Jemena Gas Networks (NSW) Ltd

ICT Investment Brief – Works Management Schedule Optimisation

Non-Recurrent – New Capability

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bringing energy to life

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Glossary

Capex	Capital Expenditure
Current regulatory period	The period covering 1 Jul 2020 to 30 Jun 2025
DWOMs	Digital Work Order Management System
ICT	Information and Communications Technology
Jemena	Refers to the parent company of Jemena Gas Network
JGN	Jemena Gas Network
Next regulatory period	The period covering 1 Jul 2025 to 30 Jun 2030
NPV	Net Present Value
Opex	Operating Expenditure
RYxx	Regulatory year covering the 12 months to 30 June of year 20xx for years in the Next Regulatory Period. For example, RY25 covers 1 July 2024 to 30 June 2025
Totex	Total Expenditure
Works	Refers to service connections, repairs and maintenance

Works Management Schedule Optimisation

Objective	The objective of this initiative is to build new Works Management Schedule Optimisation capabilities for Jemena Gas Networks (**JGN**) to streamline maintenance, enhance resource utilisation, minimise downtime, improve operational efficiency and ensure the reliability and safety of the team and network.		
Non-recurrent ICT sub-categorisation	☐ Maintaining existing services, functionalities, capability, and/or market benefits	☐ Complying with new/altered regulatory obligations/requirements	☒ New or expanded ICT capability, functions, and services
Background	JGN undertakes a range of maintenance and routine capital works to provide safe and reliable service to customers. These works are delivered through around 300,000 work orders each year. Work orders are issued for a range of items including (but not limited to) responding to faults and emergencies, undertaking planned and corrective maintenance, connecting new customers, replacing meters, and abolishing connections. **Current capability and extended capability required** To support the delivery of these activities, in 2019 JGN implemented an end-to-end Digital Work Order Management System (DWOMs). This system manages the planning, scheduling, dispatch, work execution, field information capture and closure of work orders. There have been some improvements to DWOMs over the last five years. However, there has been no significant change to the scheduling and dispatch process. This component of the system remains manually intensive, relying on schedulers knowledge and experience. A number of products are now available on the market which provide schedule optimisation capabilities with the potential to: • Improve scheduling decisions through automated or semi-automated schedule and route optimisation. • Provide near real-time, accurate information to improve scheduling decisions. • Enable continuous improvement, through the implementation of artificial intelligence and learning to tune scheduling. This functionality is expected to improve efficiency and lower costs through reduced travel times, improved field workforce utilisation and efficiency. It is also likely to lead to greater customer satisfaction due to faster response times and more timely delivery of works. **JGN's increasingly complex operating environment** Australia is undergoing an energy market transition. Both the Commonwealth and New South Wales Governments have set interim and 2050 emission reduction targets. While the goal of net-zero by 2050 is clear, JGN's role in a decarbonised future is not. Accordingly, there is likely to be a change in the patterns of work we deliver compared to what we have seen historically. Over the 2025-30 period, we expect to see a reduction in connection numbers, increases in our meter replacement program (given the age and expected accuracy of our meter fleet), and, potentially, an increase in connection abolishments. Additionally, with the shift to direct emissions measurement, we are also likely to identify more leaks requiring an increase in reactive and planned repairs to reduce fugitive emissions. Given these changes, and our reliance on manual processes and historic knowledge and experience, there is a risk that work orders are not optimally scheduled and dispatched leading to higher than necessary costs.		

Customer Importance	Our ability to continue to safely, reliably and efficiently deliver services has broad impacts for our customers, including: • price, as any cost savings we achieve will translate to lower bills for our customers. • reducing the number of jobs that require rescheduling will improve the operational performance and customer delivery KPIs. • improved response and restoration time where additional crews are required. Essentially, optimised scheduling capabilities will improve our efficiency and ensure that services are delivered at the lowest sustainable cost in line with good industry practice.
Key Considerations	In considering whether and how to improve scheduling and dispatch capabilities, we have considered various strategic factors including: • JGN's ability to respond in a timely manner to changes in our operating environment to maintain reliability, safety and customer satisfaction. While our decision-making timeframe is dynamic and responsive to change, planning and executing the proposed capability can take some time. • The ongoing change in the work order mix with the reduction in connection volumes, increase in meter replacement works and likely increase in leak repair activities. • Ongoing pressure on supplier and labour costs. AEMO, for instance, has found that electricity transmission construction costs have increased by 30% in two years in real (after inflation) terms.[1] Accordingly, the benefits of optimising works delivery have never been higher. • The local availability of necessary labour and expertise in the technology sector to implement the new capabilities as the market in Australia for implementing these capabilities is mature.
Options	JGN has considered the following alternatives to deliver the capability articulated above: (1) do nothing – maintain status quo (2) deploy existing works management schedule optimisation capability. (3) build bespoke works management Schedule optimisation capability. **Option 1: Do nothing – maintain status quo** **Description** This option requires that no action is taken. No schedule optimisation capabilities are deployed. **Benefits** By doing nothing, JGN would avoid incurring the costs and risks associated with investing in this initiative. **Risks** Without the investment to support JGN's delivery of operational efficiencies associated with scheduling and dispatch of work there is the risk of: • Higher than necessary costs due to sub-optimal work scheduling and dispatch. This could be due to mismatch between skill-mix and work required or inefficient deployment of work orders (e.g. resulting in higher travel times). • Greater uncertainty that the work will be able to be performed the first time a crew attends; this is as a result of manual allocation of skillset and resources to a particular job. • The number of jobs that require rescheduling may increase as a result of the changes in our operating environment and reliance on manual processes and scheduler experience and knowledge. As a result, response and restoration times may be impacted. • Customer satisfaction may decline due to greater uncertainty as a result of the changes articulated above.

[1] AEMO 2023, *2023 Transmission Expansion Options Report,* p.27. Available here.

Summary

This option is not recommended as it does not reflect accepted good industry practice and does not result in the lowest sustainable cost of delivering services.

Option 2: Deploy existing Works Management Schedule Optimisation capability

Description

This option will roll out schedule optimisation capabilities through the deployment of existing products[2] with features such as advanced scheduling algorithms real-time data integration, and visualisations so JGN can systematically optimise its ability to schedule and dispatch work.

Key capabilities will include:

1. Automated scheduling of suitable types of work.
2. Semi-automated scheduling of work based on defined business rules.
3. Ability to quickly match field resources to work based on type of work, skillset and location.
4. Automated job sequencing based on route optimisation.
5. Ability to dispatch work from map views to field crews.
6. Confirm work planning has been completed and resources are available prior to work being dispatched.

Benefits

Schedule optimisation capabilities can be expected to deliver:

- Better matching field crew capabilities to works planned. This would be achieved by automatically or semi-automatically allocating field crews to work orders based on defined business rules.
- Mitigate against increasing travel times due to growing populations, road congestions and parking. This would be achieved through automatic sequencing of workorders based on the optimal route to reduce travel times.
- Reduce wasted visits through better gating prior to work being dispatched.
- Greater certainty of meeting our customer's expectations regarding when work is planned to be completed.

We expect that these capabilities will reduce the cost of undertaking routine capital works, such as undertaking new connections and our meter replacement program, by approximately $1 million per annum. Over a 10- year period the present value of these benefits is $6,374,261.[3]These benefits will help realise the meter and connection unit rate reductions already built into our 2025 Plan.

Risks

Risks to budget and timeframe can be associated with enhancement projects, but these are routinely managed and considered low for these activities.

Costs

Based on initial discussions with vendors, the estimated costs for this option are outlined in the table below.

$2023	RY26	RY27	RY28	RY29	RY30
Total Capex					
Non-recurrent Opex		[redacted]	[redacted]		
Recurrent Step Opex					

Total Opex		[redacted]	[redacted]		
Totex		[redacted]	[redacted]		

This option will incur non-recurrent total expenditure for JGN of [redacted] for the 2025-30 period to deliver works management schedule optimisation capability.

Summary

This option is recommended as we consider it reflects good industry practice given the benefits and risks outlined above. Furthermore, it provides the lowest sustainable cost.

Option 3: Build bespoke works management Schedule optimisation capability.

We considered building a bespoke solution to provide schedule optimisation capability. However, this option was not considered to be feasible given the relatively high risks, costs and unclear scope compared to an off-the-shelf solution (option 2 above) and was not considered further.

This option is not recommended as it does not reflect accepted good industry practice and does not result in the lowest sustainable cost of delivering services.

Options Summary

The table below summarises the quantitative and qualitative differences between the analysed options.

	Capex ($2023)	Project Opex ($2023)	Project Totex ($2023)	10-year net NPV	Residual Risk
Option 1	Not applicable	Not applicable	Not applicable	Not applicable	Medium
Option 2	Not applicable	[redacted]	[redacted]	[redacted]	Low
Option 2	Not applicable	Not applicable	Not applicable	Not applicable	High

What we are Recommending

JGN proposes to proceed with option 2. Investing in this capability will provide customer benefits and improve productivity and result in the lowest sustainable costs of providing services, consistent with good industry practice.

Dependencies on other Investment Briefs

This Investment Brief is also related and aligned to the following Investment Briefs for the next Regulatory period;

- SAP - Future state readiness work with DWOMS required the SAP migration will be required
- Cybersecurity Program - The Shift Left Model will ensure cybersecurity measures are incorporated into the Works Management platform from inception

Relationship to ICT Capital Forecast

The supporting modelling for this investment brief is contained in the following investment framework model: **JGN – RIN – 4.3.5 - ICT Investment Brief – Works Management Schedule Optimisation – Costs and Benefits Analysis Model**

[2] Examples include, IFS Field Service Management Solution, Microsoft Dynamics 365 Field Service, Oracle Field Service, SAP Field Service Management, Salesforce Field Service.

[3] Note that over a 10-year horizon the first two years are related to the capabilities being deployed leaving 8 years for the benefits to be realised.