Government of South Australia
Premier's Climate Change Council

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Mr Jeremy Conway
Chief Executive, Infrastructure SA
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Dear Mr Conway

I am writing on behalf of the Premier's Climate Change Council (the Council) in response to Infrastructure SA's Discussion Paper on the 20-Year Infrastructure Strategy.

The Council is established under South Australia's *Climate Change and Greenhouse Emissions Reduction Act 2007*. The Council is the State Government's key advisory body on matters associated with reducing greenhouse gas emissions and adapting to climate change.

The Council acknowledges the importance of the creation of a 20-Year Infrastructure Strategy for South Australia and is pleased to offer comments relating to its development and implementation.

The 20-Year Infrastructure Strategy Discussion Paper provides a good overview of the State's strengths as well as relevant and considered information on climate change related risks and of the need to build resilience to mitigate and prepare for the future climate.

The Council is supportive of the integrated long term approach outlined in the discussion paper and also of the vision to achieve ambitious growth while growing sustainability, resilience and liveability. At the same time, the Council suggests that the important role of green infrastructure could be better represented in the final strategy.

The synergies between positive climate action and economic development are well recognised. The final strategy should also recognise the significant opportunities relating to the rapid transition to a clean, low carbon economy which is already underway and moving quickly due to investment, innovation and consumer preferences. The infrastructure strategy also has the potential to help manage the social impacts of this low carbon transition on workers and communities, including planning for, and investing in a shift to low emissions industries.

Detailed responses to the questions raised in the Discussion Paper are provided as attachment 1.

The Premier's Climate Change Council is happy to discuss further development of the 20-Year Infrastructure Strategy and provide any further comment if required. Please contact Nicole Westbury, Project Officer on [DELETED] or [DELETED].

Attachment 1 - Premier's Climate Change Council responses to questions raised in the 20-Year State Infrastructure Strategy Discussion Paper

What infrastructure investment would make the biggest impact to unlocking economic growth in South Australia in the next 0-5, 5-10 and 10-20 years?

The Council supports the need for a strategic long-term systems approach to infrastructure planning as proposed in the discussion paper. In determining short and long term investments, the Council recommends that the strategy consider how investment can be an enabler supporting our transition to a low carbon economy and our management of climate related risk which is key to unlocking economic growth. This includes:

- Assessment, siting, design and construction of infrastructure that takes into account future climate projections and impacts for the life of the infrastructure[1] and assists individuals, communities and businesses to adapt (such as green infrastructure, hazard identification, passive design, urban heat island mitigation etc.) and reduces liability and insurance risk exposure.
- Innovative design solutions that include low carbon and sustainable construction methods and materials for infrastructure. This can be win-win as such strategies can also support the growth of new industries and businesses.
- Whole of life infrastructure planning (design, construction and operation) to include low carbon solutions.
- Acknowledging the importance of green infrastructure assets which deliver a range of health, biodiversity and liveability benefits. Quality green infrastructure also supports carbon emission reductions through sequestration. Green infrastructure can also provide natural defences particularly along our coastline, reducing the effects of erosion, flooding and storm surges.
- Consideration of energy efficiency (of current infrastructure assets and efficiency of end users) as a first principle, prior to investment in new infrastructure.

How can South Australia better manage demand on current infrastructure?

The Council is supportive of the proposed plans to better manage demand on infrastructure including improved infrastructure planning and prioritisation (particularly assessing non-build options), and optimisation and better asset management (including better maintenance, upgrades and sharing opportunities).

In the future it will be important to factor in how climate change will affect demands on current infrastructure. Both the physical impact of climate change and the transition to a low carbon economy will affect demand. The Council recommends that work is commissioned to gain greater insight into these issues and to identify relevant demand management responses. Such responses are likely to require:

- Long term planning and prioritisation that goes beyond 3-5 year cycles.

[1] https://www.nccarf.edu.au/sites/default/files/attached_files_publications/INFRASTRUCTURE_A4-Webview.pdf

- Better integration of planning controls with infrastructure development to better meet demand, avoid hazard risk and supports adaptation to climate change e.g. increased coastal inundation, hotter temperatures etc.
- Further efficiency improvements to reduce overall demand for resources including buildings, vehicles, appliances, manufacturing, irrigation and transport.
- Also, consideration to circular economy opportunities like reducing and managing waste, and keeping existing materials and assets in use.
- Modal shifts in freight transport can potentially reduce emissions and also help consolidate transport infrastructure and reduce demand on road transport infrastructure.
- Optimising whole of life value for money outcomes for infrastructure investment (i.e. cheaper outlay products may cost more in the long term or require earlier replacement).

What challenges and opportunities does South Australia have in supporting our cultural, sporting and tourism activities to ensure our global competitiveness and vibrancy as a location?

While South Australia already enjoys a reputation as a clean green state with high levels of renewable energy, premium food and wine and world class destinations and experiences, enhancing this image will become increasingly beneficial in the future to ensure our ongoing competitiveness and vibrancy.

Travellers, sporting bodies, artists and sponsors are all raising their expectations around sustainability aspects of destinations, experiences and events (including carbon neutrality and zero waste). A local example is the WOMADelaide Festival which offsets the ecological footprint of the event by investing in native biodiverse tree plantings. The Festival also aims to achieve zero waste to landfill.

The State Government aims to make South Australia a world leader in nature-based tourism. The Council is supportive of this aim and it is important that plans ensure the conservation and preservation of natural and cultural assets. Iconic sites will increasingly face dual pressure from climate change and visitor burden. It is suggested that nature-based tourism development and infrastructure plans include investment to protect and enhance nature assets (and not just visitor infrastructure).

Tourism and sporting development plans must also consider impacts of climate change, including resilience planning, such as running events during times of increased extreme heat events.

What services are we likely to use in the future that will require supporting digital infrastructure? / How can technology and data be embraced to improve quality of life?

The Council supports Infrastructure SA's assessment that digital accessibility is foundational to enabling an effective digital economy to drive economic growth and social impact.

The strategy should also acknowledge that development of low emission industries is aligned with government priorities to increase business start-ups and encourage innovation and growth. Key areas for clean growth include: food and agribusiness; tourism; energy and

minerals; defence and space industries; hi- tech, waste management, and media and creative industries among others. South Australia has a reputation for trialling and demonstrating new products and technologies, the government should consider leveraging on this reputation in order to attract new businesses and investment.

Advances in digital technology including artificial intelligence are likely to deliver a wide range of benefits. In terms of low carbon, climate resilient opportunities, some benefits include:

- Increased resource (water, energy, land use) efficiency in homes, business' and farms though smart technologies that include responsive monitoring and networking of devices (i.e. sprinkler systems triggered by soil monitors, efficient charging of electric vehicles, staggered use of automated appliances (better utilising solar power).
- Supporting energy demand management including peak energy usage for example smart appliances that are programmed to charge off peak, batteries that create virtual power plants, discharging back into the grid.
- Reduced vehicle emissions from the deployment of shared-use autonomous electric vehicles.
- Improved modelling of complex climate and environmental systems, to better predict, prepare and respond to future hazards and emergency situations.
- Supporting new models for remote or rural health service delivery including telehealth.

What complementary infrastructure can be built to support better health outcomes across the population?

The Council is supportive of the health related approaches outlined in the strategy including using technology to help bridge the gap in health services for remote and regional populations including updated delivery models such as telehealth services, care co-operatives and integrated care services (integrating childcare, disability care, mental health and aged care providers). It is noted that this would require appropriate infrastructure to ensure digital services are at national and global standards across the State.

In addition, infrastructure planning should take into account current and future increasing pressures on the health system from weather related events, such as heat waves, drought, flood and bushfire. Infrastructure policies should refer to and be aligned to the *National Strategy for Disaster Resilience*[2] which provides high-level guidance on disaster management.

The importance of green infrastructure on health outcomes should also be acknowledged. The health and wellbeing benefits from spending time in nature and living close to parks and other green spaces is well documented[3]. This also contributes to the strategy's aim of creating a walkable urban form.

[2] https://knowledge.aidr.org.au/media/2153/nationalstrategyfordisasterresilience.pdf

[3] https://www.environment.sa.gov.au/topics/park-management/state-wide-park-strategies/healthy-parks-healthy-people

How will technology change the transport system in South Australia?

Any strategies for infrastructure investment should consider emerging energy and transport technologies including vehicles powered by electricity, hydrogen fuel and biofuels and autonomous vehicles.

Similarly investment should be cognisant of any risk of stranded assets and disrupted businesses due to the shift from fossil fuels to low carbon, renewable energy sources.

How can South Australia take the lead on reducing emissions from transport?

In order to reduce transport emissions and support the transition to a low carbon economy fuelled by renewable energy, it is important to recognise the need to increase energy efficiency and transition away from fossil fuels. This includes further electrification of networks and increasing the uptake of electric, hydrogen and other alternative fuel powered vehicles (both public and private) in light and heavy duty fleets.

The relationship of sustainable transport within a multi-modal transport system is also important. The whole transport system needs to be considered from an emission reduction and efficiency perspective including increasing the use and uptake of low carbon modes of public and private transport.

Promoting a more walkable urban form including precinct development will also reduce emission and promote health benefits. Working in partnership with Local Government to plan and implement appropriate cycling infrastructure and to encourage the health and environmental benefits of cycling, are also key components.

With transport emissions continuing to rise, the Council has identified this as a key focus area for South Australia. The SA Government could take the lead by adopting standards to further electrify or move the public transport system to hydrogen power.

In supporting an early transition to lower emission vehicles (LEV's), the Council suggests that the government considers ways to:

- Support the reduction of whole of life cycle vehicle emissions (from manufacture to use and decommissioning) and maximise vehicle lifespan.
- Support the development of battery and component recycling programs.
- Leverage from our high levels of renewable energy to support economic opportunities for LEV manufacturing, battery recycling, green mineral (for batteries and components) and hydrogen development in South Australia. Also continuing to explore autonomous mobility opportunities.
- Incentivise and regulate (for example advocate to strengthen fuel efficiency standards) to send clear market signals and support the transition including through government procurement.
- Ensure action is taken to avoid and mitigate adverse environmental impacts.

The Council would welcome the opportunity to provide further advice or support the strategy development in the transport area.

What options are there to establish a reliable, affordable, decarbonised energy system in South Australia?

The South Australian Government has supported the early and ongoing development of a strong renewable energy generation system. The Council supports the government's diversified and collaborative approach to deliver lower cost, secure and clean energy to South Australians as well as to neighbouring states. While South Australia has already come a long way in its aim to establish a reliable, affordable, decarbonised energy system, the Council suggest the following:

- Transitioning away from fossil fuel use and development including through renewable generation, hydrogen and biofuels and storage (batteries, pumped hydro).
- Aiming for greater than 100% renewable energy production, enabling our state to be a net renewable energy exporter (including via the interconnector with NSW and through developing the hydrogen industry).
- Building the capacity of regional South Australia to build on its competitive advantages in renewable energy through zone development and continuing to encouraging and trial new energy technologies.
- Better leveraging off of and building upon our high levels of renewables to attract energy intensive industry and businesses that will benefit from the availability of low emission energy supplies (green industries, businesses that aim to reduce supply chain emissions through renewable energy or alternate fuel use).
- Supporting increasing security and reducing our reliance on gas though high-inertia synchronous condensers and storage.
- Supporting the development of smart grids, smart homes, smart cars, smart businesses etc. to better manage grid energy demand and better integrate and maximise home solar production and use.
- Continuing to support and advocate for energy efficiency measures and strong minimum standards to reduce energy demand. This includes in appliances, planning and building code requirements, supporting green infrastructure (reduce air conditioning requirements) etc.
- Supporting new contractual energy supply models including community energy plans.

What strategies should be adopted to ensure Adelaide maintains its liveability as it grows?

A good infrastructure strategy should aim to enhance and retain key characteristics to retain residents and attract visitors and build Adelaide's enviable reputation as an affordable, liveable city. The strategy will need to strengthen specification and performance requirements for buildings, infrastructure and public spaces that are well designed to adapt to the changing climate and which reduce emissions.

Maintaining and enhancing our reputation as a clean green city is fundamental. Policies to increase the amount and quality of green infrastructure will help not only in visual amenity but also in reducing impacts associated with the urban heat island effect.

The Council is supportive of precinct development as raised in the discussion paper. There are significant work-life and financial benefits in transitioning Adelaide and other major centres to

become more poly-centric and agglomeration driven. The Tonsley district in particular is a great example.

How can South Australia best prepare its infrastructure to be able to adapt to and embrace future technological disruptions?

Opportunities to increase the resilience of infrastructure are discussed in other sections.

What infrastructure is required to support our justice system and emergency services across the state? / How can infrastructure provide resilience against bushfires, drought, flooding, sea level rises and the like?

Climate change is already increasing our exposure to natural hazards. The Council supports the assertions that infrastructure is at the forefront of climate change adaptation and also that continued warming presents a mega-trend that will impact the physical environment in which economies and communities exist and the ways they function. The Council also suggest the following considerations:

- Infrastructure policies should reflect the importance of considering the anticipated changes and exacerbation of impacts due to climate change as well as the hazards themselves. Multiple and cascading hazards, cumulative effects and exacerbating factors should also be considered.
- The Council is aware of the need for improved hazard data and mapping across the state. High quality accessible data will allow land managers (public and private) and land holders an understanding of relevant hazard risks to inform decision making, strengthen transparency and accountability and to reduce exposure to legal liability.
- Given that all levels of government and all levels of planning have responsibilities around hazard management, an integrated approach is recommended. Infrastructure policies should refer to and be aligned to the National Strategy for Disaster Resilience (previously mentioned) which provides high-level guidance on disaster management.
- Supporting regions, communities and businesses to become more resilient by assisting to identify and mitigating direct and indirect physical, financial, litigation and reputational risks associated with climate change (including the hazards mentioned above).
- It is important that the infrastructure strategy reflects the impact that climate change will have on coastal environments. Sea level rise will exacerbate coastal erosion, flood hazards and damage from storm events which will increasingly threaten assets and infrastructure.
- Policies may consider which types of development should and should not be supported in different hazard zones. A risk based approach to hazard management should be considered for assessing development on hazard-prone land.
- Infrastructure policies should also consider and promote natural defences (including sand dunes, sea grass, mangroves etc.) and identify alternative risk mitigation approaches (including relocatable or removable development). Staged retreat options may also need to be considered in some instances and areas.

What strategies should the Government adopt to ensure the necessary infrastructure is in place so our regions can thrive?

As mentioned in the discussion paper, regional South Australia has great capacity to build on its competitive advantages in renewable energy with high quality wind and solar resources combined with land availability. Renewable energy zones will likely attract new low emission industries or industries that require high energy inputs but require clean and cheap sources. The following strategies could be considered:

- Helping to manage the social impacts of a low carbon transition on workers and communities, through planning for, and investing in an orderly shift to low emissions industries. Targeted investment can assist to facilitate: increased skill development; knowledge exchange networks; demonstration products, product commercialisation (including early adoption and wider dissemination); and critical infrastructure requirements.
- Developing regional innovation hubs for: alternate fuels (i.e. hydrogen and biofuels) that is locally produced, demonstrating the safety and viability of new technology and products, and supporting the transition away from fossil fuel use and development; or AgTech businesses and consultancies that can share knowledge and resources in one location (similar to Sundrop Farms but as a hub).
- Supporting regions, communities and businesses in identifying and mitigating both the direct physical impacts as well as the financial risks (including stranded assets and increasing insurance premiums for high risk assets), litigation risks (from parties who have suffered loss or damage from a failure to address climate change risk) and reputational risks (addressing expectations of shareholders and customers who expect companies to divest from carbon intensive industries).

What factors should be considered when making inevitable trade-offs about investment in public infrastructure in the context of funding constraints?

Climate change calls for an increase in scale and ambition for long lived, robust and resilient planning and development. Physical infrastructure often has a long lifespan and therefore it is critical that any siting, design and construction of infrastructure takes into account climate projections.

While more sustainable products and lower emission approaches may be more expensive initially, the whole of life costings will often balance out particularly if accounting for operational energy savings and any co-benefits including reducing waste (when using recycled materials). New expertise and commercial potential of new products and approaches should also be considered.

How can we best plan and accommodate the infrastructure needed to create vibrant and economically productive precincts?

The Council is supportive of the vision of Adelaide and other South Australian cities to transition to a more poly-centric urban structure and agree that an agglomeration driven economy can better respond to the changing needs of the workforce and consumer. Associated infrastructure polies should consider the following:

- South Australia's leadership as a low carbon economy is providing the opportunity for entrepreneurialism in emerging technologies. It is important to capitalise on these opportunities and leverage off of our abundant renewable energy, land, infrastructure, expertise and access to key trade markets including the development of further innovation hubs, supporting renewable energy zones, a developing a green hydrogen industry.
- South Australia also has a reputation for trialling and demonstrating new products and technologies, and the government should consider ways to leverage off of this reputation to attract new investment and industries.
- Explore opportunities to improve sustainability and climate resilience within precinct developments which will also support economic efficiencies (e.g. waste, water and energy savings) and potentially increase competitiveness.
- As discussed above the innovation hub approach could be extended within regional centres potentially around AgTech or alternative fuel development.