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Submission to Productivity Commission Draft Report: Natural Disaster Funding Arrangements

1. Supply chain resilience – balancing efficiency and effectiveness

Natural disasters and extreme weather conditions are a threat to supply chains and can adversely impact communities, businesses and livelihoods when disrupted. When supply chain disruptions cannot be prevented, transport flexibility is required to support the communities' ability to recover. Being a highly competitive industry, freight transport businesses are primarily concerned with mitigating high-probability failures to drive efficiency. The mitigation of low-probability disruptions such as flooding, which can cause system-wide failures of the supply chain, cannot be provided by individual businesses and requires effective solutions that are integrated with the government's broader infrastructure agenda. A flexible approach that avoids total dependence on specific transport modes builds supply chain resilience and enables the supply chain to effectively maintain output following a large-scale network disruption.

2. The potential for diversifying modes of transport for supply chain resilience

A distinguishing feature of all supply chains is the mode of transport. Different modes of transport have varying levels of susceptibility to network disruptions caused by natural disasters. For non-bulk cargoes, the most utilised transport modes in domestic supply chains in Australia are road and rail, with road being significantly dominant compared to rail. Common to both road and rail supply chains is dependence on the accessibility of infrastructure that is subject to disruptions such as flooding. The heavy reliance on these modes to facilitate Australia's domestic supply chains exposes regional communities to risks which could be mitigated by the ability to transfer cargo to or by other transport modes.

Aviation and maritime transport modes are the backbone of international supply chains and have the potential to also be utilised domestically. Cargoes are generally specific to either aviation or maritime transport, such that light weight, low volume, time-sensitive cargo is suitable to air transport while heavy, high volume, price-sensitive cargo is most suited to transport by sea:

Air Cargo	Sea Cargo
Light weight	Heavy, oversize
Low volume	High volume

Time-sensitive	Price-sensitive
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Through diversified transport modes, a more resilient supply chain can deliver essential items (such as medicines, food and fuel) and maintain business continuity in regional communities impacted by natural disasters. Similar to the international supply chain, a resilient domestic supply chain would transport cargo specific to the mode. For example, in the event of a disruption caused by flood, air freight would be suitable for the delivery of essential items such as medicines, and coastal shipping would be readily applicable to the support of business continuity.

3. Cost-benefit analysis of disaster funding for business continuity

Following a natural disaster, increased supply chain resilience and sustained business continuity enable faster recovery and reduce the overall costs to communities and the national economy.

A resilient supply chain which integrates coastal shipping for mitigation activities is optimised by utilising the capacity of ships on international voyages. Shipping is a highly flexible transport mode and offers a variety of highly effective applications for mitigating the disruptions of landside networks, such as:

- A. Utilising the latent capacity on a vessel's scheduled voyage
- B. Changing the order of a vessel's port calls
- C. Diverting a vessel to a designated port to load/unload
- D. Chartering a vessel for a designated voyage
- E. Anchoring a vessel near an isolated community and discharging cargo on to a lightering barge.

The order in which these options are listed above reflects the increasing organisational complexity and cost to the beneficiaries. The order of the options on the list also represents the decreasing level of infrastructure required to utilise the option. For example, to maximise the potential of Option A, ports with adequate facilities to accommodate the available vessels are required; in the case of a typical large container ship, sufficient draught for the vessel to berth and crane facilities to handle the containers would be required. At the other end of the spectrum, Option E would require minimum infrastructure and could be performed by a vessel with on-board cranes in a protected anchorage with a lightering barge.

The international vessels that regularly call the capital city ports of Australia have the capacity to carry hundreds of semi-trailer trucks and thousands of rail containers. The utilisation of Betterment Funding for regional port development to increase access for high capacity vessels would optimise coastal shipping as a mitigation option for business continuity.

4. Scenario analysis: Cairns

Cairns is a growing tropical city in Far North Queensland whose population of 150,000 is predicted by the state government to rise to 200,000 within the next ten years. It is a community dependent on landside supply chain networks that are subjected to flooding which disrupts the connection to the nearest population centre, Townsville, 350 km to the south.

Reasons for the limited uptake of Betterment funding are analysed in the Productivity Commission's draft report 'Natural Disaster Funding Arrangements' (p. 352). A focus on these analyses provides the opportunity to reflect on the current arrangements for the recovery and mitigation of Cairns supply chains and to recommend methods to evaluate the optimal balance of expenditure between the two goals of recovery and mitigation.

4.1 Productivity Commission analysis — Sources of funding for Betterment activities

"There is no budget allocation by the Australian Government for Betterment activities, which means that Betterment must be funded by offsetting savings elsewhere." (Productivity Commission, 2014, p.352)

One of the Australian Government's 45 Infrastructure Investment Programmes for the Bruce Highway is the 'Ingham to Cardwell Range deviation' which the Queensland Government reported in 2012 is projected to increase flood immunity and cost \$780M.

Recommendation 1: Perform a cost-benefit analysis comparison of the supply chain resilience offered by upgrading the Ingham to Cardwell Range section of the Bruce Highway vs the most effective coastal shipping option supported by Betterment Funding contributed from offsetting savings of \$780M.

4.2 Productivity Commission analysis — funding of more disaster-resilient assets

"The Australian Government contributes a lower proportion of the cost of Betterment works than to rebuild to the pre-disaster standard. The Department of Infrastructure and Regional Development (sub. 99) commented that, in practice, reduced reimbursement for betterment works and the ready availability of funds from an external source for rebuilding, act as a disincentive to use restoration works to improve the resilience of an asset. Similarly, the Department of Finance (sub. 92) commented that the current arrangements create a strong incentive to undertake restoration activities, even if the better long-term alternative option is expenditure on more disaster-resilient assets but which attracts a lower level of Australian Government contribution." (Productivity Commission, 2014, p.352)

The current development plan for the Port of Cairns (the Cairns Shipping Development Project) includes investment in channel and berth dredging to accommodate larger cruise vessels. This work is not considered as betterment even though improving the facilities at the Port of Cairns to equivalent accessibility of the Port of Townsville would enable Ro/Ro vessels to transfer trucks between the cities when flooding of the Herbert River inundates the Bruce Highway.

Recommendation 2: Promote the recognition of the supply chain as an asset and coastal shipping as a flood mitigation activity that improves resilience; thus making the Cairns Shipping Development Project eligible for Betterment Funding from the Australian Government.

4.3 Productivity Commission analysis — Cost effectiveness of Betterment Funding proposals

"Betterment funding is only available if the Australian Government is satisfied with the cost effectiveness of the proposal and that increased disaster resilience of the asset will mitigate the impact of future natural disasters. This means that the administrative burden is higher than that required to rebuild to the pre-disaster standard." (Productivity Commission, 2014, p.352)

The cost effectiveness of developing the Port of Cairns should include a calculation of the value of increasing the city's supply chain resilience and also include a calculation of the additional benefit of establishing greater accessibility for the city and surrounding hinterland including the Atherton Tableland to international markets.

Recommendation 3: *The cost benefit analysis of increasing the supply chain resilience of Cairns through the funding of port development should account for all the benefits greater access to regular shipping services can provide.*

4.4 Productivity Commission analysis — The definition of betterment as distinct from restoration or reconstruction

“There appears to be considerable confusion over what constitutes betterment as distinct from the restoration or reconstruction to a ‘pre-disaster standard’. In some cases, the application of current engineering standards for the restoration of public assets will result in a higher standard than that which existed pre-disaster (IPWEA, sub. 30). The Sunshine Coast Council (Qld) (sub. 112) commented on a lack of clarity on agreed betterment engineering standards and expertise available under the NDRRA to support the approval of engineering standards developed at the council level.” (Productivity Commission, 2014, p.352)

Confusion exists regarding the definition of betterment when considering whether utilising coastal shipping is ‘reconstructing’ the supply chain as distinct from ‘restoring’ the Bruce Highway each time flooding occurs between Townsville and Cairns. Shipping Australia Ltd is currently undertaking a project to assess the capability of shipping to provide coastal services to mitigate supply chain disruptions. The outcomes of the project can be to assess real options for shipping to mitigate flooding and will provide new information to inform this discussion.

Recommendation 4: Perform sensitivity analysis and scenario planning based on the flooding of the Herbert River to identify what options have benefits that exceed their cost in any future scenario.

4.5 Productivity Commission analysis — Community expectations of public asset restoration following natural disasters

“Communities have high expectations that essential public assets will be restored quickly following natural disasters. This creates disincentives for government to undertake betterment actions that involve longer timeframes.” (Productivity Commission, 2014, p.352)

Community expectations that essential supply chains are quickly restored following a natural disaster are high as community members’ businesses and livelihoods are impacted. The Cairns community is tolerant of inconveniences and delays caused by flooding. This tolerance provides coastal shipping—which is often dismissed as slow compared to road transport—the opportunity to provide business continuity and deliver essential items in acceptable timeframes. This activity would also have the benefit of reducing the supply chain’s dependence on landside networks and decrease public and corporate pressure to provide access to roads before the roads are fully fit-for-purpose following inundation. In addition, any betterment works undertaken for the development of the Port of Cairns are unobtrusive to the general public.

Recommendation 5: Survey the Cairns community to determine acceptable levels of supply chain services following a natural disaster.