

APPROVAL HISTORY

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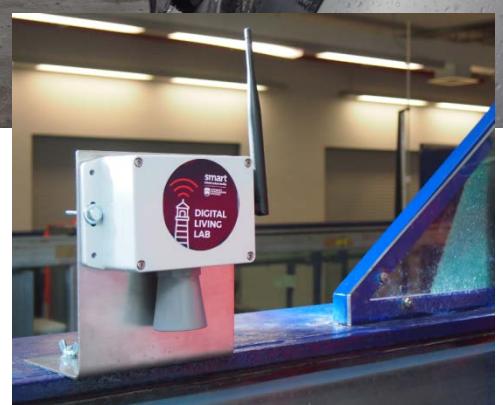


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EXECUTIVE SUMMARY

With 85 percent of Australians living within 50km of coastal areas and waterways, their communities have resigned themselves to the realities of weather extremes such as floods and storms impacting their towns and businesses.

Over the past 50 years the Illawarra-Shoalhaven region has experienced 30 floods classified as serious, severe or very severe and three classified as extreme. It is well placed to apply its experiences to help improve public safety and water management outcomes around these events.

Coordinated by the Illawarra-Shoalhaven Joint Organisation endorsed Smart Region Strategy, the four Councils within this region have developed a framework to apply smart technologies to address pressing regional challenges, improve regional competitiveness and deliver a superior experience for locals and visitors alike.

The ISJO Councils have formed an unprecedented partnership with the University of Wollongong (UOW) and corporate property group Lend Lease, to break new ground in the field of innovative water management. Water management is an area of key community concern and is identified in the Smart Region Strategy as an area warranting early investment in smart technologies.

The **SMART WATER MANAGEMENT** project will use new smart technologies and develop data analytics to help improve water quality, flood mitigation and ensure community safety in flash flood events.

The project will be delivered through five components:

- 1) **Stop Block:** Improved stormwater culvert blockage management and analytics including new rugged sensors
- 2) **Flood Aware:** A new information platform for the public to provide warnings and other information to reduce risk to life and property
- 3) **Go Flow:** New estuary management solutions including sensors and cameras to reduce flooding
- 4) **Quality Watch:** New water quality monitoring stations including custom technology, sensors and a regional Internet of Things network at Lend Lease's Calderwood development
- 5) **Pollution Stop:** Improved water quality with new sensing devices and analytics in monitoring stations including changes to management of gross pollution traps

The project will also:

- Extend and augment the coverage offered by UOW-hosted Digital Living Lab **Internet of Things (IoT) radio communication network**. Currently servicing the Wollongong and Shoalhaven local government areas, this open-source platform provides a 'hacking space' for citizens, entrepreneurs, researchers and students to apply smart technologies in novel applications to resolve real-world challenges.
- Through the UOW **Smarter Schools for a Smarter Planet** program, provide ten regional high schools with the opportunity to gain skills in the construction and uses of smart technologies by building and providing the sensors used in this project and educating student about Internet of Things (IoT) technologies and the water management issues being analysed by these technologies.

1 PROJECT BACKGROUND

The Illawarra-Shoalhaven region, coordinated by the Illawarra-Shoalhaven Joint Organisation (ISJO), has established a strategic framework to leverage smart technologies to deliver a range of economic, social and environmental benefits across the region. This strategy, the Illawarra-Shoalhaven Joint Organisation (ISJO) Smart Region Strategy is included as Appendix 1 to this document.

The Smart Water Management project is an identified ‘lighthouse project’ within this strategy; providing a catalysing platform to demonstrate to the regional community how the deployment of smart technology can help to enhance the natural environment, community liveability and build resilient communities and urban infrastructure.

The management of stormwater is a key responsibility for local governments and major challenge to consider in planning for urban growth to address Australia’s ever-expanding population. Annually, significant investment is required to manage our waterways and install, renew and upgrade stormwater infrastructure; ensuring that this infrastructure continues to achieve the twin objectives of safely conveying stormwater to local waterways while minimising the impact on the water quality. With a modest investment smart technology; this previously ‘inert’ infrastructure will come alive as ‘living labs’ to provide valuable data back to both infrastructure managers and the local communities that they service.

The purpose of the Smart Water Management project is to invest in smart technology solutions to respond to stormwater management challenges affecting the Illawarra-Shoalhaven community; solutions that will be scalable and immediately transferrable to communities and industries across Australia.

The project will be split into two phases.

Phase 1 will seek funding from round 2 of the Commonwealth Government’s Smart Cities and Suburbs program to:

- Procure, install and commission a variety of smart technology solutions in locations across the Illawarra-Shoalhaven Region to demonstrate a proof-of-concept for each of the following project components.
 - **Stop Block** –using water level sensors, pluviometers and cameras to monitor debris build-up at the inlets to major stormwater culverts.
 - **Flood Aware** – development of flash flood hydraulic model for the Fairy Creek / Cabbage Tree Creek catchment, within the Wollongong local government area, and multi-channel alert warning system for residents and businesses within the catchment.
 - **Go Flow** – using sensors and camera technology to identify the best time to manually open estuary entrances prior to major rainfall events (to reduce flooding).
 - **Quality Watch** – using sensors to actively monitor key water quality parameters.
 - **Pollution Stop**– using sensors to monitoring the build-up of collected rubbish in stormwater rubbish-removal traps.
- Engage the regional community in the project design, installation and use of outputs.
- Extend and augment the Internet of Things network across the Illawarra-Shoalhaven region.
- Engage ten regional high schools through the “Smart Schools for a Smarter Planet” program to support the construction of key project components and using the outputs from these projects to support STEM-related learning experiences.

The application of smart technology to respond to these challenges will provide significant economic, social and environmental benefits to the Illawarra-Shoalhaven community. Besides regional benefits, the designed smart technology solutions are designed to be scalable and modular; that is, these technology solutions could be deployed to address water management challenges common to the 85% of Australians that live within 50km of the coast (State of the Environment 2016, <https://soe.environment.gov.au/sites/g/files/net806/f/soe2016-coasts-launch-17feb.pdf?v=1488793015>). Through industry forums, professional networking activities and informal gatherings, the project partnership will share project learnings with all parties who are eager to learn how the innovative application of smart technology can address common water management challenges.

This investment will be delivered by a partnership formed by the four local Councils within the Illawarra-Shoalhaven region (Wollongong, Shellharbour, Kiama and Shoalhaven), private sector developer Lend Lease and the University of Wollongong’s SMART Infrastructure Facility. UOW SMART Infrastructure Facility is one of the largest research institutions in the world dedicated to helping governments and businesses better plan for the future. SMART’s work is augmented by collaborations with experts across UOW’s Faculties in infrastructure-related fields such as energy generation and storage, water sustainability, environmental engineering, spatial geotechnics and social planning.

Lend Lease is an Australian-based international property and infrastructure corporation with 60 years' worth of experience in successfully delivering complex buildings and infrastructure projects.

The project element to extend and augment the UOW-hosted Digital Living Lab Internet of Things (IoT) communications network will provide a cost-effective mechanism to collect data from thousands of small digital devices to provide improved information for decision-making. Based on the LoRaWAN protocol, this network has been established by the University as a 'hacking' space; a platform for citizens, entrepreneurs, researchers and students to apply and test smart technologies to resolve real-world challenges. This network currently services the Wollongong and Shoalhaven local government areas (LGA), and through this project, would be extended through to the Shellharbour and Kiama LGA's. Further details regarding the Digital Living Lab network are included in Appendix 3 of this application.

The "Smart Schools for a Smarter Planet" project element supports one of the objectives of the ISJO Smart Region Strategy: to 'engage early with school students to increase digital capability and skills for the jobs of the future'. The project will fund ten high schools (targeting Years 9 -12) across the region to:

- Assist in the construction of sensors that will be installed in each project component (or supplementary sensors to support individual project components).
- Use the data from this project to improve student understanding of STEM-related issues (e.g. flood/storm behaviour, water quality) through analysis of data sourced from the Smart Water Management project.

This component of the project will be delivered by the UOW SMART Infrastructure Facility under the 'Smart Schools for a Smarter Planet' program (see Appendix 2 for more details).

Phase 2 of the project will build upon the partnerships; project governance structures and technology solutions developed for Phase 1 and seek opportunities to fund the 'scaling-up' of individual project components across the region and more broadly. Phase 2 of the Smart Water Management project would be subject to a separate project plan.

By pre-empting Phase 2, the project partners are recognising that, while Phase 1 of the project will generate significant community benefits in its own right, this is just the first step towards achieving even greater community benefits in the future through ongoing innovation, expansion and augmentation of Phase 1 outcomes. Further, the experience gained in the completion of the Smart Water Management project will be invaluable to all participating project partner organisation and will assist in the development of future projects identified under the ISJO Smart Region Strategy.



**ABOVE: ILLAWARRA-SHOALHAVEN REGION, LOCATED IMMEDIATELY SOUTH OF THE CITY OF SYDNEY.
IMAGES COURTESY OF NSW DEPARTMENT OF PLANNING AND SHELLHARBOUR CITY COUNCIL.**

2 OBJECTIVES

The purpose of the Smart Water Management project is to invest in smart technology solutions to respond to stormwater management challenges affecting the Illawarra-Shoalhaven community; solutions that will be scalable and immediately transferrable to communities and industries across Australia.

The objectives of the project are to:

- Deliver the Smart Water Management project as a Lighthouse project to promote and enable the Illawarra Shoalhaven Smart Region Strategy
- Install and commission all project components, identified in the scope of works (Section 5), within the agreed timeframes.
- Establish community engagement framework as a mechanism for gaining community input to project design, installation and project outputs; in particular how each component can be geared towards maximising community benefits and community useability.
- Increase the digital and STEM capabilities of regional school students.
- Extend and augment UOW's Digital Living Labs Internet of Things (IoT) network, currently servicing the Wollongong and Shoalhaven local government areas, into the Shellharbour and Kiama local government areas.
- Adjust business process where the output from installed project components provides Council infrastructure managers with additional information to guide improved decision-making.
- Communicate the outcomes and application of the developed smart technology solutions to promote and enable scalable solutions to address common water management challenges across and beyond the Illawarra-Shoalhaven region.
- Complete a project close-out and review of Phase 1 of the Smart Water Management project and work with project partners to develop a project plan for Phase 2 of this project.

3 EXPECTED BENEFITS

The technology solutions developed for the Illawarra Shoalhaven Smart Water Management project will deliver significant economic, social and environmental benefits, initially to the Region and ultimately, through broader application, to the Local Government, water industry and technology sectors:

- Reduced costs to the community from flooding.
- Extended community, business and Government access to an augmented Internet of Things (IoT) radio network (LoRaWAN network) across the entire Illawarra-Shoalhaven region (four Local Government Areas with a combined population expected to reach 472,000 by 2036).
- Increased access to existing and new open datasets, data analytics and visualisation tools via the Vision Illawarra Platform for use by the regional community, researchers and entrepreneurs in a variety of commercial and non-commercial applications.
- Increased digital and STEM capabilities of regional high school students through engaging high schools directly to support delivery of project components and sharing outcomes for improved learning.
- Improved service efficiencies and reduced costs to Councils in managing stormwater infrastructure and responding to flood hazards.
- Increased citizen engagement and participation through greater transparency of decision-making.
- Improved water quality of local waterways.
- Development of new smart technology solutions which are readily scalable to address water management challenges common across the Illawarra-Shoalhaven region; indeed, these solutions will address water management challenges common across the nation.

The benefits associated with reducing the impact of flooding will address an area of key concern for the Illawarra-Shoalhaven community. Serious flooding has impacted this community 30 times over the past 50 years:

- <https://www.southcoastregister.com.au/story/3306362/south-coast-flood-watch-updates-thursday-rolling-coverage/>

- https://www.huffingtonpost.com.au/2017/03/16/wollongong-is-copping-an-insane-drenching-and-crazy-floods_a_21898622/
- <https://www.illawaramercury.com.au/story/1710997/photos-memories-of-1998-flood-still-raw/>
- <https://www.illawaramercury.com.au/story/3949350/rain-wind-flooding-falling-trees-and-a-record-high-tide-keep-illawarra-on-alert/>
- <https://www.illawaramercury.com.au/story/2513416/roads-affected-by-flooding-in-the-illawarra-region/>



ABOVE: FLOODING IN SOUTH WOLLONGONG, 2017



ABOVE: STORMWATER DIVERTED FROM BLOCKED CULVERT HAS CAUSED LIFTED VEHICLE AND PUSHED IT DOWN THE HILL, SHEARING AWAY THE SIDE OF THIS HOUSE

(WOLLONGONG LOCAL GOVERNMENT AREA) - 1998



**ABOVE: ENTRANCE TO SHOALHAVEN RIVER IN FLOOD, NOWRA
(SHOALHAVEN LOCAL GOVERNMENT AREA)**





LEFT: DOBINSON STREET
BALGOWNIE (WOLLONGONG
LOCAL GOVERNMENT AREA) –
1998 FLOOD.



BELOW: AFTERMATH OF 1998
FLOOD, CABBAGE TREE CREEK
HOTEL CAR PARK, FAIRY
MEADOW (WOLLONGONG LOCAL
GOVERNMENT AREA).

Each project component provides an important contribution to the realisation of these benefits:

- **Stop Block**
 - Reduced costs to community – the installed smart technology solution will provide advice regarding the need for the proactive removal of debris from a culvert inlet prior to a rainfall event; reducing the risk for culvert blockage and downstream flooding impacts.
 - Assist in engaging the community regarding the issue of culvert blockage and subsequent impact on flooding behaviour within the affected catchment, and how Councils are responding to these blockages.
 - Provide live data on waterway levels and support the flash flood warning system component of the project.
 - Reduced costs to Councils – the installed smart technology solutions will provide advice regarding when resources need to be deployed to clear debris from culvert inlet both proactively (prior to a storm event) and reactively (following a storm event).
 - Provide Councils with advice regarding options for new infrastructure for reducing the risk of culvert blockage.
 - Provide data on debris behaviour to improve flood risk management practices.
- **Flood Aware** - integrating with Stop Block, Go Flow and Quality Watch, the flash flood warning system will provide:
 - Residents and businesses within the monitored catchment 'live' and accurate information regarding their flood risk associated with a forthcoming rain event,
 - Residents and businesses with advice regarding measures to reduce risk to life and property.
 - Improved community engagement regarding Councils' actions to manage flood risk within the catchment.
 - Improved information for Councils to better manage local flood risks.
 - A service that the Commonwealth Bureau of Meteorology (BoM) has identified as not being the responsibility of the Commonwealth Government. The Intergovernmental Agreement on the provision of BoM hazard services to the States and Territories notes that 'the prime responsibility for flash flood warnings lies with State and Territories through local councils as the Bureau does not have the capacity to directly communicate with all councils during a major wide-spread disaster event on every occasion'
<https://www.coag.gov.au/sites/default/files/agreements/Intergovernmental%20Agreement%20on%20Provision%20of%20Bureau%20of%20Meteorology%20Hazard%20Services%20to%20the%20States%20and%20Territories%20-%202023%20March%202017.pdf>
- **Go Flow**
 - Improved transparency regarding Councils' decisions to mechanically open an estuary (using Council plant to breach the existing sand berm) prior to a significant rainfall event.
 - Reduce flood-risk for residents and businesses upstream of the ICOLLS entrance.
 - Reduced costs to Councils – the smart technology solutions will automatically advise Councils if ambient conditions are conducive to mechanically breaching the sand berm. This replaces the periodic site observations that currently need to be made by Council officers to assess berm breach conditions.
 - Improved information for Council officers to assist in refining the berm breach policy over time and to better understand the trade-offs between reduced flood risk and any ecological and/or recreational impacts that may be created through compliance with existing ICOLLS management policy.
- **Quality Watch**
 - Monitor the impact of Grose Pollutant Traps (GPTs) on water quality parameters within the development.
 - Establishment of a high-quality open-source data set for:
 - Improved community transparency regarding the water quality of local waterways.
 - Informing Councils regarding the efficacy of infrastructure and non-infrastructure intervention measures to improve water quality of local waterways.
 - Potential use in longitudinal studies, for example, measuring the benefits enabled by a range of stormwater management actions and infrastructure interventions within the study
- **Pollution Stop**
 - Improved water quality of local waterways; highly valued community assets.
 - Reduced costs to Councils through improved asset maintenance regimes:

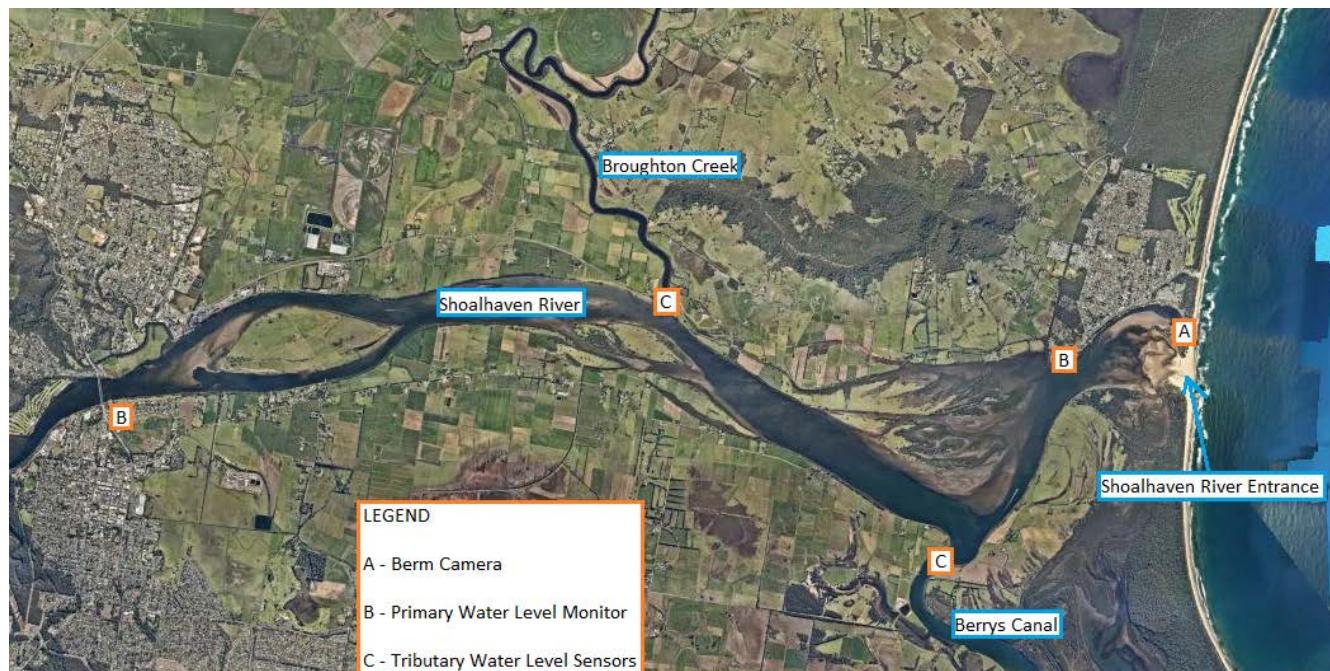
- Sensors will confirm, after a rain event, whether or not the trap needs to be emptied.
- Improved understanding of how assets perform during a range of different rainfall events.
- Provide a useful data source to assist in evaluating the efficacy of litter reduction interventions within the catchment that is serviced by the GPT.
- **Smarter Schools for a Smart Planet**
 - Improved understanding of IoT technologies, and their use in real-word applications, for regional high school students.
 - Improved understanding of STEM-related issues (e.g. flood/storm behaviour, water quality) through analysis of data sourced from the Smart Water Management project.

4 DELIVERABLES

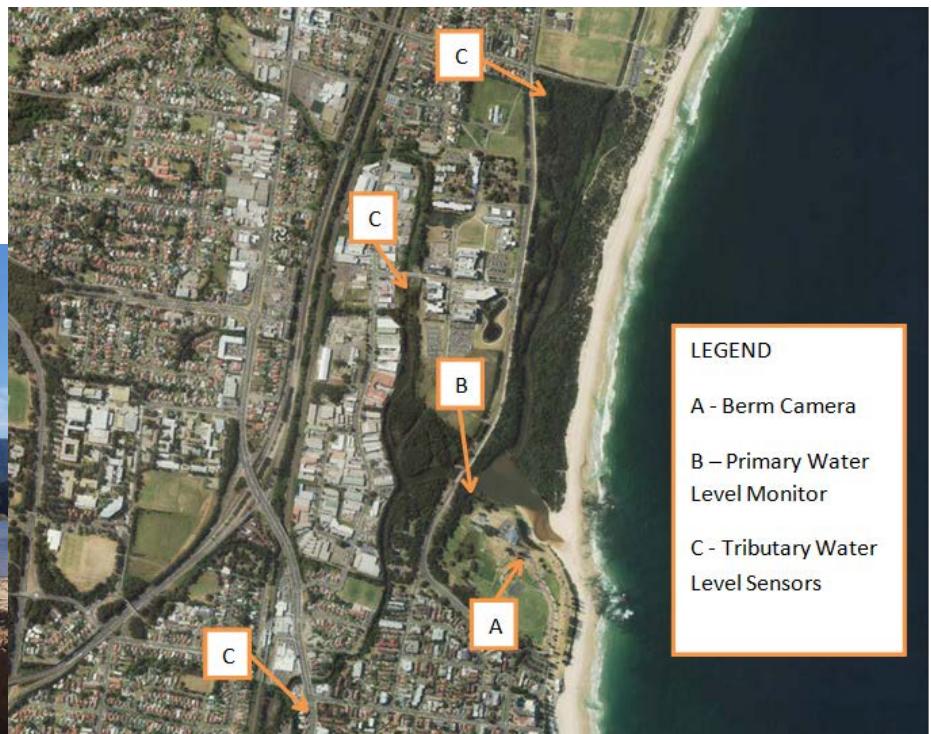
The Deliverables of the Smart Water Management Project are listed below under each of the project components:

- **Stop Block - Stormwater Culvert Blockage Management**
 - Construction and installation of 4 culvert monitoring locations in Wollongong (3) and Kiama (1).
 - Construction and installation of 10 waterway level sensors in Macquarie Rivulet located within the Lend Lease Calderwood development.
 - Integration of sensors with regional Internet of Things (IoT).
 - Development of analytics software to translate collected data into user output.
 - Disseminate user outputs via Vision Illawarra Platform
- **Flood Aware - Flash Flood Warning System**
 - Development of flash flood warning system analytics software to translate collected data into user output. The system will service Fairy/Cabbage Tree Creek catchment, within the Wollongong local government area and rely on radar rainfall data, sourced from the public domain, and water level sensors installed as part of the Stop Block and Go Flow project component.
 - Disseminate user outputs via Vision Illawarra Platform
- **Go Flow - Smart ICOLLS Management**
 - Construction and installation of two ICOLLS estuary management solutions in Wollongong (Fairy Creek) and Shoalhaven (Shoalhaven River)
 - Integration of sensors with regional Internet of Things (IoT).
 - Development of analytics software to translate collected data into user output.
 - Disseminate user outputs via Vision Illawarra Platform
- **Quality Watch - Stormwater Quality Management**
 - Supply and install 7 water quality monitoring stations in Shellharbour (2 on Council land) and 3 in the Lend Lease Calderwood Development and Shoalhaven (2)
 - Integration of sensors with regional Internet of Things (IoT).
 - Development of analytics software to translate collected data into user output.
 - Disseminate user outputs via Vision Illawarra Platform
- **Pollution Stop - Gross Pollutant Trap (GPT) Management**
 - Supply and install 5 GPT monitoring stations in Wollongong (2 in Wollongong CBD) and Shellharbour (3 in the Lend Lease Calderwood Development)
 - Integration of sensors with regional Internet of Things (IoT).
 - Development of analytics software to translate collected data into user output.
 - Disseminate user outputs via Vision Illawarra Platform
- Engagement of 10 high schools within the Illawarra-Shoalhaven region to assist in the construction of sensors that will be used in individual project components or installed to supplement available data streams for individual project components. For example, the engaged high schools will construct additional water level sensors to provide additional data for the flash flood warning system.

- Extension of the UOW Digital Living Lab Internet of Things (IoT) network from the Wollongong and Shoalhaven local government areas into the Shellharbour and Kiama local government areas through investment in two new network gateways.
- Project Management Deliverables including
 - Governance framework including Community Reference Group
 - Community engagement plan and promotion/media opportunities

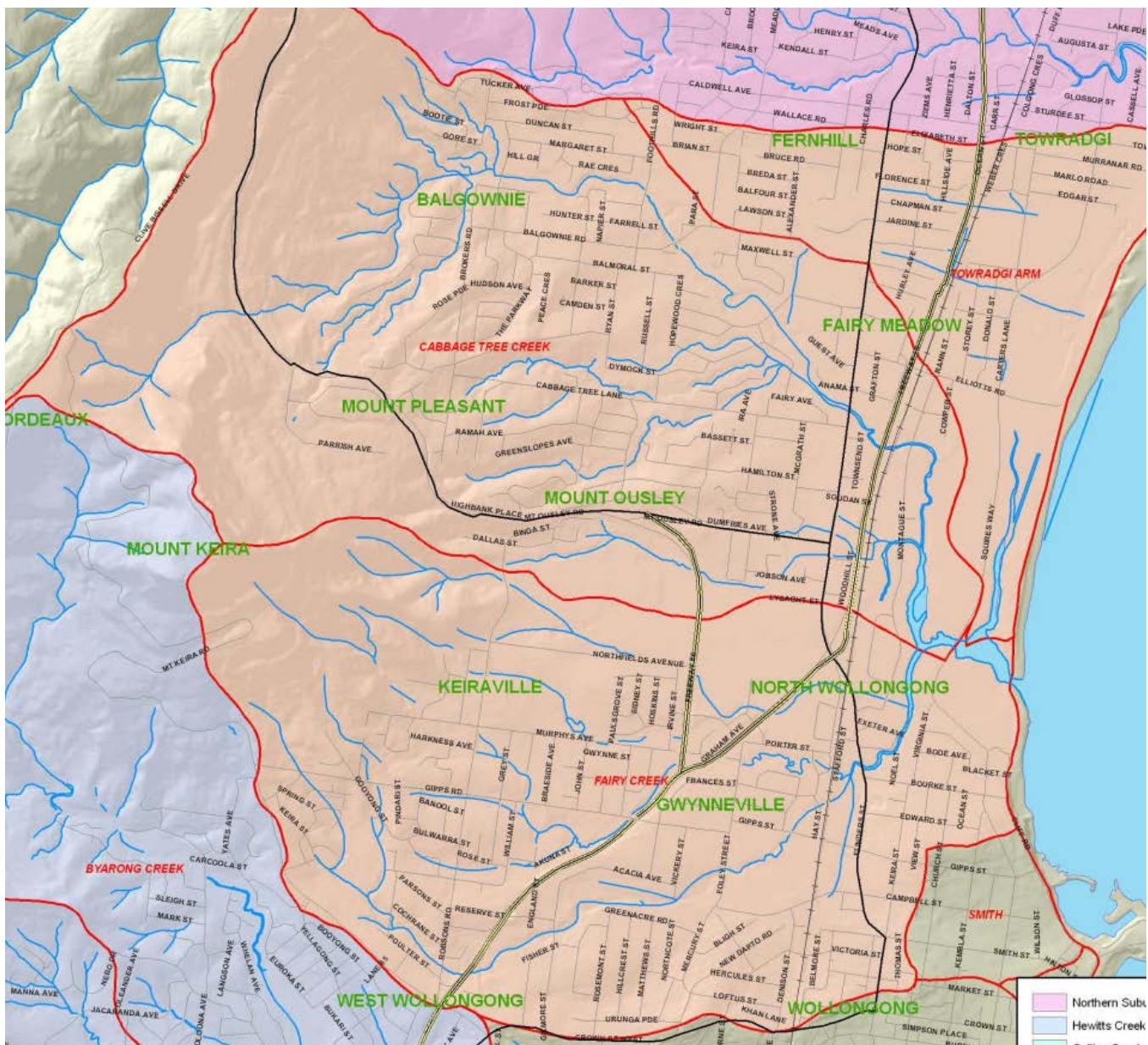


ABOVE: SHOALHAVEN RIVER GO-FLOW DESIGN



ABOVE: FAIRY CREEK GO-FLOW DESIGN

LEFT: EXAMPLE OF MECHANICAL OPENING OF FAIRY CREEK ENTRANCE.



ABOVE: FAIRY CREEK CATCHMENT (WOLLONGONG LOCAL GOVERNMENT AREA)

**INSTALLATION OF THREE STOP-BLOCKS (OPTIMUM SITES STILL TO BE IDENTIFIED) AND STUDY
CATCHMENT FOR FLASH FLOOD WARNING SYSTEM**



LEFT: DIDO STREET
CULVERT, STOP-
BLOCK INSTALLATION
SITE – KIAMA LOCAL
GOVERNMENT AREA



ABOVE: CALDERWOOD VALLERY MASTERPLAN – LEND LEASE DEVELOPMENT AREA

5 SCOPE (OF WORK)

Table 1: Project Scope of Work

Part of the Project (Inside Scope)	Responsibility
PROJECT MANAGEMENT	
Develop project governance structure integrated with the ISJO Smart Region Strategy governance framework.	Project Steering Committee (PSC)
Appoint Project Manager	PSC
Develop community engagement framework based on community engagement architecture developed for the ISJO Smart Region Strategy.	PSC / Project Manager (PM)
Establish Community Reference Group	Project Manager
Implement project monitoring and reporting framework	Project Manager
PROJECT DELIVERY COMPONENTS	
<p>Installation of New Internet of Things (IoT) LoRaWAN network gateways:</p> <ul style="list-style-type: none"> • Shellharbour local government area • Kiama local government area; and • Lend Lease (Calderwood) development area). 	Project Manager / UOW Smart
New gateways required to connect installed smart technology to regional Internet of Things network.	
Construction, installation and commissioning of smart technology solutions for all project components. The installed components include:	Project Manager / PCG
<ul style="list-style-type: none"> • Water level sensors. • Image processing devices. • Solar arrays. • Debris sensors. • Pluviometers. • High-end PC for hosting flood modelling analytics software 	
Engage with 10 regional high schools to construct sensors that will be installed as part of each project component, or installed to provide supplementary data.	UOW Smart
Enable telemetry data from sensors to the Illawarra-Shoalhaven regional Low Power Wide Area Network (LoRaWAN) network	PM / PCG / UOW SMART
Develop analytics software to translate data from the sensors into useful information and, with community input	PM / PCG / UOW SMART
Make data and derived information accessible on the Vision Illawarra regional Internet of Things platform.	PM / PCG / UOW SMART
Adjust business process where the output from installed project components provides Council infrastructure managers with information to guide improved decision-making	PCG / PSC
Communicate the outcomes and application of the developed smart technology solutions to promote and enable scalable solutions to address common water management challenges across and beyond the Illawarra-Shoalhaven region.	PCG / PSC
Project evaluation and close.	PM / PCG / PSC.
Development of Smart Water Management Project (Phase 2) – <u>OUTSIDE OF SCOPE</u>	PSC

6 PEOPLE

6.1 Project Team

Before defining the project structure, two key definitions are required

- Project Partner – a project partner is an identified party that:
 - provides a cash contribution towards implementation of the Smart Water Management project; or
 - is contracted to deliver a key element of the Smart Water Management project.
- Project Supporter – advocates for regional transformation through investment in smart technology solutions identified in the ISJO Smart Region Strategy.

The project structure for the Smart Water Management project is supported by and subordinate to the governance structure established to deliver the ISJO Smart Region Strategy. The delivery of the Smart Water Management project will be enabled through the following project structure:

- **Project Steering Committee (PSC)** – The Illawarra Shoalhaven Joint Organisation Board is the Steering Committee for both the Smart Region Strategy and for the Smart Water Management project. The steering committee consists of the Mayors and General Managers from the following organisations:
 - Illawarra-Shoalhaven Joint Organisation (Convenor)
 - Wollongong City Council (Chair)
 - Shellharbour City Council
 - Kiama Municipal Council
 - Shoalhaven City Council
- **Project Control Group (PCG)** – the project control group will support the Project Manager in implementing each component of the Smart Water Management project and will report to the Project Steering Committee and Funding Agency. Member of the PCG will consist of senior representatives from each of the following partners:
 - Illawarra Shoalhaven Joint Organisation (Project Manager and Chair).
 - Wollongong City Council
 - Shellharbour City Council
 - Kiama Municipal Council
 - Shoalhaven City Council
 - University of Wollongong SMART Infrastructure
 - Lend Lease
- **Project Manager** – a dedicated project manager will be recruited and funded for a period of at least 15 months and will have overall responsibility for all aspects of project delivery, including:
 - Community engagement;
 - Coordinating and managing the construction and installation of smart technology solutions across the four local government areas and Lend Lease development site;
 - Coordinating managing the installation of two new smart gateways;
 - Coordinating and managing the development of analytics software to translate the data from each installed project component into useful information.
 - Integrating the output and visualisations from all project components into the publicly accessible Vision Illawarra platform.
 - Preparing and tabling regular project status reports to the Project Steering Committee and Funding Agency.
 - Seeking direction and support from project partners and the PSC to identify and address project risks and emerging issues.
 - Completion and submission of grant audit.

The Project Manager position will be funded from the combined budget allocations from each Project partner and the matched funding from the Commonwealth Government.

The total budget allocated to project management is less than 10% of the value of funding sought from the Commonwealth.

- **Delivery Partners** – University of Wollongong SMART Infrastructure and Lend Lease are the project's two key delivery partners for the project.
 - UOW SMART will construct the new technology sensors, support their installation and develop analytics software for each of the project component. They will also undertake engagement with all regional high schools to expand the project into the education sector. This will be delivered through the UOW SMART's 'Smart Schools for a Smarter Planet' program. Details regarding the personnel from SMART Infrastructure involved in delivering the project have been included in Appendix 4.
 - Lend Lease will purchase and install sensors for all project components to be implemented within their West Dapto Calderwood Development site
 - The Project Manager will appoint suitably skilled and experienced suppliers and contractors to supply and deliver all other project elements on behalf of the Project Partners.
- **Other Delivery Partners** include Regional High Schools – in partnership with the NSW Department of Education, a total of 10 high schools will be identified across the region to participate in the construction of smart sensors that will integrate into each component of the Smart Water Project (or provide supplementary data to enhance the output from the each project component). Engagement of regional high schools will be led by the University of Wollongong's Smart Infrastructure.
- **End Users / Community** – Expressions of Interest (EOI's) will be called from interested community members to form a community reference group, which will provide advice to the PCG and PSC regarding:
 - Optimal project installation sites.
 - How best to interface the outcomes of each component of the Smart Water Management project with the community. E.g. the design of user interfaces for the flash flood warning system.
 - Communications channels and strategy to promote the successes of the project to the regional community.
 - Opportunities to liaise with other third-party organisations (particularly community groups) to demonstrate the outcomes of the Smart Water Management project.
 - Opportunities for further investments in smart water management technology under Phase 2 of the Smart Water Management project.

It is envisaged that this reference group will periodically be invited to attend PCG's, and to enable representation across the Illawarra-Shoalhaven community, it is proposed that the reference group would predominantly attend via teleconference.

The full project team is identified in the block diagram in the follow page and further detailed in the stakeholder matrix in Section 6.2.



6.2 Stakeholder Identification

Stakeholder Name (Individual and/or Group)	Level of impact	Level of influence	Required Commitment	Roles & Responsibility
ISJO Smart Region Strategy – Project Steering Committee (PSC)	High	High	High	<p>Responsible for oversight and directing the delivery of the ISJO Smart Region Strategy.</p> <p>Responsible for overall governance of all 'lighthouse projects' within the strategy, including the Smart Water Management project.</p>
Smart Water Management - Project Control Group (PCG)	High	High	High	<p>Responsible for supporting the appointed Project Manager (PM) in coordinating and implementing each component of the Smart Water Management project.</p> <p>The appointed PCG representative from each partner organisation will have the authority to assist in working through site-specific issues that may arise during project implementation (e.g. site access, organisation-specific approvals, local community engagement activities etc.)</p>
Project Manager	High	High	High	<p>Responsible for managing and implementing each component of the Smart Water Management project.</p> <p>It is proposed that a Project Manager (PM) be appointed for a period of at least 15 months to enable the Smart Water Management project.</p> <p>The PM will chair all PCG meetings and attend the ISJO Smart Region Strategy Steering Committee at the invitation of the committee chair.</p>
Project Partners	High	Medium	Medium	<p>Responsible for leading the implementation of specific elements of each component of the project. These resources have been identified in Section 6.1.</p> <p>Provision of funding and resources to the project as outlined in the Project Plan</p> <p>Representation of Project Control Group and Project Steering Committee</p>
End Users / Community Reference Group (CRG)	High	High	Medium	<p>Provide community input and feedback to the design, construction, commissioning and communications for the Smart Water Management project.</p>
Grant Funding Body - Commonwealth Department of Industry, Innovation and Science	High	High	Low	<p>Receive Project status reporting to enable progress payments and acquittal</p> <p>Involvement in Media opportunities for staged project achievements</p>
Project Supporters and broader community and industry stakeholders are listed in section 6.3 and in the project Communications Plan in section 11.				

6.3 Project Supporters

In developing the scope of works for this project, a number of external organisations, some of which have been involved in developing the ISJO Smart Region Strategy, have indicated their support for the implementation of the Smart Water Management project. While not formal project partners, each organisation acknowledges, and advocates for the significant economic, social and environmental benefits that the project will generate. These organisations include:

- NSW Department of Education
- Australian Rainfall and Runoff – group within Geoscience Australia responsible for developing and updating national guideline documentation, data and software suite that can be used for the estimation of design flood characteristics in Australia.
- Regional Development Australia – Illawarra (RDA-I)
- Meshed – principal supplier to UOW Smart for the supply smart technology that will be used in most project components.
- Illawarra Shoalhaven Joint Organisation (ISJO)
- Sydney Water
- NSW State Emergency Services
- Illawarra Business Chamber
- Stormwater NSW – the peak industry association for professional urban water management within the State of NSW; consisting of over 500 corporate, institutional, government and individual members.

Mike Dowd
Application Leader, Smart City and Suburb Grant
Wollongong City Council
Wollongong 2500 NSW

Dear Mike,

The NSW Department of Education's Technology for Learning team are excited by the project you and your team are planning to run in schools in the Illawarra.

The project ties in nicely with work we are completing on the state-wide STEMShare project and would be a great extension activity for schools around the state who have dipped their toes in the water with circuits, IOT tools and data science. Links too with the updated Science and Technology Curriculum (K-6) and Digital Technologies Curriculum 7-10, make this an extraordinarily timely project.

We look forward to hearing the progress of your pilot and working with you to report the findings in the form of a Future.Stories article if appropriate to spread the word beyond the Illawarra!

All the very best with this project please let us know if you need any support in implementation!

Regards,



Joachim Cohen
Schools Technology Innovation Lead
Information Technology Directorate
Level 8, 8 Central Ave, Eveleigh
Joachim.cohen@det.nsw.edu.au
0422 913 506

Isabelle Ghetti
Floodplain + Stormwater Unit Leader
POST LOCKED BAG 8821
WOLLONGONG DC NSW 2500

Dear Isabelle,

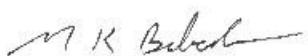
RE: Wollongong City Council culvert blockage research proposal- Letter of Support

The Australian Rainfall and Runoff (ARR) technical committee strongly supports the application by Wollongong City Council for funding under the SMART program. While the proposed project will help Wollongong Council managing its LGA wide flood risk the project will have national benefits. Blockage of culverts and bridges is a serious national problem that compounds existing flood risk. As highlighted in the submission there is a lack of good data on the mechanisms and probability of blockage. This project will directly capture much of data before it is removed by maintenance.

The current guidance in ARR (ARR.ga.gov.au) is based on very limited data. Most of which was provided by Wollongong city council. If this type of comprehensive data was available during the development of ARR the national guidance on blockage would be have a more scientific and defendable. The other advantage of this project is it will visually capture blockage and its impact. This has a distinct advantage over other techniques as no prior decisions needs to be made about how will be analysed the data prior to capture.

Please feel free to contact the undersigned if you require any further information.

Regards



Mark Babister



29 June 2018

David Farmer
General Manager
Wollongong City Council
41 Burelli Street
WOLLONGONG NSW 2500

Dear David

**Letter of Support –Smart Cities and Suburbs Program Round 2
Smart Water Management project**

Regional Development Australia (RDA) Illawarra is pleased to support the Smart Water Management project and your application to the Smart Cities and Suburbs Program – Round 2.

It is our understanding that the Smart Water Management project will provide innovative technological solutions to enable effective stormwater management throughout the Illawarra and Shoalhaven communities, across the four local government areas of Wollongong, Shellharbour, Kiama and Shoalhaven.

It is the innovative use of collaboration through the Internet of Things network, which enables a more effective and efficient system of managing and responding to water-related hazards in the region. In effect, the project will serve to bolster the resilience of the region and the effectiveness of emergency and environmental management.

The Smart Water Management Project is one of the lighthouse projects contained within the Illawarra-Shoalhaven Smart Region Strategy, which RDA Illawarra has been actively involved in developing with our regional stakeholders.

Wollongong City Council has proven capacity in delivering large scale infrastructure projects. RDA Illawarra welcomes this project and looks forward to the widespread economic and environmental benefits which could be delivered in the region through the Smart Water Management Project.

Yours sincerely

A handwritten signature in black ink, appearing to read "Debra Murphy".

Debra Murphy
Chief Executive Officer

Meshed Pty Ltd
81 Sugarloaf Crescent
Castlecrag NSW 2068
ABN: 49 605 631 758
www.meshed.com.au
1300-637-433

AusIndustry
Department of Industry, Innovation and Science
Industry House, Level 9
10 Binara Street
CANBERRA ACT 2601

Monday, July 2, 2018

**Smart Cities and Suburbs Program Round Two
Letter of Support**

Dear Program Manager,

Project Title: *Smart Water Management*
Lead Applicant: *Wollongong City Council*

As specified in Section 4.2.2 ‘Your funding co-contributions’ and Section 7.3 ‘Joint applications’ of the Smart Cities and Suburbs Program (SCSP) Round Two Grant Opportunity Guidelines, this letter provides in-principle commitment to the project and in-principle confirmation of funding for the project from sources other than the Commonwealth.

This organisation is a private company.

Meshed is a foundation partner in the Wollongong Digital Living Lab, which underpins the SCSP application, and fully supports its broader application for Smart Water Management.

Meshed will work with the Wollongong City Council and the Southern Councils Group and any other project partners in the group to successfully complete the project. Meshed has a vision for enabling cities achieve their goals through open communications, platforms, managed data sharing and community engagement.

For the Smart Water Management program Meshed will supply:

- LoRaWAN network equipment and installation services
- Associated maintenance services
- LoRaWAN network data visualisation
- Public access via the Things Network backbone (thethingsnetwork.org)
- Community IoT engagement & enablement
- Selected water and environmental sensors

Following is an outline of the relevant experience and/or expertise this organisation will bring to the group:

- Meshed are the largest provider of public access "free to air" IoT networks in Australia with coverage in Melbourne CBD, Sydney CBD and Brisbane CBD as well as many major regional centres such as Wollongong, Sunshine Coast and Ipswich.
- We partner with cities and universities including UoW to support their community engagement, environmental management, economic development, innovation and smart cities initiatives.
- Meshed founders are recognised global leaders in smart cities, asset management and being early entrants in the internet revolution and now the IoT world of connected devices and networks.
- Our customers are local government, state government and major corporations. Some of our customers include NSW DPI, UTS, UNSW, UoW, Economic Development Queensland, Ipswich City Council, Sunshine Coast Council, City of Gold Coast, Liverpool City Council, Canada Bay Council, KPMG and IAG.
- Meshed is a foundation partner of the Wollongong Digital Living Lab, technology partner of the Food Agility CRC, founding members of the IoT Alliance Australia, participants in the IoT Alliance Australia Water Sector Workstream, members of the Smart Cities Council ANZ and ASCA.
- Meshed has been working with Sydney Water and other water and environment agencies for the advancement of IoT in smart water management including smart water metering, storm water management, flood monitoring, water quality and climate change adaptation.

The nominated management level contact officer for this project is:

- Catherine Caruana-McManus, Director

Signature:



Catherine Caruana-McManus
Director, Meshed
Executive Council Member IoT Alliance Australia (iot.org.au)
Chair – IoT Alliance Australia Sectoral Engagement (Smart Cities) Work Stream
Founder – facebook.com/smartercitiesIoT
Advisory Council Member UoW SMART Facility

27 June 2018

Chris O'Connor
Wollongong City Council

coconnor@wollongong.nsw.gov.au

LETTER OF SUPPORT – SMART WATER MANAGEMENT PROJECT

The Illawarra Shoalhaven Joint Organisation (ISJO) is the peak organisation representing Local Government in the Illawarra and Shoalhaven regions. Member Councils include Kiama Municipal, Shellharbour City, Shoalhaven City and Wollongong City Councils.

The Illawarra-Shoalhaven region has established a strategic framework to leverage smart technologies to deliver a range of economic, social and environmental benefits across the region. The Smart Water Management project is an identified ‘lighthouse project’ within the Illawarra-Shoalhaven Smart Region Strategy; which provides a platform to demonstrate for this regional community how the deployment of smart technology can help to enhance the natural environment and build resilience in urban infrastructure.

The management of stormwater is a key responsibility for local governments. Annually, significant investment is required to renew and upgrade stormwater infrastructure; ensuring that this infrastructure continues to achieve the twin objectives of safely conveying stormwater to local waterways while minimising the impact on the water quality. With a modest investment smart technology; this previously ‘inert’ infrastructure begins to provide valuable data back to both infrastructure managers and the local communities that they service.

The purpose of this project is to invest in smart technology solutions to respond to stormwater management challenges affecting the Illawarra-Shoalhaven community. The project will install a variety of smart technology solutions, in locations across the Illawarra-Shoalhaven region, to address the following challenges:

- *Stormwater Culvert Blockage –using water level sensors, pluviometers and cameras to monitor debris build-up at the inlets to major stormwater culverts.*
- *Flash Flood Warning – development of flash flood hydraulic model and warning system for the Fairy Creek / Cabbage Tree Creek catchment within the Wollongong local government area.*
- *Smart Intermittently Closed And Open Lakes and Lagoons (ICOLLS) Management – using sensors and camera technology to identify the best time to manually open estuary entrances prior to major rainfall events (to reduce flooding).*
- *Stormwater Quality Monitoring – using sensors to actively monitor key water quality parameters.*



- Gross Pollutant Trap (GPT) Management – using sensors to monitoring the build-up of collected rubbish in stormwater rubbish-removal traps.

The Smart Water Management project will be a collaboration between the local governments in the region, the University of Wollongong's SMART Infrastructure research unit and private-sector developer Lend Lease.

ISJO fully supports the application by Wollongong City Council on behalf of member councils of the ISJO and its project partners for the Smart Water Management project and looks forward to a positive outcome with funding from the Commonwealth Government's Smart Cities and Suburbs program.

Yours sincerely



Lesley Scarlett
Executive Officer



30 June 2018

Mike Dowd
Regional Bid Coordinator
Wollongong City Council
Wollongong 2500 NSW

Dear Mike,

Sydney Water is pleased to offer its support to the *Illawarra and Shoalhaven Smart Water Management* application, led by Wollongong City Council and including Shellharbour City Council, Kiama Municipal Council and Shoalhaven City Council. We note that this regional initiative is also endorsed by the Illawarra-Shoalhaven Joint Organisation.

Sydney Water has developed an ambitious research and development program focusing on smart monitoring and automation of its assets and operations, including the deployment of a LoRaWAN communication network in the Illawarra.

The *Illawarra and Shoalhaven Smart Water Management* project would provide a unique opportunity to assess and implement service integration between private and public networks that would benefit local communities and businesses, providing a national template for the *Smart Cities & Suburbs* program. We are also thrilled to see that the regional application includes an ambitious community and school engagement program.

In case of success, Sydney Water proposes to contribute to the project through:

- Provision of a public channel on each of its LoRaWAN gateways installed in the region;
- Collaboration between Sydney Water's Operations Technology Services and UOW's SMART Infrastructure Facility.

We hope that this highly innovative and well-designed regional application will be favourably considered by the Minister in order to make a significant contribution to the federal Smart Cities and Suburbs program.

Yours sincerely



Dr Nicola Nelson
Manager, Science, Research & Innovation

From: Ailsa Schofield
To: [Chris O'connor](#)
Cc: [Alexandra McFadden](#); [Steve Cliffe](#); [Kirra Waine](#)
Subject: RE: Request for Letter of Support: Smart Water Management Project
Date: Thursday, 28 June 2018 10:38:46 AM
Attachments: [image010.png](#)

Hi Chris

Thank you for considering NSW SES as a key stakeholder in this future project.

NSW SES is supportive of this project which aims to reduce risk to life and property.

NSW SES particularly supports the Flash Flood Warning development which aims to provide additional and increased warning to flood affected communities, as well as the SMART ICOLL Management which aims to reduce flooding.

It is great to see Councils working together across the Illawarra and Shoalhaven to deliver this project for the community.

We look forward to working with you in the future to develop and deliver this project.

Ailsa



Ailsa Schofield

Acting Manager | Emergency Risk Management

NSW State Emergency Service - SHQ

P (02) 4251 6670 M 0408 273 690 E ailsa.schofield@ses.nsw.gov.au

93 – 99 Burrelli St Wollongong NSW 2500
PO Box 6126 Wollongong NSW 2500
www.ses.nsw.gov.au



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This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of the NSW State Emergency Service.

29 June 2018

Mr David Farmer
General Manager
Wollongong City Council
Locked Bag 8821
WOLLONGONG DC NSW 2500
c/o coconnor@wollongong.nsw.gov.au

Illawarra Business Chamber
Level 1, 87-89 Market Street
Wollongong NSW 2500
DX 15232
t (02) 4229 4722
f (02) 4229 6392
e info@illawarrabusiness.com.au

Dear Mr Farmer

Smart Water Management Project

I write to you concerning the Australian Government's Smart Cities and Suburbs Program, in support of a Wollongong City Council-led application for Round Two funding.

The Illawarra Business Chamber is encouraged by and has supported the development of an Illawarra-Shoalhaven Smart Region Strategy, which identifies a Smart Water Management Project as a 'lighthouse project' under the Strategy.

The management of stormwater is a key responsibility for local government. Annually, significant investment is required to renew and upgrade stormwater infrastructure, ensuring that this infrastructure continues to achieve the twin objectives of safely conveying stormwater to local waterways while minimising the impact on the water quality.

The Chamber strongly agrees that there is much to be learnt through investing in smart technology solutions to respond to stormwater management challenges affecting the Illawarra-Shoalhaven community.

The Chamber supports Council's application to fund a Smart Water Management Project, as the lead proponent on behalf of surrounding local councils, the University of Wollongong's SMART Infrastructure research unit and private-sector developer Lend Lease, and looks forward to supporting this project, consistent with the Illawarra-Shoalhaven Smart Region Strategy.

Please do not hesitate to contact me on ed@illawarrabusiness.com.au if I can be of any further assistance or advice.

Yours sincerely



Adam Zarth
Executive Director
Illawarra Business Chamber



STORMWATER

NEW SOUTH WALES

29 June 2018

Smart Cities and Suburbs Program – Round 2

To the Program Administrator,

Stormwater NSW provides its in-principle support for the proposed "SMART Water Management" project, which includes a grant application through the Smart Cities and Suburbs Program – Round 2.

Stormwater presents significant challenges and opportunities in relation to the long-term liveability, productivity and sustainability of Australian cities. Challenges include acute threats to public safety and infrastructure due to flooding and inundation, magnified by the uncertainties of global climate change. Stormwater also presents both acute and chronic risks to productivity, liveability and sustainability due to the pollution of local waterways, lakes and our oceans, as well as the loss of public and private assets due to accelerated stream erosion.

Stormwater can be a positive force in making our cities more sustainable and better places to live by bolstering water security, improving aesthetics and mitigating the heat-island effect. Improved data and information acquisition is an important component in ensuring we not only mitigate the negative aspects of stormwater, but also enhance its benefits. Benefits include improved flood mitigation and environmental protection stormwater infrastructure, through enhanced performance monitoring and increased accuracy in modelling software. Improved data and information acquisition will also enhance catchment management decision making and the development of related strategy and policy. It can also be used for research purposes, particularly the long-term effects of urbanisation on watersheds and receiving waters, an area known to be lacking in the scientific literature.

We therefore support the proposed project "SMART Water Management" as developed by Wollongong City Council and its project partners. Their concept of a scalable, synergistic scheme comprised of a coordinated suite of measures integrated through the use of today's advances in digital and communications technology is precisely the kind of innovative thinking that will drive advances in the stormwater industry. Further, the collaborative nature of the project, including local councils, developers and the research sector, is highly consistent with our own values, as demonstrated by the theme of our 2018 National Conference, *Working Together, Building Tomorrow*. Hence, it is our sincere hope that you will consider the "SMART Water Management" project for funding under the *Smart Cities and Suburbs Program – Round 2*.

Your sincerely

29.6.2018.

ALAN BENSON
President Stormwater NSW

7 ACTION PLAN WITH TIMELINE (PROJECT SCHEDULE)

ID	Task Description ¹	Who	Scheduled Start	Scheduled Finish	Predecessor ²
1	Appoint Project Manager	Wollongong Representative on ISJO Smart Region Strategy PSC	February 2019	March 2019	
2	Project Initiation Meeting	Project Manager	April, 2019	April, 2019	1
3	Establishment of Community Reference Group	The PSC will delegate this task to a member to ensure that this group is established in parallel to, but just following, appointment of the Project Manager	Mar 2019	May 2019	
4	Community Engagement Activities (Including Regional Schools Engagement Under The 'Smarter Schools for A Smarter Planet' program).	Project Manager	April, 2019	June, 2020	1
5	Design, Development and Site Preparation	Project Manager / University of Wollongong SMART Infrastructure	May, 2019	September, 2019	2,3
6	Prototype Testing Of All Project Components Across the Illawarra-Shoalhaven Region.	Project Manager / University of Wollongong SMART Infrastructure	September, 2019	December, 2019	5
7	Full Deployment of All Project Components Across the Illawarra-Shoalhaven Region (including connections to the Regional Internet-of-Things Network)	Project Manager / University of Wollongong SMART Infrastructure	December, 2019	April, 2020	6
8	Development of Analytics Software	Project Manager / University of Wollongong SMART Infrastructure	October, 2019	April, 2020	6
9	Integration Of Project Component Outputs Into Vision Illawarra Platform	Project Manager / University of Wollongong SMART Infrastructure	April, 2020	June, 2020	8
10	Project Close and Evaluation	Project Manager	June, 2020	June, 2020	8, 9

In addition to the tasks outlined above, the project manager has a responsibility to complete regular project reporting as defined in Section 8.1 of this project plan.

¹ All Statutory and Legislative Approvals required delivering the project need to be identified as milestones in this table.

² Activities in the Predecessor column must be completed prior to this activity commencing.

8 PROJECT REPORTING & APPROVALS

8.1 Project Reporting Requirements

Reporting requirements for this Project are:

Reported by	To whom	Reporting requirements ³	Frequency	Format
REQUIRED				
Project Manager	PCG and ISJO Smart Region Steering Committee	Project Progress Report (including risk register)	PCG - Monthly. PSC - Quarterly	Written and verbal
Project Manager	Commonwealth Department of Industry, Innovation and Science	Funding Body Report to report project progress, expenditure and progressive outcomes	To be determined in consultation with the Department, however, we will assume monthly.	Online
Project Manager and PCG	Community Reference Group	Project Progress Report and highlights	Quarterly or as determined based on milestones	Written and in person
Project Manager	PCG, CRG and ISJO Smart Region Steering Committee	Acceptance & Closure Report	At End of Project.	Written

8.2 Project Approvals

No specific approvals are required to deliver the project as a whole.

Through development of the Grant Application, all project partners have committed the identified expenditure and resources to enable the project to be delivered in accordance with this Project Plan.

All sites identified for physical infrastructure installation are on lands owned and managed by project partners or NSW Crown Lands. Approvals for installation of infrastructure including sensors and Internet of Things Gateways will be facilitated directly by the project partners through internal processes. Consultation with project partners has confirmed that:

- given the small physical size of each installation, receiving installation approvals from NSW Crown Lands should occur within 40 days of approvals application being submitted; and
- there will be no charge for this application.

The project manager will coordinate submission of applications to NSW Crown Lands within first three months of appointment.

³ Add names and necessary reporting to table and delete reports not required for this project

9 PROJECT BUDGET & OTHER RESOURCES

9.1 Budget

Budget item breakdown ⁴	Funding Contribution	Matched Commonwealth Funding	Total	Year 1 (FY2018-19)	Year 2 (FY2019-20)
Funding					
<i>Wollongong City Council</i>	\$150,000				
<i>Shellharbour City Council</i>	\$55,415				
<i>Lend Lease (Calderwood Development) – Lies Within Shellharbour City Council LGA Boundary.</i>	\$218,000 (\$70,000 Seeking Matched Funding)				
<i>Kiama Municipal Council</i>	\$31,034				
<i>Shoalhaven City Council</i>	\$72,000				
University of Wollongong SMART Infrastructure	\$100,000				
Total Project Value (Total Project Eligible Expenditure):	\$626,449	\$478,449	\$1,104,898	\$157,509	\$799,389
		(478,449 Seeking Matched Funding)		(956,898)	
Expenses:					
<i>Labour</i>			\$568,338	\$30,000	\$538,338
<i>Contract</i>			\$0	\$0	\$0
<i>Travel</i>			\$0	\$0	\$0
<i>Other</i>			\$338,560	\$127,509	\$261,051
Total Project Matched Funding			\$956,898	\$157,509	\$799,389
<i>Works Delivered Directly By Lend Lease And Not Seeking Matched Funding From The Commonwealth Govt.</i>			\$148,000		
Total Project Value:			\$1,104,898		

⁴ Breakdown budget items into costings

9.2 Budget Assumptions

- The budget assumes that 43% of funding is available from round 2 of the Smart Cities and Suburbs Program (SCSP). If this budget is not available, the Project Steering Committee will:
 - Identify alternative options to assist in co-funding the Smart Water Management project.
 - Review the scope of works of the Smart Water Management project and consider funding only some components of the project or funding the project over an extended period depending on funding availability.

10 RISK REGISTER

Date Updated: DRAFT At June 2018				Project Manager: TBC (Draft Developed By Project Steering Committee Project Working Group)												
STEP 1 NATURE OF RISK	STEP 2 IDENTIFIED RISKS What can go wrong?	STEP 3 EVALUATED RISKS		STEP 4 PRIORITY OF RISKS	STEP 5 TREATMENT Who/ What/ When/ Where/ How		STEP 6 EVALUATED RISKS – RESIDUAL		STEP 7 TREATMENTS TO BE IMPLEMENTED	STEP 8 TREATMENT COMPLETED ?						
People, Property, Environment, Reputation		S	L	Level of Risk			S	L	Level of Risk	(Yes or No)						
RISK SCORE MATRIX *																
LIKELIHOOD		Catastrophic		Major	Moderate	Minor	SEVERITY									
Almost Certain		E25		E20	E15	H10	M5									
Likely		E20		E16	H12	M8	L4									
Possible		E15		H12	M9	M6	L3									
Unlikely		H10		M8	M6	L4	L2									
Rare		M5		L4	L3	L2	L1									
RISK LEVEL		ACTION YOU SHOULD TAKE														
EXTREME (E15-25)	HIGH (H10-14)	Immediate action required; Eliminate or reduce risk; or accept risk provided residual risk level is understood														
MODERATE (M5-9)		Reduce risk; or accept risk provided residual risk level understood														
LOW (L1-4)		Accept the risk; Manage by routine procedure														
* Risk Score Matrix consistent with United Independent Pools Enterprise Risk Management Model Framework August 2008 and ISO 31000: Risk Management																

Date Updated: DRAFT At June 2018								Project Manager: TBC (Draft Developed By Project Steering Committee Project Working Group)						
STEP 1		STEP 2		STEP 3		STEP 4		STEP 5		STEP 6			STEP 7	STEP 8
NATURE OF RISK		IDENTIFIED RISKS		EVALUATED RISKS		PRIORITY OF RISKS		TREATMENT Who/ What/ When/ Where/ How		EVALUATED RISKS – RESIDUAL			TREATMENTS TO BE IMPLEMENTED	TREATMENT COMPLETED ?
				S	L	Level of Risk				S	L	Level of Risk	(Yes or No)	<input type="checkbox"/>
	People, Property, Environment, Reputation	What can go wrong?		M	9	M9	Moderate	Project partners to provide a written confirmation from senior management confirming their funding contribution towards the project, as well as the project components that they are interested in investing in within their respective areas of responsibility. Project budget designed so that if project components are removed from the program, the installed project components can still proceed across region		L	3	L3	Yes	<input checked="" type="checkbox"/>
People	Suitable Project Manager unable to be recruited		M	9	M9	Moderate	Utilise Local Government Procurement or existing Council panel contracts to appoint suitable Project Manager. As an alternative, an existing staff member from a Partner Council could be seconded to the project.		L	3	L3	Yes	<input type="checkbox"/>	

Date Updated: DRAFT At June 2018								Project Manager: TBC (Draft Developed By Project Steering Committee Project Working Group)						
STEP 1		STEP 2		STEP 3		STEP 4		STEP 5		STEP 6			STEP 7	STEP 8
NATURE OF RISK		IDENTIFIED RISKS		EVALUATED RISKS		PRIORITY OF RISKS		TREATMENT Who/ What/ When/ Where/ How		EVALUATED RISKS – RESIDUAL			TREATMENTS TO BE IMPLEMENTED	TREATMENT COMPLETED ?
				S	L	Level of Risk				S	L	Level of Risk	(Yes or No)	<input type="checkbox"/>
People	Project outcomes are not embraced by broader community and users – e.g.: Strong community interest in project outputs hosted on the Vision Illawarra platform; but user interfaces are not intuitive and act as a barrier to wider use.	M	6	M6	Moderate			Establish Community Reference Group (CRG) to provide community input and feedback to the design, construction, commissioning and communications for the Smart Water Management project. Progressive communication to community and Funding body to recognise progress and outcomes.		L	4	L4	Yes	<input type="checkbox"/>
People	Lack of community interest in using project outputs hosted on Vision Illawarra platform.	M	6	M6	Moderate			Establish Community Reference Group (CRG) to provide community input and feedback to the design, construction, commissioning and communications for the Smart Water Management project.		L	4	L4	Yes	<input type="checkbox"/>

Date Updated: DRAFT At June 2018								Project Manager: TBC (Draft Developed By Project Steering Committee Project Working Group)						
STEP 1		STEP 2		STEP 3		STEP 4		STEP 5		STEP 6			STEP 7	STEP 8
NATURE OF RISK		IDENTIFIED RISKS		EVALUATED RISKS		PRIORITY OF RISKS		TREATMENT Who/ What/ When/ Where/ How		EVALUATED RISKS – RESIDUAL			TREATMENTS TO BE IMPLEMENTED	TREATMENT COMPLETED ?
				S	L	Level of Risk				S	L	Level of Risk	(Yes or No)	<input type="checkbox"/>
People	People, Property, Environment, Reputation	What can go wrong?	Safety of personnel involved in project hardware installation.	M	6	M6	Moderate	Project manager to work with the Delivery agents to establish appropriate WHS controls in place for the completion of all hardware installations and site works		L	4	L4	Yes	<input type="checkbox"/>
Reputation		Project is not completed prior to 30 June, 2020 (when grant funding must be acquitted).		M	8	M8	Moderate	Involve Project partners and Deliverers in scoping and planning of project - UOW SMART Infrastructure research unit, who will be delivering the major share of the scope of works, have confirmed that the full scope of works can be delivered by June 30, 2020 (as evidenced by the milestones provided in Section 7 of this project plan). Ongoing effective Project Management to oversight, manage and control delivery of the project within agreed timeframes.		L	4	L4	Yes	<input checked="" type="checkbox"/>

Date Updated: DRAFT At June 2018								Project Manager: TBC (Draft Developed By Project Steering Committee Project Working Group)						
STEP 1		STEP 2		STEP 3		STEP 4		STEP 5		STEP 6			STEP 7	STEP 8
NATURE OF RISK	IDENTIFIED RISKS	EVALUATED RISKS			PRIORITY OF RISKS	TREATMENT		EVALUATED RISKS – RESIDUAL			TREATMENTS TO BE IMPLEMENTED	TREATMENT COMPLETED ?		
		S	L	Level of Risk		Who/ What/ When/ Where/ How		S	L	Level of Risk	(Yes or No)			
Reputation	Community expectation that project will be scaled-up (Phase 2) and deployed across the Illawarra-Shoalhaven earlier than planned.	M	9	M9	Moderate	Ensure that the community engagement for the project makes clear that:	<ul style="list-style-type: none"> The Smart Water Management is a Lighthouse project designed to implement a number of smart technology solutions with FUTURE potential to scale and expand across the Region, the State and Nationally. Following completion and evaluation of the results of this Phase, a second phase of the project may be commissioned to scale these technologies across the region and beyond. 	L	3	L3	Yes	<input type="checkbox"/>		

Date Updated: DRAFT At June 2018							Project Manager: TBC (Draft Developed By Project Steering Committee Project Working Group)						
STEP 1		STEP 2		STEP 3		STEP 4	STEP 5		STEP 6			STEP 7	STEP 8
NATURE OF RISK		IDENTIFIED RISKS		EVALUATED RISKS		PRIORITY OF RISKS	TREATMENT Who/ What/ When/ Where/ How		EVALUATED RISKS – RESIDUAL			TREATMENTS TO BE IMPLEMENTED	TREATMENT COMPLETED ?
				S	L	Level of Risk			S	L	Level of Risk	(Yes or No)	<input type="checkbox"/>
Reputation	People, Property, Environment, Reputation	What can go wrong?	Community feeling that project is an isolated effort and not worthy of participation	M	9	M9	Moderate	Gain ISJO Board endorsement and commitment to Smart Region Strategy, which includes Smart Water Management as a Lighthouse Project. Ensure that the community engagement for the project makes clear that this project is only one of the Lighthouse Projects under the Illawarra Shoalhaven Smart Region Strategy.	L	3	L3	Yes	<input checked="" type="checkbox"/>
Reputation	Not receiving NSW Crown Lands approvals for installation approvals (where relevant).			M	9	M9	Moderate	Project Manager to coordinate affected project partners to submit applications for approvals to complete hardware installations within 3 months of their appointment. Project partners have reported that, upon receipt of application by NSW Crown Lands, approvals should be received within 40 days.	L	3	L3	Yes	<input type="checkbox"/>

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STEP 1		STEP 2		STEP 3		STEP 4		STEP 5		STEP 6			STEP 7	STEP 8		
NATURE OF RISK		IDENTIFIED RISKS		EVALUATED RISKS		PRIORITY OF RISKS		TREATMENT Who/ What/ When/ Where/ How		EVALUATED RISKS – RESIDUAL			TREATMENTS TO BE IMPLEMENTED	TREATMENT COMPLETED ?		
				S	L	Level of Risk				S	L	Level of Risk	(Yes or No)	<input type="checkbox"/>		
Technology	Poor quality of sensors constructed by high school students.	M	9	M9	Moderate	Sensor construction to be supervised by personnel from the University of Wollongong's SMART Infrastructure Unit. All sensors to be tested by SMART Infrastructure both prior to, and following, installation.				L	3	L3	Yes	<input type="checkbox"/>		
Technology	Identified locations for new Gateways becomes unavailable	M	9	M9	Moderate	Proposed Gateway locations have been inspected and assessed by UOW SMART and relevant land owners with technical suitability and legal permissibility already assessed and confirmed. Formal written agreement will be gained following determination of the grant.				L	3	L3	Yes	<input checked="" type="checkbox"/>		
Technology	Smart technology solutions are not able to get reception, and provide telemetry to, the region-wide Internet of Things (IoT) network.	M	6	M6	Moderate	SMART Infrastructure have confirmed that the proposed installation locations of each project component will have 'line-of-sight' communication to a gateway that will enable sensor telemetry to be transmitted via the region-wide Internet-of-Things network.				L	2	L2	Yes	<input checked="" type="checkbox"/>		

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STEP 1		STEP 2		STEP 3		STEP 4		STEP 5		STEP 6			STEP 7	STEP 8		
NATURE OF RISK		IDENTIFIED RISKS		EVALUATED RISKS		PRIORITY OF RISKS		TREATMENT Who/ What/ When/ Where/ How		EVALUATED RISKS – RESIDUAL			TREATMENTS TO BE IMPLEMENTED	TREATMENT COMPLETED ?		
				S	L	Level of Risk				S	L	Level of Risk	(Yes or No)	<input type="checkbox"/>		
Technology	Analytics software is not able to provide useable output to be hosted on the Vision Illawarra platform.	M	9	M9	Moderate	UOW SMART Infrastructure has been thoroughly consulted during the development the project scope of works. Applying the expertise and experience that this group has in designing and delivering smart infrastructure projects, has ensured that the developed scope of works is matched by the technical skills and capacity of UOW Smart Infrastructure.				L	3	L3	Yes	<input checked="" type="checkbox"/>		
Environment	Impacts on environment during installation of project hardware.	L	4	L4	Low	The footprint of all installed project components will be very small. The installation of these projects will be managed under each land owner's procedures and requirements for reviewing environmental factors prior to the construction of any works.				L	2	L2	Yes	<input type="checkbox"/>		

11 COMMUNICATION PLAN

Target audience: Who do we want to inform?	Key messages: What do we want to tell them?	Communication methods: How are we going to tell them?	Who is responsible for doing it?	Deadline: By when does this need to happen?	Date completed
Project Steering Committee (ISJO Board)	<ul style="list-style-type: none"> • Project Status reporting • Community engagement plan 	Quarterly reporting	Project Manager	Quarterly commencing Oct 2018	
Project Control Group	<ul style="list-style-type: none"> • Project status reporting and risk tracking • Community engagement plan – key messages • Project issues and remedial actions • Project resourcing needs, issues 	Monthly reporting Monthly meeting	Project Manager	Monthly commencing Oct 2018	
Grant Funding Body - Commonwealth Department of Industry, Innovation and Science	<ul style="list-style-type: none"> • Project status reporting • Media opportunities for staged project achievements 	Online grant reporting portal	Project Manager	In line with reporting requirements	
Community Reference Group	<ul style="list-style-type: none"> • Benefits of projects. • Project delivery progress. • How to access project dashboards hosted on Vision Illawarra Platform. • Opportunities to provide feedback on project design and implementation. 	Project Status report Quarterly meetings	Project Manager	Quarterly commencing March 2019	
Industry groups (e.g.: Water, Local Government, Technology, Smart Cities)	<ul style="list-style-type: none"> • Opportunities to participate in Community Reference Group (CRG). • Benefits of projects. • Project delivery progress. • How to access project dashboards 	University of Wollongong SMART Infrastructure Dedicated	Illawarra Shoalhaven Joint Organisation	1/03/2020 1/11/2018	
		Social Media Channels	Project Manager	1/03/2019	

	<ul style="list-style-type: none"> hosted on Vision Illawarra Platform. Opportunities to provide feedback on and participate in expansion of project elements beyond project scope. 	Promotion via Industry forums and conferences	Project Manager and Project Partners	At launch and as opportunities arise throughout project	
Broader Regional Community	<ul style="list-style-type: none"> Opportunities to participate in Community Reference Group (CRG). Benefits of projects. Project delivery progress. How to access project dashboards hosted on Vision Illawarra Platform. Opportunities to provide feedback on project design and implementation. 		University of Wollongong SMART Infrastructure	1/03/2020	
		Dedicated	Illawarra Shoalhaven Joint Organisation	1/11/2018	
		Project Launch Event	Project Manager	1/03/2019	
		Social Media Channels	Project Manager	1/03/2019	
		Links from Project Partner Websites	PCG Members	26/11/2018	

12 PROJECT CLOSURE AND NEXT STEPS

At the conclusion of the Smart Water Management Project (Stage 1), the Project Manager will -

- Prepare a project closure and acceptance report with the support of all project partners as members of the Project Control Group.
- This report will then be presented to the Illawarra-Shoalhaven Smart Region Strategy Steering Committee and to the Project's Community Reference Group (CRG) for review and acceptance.

To ensure that the outcomes from the project are transferred to appropriate partners for ongoing business as usual operations and further development and progression -

- Training will be provided to all relevant staff from Project Partners to source and interpret data from installed technology solutions to inform better decision-making (e.g. pre-emptive clearing of debris from culverts, optimising the time to open estuary entrances (Go-Flow)
- A scheduled maintenance regime will be established (predominantly battery replacements) to optimise and ensure the ongoing operation of all installed hardware.
- Under the auspices of the Illawarra-Shoalhaven Smart Region Strategy, the Project Steering Committee will develop a project brief, and identify funding opportunities, to develop and deliver Phase 2 of the Smart Water Management project. This future stage will build on the community and industry collaboration established as part of this Stage 1 project and enable the scaling-up of the deployment of the smart technology solutions developed in Phase 1, initially across the Illawarra-Shoalhaven region and ultimately to the wider water and local government community across Australia.