



Townsville Coastal Hazard Adaptation Pilot Project

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Background

- Partnership between the LGAQ, Queensland Government and Townsville City Council
- Conceived to support development and commencement of the Queensland Coastal Plan
- Funded by the Commonwealth in July 2011
- Townsville selected due to representative communities and significant risks – more than \$1B property at risk of permanent inundation in the Townsville CBD alone



What is a Coastal Hazard Adaptation Strategy?

As defined in the Queensland Coastal Plan...

“CHAS document the results of an assessment of the risk urban localities face from high coastal hazard impacts over the medium to long term, propose adaptation measures to mitigate those impacts, and establishes an implementation program for the mitigation measures.”

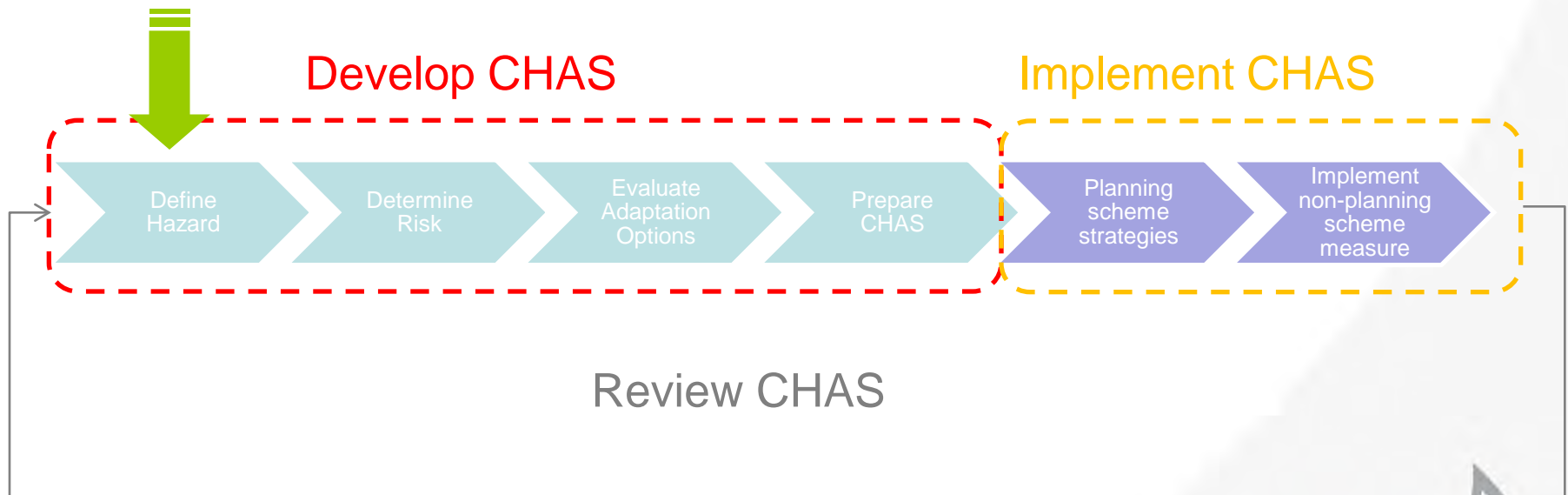


Project objectives

- Develop a CHAS for Townsville
- Identify a process suitable for all Queensland coastal councils
- To develop the tools and guidance to support councils in applying the process
- To demonstrate relevant policies under the Queensland Coastal Plan and inform ongoing discussions with stakeholder groups
- Provide recommendations for CHAS guideline amendments



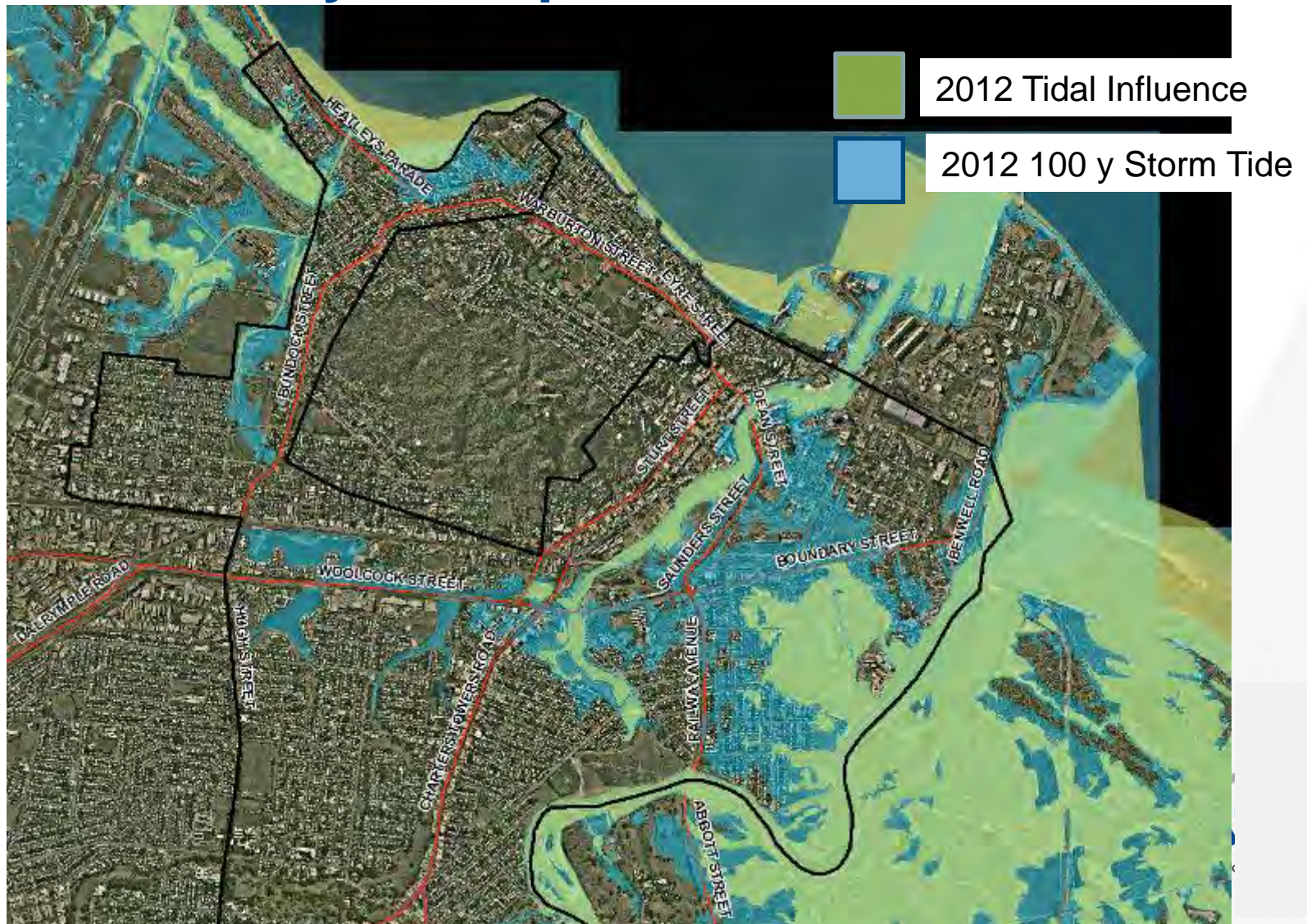
Phases of CHAS development



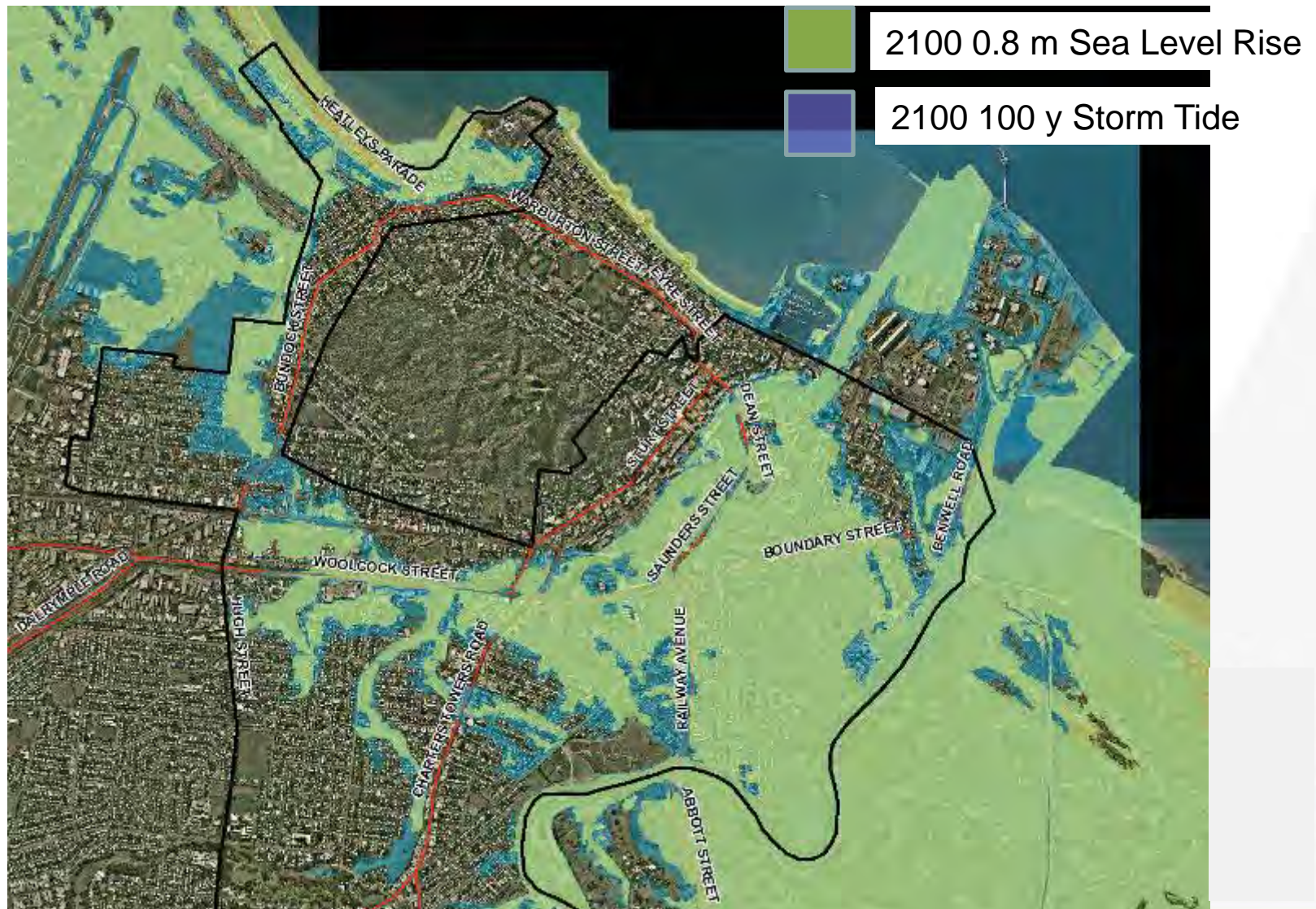
Townsville City Example



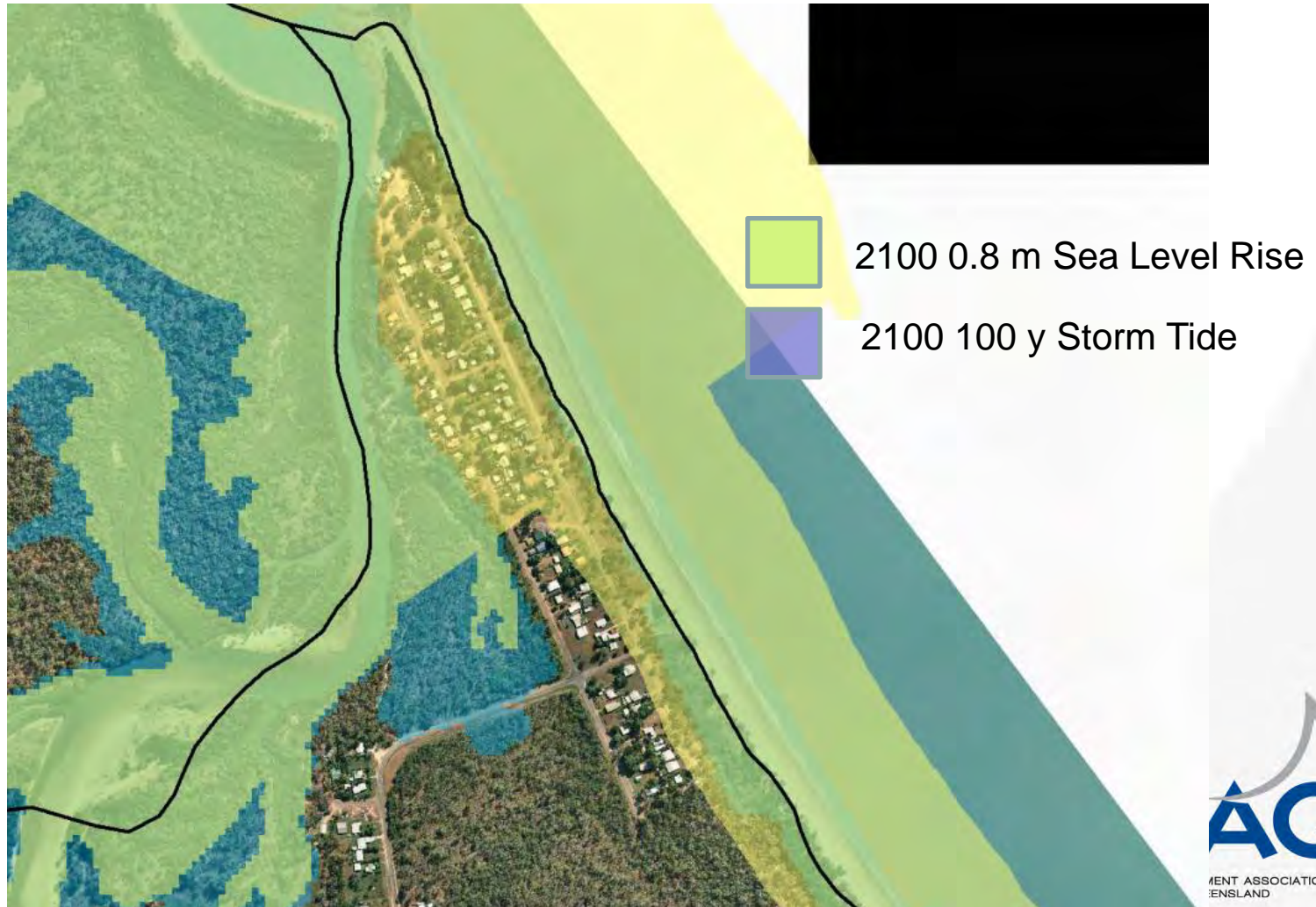
Townsville City Example 2012



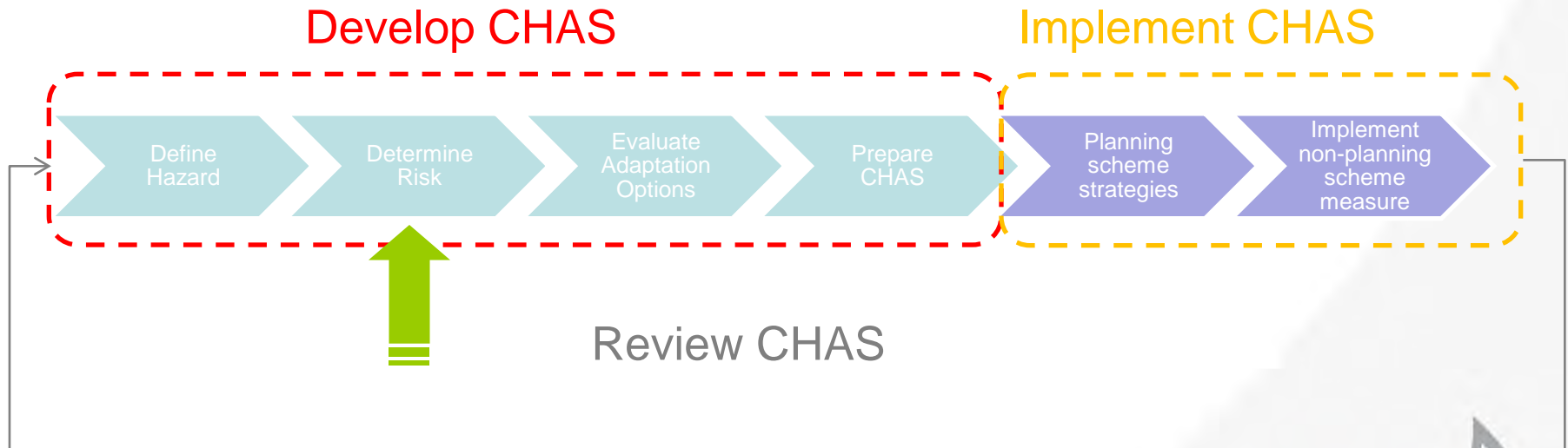
Townsville City Example 2100



Northern Beaches Example at Balgal Beach 2100



Phases of CHAS development



Vulnerability Thresholds - Property

Table 1 Risk to Property risk table – storm tide hazard

Event Range	Residential Buildings - <u>Above floor</u> flooding	Commercial Buildings – <u>Above floor</u> flooding
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100 yr ARI		
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Table 2 Risk to Property risk table – permanent inundation hazard

Permanent Sea Level	Residential Property	Commercial/Industrial Property	Embellished open space (e.g. parkland, natural reserve)
>5% of block inundated			
<5% of block inundated			



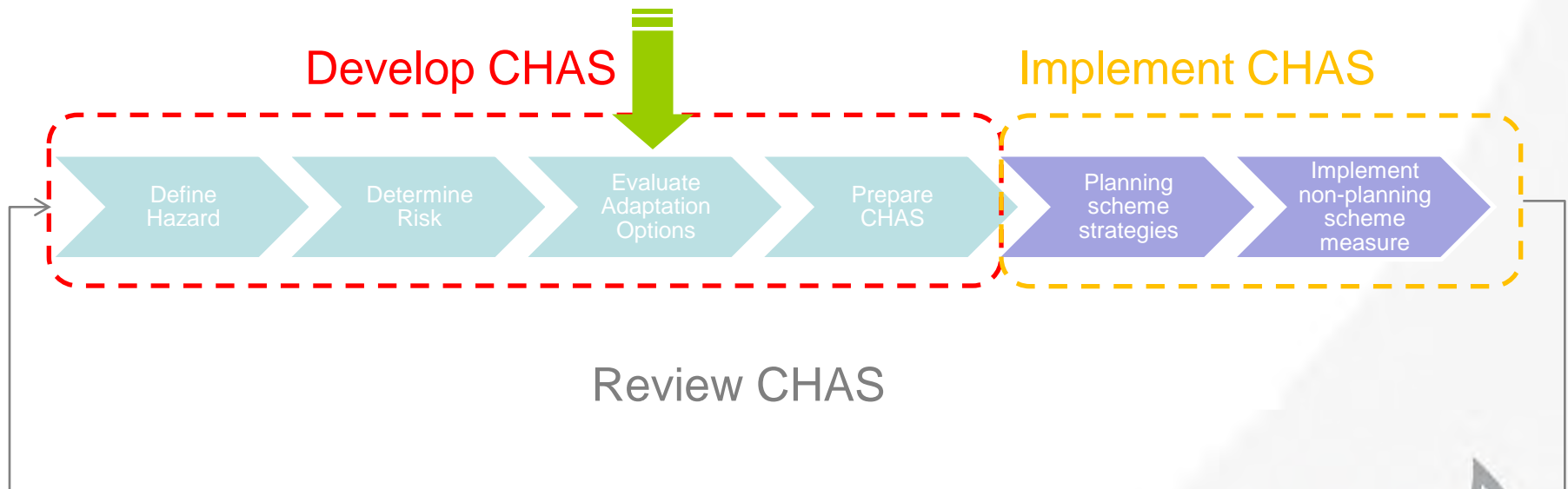
Vulnerability Thresholds - Infrastructure

Table 3 Risk to Infrastructure risk table

Infrastructure Type	Within infrastructure categorisation				
Water Supply	Trunk mains	Reservoirs/ Towers	Water Treatment Plant processing infrastructure	Water Treatment Plant throughput pumps and pipes and mains leading out of WTP	Source (e.g. Dam) and main trunk
Electricity				110/33 kV substation ¹	275/110 kV substation ¹
Telecommunications				Telephone exchanges	
Emergency Services			Minor Evacuation Centre	Station (Police/Fire brigade/Ambulance/SES)	Major Evacuation Centre or Control Centre (Police/Fire brigade/Ambulance/SES)
Cultural Heritage Facilities			Cemetery ¹		Museum/Gallery ¹
Transport/Freight			Main Roads , Rail Lines	Transport Depots, Highway/Motorway	Sea Ports/Airports
Sewage and waste			Sewage pumps and waste tips or landfill	Sewage Treatment Plant and equipment	Sewage Treatment Plant – electrical switch rooms and transformers, chemical storages, pipework
Health services		Medical Centres			Regional Public Hospitals Private Hospitals and aged care facilities Local Public Hospitals
100 year ARI					
Permanent Sea Level (>1% of block inundated)					

¹ Identified using GoogleMaps® and/or local knowledge.

Phases of CHAS development



Evaluation of adaptation options

Stakeholder Consultation

Consultant workshops

26/4 Council Workshop

15/06 Council Stakeholder Workshop

21/06 Councillor Presentation

Economic Analysis

Select the best options

Determine the trigger for the options

CHAS document



Defence Options CBD and Surrounds



MCA Criteria

Criteria	Sub-criteria
Adaptation effectiveness	Reduce severity or cost of inundation on people as well as buildings and community infrastructure
Climate uncertainty	Flexibility to respond to unexpected climate outcomes (upside / downside)
Social and environmental impacts	Impact on access to coastal areas for recreation
	Impact on natural coastal ecosystems
	Indirect economic / industry impacts
	Impact on cultural heritage and landscape
Complexity and cost	Capital cost
	Complexity of implementation
	Operating and maintenance costs

Two benefits of this combined approach:

- MCA is a technique to rank options based on performance against a range of criteria. Allows consideration and economic and non-economic criteria. Criteria can be tailored and weighting adjusted to reflect the values of the community.
- CBA costly, whilst MCA is comparatively low-cost. MCA allows for a broad range of options to be filtered before the best performing are put through the CBA, reducing overall cost.



Prepare CHAS

- Outlines preferred options and alternatives for decision makers
- Provides the basis for integration into planning schemes, infrastructure, operational and asset management plans
- Identifies relevant mechanisms for preferred options (e.g. legislative requirements and approvals)
- Provides a record of considerations and rationale for decisions made at this point in time – important for future reviews



Key Lessons

- Organisational and political buy-in is essential
- CHAS is the first step in an ongoing process – will evolve over time
- Identify and prioritise areas intended for intensification
- Less urgency for some other areas
- Minimum approach can be done cost-effectively
- Cost benefit analysis is useful, but not essential for decision-making

