

Climate Change Adaptation Research Grants Program

- Settlements and Infrastructure Projects

Project title:

Development of tools that allow local governments to translate climate change impacts on assets into strategic and operational financial and asset management plans.

Principal investigators:

Dr. Jacqueline Balston

Lead organisation:

Local Government Association of SA

Objectives:

The objectives of the project are to: identify key council assets vulnerable to climate change; determine the likely impacts of climate change on council assets; undertake an extensive financial risk modelling exercise including full life-cycle economic analysis of the various options for councils to reduce climate change asset risk; develop the necessary modifications to existing asset management and financial sustainability tools so that councils may evaluate various climate change action scenarios at the management planning level; guide service level standards.

Project design and methods:

This project will be a collaboration between the University of South Australia (UniSA), Local Government Association South Australia (LGASA), Western Australian Local Government Association (WALGA), the Institute of Public Works and Engineers Australia (IPWEA) and Municipal Association Victoria (MAV) with support and input from eight case study councils across southern Australia that represent city, rural and coastal communities.

The project will have five key stages:

1. Identify climate change scenarios – The climate change SRES scenarios and projection years used for the project will be determined based on the latest climate change science in collaboration with CSIRO and BOM researchers. Likely changes to average climate and extreme climatic event return periods at suitable spatial and temporal scales will be identified for the eight case study council areas.

2. Determine asset vulnerability – In the second stage, the project has the capacity to link with three other projects: the LGA's Mutual Liability Scheme (MLS) Climate Change Risk Assessment, the Premier's Science and Research Fund TREND project and the LGA Reform Fund Climate Change Audit. Each of these projects is either underway or will be running concurrently and could provide valuable information on vulnerable council assets (more details in the linkages section). The key council assets that are likely to be affected by changes to the climate will be identified on the basis of data provided by IPWEA, a GIS and engineering assessment of partner council areas, results from the MLS assessment, Reform Fund audit, TREND audit and an extensive literature review. The likely impact of the identified climate changes on those vulnerable assets will then be examined and quantified.

3. Financial modelling – Existing models and tools that are used to determine the financial outcomes from highly variable economic environments such as options pricing and uncertainty analysis will be modified to incorporate variables that would allow for the analysis of climate change impacts on vulnerable assets. The financial decision and risk modelling software developed will include full economic, risk and uncertainty analyses in a generic framework to allow for the input of identified climate and adaptation options. The model developed will provide a cost analysis of various scenarios and options and will output hard financial data that can input to other council financial and asset management tools. Outputs from the financial modelling will include likely changes to asset life span and maintenance, costs and benefits for various climate change adaptation actions, and the dimensions of risk and uncertainty associated with them. Although validated for the winter rainfall dominant temperate climates of southern Australia, the outputs of the project will be generic in nature and allow councils to input their climate specific, site specific and infrastructure specific variables. The model

will be integrated into existing operational and strategic business / asset management planning software currently used by councils Australia wide. Currently there are no such instruments available to councils that will translate the impacts of climate change into their financial and asset management tools.

4. *Development of financial and asset management tools* – The financial sustainability and asset management tools that are currently used by councils will be reviewed and further enhanced as appropriate to accommodate the outputs from the financial model in a user friendly format. Supporting documentation and training packages to assist councils to undertake the analysis will be developed.

5. *Council trials* – The new financial and asset management tools and supporting materials will be trialled by the eight case study councils from across southern Australia using real data. Feedback from trials will be incorporated in the final revisions of software, documentation and workshop materials to be released at the end of the project.

Each of the stages will be undertaken in collaboration with key advisory researchers from CSIRO, BOM, IPWEA, financial and economic modellers and climate change impact and adaptation researchers via a project technical panel, as well as the eight council partners. Stages of the project and major milestones are outlined in the Gantt chart on the next page.