Australian Government
Department of Climate Change and Energy Efficiency

22 June 2011

File: DCCEE

Mr John Austen
General Manager, Policy
Infrastructure Australia
GPO Box 594
CANBERRA ACT 2601

Dear John

RE: NATIONAL LAND FREIGHT STRATEGY DISCUSSION PAPER

Thank you for the opportunity to provide comment on this discussion paper. The Department of Climate Change and Energy Efficiency's submission is at **Attachment A**.

In responding to the National Land Freight Strategy Discussion Paper, the Department seeks to ensure that climate change is included as a key consideration in the development of the National Land Freight Strategy.

The Department is currently undertaking a study of the adaptive capacity of the transport sector and in developing a specific response to the issue of climate change impacts on the National Land Freight Strategy, the Department is happy to provide advice. If you wish to discuss this submission further, please contact Brendon Barratt at brendon.barratt@climatechange.gov.au or (02) 6159 7454.

Yours sincerely

Jo Mummery
Assistant Secretary
Adaptation, Science and Communications Division

Attachment A

NATIONAL LAND FREIGHT STRATEGY DISCUSSION PAPER 2011
Submission of the Department of Climate Change & Energy Efficiency (DCCEE)

DCCEE welcomes the opportunity to comment on the National Land Freight Strategy (NLFS) Discussion Paper.

Climate change and the government policies that address it will influence investment decisions in the land freight industry over the coming decades. In developing the NLFS, it will be important to take these factors into account to assure its goal of setting out a strategy for long term reform and investment.

Appropriate adaptation will help to ensure that land freight infrastructure is resilient to the impacts of climate change so that economic value is preserved and disruption is minimised especially during extreme weather events. A high proportion of land freight infrastructure that is being built now will still be in service later this century when significant changes in climate are expected to have taken place.

Physical Impacts

Climate change is expected to impact on land freight infrastructure in a number of ways. For example through higher temperatures and longer or more intense heatwaves, increased frequency and intensity of rainfall and subsequent flooding events, rising sea levels and increasing saltwater intrusion into coastal areas.

Nationally, between 1,200 and 1,500 km of rail lines and tramways are potentially at risk from inundation and shoreline recession from a sea level rise of 1.1 metres (high end climate scenario for 2100). These assets have a value of between $4.9 billion and $6.4 billion (2008 replacement value.

Similarly, between 26,000 and 33,000 km of roads are potentially at risk from the combined impacts of inundation and shoreline recession. These figures comprise 1,100-1,500 km of freeway, 10,000-13,000 km of main roads and 15,000-18,000 km of unsealed roads. This roadway has a value of between $46 billion and $60 billion.

Consideration of future climate change risks, particularly during the planning process for transport routes and hubs, and investment in long-lived assets, will be needed to manage climate change risk. Such consideration should also address the extent to which redundancy in the system is required. Redundancy through approaches such as the diversification of capital may provide robustness and efficiency of service over longer time frames and allow for the management of uncertainty surrounding future climate impacts.

Strategic consideration of the interdependencies in an integrated freight network will also be needed. Climate change risks in one sector may have the potential to contribute to the risk of 'cascade failure'[1], or the impairment of other related sectors.

Economic Impacts

The economic effect of climate change impacts on the land freight sector will be dependent on how well it incorporates adaptation in its design. Consideration of adaptation should be taken as early as possible to allow for a least cost approach to adapting to climate change. By incorporating adaptation into the considerations underpinning the design of the NLFS a range of investment options may be used which may not be available when responding to individual future climate events.

The freight industry also accounts for approximately 6% of Australia's aggregate greenhouse gas emissions[2]. The Australian Government has committed to national emissions reduction targets of at least 5% below 2000 levels by 2020. To meet these targets, the Government proposes that a carbon price commence on 1 July 2012, subject to the Government's ability to negotiate agreement with a majority in both houses of Parliament and passing legislation this year. The development of a NLFS should consider the market effects of a future carbon price on the land freight industry. A carbon price may alter the nature of different modes of freight with respect to competitive advantage. The carbon price may change the internal dynamics of the land freight network and the interrelationship of different transport modes.

The *Freight Transport in a Carbon Constrained Economy: Discussion Paper* and the *Report of the Prime Minister's Task Group on Energy Efficiency* provide further information about carbon mitigation and the transport sector that may be of interest. The Australian Transport Council has committed to introducing CO_2 emissions standards for light vehicles from 2015[3] and the Transport Minister has acknowledged such standards would be a key initiative within the wider effort to meet the challenge of climate change.

Comments on Specific Sections of the Discussion Paper

Page 3 of the Discussion Paper identified one long term goal as being "*improved economic, social and safety outcomes*". To achieve these goals, consideration of climate change policies such as carbon pricing and physical climate change impacts in the planning process for the NLFS would ensure that freight infrastructure and freight logistics remain reliable and efficient into the future.

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[1] UK Royal Academy of Engineering, 2011, *Infrastructure, Engineering and Climate Change Adaptation – ensuring services in an uncertain future.*

[2] National Transport Commission, 2008, '*Freight transport in a carbon constrained economy – The carbon emissions challenge' Factsheet.*

[3] Australian Transport Council, 24 September 2010, Communique.

- *DCCEE recommends that any planning to improve the efficiency and effectiveness of freight logistics take explicit account of the impacts of climate change policies and physical climate change impacts.*

DCCEE notes that Page 7 of the Discussion Paper states that Infrastructure Australia has identified a number of land freight network projects as ready to proceed.

- *DCCEE recommends that in determining the suitability of an infrastructure project to proceed, the effect of a carbon price and the resilience of the asset to physical climate change impacts be assessed.*

Maps 1 and 2 of the Discussion Paper set out the location and scale of freight flows currently and as projected out to 2030 by the Bureau of Infrastructure, Transport and Regional Economics. Any projections used to inform the development of the NLFS should include all relevant factors that may impact the operation of the freight industry into the future such as physical climate change impacts and carbon pricing.

- *The Department recommends that physical climate change scenarios be incorporated into the modelling used to project the location and scale of freight demand out to 2030. Such scenarios should also include an analysis of the market structural impacts of a carbon price on the land freight sector.*

Page 27 of the Discussion Paper notes the potential for climate change to affect "*Freight and freight generating activities, such as manufacturing and warehousing ...*". This section also posits that it is "*unclear to what extent freight planning documents consider scenarios of climate change impacts on physical infrastructure or on demand patterns*".

- *The Department has supplied information relating to the physical impacts of climate change on the transport sector at Attachment B and is willing to engage with you further on these matters to ensure the development of a resilient land freight sector.*

Page 38 of the Discussion Paper considers the effects of land use planning on the freight sector such as the "*location of residential developments*". Any discussion of land use planning needs to incorporate an understanding of the effects of climate change both now and well into the future.

- *Decisions about new infrastructure; type and spatial location, have implications over significantly longer timeframes than the immediate decades. For example land use planning decisions have a far longer life span than the life of the asset that might be built. This means that significant climate variability may need to be considered in long term land use planning.*

Page 39 of the Discussion Paper outlines that "*Externalities include ... global greenhouse gases*". Depending on the final decisions on design of the Government's proposed carbon

pricing policy, the release of greenhouse gas emissions by the land freight sector may become largely internalised.

- *Depending on the final decisions on design, a carbon price may have an effect on the relative competitiveness of different modes of freight given they have different emissions profiles. This should be appropriately considered in designing the NLFS.*

Page 40 of the Discussion Paper lists many of the concerns raised by stakeholders in during consultations. Page 41 of the document lists significant freight constraints.

- *The effect of carbon pricing and the physical impacts of climate change are cross cutting issues which may impact on the ability to address the concerns and freight constraints listed in the Discussion Paper. The Department therefore recommends climate change be addressed specifically in the development of a NLFS. This would be appropriate given the Government's roles and responsibilities in adapting to the impacts of climate change as set out in its position paper, Adapting to Climate Change in Australia (2010).*

DCCEE is concerned that without specifically addressing climate change in the development of the NLFS, that the adaptation of the land freight sector may be left to a reactive, ad-hoc approach following damage caused by extreme weather events. This is likely to impose a significant net loss of efficiency on regional economies. Through specifically addressing climate change impacts, proactive, anticipatory adaptation actions may be facilitated that are economically more efficient. This should provide the Land Freight sector with opportunities for flexible and low-cost adaptation, and can help to avoid adaptation responses with potentially adverse and irreversible consequences.

Attachment B

NATIONAL LAND FREIGHT STRATEGY DISCUSSION PAPER 2011
Submission of the Department of Climate Change & Energy Efficiency (DCCEE)

Additional Information on Physical Climate Change Impacts

"*As our climate continues to change the difficulty in meeting the challenge of maintaining a robust and reliable infrastructure system increases*".[4]

Brisbane experienced severe rainfall in May 2009, resulting in one road collapse and numerous road closures, which caused widespread traffic delays and large construction and maintenance costs.

A series of floods in the Nambucca Shire, NSW, in 2010 resulted in the road between Bellingen and Bowraville requiring $25 million in repairs.

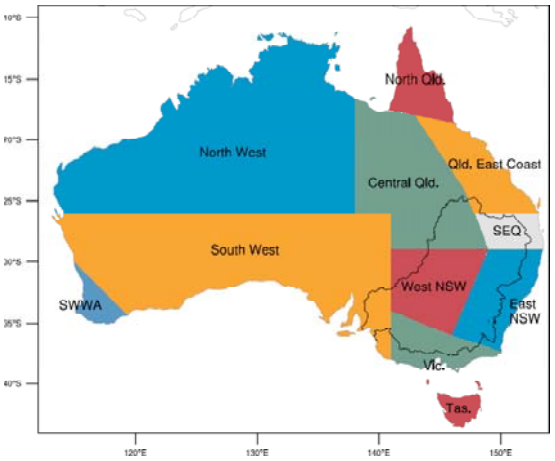
Floods in Queensland during March 2010 and December 2011 caused well in excess of $1 million of damage to the state's roads.

The Department has recently developed climate change risk ratings for the transport sector in each region in Australia which may be of relevance to the NLFS. The risk ratings relate to projected flood damage, extreme rainfall and heatwaves. The figures provided below illustrate how the regions were split up and the colours of each region do not carry any other significance. The tables found at Figures 1.1, 2.1 and 3.1 indicate the levels of projected risks to regions across Australia.

[4] UK Royal Academy of Engineering, 2011, *Infrastructure, Engineering and Climate Change Adaptation – ensuring services in an uncertain future*, p3, quote of Lord Henley.

State/region	2010	2055 MED	2090 MED
North West	MED	HIGH	HIGH
North Queensland	MED	HIGH	HIGH
Central Queensland	MED	MED	HIGH
Queensland East Coast	MED	MED	HIGH
SE - Queensland	MED	MED	HIGH
W- New South Wales	LOW	LOW	MED
E- New South Wales	MED	MED	HIGH
Victoria	MED	MED	HIGH
Tasmania	MED	MED	HIGH
South West	LOW	LOW	MED
SW - Western Australia	LOW	LOW	MED

(Left) Figure 1.1 Projected flood damage to bridges – regional variation in risk rating



(Above) Figure 1.2 Categorisation of region

Sea-level rise

With around 85 per cent of Australia's population living in coastal zones, rising sea levels and storm surges will significantly impact many coastal towns and cities. There is growing evidence to suggest that a sea-level rise of up to one metre or more this century is plausible. In low-lying areas, a sea-level rise of 18 to 79cm could lead to coastal inundation tens or even hundreds of metres inland. Sea-level rise and increased storm surges are likely to have major impacts on coastal roads in the latter half of this century, unless there is significant investment to protect, relocate or raise low-lying coastal transport infrastructure.

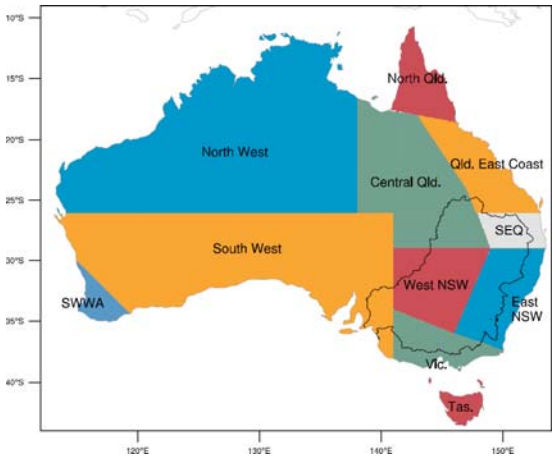
Extreme rain events

The severity of extreme weather events is projected to increase. These events, particularly extreme rain events, are likely to have significant physical impacts on transport infrastructure and disruption to transport services. Roads, railways and bridges will be worst affected, particularly those with older drainage structures and earthworks that do not necessarily meet present-day design standards. Increased flooding is considered to be the greatest climate change risk to Australia's road infrastructure. The increased intensity of extreme rainfall

events may also increase the incidence of slope failure, landslides, road collapse, washout and scouring in some areas.

State/region	2010	2055 MED	2090 MED
North West	MED	MED	HIGH
North Queensland	MED	HIGH	HIGH
Central Queensland	MED	MED	HIGH
Queensland East Coast	MED	HIGH	HIGH
SE – Queensland	MED	HIGH	HIGH
W – New South Wales	MED	MED	HIGH
E – New South Wales	MED	HIGH	HIGH
Victoria	MED	HIGH	HIGH
Tasmania	MED	HIGH	HIGH
South West	MED	MED	MED
SW – Western Australia	MED	MED	HIGH

(Left) Figure 2.1 Projected extreme rainfall impacts on roads – regional variation in risk rating



(Above) Figure 2.2 Categorisation of regions

Heat waves

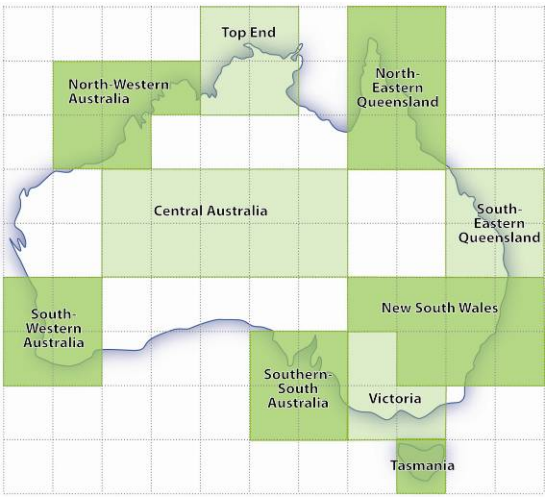
Increases in extreme temperatures throughout Australia will likely lead to increased rates of bitumen and asphalt seal cracking, causing water ingress and the subsequent deterioration of road pavement.

The heatwave in south-eastern Australia in January and February 2009 illustrates our vulnerability to extreme heat events. This heatwave set new record temperatures, had impacts on human health, and placed major stresses on critical infrastructure and ecosystems. During this heatwave, the Basslink Interconnector (which transfers electricity between Victoria and Tasmania) experienced a shut down when temperatures exceeded its design limits, reducing power supply to Melbourne. Rail lines buckled, causing major disruption to the movement of freight, both domestic and international. The frequency of heat waves is expected to double by 2030, and triple by 2070, highlighting the critical importance of designing climate change-resilient infrastructure.

Risk will be greatest in northern areas of Australia, where significant increases in extreme temperatures and rainfall intensity are projected.

State/region	2010	2030 MED	2070 LOW	2070 HIGH
NW – Western Australia	MED	MED	HIGH	HIGH
Central Australia	MED	MED	HIGH	HIGH
Top End	MED	MED	HIGH	HIGH
NE – Queensland	MED	MED	HIGH	HIGH
SE – Queensland	MED	MED	HIGH	HIGH
New South Wales	MED	MED	HIGH	HIGH
Victoria	MED	HIGH	HIGH	HIGH
Tasmania	LOW	LOW	LOW	MED
S – South Australia	MED	MED	HIGH	HIGH
S – Western Australia	MED	MED	HIGH	HIGH

(Left) Figure 3.1Buckling of rail tracks in extreme temperatures – regional variation in risk rating



(Above) Figure 3.2 Categorisation of region