



Enterprise IoT - *Realising Benefits*

21 July 2020

Opportunity Categories

Operational Efficiency



Water Meters



Parking



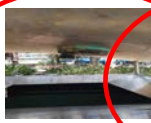
School Signs



BBQ Monitoring



Animal Traps



Bin Sensors



Water Pressure



GPS Tracker



Rain Gauges



Soil Moisture Probes



Android ML



RoRo Bin Fires



Toilet Use Counter



NEMA LED Controllers



RFID Asset Management



GPS

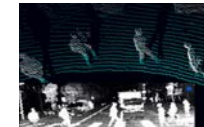
Tourism And Economy



Feedback Btn



Wearables And Payment



LIDAR Counters



Movie VR



QR Codes



Digital Signage



WiFi / Beacon offers

City Safety and Environment



Water Quality Probes



Temp+Humidity Sensors



Tensorflow Edge Analytics on Android / IoT

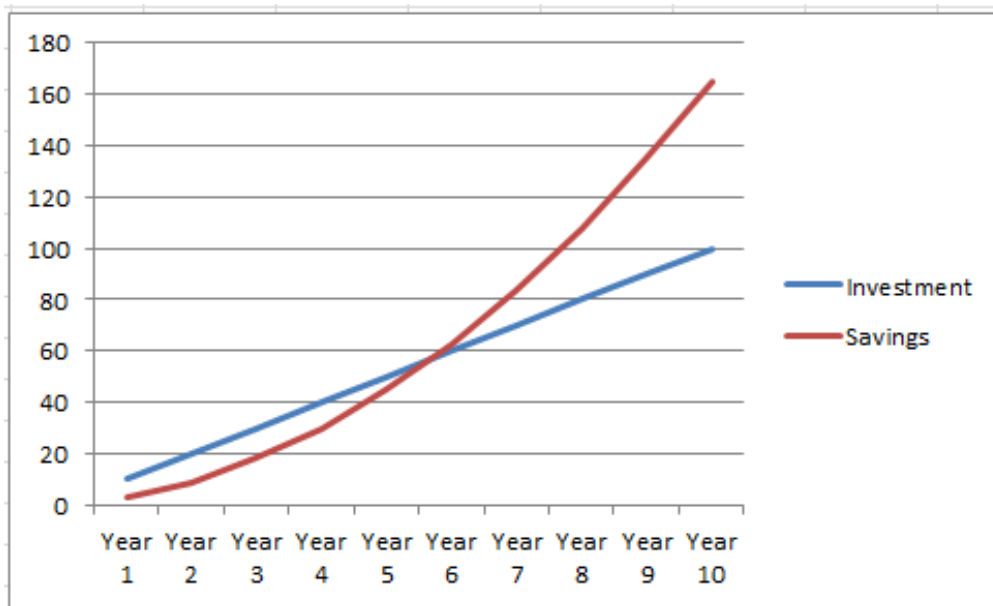
- Carbon monoxide (CO)
- Carbon Dioxide (CO₂)
- Molecular Oxygen (O₂)
- Methane (CH₄)
- Molecular Hydrogen (H₂)
- Ammonia (NH₃)
- Isobutane (C₄H₁₀)
- Ethanol (C₂H₅OH)
- Toluene (C₆H₅CH₃)
- Hydrogen Sulphide (H₂S)
- Nitrogen Dioxide (NO₂)
- Atmospheric pressure



Bushfire and Harmful Gases Detection



Financial Benefits – *enterprise version*



- Assumes >100,000 devices
- Approx. 15 use cases/service activities
- Approx. \$10m p.a. investment
- Cashflow positive after 6 years
- Benefits are marginal at the device level, but significant at scale



Variable School Signs



Problem

- End of life 2.5G network
- High cost of 3G/4G
- Programmed manually in many cases

Solution

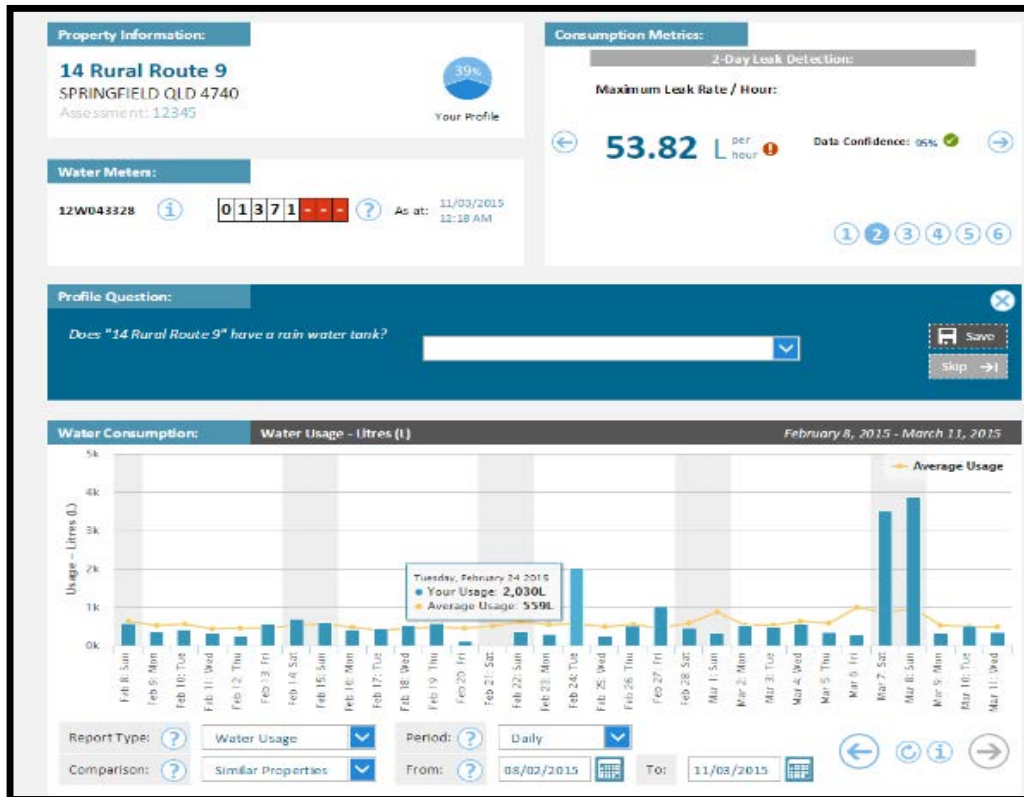
- PoC to test LoRaWAN in 2018
- New hardware and software
- Utilises N2N – with full data access via City Platform
- Management from a laptop

Benefits

- \$150,000 over ten years
- Enhanced status reporting
- Easier to configure – two-way
- Reduced risk of outages



Smart Water Meters



Problem

- Large amount of lost potable water
- High cost of leaks (customer and City)
- Leaks often unknown before billing

Solution

- PoC and trials of sensors
- Stress test LoRaWAN for reliability (underground meters)
- Deployment of loggers on to existing meters

Benefits

- >\$10m in ten years
- Early detection of leaks
- Reduced cost for customers
- Real-time reporting will reduce customer consumption
- No shock bills!



Pressure Reducing Valves (PRV)

Device 947EB90000F0375

info

device 947EB90000F0375
enterprise gccc
type nsen
sub groups master
network loraWan
source activity
last online 15/04/2020, 07:30:07
11 minutes ago



lorawan

rssi -118
snr -4.25
sp factor 11
sub band G0

lora port 3
uplink cnt 806
downlink cnt 141
adr yes

lrc id 00000231
lrr time 15/04/2020, 07:30:06
lrr cnt 1
lrr id 00002EDC
lrr lat -28.043859
lrr long 153.331696

readings

ch	type	value	label
0	primary-battery	3.66 V	
12		64.5 %	
13		24.8 °C	
21	pb-state-of-charge	99 %	
24	LORA-RSSI	-115 db	rssi-down
28		ON	pulse-state-3
32		6.41 mBar	bridge-1



Problem

- Incidences of pipes bursting or services failing
- High cost of SCADA expansion

Solution

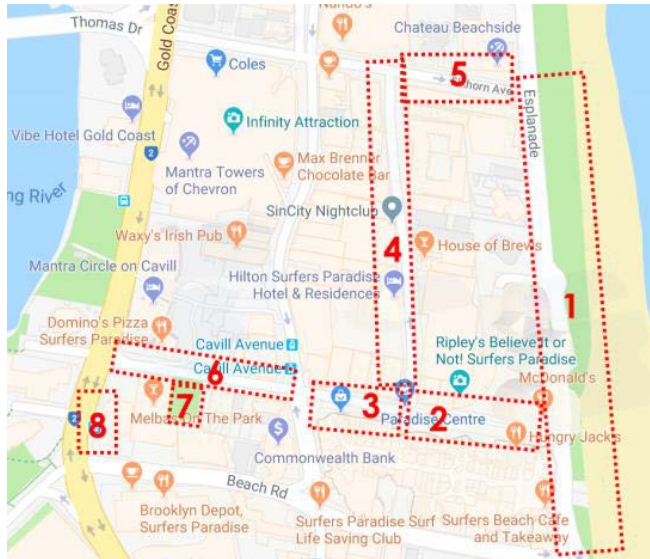
- PoC for LoRaWAN-connected PRV
- Test reporting and reliability
- Design integration with SCADA

Benefits

- Reduced capital cost by 90%
- Reduction in service failure through early detection
- Significant savings on future capital works for repairs
- Reduced negative customer experiences



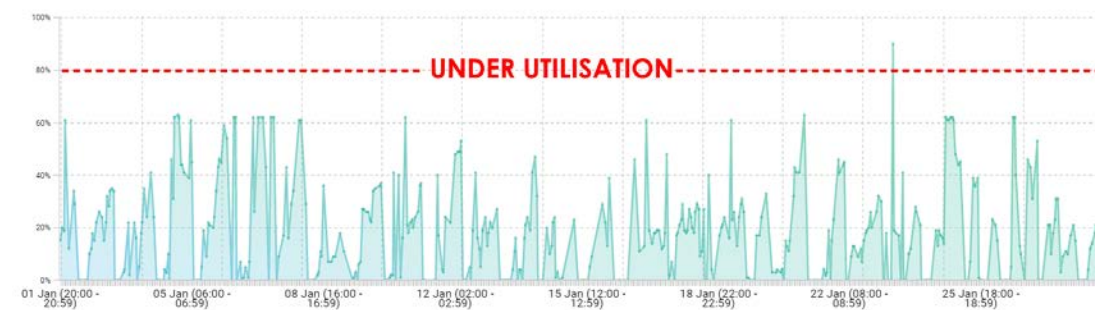
Public Bins



Filter Date From 01/01/2018 8:15 PM To 28/01/2018 8:16 PM

Filter Bin Filter Sensor

Orchid Avenue 02 x Display all sensors



Problem

- 3,200 bins in parks/beaches/etc
- Fixed route planning and management
- Increasing use is driving up costs
- Regular overflowing
- Average fill level at collection 30%

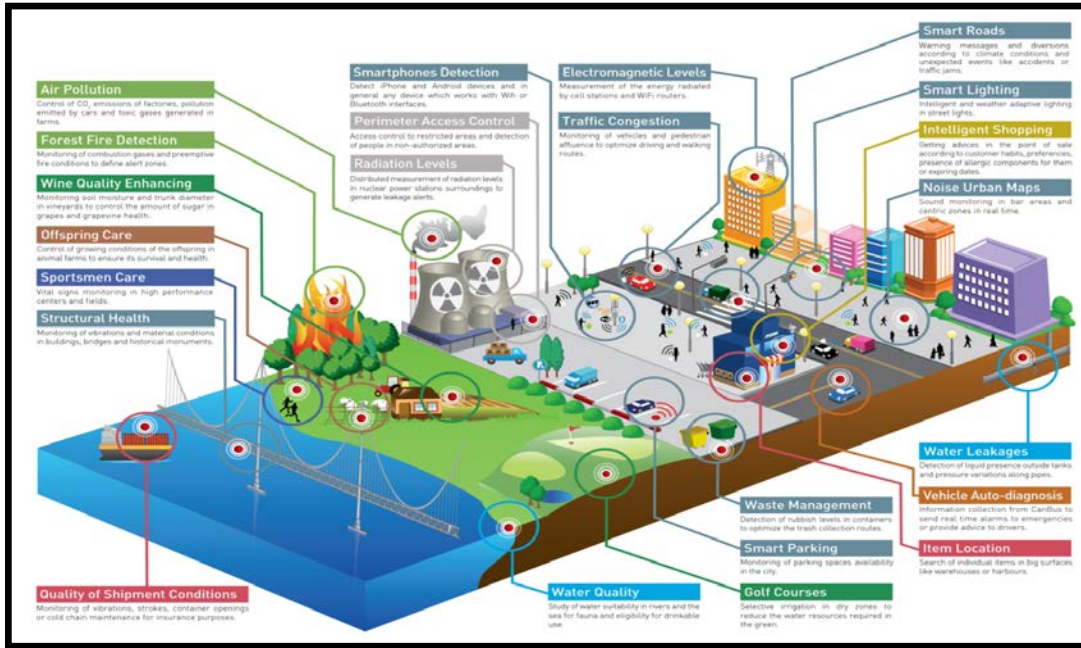
Solution

- 55 bin trial in Surfers Paradise
- Redesign routes based on demand
- Early warning of fill levels

Benefits

- \$5m over ten years
- Reduction of bins overflowing (tourism)
- Reduce over-servicing
- Cleaner public realm

Lessons to Date



People

- Traditional work practices
- Fear of technology
- Technical knowledge of hardware and software needs to be on offer

Process

- Deep critical thinking and solutions design required
- Interoperability is critical
- True public/private collaboration is key to success

Technology

- Cost of deployment of hardware can outweigh benefits
- Network coverage needs to be very strong
- Trial first, and scale (or stop) based on results
- Not traditional ICT



What Next?

DIGITAL CITY INSIGHTS

Easter long weekend (10 – 13 April 2020)

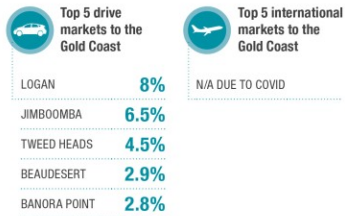
VISITATION NUMBERS



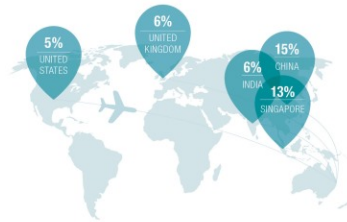
MOST VISITED PRECINCTS

ORMEAU/YATALA	21%
COOMERA/UPPER COOMERA	12%
CURRUMBIN	8%
COOLANGATTA	8%
SURFERS PARADISE	5%

WHERE ARE OUR DOMESTIC VISITORS FROM?



WHERE ARE OUR INTERNATIONAL VISITORS FROM?

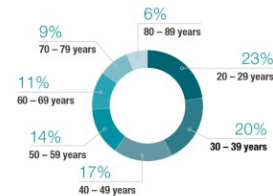


ECONOMIC VALUE*

Economic value of visitors to the Gold Coast over the Easter weekend.



DOMESTIC VISITOR AGE GROUPS



INSIGHTS

In 2019, the Easter long weekend on the Gold Coast had a total of **25,736** international visitors arriving from **61** different countries. In 2020, the Easter long weekend on the Gold Coast saw **7,557** international visitors from only **37** countries.

Over the Easter long weekend in 2020, a total of **33,183** visitors to the Gold Coast spent between 1-4 hours visiting the Gold Coast. With a total of **11,307** day trippers spending more than 4 hours on the Gold Coast and **11,505** who stayed overnight.

In 2020, there was an estimated **83%** drop in tourism's economic value to the Gold Coast due to the decrease in visitor numbers to the city over the Easter long weekend. This equates to an approx **\$20,091,527** decrease in economic value.

* Figures have been calculated using Tourism Research Australia's definition and average expenditure calculations of a day trip and overnight visitor. Source: DSpark.

CITY OF
GOLDCOAST

Investment

- Proposed ten year investment in E-IoT to Executive in Oct/Nov
- Expand from operational efficiency to broader public value
- Deep analysis of asset use and economic conditions (tourism)

Tools

- Publication of big data and IoT outputs for public review
- Continued development of IoT on LoRaWAN
- Industry collaboration

Outcomes

- Tourism/economy growth
- Financial benefits to the City
- Reputation as a leading Digital City
- Drive industry adoption of IoT/LoRaWAN to secure volume pricing and benefits

