E2E Project

A Better Way for Our People

Data Analytics for Asset Management Decisions

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"We acknowledge the Traditional Owners of the land on which we operate and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging."

The Jemena Group at a glance

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Jemena Gas Network

As the largest gas distributor in NSW, Jemena delivers natural gas, hot water, heating, cooking and more to over 1.5 million customers each year

Jemena Electricity Network

Jemena delivers electricity daily to over 350,000 homes and businesses across north and western Melbourne, plus more than 72,000 local streetlights

Jemena Pipelines

Jemena owns and operates some of Australia's most important gas transmission pipelines, offering producers and customers safe, reliable and competitive transport via direct and dependable routes

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Zinfra is a wholly owned subsidiary of Jemena and delivers a comprehensive range of engineering, project management, construction, operations and maintenance services to power and gas asset owners and other clients in the renewables, transport, and resource sectors

Jemena's Asset Management System (AMS)

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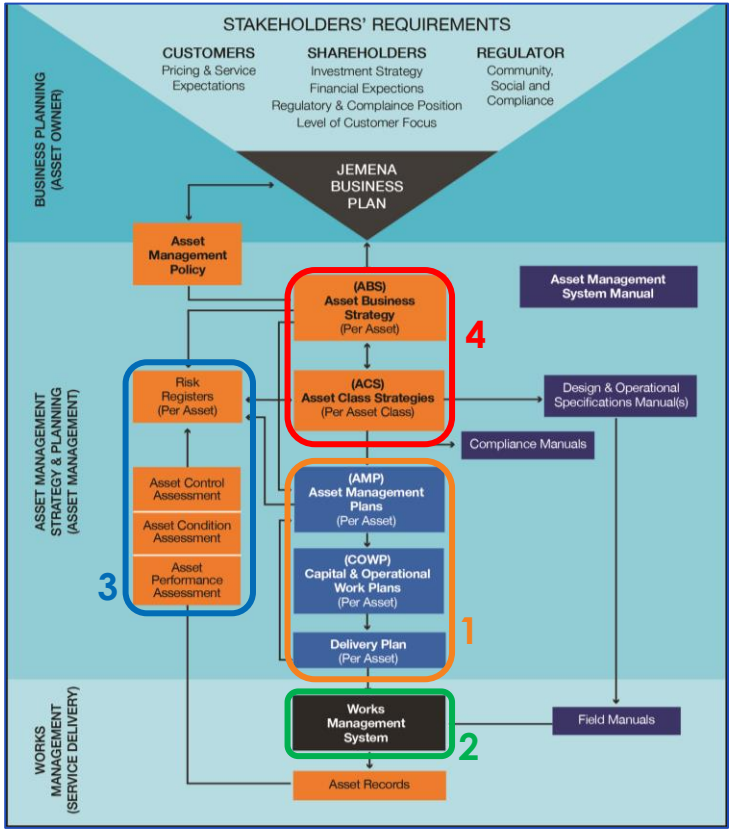
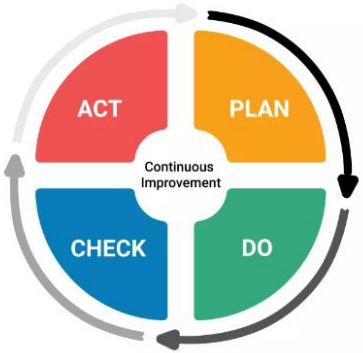


1. PLAN
2. DO
3. CHECK
4. ACT



- ISO55001 certified
- AMS ongoing cycle: plan-do-check-act
- Underpins and informs our ways of working

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E2E Project – What is it all about?

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The End to End (E2E) Project – WHY DID WE DO IT?

The Group is in a unique position as both Asset Owner and Service Provider to respond to challenges to the future of utilities (market, environmental and regulatory) through a comprehensive review of its **end-to-end asset value chain** to drive changes which would improve the reliability, affordability and responsiveness of Jemena's assets, now and into the future.

The E2E Project spans across all steps of the asset value chain:

E2E PROJECT BY NUMBERS

6 Streams (EDAM, EDFD, GDAM, GDFD, GMAM, GMFD)

46 Initiatives across all six streams

1,000+ Employees directly impacted by changes delivered (with further indirect impacts across the Group)

20% of employees across the Group were engaged to provide input to help design initiatives

$11B Group Asset value impacted through initiatives

$20M sustainable Financial benefits delivered in CY22

Top 6 Strategic Priority for CY22 to support Group KPIs

KEY FOCUS AREAS OF E2E PROJECT

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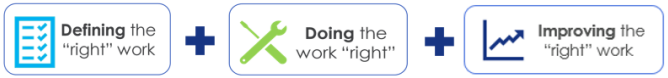
- **Defining the "right" work** - understanding the work needed to be done to make it easier for people to perform their jobs and get the most out of existing assets;
- **Doing the work "right"** - how to get productivity right so people can get on with the work that really matters without getting deviated by tasks that do not add value; and
- **Improving the "right" work** - ultimately delivering on current and future improvements aiming towards better outcomes for customers/clients and the business



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Making Decisions

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We all make decisions

We try to have as much data that's necessary

Usually this data comes from multiple sources

How to we combine these pieces data to make informed decisions for JGN

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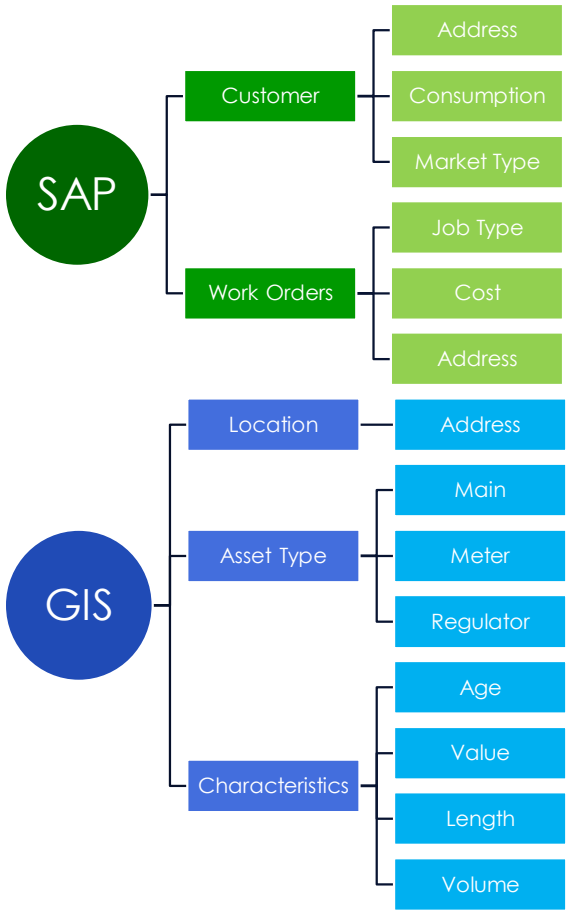
Where is the Data

Much of the Data at Jemena is within two systems

1. The financial and data system (SAP)
2. The Geospatial Information System (GIS)



Defining the problem

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Limited ability

- JGN has limited ability to analyse together different metrics from these two systems providing insights into asset performance and understanding return on asset or profitability outside of an aggregated view.

Lack of consistency

- This gap prevents consistent data-driven decision processes for asset investment, replacement, and maintenance strategies.

Time consuming

- Obtaining information is time consuming and often not easily repeatable which impacts analysis, reporting and the quality of decision making.

Frustrating

- Employees find the process frustrating and may miss data to support decisions or rely on others to provide relevant information.

Multiple transactions

- The user needs to conduct multiple transactions in SAP and the try to collate information that could be used for data analytics and decision making.

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Developing a solution

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- Know what the end state should look like and what information or measures will be the output.
- What data or information is used to make decisions
- How to collate this information and outputting it into a result that makes sense.
- Being able to assess different scenarios and is it repeatable
- The project, named the Enterprise Asset Management Tool (EAM Tool), was kicked off to collate data from completely separate datasets; Customer Information, Work Orders and Geospatial Information.
- What the project aimed to achieve was to build a dashboard which links the asset data, customer data and Opex costs from SAP and GIS and pull this information into user friendly dashboard reports
- Allowing users to view and analyse data on customer numbers, usage, maintenance costs, reliability, location and asset history.
- This provides multiple lenses to view this data to enable reporting and analysis and support enhanced decision making by our asset management, commercial and operations teams

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Identifying data

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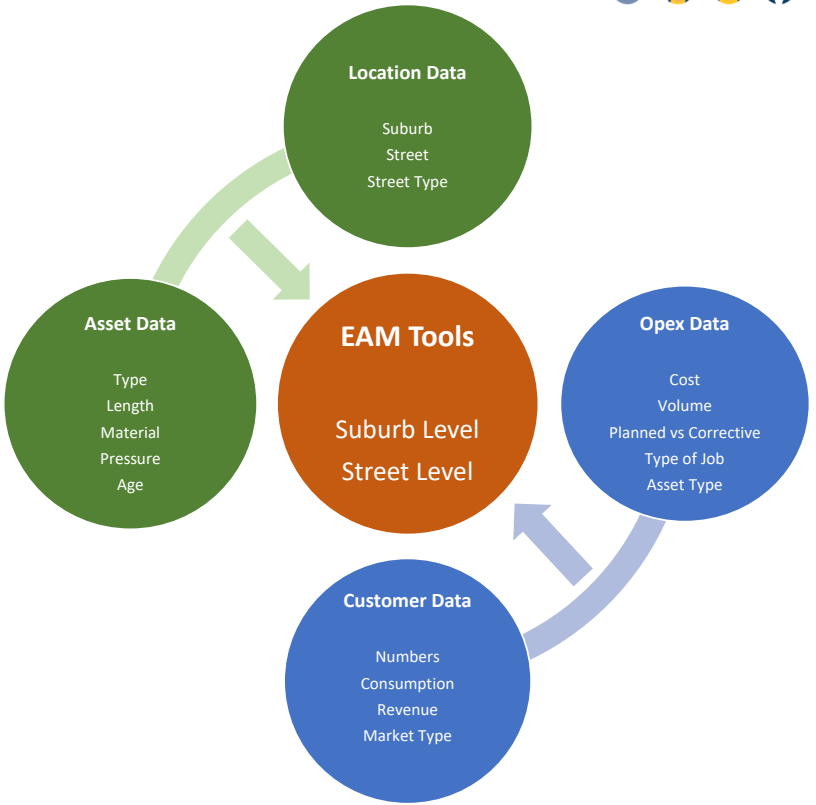
- This was developed into one data repository where the information enables powerful data analytics to be performed on key metrics pertaining to Return on Asset, Revenue, Opex and Asset Value with sufficient history on JGN
- Likened to a digital twin of the gas network
- This project delivered two interactive analysis tools where information can be viewed at a Suburb level, and another tool at a deeper Street level granularity.



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Data quality

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- It is well known that in order to make informed decisions then it is important to ensure that the integrity and the confidence of the data is of a high enough level.
- This ensures the data used is of sufficient quality to measure asset performance with the accuracy required.
- This project benefited from another project occurring in parallel that reviewed the customer data quality.
- The majority of the data quality issues pertained to address information of customers, where the street name, suburb or postcode may have been spelt incorrectly, or a postcode boundary may have changed.
- Towards the end of this project the data quality improved to the level of less than 2% inaccuracy which was a significant improvement.
- Whilst data quality is an important aspect for accuracy of analysis, it should not be the reason not to move towards digital decision making.
- Knowing the limitations of your data can help with improving it going forward, in turn improving the quality of data analytics.

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Using the tool

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- The EAM Tool dashboards contain separate pages related to the source of the information.
- Each page has an interface with different filters across the top menu bar called Measures, such as year, or the type of asset.
- On each page the user can select the Measure being sought; e.g. cost/km, consumption/customer.
- Both tools are similar but also differ to enable more detailed and granular data analytics when conducted at the street level.
- Different options or scenarios can be quickly evaluated by changing the appropriate filters,
- Each tool is used for different uses, but also complement each other.
- By observing a suburb with a high Opex cost, you can conduct further data analytics at a street level to establish what the reasoning behind this may be.

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EAM Tool 1 – Suburb Level

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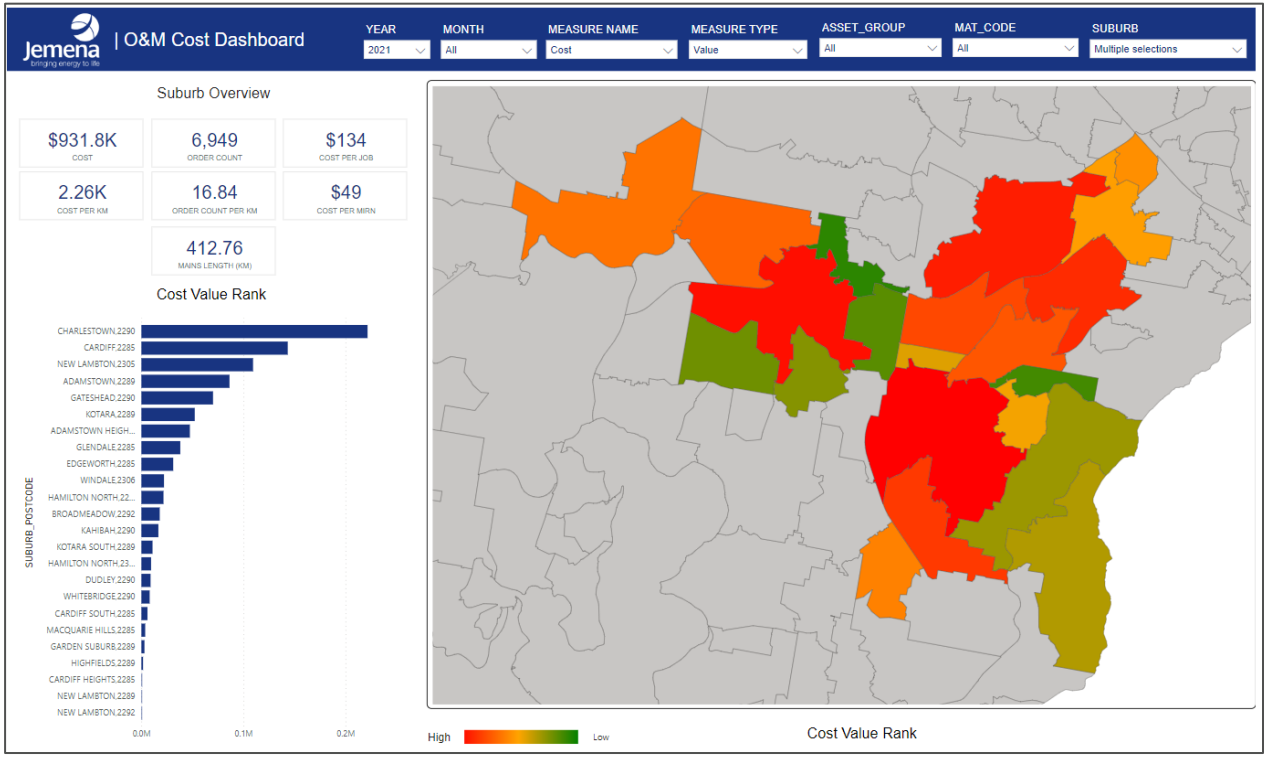
- The suburb level tool enables data analytics at a higher level by collating the information at a suburb level.
- This page is showing Opex and the user can drill down further such as selecting work code that a job was conducted, such as a repair on a main.



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EAM 2 Tool – Street Level

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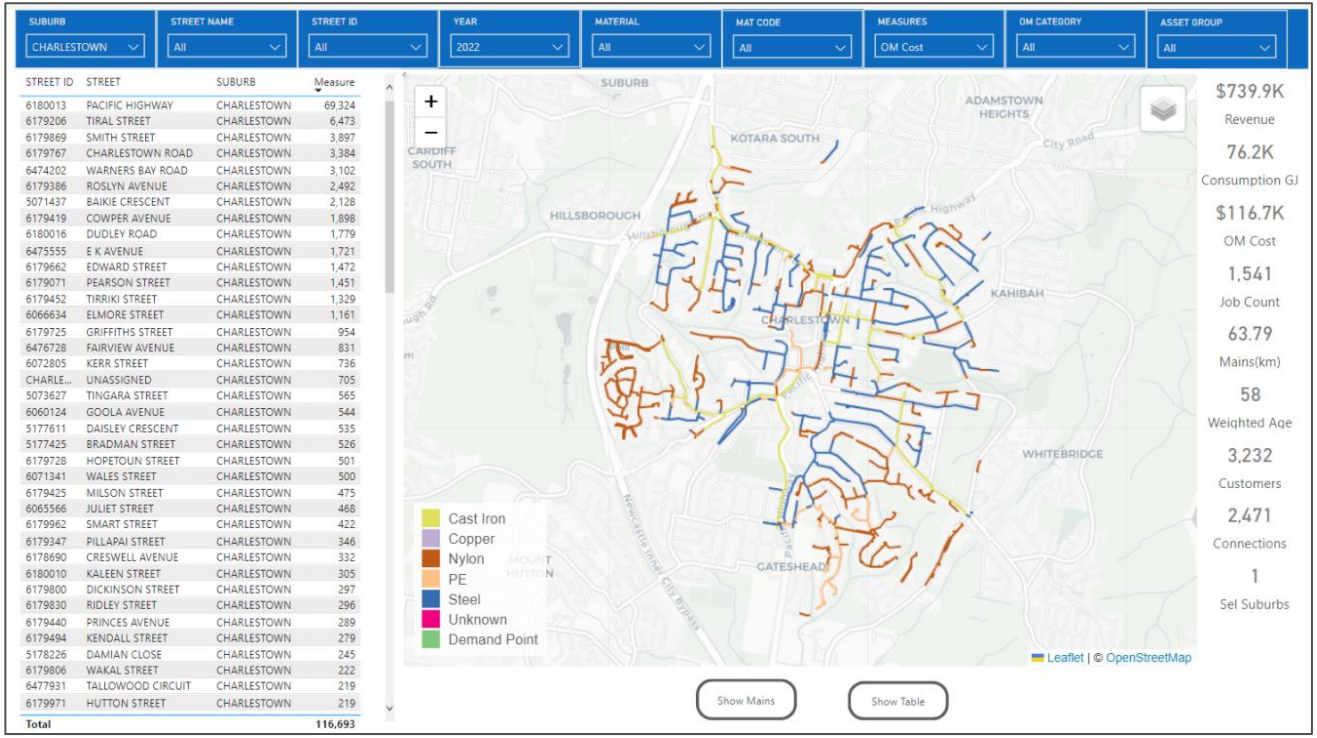
- At the street level the user can view much greater level of granularity in the data.
- But is still able to retain and show the data at the higher level of suburb.



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Project Benefits

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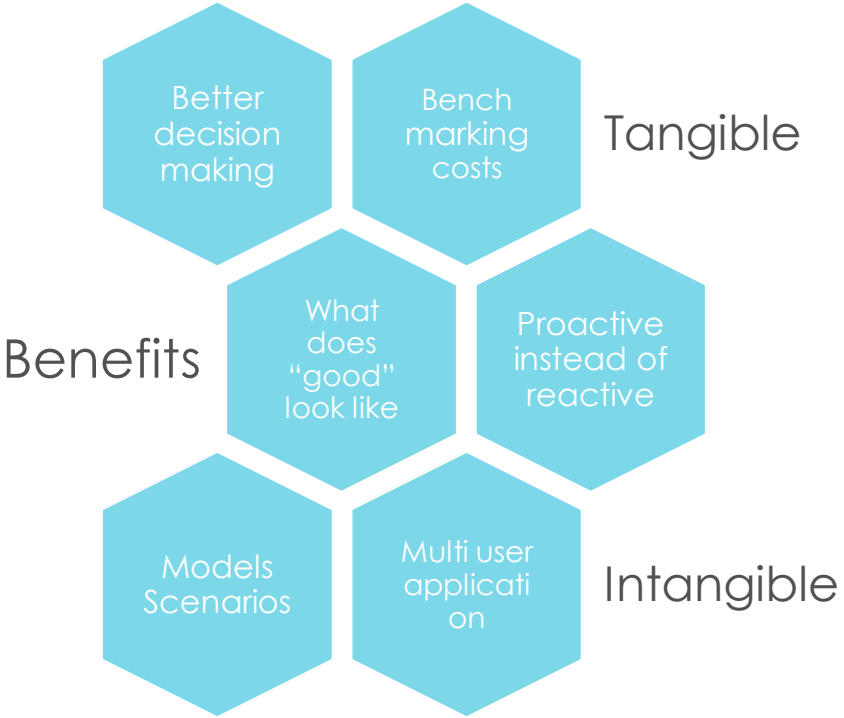
- Benefits can be tangible, such as where costs were saved by pursuing an optimum option with the highest payback or by deferring capital.
- Intangible benefits include time saved by the user having the information already accessible for data analytics, without needing to source this information separately from the data sources and compiling it together.
- The EAM Tools have been used to optimise capital programs that deliver a balance of lower capital expenditure and/or higher operational cost savings for the same capital expenditure.



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Use Cases

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Optimised Scope

- Impact the investment decision in a Mains Replacement Project Capex was reduced by more than AUD$1M while retaining 85% of Opex savings. The scope of the project was reduced by more than half.

Optimised Capex

- A review of Capex during 2022 across 5 projects saw AUD$2.3M in savings when options reviewed.
- This review was taken at the Suburb level and took into account asset value, revenue from customers and return on asset to decide on the most optimum Capex solution.

Timing of Projects

- JGN conducts pressure monitoring across the whole network and where the pressure begins to approach minimum acceptable levels,
- Understanding customer numbers and market type (single dwelling, high rise or commercial customers), data analytics can determine an optimum year when Capex is required.

Repair or Replace

- For a leak on a gas pipe, the repair is usually to dig down install a clamp with the activity considered as Opex.
- Data is now readily available and an NPV analysis can be conducted using historical costs and the pipe characteristics to forecast whether it is prudent to replace a larger section of pipe as Capex and remove future Opex costs.

Combined Index

- Sometimes NPV Analysis above is not prudent
- The physical context of where the pipe may necessitate revaluating the solution.
- Combined Index score has been included based on characteristics of the street.
- Such as if street is an arterial road or local road, does the street have an area consider a higher risk due to where the public may congregate, or if the street is considered within a bushfire risk area.
- The Combined Index provides a relative score across all the streets and can be used to decide the course of action for a section of pipe.

The power of the EAM Tools is that the information to conduct data analytics to drive business decisions is readily available and different scenarios using different filters can be quickly evaluated.

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Thank You