Research and Innovation Fund
Awarded Projects 2019/2020

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Background

The aim of the LGNSW Research and Innovation Fund is to support new areas of research, policy development and innovation for the advancement of local government in NSW. Its purpose is to fill gaps in the evidence base, explore emerging issues, promote informed discussion and debate, and encourage the development of research capacity within the sector.

Councils were invited to put forward proposals by 25 September 2019 for new research, policy development and innovation in the following fields:

- Water management (e.g. supply, quality)
- Infrastructure (e.g. digital technology, asset)
- Environment (e.g. waste management, rehabilitation, climate change)
- Economy (e.g. population, economic development)
- Community and Social (e.g. engagement, new services).

Criteria for success within this fund were stated as:

- Alignment with the LGNSW Policy Principles
- Alignment with nominated areas of research
- Important for NSW local government
- Will generate new knowledge or innovation
- Involves active council contributions; and
- Capacity to attract other project partners.

Fifteen (15) Expressions of Interest were received from Joint Organisations and metropolitan and regional councils. An Advisory Committee assessed these proposals, three projects were short-listed and all councils were invited to express their interest in collaborating as an industry partner.

Following this consultation, two projects were selected for funding in 2019/20.

AWARDED PROJECT 1

Council	**Willoughby City Council**
Contact name	Greg McDonald
Title	Planning & Infrastructure Director
Contact details	greg.mcdonald@willoughby.nsw.gov.au 02 9777 7701
Project name	**Move my way – giving the community real-time data to make better informed transport choices**
Your Council's Cash Contribution	$50,000
Your Council's In-kind Contribution	$20,000

Describe the type/s of In-kind contributions your Council will make.

Access to street space, staff, council's design lab and council data sets. In addition to contributing $50k, Willoughby City Council will work partner iMOVE who are able to contribute $80k.

Project Overview

The project will use the Chatswood central business district as a living laboratory, deploying sensors to collect new data as well as collating existing data held in fragmented ownership by government, industry and community data custodians. A local transport data community will be developed, with appropriate privacy and sharing policies to protect the rights of participants and the community.

The project's objectives are:

i) Identify data assets that can be made available to the community

ii) Develop open source tools to analyse the data to offer insights to inform decision making

iii) Create a scalable approach to be used by any council in NSW iv

iv) Create an approach that can anticipate different centre types and remains fit for purpose as these centres change over time

v) Create a financial model that spreads the cost of operating the program across a number of benefices to limit the financial impact on ratepayers.

The research methodology will be developed by the iMOVE Co-operative Research Centre, supported by its partner universities. iMOVE is a consortium of 44 industry, government, and research partners engaged in a concerted 10-year effort to improve Australia's transport systems through collaborative R&D projects. iMOVE will build on the body of knowledge in the sector and will use an agile research approach, delivering the project in stages, selecting the right academic partners to work on the project as it evolves over time.

Stage 1 – data identification and categorisation

Stage 2 – data structure and definitions

Stage 3 – data sharing and financial sustainability

Stage 4 – data analytics and tool development

Stage 5 – documentation and briefings to stakeholders including other councils

What is the problem your research project is trying to solve?

This project will create solutions to congestion and promote diverse types of movement. Car related congestion wastes time, creates emissions and reduces the attractiveness of places.

A person's decision to drive is often made without an understanding of:

- all of the transport options available to them,
- the congestion likely to be experienced on their journey and
- the availability of parking at their destination.

Our research project will create an open source, real-time data catalogue and analytics toolkit. Possible use cases for this are for these to be made available to the community, businesses, software developers and researchers to develop products and services to promote better transport choices. The use of data will provide significant information to gaps of understanding in movement and place.

What would be impact of resolving that problem?

Congestion in our local centres can cost local communities many millions of dollars in lost productivity, car running costs and vehicle exhaust emissions. By creating tools that reduce congestion by enabling better informed community choices we will:

- Reduce the reliance on private motor vehicles, improving rates of public transport, shared transport and active transport
- Reduce emission related pollution and improve the attractiveness of local centres promoting visitation and local commerce
- Communicate congestion and capacity constraints to encourage those who have flexibility in movement options to avoid problem areas and times
- Develop a data driven approach to transport planning, regulatory reform and investment to support the implementation of future focused technologies such as electric vehicle charging stations, autonomous vehicle zones, shared and on demand transport

How will your research drive innovation in local government?

The research will support local government's role as the convener of local innovation where there are many partners unable to act without local leadership. The project will provide tools and products that can be used by multiple councils across NSW and will be a demonstration project on how other levels of government and the private sector can work with a Council to deliver community outcomes.

It is very common for a Council's community strategic plan consultation to identify congestion and parking as an issue. The project will show that data driven innovation can address these issues without the need for costly, additional car park investment.

The approach of empowering communities to make decisions places the community at the centre of the solution and encourages the many public and private stakeholders to work together to solve local problems.

The project aligns to the LGNSW policy principles:

- Economic – Promotes commerce, improves productivity
- Infrastructure – Reduces the need for additional investment, better utilises assets
- Planning – Informs planning decisions and modelling
- Environment – Reduces pollution and prepares for the use of cleaner mobility options
- Social and community – Promotes choice and more accessible transport options

• Governance – Asserts the role of local government and develops new approaches to share data, develop and fund solutions • Accountability – Allows for the transparent measurement of transport option performance.	
Policy Principles	Economic, Infrastructure, Planning, Environment, Social and Community, Governance, Accountability
Field of research	Infrastructure, Environment, Economy, Community and Social
Your Council's role in this research	
Council will co-design the solution with researches, clearly articulating the problems and opportunities to be addressed by delivering the project. Council will manage stakeholder engagement including providing advice on how the solution can be scaled across NSW.	
Potential partners – Councils, Businesses and Community	
Transport for NSW as project contributors Central Coast Council and other councils along the pacific highway corridor whose community access the highway as project collaborators iMOVE with other university partners as project contributors.	
Potential University Partners	iMOVE's partners include UTS, UNSW, Sydney University, Newcastle University https://imoveaustralia.com/
Supporting documents	
None	

AWARDED PROJECT – 2

Council	**Central Coast Council**
Contact name	Matthew Hingee
Title	Ecologist/Strategic Environmental Planner
Contact details	Matthew.Hingee@centralcoast.nsw.gov.au 02 43258269
Project name	**Developing a Maximum Benefit Framework for Urban Greening**
Your Council's Cash Contribution	$30,000
Your Council's In-kind Contribution	$86,000

Describe the type/s of In-kind contributions your Council will make

Council will allocate 10% of staff time for an Environmental Planner and 5% of the Principal Environmental Planner to support the project. These staff members will communicate the results of the research with Council's operational staff. Council will also grow, plant and maintain urban trees to be used for the field experimental aspects of the research. The Council staff hold PhD qualifications thus will also act as associate supervisors of the PhD and Honours students and would also be co-authors on any research where they have made a significant intellectual contribution to.

Council's engagement team will also engage with the community throughout the project on what the project is about, the results to date and how the community can be involved through Citizen Science aspects.

Project Overview

The project will develop a maximum benefit matrix for selecting the most suitable species for a planting site. This would be resourced through engaging a Doctor of Philosophy (PhD) student for three years, supported under a scholarship offered to a student with exemplar undergraduate grades to complete the experimental components of the project, namely investigating flammability and drought effects on plantings.

Research methodology would include flammability studies to investigate variation in combustion temperatures of different plant species. Glasshouse studies would investigate the influence of drought and increasing temperature on plant growth. Whilst field studies would investigate effects of different planting preparation regimes on plant growth and determine which plant species provide the greatest benefits to biodiversity. The social science component would survey local residents in a randomised manner to understand community perspectives and negative perceptions on urban planting.

If the funding is successful, the University of Technology Sydney (UTS) would provide a suitable student with a PhD scholarship for three years with a total value of $81,000. The project would also appoint a Bachelor of Science (Honours) student to complete a one-year project on the biodiversity benefits from urban plantings which would also involve community members on Citizen Science projects. Council staff would complement this research through undertaking a social science project focusing community values associated with urban planting.

This project will focus on the selection of native plant species for residential garden, public gardens and roadside plantings in the urban environment and the urban-bushland interface. The project will also determine appropriate native species for planting on the

Central Coast which benefit the conservation of biodiversity and best deliver ecosystem service goals related to use by indicator fauna species and for bushfire mitigation.

What is the problem your research project is trying to solve?

This project aims to address the uncertainty of determining the most suitable trees and large shrubs to plant through urban greening projects, referred to as a maximum benefit framework. This uncertainty occurs due to a changing climate with more frequent drought, community concern that planting will increase bushfire risk and a perception among some members of the community that trees are dangerous or create mess. There is a strong push for urban greening by government and the community, as reflected through initiatives such as the NSW Government's Greener Places Policy and the 20/2020 Vision, which proposes a 20% increase in greenspace by 2020. This is due to the multiple benefits that urban greening creates, including mitigating climate change impacts, improving property values and providing habitat for urban wildlife. Community ownership is also important, which occurs through community empowerment, for example through involvement in Citizen Science projects.

Urban areas are often affected by bushfires, which may result in property loss and damage. Some authors have proposed using trees and shrubs with 'glossy' leaves to act as 'ember curtains' in fire prone regions, as ember attack is one of the main avenues of property loss from bushfire. Through planting of low-flammability trees and shrubs with dense branches, it is often proposed that these would catch the embers before they reach property, however little evidence is available to support this.

Council has already committed to planting two trees for each one that it removes which will account for the planting of over 4000 trees per year. In addition, Council's Greener Places Strategy proposes addressing serious Urban Heat Islands in 19 Priority Urban Suburbs. This will account for upwards of a further 20,000 trees and large shrubs to be planted over the next 5-10 years. Council has significant investments in ensuring that these plantings survive into the future. As such Council needs to understand what species are best for planting in terms of survival, are of low flammability, resilient to future climate change, benefit urban biodiversity, mitigate urban heat and meets community values. Some work towards this problem has already been completed through the What Plant Where program, led by Macquarie University and Western Sydney University. This has developed distribution models for commonly planted trees, however these are not field validated yet and do not consider flammability and use of these plants to stop the spread of embers into urban areas.

While a large proportion of the community supports Council's Greening Vision, not everyone is engaged or fully supports this initiative. As such Council requires a more detailed understanding of reasons why some individuals do not support living in a greener neighbourhood. Some of these reasons are thought to include a perception of trees being a serious risk to life and property or due to the amount of mess that trees generate. As such, this project will also address plant species selection that meets community values.

What would be impact of resolving that problem?

The following outcomes from resolving the problem include:

1. Development of a maximum benefit matrix for selecting the most suitable species for the planting site. This relates to effective place-based planning based on leaf flammability, drought resistance, community acceptance and biodiversity benefits.
2. Understand the flammability of different plant species as a way of determining the most effective way to establish ember curtains as a mechanism to mitigate bushfire impacts on properties.

3. Determine why certain members of the community have a strong dislike for trees and ways to overcome this.
4. Develop a model program for Citizen Science where data collected by the community can contribute to quality datasets that can be used for expanding our scientific knowledge.
5. Determine which species have the maximum benefit for biodiversity and ecosystem function in urban areas.

How will your research drive innovation in local government?

The following outcomes would occur:

- Provide a list of suitable and appropriate native species for planting that benefit conservation of biodiversity and provide bushfire mitigation through establishment of ember curtains.
- Improved understanding of how to engage with the community for large-scale urban planting programs.
- Reduce naturalisation to invasion pathways for ornamental plants.
- Develop best practice climate change mitigation.
- Provide a framework for involving volunteer 'citizen scientists' in real world research led by a University.

Policy Principles	Planning, Environment, Social and Community
Field of research	Environment, Community and Social

Your Council's role in this research

Council will provide:

- Co-supervision for the PhD and Honours students.
- Coordinate the provision of volunteers to the PhD and Honours student for completion of Citizen Science projects.
- Provide land access, propagate, plant and maintain plants to be used in the experiment.
- Complete social science research project with in-house staff.
- Provide liaison between research and on-ground implementation, including coordination of workshops.
- Provide industry focus to the research to ensure applicability across local government and horticultural industries.

Potential partners - Councils, Businesses and Community

Council has active partnerships with the community group, Grow Urban Shade Trees (GUST). GUST was established around three years ago and has since planted over 200 street trees on the Woy Woy peninsula to address the shortage of shade trees in this area. GUST has indicated an interest in being involved in this project through participating in Citizen Science projects.

Council also has active partnerships with the Community Environment Network (CEN) who complete Council's Water watch program and support private landholders through Land for Wildlife. Council would engage with CEN in developing Citizen Science projects associated with this research program. Council also commits over $1M per year to supporting 80 Landcare groups in the LGA. These volunteers would be approached to

determine if they wish to be part of this research program through measuring planted trees.	
Potential University Partners	Academics from the University of Technology (Sydney) have completed a workshop with Council's Environmental Planning staff. The results of the workshop have been included in the attached research proposal.
Supporting documents	
Developing a Sustainable Biodiversity Approach for Urban Greening in the Central Coast	