International Transport Forum

ITF Transport Outlook 2023

Summary

This is a summary version of *ITF Transport Outlook 2023*. Download the full publication: https://www.itf-oecd.org/itf-transport-outlook-2023.

Disclaimer in the full publication: This report is part of the Programme of Work of the International Transport Forum (ITF) at the OECD. It has been approved for publication by the Transport Research Committee of the ITF. This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Note by Türkiye: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Please cite this publication as: ITF (2023), "ITF Transport Outlook 2023: Summary", OECD Publishing, Paris.

Introduction

Every two years, the International Transport Forum (ITF) publishes the *ITF Transport Outlook,* which provides an overview of current trends and future prospects for the global transport sector based on its in-house transport models.

This edition of the *ITF Transport Outlook* focuses on how the global transport sector can meet the ambition to reduce carbon dioxide (CO_2) emissions in line with the Paris Agreement between now and 2050. Using the ITF's in-house global transport models, it projects the potential effects of two specific policy scenarios: a Current Ambition scenario and a High Ambition scenario.

The Current Ambition scenario: Projecting the impact of existing commitments

The Current Ambition scenario provides insights into how transport demand and emissions could evolve over the coming decades if transport policy continues along its current path. It reflects a general recognition that the transport sector needs to decarbonise and takes into account existing policies and forthcoming policy commitments in national and regional governance directives, government strategies and laws.

The Current Ambition scenario also reflects the reality that many decarbonisation plans are progressing slowly and will be even slower in terms of worldwide implementation. This scenario accounts for the early actions that have been taken to translate existing ambitions into action. However, the scale of these actions varies greatly from region to region.

The measures in the Current Ambition scenario include policies or technological developments aimed at replacing internal combustion engine (ICE) vehicles; demand management and encouraging mode shift; investment in attractive and sustainable alternatives to the private car; and improving efficiency and operations to reduce carbon intensity.

The High Ambition scenario: The necessary pathway to decarbonisation

The High Ambition scenario, by contrast, looks at the impact of adopting more ambitious policies to decarbonise the transport sector. It takes the Current Ambition policies and imagines a policy pathway with accelerated implementation timelines, or increased scales. It factors in the impacts of bolder policies aimed at encouraging more sustainable developments and travel behaviour.

The High Ambition scenario also takes into account the scale of ambition set by the goals of the 2030 Breakthroughs for the global transport sector. The 2030 Breakthroughs include ambitious targets for ending new sales of ICE vehicles for both passenger and freight road fleets, the rollout of sustainable aviation fuels and the uptake of zero-emission fuels for maritime shipping.

Executive summary

This edition of the *ITF Transport Outlook* examines the impacts of different policy measures on global transport demand and carbon dioxide (CO_2) emissions to 2050. The analysis covers passenger and freight activity across all transport modes. It places a particular focus on transport policies that make cities more liveable. A second focus is on infrastructure investment decisions and what different policy scenarios mean for them. As a third focus, the report explores regional differences in policy impacts.

Background

The report analyses two policy scenarios for the future of transport, using the ITF's in-house transport models. The Current Ambition scenario assumes policies to decarbonise transport continue along their current pathway and considers the implications for transport demand, CO_2 emissions and further aspects over the next three decades. The High Ambition scenario assumes policies focused on accelerating the decarbonisation of the transport sector and their impact.

Findings

Time is running out to meet the Paris Agreement goal to limit global warming to "well below" 2 degrees Celsius above pre-industrial levels. Despite efforts by some regions to decarbonise, transport emissions will not fall fast enough, as transport demand will grow in the years to come. By 2050, passenger demand will increase by 79% under the Current Ambition scenario and freight demand will roughly double. Under the High Ambition scenario, the equivalent increases are 65% and 59%.

Policy makers play a crucial role in breaking the link between transport demand and emissions. They must use the tools at their disposal to ensure zero- and low-carbon technologies and fuels scale up to become cost-competitive. For road and rail transport, low- and no-carbon technologies require large-scale rollout. For the maritime and aviation sectors, developing sustainable and affordable fuels, in sufficient quantities, will be crucial to decarbonising in the long term.

Public transport and mass transit offer great opportunities to advance zero-emission travel. But an integrated mixture of transport modes – including ridesharing, shared vehicles and infrastructure for walking and cycling – will be essential. With bolder policies, mode share for private motorised vehicles in urban areas falls from 49% in 2019 to 36% in 2050, as most passenger travel switches to sustainable modes. Outside urban areas, mode-shift policies will succeed in specific contexts. Rail, in particular, achieves a higher mode share under both the Current and High Ambition scenarios. However, roughly 50% of regional trips will still happen by passenger car in 2050, even with ambitious policies.

International and intercity travel rely on carbon-intensive transport modes. Aviation alone accounts for nearly half (47%) of international and intercity passenger-kilometres. Long-distance trips are particularly hard to decarbonise for both passenger and freight. Making these trips more sustainable without reducing travel will require reducing the carbon intensity of the travel.

Freight mode choice is mostly unresponsive to pricing measures. The exceptions are road and port access modes in multimodal trips. Coherent pricing policies can ensure that the most sustainable of the viable modes are chosen. Carbon pricing can encourage a move away from the most carbon-intensive fleets and make low-carbon fuels more cost-competitive.

Regardless of the pathway chosen, the transport system will require significant investment in the coming decades. Core infrastructure investment needs to meet projected demand are estimated at 1.7% of global GDP annually through to 2050 under the Current Ambition scenario, and marginally less (1.6%) under the High Ambition scenario. However, the rollout of electric vehicle charging networks, which is essential for electric vehicle uptake, will require significant additional investment.

Policy recommendations

Develop comprehensive strategies for future mobility and infrastructure

To ensure increased transport activity is as sustainable as possible, governments should change their approach to planning. Instead of providing infrastructure as a reaction to predicted demand, the "decide and provide" approach invests in infrastructure in a vision-led way, with a view to achieving certain public policy objectives. This approach is not necessarily costlier: core infrastructure investment needs could be lower if ambitious decarbonisation policies are implemented now.

Implement mode shift and demand-management policies where they are most effective

Measures that reduce trips and travel distances, and encourage the use of more sustainable modes, work well in cities but are not always feasible elsewhere. Some countries can expect to shift regional and short-distance intercity and international travel, to rail, and should pursue this where feasible. Mode-shift policies will make little impact on longer-distance travel, as long-haul air trips are difficult to replace, for instance. Here, transitioning to lower-emitting vehicles and fuels should be the priority.

Accelerate the transition to clean vehicle fleets

New vehicle technologies and alternative fuels are crucial for decarbonising transport. Accelerating the transition towards cleaner vehicles and fuels requires targeted policy support with clear, ambitious objectives and support measures. Incentives to accelerate zero-emission passenger vehicle use should not disadvantage citizens on lower incomes. Alternative fuels and vehicle technologies rely on enabling infrastructure (e.g. electric charging networks and refuelling sites), which will require additional investment.

Consider the additional benefits for urban areas when evaluating policies

Many policies to decarbonise urban mobility have additional positive impacts. Measures that reduce car dependency in cities and improve sustainable transport options, for instance, can make mobility more affordable and improve access. They can also reduce congestion, free up urban space and improve health outcomes by reducing crash risks for cyclists and pedestrians and limiting air pollutants from road traffic.

Reform vehicle taxation to capture external costs of new vehicle fleets

Government revenues from fuel-excise duties will continue to fall as vehicle efficiency improves and the transition to zero-emission vehicles accelerates. This will make them less effective as a policy lever to encourage sustainable behaviours. Efficient road pricing would mitigate the impact of diminishing revenues from fuel duties. Congestion charging can also help capture the external costs of road use more fairly over time and encourage more sustainable travel and transport choices.

1. The outlook for transport: Speedy recovery, new uncertainties

Global disruptions have hindered the transport sector's post-pandemic recovery

The Covid-19 pandemic led governments worldwide to introduce lockdowns and restrictions on travel and movement in 2020-22. These actions profoundly affected the global transport sector, which has nevertheless bounced back quicker than expected. Policy responses have also moved on. Some measures, such as travel restrictions, have ended. Others, such as investment in active travel, have become more mainstream in several regions.

However, in 2022, just as the post-Covid recovery gained momentum, the war in Ukraine brought untold destruction and human suffering. The war has been accompanied by an energy crisis and widespread supply-chain disruptions. These disruptive events create new uncertainties for users and providers of transport worldwide, and their effects continue to unfold as this report went to press.

Global gross domestic product (GDP) trends, changing trade patterns, and the volatility of energy prices provide clues as to the potential impact of current events on transport demand. GDP influences both freight and passenger transport. International trade determines freight transport patterns and demand. Fluctuations in energy prices affect travel behaviour.

Uncomfortable truths accompany evidence of the sector's recovery. Yes, passenger travel is booming now that restrictions on movement have ended. Yes, new trade routes have replaced those closed by the war and sanctions. But the transport sector remains overwhelmingly reliant on fossil fuels. And this continues to make it particularly vulnerable to energy price variability.

The transport sector's future sustainability depends, to a large extent, on its response to the structural crisis created by global warming. Populations and economies are due to grow in the coming years, meaning freight and passenger demand will also increase. The projections for this report demonstrate that current commitments to reduce carbon emissions are insufficient (see Figure 1).

The scale of the decarbonisation challenge is vast. International co-operation to achieve decarbonisation goals is making progress but needs to accelerate. The question of equity in meeting climate goals becomes even more urgent in this context. For many governments, balancing national priorities against the need to meet their commitments under the Paris Agreement remains a serious challenge.

Key takeaways

The transport sector's recovery following the pandemic has been faster than expected but significant challenges remain.

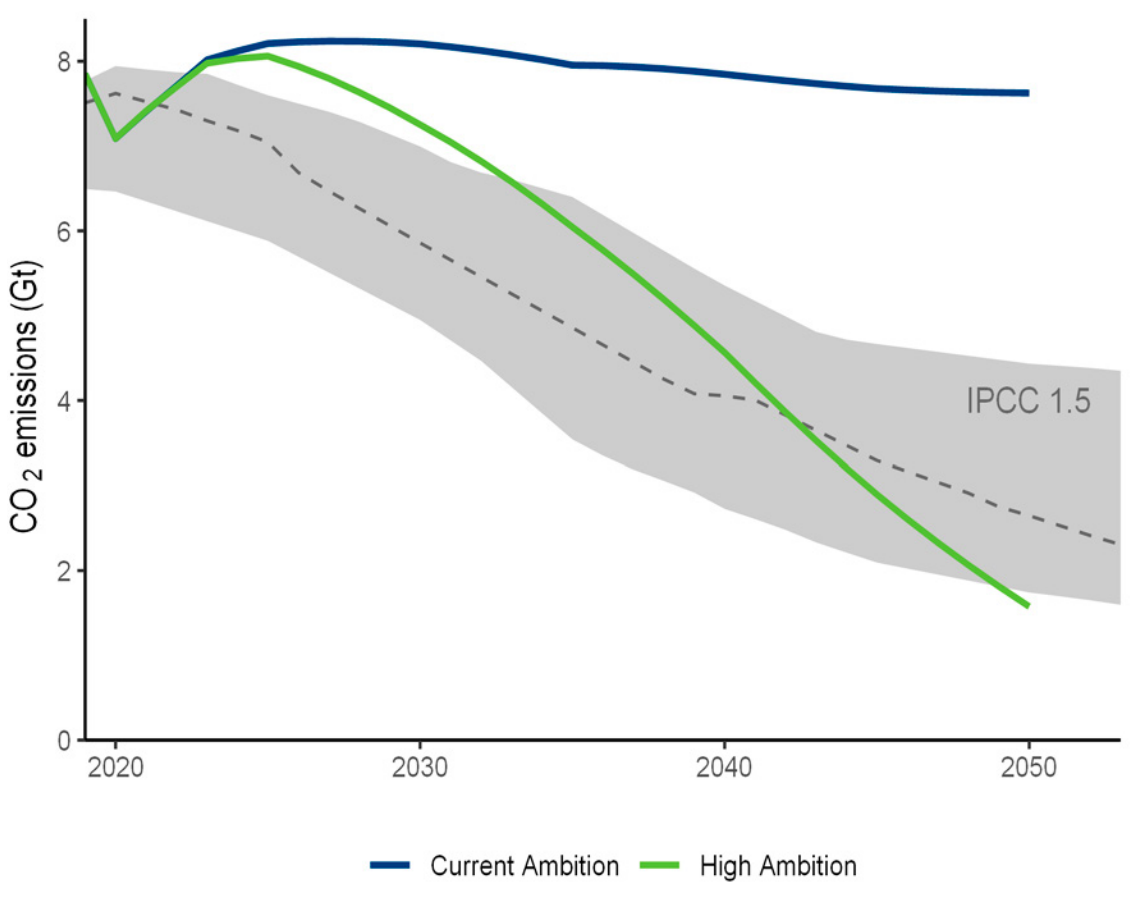
Turmoil in energy markets and cost-of-living crises complicate efforts to decarbonise transport.

Despite some progress, transport emissions will not fall fast enough in the coming years to meet international climate objectives.

Mechanisms exist to advance decarbonisation goals but they need to become more ambitious.

Governments face the challenge of balancing multiple priorities while meeting climate commitments.

Figure 1. **Carbon dioxide emissions under the Current Ambition and High Ambition scenarios**



Note: Current Ambition (CA) and High Ambition (HA) refer to the two main policy scenarios modelled, which represent two levels of ambition for decarbonising transport. IPCC 1.5˚C represents the emission levels needed to limit warming to 1.5˚C as introduced by the Intergovernmental Panel on Climate Change. The levels were calculated based on data sourced from the International Assessment Modelling Consortium.

Sources:
IAMC (2019), IAMC 1.5°C Scenario Explorer hosted by IIASA, https://data.ene.iiasa.ac.at/iamc-1.5c-explorer.
IPCC (2018), Special report: Global Warming of 1.5 °C, Intergovernmental Panel on Climate Change, Geneva, https://www.ipcc.ch/sr15

2. Decarbonising transport: Scenarios for the future

As time runs out to meet climate goals, the case to accelerate action is undeniable

The transport sector is a significant part of the global economy. It provides access to opportunities that contribute to countries' and individuals' economic and social well-being. But transport faces a critical challenge: how to meet increasing demand (see Figure 2) while reducing carbon dioxide (CO_2) emissions. Tackling poor air quality, reducing congestion and improving equity are equally important tasks for the sector globally.

The transport sector accounts for 23% of the world's energy-related CO_2 emissions. Transport also indirectly contributes to increased demand for energy. Transport infrastructure construction, vehicle manufacturing and fuel production generate greenhouse gas emissions. And the sector locks in future emissions because of the longevity of vehicle fleets and infrastructure.

This edition of the *ITF Transport Outlook* models two scenarios for future transport policies and their potential impacts on demand and emissions through to 2050. The Current Ambition scenario represents the business-as-usual approach. It projects the potential effects of existing commitments, including Nationally Determined Contributions made under the Paris Agreement.

In contrast, the High Ambition scenario assumes policy makers take accelerated action to decarbonise transport. This scenario models the impact of specific policy objectives, including providing alternatives to private motorised vehicles, enhancing public transport services, improving walking and cycling facilities, and improving the efficiency of the movement of goods.

Some regions' current efforts will make a difference over time and overall transport CO_2 emissions will fall slightly by 2050 (see Figure 3). However, a business-as-usual approach will not make enough difference to deliver against the Paris Agreement goals. The projections also show that the carbon-intensity of passenger activity falls faster than freight's under the Current Ambition scenario.

Without decisive action, the transport sector will continue to contribute significantly to the world's CO_2 emissions. The need to break the link between emissions and transport activities is increasingly urgent. Achieving decarbonisation in the transport sector will require increased policy ambition and international co-operation. But solutions for specific transport types, and economic and geographic contexts, will vary.

Key takeaways

Transport is central to economic development and social opportunity, but it also contributes significantly to the world's CO_2 emissions.

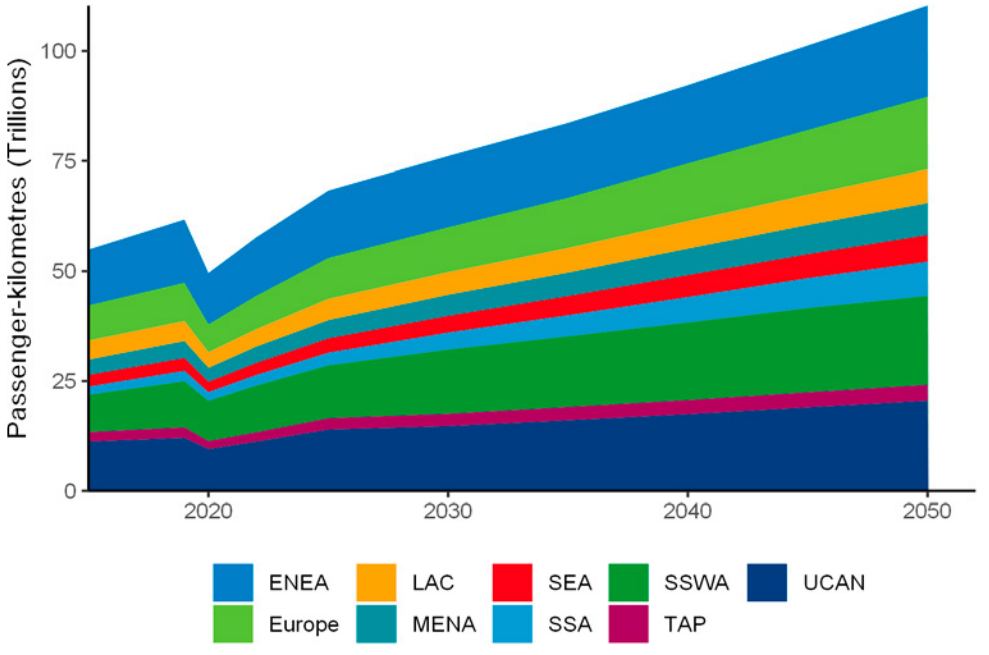
This report models two future transport demand scenarios and CO_2 emissions to 2050: a Current Ambition scenario and a High Ambition scenario.

Overall, the scenarios show that current policies will begin make a difference over time at a global level, with transport CO_2 emissions falling slightly by 2050.

However, continuing on the current path will not make enough of a difference for the transport sector's CO_2 emissions to deliver against the Paris Agreement goals.

The urgent need to break the link between transport activities and emissions requires increased ambition and more international co-operation.

Figure 2. **Passenger transport demand by region under the Current Ambition scenario, 2019-50**



Note: Figure depicts ITF modelled estimates. Current Ambition (CA) and High Ambition (HA) refer to the two main policy scenarios modelled, which represent two levels of ambition for decarbonising transport. ENEA: East and Northeast Asia. LAC: Latin America and the Caribbean. MENA: Middle East and North Africa. SEA: Southeast Asia. SSA: Sub-Saharan Africa. SSWA: South and Southwest Asia. TAP: Transition economies and other Asia-Pacific countries. UCAN: United States, Canada, Australia and New Zealand.

Figure 3. **Passenger and freight emissions under the Current and High Ambition scenarios, 2019-50**

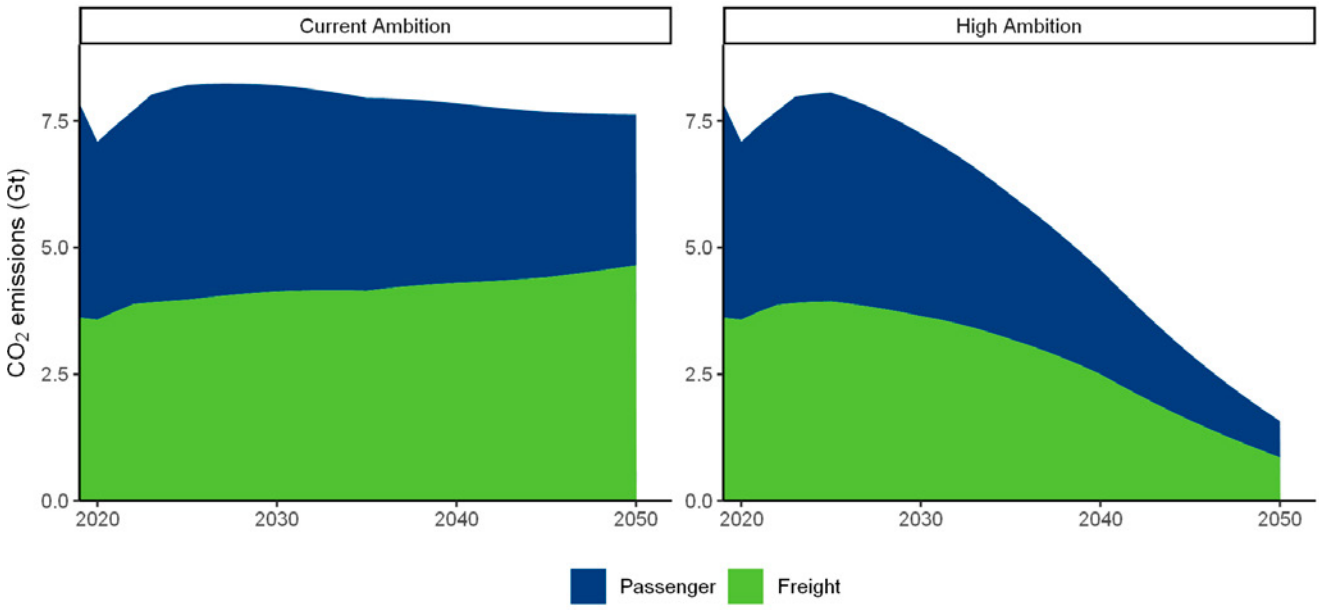


Figure depicts ITF modelled estimates. Current Ambition (CA) and High Ambition (HA) refer to the two main policy scenarios modelled, which represent two levels of ambition for decarbonising transport.

3. Managing transport demand: Offering attractive choices

A mix of policies is needed to promote sustainable choices in different contexts

Demand for passenger and freight transport will continue to grow in the coming decades across all world regions, regardless of the scenario. Without appropriate policies, unmanaged growth could result in increased urban sprawl, longer average trip distances and a lack of any meaningful emission reductions.

International and intercity passenger travel will grow fastest under both scenarios, more than doubling between 2019 and 2050. Urban transport demand will also grow considerably: by 74% under the Current Ambition scenario and 54% under the High Ambition scenario (see Figure 4). Meanwhile, regional travel will increase by only 5% Freight demand will also grow in both policy scenarios, with international movements accounting for the greatest share of activity, measured in tonne-kilometres (see Figure 5).

A mix of policies increasing the efficiency of the transport system and of individual trips could significantly change how people move in cities. Denser and more compact urban areas increase the travel options available to users, putting public transport and essential services within reach. The total distance travelled in cities could fall without significantly reducing the number of trips people actually make.

Yet this will require integrating land-use and transport planning to avoid urban sprawl and expand access to sustainable modes. Public transport will be at the heart of these future urban transport systems. More flexible on-demand services such as ride-hailing and shared vehicles can complement public transport; adding them reduces private motorised vehicle use more than investing in public transport alone.

Authorities should combine policies to discourage private motorised vehicles with investment in multimodal transport. These investments should strengthen links between public transport, shared mobility and active mobility. With such policies, walking, cycling and public transport use could grow in every world region. Outside urban areas, opportunities to shift passenger demand to more sustainable modes are heavily influenced by trip length.

For freight transport, authorities and operators can work together to avoid unnecessary freight movements within and outside cities. High-capacity vehicles, intelligent transport systems and asset sharing can make freight transport operations more efficient and contribute to limiting the growth of freight vehicle-kilometres to 2050.

Urban deliveries are comparatively easy to decarbonise. Shifting deliveries to non-motorised modes (e.g. cargo-bikes) or more efficient vehicles will reduced motorised vehicle-kilometres. Introducing parcel pick-up points will limit delivery movements in cities. Shifting goods to sustainable modes is more challenging for longer-distance freight. Coherent approaches to pricing can encourage efficiencies and increase the use of railways and waterways for multimodal delivery journeys.

Policy recommendations

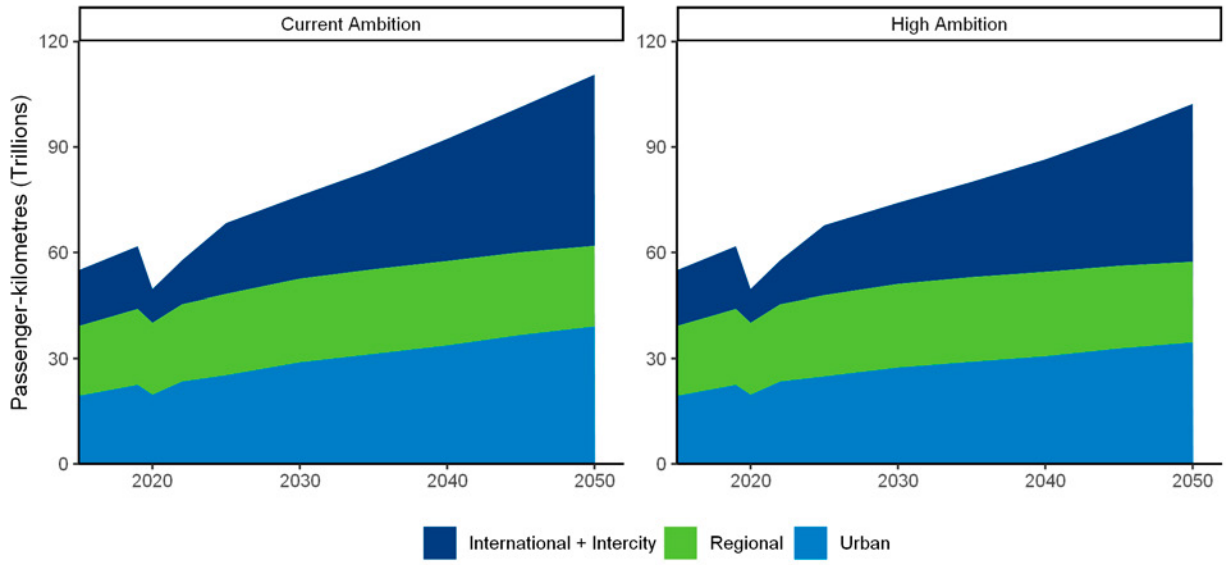
Take a long-term view of urban development and adopt integrated approaches to transport and land-use planning to avoid future sprawl in growing cities.

Adopt holistic sustainable urban transport plans that combine investment, pricing and access or space restrictions to encourage sustainable choices.

Support multimodal and sustainable transport networks.

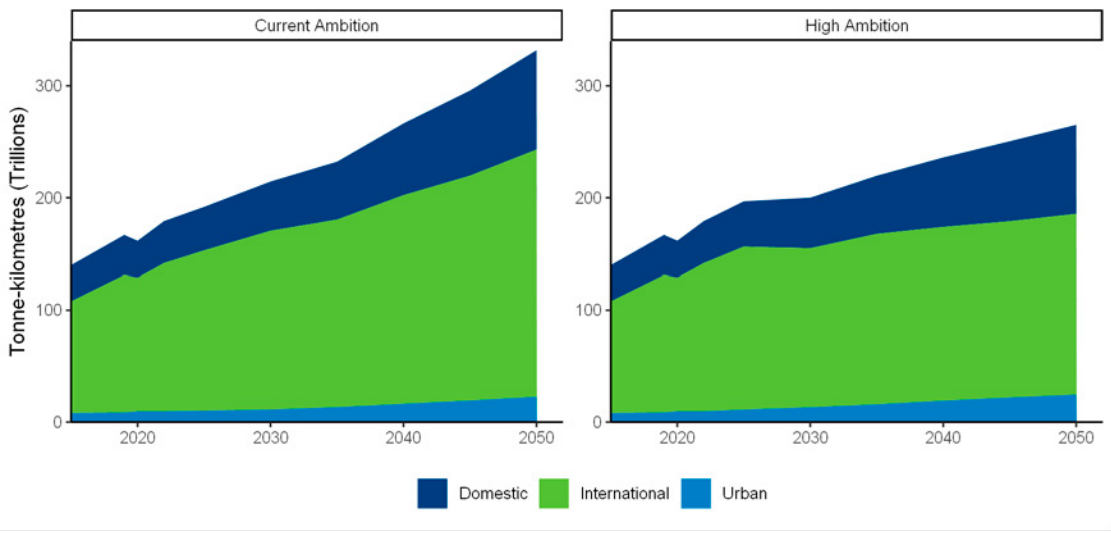
Combine pricing measures in a coherent manner and allocate funds to sustainable modes.

Figure 4. **Passenger-kilometres grouped by activity type under the Current Ambition and High Ambition scenarios**



Note: Figure depicts ITF modelled estimates. Current Ambition (CA) and High Ambition (HA) refer to the two scenarios modelled, which represent two levels of ambition for decarbonising transport. International+Intercity: travel across national borders; Regional: non-urban travel within national borders.

Figure 5. **Tonne-kilometres grouped by activity type under the Current Ambition and High Ambition scenarios**



Note: Figure depicts ITF modelled estimates. Current Ambition (CA) and High Ambition (HA) refer to the two scenarios modelled, which represent two levels of ambition for decarbonising transport. International: between national borders; Domestic: non-urban, within national borders.

4. Cleaner fleets: The key to decarbonising transport

Ambitious timelines for zero-emission vehicles and alternative fuels must be met

A future where clean vehicles and fuels are commonplace is attainable. To reach the Paris Agreement goals, governments must implement policies to improve vehicles and the fuels that power them, and set very ambitious timelines for this transition. They should prioritise policies that interact with and multiply the benefits of measures to manage transport demand and encourage shifts to cleaner transport modes.

Accelerated actions on clean vehicles and fuels account for three-quarters of the difference in emission reductions between the Current Ambition and the High Ambition scenario (see Figure 6). But implementation depends on policy support, funding, and cross-sector collaboration and co-ordination.

Progress on cleaner vehicles is already evident in many countries. A transition is clearly underway, with governments in some regions already making firm policy commitments. In fact, the world may have already reached the peak number of internal combustion engine (ICE) passenger vehicles in the 2020s, even under the Current Ambition scenario (which assumes countries honour existing commitments).

Several leading markets have set a target to sell only zero-emission vehicles (ZEVs) by 2035 for new passenger cars. This is not enough to decarbonise road transport: more governments and vehicle types must follow suit. The High Ambition scenario assumes all governments reach 100% ZEV sales targets for new vehicles by 2050 (see Figure 7). As the purchase-price gap between ZEV and ICE vehicles closes, policy incentives will need to become more targeted to achieve a more equitable transition.

Understanding fleet renewal rates and the global used-car trade can help policy makers identify interim measures for decarbonisation in different contexts. Governments will need to take a different approach to decarbonising larger vehicles such as buses and heavy-goods vehicles. Electric powertrains for heavy vehicles can maximise operational cost savings due to lower running and maintenance costs.

The aviation and maritime sectors are hard to decarbonise. The cost of CO_2 emission reductions is high and the pace of technological improvements slow. Alternative fuels will need to be more widely available and cost-competitive with conventional fuels. This requires targeted policy interventions.

Exemptions from fuel taxes for aviation and shipping work against the sector's goal to decarbonise. They should be discontinued. Carbon-pricing will play a crucial role in addressing and removing these structural impediments. Closing the price gap between conventional and low- and zero-carbon fuels could also create sources of revenue for investments in the necessary infrastructure for decarbonisation.

Nevertheless, aviation and maritime transport will not decarbonise overnight. To maximise economy-wide emission savings, policy makers must prioritise alternative fuels in contexts where other measures (including full electrification) are not feasible, particularly given the competition for alternative fuels between industries.

Policy recommendations

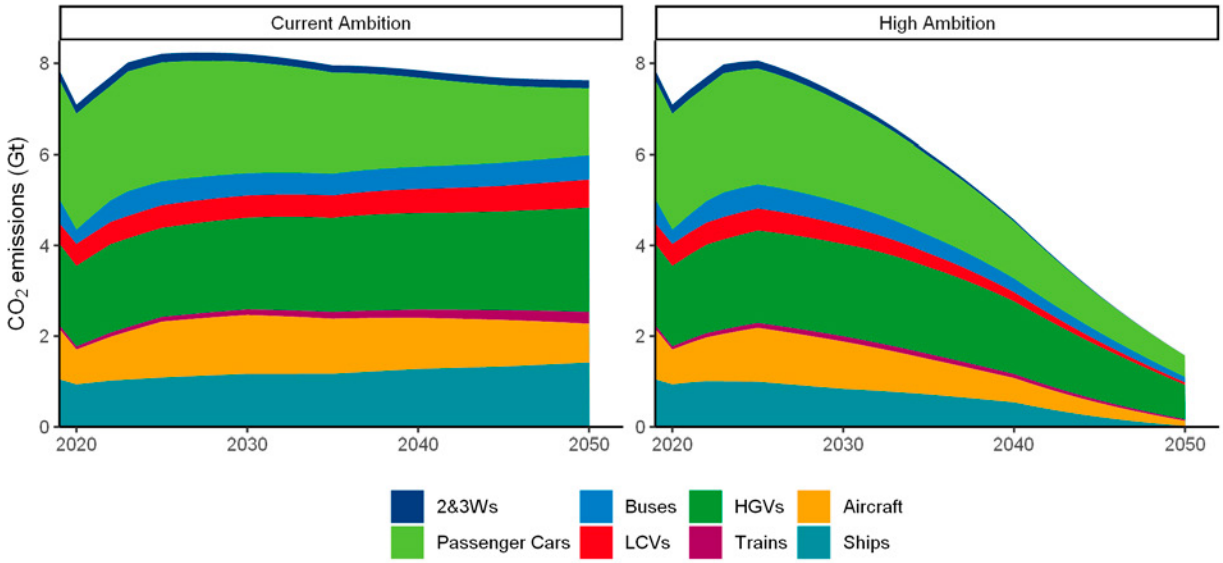
Set targets and collaborate across sectors to decarbonise all vehicle fleets.

Target incentives and introduce access restrictions in cities for high-emitting vehicles to increase the uptake of zero-emission road vehicles.

Deploy public charging infrastructure to increase the pace of adoption.

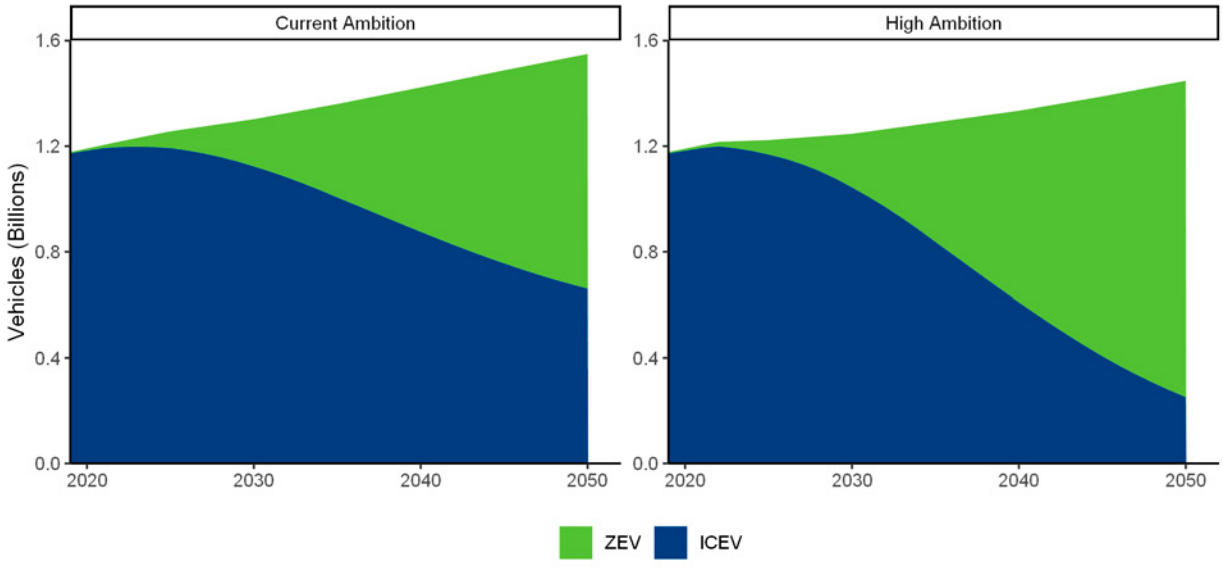
Use pricing measures to improve the commercial viability of low-carbon alternative fuels.

Figure 6. **Emissions by vehicle type under the Current Ambition and High Ambition scenarios, 2019-50**



Note: Figure depicts ITF modelled estimates. Current Ambition (CA) and High Ambition (HA) refer to the two main policy scenarios modelled, which represent two levels of ambition for decarbonising transport. 2&3Ws: Motorised two- and three-wheelers. HGVs: Heavy-goods vehicles. LCVs: Light commercial vehicles.

Figure 7. **Global passenger car fleet by powertrain under the Current Ambition and High Ambition scenarios, 2019-50**



Note: Figure depicts ITF modelled estimates. Current Ambition (CA) and High Ambition (HA) refer to the two main policy scenarios modelled, which represent two levels of ambition for decarbonising transport. ZEV: Zero-emission vehicles. ICEV: Internal combustion engine vehicles.:

5. Liveable cities: The broader benefits of transport decarbonisation

Holistic policies will play a crucial role in improving the quality of urban life

Liveable cities provide their residents with easy access to the various opportunities an urban environment offers. Transport options therefore dramatically affect liveability. They contribute to the range of social activities accessible to city-dwellers but also to negative aspects such as quantity of pollutants in air they breathe. Transport policies that reduce CO_2 emissions and moderate travel demand can also make cities more liveable.

With the policies currently in place, emissions of toxic pollutants from city traffic are expected to grow over the coming decades in all but the high-income world regions, even as more fleets become cleaner. Substantially reducing transport-related pollutant emissions in urban areas requires ambitious fleet and demand policies. The combination of policies under the High Ambition scenario – including road pricing, fuel economy standards, green procurement and electrification of freight and passenger vehicles – can reduce CO_2 emissions in urban areas by more than 78% by 2050 relative to 2019.

Encouraging active mobility is one important focus of urban decarbonisation policies. With this, however, the risk that pedestrians and cyclists will be exposed to conflicts with other road users is likely to rise (see Figure 8). Mitigating or reversing this risk requires major investments in active mobility infrastructure and new restrictions on vehicle speeds in cities. By 2050, crash risk grows 4.5 times more under a continuation of today's policies compared to the High Ambition scenario.

Transport will only be accessible and inclusive if it is affordable. Making shared modes more widely available in urban spaces can make them accessible to more users and combining this with integrated payment systems (including public transport and shared modes) will put them within reach of more users.

High-coverage public transport networks are a critical component of accessible and affordable urban mobility. Increased investment in public transport links connecting historically underserved neighbourhoods will address issues of inclusion and equity. By giving priority to public transport over cars, ambitious decarbonisation policies can shorten travel times for public transport users, making it more convenient to access opportunities across the city for those who do not drive.

Transport policy can also make cities more liveable by contributing to a more human-centric use of urban space. Space-efficient transport systems (see Figure 9) make room for more parks, new services and opportunities for recreational activities. The measures assumed in the High Ambition scenario would limit demand for private motorised transport and result in 2-10% lower road occupancy in 2050, compared to the Current Ambition scenario. Public support for such ambitious measures will be crucial to their acceptance and success.

Policy recommendations

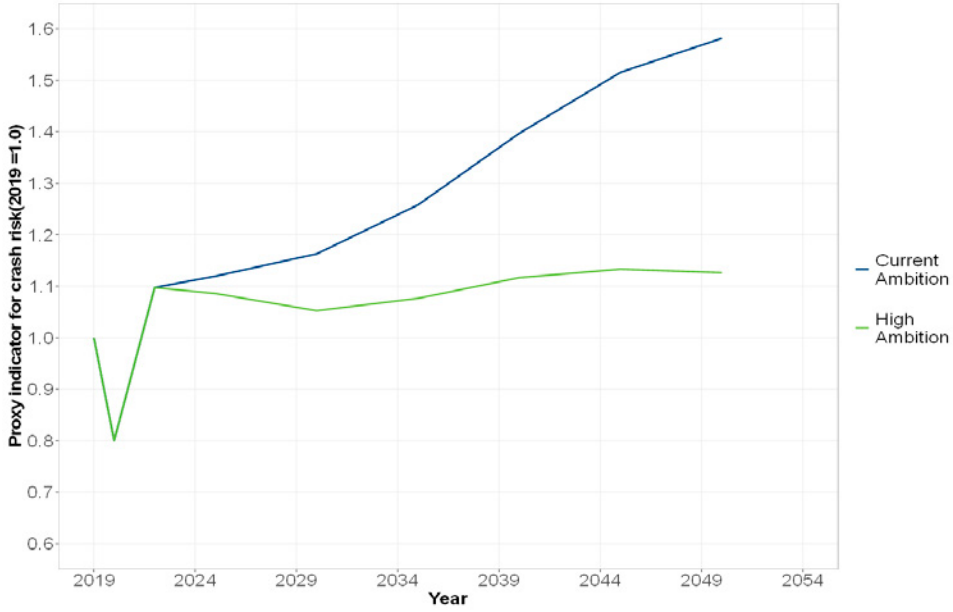
Create attractive alternatives to private motorised vehicles to encourage the shift to sustainable transport and reduce pollution.

Consider equity impacts when developing new transport policies, investments and programmes.

Prioritise people, not vehicles, in urban design to improve safety for all road users.

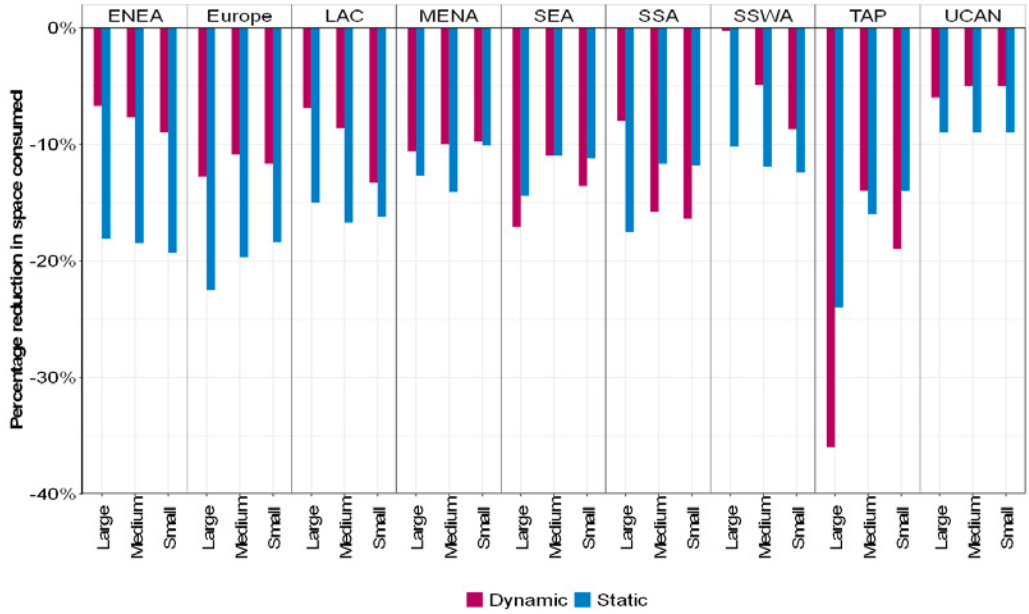
Set ambitious goals for reducing pollutant emissions and take actions to achieve them.

Figure 8. **Change in proxy indicator for crash risk over time under the Current Ambition and High Ambition scenarios**



Note: Figure depicts ITF modelled estimates. The proxy indicator for crash risk measures the exposure to potential conflicts between vulnerable road users and passenger vehicles. It incorporates vehicle volumes, the difference in speed between modes and the degree of longitudinal separation between modes. Lower values represent less risk of exposure to conflicts. These indicators only account for conflicts with passenger cars, not freight vehicles. Current Ambition (CA) and High Ambition (HA) refer to the two main policy scenarios modelled, which represent two levels of ambition for decarbonising transport.

Figure 9. **Percentage change in static and dynamic urban space consumed by passenger transport in 2050, High Ambition scenario relative to Current Ambition scenario, by city size**



Note: Figure depicts ITF modelled estimates. Results reflect the dynamic and static space consumption of passenger vehicles and do not include freight vehicles. For details of the methodology used to calculate space consumption see the ITF report *Streets That Fit: Re-allocating Space for Better Cities* (2022). Dynamic space refers to the space consumed by traffic. Static space refers to the space consumed on a permanent basis for the use of passenger modes (e.g. parking spaces). City sizes refer to the size of the population of the city: Large: more than 5 million inhabitants; Medium: between 1 million and 5 million inhabitants; Small: fewer than 1 million inhabitants. ENEA: East and Northeast Asia. LAC: Latin America and the Caribbean. MENA: Middle East and North Africa. SEA: Southeast Asia. SSA: Sub-Saharan Africa. SSWA: South and Southwest Asia. TAP: Transition economies and other Asia-Pacific countries. UCAN: United States, Canada, Australia and New Zealand.

Source: ITF (2022), *Streets That Fit: Re-allocating Space for Better Cities*, OECD Publishing, Paris, https://doi.org/10.1787/5593d3e2-en.

6. Investing in the future: The financial implications of decarbonising transport

A sustainable transport system could require lower core infrastructure investment

Transport competes for investment with other essential services and networks, such as healthcare, energy and water. Conversations about decarbonisation in all sectors often focus on funding or financing needs for the transition to net-zero. Where money is tight, benchmarking the investment needs for a net-zero scenario against those for a business-as-usual approach to infrastructure investment can yield important evidence to support important strategic decisions and set priorities.

In the case of transport, comparing investment needs under the Current Ambition scenario with the High Ambition scenario reveals that a strong push for decarbonising transport is in fact not more expensive: the total capital investment needs of core infrastructure for road, rail, airports and ports are 5% lower with ambitious policies in place than carrying on with business as usual (see Figure 10).

The "decide and provide" approach is one example of an ambitious investment policy. Instead of providing infrastructure as a reaction to predicted demand ("predict and provide"), this approach involves investing in infrastructure in a vision-led way, with a view to achieving certain public policy objectives. In a transport decarbonisation context, this means investing in public transport infrastructure and policies that support the move to transport modes with higher occupancy or load factors, and more compact cities. Such an approach could potentially save governments from spending USD 4 trillion globally on road maintenance and investment (but excludes investment in adaptation).

Nevertheless, transport decarbonisation requires significant investment in support infrastructure. The charging-point network, for example, is critical for the electrification of vehicle fleets. Under the High Ambition scenario, this network will require additional investments equaling roughly 0.4% of global gross domestic product.

Transport decarbonisation also has an impact on revenues from fuel taxes. This revenue stream has already begun to diminish in many countries as internal combustion engines are becoming more efficient and electric vehicles increase their share of the passenger car fleet. The rate of this decline in revenue accelerates under the High Ambition scenario, as the uptake of zero-emission vehicles accelerates (see Figure 11). Because of this, governments will lose income and, with it, the behavioural policy lever of taxing car use through fuel consumption.

Therefore, fuel tax regimes need reform. Distance-based pricing gives policy makers a stronger lever for encouraging sustainable travel choices. In addition, maintaining fuel taxes while vehicles with internal combustion engines remain on the roads helps phase out polluting vehicles. That said, policy makers need to design pricing regimes carefully to avoid perpetuating inequities.

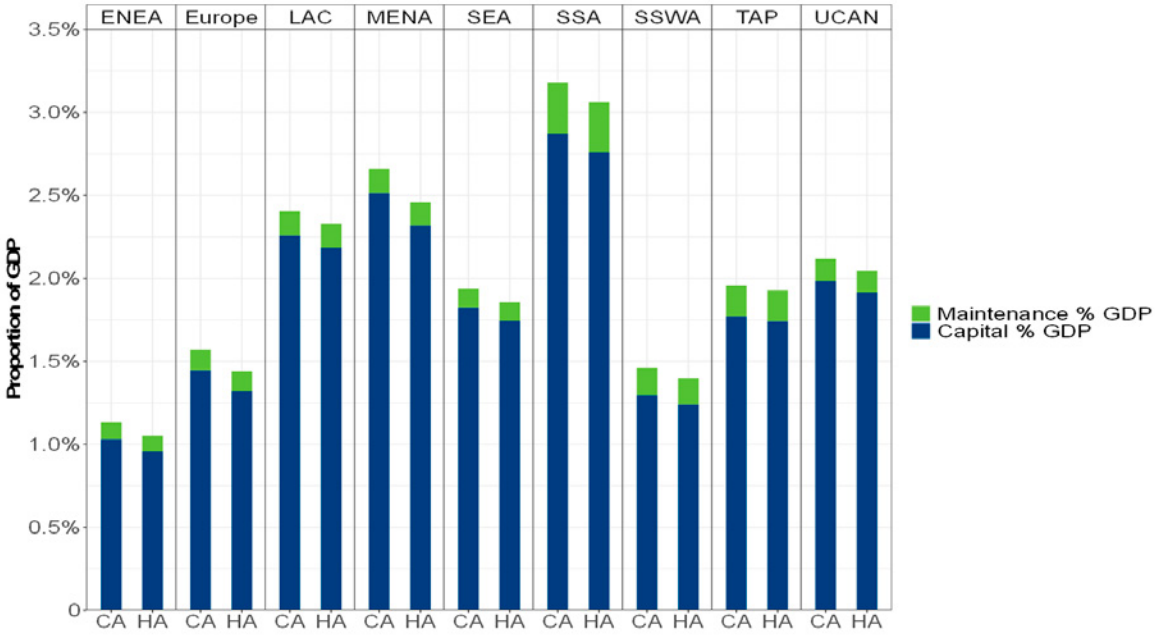
Policy recommendations

Adopt a vision-led "decide and provide" approach to infrastructure planning instead of a reactive "predict and provide" approach.

Account for the significant additional investment needed for electric vehicle charging infrastructure.

Reform the current method of taxing car use through fuel excise duty and introduce more distance-based pricing.

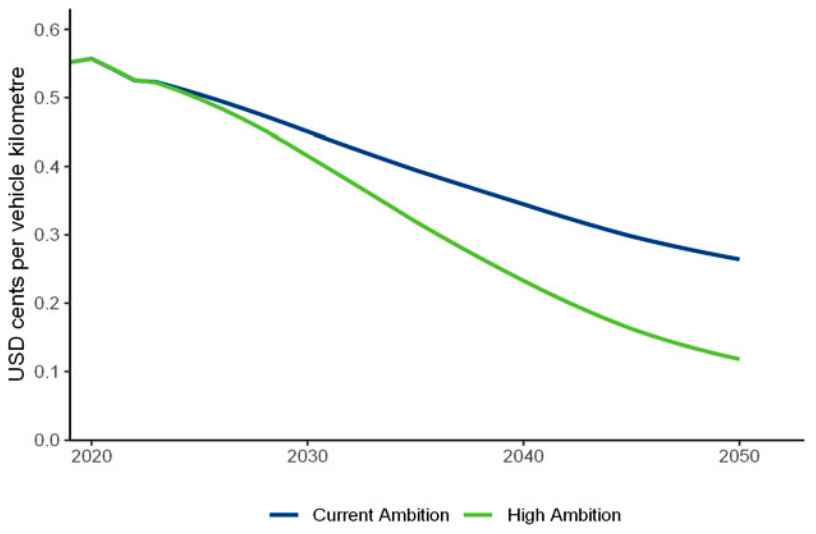
Figure 10. **Average core infrastructure investment under the Current Ambition and High Ambition scenarios as a proportion of gross domestic product, over the period 2019-50**



Note: Figure depicts ITF modelled estimates. Current Ambition (CA) and High Ambition (HA) refer to the two main policy scenarios modelled, which represent two levels of ambition for decarbonising transport. ENEA: East and Northeast Asia. LAC: Latin America and the Caribbean. MENA: Middle East and North Africa. SEA: Southeast Asia. SSA: Sub-Saharan Africa. SSWA: South and Southwest Asia. TAP: Transition economies and other Asia-Pacific countries. UCAN: United States, Canada, Australia and New Zealand.

Source: GDP data based on the OECD ENV Linkages model, http://www.oecd.org/environment/indicators-modelling-outlooks/modelling.htm.

Figure 11. **Global fuel tax revenues under the Current Ambition and High Ambition scenarios**



Note: Figure depicts ITF modelled estimates based on estimates of fuel tax rates derived from OECD and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) figures. Current Ambition (CA) and High Ambition (HA) refer to the two main policy scenarios modelled, which represent two levels of ambition for decarbonising transport.

Sources:
OECD (2022), Consumption Tax Trends 2022: VAT/GST and Excise, Core Design Features and Trends, OECD Publishing, Paris, https://doi.org/10.1787/6525a942-en.
GIZ (2021), International Fuel Prices, Deutsche Gesellschaft für Internationale Zusammenarbeit, Eschborn, https://sutp.org/publications/international-fuel-prices-report/.
OECD (n.d.), OECD Tax Database, https://www.oecd.org/tax/tax-policy/tax-database/ (accessed on 15 February 2023).

About the International Transport Forum

Who we are

The International Transport Forum is an intergovernmental organisation with 64 member countries. It acts as a think tank for transport policy and organises the Annual Summit of transport ministers. The ITF is the only global body that covers all transport modes. The ITF is politically autonomous and administratively integrated with the OECD.

What we do

The ITF works for transport policies that improve peoples' lives. Our mission is to foster a deeper understanding of the role of transport in economic growth, environmental sustainability and social inclusion and to raise the public profile of transport policy.

How we do it

The ITF organises global dialogue for better transport. We act as a platform for discussion and pre-negotiation of policy issues across all transport modes. We analyse trends, share knowledge and promote exchange among transport decision-makers and civil society. The ITF's Annual Summit is the world's largest gathering of transport ministers and the leading global platform for dialogue on transport policy.

The Members of the Forum are:

Albania	Armenia	Argentina	Australia
Austria	Azerbaijan	Belarus	Belgium
Bosnia and Herzegovina	Bulgaria	Cambodia	Canada
Chile	China (People's Republic of)	Colombia	Croatia
Czech Republic	Denmark	Estonia	Finland
France	Georgia	Germany	Greece
Hungary	Iceland	India	Ireland
Israel	Italy	Japan	Kazakhstan
Korea	Latvia	Liechtenstein	Lithuania
Luxembourg	Malta	Mexico	Republic of Moldova
Mongolia	Montenegro	Morocco	The Netherlands
New Zealand	North Macedonia	Norway	Poland
Portugal	Romania	Russian Federation	Serbia
Slovak Republic	Slovenia	Spain	Sweden
Switzerland	Tunisia	Türkiye	Ukraine
The United Arab Emirates	The United Kingdom	The United States	Uzbekistan

International Transport Forum

ITF Transport Outlook 2023

The *ITF Transport Outlook 2023* examines the impacts of different policy measures on global transport demand and carbon dioxide (CO_2) emissions to 2050. The analysis covers the movement of passengers and freight across all transport modes. It places a particular focus on transport policies that make cities more liveable. A second focus is on infrastructure investment decisions and what different policy scenarios mean for them. As a third focus, the report explores regional differences in policy impacts.

The analysis is based on two distinct scenarios for the future of transport, simulated with the ITF's in-house transport models. The Current Ambition scenario assumes policies to decarbonise transport continue along their current pathway and considers the implications for transport demand, CO_2 emissions and further aspects over the next three decades. The High Ambition scenario assumes policies focused on accelerating the decarbonisation of the transport sector and their impact.

This summary version contains the main findings and recommendations from the full report, as well as selected statistical projections and results.

International Transport Forum
2 rue André Pascal
F-75775 Paris Cedex 16
+33 (0)1 73 31 25 00
contact@itf-oecd.org
www.itf-oecd.org

OECD