



# Smart sustainability — tapping the power of IoT technology

Melbourne Water improves stormwater  
management with IBM Maximo solutions

by Mike Tucker

6-minute read

After Tasmania, the Australian state of Victoria receives the continent's highest amount of annual rainfall. This level of precipitation, along with good soils, contributes to Victoria's reputation as "The Garden State." Melbourne, Victoria's state capital, is also well-known for its extensive green spaces that cover 19% of the city.

However, due to climate change, Melbourne is experiencing more extreme weather, including more severe rainfall events. For example, in 2018, a one-in-1,000-year rainfall event struck the



city. Over 50 mm of rain fell in 15 minutes, resulting in flash floods and widespread power outages. In addition, the sea level near Melbourne is projected to rise by 24 cm during the next 30 years, which could lead to more coastal flooding caused by storm surges.

To help provide protection against flooding, the city's water management

utility, Melbourne Water, operates a vast drainage network that includes approximately 4,000 collection pits and grates. To function properly, the stormwater drainage system requires regular inspection and maintenance.

"In the past, we scheduled regular inspections and sent out crews to look at the stormwater grates and make sure

they were operational,” says Russell Riding, Automation Team Leader for Melbourne Water. “Sometimes, a crew would arrive at a grate and it wouldn’t need cleaning, but it would be blocked by an event the next day and stay blocked, until the crew came back. If there was a high rainfall event, the nearby area could be flooded. Our real need was to increase inspections to keep grates in an operational state.”

However, increasing the tempo of manual grate inspection has logistical issues. In addition to sending out four-person crews from Melbourne Water, additional resources are needed for onsite traffic control. “Whenever crews are on the move, there also is a safety aspect,” says Riding. “We knew there was a smarter way we could be working, freeing up resources to do other things. That’s one of the reasons why we started looking at remote inspection alternatives with IBM.”

Started automating  
visual inspection of  
stormwater grates  
spread out over a

14,000  
sq km

region of stormwater catchments

Reduced need for  
onsite stormwater  
grate inspections  
with potential to save

thousands

of hours of maintenance staff time

# Automating visual inspection

Melbourne Water was already familiar with the [IBM® Maximo® Application Suite](#), which it began using in 2013. “I was the Maximo user group leader in the Victoria and Tasmania regions, and we had many discussions with IBM,” says Zoltan Kelly, Asset Information Improvement Specialist for Melbourne Water. “There were a lot of product capabilities that we didn’t utilise, and one of the reasons we invested in the Maximo platform was its built-in potential to expand as we needed it to.”

When a supplier presented a new still image camera that could be integrated with Melbourne Water’s IoT platform,



a new plan began to take shape. “We had regular conversations with the local IBM team and they helped us to see what was possible,” says Riding. “And

then it hit us — let’s develop an image recognition solution to help improve our stormwater grate inspection process.”

When planning was finished, Melbourne Water installed still image cameras to monitor conditions at trial locations. The cameras were connected to a network of integrated solutions, including [IBM Maximo Health](#) (PDF, 274 KB), [IBM Maximo Monitor](#) (PDF, 285 KB) and [IBM Maximo Visual Inspection](#) software.

“We picked up strategies from the software management modules right off the shelf, without any changes,” says Kelly. “Essentially, it’s an internal project without having the need to engage an external vendor, so out-of-the-box deployment was a huge benefit.”

The overall image recognition system was deployed on [IBM Cloud](#)<sup>®</sup>. “Essentially, we’re using a SaaS monitor product and we extend that with IBM Cloud services and components where we need to,” says Kelly. “It’s easy for us to spin up and scale up services with IBM Cloud. Their catalog allows us to pick and choose whatever we need. There hasn’t been a thing we wanted to do that we haven’t been able to do with it.”

Working with data from the trial sites, the first phase of the solution has focused on analysing the detection

of blockages occurring at pit grates. This also includes the development of AI tools to recognize the blockages, with the goal of moving toward a fully automated AI solution over time.

Throughout the development and deployment process, Melbourne Water and IBM have worked closely together to make sure the Maximo platform met its operational goals. “Any time we’ve had questions, we’ve never had a problem getting answers,” says Riding. “The level of support we get from IBM is something that we can’t get elsewhere.”

“There’s a whole lot more we can do with our Maximo IoT solution because it’s just more cost-effective. And building anything we want is easily achieved with the support available from IBM.”

**Russell Riding**, Automation Team Leader, Melbourne Water

# Reducing maintenance time and building sustainability

Even before Melbourne Water installed IoT inspection cameras to monitor trial locations, it became clear that this solution would cost significantly less than other methods under consideration, which included Supervisory Control and Data Acquisition (SCADA) sensors. “The costs for a SCADA solution to measure flow or levels in the drain, were prohibitive,” says Riding. “It’s a much lower capital investment to install IoT devices.”

After using IBM Maximo solutions to shift from time-based maintenance to condition-based maintenance,



Melbourne Water is looking to expand its use of IoT technology. “During the next 24 months, we’ll be bridging gaps where we don’t have SCADA-level control and monitoring,” says Kelly. “Our IoT devices have been very

good at providing supplementary data and there is a lot of value in these platforms being on IBM Cloud. The data becomes easier to share with external organisations rather than being an internally focused solution.”

Currently, Melbourne Water employees use an IBM Maximo dashboard to monitor images captured from grate cameras installed at trial locations, and there are plans to integrate analytics with more functions. “We’re in the process of implementing an end-to-end solution,” says Riding. “AI has been developed to recognize blockages so we can connect AI classification to Maximo and trigger work orders.”

The next phase of deployment will extend past trial sites and include the installation of cameras at the most critical sites in the Melbourne Water drainage network. As cameras monitor

more pit grates, and fewer crews are sent out for onsite inspections, Melbourne Water expects to save thousands of staff hours. When the system is completed, preliminary estimates of cost savings range from tens of thousands to hundreds of thousands of dollars per year.

Melbourne Water is also exploring opportunities to use its IoT network to detect pollutants and develop more sustainable water resources for a growing population. The city has built a desalination plant to augment fresh water supplies to maintain a buffer for when they need it. “How can we push

that out by using alternate water sources, such as drainage water?” says Riding. “We can make use of stormwater, store it and treat it, and use it in areas where we traditionally use potable water, such as watering gardens.”

“For years, Melbourne has been recognised as one of the most livable cities in the world,” says Kelly. “By integrating water management with our IBM Maximo and IBM Cloud tools in the drainage, recreation and natural environment space, we can continue focusing on making Melbourne a more livable city in the future.”

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**Zoltan Kelly**, Asset Information Improvement Specialist, Melbourne Water



### About Melbourne Water

In operation for over 130 years, [Melbourne Water](#) (external link) manages all parts of the water cycle, including providing clean drinking water, treating sewage to recover and reuse this valued resource, planning to prevent flooding and keeping all 25,000 km of Melbourne's rivers and creeks healthy. Melbourne Water has over 1,100 employees and is owned by the Government of the State of Victoria.

### Solution components

- IBM Cloud®
- IBM® Maximo® Application Suite
- IBM Maximo Health (PDF, 274 KB)
- IBM Maximo Monitor (PDF, 285 KB)
- IBM Maximo Visual Inspection

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