



Managing and upgrading Stormwater Drainage Assets

A City of Greater Bendigo Case Study

Between 2010 and 2015 Bendigo experienced several significant storm events that revealed substandard parts of the drainage network. The circumstances that led to this included: poor development practices of the past; interference with stormwater infrastructure; insufficient & differing design standards, and inadequate maintenance.

To overcome these challenges, the City of Greater Bendigo is currently in the process of renewing and upgrading stormwater assets. Through data collection and condition assessments, the council is implementing long-term asset management standards to ensure challenges of the past are not perpetuated through new development.

Ahead of [The 2nd Annual Public Sector Asset Management 2017](#), Mark Atkinson, Coordinator Infrastructure Development at City of Greater Bendigo, shares the steps his team is using to prioritise the renewal of stormwater infrastructure and how they are using data capture techniques to maintain assets and improve service delivery for the local community.

Renewing ageing stormwater assets: an overview

“The City of Greater Bendigo is approaching storm water drainage from a number of different levels. At a strategic level, we’re collecting data, establishing and communicating service levels, undertaking condition assessments, undertaking renewal; and carrying-out upgrades and maintenance on our stormwater assets.

We’re not unlike other municipalities who are responsible for ageing stormwater assets. While we do have an Asset Management plan and are collecting data, we do need to start focusing on more proactive ways to use that data.



We're also currently in the process of communicating this service to the public. Stormwater drainage is often misunderstood by the community and it is important that we communicate what the system actually does and what it doesn't do. Service levels are important and we are progressing towards communicating these service levels with the community.

We've also undertaken quite a substantial flood model in conjunction with the Catchment Management Authority and this will inform a Planning Amendment which will ensure going forward that we don't have poor departmental decisions around asset management and maintenance, which has probably led to a lot of the issues we have currently.

Additionally, we're also in the process of developing a major flood mitigation solution on the northern side of town where all our creeks discharge out to and then spread out into a wide flood plain. There is a lot of development in this area that needs protection and we are doing this in close consultation with the community. Holistically we're working across the whole capital and operational spectrum of stormwater assets."

Assessing and improving network capacity

"Bendigo experienced three significant storm events between 2010 and 20115 which exposed the shortcomings in our network and the lack of resilience our assets have to major storm events.

These events produced in excess of 500 complaints from the community and \$40 million required upgrade works as part of our Capital Works program. There are also major network deficiencies that were identified, such as overland flow path issues.

We've commenced studies to identify the work that is required to overcome these issues, but it's a large scale of work that may require retardation basins, land acquisition and other sorts of things that contribute to improving service delivery for the community.

However some deficiencies were purely maintenance related and we have addressed those as they have come along. Other issues were some assets being at the end of service life, ageing assets and insufficient capacity which required capital investment. We prioritised our renewal on a cost-benefit approach and used factors like the age and condition of assets, their existing capacity, potential damage to buildings and property, safety risks, ongoing maintenance costs, connectivity with other parts of the network and overall alignment with our strategy.

Establishing costs was pretty straightforward and objective. Valuing all the associated benefits and risks of drainage renewal was more complex, but we applied this consistently across all work which resulted in a reasonable priority list of asset renewal and management. While we are a long way off a municipality wide network that caters for a 100-year event, we're on the path towards it."

Using data to improve asset management

"Data comes from a number of sources. Some of our drainage assets are up to 100 years old, so we have data from legacy construction plans. We also have detailed design plans from new developments with regard to donated assets, so we're capturing this, as well as data from our own renewal and upgrade works.

All these sources are utilised in informing the city's stormwater asset register in a GIS system. The vast majority of the city's stormwater assets are mapped geographically, but like any data set there are gaps in these maps. But we are trying to be as diligent as we can in capturing everything that is happening out there.

Captured data also has metadata attached so we can query things about our assets, such as materials, lengths, age etc. This is an invaluable resource for our engineers and they are readily accessing this and responding to queries from the community.

What's more, the Bendigo Urban Flood Study produced GIS layers, illustrating the inundation footprint for the 100-year Storm Management plan for the creek zone and also the extensive overland flow into creeks. This data is vital in understanding flood behavior of our urban catchment and providing informed advice to those that enquire.

From a financial point of view, we're using asset age, expected life service and estimated consumption of those assets for forward renewal modeling of stormwater. We haven't quite moved to a fully proactive condition-based approach, but we're looking at moving towards this in the future.

We also have a great deal of video footage in our stormwater lines. The data from these videos has been vital in pinpointing network problems, from simple debris blockages and subsidence to major intrusions by other utility services."

Improvements in service delivery through asset upgrades

"It has been somewhat of a slow burn getting all the pieces together into a framework and we have invested a lot of time into developing an Asset Management plan. The Flood Study was quite a significant exercise and developing our prioritisation system took many months, but we are well on the way and the benefits are starting to flow out of it.

The Asset Management plan involved a gap analysis of our whole management approach and identified a number of areas that needed to be addressed. One of these was the overland flow path studies and the recommendations from these studies have started to inform the Capital Works program.

Not a lot of the work has started yet, but when it does, we will see substantial improvements to our network and give the community some good relief from flooding.

There's also no question that the target spend from the council in Bendigo in improving the assets over the last five years has provided parts of the community with relief. We haven't always been able to cater for large events in all cases and while there is more work to do, we are improving things within the limited funding we have.

While our system is not perfect, we are seeing the benefits start to roll-out as part of our Asset Management plan. We know the areas we need to focus on and in the meantime we're bringing vulnerable parts of the network up to standard."

Interested in learning more?

Join Mark at the **2nd Annual Public Sector Asset Management Summit 2017**, where he will further explore:

- The approach the City of Greater Bendigo is taking to address the problem, including how it is prioritising the renewal of stormwater infrastructure
- How data is being managed to improve asset outcomes
- How condition and network capacity is being assessed
- The strategic approach taken to ensure challenges of the past are not perpetuated through new development
- How customer service is being delivered and levels of service are being communicated.

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