

# Local Government Sensor Trial 2013 – 2015

## SITUATION

Commencing November 2013, CBS Group Australia partnered with Transfield Services to develop and deliver smart sensor solutions on remote infrastructure in a range of settings including Local Government and Defense.

This study details the solution developed and trialed on Victoria's renowned Mornington Peninsula for Transfield Service's client, the Shire of Mornington Peninsula.

The Mornington Peninsula is located over 40 km southeast of Melbourne. It has a population of approximately 180,000, which swells to over 300,000 during the summer months. The governing body, the Shire of Mornington Peninsula occupies the entire peninsula and as such offers a complex holistic environment that stands as an effective and persuasive proxy for Local Government Areas throughout Australia.

In early discussions with the Shire each of their community, infrastructure, and business projects were initially considered as candidates for smart sensor monitoring on the basis that worldwide evidence supports commercial, social, and environmental benefits from sensors that align with the Shire's strategic plan.

For example, early evidence showed that proposed sensors and sensor networks in Shire buildings would significantly reduce *energy usage*, projected at up to 30%, based on sensors providing more precise climate, air quality, and occupancy data than traditional building automation technology.

However our planning sessions also identified significant *operational efficiencies* that would become available as sensors eliminated or reduced latency from business processes.

With the Shires' drive for continuous improvement in service quality, these operational efficiencies quickly became the preferred focus for the sensor trials as they held the potential to directly improve both Shires' costs but importantly, ratepayer and visitor amenity.

Typically when people communicate in business processes, they are reacting to retrospective data and Shire's recognized that incorporating intelligence from smart sensors directly into the business processes would improve, even remove, this communication lag, creating a path for more efficient, and often less expensive, action.

With this in mind it was agreed that the sensors would be established to monitor threshold's that had the greatest effect of the amenity of Shire's ratepayers and visitors.

On this basis it was agreed:

We would deploy and manage a range of sensors and remote controlled switches across the Mornington Peninsula Shire facilities including the swimming pool at Pelican Point,

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Hastings, and public camping ground foreshore facilities (Showers and Toilets) at Rosebud to:

- Provide tangible data upon which cost savings initiatives can be costed, implemented and the benefits tracked
- Automate manual maintenance processes where-ever possible
- Ensure the up-time amenity of the Facilities

## SOLUTION

### Simple Smart Devices

CBS Australia used bespoke technology solutions to create a simple, smart network of “plug and sense” encapsulated (non-video) wireless sensor devices. These devices created encrypted, secure, scalable, modular wireless sensor networks and a live reporting dashboard.

Upon completion sensor sites were established at the Mornington Shire Swimming Pool (Pelican Point, Hastings, Vic), and at the Rosebud Foreshore Pumping Station, (Rosebud, Victoria).

At each location, sensors were installed streaming live data (voltage, vibration, and environmental parameters) to a dedicated portal accessible to registered users via a web browser or mobile device.



Table 1.1 Location and Infrastructure Mornington Shire Sensors 2013- 2015

Location	Infrastructure	Data
<b>Pelican Point</b>	<ul style="list-style-type: none"> <li>▶ (2) Sensor units located in the pool pump room</li> <li>▶ (1) Sensor unit located on the pool deck</li> </ul>	<ul style="list-style-type: none"> <li>▶ 3G data transmission (pump operation, heat exchanger water flow, and environmental parameters) to dashboard</li> <li>▶ 3G data transmission (temperature, light level, humidity).</li> </ul>
<b>Rosebud Foreshore</b>	<ul style="list-style-type: none"> <li>▶ (1) Sensor unit adjacent the beach pumping station to detect pump blockages.</li> </ul>	<ul style="list-style-type: none"> <li>▶ 3G data transmission (pump operation, heat exchanger water flow, and environmental parameters) to dashboard</li> </ul>
<b>Web Portal</b>	GUI dashboard where data can be monitored live, with email threshold alerts	

### Power

Each of the sensors is solar powered removing the need for electricians to support installation. For the swimming pool sites, the units have an internal solar panel co-mounted with the sensor unit.

### Software and Alarms

A GUI dashboard displays all of the sensor data in a live, tabulated format that can be accessed by authorized users via a web browser. The dashboard allowed for dynamic configuration of sms and email messaging in response to threshold activity.

## RESULTS

### Lightweight, Low Cost Technology – Rapid ROI

Local Governments typically face the requirement to achieve a great deal within tight timeframes and constricted budgets.

The success of the sensor trial within MPSC is based on the lightweight and low cost solution that is developed and deployed for use in this setting. CBS Group installed the solution within hours and the dashboard went live the following day.

Their low-cost subscription model, designed for Local Governments is based on a monthly payment that was paid by Transfield Services as part of the Facilities Maintenance Services provided to MPSC. Nonetheless the Shire would have achieved a satisfactory ROI had it paid the same costs over the period \*

### Smart Deployment of Resources

As anticipated, improving the quality and timeliness of access to infrastructure data improved operational efficiency, reduced costs, and improved user amenity at the sites.

For example, environmental data monitoring at the Pelican Point pool revealed peak levels of humidity that were leading to increased chlorine use and a reduced benefits for swimmers until rectified.

Power use monitoring at the Rosebud Foreshore alerted septic tank blockages that were cleared before they became critical.

At Pelican Point there was a reduction in chemicals used within the pool and at Rosebud there was a reduction in labour costs. At Rosebud the sensor data had forestalled emergency after – hours call out costs, allowing the blockage to be cleared during standard hours. And there were health and environmental benefits as sewage blockages and overflows, previously a common issue during the peak summer camping period on the foreshore, were averted.

### Power Savings

At both sites the sensor data was used to adjust the pumps to run more efficiently with concomitant power savings.

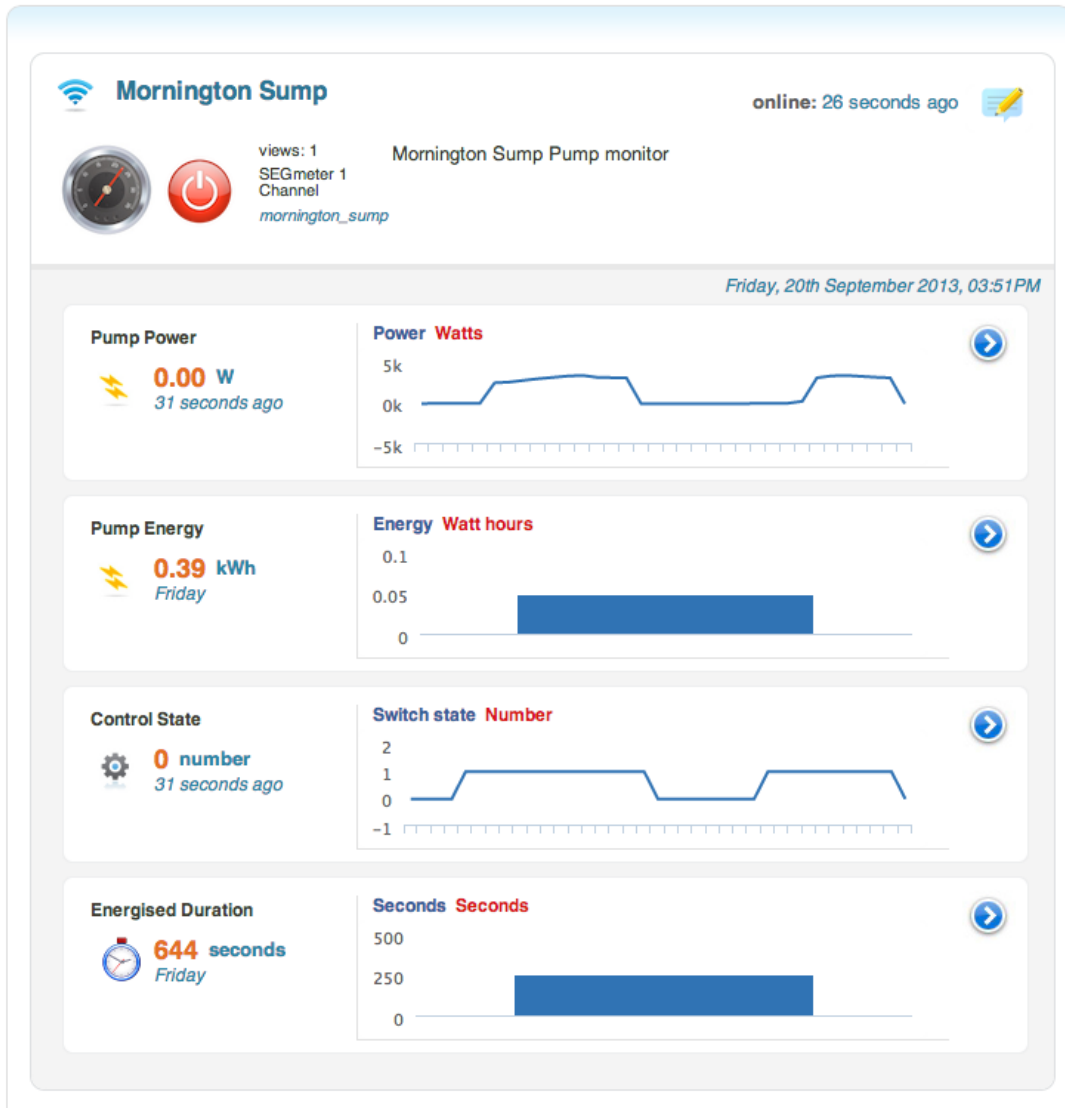
### Capital Costs

At both sites the sensor data was used to extend the useful life of capital equipment

### Environmental Benefits

Sensor data shows environmental benefits occurring at both sites

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## RESULTS TO BE REALISED

CBS Group, Transfield Services, and Mornington Shire envisage the sensor trial of 2014 – 15 as a project that builds on the intelligence of the nominated assets and environments as baseline for the addition of further infrastructure into the sensor environment.

We expect that that the availability of power use, vibration, environmental parameters of addition critical equipment and environments will allow:

- The comprehensive development of on-condition maintenance practices – whereby maintenance is scheduled in response to data showing a trend to impending failure (increased vibration or power use). For the Shire or FM Service partner this translates into reduced use of high cost labour to meet reactive maintenance requirements, allowing this maintenance to be scheduled and incorporated into more efficient maintenance work programs.
  - A broadening review, and analysis, of this data over time will provide your management team with patterns, causal links, and predictive intelligence that leads to the development of further enhanced business processes and greater efficiency.
  - Increased scope of the sensor environment will lead to the identification of practices that lead to improvements in power, water, waste, and usage with associated savings.
  - Increased scope of the sensor environment will support Facilities Maintenance and other contract performance with hard operational data and analysis.
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