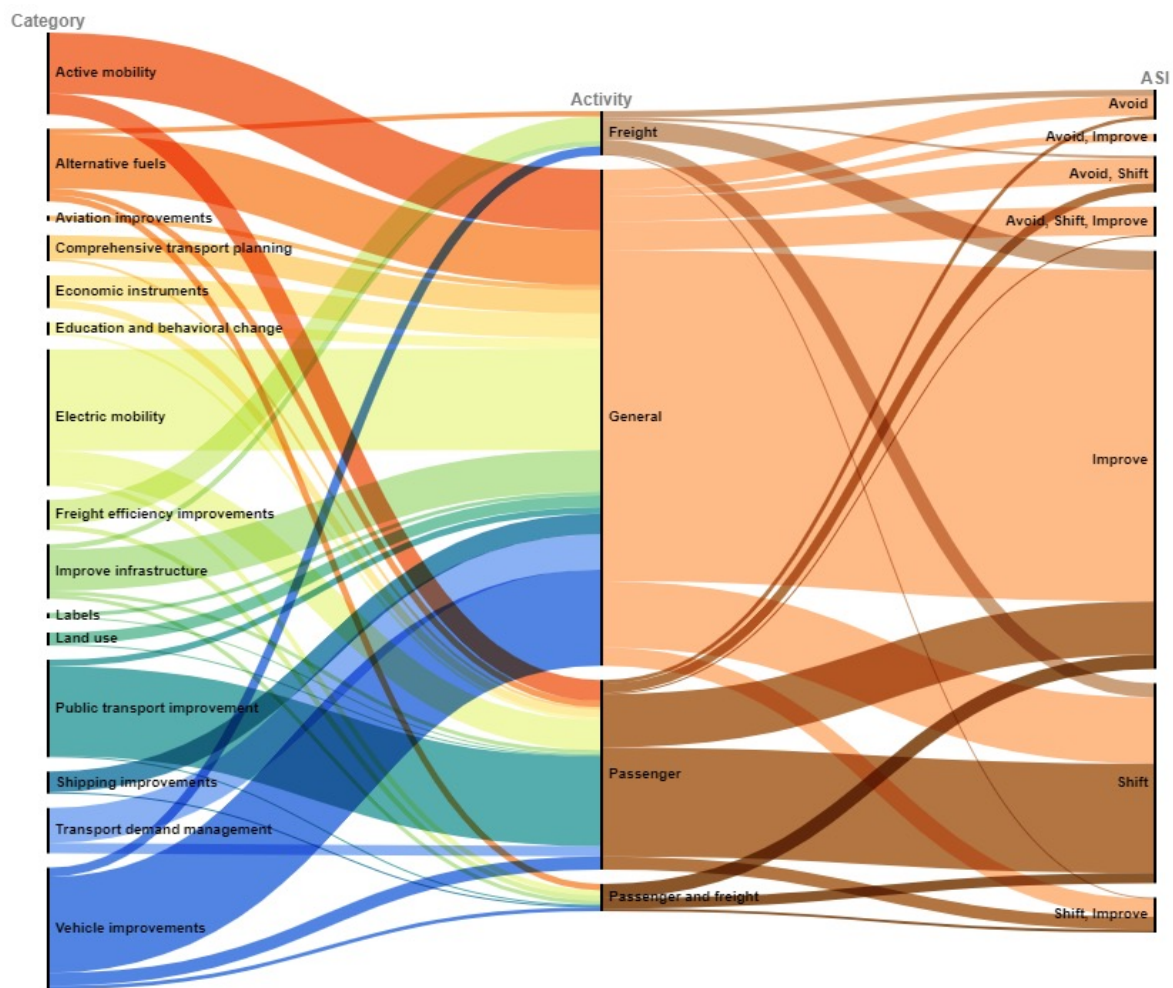
95% of second-generation NDCs with transport actions have at least one action focusing exclusively on improving energy efficiency or shifting to low-carbon fuels. 70% of NDCs with transport actions have at least one action focusing on shifting transport to more efficient or non-motorised modes.

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



Actions have been categorised as Avoid, Shift and/or Improve 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.

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



Sri Lanka's updated NDC	Singapore's LTS with strong linkages between transport and land use planning
<p>It contains a balanced mix of 35 measures in the transport sector which cover all areas, including:</p> <ul style="list-style-type: none"> • Reducing commuting and travel times • Parking management • Enhancing public transport • Enhancing pedestrian walkways • Promoting cycling • Shifting freight to rail • Promoting sea transport <p>along with measures to improve efficiency and promote electrification</p>	<ul style="list-style-type: none"> • 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

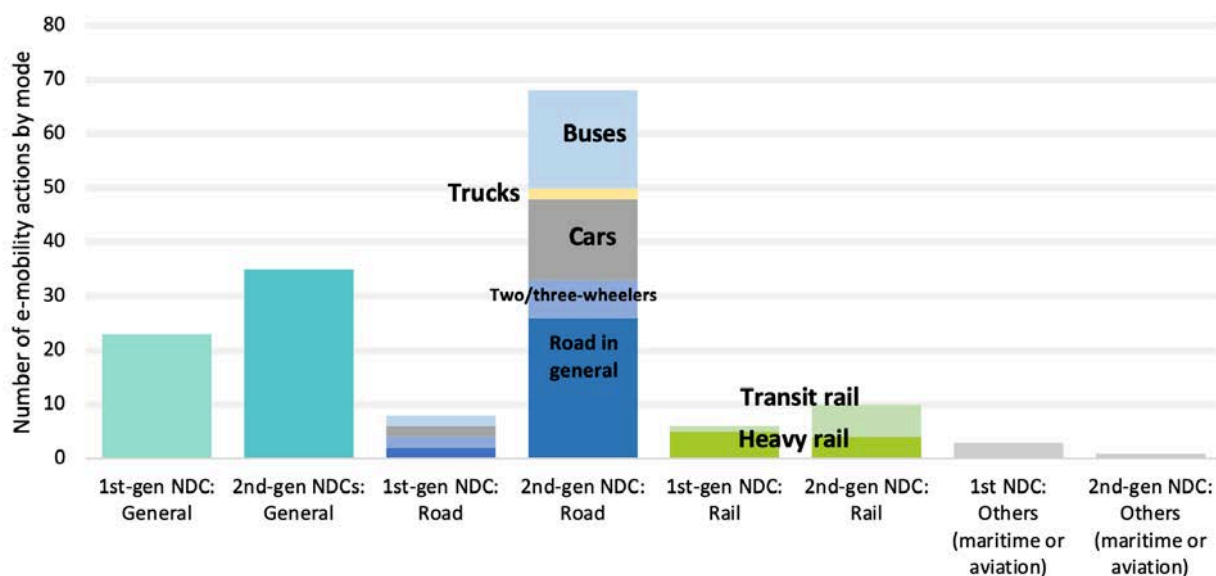
2.5. Electrification takes pole position

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. 60 second-generation NDCs (52%) include e-mobility-related actions, representing 19% of all actions. The large majority 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 favored, followed by cars, two/three-wheelers and rail.

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



Electrification targets

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

The Annex shows the variation in countries' vehicle electrification targets. Notably, many countries in LAC (Antigua and Barbuda, Barbados, Chile, Colombia, Costa Rica 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 UK includes a target to end sales of fossil fuel-powered cars

and vans by 2040, but after its release the UK 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. **13 second-generation NDCs provide clear linkages between the electrification of transport and the use of renewable energy.** 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.

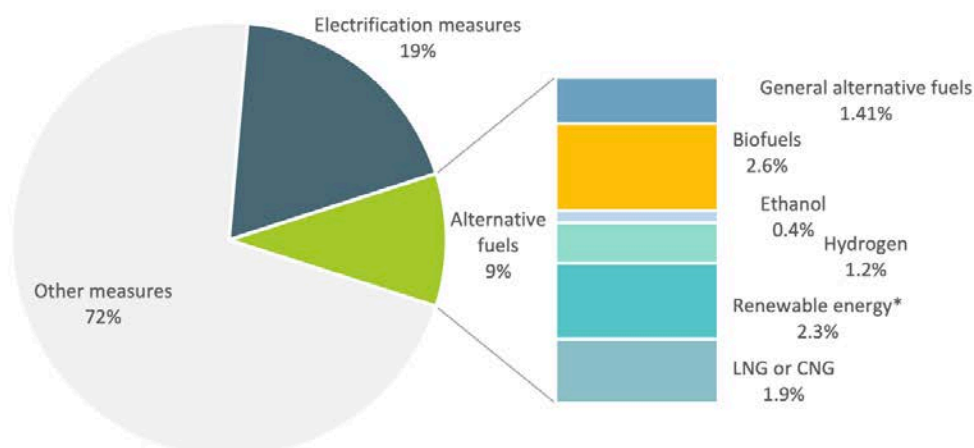
The use of alternative fuels (not just limited to fuels from renewable sources) to lower transport emissions has been mentioned in 9% of transport mitigation actions in second-generation NDCs. The majority of actions

in this category focus on biofuels, followed by renewable energy (either mentioning electricity provided through renewables or including general references to renewables in transport).

Hydrogen

Seven 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 UAE’s

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 2050.⁹

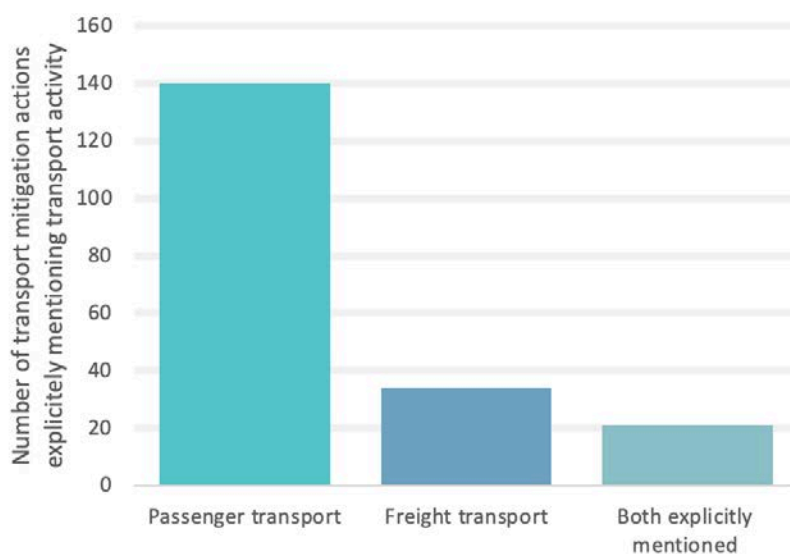
⁹ SLOCAT (2021), Tracking Trends in a Time of Change: The Need for Radical Action Towards Sustainable Transport Decarbonisation, Transport and Climate Change Global Status Report – 2nd edition, available at: www.tcc-gsr.com

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 18% refer to freight transport while 72% 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 (31%) and passenger (60%) 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.

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.

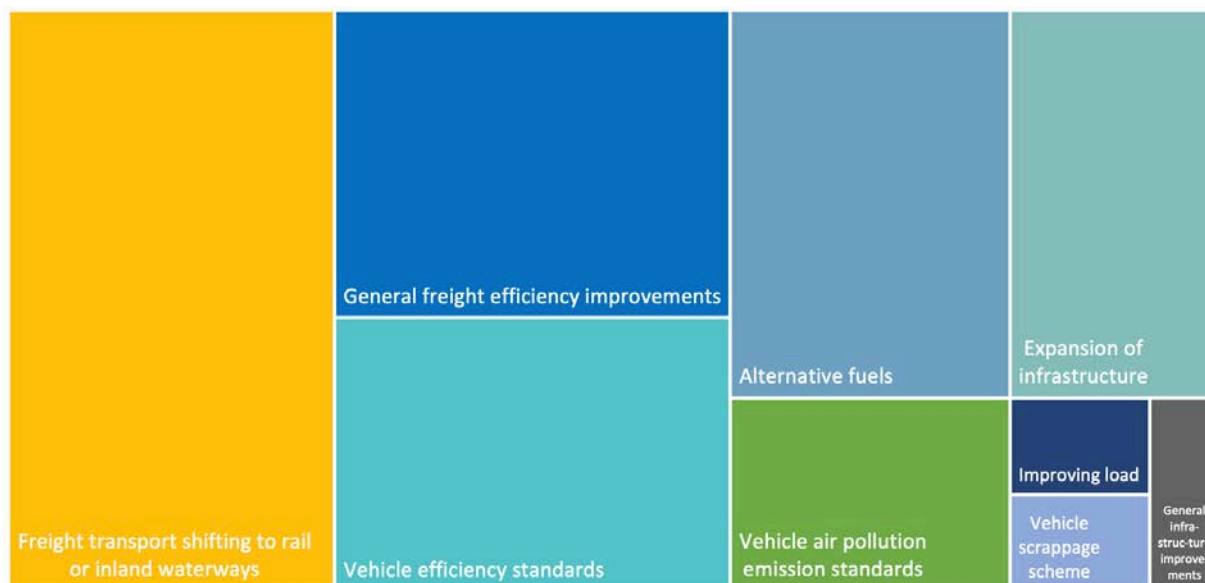
Fig. 20: Second-generation NDCs transport mitigation actions mentioning passenger and/ or freight transport



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 (9 actions) and vehicle-focused improvements (8 actions) (Fig. 21).

Fig. 21: Freight measures in second-generation NDCs



Only 2.4% of mitigation actions (14 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 CO₂ emissions by 70-80%, according to UAE's second NDC. However, in absolute numbers, there are more freight actions in the 116 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.¹¹ 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.

¹⁰ OECD/ITF (2021), ITF Transport Outlook 2021, available at: www.itf-oecd.org/itf-transport-outlook-2021

Urban-level actions

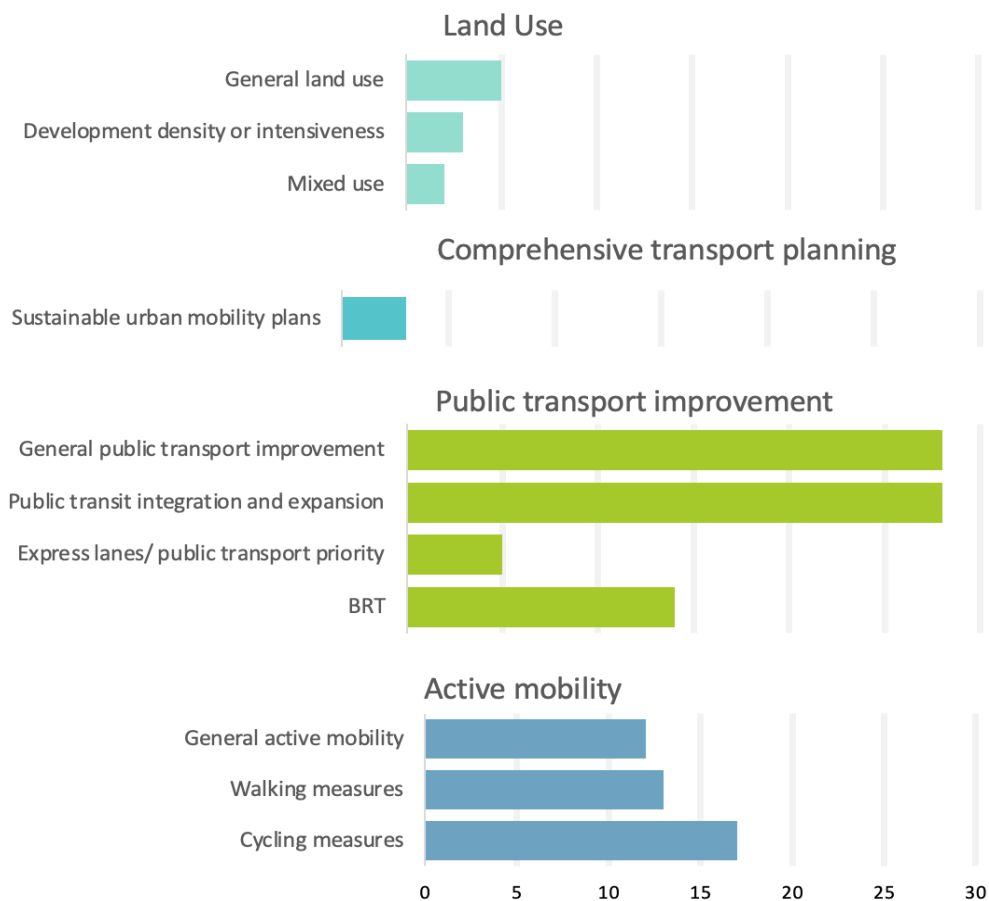
Of the second-generation NDCs that include specific references to the geographic scope of measures, 19% (over 100 actions) mention urban transport and just 2% mention rural transport and intercity transport. The large majority of measures, however, more generally cover national transport.

A unique characteristic of these urban measures is that the majority focus on Avoid and Shift measures. 28 actions are linked to Avoid or a combination of Avoid and Shift and/or Improve. 60 actions are associated with Shift. In addition, there are several measures exclusively applicable to urban mobility including land use (8% of relevant urban transport-related actions), comprehensive

transport planning (2%), public transport improvements (57%) and active mobility (33%) (Fig. 22).

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

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



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 CO₂ 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.¹¹

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 9 second-

¹¹ 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>

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 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.

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.

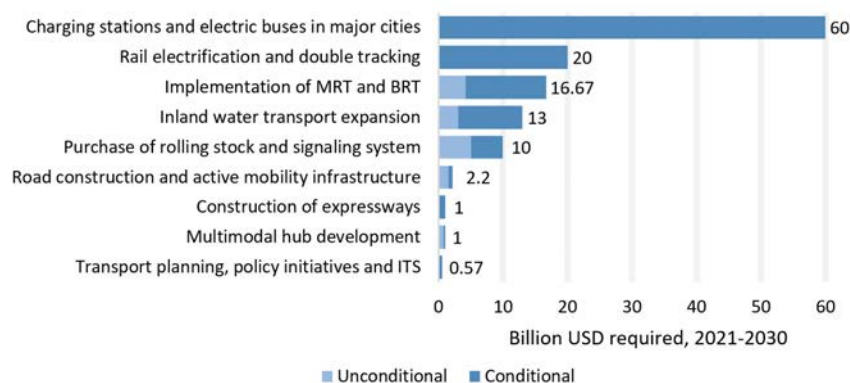
In the case of Tonga, its submission mentions that a transport GHG mitigation target is missing due to a lack of viable alternatives for fossil fuels in transport. It clearly shows that widespread awareness of viable solutions is currently lacking.

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.¹² 28 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.

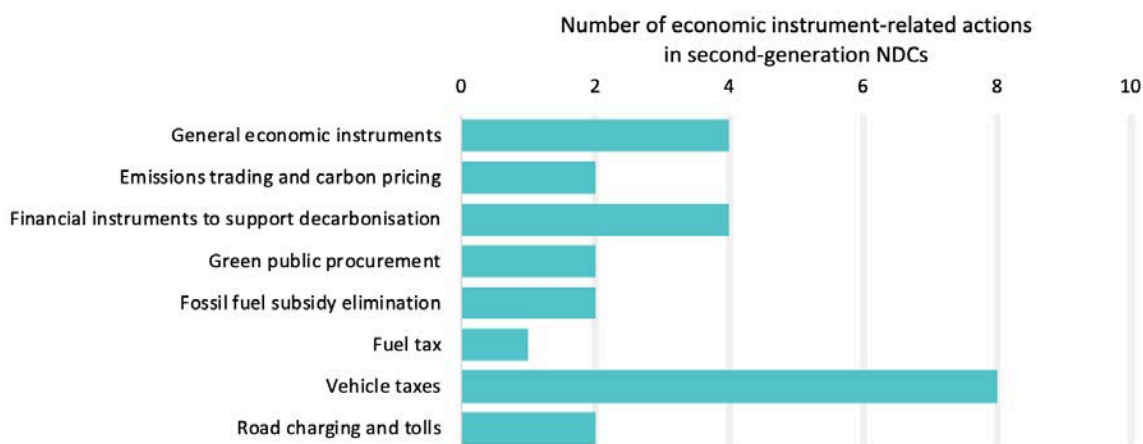
References to economic instruments that can enable new financing streams for sustainable transport are also included in a few second-generation NDCs. The use of vehicle taxes aimed at reducing polluting vehicles was the most common economic instrument (Fig. 24). However, overall, very few NDCs consider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

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



¹² 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 21 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 15 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 CO₂ 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 and Singapore 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.



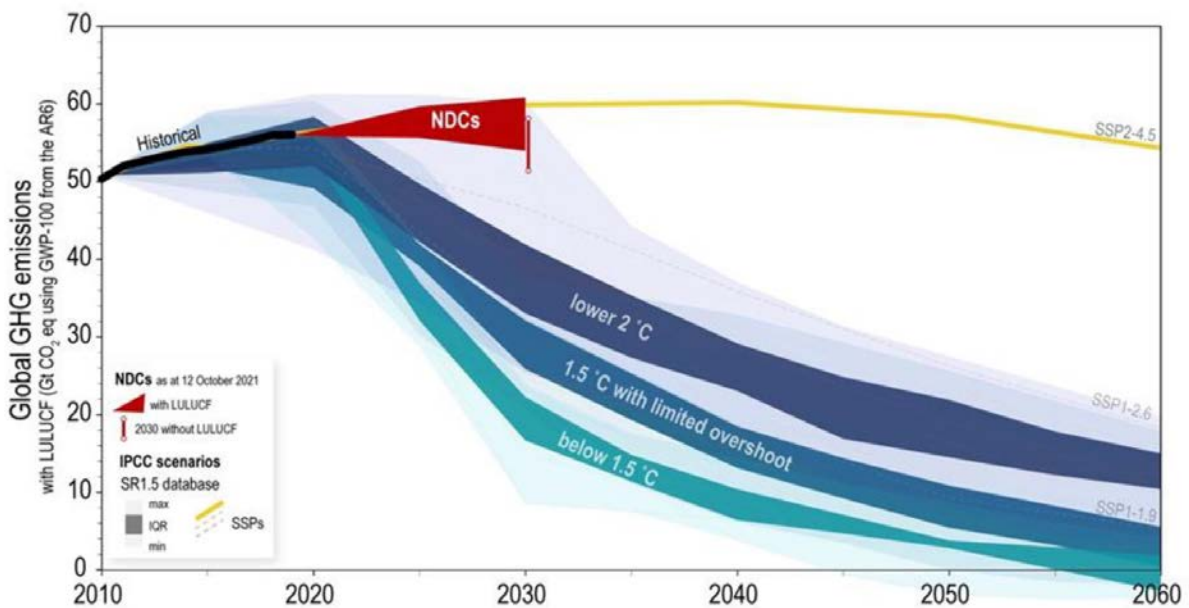
3. Conclusions

Second-generation NDCs will lead to a global warming level of 2.4°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. Targets in the second-generation NDCs (if implemented) will put the world on track to a warming of 2.4°C, compared to current implemented policies' scenario of 2.9°C.¹³ The UNFCCC synthesis report¹⁴ 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 16% by 2030 (see Fig. 25).

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



¹³ Climate Action Tracker (2021), Climate target updates slow as science ramps up need for action, available at: https://climateactiontracker.org/documents/871/CAT_2021-09_Briefing_GlobalUpdate.pdf

¹⁴ 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 favor 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.



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 and second-generation NDCs compared to middle- and high-income countries. 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
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
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
Seychelles	30% of vehicles by large tourism businesses and 20% of small to medium-size tourism businesses to be electric
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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