



## **Technical Report**

# **Designing a climate resilient future: A guide to integrating multiple perspectives in spatial planning**

**Authors: Dr Stephen Clune, Professor John Martin, Professor Ralph Horne**

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## Contents

Executive summary	2
1. Introduction	3
2. Charrette outcomes	3
3. Key findings	6
4. Policy recommendations	10
References	10

## Executive summary

This paper articulates policy recommendations arising from the design-led approach to developing responses to climate adaptation, developed as part of the VCCCAR-funded project, Design-led Decision Support for Regional Climate Change.

The recommendations are intended to facilitate the integration of multiple perspectives in spatial planning. The process for the project is being replicated to assist in regional climate adaptation planning. *Design charrettes*, which involve a range of stakeholders with diverse skill sets from multiple levels of governance, generate context specific spatial plans that could provide effective climate adaptation. The following six recommendations are grouped under the three main aspects of an effective charrette process:

### **Engage and manage multiple perspectives:**

1. Synchronise the charrette with existing planning processes
2. Ensure engagement and representation from multiple perspectives and levels of governance. This includes the recruitment of high level CEO's, representatives from state and local government and the acknowledgement of local stakeholders and their tacit knowledge.

### **Maximise the value of the design-led approach:**

3. Reframe climate adaptation from risks to opportunities
4. Develop context specific solutions and criteria for climate change adaptation at a regional and/or local level.

### **Effective application of design-led findings:**

5. Adaptation and mitigation initiatives are often complementary, however; the potential for adaptation to be part of funded mitigation projects could be explored.
6. Ongoing co-ordination and financing across multiple levels of governance and timeframes is required to ensure cumulative findings contribute to resilient futures.

These recommendations should be read in association with Policy Brief 3.2: Sustainability appraisals of design-led responses to climate adaptation.

# 1 Introduction

This paper draws on the outcomes of an 18-month project Design-led Decision Support for Regional Climate Change, undertaken by RMIT University and funded by the Victorian Centre for Climate Change Adaptation Research (VCCCAR). The project, aimed to use *design charrettes* to support local/regional communities in planning and adapting to future climate impacts. A design charrette is an intensive and creative design workshop in which participants from many disciplines collaborate over several consecutive days on future visioning. Charrette outputs include sketches, visualisations and 3D models, which are generally collated into a summary report of the charrette process. The intent of the summary report is to document the creativity and energy generated by the charrette process, the range of ideas developed and also to demonstrate the potential capacity available in the local community to contribute to adaptive, future thinking. The project designed and delivered charrettes for climate change adaptation in two Victorian communities:

- City of Greater Bendigo: 17 & 18 November 2011 (Charrette I); 26 October 2012 (Charrette II)
- The regional community of Sea Lake: 15 & 16 June 2012 (Charrette I); 19 October 2012 (Charrette II).

The aims / design principles of the charrettes were to:

- establish a community that is safe, i.e. protected from climate hazards
- provide ecological and hydrological systems that are resilient and provide mitigating effects in times of heat and drought as well as during severe rainfall events and floods
- design an urban development strategy, which is based on the natural features of the landscape and is therefore better able to react to climate disasters
- accommodate population and economic growth in a way that acknowledges and incorporates projected climate change impacts, while enhancing spatial quality and sustainability.

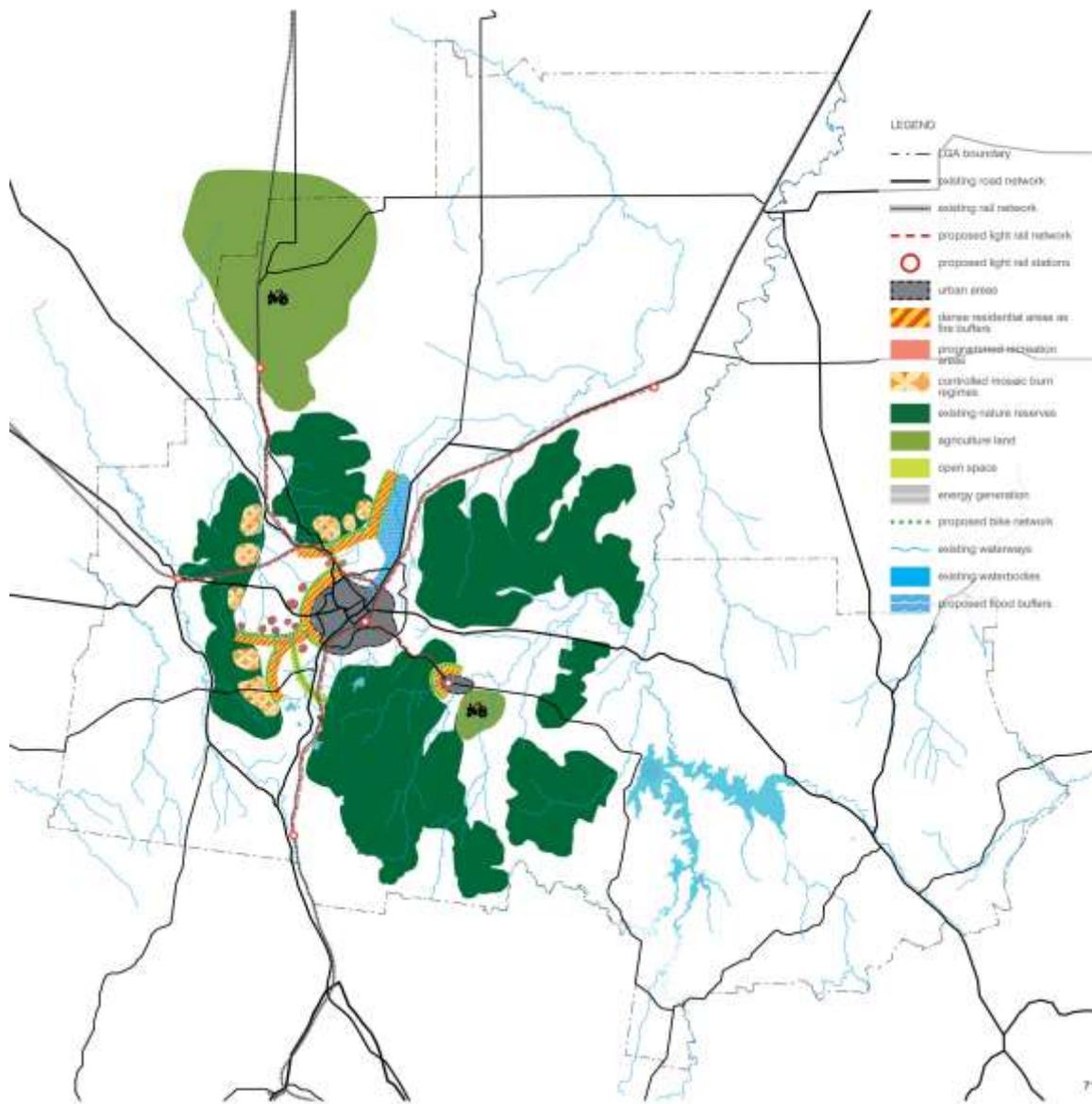
Design charrettes rely heavily on design thinking as a process for solving complex (or wicked) problems. Design thinking involves the synthesis of various, often disparate ideas into multiple plausible solutions. Swann describes the synthesis process as 'intuition, inspirational guesswork and holistic thinking' (2002, p.51). Cross (1989) articulates the difference between design and engineering by suggesting that designers solve complex problems through synthesis in the generation of multiple solutions, 'many quick solutions are generated through continuous on the fly reflection' until one works, whereas in science or engineering, problems are solved through analysis. Design charrettes also places greater value on the tacit local knowledge of participating stakeholders.

## 2 Charrette outcomes

Design concepts resulting from the first charrette in Bendigo indicated a range of common planning themes for a climate adaptive future including: higher density, a strengthened local independent identity via design, integrating renewable energy and the passive design of buildings.

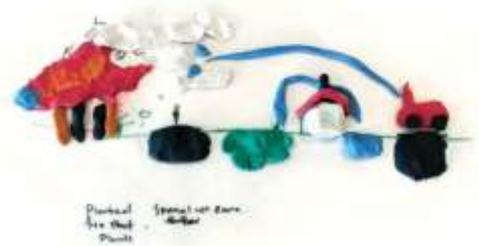
The reframing of climate adaptation from a risk to an opportunity through the charrette process allowed novel solutions to be generated in response to climate risks. For example, the *life saver city* (Figure 1) positioned development on the outskirts of the town that, in combination with integrated open space networks, acted as a fortress protecting the city from fire. The integrated open space includes bike paths and recreation facilities that simultaneously act as a buffer zone, thereby enabling the designed landscape to serve multiple functions.

The notion of creating landscapes with multiple functions was a specific focus of Charrette II, which attempted to integrate the outcomes of Charrette I in the development plan for a new industrial zone in Marong Business Park.



**KEY DESIGN PRINCIPLES**

- Almost a "fortress":
  - Build urban centres with protective high density housing on the outer edges and in the centres
- Developing a housing typology more resistant to bushfires:
  - "Eva-curate" strategy
  - High density housing on urban fringes become "lifesaver"
  - Typical cross-section of a high-density residential neighbourhood:



Integrated open space network and road corridors become natural fire buffers for housing units and fire-fighting zones during bushfires

- Controlled burns and planting for fire-management
- Energy self-sufficiency:
  - Combined corridors of open spaces and green infrastructure
- Improved public transport network by encouraging rail and light-rail systems
- Flood buffers outside urban areas to reduce flooding

**Figure 1. The lifesaver region, one of four final outcomes of Bendigo Design Charrette I**

The outcomes of the Sea Lake charrette eventuated in a strategy for Advance Sea Lake Inc. (a community activist group) to mobilise that would finance landscaping and building retrofits for climate adaptation within the town centre, and reverse population decline. Figure presents an impression of a tourist information app for the region that would generate income and population throughput to the town.

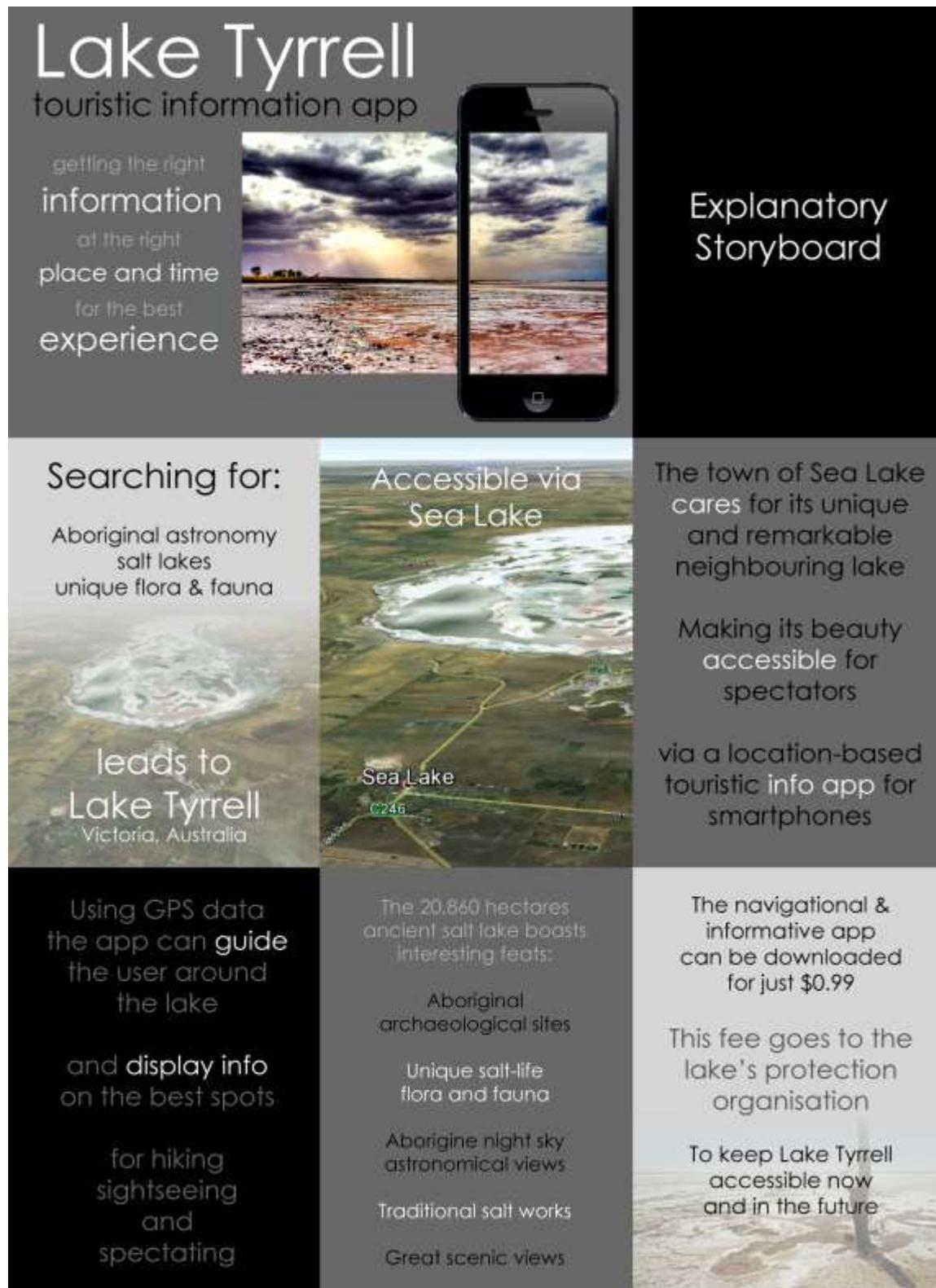


Figure 2. Artistic impression of proposed Advance Sea Lake smart phone application

### 3 Key findings

Six key findings emerged from the design-led charrettes that have implications for a range of policy makers at the local and regional scale. Each finding relates to one of three broader categories that have been identified as central to the planning and delivery of a successful charrette:

1. engage and manage multiple perspectives
2. maximise the value of the design-led approach
3. implications of design-led spatial plans.

#### 3.1 Engage and manage multiple perspectives

The importance of engaging local council in a design-led perspective on climate change has been identified as a key component in the successful engagement and management of multiple perspectives. In this respect, findings indicate that this local council engagement should:

1. synchronise with existing planning processes
2. include representation from multiple perspectives and levels of governance.

##### **Synchronise with existing planning processes**

Synchronisation of the design charrette within existing planning processes can more effectively engage councils by identifying where the charrette can address a gap or provide an answer to a specific question in the regular planning process. Clear connections and integration of the charrette with existing planning processes, rather than viewing it as a stand-alone exercise, increases the likelihood of successful engagement and the generation of ongoing commitment and enthusiasm.

It is considered more advantageous to organising a design charrette at the beginning of regular planning processes, before critical decisions that relate to climate adaptation are locked in. This increases the value and effectiveness of the charrette and allows new ideas to emerge at a time when they can be incorporated more easily into the planning process.

##### **Include representation from multiple perspectives and levels of governance**

Ensure the contact person in council is the CEO or has direct access to the CEO. A design-led charrette engages local government staff and the community in a process of learning which discusses planning futures at both neighbourhood and regional scales. As such, many interesting and challenging topics are likely to be raised. It is important that the CEO is aware of the scope of the charrette and is able to brief councillors and staff accordingly and with appropriate lead time. Ideally, the CEO would attend the charrette and encourage relevant staff and stakeholders to participate thereby maximising opportunities for new and innovative ideas to surface in relation to climate adaptation planning for the community.

Ensure representation from relevant state government departments and agencies. Climate change adaptation requires planning and coordination at both state and local government levels. Appropriate state government officers can bring considerable professional expertise and understanding to a design-led charrette as well as awareness of state government public policy relevant to the development and implementation of adaptation strategies at the local level. Historically, the impacts of climate related events in Victoria have been addressed through collaborative efforts by both state and local governments.

Recognise the value of tacit knowledge within the community. One of the key reasons why participants reportedly enjoy the charrette process is that it asks them to call on their tacit, or 'taken

for granted' knowledge, of the neighbourhood, community and region in which they live. It is often surprising just how much knowledge and awareness people have about their locality and the impact of weather and climatic events in the area. A well facilitated charrette moves from asking individuals to broadly reflect on possible adaptation options to small, focused group discussion about the details and implications of these options. Through this process of individual reflection to group discussion, participants typically share information that they may not have previously regarded relevant. It is important to acknowledge this tacit knowledge from multiple perspectives throughout the process as it constitutes one of the key elements of a successful charrette.

### **3.2 Maximising the value of the design-led approach**

To ensure maximum value of the design-led charrette in terms of offering new perspective and frames for climate adaptation, it is important to:

1. reframe climate adaptation from risks to opportunities
2. develop context specific solutions and criteria for climate change adaptation at a regional and/or local level.

#### **Reframe climate adaptation from risks to opportunity**

While the risks and consequences of climate change cannot be downplayed, the novelty of the design charrette as a planning approach lies in its ability to reframe climate adaptation as a potential opportunity as opposed to a risk. Designing spatial plans based on the natural features of the landscape can increase communities' resilience and their capacity to adapt to climate related events. The design-led process identified *no regret solutions* that would be of benefit to the community irrespective of a climate changed future, such as the recreational zones on the edge of town that provide open space and bushfire buffer zone.

#### **Develop context specific solutions and criteria for climate change adaptation at a regional and/or local level**

The outcomes of the charrettes highlighted the value in addressing climate adaptation at a regional and local scale to enable the participatory development of:

- (1) context specific scenarios
- (2) criteria for 'good adaptation'.

Context specific criteria are equally as valuable as design outcomes. The criteria developed during the second Bendigo charrette are shown in Table 1. They have been generated in a participatory manner within local council with cross-departmental engagement and buy-in, and have the ability to serve as future planning criteria in association with the design outcomes.

**Table 1. Development criteria and appraisal for Marong Business Park from Charrette II**

<b>Must have</b>	<b>Nice-to-have</b>	<b>Maladaptive – to be avoided</b>
<b>ENERGY:</b> Integrated energy system on-site; Energy security of supply (secure for 24/7 operation if grid fails); Demand Side Management	<b>FLOODING:</b> Flood prone tendency becomes an advantage. Site provides a buffer before the next town for water filtration.	<b>WIND:</b> Avoid wind tunnels in hot south westerlies
<b>TRANSPORT CONNECTIVITY:</b> Transport and logistics centre; Walking and bike path, light rail, electric bus; <b>MULTIPLE CONNECTIONS TO Marong and Maiden Gully residents</b>	<b>DESIGN INTEGRATION:</b> Landscape system to support industrial system. Multifunctional landscape features i.e. wetlands may assist to treat stormwater).	<b>RISK MANAGEMENT:</b> Failure of engineered system in severe climate events; e.g. water inundation, drought and or severe heat waves
<b>WATER:</b> WSUD; Hydrology zoned and contained resilient storage capacity.	<b>WASTE/ENERGY/WATER:</b> Waste management and integration on site; Self-sufficient in energy, water, 24/7	<b>POST-PEAK OIL AND MITIGATION:</b> Reliance on fossil fuels for transport, Avoid GHG intensive uses/design
	<b>INNOVATIVE INTERNAL COHESION:</b> Flexibility and adaptability of plot uses, and integration with industry cycles; Maximise benefits of co-location; Industrial Ecology for value added businesses.	
	<b>REGIONAL CONNECTIVITY,</b> a focus for regional industries	

### 3.3 Implications of design-led spatial plans

Charrettes can generate multiple climate adaptation design concepts and solutions. To increase their relevance and applicability for future implementation, our findings indicate that:

1. adaptation and mitigation efforts should be complementary
2. ongoing coordination and financing across multiple levels of government and timeframes is required to ensure resilient futures.

#### **Adaption and mitigation should be complementary**

Despite the design-led project focusing exclusively on climate adaptation, many adaptation solutions doubled as mitigation measures from both charrettes. For example, renewable and distributed energy may provide a more resilient power form for Marong Business Park (Bendigo Charrette) as well as reduce CO<sub>2</sub>-eq emissions. Passive design and landscaping to reduce the heat island effect may reduce the perceived need for air conditioning, which also reduces energy use and CO<sub>2</sub>-eq emissions.

In Australia, the trading of carbon credits tends to favour overseas initiatives, as opposed to local initiatives. A significant constraint to the implementation of identified adaptation initiatives from the charrette (specifically Sea Lake) is, reportedly, lack of capital. A framework and incentives to finance local initiatives that reduce CO<sub>2</sub>-eq emissions is desirable, and could progress adaptation to climate change when mitigation and adaptation appear complimentary.

Equally important is identifying mechanisms that may reduce the development of maladaptive initiatives, which may be inherent in the *business as usual* scenario for Victorian regions.

#### **Ongoing co-ordination and financing across multiple levels of governance and timeframes to ensure resilient futures**

Initiatives for climate adaptation are not 'fit and forget' solutions. The scenarios developed by the local councils in all charrettes involved various timescales and would require input from various levels of government if they are to be realised. For example, the Sea Lake Charrette identified short, near and long term goals that would require a committed, multi-level strategy and funding over time in order to realise

The Sea Lake Charrette identified six themes that encompassed their Climate Adaptation initiatives. (1) Land use and agriculture, (2) Lake Tyrell, Green Lake and Tourism, (3) Renewed Town Centre and Community Garden, (4) Silo and Railway Station Redevelopment including Art Precinct, (5) Aged Care Accommodation and Services, and (6) Education Development and Accommodation. Table 2 lists the initiatives from theme 2 and illustrates the diverse range of stakeholders that may need to be engaged over various timescales in the process of implementing the outcomes of one theme.

**Table 2. Theme 2: Lake Tyrell and Green Lake tourism from the Sea Lake Charrette**

Theme	Proposed initiatives	Relevant stakeholder	Timing
2. Lake Tyrell, Green Lake and tourism	Eco lodge for Tyrell or Green lake, Site seeing air tours, Co-ordinated Farm stays for visitors promoting Lake Tyrell's heritage	Developers and entrepreneurs, Buloke Shire Council, Tourism Victoria, DBI Tourism & Aviation, Air B&B, Advance Sea Lake inc, & Green Lake committee	Potential near term and medium term
	Restoration of Green Lake	Green Lake committee & Buloke Shire Council	Progression on current initiatives, Near term
	Promote Aboriginal heritage (30,000 year evidence of aboriginal population); astronomy: Aboriginal night skies (first documented aboriginal astronomy in 1857 at Lake Tyrell from Boorong people); opera under the stars – planetarium/ observatory	Advance Sea Lake inc, Tourism Victoria, DPCD (Aboriginal affairs), Victorian Aboriginal Heritage Council, local elders and indigenous people, Tyrell College, Buloke Shire Council, Sea Lake tourist information centre, potential developers	Progression on current initiatives, near, medium and long term
	Vegetation protected, biolinks expanded and biodiversity increased	Sea Lake Landcare/VFF, local landowners, DPI, DCEE (CFI), DSE, BCG	Progression on current initiatives
	Cycle tracks to and around Lake Tyrell and Green Lake, Cyclo-cross (mountain bike) event like Mallee Rally	Tourism Victoria, Advance Sea lake Inc, Mallee Rally Committee, DoT, DSE, Buloke Shire Council, cycling Victoria, sporting clubs	Near - medium term
	Sculpture park connecting sea lake to lakes, with an exhibition of statues and art through sea; lake and Tyrell, (residencies for artists)	Tourism Victoria, Arts Victoria, Culture Victoria, Advance Sea Lake inc, community groups, Sea Lake beautification committee, DSE	Near - medium term
	Lake Tyrell salt works employment	Cheetham Salt Works, DPI, Buloke Shire Council	Progression on current initiatives
	Public transport to Sea Lake on weekends, using school bus on weekends	DoT, V/line, private bus company, Buloke Shire Council	Medium term
	Educational tourism, astronomy, science tourism, schools and camps, Educational support material, smart phone application collating sea lake science, stories and education	Advance Sea Lake, Tourism Victoria, Sea Lake tourist information, DPCD (Aboriginal affairs), Victorian Aboriginal Heritage Council, local elders and indigenous people, Tyrell College, Buloke Shire Council, centre, Australian Centre for Astrobiology, Macquarie University, DEECD, DPI	Mix of near and medium term initiatives

Given the large number of potential stakeholders, co-ordination between multiple entities is required to foster and facilitate effective collaboration on project proposals that could benefit from existing (and future) funding opportunities within state departments and the private sector. A direct outcome of the Sea Lake Charrette has been the selection by Advance Sea Lake Inc. (local community group) two small but manageable initiatives from Table 1 to pursue - the development of an educational tourism smart phone app for the region; and supporting the restoration of Green Lake. With co-ordinated effort and funding, a broader number of the initiatives identified during the charrette could be implemented.

## 4 Policy recommendations

Based on the key findings from this project, the following recommendations are provided to assist policy makers, predominately at a regional planning level to deliver climate resilient futures. The mobilisation of adaptation plans requires co-ordination across multiple levels of governance.

### **Engage and manage multiple perspectives:**

1. Synchronise the charrette with existing planning processes
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### **Maximise the value of the design-led approach:**

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### **Effective application of design-led findings:**

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