Decarbonisation of Road Transport Network Operations in Australia and New Zealand

16 June 2020

Austroads

Today’s moderator

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Austroads acknowledges the Australian Aboriginal and Torres Strait Islander peoples as the first inhabitants of the nation and the traditional custodians of the lands where we live, learn and work. We pay our respects to Elders past, present and emerging for they hold the memories, traditions, culture and hopes of Aboriginal and Torres Strait Islander peoples of Australia.

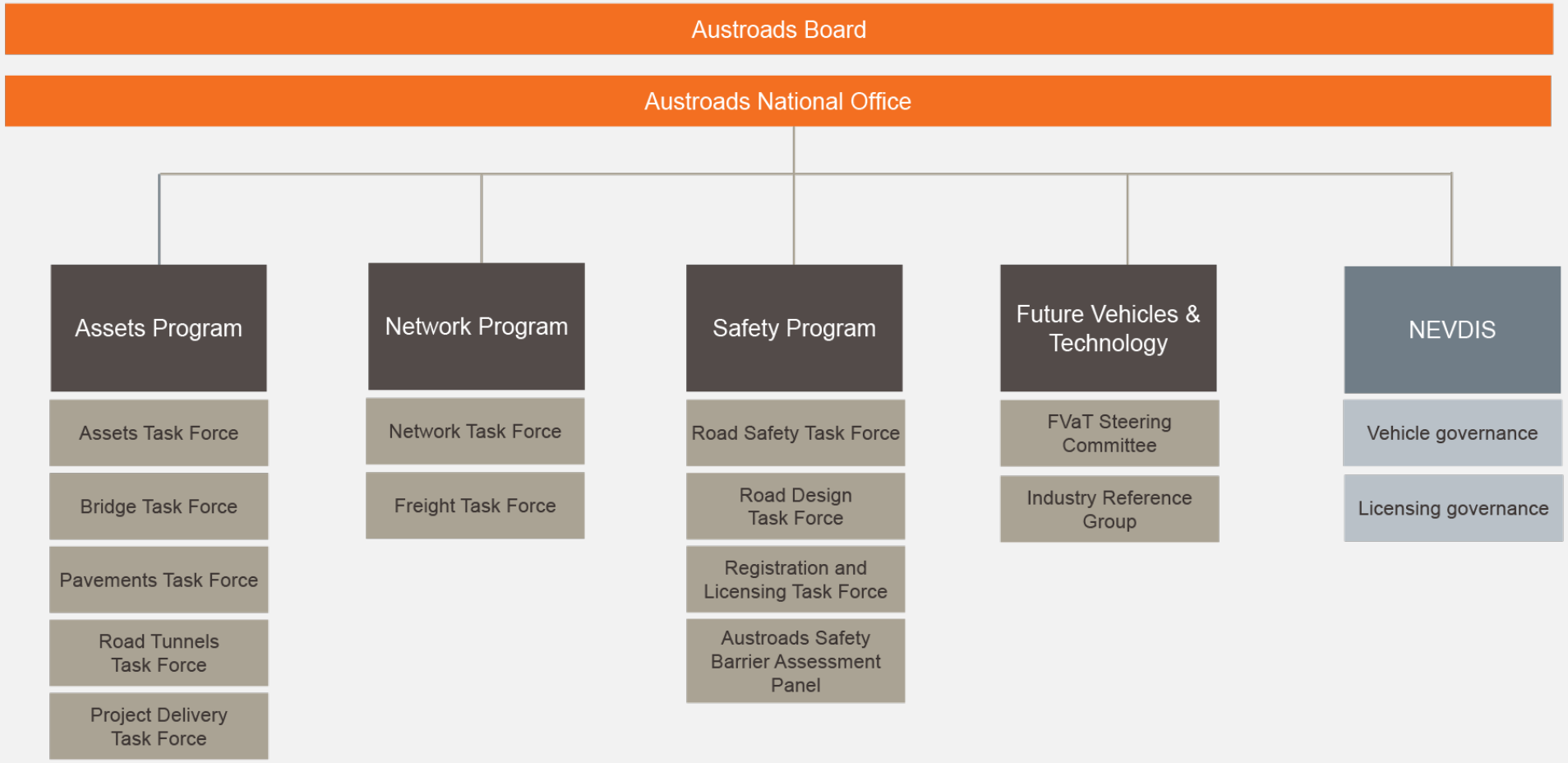
Austroads acknowledges and respects the Treaty of Waitangi and Maori as the original people of New Zealand.

About Austroads

The peak organisation of Australasian road transport and traffic agencies

- Transport for NSW
- Department of Transport Victoria
- Department of Transport and Main Roads Queensland
- Main Roads Western Australia
- Department of Planning, Transport and Infrastructure South Australia
- Department of State Growth Tasmania
- Department Infrastructure, Transport, Regional Development and Communications Northern Territory
- Transport Canberra and City Services Directorate, Australian Capital Territory
- Department of Infrastructure, Transport, Cities and Regional Development
- Australian Local Government Association
- New Zealand Transport Agency

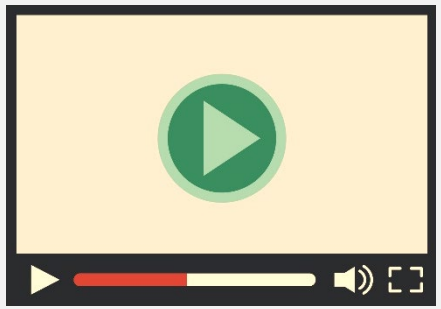
Our structure



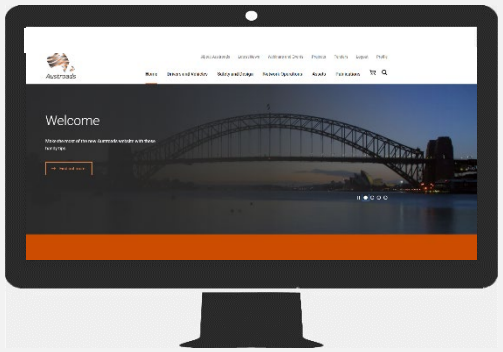
Housekeeping

Presentation = 40 mins

Question time = 15 mins



Recording



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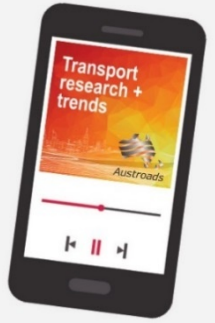
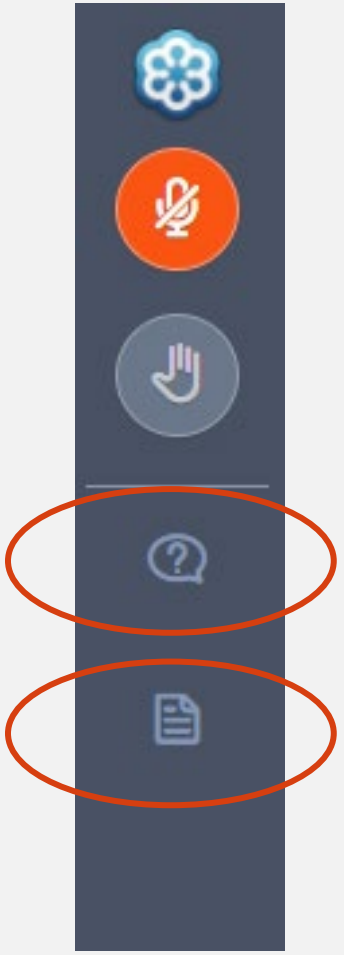


Podcast



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Free online access and PDFs at

https://austroads.com.au/publications/network/ap-c110-20

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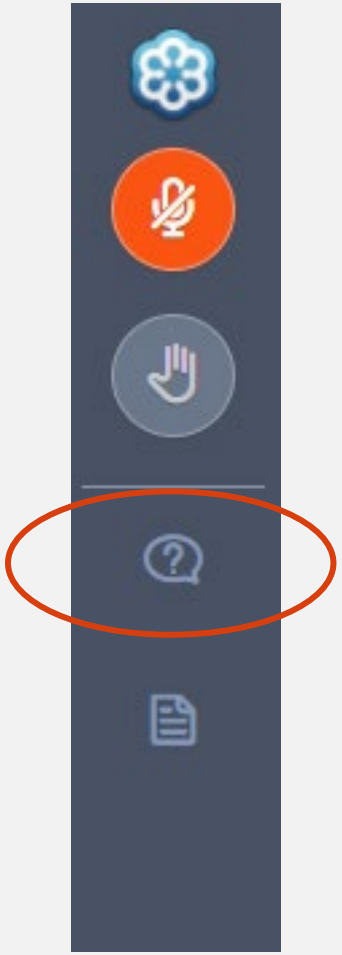
Send us your questions



Type questions here
Let us know the slide number your question relates to

Today's presenter and agenda

Topic	Presenter
Scope and methodology	Richard Palmer
Global and local policy level of ambition	
Transport and roads in the Australian GHG accounts	
Electric vehicles supporting emissions reduction	
Other levers for decarbonisation	
Insights	

Richard Palmer
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Scope and methodology

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Introduction to the team

Project Team

Austroads Project Manager
Richard Delplace

Project Manager, Integral Group
Richard Palmer

Project Consultant, Integral Group,
Cassandra de Stigter

Review Team

Austroads Working Group

Austroads Network Task Force (Jurisdictional Members)

Austroads Board

Method

1. What is the task in reducing emissions?
2. What is the level of ambition for emissions reduction in Australia and New Zealand?
3. What role does transportation and the roads network play in contributing to emissions?
4. How might existing trends in vehicle electrification support emissions reduction in the roads sector?
5. What other opportunities are there in the roads sector to meet our ambitions?

Policy and Level of Ambition

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The Emissions Reduction Task

Commitments at the Paris Agreement

In 2015, at the United Nations (UN) Climate Change Conference, COP 21, the world's leaders committed to limit the global average temperature rise caused by anthropogenic climate change to less than 2°C above pre-industrial levels and pledged substantial efforts to achieve 1.5 °C.

The Case for 1.5 °C

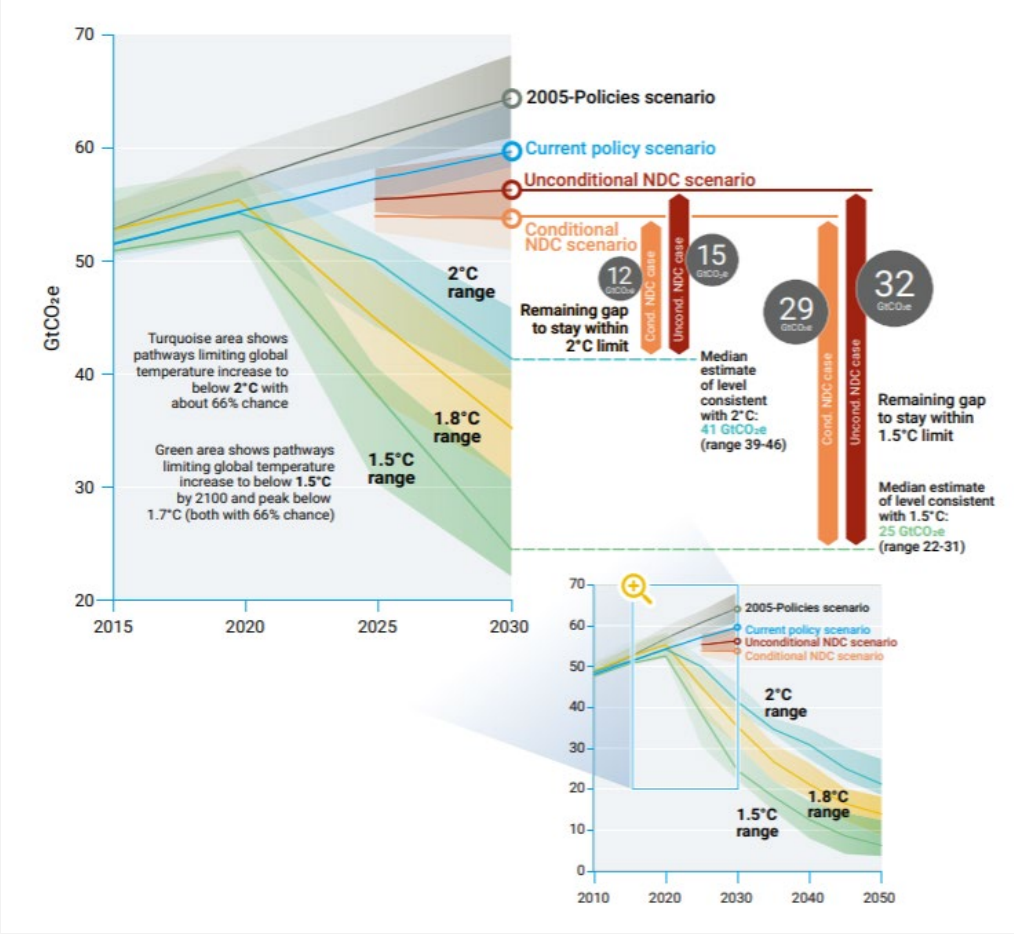
Further to the commitments made at COP 21, in 2018 the Intergovernmental Panel on Climate Change (IPCC) produced a Special Report on the impacts of global warming above 1.5 °C, which made a compelling case for targeting 1.5 °C as a global target.

Emissions Scenarios for 1.5 °C

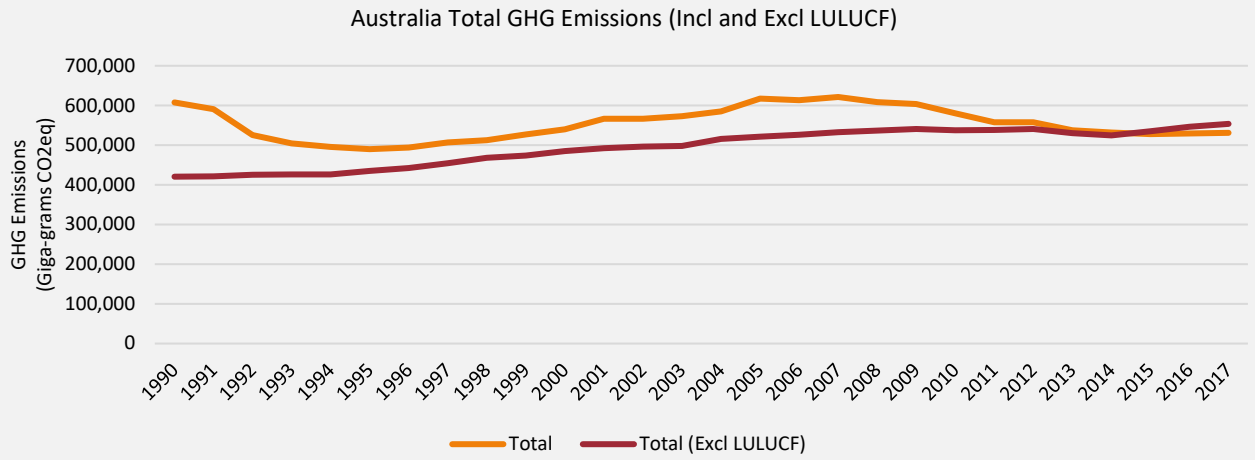
- 2030: at least 50% reduction from 2018 levels
- 2050: 100% reduction from 2018 levels
- 2050+: Negative emissions

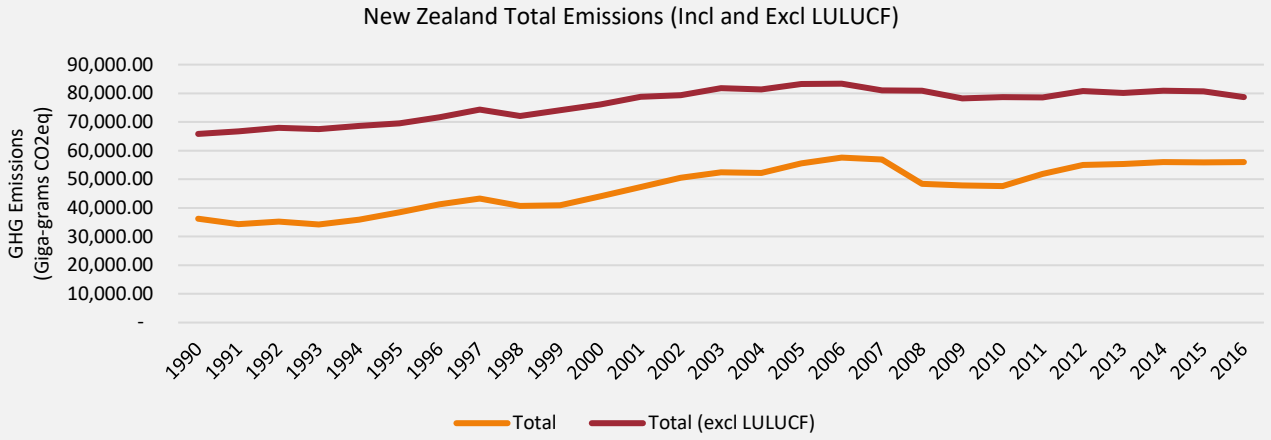
Emissions Gap

The gap between the unconditional NDC scenario and the 1.5 °C temperature increase to be 32 GtCO2e



Emissions in Australia and New Zealand





State/ Nation	Commitment
Australia	• **26-28% emissions reduction by 2030 as per NDC**
New Zealand	• **30% emission reduction from 2005 levels by 2030** • 100% renewable target by 2035 • **Net zero emissions by 2050**
New South Wales	• **Net zero emissions by 2050**
Victoria	• 25% renewable energy target by 2020 • 40% renewable energy target by 2025 • 15-20% emissions reduction below 2005 levels by 2020 • 30% emissions reduction from government operations from 2015 by 2020 • **Net zero emissions by 2050**
Queensland	• 50% renewable energy target by 2030 • 30% reduction below 2005 levels by 2030 • **Net zero emissions by 2050**
South Australia	• Achieved 20% reduction from 1990 levels • 50% emissions reduction from 2005 levels by 2030 • **Net zero emissions by 2050**
Australian Capital Territory	• 100% renewable energy target by 2020 • 40% emissions reduction from 1990 levels by 2020 • 50-60% emissions reduction from 1990 levels by 2025 • 65-75% emissions reduction from 1990 levels by 2030 • 90-95% emissions reduction from 1990 levels by 2040 • **Net zero emissions by 2045**
Western Australia	• **Net zero emissions by 2050**
Northern Territory	• 50% renewable target by 2030 • **Net zero emissions by 2050**
Tasmania	• 100% renewable energy target by 2022 • Achieved 95% emissions reduction from 1990 levels in 2017 • **Net zero emissions by 2050**

Other Decarbonisation Considerations

Financial Regulators

- Network for Greening the Financial System
- Reserve Bank of Australia
- Bank of International Settlements
- APRA and the BOE PRA Stress Testing

Directors Duties

- Centre for Policy Development

Trade

- EU Border Carbon Adjustment

Transport and roads in the Australian GHG accounts

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Transportation and Roads Emissions

Transportation Emissions

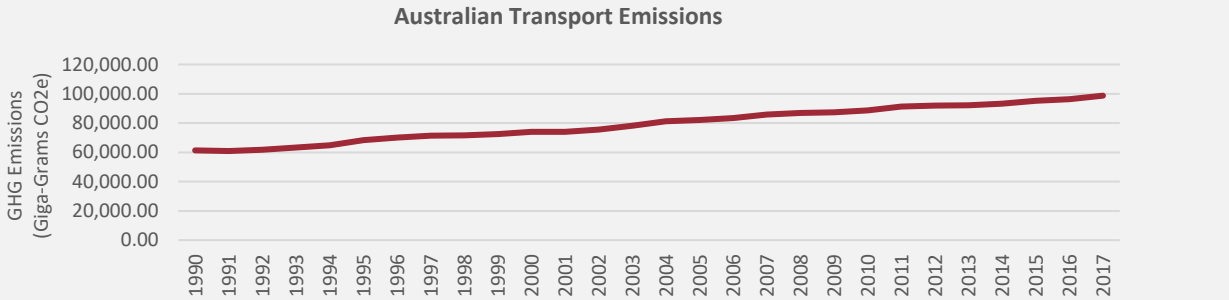
- 20% of Australian Emissions
- 20% of New Zealand Emissions
- Growing consistently since 1990

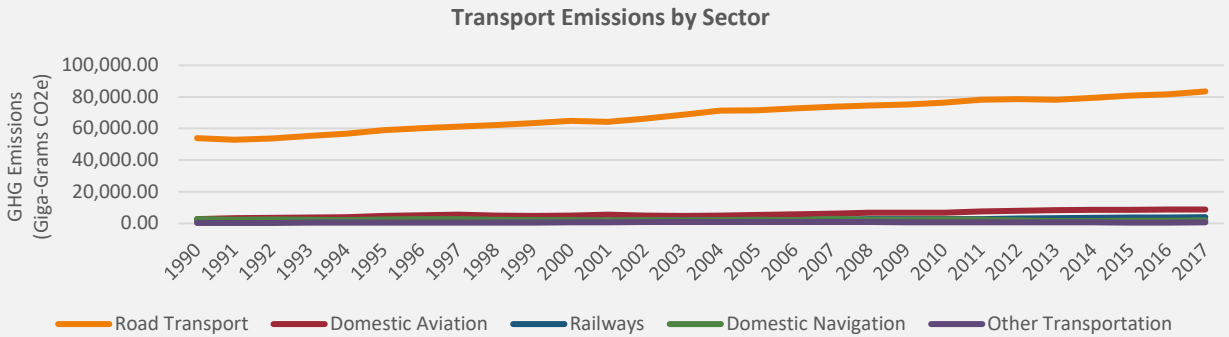
Road Emissions

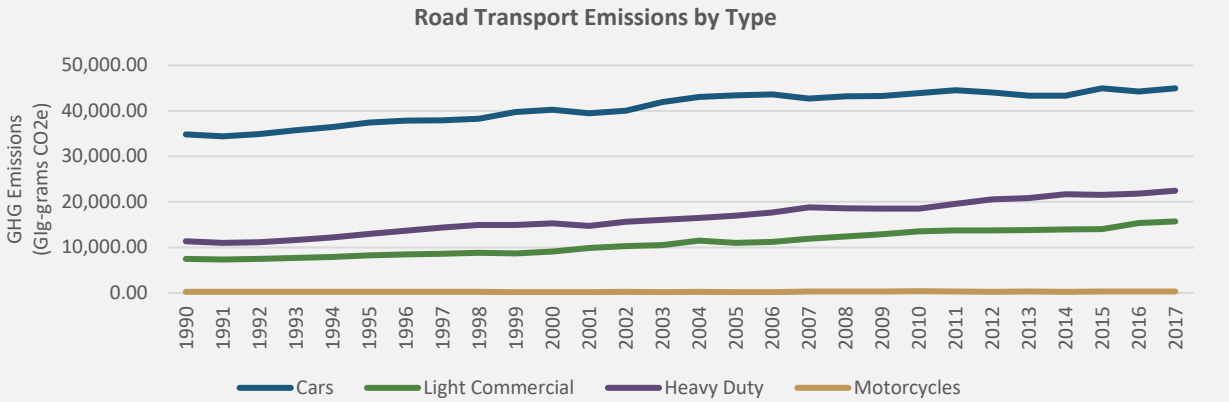
- Dominant contributor to transportation emissions
- Growing consistently since 1990

Road Emissions Breakdown

- Cars
- Heavy duty vehicles
- Light commercial vehicles







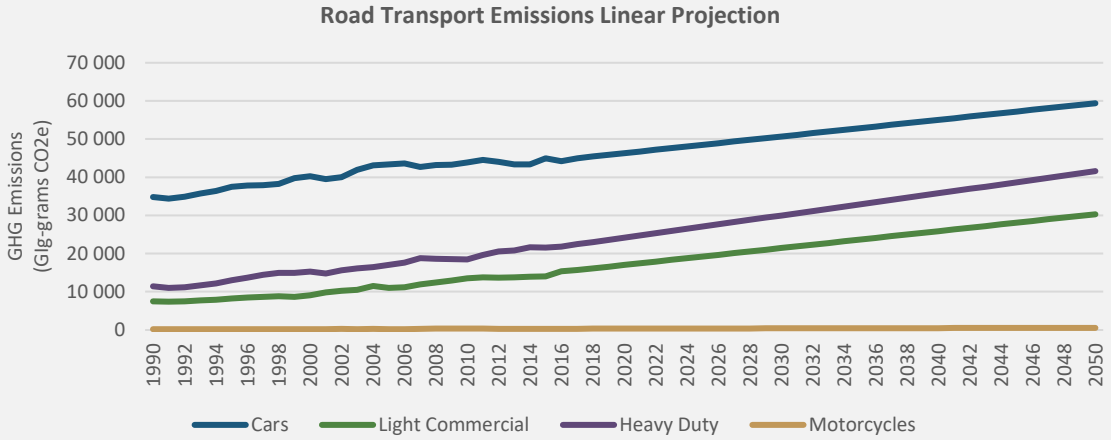
Road Sector Forecasts

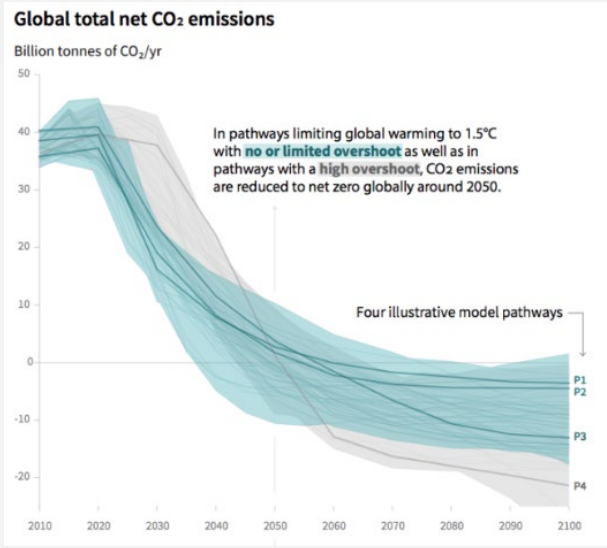
Forecast Emissions

- Linear road sector emissions forecast

Trajectory

- Left unabated, the roads sector trajectory presents a challenge to emissions mitigation ambitions across the broader economy.





Source: IPCC 2018, *Global warming of 1.5°C, An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*.

Electric vehicles supporting emissions reduction

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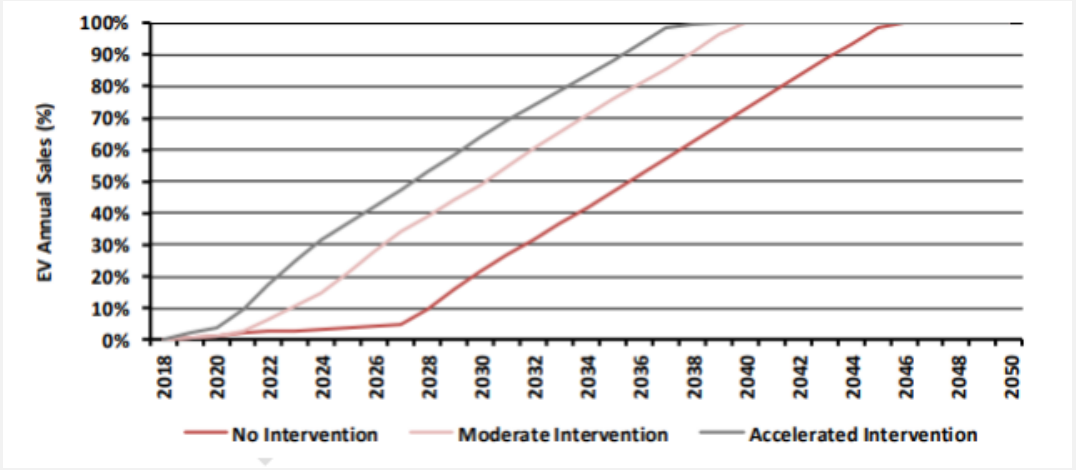
Electric Vehicle Scenarios

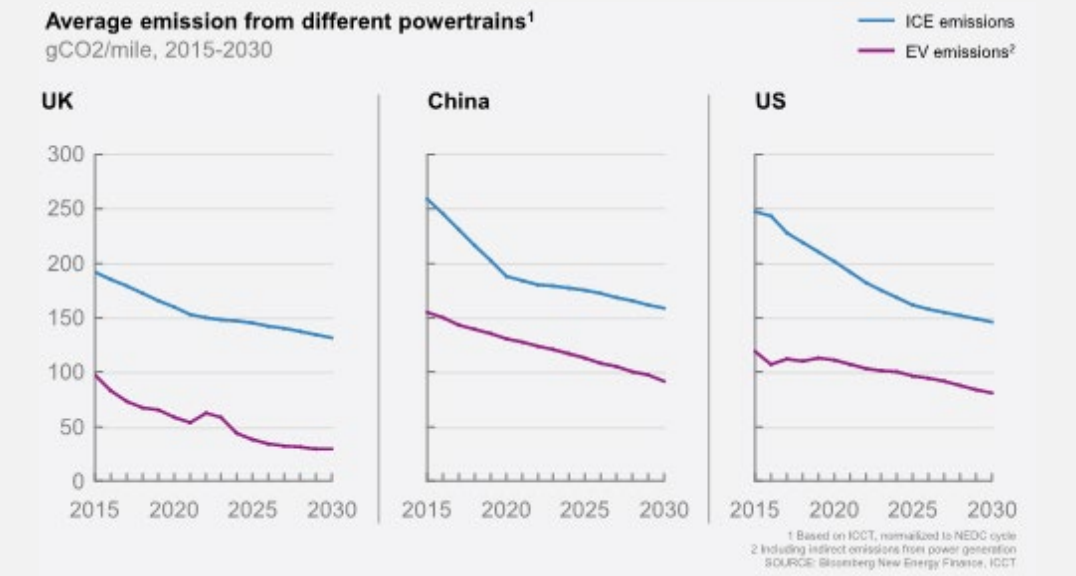
Electric Vehicles Sales

- No Intervention: EVs progress to 100% of new sales by 2044 (~22% by 2030)
- Moderate Intervention: EVs progress to 100% of new sales by 2040 (~55% by 2030)
- Accelerated Intervention: EVs progress to 100% of new sales by 2036 (~65% by 2030)



Intersecting grid transformation for stationary energy emission

- EVs show 50% improvement on ICE to 2030

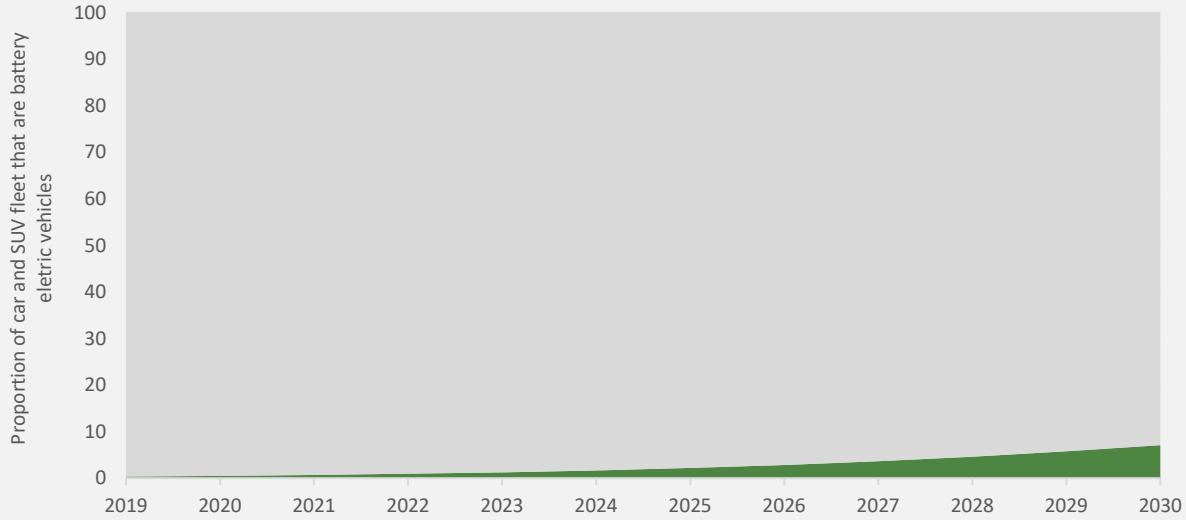


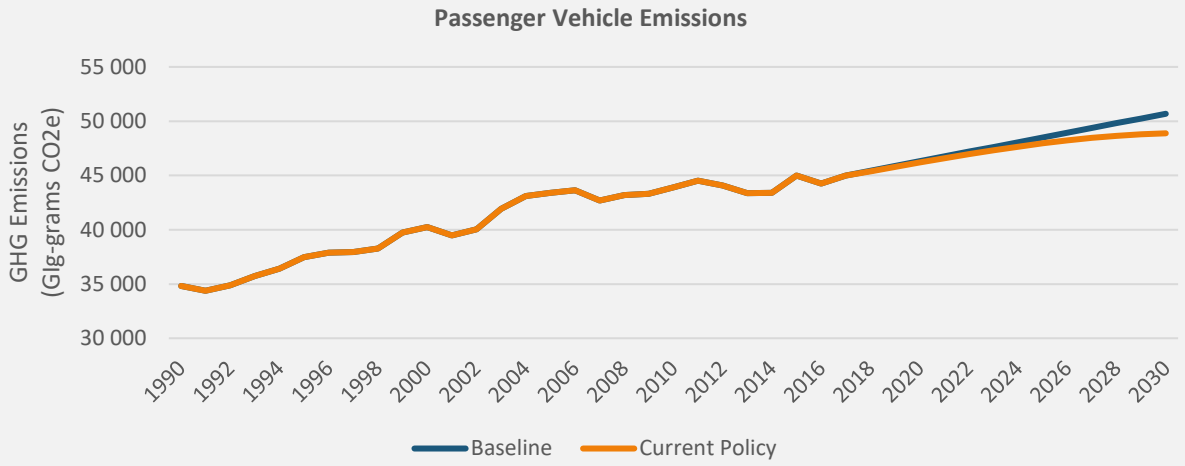
Resultant Emissions Profiles due to EVs

The sales forecasts for EV passenger vehicles are approximately 2% of new sales in 2019, increasing to around 23% of new sales by 2030.

This provides for a fleet penetration of EV passenger vehicles of approximately 7% by 2030.

Fleet transition forecasts beyond 2030 are not currently available.





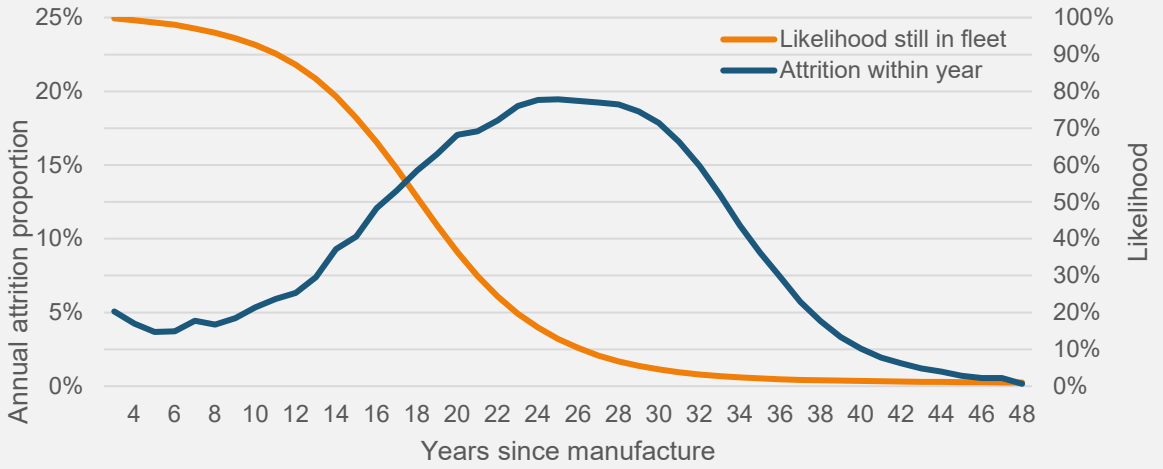
Accelerating ICE Vehicle Retirement

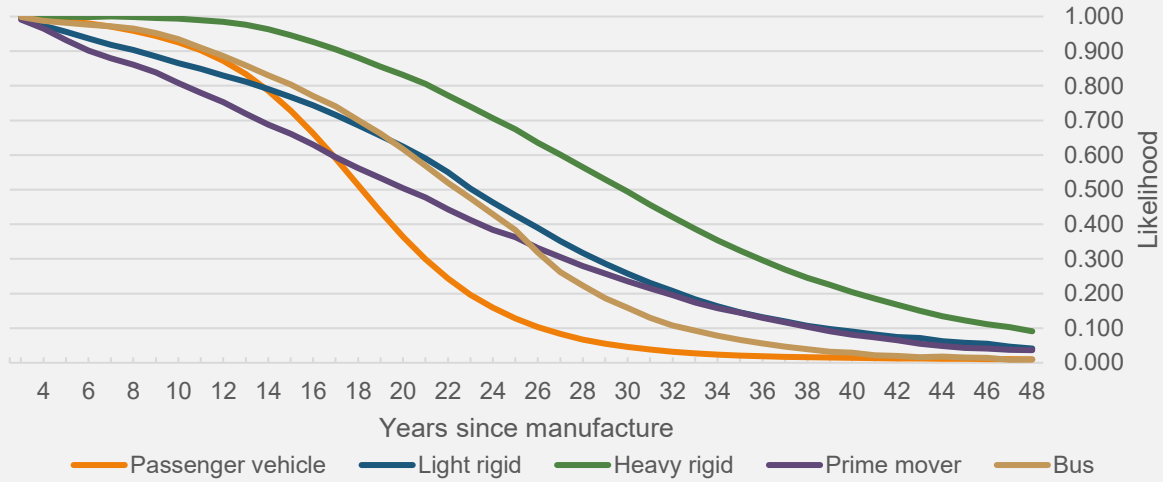
The likelihood that a vehicle will remain in the fleet drops below 10% as follows:

- Passenger vehicles – 26 years
- Busses – 33 years
- Light rigid vehicles – 39 years
- Prime mover vehicles – 39 years
- Heavy rigid vehicles - >50 years

Under current vehicle attrition patterns, for 90% of current vehicles to be replaced by 2050, the last vehicles of each type must be sold by:

- 2024 for Passenger vehicles
- 2017 for Busses
- 2011 for Light rigid vehicles and prime mover vehicles
- 2000 for Heavy rigid vehicles





Other levers for emissions reduction

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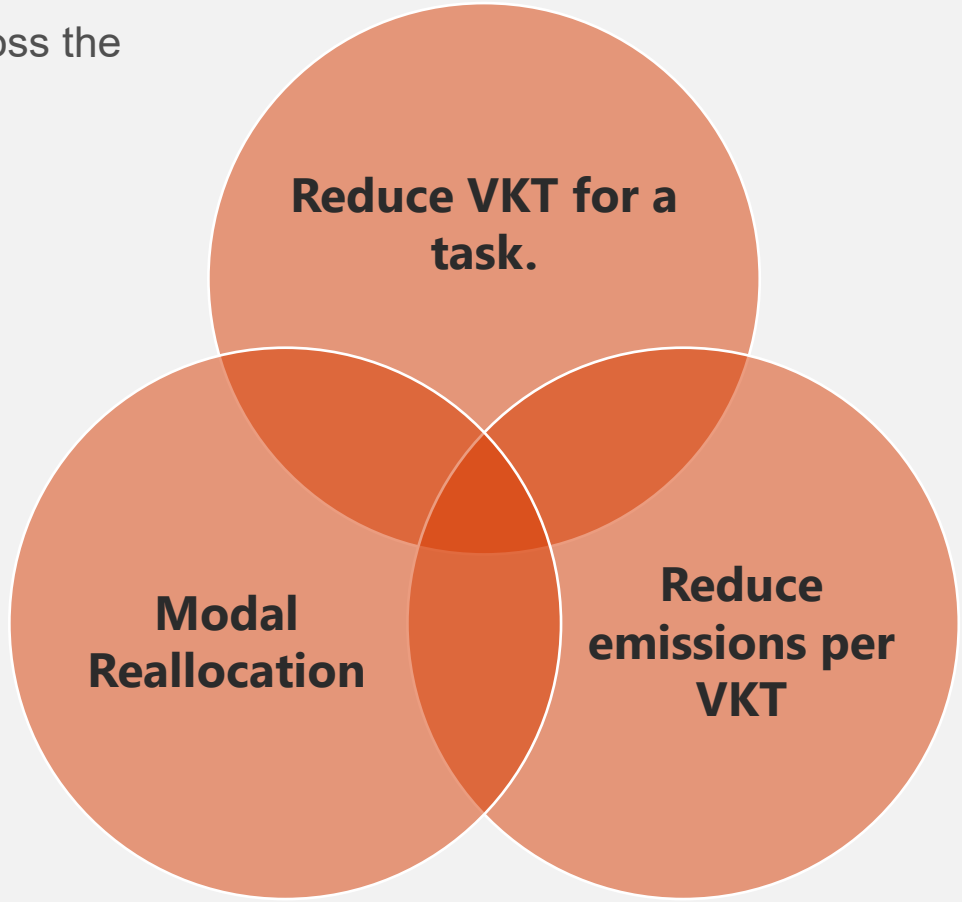
Network Management Levers for Decarbonisation

Emission Reduction Levers

We have three primary levels to reduce emissions across the transport sector.



Network Management Levers for Decarbonisation

Network Management Opportunities

- Road pricing
- Mobility as a Service
- Travel Demand Management
- Freight & logistics innovation and regulation
- Urban parking restraints

Emissions Reduction Co-benefits

- Air quality and health
- Place branding and innovation
- Fuel security
- Road safety
- Land use benefits of modal diversity

Network Management Priorities

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Network levers

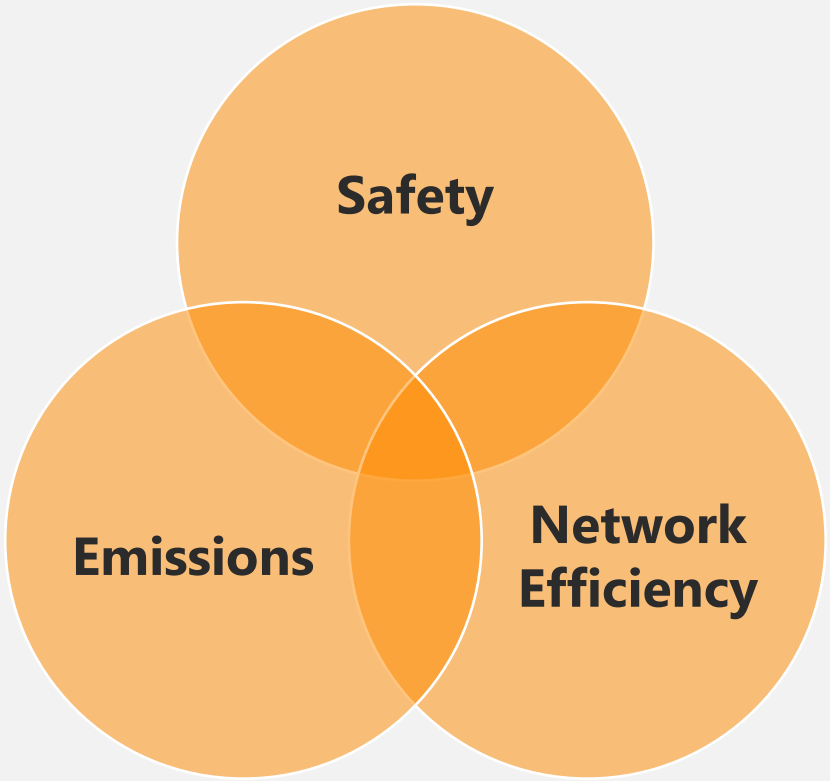
- There are several technical levers available to road network managers to support emissions reduction. However, at the heart of the challenge is the recognition that emissions reduction should be a priority for the management of roads in Australia.

Safety and efficiency

- The long-term priorities for network management over the past decades have been the dual goals of safety and network efficiency.

A third priority

- This paper suggests a strategic rebalancing of network priorities to include greenhouse gas emissions reduction alongside safety and network efficiency at the most fundamental thinking in our policy, planning and management of network operations.



Insights

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Insight Summary | Emissions Policy

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1. There is a global economic case for keeping temperature increases due to climate change below 1.5 °C above pre-industrial levels.

2. The Nationally Developed Contributions of all countries under the Paris Agreement are insufficient to meet the emissions trajectory associated with this temperature rise – greater ambition is required to have a chance of maintain temperature rise to less than 1.5 °C.

3. The global emissions reduction targets consistent with a 1.5 °C trajectory are:

- 2030: at least 50% reduction from 2018 levels
- 2050: 100% reduction from 2018 levels
- 2050+: Negative emissions

4. Each of the states and territories in Australia and the New Zealand National Government have established emissions reduction policy with the ambition to achieve net zero emissions by 2050.

Insight Summary | Transportation Emissions Trajectories

Austroads

5. Left unabated, the transportation sector will continue to drive emissions growth in Australia and New Zealand largely as a result of the road network.

6. Business as usual in road network emissions is inconsistent with the stated ambition for net zero emissions by 2050 across Australia and New Zealand jurisdictions.

7. Moderate or accelerated policy interventions in support of EV sales in both passenger and freight sectors are required to address medium- and long-term road transport emissions.

8. The retirement of older vehicles from the fleet is a strong driver of emissions reduction in partnership with the support for new EV sales.

Insight Summary | Network Management Opportunities

9. There are several practical opportunities for supporting emissions reduction in the roads sector; supporting the adoption of EVs, supporting the retirement of inefficient vehicles from the fleet, encouraging behaviour change with respect to modal choice, supporting strategic planning for efficient freight networks and supporting active transportation.

10. There are co-benefits to the consideration of emissions reduction in the road network, which may support policy reform to reduce emissions: health benefits, competitiveness benefits and broader economic benefits.

11. To achieve substantial emissions reduction in the road network, operators and agencies will need to consider emissions reduction alongside safety and network efficiency as a strategic priority in the future.

Questions?

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Topic	Date
Introduction to the Life-Cycle Costing Framework and its Application to Sealed Roads	17 June
Introduction to the Life-Cycle Costing Framework and its Application to Unsealed Roads	30 June
Transport Modelling for Project Managers	9 July
Vehicles and Technology Future State 2030	6 August

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