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Demand Management Case Studies in Regional Queensland

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1. Introduction

For Queensland Water Service Providers the provision of safe, secure and sustainable urban water supply is a key challenge. Relative to many countries that are exposed to high levels of threat to water security and safety, Queensland is reasonably fortunate in its domestic water supply situation. While we grapple with the extremes of droughts and floods, our population growth is moderate, financial capacity reasonable, and governance and asset management standards are applied across the state.

This is not to imply that the local scenario is without challenges, and the fragility of our natural water resources has become apparent with much of Queensland again suffering a prolonged drought. In many parts of our State, local government elected members regularly must make important decisions to balance human demand for water with the health of our fragile ecosystems and other users such as agriculture and mining while also balancing the books.

A key element of any decision to manage demand is to manage the expensive infrastructure used to deliver water services. Unchecked water use increases the need for investment in new assets which must then be operated and maintained at the expense of the community. Optimising these costs to suit the desired levels of service of each community can be difficult. While most communities would prefer unlimited access to water, the costs associated with sourcing, treating and delivery can make this unaffordable. This means that demand management is required even in the absence of water shortages (Figure 1).

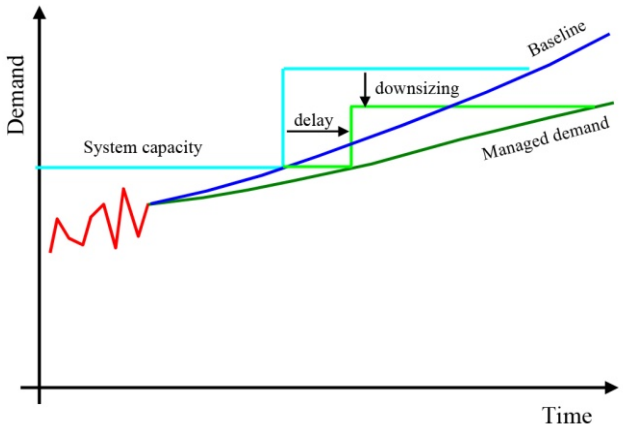

Figure 1. *Delaying or down-sizing capital expenditure based on demand management. (Source:* ***qldwater*** *Demand Management Fact Sheets).*

Addressing future urban water security and making efficient asset investments requires a range of adaptive approaches by individuals, communities, local and state governments. These include water efficiency measures, leakage reduction, water price signals, recycling and mandatory approaches such as water restrictions or water conservation measures. Each of these mechanisms have clear positive and negative aspects and all require political will so the best path towards improving water security must be carefully planned. However, as 70% of urban water is for residential use, and the majority of this is used for irrigation the case studies in this report focus on mechanisms to help manage water demand in residential settings and particularly for gardening.

For urban water service providers (WSPs), a permanent reduction in water demand can be equivalent to an increase in supply. By reducing average demand, the costs of sourcing, transferring and treating water are also reduced. The size and cost of most treatment and transmission infrastructure is not determined by total water use but rather by the volume required during periods of highest water demand. Reducing peak demand thus means that capital investment required to meet the needs of growing communities can be deferred or even avoided.

Advantages of reduced water use extend beyond these direct supply and financial benefits. From the perspective of the community and business, water bills can remain manageable. The environment can also benefit if there is reduced extraction from rivers and aquifers leading to increased flows which can improve river health. Lower energy consumption also leads to a reduction in greenhouse gas emissions. Indeed, the Intergovernmental Panel on Climate Change described demand management as a no-regrets solution to cope with future vulnerability of water supplies in the face of climate change impact (Bates, 2008).

However, for local government WSPs demand management can pose significant problems and create difficult decisions. For example, if not managed appropriately, demand management can result in:

- community unrest where high, or free water use is seen as a community right;
- reduced income where customers are paying for high water use; and
- lower liveability or community amenity if poorly managed irrigation practices result in browner and dustier outdoor areas.

These common concerns highlight the need to carefully manage any program to conserve urban water with a clear view of what the desired outcomes are for the broader community. This report showcases programs from regional Queensland that minimise these risks while managing demand for clearly defined council and community benefit.

2. Background

Water security programs are common across Queensland and significant research has been undertaken in recent years in SEQ and other cities to determine which solutions are most appropriate in metro areas. However, key information and technologies have been adopted to different degrees by regional councils. This project was funded by the Department of Energy and Water Supply through the Queensland Water Regional Alliances Program (QWRAP) which is managed by LGAQ and ***qldwater*** in order to investigate demand management strategies that are successful in regional Queensland.

As an initial indicator of the uptake of water security measures in regional councils, a preliminary survey was undertaken of websites of a range of QWRAP councils to determine the level of online interaction each provided on water security. While relevant information and tools filled many pages for some, the topic was entirely absent for others. Tellingly, there was significant variation in the degree of use of State-developed 'Waterwise' materials with some councils not using these highly-regarded and free resources. The presence of online material does not necessarily reflect all water security measures undertaken by councils but provision of appropriate information tailored for customers is an essential (though not sufficient) element for encouraging efficient water use.

Much of regional Queensland is subject to intermittent rain and many urban water supplies are regularly impacted by drought, so water security forms an important part of the Queensland psyche. However, many regional urban centres consume far higher volumes of water than most Australian and many international metro areas. This apparent paradox results from a complex cultural history of the development of Queensland regional communities which has always centred on the presence and reliability of a water supply. Equally important is the universal desire to overcome the intermittently arid climate using water to maintain liveable urban environments that enhance

community wellbeing. These factors often combine with cheap raw water prices and abundant artesian supply to reduce or eliminate practical drivers for water efficiency. However, there are important business drivers for councils to pursue water efficiency including to:

1. extend a limited or insecure supply for as long a period as possible,
2. maintain or enhance environmental flows and waterway health,
3. respect community expectations for water conservation,
4. avoid or defer investment in additional capital.
5. reduce costs of production (raw water, electricity, consumables),

These drivers are present to differing degrees in each community dependent on the local infrastructure, water source and community values. There are also a range of barriers and perverse incentives acting against each of the drivers which also vary from community to community. The decision to invest in water security programs is complex and not always well understood and is one of many issues where immediate action may reap rewards only in the future while potentially raising significant present-day costs and often political risk. The consequence is that water security measures are most often implemented as interventions at times of severe water scarcity. Examining and sharing diverse cases studies from regional Queensland will assist in informing decisions to evaluate demand management options outside of drought periods.

3. What is Demand Management?

Water demand management is defined here as managing the urban demand for water to achieve a balance between economic, social equity and environmental outcomes. Optimal demand management programs incorporate measures that improve water use efficiency, offer the opportunity to reuse and recycle water and minimise water waste.

Effectively managing water demands involves:

- Understanding how and where water is used
- Understanding council business drivers for demand management
- Identifying options applicable to the local situation Identifying barriers to change
- Consideration of the costs and benefits of each option
- Development and implementation of a demand management program
- Reviewing progress and iteratively modifying the program based on customer response.

A common theme for all demand management programs is understanding community engagement.

4. Challenges and Evolving Trends in Community Engagement

Community engagement is central to any demand management effort and there are many ways to communicate with communities about the value of water efficiency. While some organisations have traditionally used a one-way transfer of information to inform and educate the public and other stakeholders a shift to a broader spectrum of community engagement where relationships are built

on shared visions and trust is occurring in many sectors. The shift indicates in part the radically different forms of communication organisations now need to embrace due to a fast pace of innovation compounded by increasing diversity, complexity and change in communities.

An initial survey of Water Service Provider websites across regional Queensland demonstrated various degrees of communication and community engagement in an effort to educate and involve the community in water demand management. There are some excellent examples of water conservation education and most communities already know the basics of using water efficiently. For example, messages about not hosing the footpath, turning off the tap while we brush our teeth, mulching our gardens and taking shorter showers are common.

But consumers don't always adopt these efficient behaviours, particularly if there is even an inconvenience factor involved. After all, water is cheap, as easy as turning on a tap, and at a level of service that is generally consistent in spite of our highly variable climate. Moreover, many people do not appreciate the value of water services and the costs to councils of providing a food-quality product to customers' taps consistently every day of the year.

Even when behaviour change is adopted, it may not last. In an experimental test of voluntary strategies to promote urban water demand management, voluntary demand management strategies were found to complement a range of other strategies such as regulation and water efficient infrastructure to reduce water usage (Fielding *et al.*, 2013). These reductions were often maintained for some months beyond the intervention period. However, the results showed that if the interventions ceased, water usage eventually returned to previous levels without the presence of further environmental cues like drought or water scarcity. Although this 'rebound effect' is not always immediate (e.g. as was the case in SEQ), in regional Queensland, engagement programs must take into account the drought-flood cycle on water supplies and the consequent cyclical nature of community perceptions.

Another study (Gilbertson, 2011) found that significantly more people from a water-scarce location are supportive of water conservation behaviours than those living in a region with water surplus. The timing of community engagement programs and type of messaging is therefore critical to its success, and reframing messages from a focus on drought response to a focus on long-term water supply reliability can build continued support in the local community.

Another key component of the evolution of community engagement that will have a dramatic impact on demand management is the rise of digital and social media networks. Organisations in both the public and private sector can now harness these channels to deliver timely information, engage in conversation and respond to enquiries and feedback.

5. What constitutes best practice?

Best practice community engagement starts at the top of organisations with a full commitment to genuinely involve all stakeholders who are affected by or interested in a decision, and offers opportunities to participate in the decision-making process. Engagement is an outcome – consultation is a process.

The International Association of Public Participation (IAP2) summarised the spectrum of public participation approaches with increasing levels of public impact as it progresses through successive

stages including inform, consult, involve, collaborate and finally empower (Figure 2). According to the 'IPWEA Practice Note 8: Levels of Service and Community Engagement', Councils should aim to achieve at least the level of 'involve' with the preferred level being to collaborate.

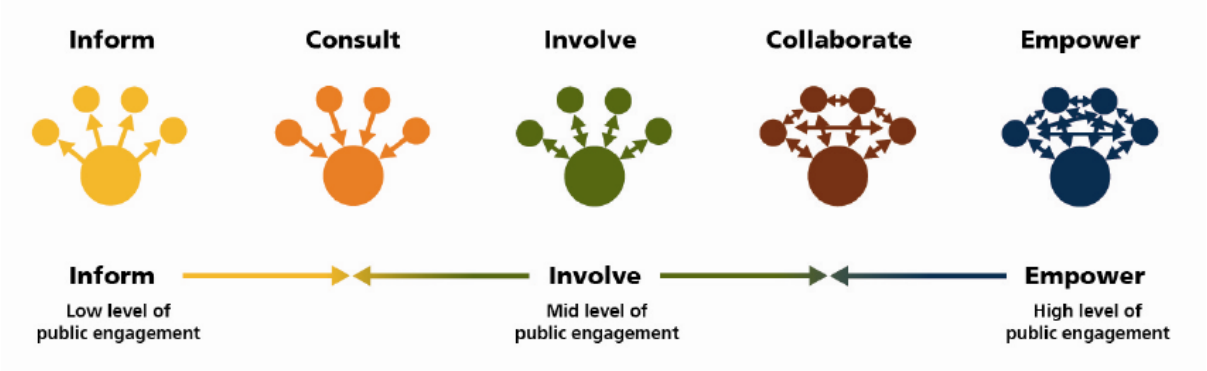

***Figure 2**. The IAP2 Spectrum of Public Participation. Source: Butteriss (2016)*

Best practice depends on the situation and must always be context sensitive. While highly collaborative models may be perfect for some situations, they may not be difficult for example,

- when most of the stakeholders are spread out over large geographic distances,
- where information and education alone are best suited to help, or
- most importantly, where such a process is not suited to the cultural or community norms.

The techniques used for best practice must therefore be case specific, but the aim should always balance the competing needs of a council, its public and the community as a whole.

Each of the approaches summarised in the IAP2 spectrum are relevant for water demand management at different times. A study on Community Engagement in the Water Sector by the Cooperative Research Centre for Water Sensitive Cities (CRC for WSC) evaluated the effectiveness of different ways of engaging with communities (Dean *et al.*, 2016). The review aimed to highlight the degree to which different engagement techniques could achieve positive outcomes, dividing techniques into:

1. Initiatives that provide input to the community with the aim to inform, educate or raise awareness, change individual or household behaviour and/or build policy support;
2. Initiatives that seek input from the community in order to gauge community opinion and preferences about current water practices and specific policy options, or to explore broader visions for the local area; and
3. Initiatives that build active and connected communities, focusing on participation in decision making, building trust and effective long-term relationships between and within water organisations and communities, and building active community stewardship through the use of citizen science programs where community members conduct environmental monitoring or community management programs.

The report found that face-to-face and mass media water education and awareness campaigns were generally successful at increasing knowledge and improving attitudes to more sustainable water practices and policies.

"In terms of behaviour change programs, overall there is good evidence for the effectiveness of a range of approaches to reducing household water demand management. Although the effectiveness

of these programs likely depends on the social and environmental context, studies have shown that public behaviour change campaigns can result in substantial reductions in household water use; estimations range from 2-25%. Studies suggest that programs that encompass multiple approaches may be more effective" (Dean *et al.*, 2016, p. 17).

The key elements of community engagement for demand management programs thus include:

- identifying the optimal level of engagement,
- deliberate sensitivity to local contexts and needs,
- embracing multiple approaches where necessary.

Each of these elements requires a service provide to target the appropriate segment(s) of their community.

6. Being on target

Water Service Providers must communicate with a broad range of audiences including:

- consumers who pay for water and related services,
- citizens with a right to access clean water and related services,
- the general public,
- communities of interest (individuals linked by a shared location or interest) and
- stakeholders that are directly or indirectly affected by an issue.

A review by the CRC for Water Sensitive Cities provided a number of principles to increase the likelihood of effectiveness of different engagement processes, including:

- Know your audience / community: understand who you are targeting and what their current issues, constraints, knowledge and behaviour are to ensure you develop a program that is relevant to your audience or community.
- Use diverse mechanisms to reach diverse communities: diverse groups vary in their ability to engage and participate, and it is important to provide diverse outreach pathways to maximise your reach.
- Frame the issue carefully: think carefully about what aspects to draw out that will guide people's thinking about the issue, e.g. messages that appeal to closely held values usually have more traction. Frame your message using local examples and choose words and images that enhance motivation and reduce negative responses.

"The question of what community engagement techniques are effective should be rephrased as 'what engagement techniques are most effective to achieve a particular outcome'." Producing an Impact-Likelihood Matrix can help service providers select behaviours that will have a high likelihood of uptake but also delivers a worthwhile impact (Figure 3). This type of analysis can help in understanding the current position and needs of a particular community.

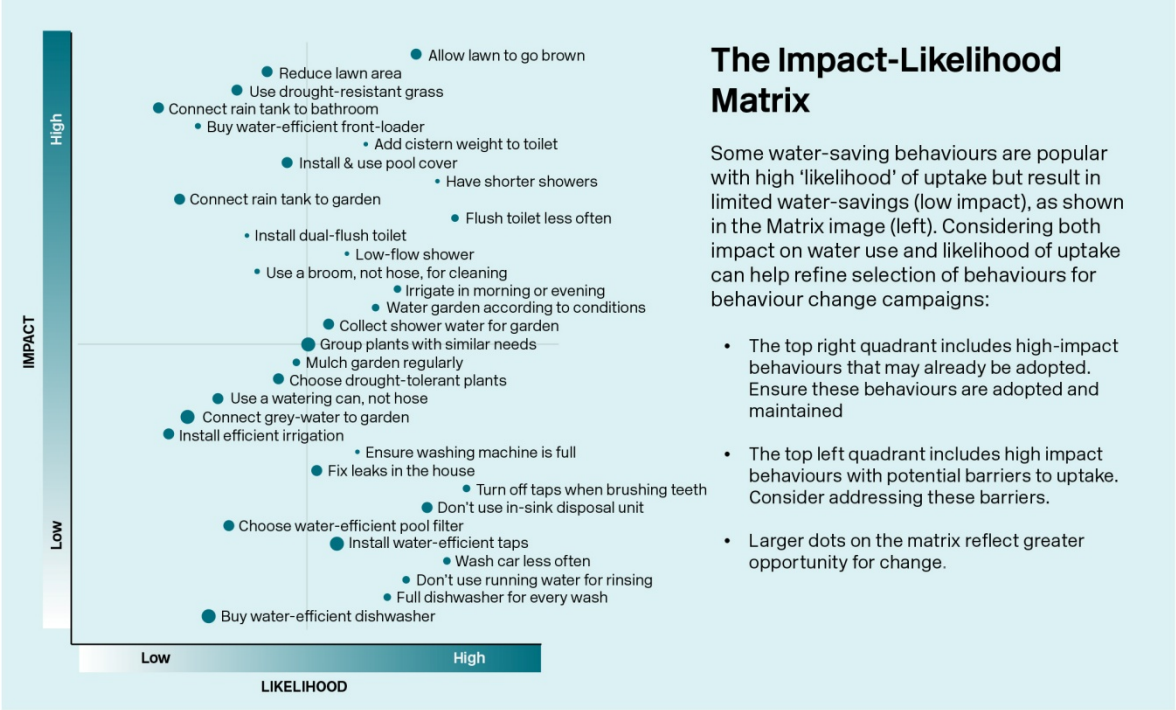

Figure 3. Projected impact and likelihood of adoption of a range of water saving behaviours. Source: Dean et al. *(2016).*

When a community profile for specific water-saving behaviours is known, a local "roadmap for change" can be developed with a focus on high-impact behaviours that will save the most water but also have a high likelihood of adoption by the community.

7. The community engagement toolbox

Selecting the right tools and techniques to reach your target audience will depend on the size of the community, available budget and the preferred level of engagement. The *IPWEA Levels of Service and Community Engagement Practice Note 8* identifies a number of tools and techniques available for use at the different levels of engagement, including their inherent strengths and weaknesses (Table 1). WSPs should identify the tools and techniques that are relevant to their communities, and build a 'toolbox' for use when needed. Additional Queensland specific examples are provided later in this report.

Table 1: Engagement techniques: strengths and weaknesses. Source: IPWEA 2014.

	Strengths			Weaknesses		
	Represents broad cross section of community	Low cost, time and resource efficient	Community capacity/ knowledge building	Limited community engagement	Resource intensive/ specific skills required	Language/ cultural/ literacy/ disability hazards
Information sharing						
Advertising	✓	✓				
Online information processes	✓	✓			×	×
Briefings			✓			
Education and awareness programs				×	×	
Fact sheets	✓					×
Newsletters	✓				×	×
Media stories	✓	✓		×		×
News conferences		✓		×		
Telephone hotline	✓				×	
Displays	✓	✓	✓	×	×	×
Newspaper inserts	✓				×	×
Community fairs and events	✓		✓		×	
Community meetings		✓		×		
Shop fronts	✓		✓	×	×	
Informal club forums					×	
Consultation						
Discussion groups and workshops			✓	×	×	
One-on-one interviews			✓	×	×	
Open days	✓	✓	✓		×	
Polls		✓		×	×	
Road shows	✓				×	×
Survey research	✓	✓			×	×
Web-based consultation	✓	✓		×	×	×
Active participation (<20 people)						
Action research				×		
Advisory committees		✓		×		
Charrettes			✓	×		×
Citizens' juries			✓	×	×	
Community reference groups			✓		×	
Deliberative retreats			✓	×	×	
Drama workshops					×	
Learning circles			✓	×		
Design workshops			✓	×	×	
Focus groups			✓	×		
Participatory editing	✓				×	×
Precinct committees	✓		✓	×		
Partnerships for active participation			✓		×	
Active participation (20–100 people)						
Future search conferences	✓		✓		×	
Imagine (appreciative inquiry)	✓		✓	×		
Nominal group workshops		✓		×		
Photovoice					×	
Policy action teams			✓		×	

Another technique that is being used more is Community Based Social Marketing (CBSM). Traditional marketing campaigns focus on providing information, using printed material to inform communities about certain issues and recommending or suggesting ways they could make a difference. These

types of campaigns are becoming decreasingly effective due to the large amounts of information people need to process every day, and when used in isolation they therefore have little effect on actually changing behaviour (McKenzie-Mohr, 1999).

Although information intensive campaigns are good as a first point to raise awareness, CBSM offers a complementary approach that uses psychological theories about social norms, social diffusion and self-perception to generate change and foster sustainable behaviour. Some of the persuasive communication and behaviour change tools used in CBSM include:

- A pledge or commitment in writing or verbally can increase the likelihood of adopting a behaviour;
- A reminder through the use of prompts (in a water efficiency project in Perth, the application of prompts like stickers near taps reduced water use by 23%);
- Incentives like the provision of rebates for water saving devices;
- Reinforcing social norms by highlighting the number of people already doing the desired activity can pressure others to conform;
- Providing feedback about behaviour, for example the Queensland Water Commission's highly successful Target 140 campaign that provided weekly graphical illustrations of residential consumption over the course of the campaign;
- Making it easier for people to do the desired activity; and
- Framing messages to emphasise the benefits of acting or the consequences of not acting.

CBSM takes a deliberate approach to apply the strategies discussed above including:

- carefully selecting the behaviour to be promoted;
- identifying the barriers and benefits associated with the selected behaviour;
- designing a strategy that utilises behaviour-change tools to address these barriers and benefits;
- piloting the strategy with a small segment of a community, and finally;
- evaluating the impact of the program once it has been implemented broadly.

A number of Queensland Councils have embraced CBSM as an effective strategy to engage with their communities, allowing them to establish what the barriers to change are in their communities and then develop strategies that will drive down those barriers and increase the benefits to change. Case studies (see below) that include examples of CBSM campaigns include the Townsville Great Sprinkler Swap and the Cairns Sponge Campaign.

8. *Benefits of effective community engagement*

Benefits for organisations that embrace community engagement are numerous and can include:

- Better issues management created by listening to public discussions about contentious issues;
- Improved communications and relationships with public leading to long term partnerships;
- Better knowledge of public values and priorities, leading to better policies and service delivery options;
- Building trust and respect within the community leading to greater public understanding of issues and, possibly, shared responsibility for successful policy and service delivery outcomes; and

- Through digital and social media, gaining an understanding of the psychology of community groups and stakeholders to better address the positive or negative sentiments shared online and adjusting strategies accordingly.

9. *Case Studies of Water Demand Management in Queensland*

Examples of successful community engagement for demand management in regional Queensland are investigated here through several case studies of campaigns across regional Queensland. These examples were chosen following a review of a range of water security management approaches across the state and each case study is analysed to examine the following aspects:

The reason(s) behind the campaigns

Target audience and participation rate

Set up and ongoing costs

Overall benefit to the service provider

Case studies

Fraser Coast Regional Council/ Wide bay Water – Schools Gardening Competition

Engaging children through school activities is recognised as an important communication mechanism for encouraging behaviour change to support demand management. Wide Bay Water successfully used the extensive range of DEWS Waterwise materials to develop a school gardening competition. Now in its eighth year, the competition has evolved over time to become a strong engagement program involving local schools and businesses.

Mackay Regional Council – myh2o Website

Mackay's myh2o website allows property owners, property agents and tenants to access reports to better understand and help control water consumption and residential leaks. The program includes a website, web app and a social media campaign following the rollout of automatic meter reading technology.

Cairns Regional Council – Sponge Campaign

The three year 'Our Cairns Water' campaign was designed to highlight the importance of water in a tropical environment where the annual wet season can raise expectations that water is always in plentiful supply. The campaign used an animated sponge as a metaphor for the thirsty Cairns environment. Based on the popular Community Based Social Marketing (CBSM) strategy, the "sponge" water savings campaign managed to tap into community sentiment to deliver successful behaviour change.

Townsville City Council – The Lawn Tamer

As a guide to better managing outdoor water usage, Townsville City Council introduced an entertaining series featuring Bradley the The Lawn Tamer. The video series effectively uses humour to convey more serious messages about what lawn species to use and tips to improve soil, minimise watering, fertiliser use, irrigation & leaks and mowing. The campaign also includes a series of fact sheets.

Townsville City Council – The Great Sprinkler Swap

Townsville residents consume approximately four times more water per person than in most major cities. On average, about 70% of the total household water usage in Townsville is used to maintain lawns and gardens. The council thus identified residential irrigation as a key driver of water use. The Great Sprinkler Swap campaign invited residents to swap older inefficient sprinklers for water saving Wobble-Tee sprinklers. During the swap, the most commonly returned sprinkler was the 'Rose' sprinkler which throws out approximately 24 L/minute over 8 m^2 area. The Wobble-Tee uses less than half the water at approximately 10 L/minute.

Townsville City Council – Social Media with Maggie Towns

The use of social media to engage with communities is growing but most Councils are still grappling with the implications of social media. Townsville introduced an avatar called Maggie Towns as their online customer service consultant. Maggie provides an easy way for residents to connect with Council. She has an excellent response time to feedback thanks to a support process through internal staff allowing frequent responses to comments from the community.

Toowoomba City Council Waterwise Website

Recovering from demand management fatigue after the highly publicised Water Futures Toowoomba water recycling project, Toowoomba Regional Council ceased all promotion and advertising with regards to water demand management. Instead, Council opted to focus on an in-depth website and an education program. Spearheaded by two educators, the team visits schools and community groups to raise awareness and to allow Council to maintain a leadership role in waste and water efficiency.

Wujal Wujal Aboriginal Shire Council Water Demand Management Project

Located in a world heritage declared area approximately four hours drive north of Cairns, Wujal Wujal Aboriginal Shire Council (WWASC) has a maximum population of 480 people and a very small rateable base consisting of state housing, a hospital and a police station. With the running costs of the microfiltration water treatment plant spiralling, Council implemented a water demand management program to provide much-needed savings while also promoting Waterwise habits in the community.

Table 2 provides an overview of the water security management measures, audience, resources and costs related to the selection of case studies.

Table 2: Selection of Case Studies – Measures, Audience, Resources and Cost

Case Study	Water Security Management Measure	Target Audience	Community Acceptance[1]	Time / Resource Intensiveness[2]	Cost[3]
Cairns Regional Council – Sponge Campaign	Engagement (broad community) Customer use efficiency – water efficient gardens and landscaping.	Broad community audience	**Good**: Market research identified unique features the community value and campaign was based around that.	**High**: Broad campaign across multiple media and ongoing measurement and benchmarking.	**High**: $500k over three years
Fraser Coast Regional Council/ Wide bay Water – Schools gardening Competition	Education and awareness - School education programs.	Primary and high school students, parents, garden groups and local businesses	**Good**: Positive campaign targeting high outdoor water use and resulting in a more informed community.	**Medium**: Time of Council staff to build relationships, campaign planning and judging	**Low**: campaign uses existing Waterwise and other materials.
Mackay Regional Council – myh2o Website	Customer use efficiency – leaks and water meter checks. Council water efficiency – loss management. Engagement (customers)	Residential and commercial water users, but better able to target messages at individual property level.	**Very Good**: High consumption and leak alert notices save customers money.	**High**: multi-stage strategy requires staff to monitor data, manage social media and communications.	**High**: Installation of automatic meters, software to collate and interrogate meter data, web portal, information and social media campaign. Campaign resulted in deferral of $100 million capital expenditure.
Toowoomba City Council	Education and Awareness – broad community engagement and school education programs Water efficiency audits	Residential customers that are active on the internet, school students and community groups.	**Mixed**: Recycled water campaign left Councillors wary of talking about demand management.	**Medium**: Time of educational team, IT/web infrastructure, Communications.	**Medium**: $95k per annum currently to promote water and waste initiatives.
Townsville City Council – The Great Sprinkler Swap	Customer use efficiency - water efficient devices and customer engagement.	Households with automatic irrigation systems.	**Good**: Customers get something for free and saves money / water in the process.	**Medium**: Staff time to manage exchange program at events	**Medium**: Funds for bulk purchase of sprinklers at $24 each with 1,400 given away to date. The ROI of one sprinkler is 1.3 years.

Case Study	Water Security Management Measure	Target Audience	Community Acceptance[1]	Time / Resource Intensiveness[2]	Cost[3]
					Advertising costs.
Townsville City Council – The Lawn Tamer	Engagement (key residential irrigators) Customer use efficiency – water efficient gardens and landscaping.	Home owners with a lawn	**Medium**: Humour helps to alleviate the seriousness of high outdoor water use.	**Medium**: Production of videos outsourced	**Medium**: $50k to produce six videos, $5k for fact sheets and approx $15k per year for advertising
Townsville City Council – Social Media with Maggie Towns	Engagement (broad community/social media)	Residential and business customers active on social media and prefer to engage this way	**Medium**: Negative comments can be deflected by positive responses.	**High**: Quick response time to comments and questions are required.	**Medium**: Cost of social media engagement staff.
Wujal Wujal Aboriginal Shire Council Water Demand	Customer use efficiency – leaks and water meter checks. Council water efficiency – loss management. Engagement (customers)	Residential customers	**Good**:	**Medium** – only possible in a small community	**Low**: Approx. $20k

1. Very High = strong positive response. Good = positive response. Medium = Response has not been negative but is not yet fully tested.
2. High = multiple staff and many dedicated hours. Medium = Small number of staff dedicating focussed time
3. High = >$100,000 per year in first three years. Med = $30,000-$100,000. Low = <$30,000

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Wide Bay Water Corporation Schools Gardening Competition

In the throes of the millennium drought in 2006, Wide Bay Water Corporation (WBWC) investigated options to provide a more secure source of water to the region - including raising the walls of their primary water reservoir, Lenthalls Dam. When a vocal focus group formed in the community, WBWC increased its level of community consultation and engagement, focusing on garden groups to raise awareness of and curb outdoor water use. The connection through gardening clubs lead to the development of a school program and the introduction of a school gardening competition eight years ago.

According to Jeanette Harrold, Environmental Services Manager at Wide Bay Water, gardening is a great way to increase water and recycling awareness in the younger generation and a fulfilling activity that may just turn into a lifelong interest.

A different theme is selected each year: the 2016 School Water & Wastewise Challenge theme is “Be seen teaching blue & green in 2016”. Blue represents water sources and green represents natural resources.

WBWC successfully used DEWS Waterwise materials to build a strong engagement program with local schools and businesses.

While the competition is promoted to both primary and high schools within different categories, entries are generally from prep and Grade 1 classes where teachers have more time to pursue such activities. Entries are also received from school gardening clubs.

Since 2008, the schools program has engaged 28 schools and approximately 1,200 students per year.

The program also engages local businesses including support and funding from Bunnings and prizes worth $3000 provided by council and other sponsors. Councillors regularly launch the event and attend awards ceremonies, resulting in positive media coverage.

The cost of the program is primarily related to the time dedicated by staff and outcomes are measured in terms of the number of children and residents taking part in the program and attending information forums.

Costs are kept low by utilising existing materials and combining it with local action to promote a positive water efficiency message. The program includes all DEWS Waterwise materials, and activities are linked with special days or weeks of the year (judging takes place during National Water Week and winner are announced during National Recycling Week). Tying in with the special calendar provides access to more free resources, saving both time and money.

With outdoor water identified as the main culprit in excessive residential water use, the schools gardening competition allowed WBWC to capitalise on the feel-good factor while conveying a more serious message.

To enter the competition, each garden records the whole story of soil, pH levels, moisture content and the benefits of composting – lessons that the students will take with them on the journey of life and hopefully pass on to their friends and families. The overall benefit to WBWC is a more informed community in tune with their environment.

What is needed…

- Time of council staff,

- Relationship with local businesses for sponsors and materials,
- Campaign planning and judging team,
- Opening and award ceremonies by councillors,
- Council funds for prizes,
- Relationship with local schools.

Audience: Schools, Students, Parents and local businesses.

According to Jeanette, it is important to remain flexible and learn through trial and error.

"We continually change the competition according to feedback and personal observation. Another important element is to provide clear guidance and not have too many options which could confuse the teachers and students, with the competition ending up in the too hard basket.

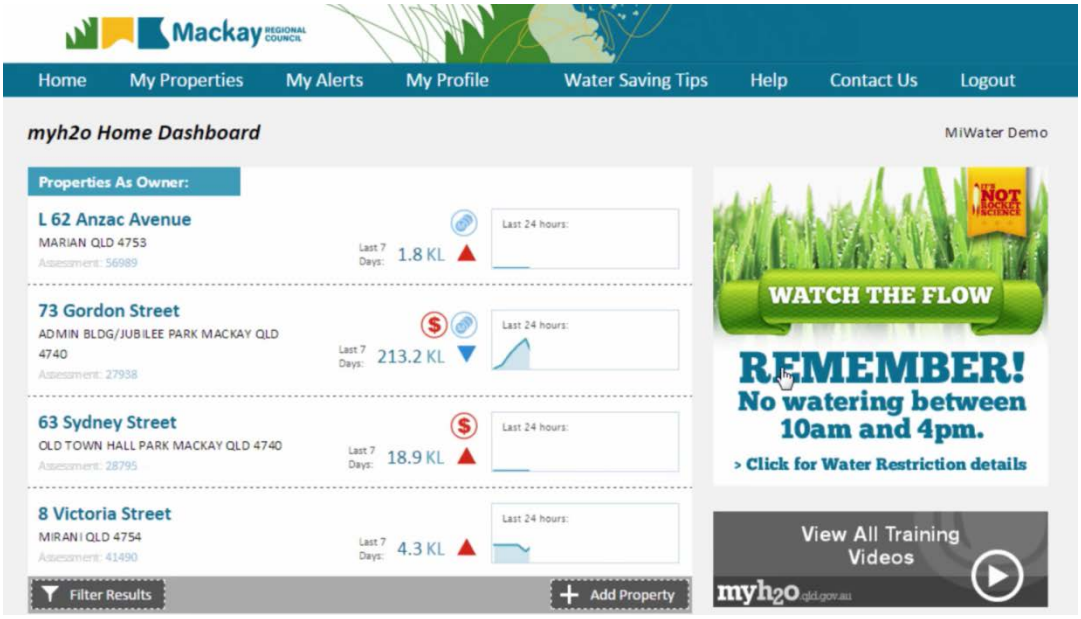
Entries are scored against a number of criteria and a range of categories including early childhood, lower primary, upper primary, junior secondary, senior secondary and special education. Wide Bay Water staff offers free water and waste wise educational talks to get started.

Prizes range from vouchers to tools, gloves and watering cans.

Mackay Regional Council – My H_2O Website

High population growth within the Mackay region over the past decade has created several challenges for Mackay's Water and Waste Services (WWS), resulting in tariff growth well in excess of inflation rates. Recognising that continued tariff increases are not sustainable, WWS adopted a strategy of incorporating and prioritising non-capital solutions. The resulting demand management program included the installation of automated metering infrastructure (AMI) and the development of consumption monitoring software called MiWater. The program includes a free community portal, myh$_2$o, to provide council and its residents with detailed information on their water consumption patterns and habits to help them make better informed decisions on their water usage.

An early case study identified that non-capital solutions and investment in new technologies to better understand and improve network performance could achieve significant savings – a reduction of peak demand by just 10 per cent had the potential to defer planned capital expenditure by four to five years, an approximate saving of $100 million.



WWS targeted both residential and commercial water users within the Mackay Regional Council area, engaging through a comprehensive social marketing program which has taken them on a journey of behaviour change over a number of years.

Prior to the commencement of the social marketing strategy it was identified that residents were unaware of any peak demand challenges in the region. The strategy was therefore broken down into a number of stages:

- create awareness of water related issues within the region,
- remove any barriers to change,
- prepare residents for the behaviour changes that they would need to make, and
- provide them with the tools in order to make the required changes and maintain the new desired behaviour.

The campaign is currently in the action stage following the launch of the myh$_2$o website

which allows residents to take control of their water consumption and implement their own action for improvements.

The myh$_2$o technology allows WWS to engage with customers on a continual basis through direct marketing and communication rather than the traditional mass marketing approach. It allows council to better understand their customers' needs through the development of autonomous machine intelligent agents (bots) which analyse an individual property's water usage, identify usage patterns, and profile each property based on the analysis and patterns identified. Council then utilises the property profiles to better target relevant messages based on the behaviour at an individual property level, for example profile groups with a pool or with timed irrigation.

Over 9170 residents have now registered to myh$_2$o since the website launch in early 2015. The website is being actively promoted through a comprehensive marketing program to encourage further registrations. WWS continues to issue high consumption and leak alert notices to all residents with potential water issues as identified through MiWater (approximately 1500 notices issued per month) ensuring all residents reap the benefits of the system.

The myh$_2$o program forms part of a much larger overarching strategy to reduce peak water consumption and wastage and improve network performance. The strategy was formed using a two-pronged approach consisting of:

1. The creation of an intelligent water network to obtain improved outcomes in operational and capital decisions.
2. Demand management program to minimise the daily per capita consumption of water, primarily targeted at outdoor water usage.

A lack of detailed and reliable information available on capacity utilisation, especially in the network assets lead to the development of a number of digital innovation strategies to better understand the network. These included:

- Automated data capture (using tablets at all water extraction and treatment facilities) and establishing a single centralised database to hold that information
- Online water quality monitoring at the primary water source (Dumbleton Weir) linked to the treatment process to automatically react to changes in quality of inflow water
- Integrated water testing results
- Integrated operational data from the SCADA systems into the same database to enable analytics to be carried out across the related but different datasets
- Automatic Meter Readers (AMR) installed across the entire water meter fleet (first water utility in Australia to embark on such a project) and developing software to enable the management and analysis of the data generated through the AMRs
- Trialling sewer manhole monitors to manage potential overflows
- Improving job and asset data capture and feedback process of preventative and corrective maintenance activities.

What is needed…

- Automatic meters on residential and commercial properties,
- Software to collate and interrogate meter data in real time,
- Customer web portal,
- Information and social media campaign.

Audience: Residential and commercial customers.

Mackay Regional Council and the entire Mackay community (123,000 residents) have benefited from the installation of AMI, the development of MiWater, including the myh$_2$o website. Together, the Automatic Meter Reading (AMR) technology and the myh$_2$o website identifies and informs council and its residents of water leaks and high consumption faster, saving everyone time, money and water.

Around 12 per cent of residential properties were successfully informed of water leaks in 2015, significantly reducing water loss and the associated costs to customers. WWS has now also installed AMI to monitor water losses in its own network, which will potentially save up to 10 per cent of its current output.

In addition, the analysis of the consumption data is enabling direct targeted conversations and messages to consumers instead of generic mass mail outs, better understanding and utilisation of treatment plants and distribution network capacity, and a better insight to manage the WWS capital program allowing appropriate deferrals in coming years.

The most significant impact of this initiative has been the deferral of around $100 million from the ten year forward capital program allowing WWS to reduce its operational budgets. This in turn resulted in a zero per cent increase in water tariffs for the 2015/16 financial year. It's now expected that WWS will be able to maintain tariff increases at less than inflation for the next three to five years, resulting in significant savings for their community.

Cairns Regional Council – Sponge Campaign

Nestled in the wet tropics of North Queensland with generally high rainfall, Cairns Regional Council (CRC) faced a difficult challenge to educate the local community on water demand management. For CRC the problem is more a lack of storage rather than a lack of water, so when existing water supplies were under pressure due to strong population growth, a demand management strategy was put in place to extend the life of its existing supplies. At the time (2006) it was estimated that water supplies may not be able to meet demand by 2008.

With most of Queensland experiencing severe drought at the time, the federal government announced funding to assist local governments in demand management strategies and CRC managed to secure funding of $1.3million from the Department of Local Government, Planning and Sport.

The Sponge Campaign was launched in April 2007 with funding provided until the end of 2009, but CRC has managed to keep the campaign going on a much smaller budget as and when needed over succeeding years.

Following benchmark market research, CRC recognised the position of the community in relation to the subject. Overall they did not identify with state marketing and education around the drought at that time, as they felt it did not relate to their region. Being the wet tropics they referred to the "unique" features of the region they most valued as the reef, the rainforest, the rivers and the "greenness" – so this drove the creative angle for the campaign. As such it was a general broad community audience target.
Using Community Based Social Marketing principles, the main intent was to raise the awareness around WHY water conservation was important in the wet tropics, and establish general community acceptance of the relevance before introducing means and ways to reduce water use (the HOW).
Engagement was achieved using a multi-media mix of TV, press, radio, web, billboard, bus decals and more recently online AV's and social media, a school education program and face to face Community Engagement at local community events and festivals. The campaign included a range of promotional materials.

The initial communications campaign, including production and delivery, was $500,000 over three years. Following this a delivery and maintenance scheduling program has been around $80-100,000 annually depending on the weather circumstances and water use.

The benchmark survey conducted in 2006 was followed by another in 2007 to gauge the effectiveness after one year and another more recently in 2014. A sample of 400 households equating to an 80-90% representation of the population showed a definite improvement with CRC achieving the 10% reduction target over three years within the first year of the campaign. The overall reduction over three years was 15%.
In any behaviour change campaign it is vital to understand the positioning, barriers, triggers and drivers of the target audience, and market research (both qualitative and quantitative) are the most cost-effective mediums for measurement.
Some of the findings are below:

Benchmark	2007	2014
Understanding Cairns' water supply situation as a shortfall	67%	93%

Importance of water conservation in Cairns as important/crucial	12%	33%
Things that would encourage more water conservation, more education	29%	46%
Likeability of the media, positive	47%	60%

The top four mediums for information was: **TV 58%, Internet 36%, radio 34%, press 26%**

With several seasonal and extreme weather incidents, water use has increased during peak periods and the dry season in line with the population increase in the past 10 years, however per capita use has remained steady. As a result, CRC is now developing a new campaign as part of a new Demand Management Strategy which is also associated with the long term Cairns Water security Strategy (link to flyer).
The campaign maintained Council support through monthly reporting requirements and positive community feedback. The reduction in water use over the campaign period aligned with additional Demand Management Strategy initiatives such as leak detection and pressure reduction, resulting in an offset for funding in infrastructure upgrades during this period.

What is needed…

- Understanding of community attitudes,
- Multi-media marketing campaign,
- Ongoing measurement and benchmarking of water savings and community attitudes.

Audience: General public.

A new five year campaign is currently in production with an anticipated launch for July/August 2016. The focus is now on raising awareness for garden water use, targeting firstly domestic gardens then moving onto Multi Use Developments and businesses in the coming years. An additional feature for this campaign will be the development of new technologies and communication platforms with the development of a smart phone Plant App – identifying tropical plants and their watering requirements, and moving to increased paid social media marketing.

Townsville City Council – Bradley the Lawn Tamer

Over the past five years, Townsville City Council (TCC) has built an in-depth understanding of water use in the region through the Dry Tropics Water Smart Program (now called Townsville Water Futures). Up to 70% of residential water consumption in Townsville is used outdoors, with the vast majority of this water being used to keep lawns green.

TCC has undertaken extensive research to better understand water requirements for different types of lawns and how soil improvements can assist in water retention.

If any form of sustainable behaviour is to be widely adopted, barriers that prevent people from engaging in the activity must first be identified along with what would motivate them to act. These barriers are activity-specific, so it is important to select the behaviours that will have the greatest impact – in this case watering the lawn.

The resulting Lawn Tamer campaign is designed to reconnect residents with their lawn and to give them the tools and support to help train their lawns to use less water. As Townsville's very own Guru of Grass, Bradley provides interesting tips on mowing, watering, fertiliser use and different types of soil and turf.

The program is still in its early stages following a soft launch in October 2015; however, due to current water restrictions TCC has delayed the community wide rollout until May/June 2016. This is mainly due to perceptions - plus it is hard to train your lawn if you are not allowed to water it at all!

TCC targeted home owners with a lawn (not units) and engaged them through a wide range of tools including social media, billboards, bus wraps, events and in store displays.

The campaign also targets hardware stores as Lawn Tamer partners, providing discounts on products such as efficient sprinklers, soil ameliorates and more.

The effectiveness of the program will be gauged by view counts on the videos and factsheets. At the time of writing, approximately 1,700 people have watched the videos

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The cost of the campaign included $50,000 to produce six videos, $5,000 for factsheets and approximately $15,000 per year for ongoing advertising (billboards etc.)

What is needed…

- Identified water conservation behaviours that are ranked based on water benefit, likelihood of adoption and existing community penetration
- Understanding of community needs and attitudes towards identified behaviour
- Development of video clips, fact sheets and industry partnership
- Development of a marketing campaign specific to target behaviours
- Supporting information and evaluation tools

Audience: The audience is both home owner and renters of Townsville that maintain a lawn and garden

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When the whole of community rollout begins, TCC will provide 100 lawn training kits which will include an automated meter reading device. This will be used as a representative sample to assess water reductions across various interventions.

The work previously done through the water conservation program clearly identifies the benefits of residents improving the way they water their lawn, improve their soil and maintain their lawn. At this stage communication is mainly about the water,and

Council is currently refining the videos to ensure they are social media compatible, thought provoking and appropriately linked to the technical information identified as a barrier to improving lawn health. Industry collaboration and partnership is essential to further remove barriers to water conservation that are linked to product costs.

Townsville City Council – The Great Sprinkler Swap

Five years of research through the Dry Tropics Water Smart Program (now called Townsville Water Features) provided Townsville City Council (TCC) with an in-depth understanding of water use in the region. With up to 70% of residential water consumption being used outdoors and the vast majority of this water being used to keep lawns green, TCC took a closer look at the way water was applied to lawn areas.

The most common soil type in Townsville is heavy clay with infiltration rates around 3-5 mm/hour. The most common (cheap) sprinklers put out anywhere between 17 mm/hr and 55 mm/hr using from 15 L/min up to 36 L/min. Any water applied at a rate greater to that of the infiltration rate is lost as runoff with known links to council maintenance costs. In an effort to provide momentum for change, TCC identified a sprinkler that uses 10 L/min and has an application rate of approximately 4 mm/hr and provided this brand to their customers free of charge. This sprinkler can also water large areas (170 m^2) and has other desirable features. In addition, the benefit of face to face interaction during the physical swap over is invaluable as it provides first hand feedback from the community as well as provide the perfect opportunity to discuss related initiatives and actions.

Initially TCC ran a pilot where they asked residents if they could access their water use data and share it with researchers. This involved giving away 50 sprinklers, follow up phone surveys and analysis of water use. The results showed that on average one sprinkler swapped could save approximately 45 kL per household per year.

This program has been running for nearly three years now, and effectiveness is gauged by the numbers of sprinklers swapped. Taking an average number for water use from old sprinklers and comparing it with the new ones, conservative estimates of kL saved are calculated.

The sprinkler swap campaign targeted all households without automatic irrigation systems (approx. 44% of Townsville homes).

Sprinklers are swapped at Council events and advertised through social media, radio, TV, billboards, letterbox drops, websites, mail outs.

To date approximately 1,400 sprinklers have been swapped while increasing attendance at events and anecdotal evidence suggests that the benefits of the sprinkler have started to permeate through the community with many purchasing a second efficient sprinkler and recommending it to friends and families.

TCC subsidises the entire cost of the sprinklers. The ROI of one sprinkler is 1.3 years.

What is needed…

- Funds for bulk purchase of sprinklers,
- Complementary advertising campaign,
- Staff time to manage exchange program.

Audience: Residential customers.

The main benefit to council is water saved, reducing operational expenditure. Other benefits include a reduction in base flow (constant flow of water) which affects biological stormwater treatment assets, and a reduction in weed management (from weeds growing in constantly wet drains). According to Simon Igloi, Coastal Catchments Officer - Integrated Sustainability Services at TCC, positive community feedback shows that Townsville residents are happy with this initiative as they are getting something for free. This in turn provides positive feedback to local Councillors, providing a positive loop within Council to keep the program going.

Townsville City Council – Maggie Towns

A 2012 report titled 'Connecting with Communities: How Local Government is using social media to engage with citizens' by the Australian Centre of Excellence for Local Government found that there is enormous interest in social media among councils and that Councils that take a strategic online approach are already achieving impressive outcomes.

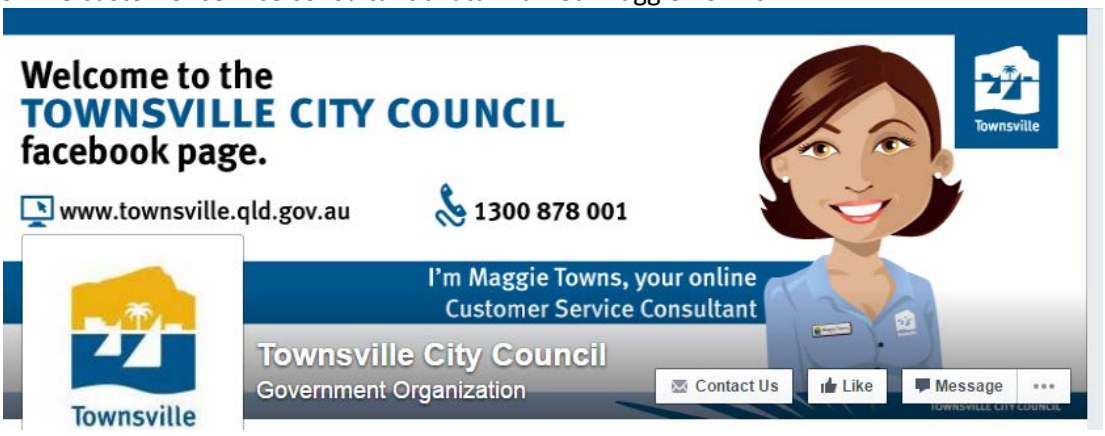
"Councils are using social media to promote events and activities, reach out and communicate with hard-to-reach groups, develop networks within the community around specific issues, plan and implement consultation processes, deliver services such as libraries and gain community feedback and reports on problems."

The benefits of social media in times of emergency became clear during the Brisbane floods when Brisbane City Council could share vital information and engage with residents and businesses that needed to evacuate.

The research also highlighted a number of challenges and barriers to adopting social media, with Councils concerned about:

- Risks relating to negative comments about their council; of losing control of the communication message; about information technology (IT) security and information management protocols; and staff divulging confidential information. There are also fears of litigation.
- Lack of expertise with staff not having the skills to use social media effectively, or that they may make insensitive comments.
- Undue resourcing and workload pressures on employees.
- Raising the community's expectations and potentially not being able to meet these expectations, as many in the community are more familiar with social media than those in councils.

Townsville City Council opted to take on the social media challenge and introduced an online customer service consultant avatar named Maggie Towns.



The target audience is residential and business customers that are active on social media and prefer to engage this way.

$2k in development of original avatar artwork. All resource costs for running and maintenance of the campaign.

What is needed…

- Staff time to monitor feedback and provide timely responses
- Resource to create artwork, content and advertising
- Resource to create governance guidelines and carry out training of staff to be "Maggie"
- Education of council employees as to what content is appropriate for social platforms.

Audience: Residential customers.

Townsville City Council uses the TCC Facebook page and Maggie Towns both a marketing initiative and a customer service channel. Social trends see large organisations moving towards serving customers within this space and Townsville City Council aims to meet this growing customer expectation where possible.

In the public space, users that report issues that are on public land and make any enquiries that are relevant to themselves are asked to do so without disclosing private information. In the event that private information needs to be exchanged Maggie encourages users to contact the page via private message and we record and response to enquiries in this space.

To comply with recordkeeping requirements we capture and store the requests just as we would a phone call or email – via our CRM or record keeping systems.

Council also utilises the inbuilt advertising and video streaming options for identified content.

Toowoomba Regional Council – Waterwise Website

Four years into the Millennium Drought, Toowoomba Regional Council (TRC) stepped up investigations and costing of new water source options. With Toowoomba sitting atop the Great Dividing Range, available options were going to be expensive and ranged from the construction of a new dam, a connection to Wivenhoe Dam or the Water Futures Toowoomba Water Recycling Project that proposed a multi-barrier treatment train to produce purified recycled water from water sourced from Council's Wetalla Wastewater Treatment Plant. In 2006, amidst a widely publicised recycled water debate, the community voted against the recycled water option and work started on the pipeline connection to Wivenhoe Dam. At the time, the local dams were sitting on a meagre 7% capacity and people had no choice, they had to save water.

Council and the State Government poured money into advertising campaigns, rebates and waterwise devices, and residents managed to reduce water use from 238L/p/d down to 125L/p/d.

By honing in on the message of personal responsibility and keeping people informed of the dam levels and how long water would last was very effective.

A number of factors likely contributed to the big reduction in water use, including:

- Changes in labelling schemes with strict requirements for water efficient fittings (most houses now have more efficient showers and toilets);
- Council's shower rose rebate scheme where residents could exchange old shower roses for more efficient ones;
- The Queensland Water Commission's Home Waterwise Service that provided an audit at residential homes to retrofit low-flow showerheads and check for leaks.

According to Bruce Gaydon, Principal Officer Reporting and Education – Water and Waste Services at TRC, efficient shower roses are one of the most effective water saving measures that a Council can provide. At the cost of $20 per head it halves the amount of water used in the shower. Water efficient toilets can also save a lot of water but have a much higher upfront cost and therefore not cost effective for Councils to provide as part of a rebate scheme.

Since the drought has broken, there has been limited political interest in saving water and Water Demand Management has been construed as bad news. The Mayor sensibly treads the line between people having freedom to use water but not wasting it. Council ceased all promotions and advertising with regards to water demand management, instead opting to focus on an in-depth website and an education program. Spearheaded by two educators, the team visits schools and community groups to raise awareness and to allow Council to maintain a leadership role in waste and water efficiency.

During the drought, TRC saturated all media platforms with water saving messages. With no specific demographic in mind, they covered all media outlets including television, radio, news and the internet.

TRC found that the elderly and the very young were very conscientious and took a high level of interest. Anecdotal evidence suggested lots of primary school students would go home and talk to their parents about ways to save water.

Council now aims Waterwise education at students and community groups with a focus on water and waste efficiency.

During the drought there was ample funding available at both the State and local level with approximately $250,000 spent on advertising and another $100,000 on education. This allowed TRC to promote demand management through an intensive media

campaign.
Currently the education and promotional budget is $95,000 per year to promote both water and waste initiatives. Give-aways at shows and the annual garden festival including water bottles, water drop stress balls and other promotional items are used to get people over for one on one discussions to convey key messages and to get a feel for community sentiment over water issues.

TRC's intensive website content is written in-house and part of a much bigger strategy to reduce water use. It refers to a lot of DEWS Waterwise materials and is consistent with what the Queensland Water Commission had put together in brochures on restrictions levels etc.
The website needs to look good and attract attention while also providing useful information and as such it's a constant work in progress.

What is needed…

- Communications team to write and maintain web content
- IT / Web infrastructure
- Educational team to visit schools and community groups.

Audience: Residential customers that are active on the internet, school students and community groups.

Wujal Wujal Aboriginal Shire Council Demand Management Project

Located in a world heritage declared area approximately four hours drive north of Cairns, Wujal Wujal Aboriginal Shire Council (WWASC) has a maximum population of 480 people and a very small rateable base consisting of state housing, a hospital and a police station.

Between 2006 and 2013, WWASC invested heavily in its water infrastructure, completing a number of projects including:

- installing a microfiltration water treatment plant to manage the extremely variable water quality sourced from the Bloomfield River;
- upgrading the reticulation mains and house supply lines from asbestos to 150 mm polyethylene pipes;
- adding water meters to the system and houses; and
- upgrading from septic tanks to a sewerage network with activated sludge BNR treatment.

While the water treatment plant was designed to produce 21 litres per second or 380 L per person per day, actual consumption was much lower at 277 L/p/d. Running the plant at a reduced rate of 7 litres did not reduce overall running costs, and Council needed to find a way to cope with the spiralling cost of servicing their community's needs. It was projected that further reductions in water use could provide these much-needed savings.

As no leak detection had been done since the upgrades, Council decided to carry out a full house and infrastructure leak and use audit and create a simple and cheap way to capture and log the data. Data captured from the household surveys revealed notable variances in flows from house outlets which was attributed to ad hoc, non-conforming plumbing works done by various contractors over the years.

WWASC decided to fit Aqualock flow reducers to every fitting in order to normalise all house outlets, both low and high flows. The installation was completed over a three month period by Council officers and under guidance from a local plumber. Occasionally water saving fittings like shower heads were also replaced where needed to cope with the supply flow reduction.

At the same time, Council contracted Cairns Water to inspect and assess the condition of the town reticulation and raw water rising main. The assessment found no issues with the reticulation but identified a lack of metering on branch lines which could skew the monthly data figures and did not allow any monitoring for leaks and raw water usage. According to WWASC Team Leader Water and Waste, Peter Kirchmann, this project gave Wujal officers the opportunity to learn the operation of basic leak detection equipment for future reference.

Ongoing data collection and graphing of house water meters are now done using Android tablets. An Excel spreadsheet is used to calculate monthly usage and to monitor and identify leaks. Bulk smart meters with leak detection functionality were also installed so Council could access data for sports fields, road works and backwash water.

This is a rare example where a water service provider could reach a 100% participation rate. With all main rateable properties being social housing, Council could carry out a full audit and subsequent modifications with relative ease. The project targeted each and every household in the Wujal Wujal Shire with Council officers completing a house by house survey of tap flows and documenting all tap outlets and toilet systems. One on

one visits also allowed Council staff to explain and hand out information sheets about the project. Public understanding of the benefits of water conservation was built via flyers and information kits supplied to the local schools by Waterwise Queensland.

WWASC spent approximately $20k on the program, which has led to significant savings in terms of reduced wear and tear on membranes and equipment. Improvements and other savings after the program are recorded in the table below.

Areas of Reduction	Per Month	Per Year
Water production (potable)	1532 kL	18348 kL
Chlorine	80 L	960 L
kW saved	3,040 kWh	36,580 kWh
Reduced plant run time	60.8 hours	729.6 hours

The results were significant, with daily water use dropping from 277 L/p/d to 137 L/p/d. The leak detection and water demand management project resulted in Council having a very clear overview of its water infrastructure, the typical stock installed in all homes as well as water consumption habits in the community. The project allowed Council to identify and repair major leaks and poorly maintained fixtures.
The knowledge gleaned from exercise and the availability of ongoing data opens up opportunities for further water demand management programs, especially in the area of behavioural strategies to encourage increased awareness and water-saving tips to reduce water consumption.

What is needed…

- Understanding of existing infrastructure and its shortcomings,
- A small enough community to audit the majority of houses,
- Ongoing measurement and graphing of water use.

Audience: General public.

Further research as part of a collaboration between the Department of Energy and Water Supply, the Department of Local Government, Community Recovery and Resilience, Cook Shire Council, Wujal Wujal Aboriginal Shire Council and Griffith University was undertaken to investigate water consumption patterns in remote Queensland towns and to compare rated versus non-rated communities.

The pilot study of 10 Far North Queensland homes, five in Wujal Wujal and five in Cooktown, revealed a number of opportunities for water demand management in remote communities, including:

- Targeting the considerably high outdoor water consumption which appears to be the main driver of peak day demand;
- Installing low-flow shower roses and promoting shorter showers;
- Promoting the link between hot water consumption and energy consumption, particularly in non-rated communities such as Wujal Wujal where water is not paid for but electricity is;
- Leak management, in particular in regions with sandy soils where leak patches may not always be evident and in older homes where routine maintenance checks can provide some low hanging fruit in terms of water conservation; and
- Future remote residential end-use studies to better understand consumption trends and water use behaviours, as it can help to populate demand forecasting

modelling, infrastructure planning, water supply and wastewater treatment infrastructure augmentation and targeted demand management programs.