DATA VISUALISATION - THE NEW CURRENCY OF THE WATER INDUSTRY

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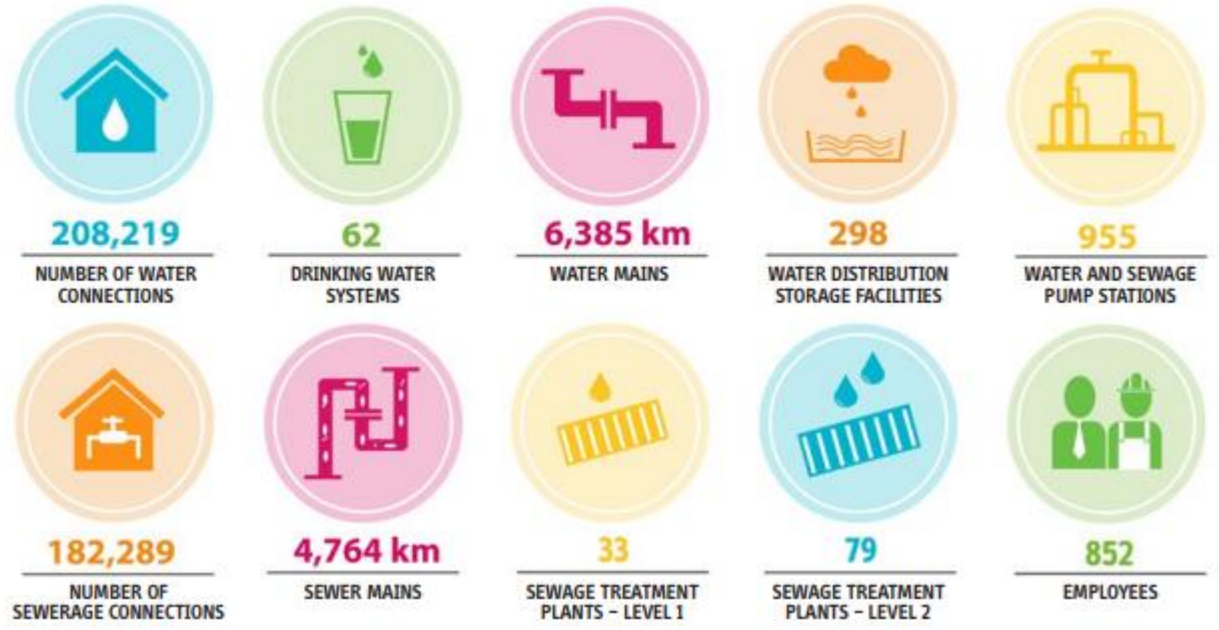
taswater

Introduction & Agenda

1. Introduction to TasWater and little about me
2. Where has TasWater come from? And where are we now?
3. Why visualise data?
4. Data Visualisation – The New Currency of the Water Industry
5. Lessons Learnt
6. Finishing Thoughts

About TasWater



515,000/24,697,851= 2.1% of Aus Population

Where has TasWater come from?

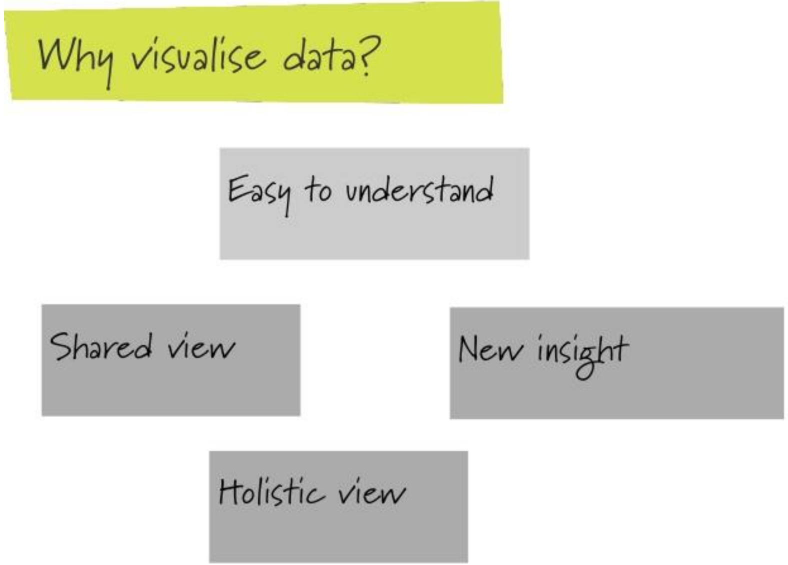
Table 7: Business Systems & Processes KPIs, Targets and Initiatives

Strategic Objective: Build fit-for-purpose consistent systems that enable 'best for business' outcomes					
Key Measures: Operational effectiveness					
KPIs	Corporate Plan 2013-2015 Target	EOY 2013-14 Estimate	Targets		
			2014-15 Forecast	2015-16 Forecast	2016-17 Forecase
Efficiency of capital spend					
Data quality improvement					
IT systems effectiveness					
Risk management					
Maturing					
Inventory management					
Standardisation of procedures					

Under Development

Data Visualisation

Data Visualisation – Why?



Through business insights TasWater seeks to drive:

- Productivity and optimisation;
- Understand and reduce risk through system knowledge;
- Better communicate business performance knowledge;
- Remove ambiguity; (consistent)and
- Develop reporting capabilities.

Line of Sight

Any data visualisation effort must have line of sight to the desired outcomes. This case study is focused on Asset Performance monitoring.

The Case Studies

Data Visualisation – The New Currency of the Water Industry

The main stages of data visualisation are:

- Defining the need for data visualisation and intended uses;
- Identifying the mechanism for data visualisation;
- Rapid prototyping and refinement of data dashboards;
- Application to decision making; and
- Identifying lessons learned

The Objective

"To provide consistent, repeatable and accessible insights to the performance of TasWater's Assets"

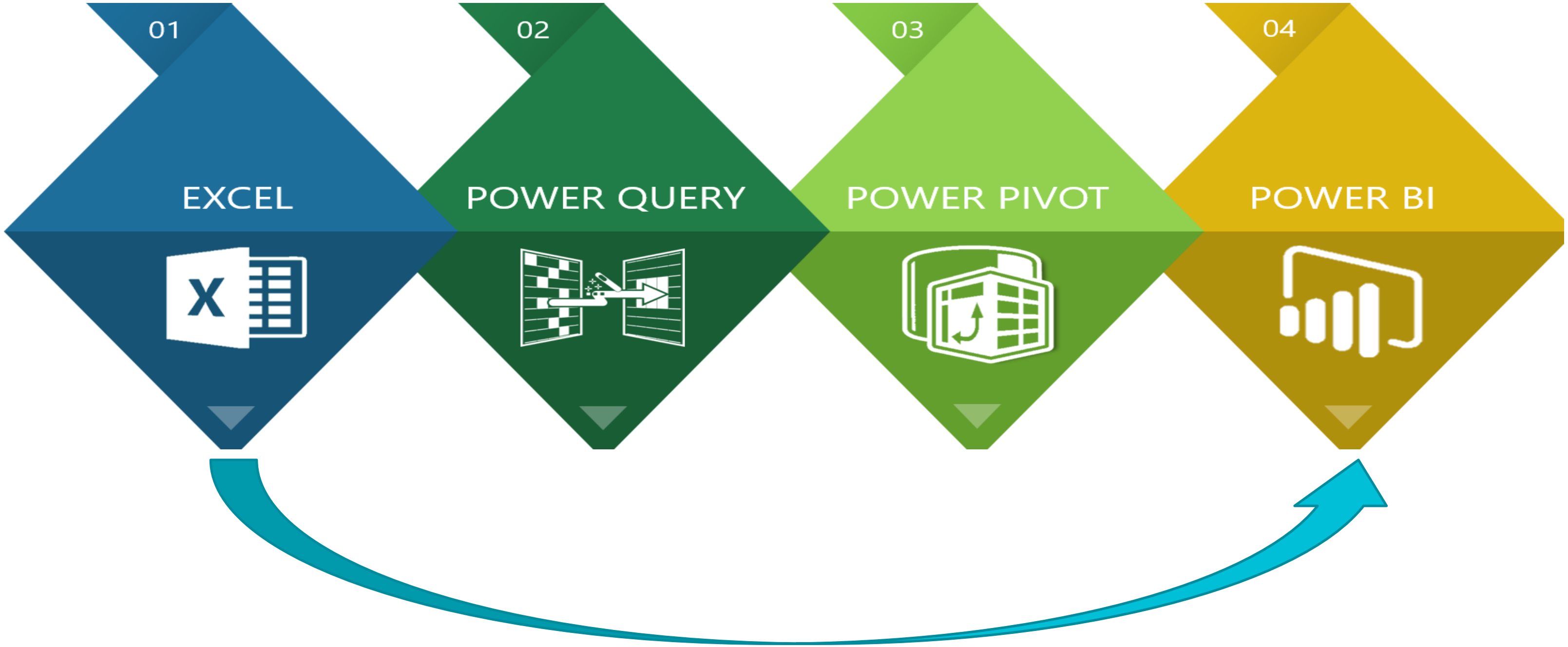
The Mechanisms

The Mechanisms

- How to access the data
- How to visualise the data
- How will the information be made accessible and shared
- The information driving the visualisation must update without manual intervention.

1. How to access the data?

2. How to visualise the data?



3. How will the information be made accessible and shared?

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4. The information driving the visualisation must update....

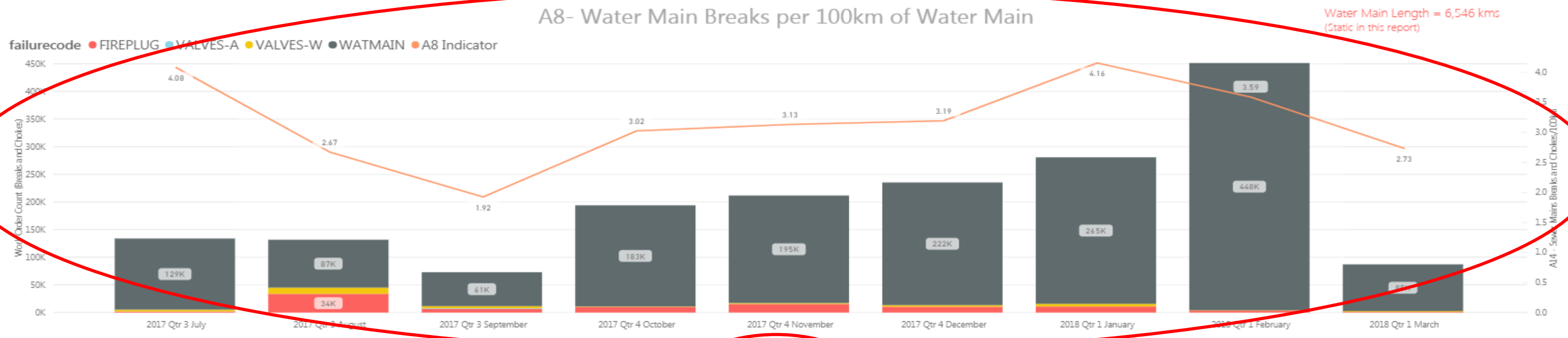
Without MANUAL Intervention!

Rapid Prototyping and Refinement of Data Dashboards

Stakeholder engagement for Prototyping?

- Determine the need for performance reporting?
- What are our goals and who is our audience?
- What are the key metrics?
- How do we want to visualise these metrics?

Workshop Outputs: Water Data



system

Search

BAGWN
BICWN
BOTWN
BRCWN
BRDWN
BRIWN
BURWN
CAPWN
CATWN

1866 Count of wonum	1.80M Total WO Cost
28.51 A8 Indicator	964.80 Average of Total WO Cost

Cause	Count of wonum	Total WO Cost
GNDMOVE	523	431,617.68
PIPEFIT	523	448,500.72
CORROSN	382	464,424.87
OVERPRES	63	49,248.76
MECHJNT	49	40,382.63
GASKET	47	30,656.13
RUBRING	45	78,504.39
GLAND	41	14,632.13
BRAZED	27	26,497.66
FP_BALL	25	11,811.59
LEAD	22	31,267.89
FLANGE	18	23,108.24
FWASHER	16	4,720.34
SEAT	15	3,939.74
Total	**1866**	**1,800,317.81**

Definitions

Total number of water main breaks

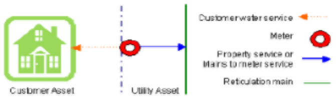
The total number of main breaks, bursts and leaks in all diameter water distribution and reticulation mains for the reporting period.

Breaks exclude those in the property service (i.e. mains to meter connection), , and weeps or seepages associated with above ground mains that can be fixed without shutting down the main.

Note: The 'property service' includes any water infrastructure between the water main and the meter connection or other connection assembly and the internal plumbing of the property. It may be owned by the water utility, and it is often referred to as the 'mains to meter' service or connection. All water plumbing downstream of the meter is usually the property owner's asset.

Calculations

A8 – Water main breaks per 100 km of water main =
(Total number of water main breaks) / (Total length of water mains) x 100



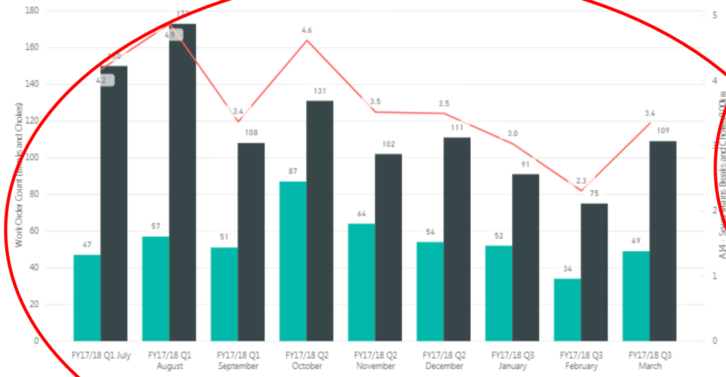
reportdate

Y Q M W D
month

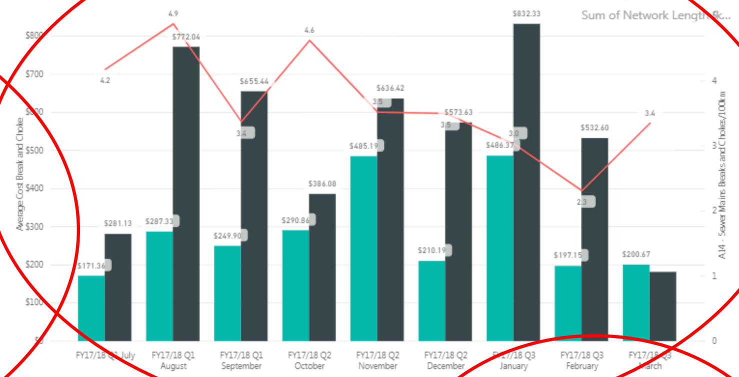
Jul 2017 - Mar 2017

Workshop Outputs: Sewerage Data

A14 - Sewerage mains breaks and chokes (No. per 100 km of sewer main)



Avg. Costs of Sewerage mains breaks and chokes & A14 (No. per 100 km of sewer main)



A14 by System

32.77

Date Range

A14 by System

43.84

Annualised

Count of Breaks and Chokes

1545

(SEWGRAV and MHOLE)

Cost of Breaks and Chokes

$707,870

(SEWGRAV and MHOLE)

NOTE:
A15 - LENGTH OF SEWER IS UNDER QUOTED AND USES FIGURES FROM OCT16.

A15 - NUMBER OF CONNECTION NEEDS TO BE UPDATED AS CURRENT DATA IS POOR. ONLY **TOTAL COUNT** SHOULD BE USED HERE

Avg. Cost of Breaks and Chokes

$458.17

(SEWGRAV and MHOLE)

Network Description

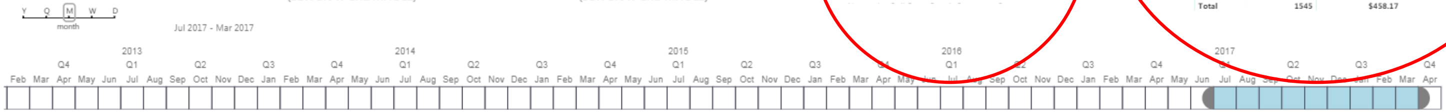
Search

- Network - Ansons Bay East Sewerage System
- Network - Ansons Bay West Sewerage System
- Network - Arthur River Sewerage System
- Network - Arthurs Lake Sewerage System
- Network - Bagdad Sewerage System
- Network - Beaconsfield Sewerage System
- Network - Beauty Point Sewerage System

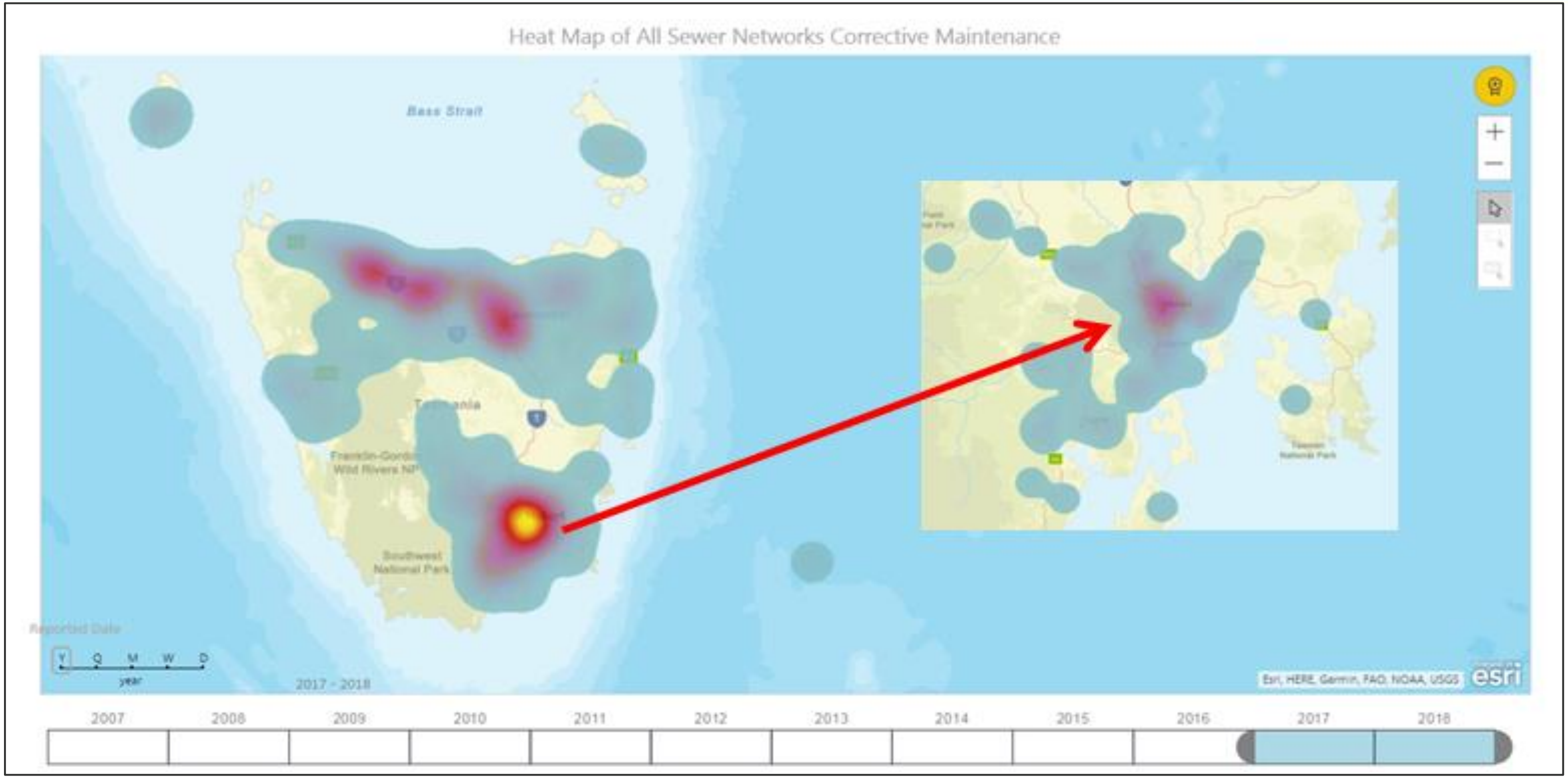
cause	Count of wonum	Average of Total Cost
ROOTS	1085	$409.91
FOREIGN	212	$240.59
FOG	124	$355.57
TW	27	$1,993.48
SILT	18	$1,007.83
THIRDPTY	18	$1,384.83
	13	$914.15
BREAK	11	$1,135.00
COLLAPSE	11	$1,918.73
GRIT	11	$679.55
RAG	7	$64.57
STORMDAM	4	$1,515.25
PROTRUDE	2	$3,596.50
CORROSN	1	$131.00
VANDALSM	1	$4,347.00
Total	**1545**	**$458.17**

Reported Date

Jul 2017 - Mar 2017



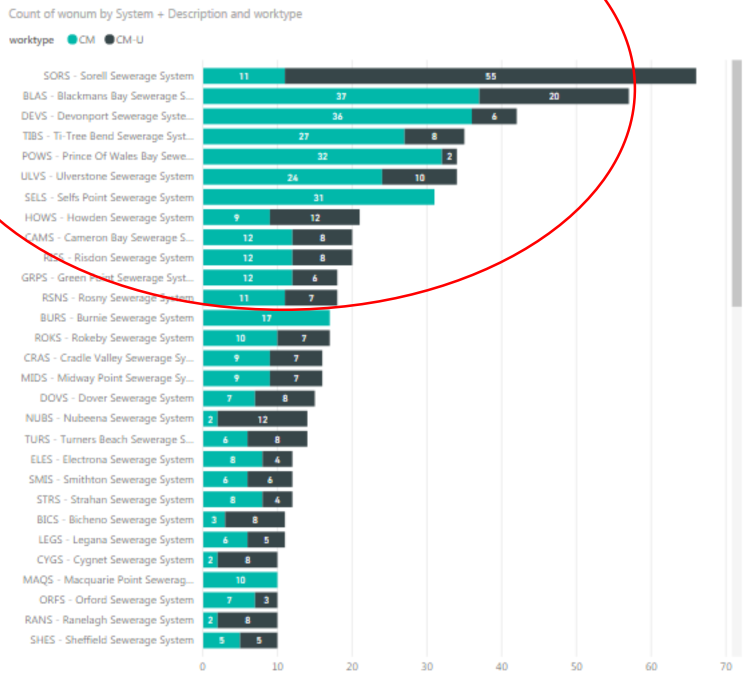
Workshop Output: Failure areas

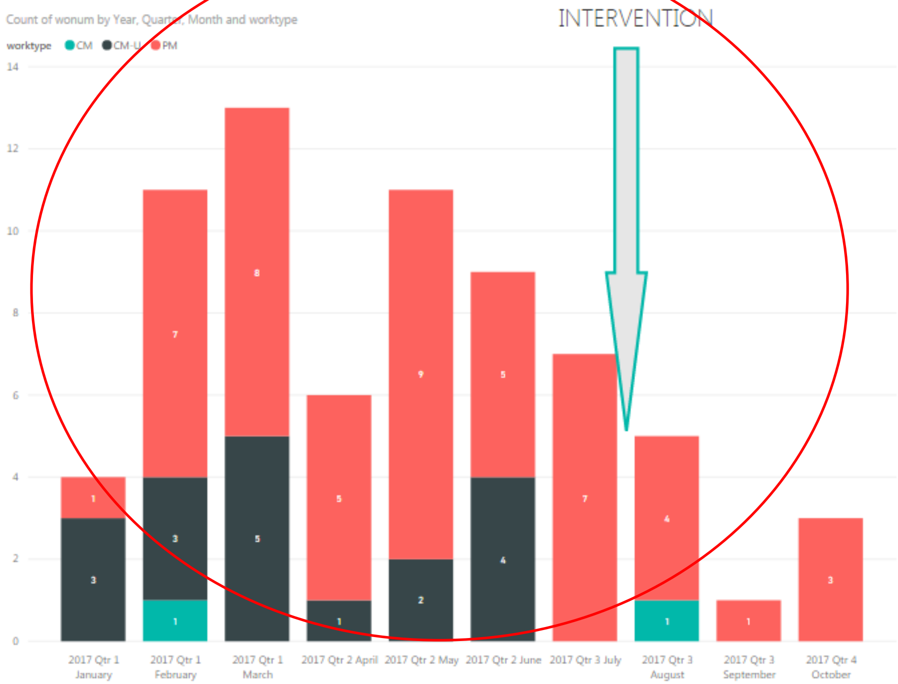


Application to Decision Making

SPS Performance Monitoring

Proof of Concept 2 – SPS Monitoring

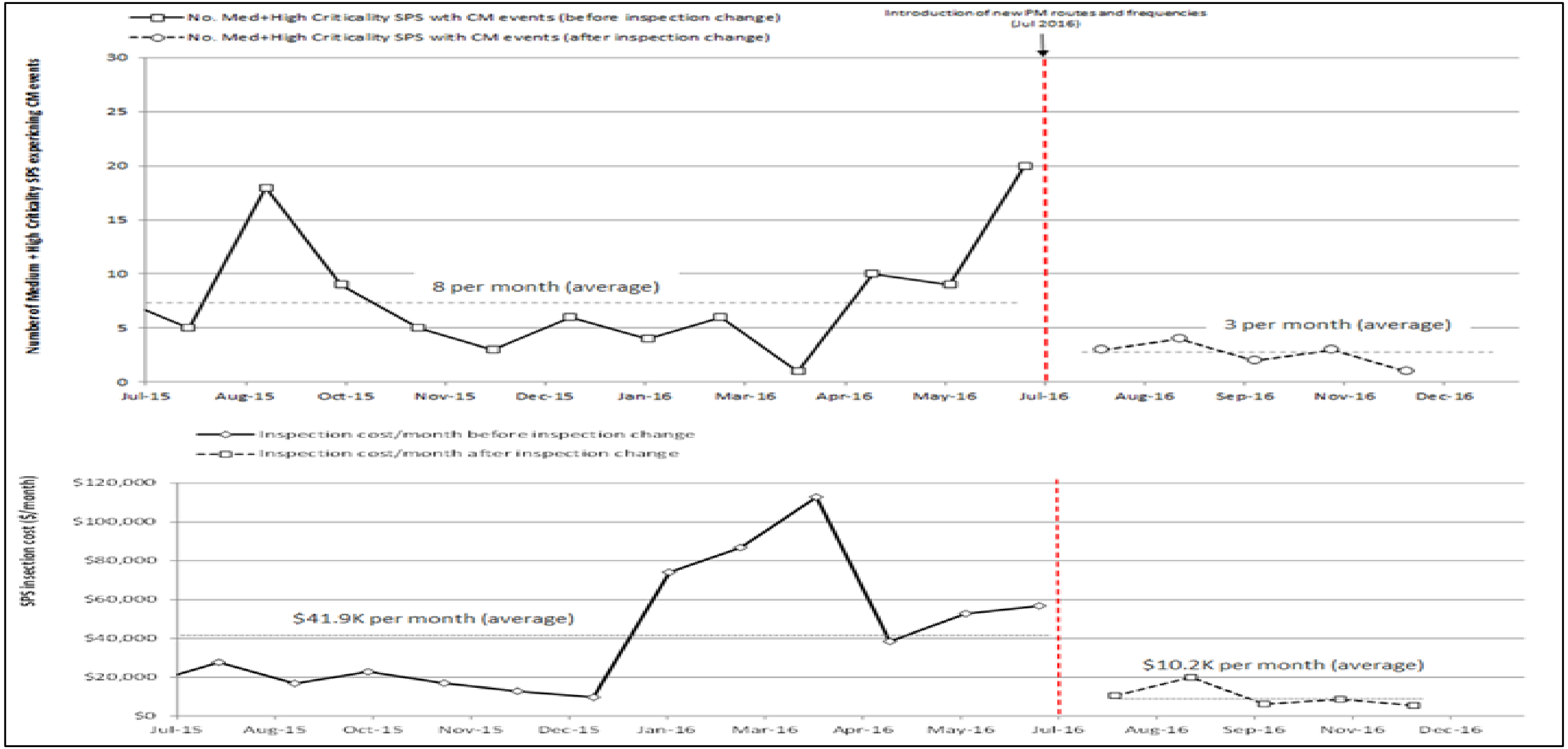




Application to Decision Making

Preventive Maintenance Optimisation (PMOP)

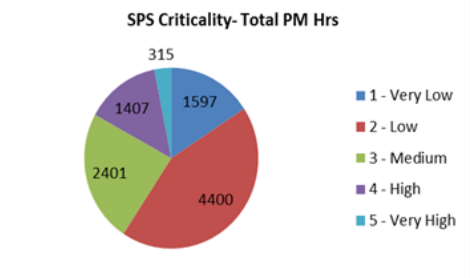
Proof of Concept 1 - PMOP

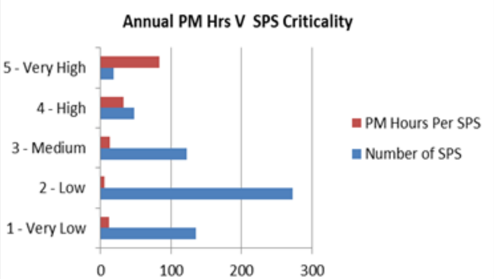


Levels of Service

Driver	Objective Measure
To minimise odour complaints	Total number of reportable complaints attributed to SPS' year
Preparedness for future demands	Forecast utilisation not exceeding X% of proposed capacity
To minimise dry weather overflow events in SPS'	Total number of dry weather overflows in SPS' per year
To minimise wet weather overflow events in SPS'	Total number of wet weather overflows in SPS' per year
To minimise spills from SPS' to shellfish lease areas year	Total number of reported spills from SPS' to shellfish leases per
To minimise spills from SPS' to receiving environments classified as high environmental sensitivity	Total number of reported spills from SPS' to receiving environments classified as high environmental sensitivity

Asset Planned Maintenance Profile





Maintenance Strategy

Program Types	Programs and Job Plans	Program Intent	Frequency	Program Benefit	Resource Hours 2019	Resource Hours 2020	Resource Hours 2021
Mechanical Inspections	SPS Minor/Major Inspection, Valve Inspection, Auto washer Inspections,	Reducing SPS overflows and spills Maintain Operational status	1 W 12 W 26W	Reducing negative environmental impact Reactive maintenance cost reduction	5679 Q3 → 890	5679	5679
Mechanical Maintenance/ Servicing	Sewer Pump Maintenance Station Maintenance, Control Valve Service, RPZD Testing,	Reducing Pump failure Pump Lifecycle management SPS Maintainability & Safety Valve Operation	26 W 52W	Reactive maintenance cost reduction Maintaining useful life of asset Reducing known failure rates	2255 Q3 → 600	2255	2255
Civil & Structural Inspections	Facility Inspections, Odour Management, Lifting equipment,	Odour system cleaning and management Site condition and safety	12W 52W	Reducing odour complaints Improving WHS outcomes	799 Q3 → 162	799	799
Electrical Inspections/Maintenance	Site Electrical checks, Switchboard Management, Generator Maintenance,	Site & People Safety Operational Status	2Y 26W 52W	Improving WHS outcomes Legislative compliance Preserving function and operation of SPS'	1238 Q3 → 645	1114	1238
Condition Assessment	Valve pit, Facility	Valve exercising and operational status	52W	Increase asset knowledge	361 Q3 → 1	361	361
Civil & Structural Maintenance	Wet Well Cleaning,	Reducing Overflows and Pump Blockages Odour control	4W 12W 2Y	Continuity of Flow Reducing negative environmental impact Reactive maintenance cost reduction	353 Q3 → 76	139	328
Instrumentation Management	Flow Meter Verification, Instrument Calibration/ Verification Instrument Servicing,	Water Quality management Operational Status	4W 52W	Accurate quantification of flows Preserving function of level sensors	149 Q3 → 19	149	149
				Calendar Yr. Total Labour Hours	**10950** **(Q3: 2374)**	**10792**	**10924**

Lessons Learnt and Final Thoughts

Lesson Learnt

- Upfront early communications
- Key stakeholders must be involved
- Visualisations must have a purpose
- Any future improvements or modifications

Final Thoughts

Allows us to:

- Pick up on poorly performing assets that may or may not be critical or realised in renewals program, reconcile renewals programs, adapt and rationalise PMs (efficiency gains)
- Set performance benchmarks for assets to trigger non-compliance
- Informs business risk presented by Assets
- Communicate with our SD division to confirm their pain points
- Closes the feedback loop and constrains the debate (decisions on fact)
- Increase productivity through improved utilisation of resources

Questions?

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