Transport and Infrastructure Net Zero Consultation Roadmap

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Department of Climate Change, Energy, Environment and Water

Response received at:
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3 Published name
Brisbane City Council

4 Confirm that you have read and understand this declaration.
Yes

5 First name
Not answered

6 Last name
Not answered

7 Email
Not answered

8 Phone

Not answered

9 Who are you answering on behalf of?

Organisation

10 Organisation name

Brisbane City Council

11 What best describes you or your organisation?

Not answered

12 What sector do you represent?

Not answered

13 What state or territory do you live in?

Queensland

14 Postcode

4000

15 What area best describes where you live?

City

16 1. Do you support the proposed guiding principles?

Yes

17 1.1 Please add details to your response.

Council strongly agrees that any roadmap needs to:

- maximise emissions reduction
- maximise economic opportunity
- acknowledge significant health benefits
- be inclusive and equitable
- be evidence based.

Given that road transport makes up 25% of the city's carbon emissions, Council sees that maximising emissions reduction is key to maintaining and enhancing the city's liveability.
Council recommends the strategy acknowledges the significant health benefits to the community from improved air and noise pollution outcomes.
Emissions reduction initiatives need to focus on harnessing innovation and developing emerging industries in the green transport space, resulting in new jobs and possibly new exports.
Council sees that for success to be achieved in zero emission transport, the system needs to provide equitable access to all and does not leave anyone behind.
This means that everyone in Brisbane can access and choose zero emissions transport options that are affordable, including walking, cycling, e-mobility, public transport, and private electric vehicles (EVs).
Developing a framework that provides value for money is challenging due to the number of participants and the fact that different commercial models will work in different places and in some places, a commercial model may not be appropriate. Further definition of 'value for money' needs to be made as it may mean different things to different people.

18 ## 2. Do you support the use of the avoid-shift-improve framework as a tool to identify opportunities for abatement?

Yes

19 ## 2.1 Please add details to your response.

Council supports the thinking behind the avoid-shift-improve framework as a tool to identify opportunities for abatement.
From a Council perspective, avoid involves removing the need for emissions intensive transport, which also causes congestion, to get around. Transport demand management has a role through increasing travel options, encouraging and enabling use of public transport and to walk and cycle for short trips. Making where we live, work, play and study more interconnected is key. Council is using neighbourhood and precinct plans to manage and accommodate growth locally.
Shift involves making active, healthy and green transport options the attractive, accessible and enjoyable choice. Shift seeks to achieve a modal shift from conventional private vehicles to green transport modes, such as walking, cycling, e-mobility and public transport (bus and rail).and shared modes. Council continues to invest in walking and cycling infrastructure, e-mobility, and motivates people and organisations to change their travel behaviour through programs such as Cycling Brisbane and Active School Travel.
Council is also
investing in modernising the city's public transport through the Brisbane Metro and growing the bus network.

Improve means leveraging emerging technology to switch to renewable energy sources and vehicles. Improve focuses on vehicle and fuel efficiency. For Brisbane it seeks to optimise the operational efficiency of our public transport and how our community and businesses utilise motorised vehicles. Introducing and expanding renewable energy sources into the local transport system can achieve emissions reduction for our city.
Council is operating a current fleet of more than 1,200 buses, which move two-thirds of Brisbane's public transport users. Council's free City Loop is an all-electric bus service. Fully electric high-capacity Brisbane Metro vehicles will transform the city's public transport network, with easier and more connections to bus and train services, to connect more places across the city

20 3. Do you agree the development of a national policy framework for active and public transport will support emissions reduction?

Yes

21 3.1 Please add details to your response.

The once-in-a-generation investment in infrastructure and vehicles required to achieve a zero-carbon public transport system is beyond the funding capacity of local governments, particularly those that are striving to provide services to a rapidly growing population. Therefore, the decarbonisation and expansion of public transport services should be a priority for the Australian Government as an investor. Public transport can provide an equitable and accessible pathway for people in growing cities to materially reduce their household's contribution to the national carbon footprint.
Council supports the development of a national policy framework for active and public transport that will support increased funding by federal and state governments to support local government in the planning and delivery of active and public transport infrastructure and programs.

22 4. What should be included in a national policy framework for active and public transport and how should it be developed?

Partnership arrangements with state and local governments are needed to fund and deliver the transition to zero emissions public transport services.
The transition is a particular priority in urban environments where the challenges of servicing a rapid growing population, the economic and social costs of congestion and benefits from local air quality improvements are greatest.
In large urban areas that span across several local government areas, coordinated land-use and transport planning are crucial to reduce car dependency. Partnership with the regional or state authority to deliver efficient mass

transit infrastructure would help deliver low-emission outcomes across the region, especially in view of the expected high population growth of urban regions and growth in vehicle kilometres travelled.

23 ## 5. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the movement of people contributes to transport emissions reduction?

t is suggested that some of the following high-level key fundamentals could be included as additional actions:
Innovation and Research: Improved focus on investing in research and development of new technologies and transportation solutions, such as alternative fuels, autonomous vehicles, and mobility-as-a-service platforms.
These can help accelerate the transition to a broad low-emission transportation system, possibly through targeted grant or funding programs.
Streamlined Project Development: Implementing more efficient planning and approval processes to streamline the development of projects that seek to achieve a significant reduction in transport emissions.
Lifecycle Planning for Low-Emission Assets: Ensure planning and provision for the entire lifecycle of transport assets is considered in the development of any policy or actions.
Continuous Improvement and Monitoring: Continuous improvement and monitoring of transportation assets and operations. Regular performance monitoring and evaluation to help to identify opportunities for further emissions reduction and inform future asset management strategies and investment in infrastructure.
Coordination and Development of Changing Networks: For trips that are not possible or practical for active and public transport people must be supported to ensure there are no barriers to adopting zero emission private vehicles. This should be achieved through delivering a range of accessible, affordable and reliable vehicle charging options.

24 ## 6.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction?

Governments could offer incentives, subsidies, and tax breaks to encourage the adoption of green freight technologies such as electric trucks, hydrogen fuel cell vehicles, and renewable energy-powered ships or trains. This could also extend to investing in research and development to drive innovation in clean transportation technologies.
Incentivising and promoting the green freight maintenance industry could be facilitated by offering training and certification programs, low-interest loans and financing

programs.
Governments could introduce disincentives for the use of high emission vehicles particularly for those used for the first-last mile delivery of freight.

25 ## 6.2. How would these actions address the identified challenges and opportunities for emissions reduction in the movement of goods?

Although a mode shift from road to rail is desirable, there are a number of institutional, regulatory, and technical factors that make this difficult. However, rail needs to be a key consideration in supply chains to major ports to ensure port competitiveness is not harmed by chronic road congestion.
Council sees that there is significant opportunity in the use of micromobility in the last kilometre delivery and recognises the development of suitable infrastructure (e.g. cross river pedestrian and cycle bridges, and separated cycleways) as means to improve the attractiveness and efficiency of this task.
Council agrees that procurement of services on behalf of government (for example, waste collection and mowing services), could incentivise emission reductions and use of an electric fleet through the procurement process with the ultimate objective that all core external fleet contractors would provide services with a zero emissions fleet.

26 ## 7. Do you agree with the proposed net zero pathway for light road vehicles?

Yes

27 ## 7.1 Please add details to your response.

The pathway is within Council's expectations of the transition. Council sees that EVs will become more affordable over time, but sees the biggest risk is an adequate charging ecosystem not keeping pace with the growth of vehicles. For its part, Council convened a Zero Emissions Roundtable with industry in mid-2023 to engage with industry and academia to explore pathways moving forward.

28 ## 8. The Australian Government is currently developing an Australian New Vehicle Efficiency Standard and has already begun to implement actions in the National Electric Vehicle Strategy.8.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce light vehicle emissions?

Transport inequality is not an issue that only impacts rural areas but urban areas as well. As well as differing incomes, different living circumstances (multi-unit vs single unit dwellings) are an issue.
Policies and investment will be required to ensure that everyone can access and choose zero emissions transport options that are affordable, including walking, cycling, e-mobility, public transport, and private EVs.

29 8.2 How would these actions address the identified challenges and opportunities to reduce light vehicle emissions?

Opportunities to shift modes not only reduces the carbon footprint of transport but also reduces congestion and improves the urban environment of cities with cleaner air and less noise pollution.

30 9. Do you agree with the proposed net zero pathway for heavy road vehicles?

Yes

31 9.1 Please add details to your response

The proposed concept is supported, however, the concept focuses heavily on selecting different technology types. Different green technologies use vastly different amounts of energy to deliver 1kWhr of power through a vehicle's drive train.
The critical focus should be on achieving the zero-emission outcome as effectively and efficiently as possible. This in turn means green renewable energy is the most critical and scarcest resource in a net zero future. Therefore, the best green technology for the application is the one that uses the least amount of energy.
At this point, green hydrogen uses three times the amount of power to generate 1kWhr of power through a vehicle's drive train. Therefore, technologies will differ based on the application. For instance, battery electric appears to be appropriate for short to mid-range while long haul will likely require green hydrogen.

32 10. The proposed pathway for heavy road vehicles relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

33 ## 10.1 Please add details to your response. Why did you rank them in that order?

1. Battery electric
2. Low carbon liquid fuels
3. Hydrogen fuel cell

Battery and low carbon liquid fuels (LCLF) opportunities provide immediate competitive opportunities to reduce emissions, and these should be targeted for scale. The success of hydrogen as a fuel option requires a focus on creating generation facilities that are sized to meet global export volumes as a first priority. This volume of fuel may bring the cost down to a commercial level for domestic transport.
Batteries require the build out of greater amounts of new infrastructure and the manufacture of new vehicle models, however, they demonstrate a complete net zero transition with longer term benefits from cost of ownership. LCLF by contrast provides a more limited solution and has less potential to deliver whole-of-life cost reductions for fleet owners

34 ## 11. What role should low carbon liquid fuels play in the heavy vehicle decarbonisation?

Heavy vehicle will still rely on LCLFs in short to medium term. LCLF will be an important tool to decarbonise hard-to-electrify transport modes. These should be a bridging technology as green hydrogen efficiency is improved.
However, LCLFs are in an early stage of development and there is the risk that they do not achieve net air quality benefits as the fuel combustion is still occurring within and close to residential areas. The significant co-benefits for reducing air quality exposure particularly in populated areas of switching to EV or hydrogen need to be acknowledged.

35 ## 12. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce heavy vehicle emissions?

There should be encouragement for businesses to improve their asset utilisation and optimising the use of their existing electrical supply so that there are opportunities to extend the vehicle charging ecosystem and balance the electricity grid.
Financial assistance will reduce the timeframe on a return on investment from a 50-year horizon to a range that is equivalent to an internal combustion engine bus fleet (seven to 10 years).

36 13. Do you agree with the proposed net zero pathway for rail?

Not answered

37 13.1 Please add details to your response.

As Council does not own or operate rail infrastructure, it has no comment on Section 3.3 (questions 13 to 16).

38 14. The proposed pathway for rail relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

39 14.1 Please add details to your response. Why did you rank them in that order?

Not answered

40 15. What role should low carbon liquid fuels play in rail decarbonisation?

Not answered

41 16. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce rail emissions?

Not answered

42 16.1 How would these actions address the identified challenges and opportunities to reduce rail emissions?

Not answered

43 17. Do you agree with the proposed net zero pathway for maritime?

Yes

44 17.1 Please add details to your response.

Council's maritime interest only extends to the ownership and operation of ferry services and infrastructure.
The roadmap broadly aligns with Council's position that a staged approach will be needed to transition to a zero-emissions ferry system.
However, the pathway would benefit from greater consideration of energy efficiency and optimisation opportunities (e.g. vessel operations, scheduling) as achievable but meaningful actions in the short to medium term, while alternative fuel technologies become more developed and viable.

45 18. The Australian Government is engaging in consultation as part of the development of the Maritime Emissions Reduction National Action Plan and those consultations will also inform the final Roadmap and Action Plan. 18.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce maritime emissions?

As trade into and out of Australia is dominated by foreign-owned ships,
Australian's only course of action is to leverage emissions reduction through international treaties.
However, as Australia has a small but healthy industry in the building and maintenance of smaller vessels, there is scope for innovation and exporting technology developed here to the rest of the world.

46 18.2 How would these actions address the identified challenges and opportunities to reduce maritime emissions?

The global nature of maritime transport means that Australia's economic trade and prosperity is highly dependent on its ports being ready and able to service new fleet and fuel types at an international level (not just domestically).

47 19. Do you agree with the proposed net zero pathway for aviation?

As Council does not own or operate aviation infrastructure or services, it has no comment on section 3.5 (questions 19 to 20).

48 19.1 Please add details to your response.

Not answered

49

20. The Australian Government has already engaged in consultation on aviation decarbonisation through the development of the Aviation White Paper and those consultations will also inform final Roadmap and Action Plan.

Not answered

50 20.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce aviation emissions?

Not answered

51 21. Do you agree with the proposed net zero pathway for transport infrastructure?

Yes

52 21.1 Please add details to your response.

National standards in data collection, measurement and reporting are essential to:

- provide certainty to the construction industry through standard tendering requirements
- provide consistency in project evaluation
- lower unit costs overall as industry builds expertise and transfer of skills

53 22. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce transport infrastructure emissions and ensure that transport infrastructure is ready for and enables low-emission transport modes?

An emerging issue is the potential higher mass and differing axle configurations presented by low-emission transport in the road sector.

It is noted that the National Heavy Vehicle Regulator and the Queensland Government is introducing a new permit scheme for zero emission heavy vehicles throughout Queensland. However, there needs to be consideration of what these impacts may have on asset life in the long term.

54

22.1 How would these actions address the identified challenges and opportunities to reduce transport infrastructure emissions?

By enabling infrastructure projects to consider options for lower carbon materials at the design and procurement stage using an industry standard process this will allow the whole of carbon benefit to be considered. This also needs to consider the carbon required to recycle the material and whether it may result in a higher carbon contribution overall.

55 ### 23. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the energy mix is ready to support transport emissions reduction?

An additional action that is needed by governments, communities, industry and other stakeholders is the support of research so that opportunities in different technologies can be developed. This in turn can lead to opening up of new export markets.

Availability of zero emissions fuel sources via a reliable supply chain requires decarbonisation of the grid (additional renewables and batteries) and further development and scaling up of liquid fuel.

56 ### 24. How should the use of low carbon liquid fuels (LCLFs) be prioritised across different transport modes over time to achieve maximum abatement?

Council's experience to date is in trialling low emission fuels based upon existing technologies and commercially available fuel mixes. Council has had limited experience with LCLFs to date and is supportive of conducting investigations in the future.

57 ### 25. What are the best ways for the Australian Government to work collaboratively with industry, business, governments and communities to implement the proposed pathways?

The Australian Government is best placed to support research and employ incentives to accelerate adoption.

58 ### 25.1 What are good domestic or international examples of partnership and collaboration on transport and transport infrastructure emissions

reduction that could inform the final Roadmap and Action Plan?

The iMOVE Cooperative Research Centre has provided the avenue for government, academia and industry to work together. For example, iMOVE has sponsored the project, 'Freight vehicles: An evaluation of renewable energy fuels'.

59 ## 25.2 What opportunities can Government leverage to show leadership in Australia and internationally?

The Brisbane 2032 Olympic and Paralympic Games will be the first games that is contractually obliged to take concrete measures to reduce direct and indirect carbon emissions. This will provide an opportunity for governments at all levels to work with industry to showcase best practice processes, projects and outcomes delivered in Australia on the world stage

60 ## 26. What measures and metrics should be used to evaluate the final Transport and Infrastructure Net Zero Roadmap and Action Plan?

Potential measures could include:

- absolute emissions reductions from the transport sector
- percentage of total vehicles that are zero carbon emissions
- percentage of new vehicles that are zero carbon emissions
- emissions per passenger kilometre for public transport
- embodied emissions per dollar invested in transport infrastructure
- volume of fossil liquid fuels consumed by the transport sector
- measurement of key air quality parameters (such as O2 and particulate matter) near heavily trafficked roadways.

61 ## 26.1 What other data and evidence could governments use and how could this offer further insights on the pace, scale and location of transport emissions reduction pathways?

Council is utilising the Infrastructure Sustainability Council (ISC) rating process for major projects, including accounting for carbon emissions. There is the opportunity to baseline and publish more widely improvements in managing carbon impacts of transport projects on a national scale.

As impact measuring to ISC can be complex, its application is most appropriate for major projects. As many infrastructure projects are delivered by small contractors and local government, there needs to be an easily implemented process/system for this to be recorded and ways that reduced carbon can be

identified.

62 27. Do you have any feedback on the proposed review process?

No

63 28. Do you have any further feedback on the Consultation Roadmap and proposed pathways?

No

64 28.1 Is there anything missing? Are the sections appropriately integrated? Is the Roadmap appropriately ambitious?

All of the elements of the roadmap appear reasonable and logical.

65 29. Is there any further information or documentation that you wish to be considered with your submission?

No

66 Would you like to upload a document?

Yes

67 Have you removed any identifying information from your submission?

Yes

68 Upload a submission

Brisbane_City_Council.c0a64c9a.pdf

69 Upload a submission

Not answered

70 Upload supporting file

Not answered

71 Upload supporting file

Not answered

Brisbane City Council ABN 72 002 765 795

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Dedicated to a better Brisbane

5 August 2024

Mr Ian Porter
First Assistant Secretary, Data, Research, Strategy and Net Zero Division
Department of Infrastructure, Transport, Regional Development, Communications and the Arts
GPO Box 594
CANBERRA ACT 2601
NetZero@infrastructure.gov.au

Dear Mr Porter

Thank you for the opportunity to provide a submission on the Department of Infrastructure, Transport, Regional Development, Communications and the Arts' *Transport and Infrastructure Net Zero Consultation Roadmap* (the Roadmap).

Brisbane City Council (Council) is proud to be taking real and practical action that positions our city for a net zero and climate resilient future and is committed to reducing operational carbon emissions by at least 30% by 2031-32 and achieving net zero emissions by 2050.

Council generally agrees with the directions outlined in the Roadmap and recognises the alignment with Council's own net zero ambition. Ensuring that there is strong national leadership on this issue, supported by the availably of suitable funding support for the planning and implementation of the required transitional activities will greatly assist in ensuring a successful outcome.

Council is pleased to provide feedback on the Roadmap in the attached table and we look forward to continuing to work with the Australian Government on the development of the Transport and Infrastructure Net Zero Roadmap and Action Plan.

If you have any queries, please contact [redacted] Policy Strategy and Planning, Transport Planning and Operations, Brisbane Infrastructure, on [redacted].

Yours sincerely

[redacted]

Tim Wright
A/CHIEF EXECUTIVE OFFICER

Attachment: Council's submission on the *Transport and Infrastructure Net Zero Consultation Roadmap*

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
1.	**Introduction**			
1.2	The approach	1	Do you support the proposed principles (Y/N)	Yes.
		1.1	Please add detail to your response.	Council strongly agrees that any roadmap needs to: • maximise emissions reduction • maximise economic opportunity • acknowledge significant health benefits • be inclusive and equitable • be evidence based. Given that road transport makes up 25% of the city's carbon emissions, Council sees that maximising emissions reduction is key to maintaining and enhancing the city's liveability. Council recommends the strategy acknowledges the significant health benefits to the community from improved air and noise pollution outcomes. Emissions reduction initiatives need to focus on harnessing innovation and developing emerging industries in the green transport space, resulting in new jobs and possibly new exports. Council sees that for success to be achieved in zero emission transport, the system needs to provide equitable access to all and does not leave anyone behind. This means that everyone in Brisbane can access and choose zero emissions transport options that are affordable, including walking, cycling, e-mobility, public transport, and private electric vehicles (EVs). Developing a framework that provides value for money is challenging due to the number of participants and the fact that different commercial models will work in different places and in some places, a commercial model may not be appropriate. Further definition of 'value for money' needs to be made as it may mean different things to different people.

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
		2	Do you support the use of the avoid-shift-improve framework as a tool to identify opportunities for abatement? (Y/N)	Yes.
		2.1	Please add detail to your response.	Council supports the thinking behind the avoid-shift-improve framework as a tool to identify opportunities for abatement. From a Council perspective, **avoid** involves removing the need for emissions intensive transport, which also causes congestion, to get around. Transport demand management has a role through increasing travel options, encouraging and enabling use of public transport and to walk and cycle for short trips. Making where we live, work, play and study more interconnected is key. Council is using neighbourhood and precinct plans to manage and accommodate growth locally. **Shift** involves making active, healthy and green transport options the attractive, accessible and enjoyable choice. Shift seeks to achieve a modal shift from conventional private vehicles to green transport modes, such as walking, cycling, e-mobility and public transport (bus and rail).and shared modes. Council continues to invest in walking and cycling infrastructure, e-mobility, and motivates people and organisations to change their travel behaviour through programs such as Cycling Brisbane and Active School Travel. Council is also investing in modernising the city's public transport through the Brisbane Metro and growing the bus network. **Improve** means leveraging emerging technology to switch to renewable energy sources and vehicles. Improve focuses on vehicle and fuel efficiency. For Brisbane it seeks to optimise the operational efficiency of our public transport and how our community and businesses utilise motorised vehicles. Introducing and expanding renewable energy sources into the local transport system can achieve emissions reduction for our city. Council is operating a current fleet of more than 1,200 buses, which move two-thirds of Brisbane's public transport users. Council's free City Loop is an all-electric bus service. Fully electric high-capacity Brisbane Metro vehicles will transform the city's public transport network, with easier and more connections to bus and train services, to connect more places across the city.

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
2	**Rethinking our transport network and systems**			
2.1	Movement of people: promoting active and public transport	3	Do you agree the development of a national policy framework for active and public transport will support emissions reduction?	Yes.
		3.1	Please add detail to your response.	The once-in-a-generation investment in infrastructure and vehicles required to achieve a zero-carbon public transport system is beyond the funding capacity of local governments, particularly those that are striving to provide services to a rapidly growing population. Therefore, the decarbonisation and expansion of public transport services should be a priority for the Australian Government as an investor. Public transport can provide an equitable and accessible pathway for people in growing cities to materially reduce their household's contribution to the national carbon footprint. Council supports the development of a national policy framework for active and public transport that will support increased funding by federal and state governments to support local government in the planning and delivery of active and public transport infrastructure and programs.
		4	What should be included in a national policy framework for active and public transport and how should it be developed?	Partnership arrangements with state and local governments are needed to fund and deliver the transition to zero emissions public transport services. The transition is a particular priority in urban environments where the challenges of servicing a rapid growing population, the economic and social costs of congestion and benefits from local air quality improvements are greatest. In large urban areas that span across several local government areas, coordinated land-use and transport planning are crucial to reduce car dependency. Partnership with the regional or state authority to deliver efficient mass transit infrastructure would help deliver low-emission outcomes across the region, especially in view of the expected high population growth of urban regions and growth in vehicle kilometres travelled.

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
		5	What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the movement of people contributes to transport emissions reduction?	It is suggested that some of the following high-level key fundamentals could be included as additional actions: **Innovation and Research:** Improved focus on investing in research and development of new technologies and transportation solutions, such as alternative fuels, autonomous vehicles, and mobility-as-a-service platforms. These can help accelerate the transition to a broad low-emission transportation system, possibly through targeted grant or funding programs. **Streamlined Project Development:** Implementing more efficient planning and approval processes to streamline the development of projects that seek to achieve a significant reduction in transport emissions. **Lifecycle Planning for Low-Emission Assets:** Ensure planning and provision for the entire lifecycle of transport assets is considered in the development of any policy or actions. **Continuous Improvement and Monitoring:** Continuous improvement and monitoring of transportation assets and operations. Regular performance monitoring and evaluation to help to identify opportunities for further emissions reduction and inform future asset management strategies and investment in infrastructure. **Coordination and Development of Changing Networks:** For trips that are not possible or practical for active and public transport people must be supported to ensure there are no barriers to adopting zero emission private vehicles. This should be achieved through delivering a range of accessible, affordable and reliable vehicle charging options.
2.2	Movement of goods: decarbonising freight and supply chains	6 6.1	The Australian Government has already engaged in consultation on the 2023 review of the National Freight and Supply Chain Strategy and those consultations will also inform the final Roadmap and Action Plan.	Governments could offer incentives, subsidies, and tax breaks to encourage the adoption of green freight technologies such as electric trucks, hydrogen fuel cell vehicles, and renewable energy-powered ships or trains. This could also extend to investing in research and development to drive innovation in clean transportation technologies. Incentivising and promoting the green freight maintenance industry could be facilitated by offering training and certification programs, low-interest loans and financing programs.

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
			What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction?	Governments could introduce disincentives for the use of high emission vehicles particularly for those used for the first-last mile delivery of freight.
		6.2	How would these actions address the identified challenges and opportunities for emissions reduction in the movement of goods?	Although a mode shift from road to rail is desirable, there are a number of institutional, regulatory, and technical factors that make this difficult. However, rail needs to be a key consideration in supply chains to major ports to ensure port competitiveness is not harmed by chronic road congestion. Council sees that there is significant opportunity in the use of micromobility in the last kilometre delivery and recognises the development of suitable infrastructure (e.g. cross river pedestrian and cycle bridges, and separated cycleways) as means to improve the attractiveness and efficiency of this task. Council agrees that procurement of services on behalf of government (for example, waste collection and mowing services), could incentivise emission reductions and use of an electric fleet through the procurement process with the ultimate objective that all core external fleet contractors would provide services with a zero emissions fleet.
3.	**Net zero pathways for each transport mode**			
3.1	Road - light vehicles	7	Do you agree with the proposed net zero pathway for light road vehicles? (Y/N)	Yes.
		7.1	Please add detail to your response.	The pathway is within Council's expectations of the transition. Council sees that EVs will become more affordable over time, but sees the biggest risk is an adequate charging ecosystem not keeping pace with the growth of vehicles. For its part, Council convened a Zero Emissions Roundtable with industry in mid-2023 to engage with industry and academia to explore pathways moving forward.

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
		8 8.1	The Australian Government is currently developing an Australian New Vehicle Efficiency Standard and has already begun to implement actions in the National Electric Vehicle Strategy. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce light vehicle emissions?	Transport inequality is not an issue that only impacts rural areas but urban areas as well. As well as differing incomes, different living circumstances (multi-unit vs single unit dwellings) are an issue. Policies and investment will be required to ensure that everyone can access and choose zero emissions transport options that are affordable, including walking, cycling, e-mobility, public transport, and private EVs.
		8.2	How would these actions address the identified challenges and opportunities to reduce light vehicle emissions?	Opportunities to shift modes not only reduces the carbon footprint of transport but also reduces congestion and improves the urban environment of cities with cleaner air and less noise pollution.
		9	Do you agree with the proposed net zero pathway for heavy road vehicles? (Y/N)	Yes.
		9.1	Please add detail to your response.	The proposed concept is supported, however, the concept focuses heavily on selecting different technology types. Different green technologies use vastly different amounts of energy to deliver 1kWhr of power through a vehicle's drive train. The critical focus should be on achieving the zero-emission outcome as effectively and efficiently as possible. This in turn means green renewable energy is the most critical and scarcest resource in a net zero future. Therefore, the best green technology for the application is the one that uses the least amount of energy. At this point, green hydrogen uses three times the amount of power to generate 1kWhr of power through a vehicle's drive train. Therefore, technologies will differ

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
				based on the application. For instance, battery electric appears to be appropriate for short to mid-range while long haul will likely require green hydrogen.
3.2	Road - heavy vehicles	10	The proposed pathway for heavy road vehicles relies on a mix of battery electric, hydrogen fuel cell and low carbon liquid fuels. Rank from 1 to 3 the order in which these should be prioritised for emissions reduction.	1. Battery electric 2. Low carbon liquid fuels 3. Hydrogen fuel cell
		10.1	Please add details to your response. Why did you rank them in that order?	Battery and low carbon liquid fuels (LCLF) opportunities provide immediate competitive opportunities to reduce emissions, and these should be targeted for scale. The success of hydrogen as a fuel option requires a focus on creating generation facilities that are sized to meet global export volumes as a first priority. This volume of fuel may bring the cost down to a commercial level for domestic transport. Batteries require the build out of greater amounts of new infrastructure and the manufacture of new vehicle models, however, they demonstrate a complete net zero transition with longer term benefits from cost of ownership. LCLF by contrast provides a more limited solution and has less potential to deliver whole-of-life cost reductions for fleet owners.
		11	What role should low carbon liquid fuels play in heavy vehicle decarbonisation?	Heavy vehicle will still rely on LCLFs in short to medium term. LCLF will be an important tool to decarbonise hard-to-electrify transport modes. These should be a bridging technology as green hydrogen efficiency is improved. However, LCLFs are in an early stage of development and there is the risk that they do not achieve net air quality benefits as the fuel combustion is still occurring within and close to residential areas. The significant co-benefits for reducing air quality exposure particularly in populated areas of switching to EV or hydrogen need to be acknowledged.
		12	What additional actions by governments, communities, industry and other stakeholders need	There should be encouragement for businesses to improve their asset utilisation and optimising the use of their existing electrical supply so that there are opportunities to extend the vehicle charging ecosystem and balance the electricity grid.

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
			to be taken now and in the future to reduce heavy vehicle emissions?	
		12.1	How would these actions address the identified challenges and opportunities to reduce heavy vehicle emissions?	Financial assistance will reduce the timeframe on a return on investment from a 50-year horizon to a range that is equivalent to an internal combustion engine bus fleet (seven to 10 years).
3.3	Rail	13	Do you agree with the proposed net zero pathway for rail? (Y/N)	As Council does not own or operate rail infrastructure, it has no comment on Section 3.3 (questions 13 to 16).
3.4	Maritime	17	Do you agree with the proposed net zero pathway for maritime? (Y/N)	Yes.
		17.1	Please add details to your response.	Council's maritime interest only extends to the ownership and operation of ferry services and infrastructure. The roadmap broadly aligns with Council's position that a staged approach will be needed to transition to a zero-emissions ferry system. However, the pathway would benefit from greater consideration of energy efficiency and optimisation opportunities (e.g. vessel operations, scheduling) as achievable but meaningful actions in the short to medium term, while alternative fuel technologies become more developed and viable.
		18 18.1	The Australian Government is engaging in consultation as part of the development of the Maritime Emissions Reduction National Action Plan and those consultations will also inform the final Roadmap and Action Plan. What additional actions by governments,	As trade into and out of Australia is dominated by foreign-owned ships, Australian's only course of action is to leverage emissions reduction through international treaties. However, as Australia has a small but healthy industry in the building and maintenance of smaller vessels, there is scope for innovation and exporting technology developed here to the rest of the world.

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Section	Title	Question Number	Question	Brisbane City Council Response
			communities, industry and other stakeholders need to be taken now and in the future to reduce maritime emissions?	
		18.2	How would these actions address the identified challenges and opportunities to reduce maritime emissions?	The global nature of maritime transport means that Australia's economic trade and prosperity is highly dependent on its ports being ready and able to service new fleet and fuel types at an international level (not just domestically).
3.5	Aviation	19	Do you agree with the proposed net zero pathway for aviation? (Y/N)	As Council does not own or operate aviation infrastructure or services, it has no comment on section 3.5 (questions 19 to 20).
4.1	Transport infrastructure	21	Do you agree with the proposed net zero pathway for transport infrastructure?	Yes.
		21.1	Please add details to your response.	National standards in data collection, measurement and reporting are essential to: • provide certainty to the construction industry through standard tendering requirements • provide consistency in project evaluation • lower unit costs overall as industry builds expertise and transfer of skills.
		22	What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce transport infrastructure emissions and ensure that transport infrastructure is ready for and enables low-emission transport modes?	An emerging issue is the potential higher mass and differing axle configurations presented by low-emission transport in the road sector. It is noted that the National Heavy Vehicle Regulator and the Queensland Government is introducing a new permit scheme for zero emission heavy vehicles throughout Queensland. However, there needs to be consideration of what these impacts may have on asset life in the long term.

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Section	Title	Question Number	Question	Brisbane City Council Response
		22.1	How would these actions address the identified challenges and opportunities to reduce transport infrastructure emissions?	By enabling infrastructure projects to consider options for lower carbon materials at the design and procurement stage using an industry standard process this will allow the whole of carbon benefit to be considered. This also needs to consider the carbon required to recycle the material and whether it may result in a higher carbon contribution overall.
4	**Supporting transport's net zero pathways**			
		23	What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the energy mix is ready to support transport emissions reduction?	An additional action that is needed by governments, communities, industry and other stakeholders is the support of research so that opportunities in different technologies can be developed. This in turn can lead to opening up of new export markets. Availability of zero emissions fuel sources via a reliable supply chain requires decarbonisation of the grid (additional renewables and batteries) and further development and scaling up of liquid fuel.
		24	How should the use of low carbon liquid fuels be prioritised across different transport modes over time to achieve maximum abatement?	Council's experience to date is in trialling low emission fuels based upon existing technologies and commercially available fuel mixes. Council has had limited experience with LCLFs to date and is supportive of conducting investigations in the future.
		25	What are the best ways for the Australian Government to work collaboratively with industry, business, governments and communities to implement the proposed pathways?	The Australian Government is best placed to support research and employ incentives to accelerate adoption.

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
4.2	Transport energy use	25.1	What are good domestic or international examples of partnership and collaboration on transport and transport infrastructure emissions reduction that could inform the final Roadmap and Action Plan?	The iMOVE Cooperative Research Centre has provided the avenue for government, academia and industry to work together. For example, iMOVE has sponsored the project, 'Freight vehicles: An evaluation of renewable energy fuels'.
		25.2	What opportunities can the government leverage to show leadership in Australia and internationally?	The Brisbane 2032 Olympic and Paralympic Games will be the first games that is contractually obliged to take concrete measures to reduce direct and indirect carbon emissions. This will provide an opportunity for governments at all levels to work with industry to showcase best practice processes, projects and outcomes delivered in Australia on the world stage.
5.	**Achieving net zero together**			
		26	What measures and metrics should be used to evaluate the final Transport and Infrastructure Net Zero Roadmap and Action Plan?	Potential measures could include: • absolute emissions reductions from the transport sector • percentage of total vehicles that are zero carbon emissions • percentage of new vehicles that are zero carbon emissions • emissions per passenger kilometre for public transport • embodied emissions per dollar invested in transport infrastructure • volume of fossil liquid fuels consumed by the transport sector • measurement of key air quality parameters (such as O2 and particulate matter) near heavily trafficked roadways.
5.1	Travelling in partnership	26.1	What other data and evidence could governments use and how could this offer further insights on the pace, scale and location of transport emissions reduction pathways?	Council is utilising the Infrastructure Sustainability Council (ISC) rating process for major projects, including accounting for carbon emissions. There is the opportunity to baseline and publish more widely improvements in managing carbon impacts of transport projects on a national scale. As impact measuring to ISC can be complex, its application is most appropriate for major projects. As many infrastructure projects are delivered by small contractors and local government, there needs to be an easily implemented process/system for this to be recorded and ways that reduced carbon can be identified.

Table 1 – Brisbane City Council response to Australian Government's *Transport and Infrastructure Net Zero Consultation Roadmap*

Section	Title	Question Number	Question	Brisbane City Council Response
		27	Do you have any feedback on the proposed review process?	No.
		28	Do you have any further feedback on the Consultation Roadmap and proposed pathways?	No.
5.2	Measuring success	28.1	Is there anything missing? Are the sections appropriately integrated? Is the Roadmap appropriately ambitious?	All of the elements of the roadmap appear reasonable and logical.
		29	Is there any further information or documentation that you wish to be considered with your submission?	No.