GAAR 2024-2028 Technology Brief

Gas Distribution Management System

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1 Document Background

1.1 Purpose of this document

The purpose of this document is to outline a business case for a proposed program of work that will form part of AusNet's Technology GAAR submission.

1.2 References

Document	Version	Author
Digital Utility Strategy	V1.2	Digital Team
2021 Gas Business Plan	V1.0	Joanne Soysa
GAAR Technology Strategy	V1.0	Digital Team

1.3 Document History

Date	Version	Comment	Person
03/08/2021	V0.1	Creation of document	Shannon Shi
25/08/2021	V0.2	Updated options	Lynda Osborne
31/08/2021	V0.3	Updated cost figures	Leo Saito
20/09/2021	V0.4	Sent PwC for feedback	Matt Abraham
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10/06/2022	V.11	Pre-review draft	Matt Abraham
15/06/2022	V.12	Post review adjustments	Matt Abraham

1.4 Approvals

Position
Technology Leadership Team

2 Executive summary

Table 2-1 Summary table

Program objectives	The Gas Distribution Management System program seeks to maintain the operation of the gas distribution system reducing operational and safety risk. This program automates manual tasks and provide more comprehensive and timely data to asset managers, network planners, dispatchers, the control room and field crews. Many of our current systems that support network operations are beyond end of life, this includes our Outage Management System (OMS) and Geospatial Information Systems (GIS). Additionally in some cases manual work is being carried out to support network operations processes, for example step order management. This is especially true for our existing platform from GE being PowerOn for Gas. This creates risk in terms of the data available to use (e.g., flow, pressure, leakage data) and our ability to make informed decisions to continue to ensure the safe and reliable supply of gas to our customers. This program will mitigate the operational and safety risk created by sustaining end-of-life core network operation systems, which cannot apply further security patches or receive vendor support. Investment in this program will also increase the automation of distribution management and improve the data available to support decisions regarding pipeline management. The technology investments will allow us to meet the future requirements of an evolving gas network. This program also intends to simplify the current technology architecture and improve systems integration, which is aligned with our strategic technology direction. As a result, this will also help us to avoid the growth in costs to maintain core network systems and improve the effectiveness of network operations and asset management. Furthermore, this program provides data and digital capabilities that the Gas business can leverage in the future as the industry evolves in response to decarbonisation and broader environment, social and governance (ESG) agendas.
Key objectives of program	To mitigate operational and safety risk and uplift the effectiveness of network operations by: ● Replacing end-of-life systems to avoid system downtime, and associated recovery costs, and help ensure that we continue to provide a high level of service to our customers. This program also aims to minimise the cyber risk posed by end-of-life systems. ● Investing in contemporary network operations systems, reducing the complexity of our current environment, and improving integration between systems. This will reduce the manual work required to bring data together from different systems to inform some network activities (e.g., pipeline flow studies), and increase the automation of some tasks to reduce the room for error and enable safe and reliable network operations for employees, suppliers, and customers. ● Integrating and simplifying our systems environment, which will result in richer data sets and analytics capabilities (e.g., GIS analytics) being available to support tasks in a more automated way (e.g., step order management) and to support decision making (e.g., gas dispatching). ● Enabling decision making that is more evidence based and backed by richer data sets that provide greater visibility of network operations, to continue to meet customer expectations and our obligations under the National Gas Rules. ● Build technological capabilities that will incorporate and manage the data and reporting requirements to support the current and future gas networks

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Key risk drivers	● Lifecycle management of technologies which are vulnerable to potential security threats which if breached, would compromise the security of the network ● Mitigate knowledge loss as key people who operate the distribution network leave the organisation or retire, through enhancements of technology which will refine, and digitalise manual processes ● Digitalisation and optimisation of key system processes to reduce manual processes that increase the rate of errors and effort required to maintain safe and reliable operations. This is particularly relevant in an environment of increasing complexity of network management. ● By refreshing end-of-life systems, we increase system interoperability and increase our ability to capture and analyse network data. This will improve our readiness for the impact of decarbonisation (e.g., potential use of alternative fuels sources like hydrogen).
Key benefits	● Decreased risk of system failure and subsequent productivity loss safety and customer satisfaction from improved outage communications (GSLs) ● Improve network operations effectiveness through increased visibility of network status ● Support new regulatory obligations and rule changes particularly with respect to vulnerable customers ● Decreased risk of field crew injuries and customer complaints through earlier detection of leaks and ruptures ● Optimise asset maintenance schedules and cost based on asset condition data ● Minimise the impact of network outages and constraints through improved outage and planned work management ● Based on asset risk data, conduct targeted maintenance, minimising need for large-scale manual checks ● Improve future readiness to manage the likely new planning and operational requirements from alternative fuel sources (e.g., hydrogen).

Cost allocation	Gas Distribution*	100%	Electricity Transmission	0%
	Electricity Distribution	0%		

Program Type	**Recurrent**	☐
	Non-Recurrent	☒
	Client Devices	☐

Program timings	Program duration:	5 years

	($m)	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**Total**
Expenditure Forecast	**Capex**	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	$13.43
	Opex	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	$4.56
	Total program cost	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	**$17.99**

Estimated life of system	The solution should expect to be current for approximately 5 years.
Customer Engagement	The development of this brief has taken into consideration recent customer engagement studies conducted by AusNet including the Energy Sentiments Survey (2021) and the AusNet Listening Report “Engaging Victorians on the Future of the Gas Networks” (2021).

Alignment to AER ICT expenditure assessment framework

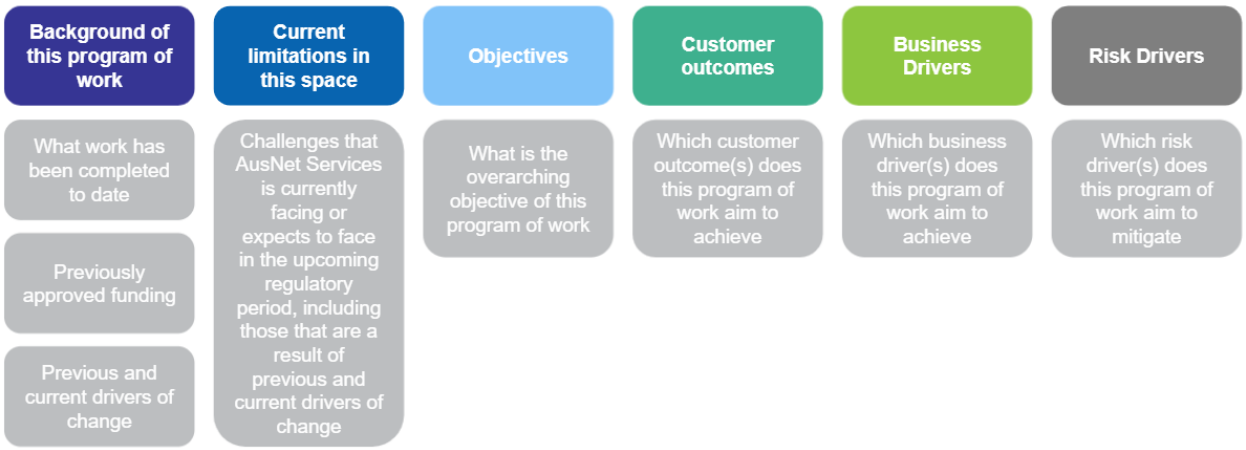
We have categorised the chosen option for this program as 53% non-recurrent expenditure, on the basis that it involves lifecycling and replacement of existing ageing Network Operations and that will maintain capabilities for network operational planning, real-time operations and maintenance of the network (see Section 4.3, which includes the scope of the recommended option, for more details).

We have also undertaken NPV analysis in support of the project, as well as developed a detailed business case. See Section 5 for the options assessment and NPV analysis.

3 Context

This chapter provides context for the program of work and the figure below lists key areas to be discussed.

Figure 3-1 Key areas of the context to be discussed



3.1 Background and limitations

AusNet's overarching strategy seeks to lead energy transformation and embrace change, drive effectiveness through the portfolio, and generate trust and respect with customers and partners. Amidst the ongoing changes in the energy sector (changes in consumption and alternative fuel sources emerging), the Gas Business Plan focuses on remaining operationally effective, improving services that customers value, continued improvements in safety and supporting a decarbonisation roadmap. Hence over the next regulatory period we will focus on ensuring the core gas business continues to manage customer outcomes, optimises asset utility, and mitigating risks to safety of operations for the current and future gas networks.

Achieving our objectives is dependent on contemporary systems and accurate data sets that will enable us to maintain our work practices whilst making informed and evidence-based decisions. Digital capabilities and data play a significant role in providing us with greater insights into asset condition and network operations (e.g., corrosion, leakage, pressure). By leveraging asset, spatial, and network operations data, we will have information to make better decisions to maintain network performance, optimise works planning for asset maintenance and replacements, and respond quickly to incidents (e.g. low pressure under peak demand).

Many of our current systems that support network operations are beyond end of life, this includes our Outage Management System (OMS) and Geospatial Information Systems (GIS). Additionally in some cases manual work is being carried out to support network operations processes, for example step order management. This is especially true for our existing platform from GE being PowerOn for Gas. This creates risk in terms of the data available to use (e.g., flow, pressure, leakage data) and our ability to make informed decisions to continue to ensure the safe and reliable supply of gas to our customers. In order to mitigate this risk and continue to provide a good level of service to our customers we need to invest in a contemporary set of network operations systems (e.g. OMS, DMS, GIS). Addressing the risks associated with end-of-life systems is the reason that this program of works is being undertaken.

However, updating to more contemporary systems does also provide additional functionality, and this is an added benefit of undertaking this program. Contemporary systems will provide greater data regarding the condition, operation, and usage of the network. This will allow us to better serve our customers and ensure that our staff are supported by appropriate levels of automation to remain focused on activities that deliver the best outcomes for our customers. For instance, integration of the OMS and CIS will enable AusNet to proactively communicate planned outages to our customers.

Investment in network operations systems also contributes to our readiness for the future. The requirement to pursue decarbonisation is accelerating change in the energy sector. We need to consider and be cognisant of potential impacts to our gas network, in particular the impact of accommodating alternative forms of gas such as hydrogen. These new systems will help us ensure we are ready for this future (if it eventuates) but are necessary in any event due to the end of life of existing systems.

The Gas Distribution Management System program will refresh the systems required to continue to inform control centre analysis, provide greater insight into network operations and use of the network, and provide ongoing support to asset management and works planning.

Key areas that require investment or enhanced capabilities include:

- OMS and GIS systems that are currently at end of life and are unsupported by vendors. These systems create operational risk that should be mitigated by new systems that have vendor support.
- SCADA, network billing, meter data management (MDM), and outage communications systems to ensure they remain current, secure, and supported by vendors, to minimise operational disruption and communication with customers,
- A DMS to minimise the current manual processes and provide a single pane of glass to manage high volumes of network operations data, and increase situational awareness which will allow us to better manage customer processes
- A contemporary and simplified architecture for network operations systems (e.g., DMS, OMS, GIS) that supports the automation of processes and integration of data (e.g. network, spatial, asset and safety data)
- Integration of network operations systems with asset and customer systems to better support service and work order management, and improve customer communications
- Increased use of data and analytics to provide the situational awareness required to make more effective decisions.

In summary, investment is required to provide contemporary network operations systems to maintain existing capabilities, enabling AusNet to mitigate the operational and safety risks associated with aging systems and manual processes, continuously inform network operations through new data from operation and usage of the network, make better decisions regarding asset planning based on more timely and accurate data, and better support customer outcomes.

3.2 Program

This program seeks to reduce the operational risk posed by higher probability of failure from our ageing and out of date systems by integrating the data available to controllers, dispatchers, asset planners, and customers where relevant, and enhance the safety of our operations. Specifically, the program will:

1. Maintain and refresh network operations technologies to:

- Mitigate the operational and safety risk of end-of-life systems that are not supported
- Remove manual processes (e.g., step order management) from day-to-day network operations activities
- Provide systems and tools that enhance control centre situational awareness. This will enable customers to be notified about outages more quickly and proactively.

2. **Maintain and enhance existing network planning technologies to:**
   - Enhance operational planning capability by integrating disparate data sources
   - Utilise existing data more effectively (e.g., for pipeline flow studies)
   - Enable greater contextual decision support (e.g., GIS analytics).
   - Support the management of gas networks integrating multiple gas fuels

3. **Inform asset management and planning effort to:**
   - Target the assignment of resources for asset management activities (e.g., through use of more granular asset condition data)
   - Utilise more comprehensive network operations data to support asset strategy and planning. Informed asset investment choices can be made to ensure the pipe quality and pipeline pressures are sufficient to provide reliable gas services to customers.

4. **Ensure predictive maintenance capability to:**
   - Ensure the focus on preventive works to extend the useful life of network assets and avoid expensive replacements costs.
   - Support the coordination of resources and proactively respond to incidents.

5. **Ensure key control, operational and performance data is captured in digital form to:**
   - Improve operational efficiency and interoperability across systems
   - Mitigate the risk of tacit knowledge loss that can occur due to the dependence on specialists, workforce attrition, and paper documentation.

This program brief describes the options to modernise our network operations systems to meet ongoing regulatory obligations, mitigate operational and safety risk, and ensure we have fit for purpose systems to continue to provide an appropriate level of service to our customers. Specifically, this brief describes how contemporary network operations systems support the following aspects of our business:

- **Plan:** Planning asset maintenance, investment, and operations by applying contemporary technology to network control functions to increase the automation of operational processes and effectively manage a changing gas network. Longer term planning also assists AusNet to prepare our asset strategies to support the possibility of adopting alternative fuel sources such as hydrogen in the future.
- **Operate:** Informing day-to-day network operations decisions (e.g. monitor pipeline pressure and flow, detect gas leakage), and automating processes by leveraging data from network devices in the field. As our workforce and work practices evolve there is a need to digitise knowledge and information regarding how we work to mitigate the risk of knowledge loss and allow us to continue to operate the network safely.
- **Usage:** Supporting the provision of services to customers and customer communications through the use of contemporary meter data management, standing data management, network billing, and outage communications systems.

3.3 Objectives

The Gas Distribution Management System program focuses on providing the technology to help maintain the reliability and effectiveness of the gas distribution network, in an environment of evolving

customer preferences. Based on the focus areas described in section 3.1, the key objectives of this initiative brief are to:

- Continue to **maintain the stability, safety and reliability of the distribution network**
- Ensure we have the ability to cost effectively accommodate new regulatory obligations and rule changes that may arise in the future. This includes our ability to meet future obligations that may result from the Security Legislation Amendment (Critical Infrastructure) Bill 2020, or the Australian Energy Sector Cybersecurity Framework (AESCSF)
- Ensure **lifecycle maintenance for key systems** to reduce the risk - in particular cyber security risk - associated with end-of-life systems, and ensuring adequate vendor support to help maintain current services
- **Simplify the technology architecture** to enable a consolidated view of the network that provides the most appropriate information when it is needed, to enable better monitoring and operations
- **Reduce manual processes** (e.g. step order management) to increase the auditability
- **Enhance the use of available data to support contextual decision making** related to operations of the distribution network (e.g. flow, pressure, leakage, demand, spatial, asset data)
- **Maintain network safety** in accordance with the Gas Safety Case **by providing greater visibility of the network**
- **Improve data collection to enable more predictive asset planning and maintenance**
- **Enable enhanced network modelling** to allow us to continue to undertake **prudent and sustainable network investment**
- **Minimise growth in cost for customers** through more targeted operation of the network and asset planning
- Uplift technology capabilities to enable management of future gas networks
- Continue to **deliver valued services to our customers**.

These objectives are in line with the National Gas Rules (NGR) which is to: "promote efficient investment in, and efficient operation and use of natural gas services for the long-term interest of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas".

3.4 Risk drivers

In designing the program, we have considered how this investment can support AusNet to maintain compliance with the distribution network obligations. As customer preferences evolve, our programs must continue to improve and enhance our capabilities to ensure we remain compliant and can meet the needs of customers safely and reliably. The selected option must be aligned to the distribution network rules and enable AusNet to meet the needs of customers.

The table below outlines risk drivers for network operations and the role of technology in mitigating them.

#	Risk Driver	Details	Consequence	Likelihood	Risk Rating
D1	Meet Demand	Ability to meet or manage the expected demand for network services over the regulatory period.	Major	Likely	B

D2	Regulatory Compliance	Compliance with all applicable regulatory obligations or requirements associated with the provision of network services.	Major	Likely	B
D3	Maintain Current Performance	Maintaining current performance of supply of gas distribution network services.	Moderate	Possible	C
D4	Maintain Reliability	Maintaining the reliability, safety and security of the distribution system through the supply of gas distribution network services.	Moderate	Possible	C
D5	Maintain Price	Maintaining the price and quality of gas supply.	Moderate	Possible	B
D6	Maintain Safety	Maintaining the safety and security of assets and network operations.	Moderate	Possible	C
D7	Knowledge Loss	Mitigate the risk of knowledge loss due to workforce attrition and tacit knowledge.	Moderate	Possible	B
D8	Aging Platforms	Mitigate the risk that aging systems and a complex architecture inhibit the ability to accommodate regulatory and rule changes cost effectively.	Major	Likely	A
D9	Cyber Security	Mitigate the risk that aging systems are vulnerable to security threats which would compromise the security of the network.	Catastrophic	Possible	A
D10	Legacy Processes	Mitigate the risk that manual processes will increase the rate of errors.	Major	Almost Certain	A
D11	Future-ready	Mitigate the risk of being unable to adapt to future industry trends or customer expectations, such as supporting the delivery of alternative fuel sources.	Major	Likely	A

3.5 Customer Outcomes

Through customer research carried out by AusNet , a list of key customer values and priorities were identified. These customer outcomes are:

- Deliver on the basics – Ensure reliability of services
- Keep me posted – Keep customers informed and improve customer service

- Affordable for me – Lower costs for customers
- Adapt to the future – Sustainability and the future supply of gas
- Always safe – Make networks safer, regarding health, safety and positive environmental impacts

Additional information on these customer priorities is provided in the overarching GAAR Technology Strategy submission 2024-2028.

This program seeks to address both business and customer priorities. This program of work targets the **'affordable for me'** priority as maintaining the efficiency of network operations will help to keep gas prices lower for paying customers. The solutions being proposed are to **'deliver on the basics'** of managing and maintaining a reliable and effective distribution network. This investment also considers AusNet's ability to **'adapt to the future'** in response to anticipated changes in the fuel mix, and the subsequent impacts this may have on the complexity of management of the network. Investments in contemporary network operations technology that supports integration of data and automation of processes, will be a key enabler for AusNet's adaptability to future fuel source requirements. As the distribution network becomes more complex due to alternative fuel sources, we will need to rely on more data about our network to ensure it is operating effectively and customer outcomes are not adversely impacted. This program also underpins AusNet's ability to be **'always safe'**, securely and reliably fulfil its obligation as a Gas Distributor.

3.6 Business Drivers

Aligned with the objectives in the Gas Business Plan we have identified four key business drivers:

- Maintain current service performance
- Lead energy transformation, embracing change
- Drive effectiveness throughout the portfolio
- Generate trust and respect with customers and partners.

All expenditure programs identified and proposed by AusNet will have regard to the business drivers and can be directly linked to at least one of these initiatives.

We consider that this program of work will be most relevant to **'maintain current service performance', 'drive efficiency and effectiveness throughout the portfolio'** and **'generate trust and respect with customers and partners**.

Current service performance will be driven by refreshing the archaic network systems, maintaining safety, and securely delivering ongoing services. By informing network operations and asset management with data from across the network this program will contribute to improved effectiveness throughout the portfolio, and uplifted customer trust and respect will be achieved via enabling improved situational awareness, compliance, and outage detection. We will further explore this in each of the options.

4 Options

4.1 Overview

This section provides an overview of the investment options to address ongoing regulatory and customer requirements, considered against current limitations. The options represent different levels of capability, with associated costs and benefits.

Table 4-1 Brief overview of the options

Brief overview of each of the options	
Option 1	**BAU** – Maintain current practices to support BAU and accommodate regulatory changes where required. It consists of continuing to run the current OMS and GIS whilst making changes to these systems to comply with regulatory requirements (e.g. reset Victorian GIS boundaries from GDA94 to GDA2020). SCADA is also upgraded to maintain currency and no DMS capability will be implemented. This option will see an uptick in OPEX/FTE to support a depreciated and unsupported system. This is at risk as there is limited skillset in the market for the OMS.
Option 2	**Like for Like Replacement & Technical Uplift -** This is a tactical option to replace the current unsupported OMS, and patch and maintain the current GIS system to simplify the OMS environment. It consists of replacing the OMS with a like-for-like vendor supported application and upgrading the GIS to current versions. Integration of the replaced OMS with GIS and the CIS is required to support customer communication with respect to outages and standing data management. SCADA is also upgraded to maintain currency. This option will maintain the current relationship between systems but without the benefits of automation or a single platform solution.
Option 3 (Recommended)	**Automate DMS & Uplift OMS** - This is a strategic, longer-term option that automates core network operations activities. This option involves implementing integrated outage and distribution management functionality. The GIS is upgraded in a similar manner to Option 2 and integrated with the DMS. Integration of the OMS with the CIS is also required to support customer communication with respect to outages and standing data management. SCADA is integrated with the DMS to feed in data. Similar to Option 2, SCADA will be upgraded to maintain currency.

4.2 Option #1 Technical Uplift

Option 1 does not address the immediate need to refresh critical network operations systems (i.e. OMS, GIS, etc.), many of which are out of support and posing significant operational and safety risks.

Security patches will remain unapplied, meaning it will be difficult to avoid any potential performance, cyber security, data, stability, or quality issues, which may increase the risk of gas service disruption for customers. No new capabilities will be introduced to support network operations.

Doing the bare minimum to maintain regulatory compliance, the only initiative involved is:

- Upgrade the existing SCADA system in 2027 when it reaches end of life to ensure currency of the existing network operations system. This option does not involve SCADA integration with the OMS.

This option is therefore not recommended for the following key reasons:

- Sustains existing inefficiencies in network operations, which is cost passed on to the customer's network charges
- Does not improve safety management for field crews, as the control room staff and dispatchers would not be equipped with the situational awareness necessary to communicate safety hazards such as pipeline leakages and ruptures to staff conducting field work
- Expensive and higher risk to sustain and make ongoing changes to legacy systems, in response to future changes in regulatory requirements
- Will not have vendor support available for most core network operation systems as they continue to be end-of-life The GIS will not be upgraded, making it impossible to recalibrate land base data to the new GDA2020 standard when the current GDA94 data is no longer available. This will hinder AusNet's ability to provide accurate Dial Before You Dig (DBYD) maps and update or insert new network assets into the GIS, as both rely on access to land base data.

Alignment to objectives

This option will align with some key outcomes sought by this program of work. However, there is a lack of alignment across all outcomes sought by this program.

Table 4-2 Objectives analysis of Option 1

Objective	Outcome
Continue to **maintain the stability, safety and reliability of the distribution network**.	✗
Ensure we have the ability to cost effectively accommodate new regulatory obligations and rule changes that may arise in the future. This includes our ability to meet future obligations that may result from the Security Legislation Amendment (Critical Infrastructure) Bill 2020, or the AESCSF.	✗
Ensure **lifecycle maintenance for key systems** to reduce the risk associated with end-of-life systems and ensuring adequate vendor support to help maintain current services.	✗
Simplify the technology architecture to enable a consolidated view of the network that provides the most appropriate information when it is needed, to enable better monitoring and operations.	✗
Enhance the use of available data to support contextual decision making related to operations of the distribution network (e.g. flow, pressure, leakage, demand, spatial, asset data)**.**	✗
Reduce manual processes (e.g. step order management) to increase the auditability.	✗
Improve data collection to enable more predictive asset planning and maintenance.	✗

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Enable enhanced network modelling to allow us to continue to undertake **prudent and sustainable network investment.**	✗
Optimise the field force and resource coordination to ensure prioritised activities are managed efficiently and effectively.	✗
Maintain network safety in accordance with the Gas Safety Case **by providing greater visibility of the network.**	✗
Minimise growth in cost for customers through more targeted operation of the network and asset planning.	✗
Undertake **prudent and sustainable network investment.**	✗
Continue to **deliver valued services to our customers**.	✗

This option has **low alignment** to the program objectives.

Costs

Table 4-3 Costs of option 1

($m)	FY24	FY25	FY26	FY27	FY28	Total
Capex	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	$1.32
Opex	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	$0.48
Total program cost	**[C-I-C]**	**[C-I-C]**	**[C-I-C]**	**[C-I-C]**	**[C-I-C]**	**$1.80**

This option will see an increase in OPEX/FTE to support a deprecated and unsupported system. This is at risk as there is limited skillset in the market for the OMS. This will amount to $400,000 from the FY25.

Benefits

The key benefits of this option are that it represents the lowest capital investment, causes the least disruption to current business practices compared to the other options, and requires the least amount of organisational change management. This can be achieved by controlling expenditure through limited extensions or upgrades of existing practices. However, this option would sustain a higher cost of operations and maintenance, as making architectural changes to the point-to-point legacy systems is cumbersome and risky, and potential for errors associated with manual work will persist. The significant operational and safety risks, as well as functional limitations it places on the business' ability to operate effectively and efficiently outweigh any lower capex spend. The other primary benefit delivered by this option is the reduced risk of a SCADA cyber-attack. Updating key operational systems such as the SCADA will minimise the risk of cyber-attack by ensuring the technology is on the latest security patches and firmware.

Mitigation of key risk drivers

This option will partially mitigate one risk driver as its scope is limited compared to other options. Where we consider that a risk driver is not directly affected by the option or irrelevant, 'N/A' is applied.

Table 4-4 Risk Drivers of option 1

#	Risk Driver		Mitigation	Consequence	Likelihood	Risk Rating
D1	Meet Demand	✗	N/A	Major	Likely	B
D2	Regulatory Compliance	✓	This option will maintain the current operability of the network ensuring compliance however in a more manual, error-prone and costly manner.	Major	Unlikely	C
D3	Maintain Current Performance	✗	N/A	Moderate	Possible	C
D4	Maintain Reliability	✗	This option allows this risk driver to increase over time as it proposes to keep operating the end-of-life OMS and GIS. The lifecycle upgrade of SCADA will minimally maintain reliability.	Moderate	Almost Certain	B
D5	Maintain Price	✗	N/A	Moderate	Almost Certain	B
D6	Maintain Safety	✗	N/A	Moderate	Almost Certain	B
D7	Knowledge Loss	✗	N/A	Moderate	Possible	C
D8	Aging Platforms	✗	This option minimally reduces this risk driver as it only proposes product lifecycle upgrades to the SCADA. It also does not address the capability gaps in distribution management.	Moderate	Likely	B
D9	Cyber Security	✗	This scope of work only includes lifecycle upgrade of SCADA leaving other end-of-life systems vulnerable to cyber attacks	Catastrophic	Likely	A
D10	Legacy Processes	✗	N/A	Major	Almost Certain	A

This option has **low alignment** to mitigating key risk drivers.

Risks

There are several risks associated with the implementation of this option, as highlighted in the table below. Based on the consequence and likelihood of each risk, we have rated each of the individual

risks blue, green, yellow, orange or red (order of severity). See Attachment 1 – Risk level matrix for additional information on this rating system.

Table 4-5 Risks of option 1

ID	Risks	Consequence	Likelihood	Risk rating
R1.1	Key people availability for subject matter expertise in delivering this option.	Moderate	Rare	D
R1.2	Product vendor commitment and resource availability.	Major	Rare	C
R1.3	Reduced or loss of employee productivity and business functions.	Moderate	Rare	E
R1.4	Risks associated with solution design, implementation, budgeting, planning, integration, future maintenance, refreshes and support.	Moderate	Rare	E

This option has a **low risk** rating.

Alignment to customer related drivers of expenditure

As discussed in Section 3.5 five key customer outcomes have been identified through discussions with customers. The table below highlights how this option will achieve these outcomes. Where we consider that a customer outcome is not directly achievable by the option or irrelevant, 'N/A' is applied.

Table 4-6 Customer related drivers of option 1

Customer outcome	How this program achieves this
Deliver on the basics	AusNet will be able to partially 'deliver on the basics' however manual processes in place today will be retained and this could impact customer outcomes. Retaining old systems which are core to the provision of gas services risks AusNet 's ability to deliver basic services, as they may fail at any point.
Keep me posted	N/A – Doesn't achieve desired outcomes.
Affordable for me	N/A – Doesn't achieve desired outcomes.
Adapt to the future	N/A – Doesn't achieve desired outcomes.
Always safe	N/A – Doesn't achieve desired outcomes.

This option has **low alignment** to the customer drivers.

Alignment to business related drivers of expenditure

As discussed in Section 3.6, AusNet is focusing on four business drivers over the next regulatory period. The table below highlights how this option will input into the initiatives where relevant. Where we consider that a business driver is not directly relevant to the option, 'N/A' is applied.

Table 4-7 Business related drivers of option 1

Distribution business drivers	How this program achieves this
Maintain current service performance	This option will maintain the current service performance but risk potential system failure and network safety in the future, given the OMS and GIS are complex, old and no longer supported by the vendor.
Lead energy transformation, embracing change	N/A – Doesn't achieve desired outcomes.
Drive effectiveness throughout the portfolio	N/A – Doesn't achieve desired outcomes.
Generate trust and respect with customers and partners	N/A – Doesn't achieve desired outcomes.

This option has **low alignment** to business drivers

4.3 Option #2 Technical Uplift

Option 2 is primarily an on-premise solution that addresses the immediate need to refresh critical network operations systems, many of which are out of support. This option does not look to introduce any new capabilities to enable more informed decision making.

This option is focused on the need to ensure currency of existing network operations systems (OMS, GIS, SCADA) as well as ensuring the availability of vendor support and critical patches to avoid any potential performance, data, stability or quality issues, which could increase the risk of gas service disruption for customers. This option does not include automation of distribution management processes or greater integration of systems and data to provide enriched data sets to end users (e.g. controllers, dispatchers, asset planners).

This option aims to solve the challenges posed by end-of-life OMS, GIS and SCADA systems through the following scope:

- Detailed requirements gathering and vendor due diligence to determine the appropriate OMS vendor.
- **Replace** the existing OMS, with the vendor's equivalent offering, or a comparable product from another vendor
- **Upgrade** the existing Gas GIS to the current version
- **Decommission** the current OMS, asset management and geospatial database, and spatial analytics system, and archive data.
- **Upgrade** the existing SCADA system in 2027 when it reaches end of life. This option does not involve SCADA integration with the OMS.
- **Upgrade** the solution currently used for standing data management.
- **Integrate** the new OMS with the future state Customer Information System to support outage communications.
- **Retain** DMS (pipeline management) as a manual process, and Geospatial Server (GSS) to continue supporting DBYD (Dial Before You Dig) web requests.
- **Upgrade** database and server firmware to support product lifecycle upgrades.

Additionally, the timing of migration and decommissioning activities must consider integration with the future CIS to support customer management activities and outage communications, as today the OMS supports customer management.

Specifically, this option consists of the following initiatives:

- **OMS Replacement & Migration** – implementation of a new OMS, archiving of historical OMS data, and decommissioning of the current OMS platform including asset management and geospatial database, and spatial analytics system, and the current GIS. Integration of the new OMS with the new standing data management solution, and outage communications system. Configuration of the OMS to send outage notifications to the outage communications system.
- **GIS Refresh** – refresh of the existing GIS application including DB and OS upgrades to bring the system to the current version. Currently GIS cannot be refreshed until OMS is refreshed due to a hard dependency between the two systems.
- **SCADA Refresh** – lifecycle refresh of the SCADA platform when it reaches end of life in 2027, including DB and OS upgrades. (This option does not include SCADA and OMS integration).

This option is not recommended due to the ongoing manual work required for distribution / pipeline management, and the fact that it does not simplify the existing, complicated architecture of core network operations systems. Specifically, this option is not recommended due to:

- Higher future cost of implementation / migrations in current and future regulatory periods to integrate and operate disparate network operations and management systems.
- Misalignment with AusNet's strategic technology direction.
- No improved capability for staff to maintain a good level of service to customers, given manual work currently required to bring data together from different systems to inform network activities and customer communications.
- Difficulty in continuing to meet shifting customer expectations and AusNet's obligations under the National Gas Rules.
- The partial investment begins the capability uplift required to manage future gas networks

Alignment to objectives

This option will align with some key outcomes sought by this program of work. However, there is a lack of alignment across all outcomes sought by this program.

Table 4-8 Objectives analysis of Option 2

Objective	Outcome
Continue to **maintain the stability, safety and reliability of the distribution network**.	✓
Ensure we have the ability to cost effectively accommodate new regulatory obligations and rule changes that may arise in the future. This includes our ability to meet future obligations that may result from the Security Legislation Amendment (Critical Infrastructure) Bill 2020, or the AESCSF.	✗
Ensure **lifecycle maintenance for key systems** to reduce the risk associated with end-of-life systems and ensuring adequate vendor support to help maintain current services.	✓

Simplify the technology architecture to enable a consolidated view of the network that provides the most appropriate information when it is needed, to enable better monitoring and operations.	✗
Enhance the use of available data to support contextual decision making related to operations of the distribution network (e.g. flow, pressure, leakage, demand, spatial, asset data)**.**	✗
Reduce manual processes (e.g. step order management) to increase the auditability.	✗
Improve data collection to enable more predictive asset planning and maintenance.	✗
Enable enhanced network modelling to allow us to continue to undertake **prudent and sustainable network investment.**	✗
Optimise the field force and resource coordination to ensure prioritised activities are managed efficiently and effectively.	✗
Maintain network safety in accordance with the Gas Safety Case **by providing greater visibility of the network.**	✓
Minimise growth in cost for customers through more targeted operation of the network and asset planning.	✗
Undertake **prudent and sustainable network investment.**	✓
Continue to **deliver valued services to our customers**.	✓

This option has **low alignment** to the program objectives.

Costs

Table 4-9 Costs of option 2

($m)	FY24	FY25	FY26	FY27	FY28	Total
Capex	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	**$9.79**
Opex	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	**$3.45**
Total program cost	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	**$13.24**

This option also includes an annual $200,000 opex step change to manage the solution on cloud.

Benefits

The key benefit of this option is that it represents a relatively low capital investment requirement, causes less disruption to current business practices compared to the other options, and requires less organisational change management than Option 3. However, these are short sighted benefits given that in the long term the higher cost of manual distribution management (e.g., step order management), and the potential for errors associated with manual work, will persist. Furthermore, it is expected that sustaining a more complicated systems architecture for network operations will be more costly in the long term particularly when changes are required to accommodate new regulatory requirements and rule changes. With little improvement to the integration of core network operations systems and the lack of a DMS, this option does not support staff (e.g. dispatchers, controllers) in accessing consolidated data sets to better inform decision making.

The primary benefits delivered by this option are:

- **Reduced risk of OMS and GIS failure** - Refreshing technology systems will maintain current operating capabilities, ensure full vendor support of network operations systems, and reduce the risk of system failure. Current systems are more likely to avoid total failure which may require significant human resource effort while systems are restored.
- **Reduced risk of SCADA cyber-attack** - Updating operational systems such as SCADA will minimise the risk of cyber-attack by ensuring the technology is on the latest security patches and firmware.

Mitigation of key risk drivers

This option will partially mitigate some risk drivers, however, as its scope is limited compared to other options, not all risks will be mitigated. Where we consider that a risk driver is not directly affected by the option or irrelevant, 'N/A' is applied.

Table 4-10 Risk Drivers of option 2

#	Risk Driver		Mitigation	Consequence	Likelihood	Risk Rating
D1	Meet Demand	✗	N/A	Major	Likely	B
D2	Regulatory Compliance	✓	This option will maintain the current operability of the network ensuring compliance however in a more costly manner.	Major	Unlikely	C
D3	Maintain Current Performance	✗	N/A	Moderate	Possible	C
D4	Maintain Reliability	✓	This option partially mitigates this risk driver through the upgrades of OMS, GIS, SCADA, and will minimally maintain reliability.	Moderate	Unlikely	D
D5	Maintain Price	✗	N/A	Moderate	Almost Certain	B
D6	Maintain Safety	✗	N/A	Moderate	Almost Certain	B
D7	Knowledge Loss	✗	N/A	Moderate	Possible	B
D8	Aging Platforms	✓	This option mitigates this risk driver as product lifecycle upgrades to key systems (e.g. OMS, GIS, SCADA) will reduce this risk. However, it does not address the capability gaps in distribution management.	Moderate	Likely	B

D9	Cyber Security	✓	This scope of work includes lifecycle upgrades of OMS, GIS, SCADA, to strengthen vulnerabilities in key systems used for network operations.	Catastrophic	Unlikely	B
D10	Legacy Processes	✗	N/A	Major	Almost Certain	A
D11	Future-ready	✗	N/A	Major	Likely	A

This option has **moderate alignment** to mitigating key risk drivers.

Risks

There are several risks associated with the implementation of this option, as highlighted in the table below. Based on the consequence and likelihood of each risk, we have rated each of the individual risks blue, green, yellow, orange or red (order of severity). See Attachment 1 – Risk level matrix for additional information on this rating system.

Table 4-11 Risks of option 2

ID	Risks	Consequence	Likelihood	Risk rating
R1.1	Key people availability for subject matter expertise in delivering this option.	Moderate	Likely	B
R1.2	Product vendor commitment and resource availability.	Major	Unlikely	C
R1.3	Reduced or loss of employee productivity and business functions.	Moderate	Unlikely	E
R1.4	Risks associated with solution design, implementation, budgeting, planning, integration, future maintenance, refreshes and support.	Moderate	Unlikely	E

This option has a **low-risk** rating.

Alignment to customer related drivers of expenditure

As discussed in Section 3.5 five key customer outcomes have been identified through discussions with customers. The table below highlights how this option will achieve these outcomes. Where we consider that a customer outcome is not directly achievable by the option or irrelevant, 'N/A' is applied.

Table 4-12 Customer related drivers of option 2

Customer outcome	How this program achieves this
Deliver on the basics	AusNet will be able to partially 'deliver on the basics' however manual processes in place today will be retained and this could impact customer outcomes.
Keep me posted	N/A
Affordable for me	N/A
Adapt to the future	N/A
Always safe	N/A

This option has **low alignment** to the customer drivers.

Alignment to business related drivers of expenditure

As discussed in Section 3.6, AusNet is focusing on four business drivers over the next regulatory period. The table below highlights how this option will input into the initiatives where relevant. Where we consider that a business driver is not directly relevant to the option, 'N/A' is applied.

Table 4-13 Business related drivers of option 2

Distribution business drivers	How this program achieves this
Maintain current service performance	This option will maintain the current service performance by ensuring systems currency and increase network safety by reducing the risk of system failure.
Lead energy transformation, embracing change	N/A – maintain current capabilities.
Drive effectiveness throughout the portfolio	This option proposes prudent investment to mitigate significant operational risks.
Generate trust and respect with customers and partners	N/A – maintain current level of services to customers.

This option has **moderate alignment** to business drivers

4.4 Option #3 Lifecycle and Strategic Integration (Recommended Option)

Option 3 is a strategic option that will modernise the core network operations involving the implementation of a standalone Gas Distribution Management System (GDMS) solution and integrations to adjacent systems. This is in addition to the lifecycle refresh of GIS and SCADA as proposed in Option 2, except for minor nuances detailed below.

Safety and operational risk are the key challenges being addressed by this option. The current OMS and GIS, and lack of a DMS, present operational risk related to the provision of sufficient information about flow, pressure, leakage, demand, incidents, and potential outages in a timely manner. This also creates risk for life support and other vulnerable customers. Furthermore, there is incomplete information or significant manual work required to consolidate available data to support pipeline flow studies and line pack estimates.

This option has been designed to modernise the core of network operations whilst maintaining our ability to operate the network. This will support better decision making and result in an improved ability to maintain network reliability and performance to deliver better customer outcomes.

This option seeks to achieve this through the following scope of work:

- **Detailed requirements gathering** and vendor due diligence to determine the appropriate GDMS vendor.
- **Implement** a solution that will enable automated DMS capabilities and modernise the OMS capability, replacing the current legacy OMS completely
- **Upgrade** the GIS and integrate with the DMS solution
- **Upgrade** the current version of SCADA in 2027 when it reaches end of life. This option involves integrating SCADA with the GDMS via an ICCP link to converge data
- **Integrate** the GDMS with the new GIS, and the OMS (component of GDMS) with the new CIS to support outage communications and standing data management functions
- **Decommission** the existing OMS, GIS application (database and OS), asset management and geospatial database, and spatial analytics system, and archive data
- **Retain** the GSS to continue supporting DBYD web requests
- **Upgrade** database and server firmware to support product lifecycle upgrades.
- **Implement** streaming Realtime data from the GDMS solution to the core Data and Analytics environment

Specifically, this option consists of the following initiatives:

- **Implementation & Integration** – implementation of a contemporary system solution that will provide DMS and OMS capabilities on a single platform. Integration of the solution with a upgraded GIS and the new CIS to perform outage communications and standing data management. Decommissioning of the current OMS and asset management repository and geospatial database.
- **GIS Refresh** – refresh of the existing GIS application including database and OS upgrades to bring the system to the current version. Currently GIS cannot be refreshed until OMS is refreshed due to a hard dependency between the two systems. This will enable us to reconfigure the Geospatial Server which manages web requests for DBYD.
- **SCADA Refresh & Integration** – lifecycle refresh of the SCADA platform when it reaches end of life in 2027, including database and OS upgrades. This will include the integration of SCADA with the GDMS via an ICCP link.

This option delivers a range of benefits to AusNet through a balanced approach. Similar to option 2, it addresses the operational risk posed by end-of-life OMS and GIS systems, and ensures SCADA remains current throughout the next regulatory period. However, importantly this option also addresses the limitations of manual distribution management that occurs today, through the implementation of a solution that will automate tasks such as step order management, and heat zone calculations. This automation provides controllers, dispatchers and other control centre staff with a richer data set e.g., pressure at more intervals along the pipeline. It also allows them to focus on more complex problem solving as they reduce the amount of manual work they currently undertake.

Another key benefit of this option is that the DMS and the OMS are enabled by a single platform, thereby simplifying the systems architecture, and minimising the integration required between the two systems. Furthermore, the integration of SCADA via an ICCP link is a cost-effective manner to avoid the need for manual extraction and consolidation of SCADA data with DMS and OMS capabilities. This will result in providing a more readily available and integrated view of network operations. In turn, this will support better decision making, increased safety, and improved customer outcomes.

This option has a dependency with the CIS brief. The DMS solution (and its OMS component) will be integrated with the new CIS to support outage communications and standing data management functions. This assumes that outage communications and standing data management functionality is provided by the new CIS as recommended in the CIS brief.

Alignment to objectives

This option will align with key outcomes sought by this program of work.

Table 4-6 Objectives analysis of Option 3

Objective	Outcome
Continue to **maintain the stability, safety and reliability of the distribution network**	✓
Ensure we have the ability to cost effectively accommodate new regulatory obligations and rule changes that may arise in the future. This includes our ability to meet future obligations that may result from the Security Legislation Amendment (Critical Infrastructure) Bill 2020, or the AESCSF	✓
Ensure **Lifecycle maintenance for key systems** to reduce the risk associated with end-of-life systems, and ensuring adequate vendor support to help maintain current services	✓
Simplify the technology architecture to enable a consolidated view of the network that provides the most appropriate information when it is needed, to enable better monitoring and operations	✓
Enhance the use of available data to support contextual decision making related to operations of the distribution network (e.g. flow, pressure, leakage, demand, spatial, asset data)	✓
Reduce manual processes (e.g. step order management) to increase the auditability	✓
Improve data collection to enable more predictive asset planning and maintenance	✓
Enable enhanced network modelling to allow us to continue to undertake **prudent and sustainable network investment**	✓
Optimising the field force and resource coordination to ensure prioritised activities are managed efficiently and effectively	✓
Maintain network safety in accordance with the Gas Safety Case **by providing greater visibility of the network**	✓
Minimise growth in cost for customers through more targeted operation of the network and asset planning	✓
Undertake **prudent and sustainable network investment**	✓
Continue to **deliver valued services to our customers**.	✓

This option has **high alignment** to the objectives.

Costs

Table 4-7 Costs of Option 3

($m)	FY24	FY25	FY26	FY27	FY28	Total
Capex	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	$13.43
Opex	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	$4.56
Total program cost	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	**$17.99**

We would expect an opex increase of $300,000 per annum from FY2025 for maintenance and support of the reconfigured Geospatial Server for the new GIS.

Benefits

This option will deliver the following benefits in addition to the benefits defined in Option 2:

- **More informed asset management and network planning** – more substantial network operations data sets to support network analysis and planning studies to better guide asset investment, to ensure consistent and reliable gas supply for customers
- **Improved works planning and coordination** – enhanced data for DBYD, improved visibility of outages and maintenance requirements so maintenance work can be planned and coordinated more efficiently and avoid unnecessary customer impacts.
- **Improved customer communications** – improvements to the customer experience in relation to planned outage notifications.
- **Reduction in cancelled maintenance works** – more efficient planning of operational processes drives a reduction in cancelled or rescheduled maintenance works, enabling field workers to fix pipeline and network asset faults promptly to sustain continuity of quality gas supply to customers. Further benefit may be recognised in future cost avoidance by mitigating unnecessary dispatchment of maintenance crews.
- **Better provision of key network status and quality information** – inform AEMO's decisions to manage supply and demand and for AusNet to comply with regulatory reporting requirements.
- **Enable digitalisation of key processes and information** – minimise double handling and key person dependencies, while increasing the accuracy and quality of process outcomes.
- **Improved ability to adapt to future regulatory requirements** – improve readiness to comply with future security obligations and integrate alternative energy sources into the network, when required.

Mitigation of key risk drivers

#	Risk Driver		Mitigation	Consequence	Likelihood	Risk Rating
D1	Meet Demand	✓	This option will bring in new capability to better meet the demand through improved insights and forecasting.	Major	Unlikely	C
D2	Regulatory Compliance	✓	This option will improve on the current operability of the network through analytics ensuring enhanced compliance	Moderate	Unlikely	D
D3	Maintain Current Performance	✓	This option will uplift performance through the use on analytics, forecasting, and easier operating interfaces.	Moderate	Unlikely	D
D4	Maintain Reliability	✓	This option will bring in greater reliability using analytics and forecasting demand.	Moderate	Unlikely	D
D5	Maintain Price	✓	This option will enable better planning of the network and outages and reduce the constraints imposed when taking outages on the network.	Moderate	Possible	C

D6	Maintain Safety	✓	This option mitigates this risk driver through improving visibility and contextual awareness of the network to inform safer decision making in the control centre and in the field.	Moderate	Unlikely	D
D7	Knowledge Loss	✓	This will reduce this risk through the introduction of systems, rules and documented insights and rely less on people's informal knowledge.	Moderate	Possible	C
D8	Aging Platforms	✓	This option mitigates this risk driver by moving off obsolete systems (e.g. OMS, GIS).	Moderate	Unlikely	D
D9	Cyber Security	✓	This option mitigates this risk driver by moving off obsolete systems (e.g. OMS, GIS).	Catastrophic	Unlikely	B
D10	Legacy Processes	✓	This will reduce the paper-based process within the control centre where more capability will be exposed through front end interfaces. This will not address all legacy processes present in field activities (Refer to Workforce Collaboration brief).	Moderate	Possible	C
D11	Future-ready	✓	This option mitigates this risk driver by moving off obsolete systems (e.g. OMS, GIS) and adopting an enhanced DMS, which is a contemporary, platform-based technology that will have a well-supported vendor roadmap to accommodate future gas industry trends, given the right due diligence to select the appropriate vendor.	Major	Unlikely	C

This option has **high alignment** to mitigate risk drivers

Risks

There are risks associated with implementation of this option, as highlighted in the table below. Based on the consequence and likelihood of each risk, we have rated each of the individual risks blue, green, yellow, orange or red (order of severity). See Attachment 1 – Risk level matrix for additional information on this rating system.

Table 4-8 Risks of Option 3

ID	Risks	Consequence	Likelihood	Risk rating
R1.1	Key people availability for subject matter expertise in delivering this option	Moderate	Likely	B
R1.2	Product vendor commitment and resource availability	Major	Unlikely	C
R1.3	Product availability and ability to easily integrate with existing IT platform	Major	Likely	B
R1.4	Complexity in delivering change management for such a complex platform modernisation	Major	Likely	B

As we have identified moderate risks, we consider that overall, this option is rated **moderate**.

Alignment to customer related drivers of expenditure

As discussed in Section 3.5 five key customer outcomes have been identified through discussions with customers. The table below highlights how this option will achieve these outcomes. Where we consider that a customer outcome is not directly achievable by the option or irrelevant, 'N/A' is applied.

Table 4-9 Customer related drivers of Option 3

Customer outcome	How this program achieves this
Deliver on the basics	This option allows AusNet to carry out network operations more effectively and ensure reliable gas supply to our customers. Customers will experience a more satisfactory customer experience consistent with their expectations. For example, this option enables better managed asset planning and maintenance to allow for more targeted spending, as well as quicker responses to incidents and network disruptions.
Keep me posted	This option allows for better network, asset and outage information management that will help support more transparent and efficient outage communications for affected customers. Experience of vulnerable customers will be improved through understanding their location relative to potential outages and incidents, providing intelligence to AusNet to take direct and specific action for these customers where possible.
Affordable for me	By improving the effectiveness of various network operations processes this will help minimise any potential for growth in costs.
Adapt to the future	By establishing an integrated DMS and OMS platform, uplifting essential capabilities such as standing data management and outage

	communications, AusNet is also making a long-term investment that can adapt more readily to changing regulatory requirements or evolving customer needs.
Always safe	Enhanced network intelligence enables greater situational awareness and informed decisions to be made for safer outcomes, across all network operations and management functions, including customer management, the control centre, the field, and the network planners.

This option has **high alignment** to the customer drivers

Alignment to business related drivers of expenditure

As discussed in Section 3.6, there are four business drivers that AusNet has identified and is focussing on over the next regulatory period. The table below highlights how this option aligns with the drivers. Where we consider that a business driver is not directly relevant to the option, 'N/A' is applied.

Table 4-10 Business related drivers of Option 3

Distribution business drivers	How this program achieves this
Maintain current service performance	● Upgrades to key systems to address evolving cybersecurity threats ● Contextual awareness for safer network operations due to an integrated platform solution providing line of sight information ● Enable enforced pipeline pressure checks ● Build safety logic into contemporary DMS solution, including leak and rupture detection before dispatching crews for maintenance work
Lead energy transformation, embracing change	● Enhanced data to support decision making and optimise network management ● Improved knowledge management through improved systematisation of processes
Drive effectiveness throughout the portfolio	● Modernise legacy core network operations technology to lay the foundations for future investments
Generate trust and respect with customers and partners	● Support the ability to inform customers about outages on the gas network proactively

This option has **high alignment** to the business drivers.

5 Assessment and recommended option

5.1 Assessment of the options

To identify a recommended option for this program of work, we have selected several criteria to assess each of the options. We consider that these criteria represent a comprehensive view of each option, in achieving AusNet's objectives as well as requirements of the AER in ensuring that expenditure is both prudent and efficient.

The table below summarises our assessment of each of the options against the criteria.

Table 5-1 Summary table of the assessment of the options

	Option 1	Option 2 (Preferred)	Option 3
Alignment to objectives	Low alignment	Low alignment	High alignment
Costs	$1.80M	$13.24M	$17.99M
Alignment to risk drivers	Low alignment	Moderate alignment	High alignment
Overall risk rating	Low risk	Low risk	Moderate risk
Alignment to customer related drivers of expenditure	Low alignment	Low alignment	High alignment
Alignment to business related drivers of expenditure	Low alignment	Moderate alignment	High alignment

5.2 Benefits of new capability

The AER - Guidance Note - Non-network ICT capex assessment approach for electricity distributors (28 November 2019) requires that for non-recurrent expenditures that deliver "*New or expanded ICT capability, functions and services*" justification must be made through demonstrating that benefits exceed costs (a positive NPV).

For this program, Option 1 delivers a refresh of current capability and mitigates risk and is therefore deemed recurrent. Option 2 includes 40% non-recurrent expenditures related to new capabilities, while Option 3 include 53% of non-recurrent expenditures.

Table 5 -2 below shows the NPV for the three options.

Table 5-2 NPV analysis of new capability-related expenditure ($2021m)

	Costs (PV)	Benefit (PV)	Net benefit (NPV)
Option 1	$ 1.60	$ 0.00	-$ 1.60
Option 2	$ 4.93	$ 6.11	$ 1.18
Option 3 (recommended)	$ 8.52	$ 10.89	$ 2.37

We have identified four benefit categories for this program in our NPV analysis:

- Cost avoidance benefits associated with reducing head-count growth, reducing manual tasks, and reducing contact centre workload from higher call volumes due to unplanned outages or work program / scheduling changes.
- Operational benefits associated with increased visibility of network operations, and richer data sets, that will support more effective tactical and strategic decision making e.g. from field crew permits, to pipeline management, and asset investment decisions.
- Safety benefits associated with greater information on network condition including leaks, pressure and ruptures, that minimise the potential for customer complaints, and injuries to field crews.

Option 1 involves the minimum level of spend across the Program Scope items. Option 1 will allow for regulatory changes to be accommodated. This option is considered recurrent as the benefits of this program relate to maintaining currency of existing systems, although in a limited way.

The first benefit category relates primarily to the outcomes that can be realised through increased automation of workloads such as core distribution management tasks, and minimising growth in workloads such as inbound contact centre calls. Through the implementation of up-to-date systems that are integrated and consistent with a simplified architecture, tasks such as step order management, heat zone calculations, and some work order creation based on alarms, can be automated. This minimises the time required for staff to gain the information they need to support decision making, and in some cases forgoes the need for human intervention to make decisions (e.g. automated alarms and the creation of associated work orders).

Cost avoidance is also expected from a reduced number of contact centre calls due to decreased planned outages, as the network is managed in a more granular manner with fewer, more targeted outages. The reduced risk of outages of key systems that are critical for network operations (e.g. GIS, OMS) also avoids incurring costs associated with system remediation and restoration, and the manual work required until systems are restored (e.g. manning telemetry stations).

The second benefit category relates primarily to Options 2 and 3 where distribution management is automated, and there is greater integration of data and processes across geospatial and telemetry information with core network operations data such as pressure, flow, leaks, incidents and events. With much richer data on the operation of the network at every point along the pipeline and an ability to automate tasks (e.g. measurements) using this data, benefits arise from improved gas pipeline management and improved effectiveness of network operations due to higher situational awareness. Benefits also arise from improved asset management investment decisions that are based on more comprehensive data sets. Specific benefits associated with these options include:

- Improved network operations effectiveness from greater automation e.g. automated work order creation in response to network alarms raised by the integrated DMS platform (e.g. high / low pressure alarms), automated heat zone value calculations.
- More informed asset management and works planning, using more substantial network operations data to support network analysis and planning studies (e.g. pipeline flow studies, line pack estimates) to guide investment
- Targeted asset planning and replacement decisions with a more risk-based asset management approach that is enabled by improved asset data capabilities (e.g. capture, storage and analysis of data). This will improve asset performance, decrease failure rates, and minimise planned and unplanned costs.
- Better support for the deployment of field crews in a timelier manner to respond to leaks, based on improved network condition data. This will lead to a reduction in costs associated with UAFG

- Better support for customer management through the provision of integrated asset, network operations and geospatial data that can be integrated with the new CIS, allowing asset managers, network planners and contact centre staff to be more informed about the customer implications of decisions
- Improved ability to accommodate future regulatory requirements, including greater readiness to comply with future security obligations
- Better ability to comply with Australian Gas Association (AGA) standardised calculations by automating the measurement of gas composition.

The third benefit category relates to increased safety resulting from greater pipeline and network status data that is available to the control room. Increased visibility of the network allows control room staff to communicate with dispatchers and field crews more effectively and reduces the potential for customer complaints and personal injuries to maintenance crews through more informed regulation of pipeline flow and pressure, and earlier detection of leaks and ruptures. Additionally, through the improved mapping of gas services to geospatial data, the effectiveness of the DBYD tool will increase.

The benefits have been calculated based on labour and days required to conduct manual activities, inefficiencies in asset management, network planning and field activities, and compliance and regulatory related penalties. Given that Option 3 has the highest NPV, or in other words creates the most value to customers, it is the recommended option.

5.3 Recommended option

Based on this assessment, Option 3 is the recommended option as it achieves the majority of the intended outcomes for the program at lower cost. This option not only reflects the most prudent level of expenditure to deliver the outcomes sought it also limits the scope to reduce the delivery risk of the program over the GAAR period. It increases the currency of key network operations systems while introducing new capabilities to uplift network operations, reduce manual work, and increase the availability of data to support short- and long-term decisions regarding gas assets and network operations.

6 Attachment 1 – Risk level matrix

The figure below shows the risk level matrix to which we have assessed each of risks within the options. Risks of highest concern are rated red, whereas those of lowest concern are rated blue.

Figure 6-1

Likelihood	Consequence 1	2	3	4	5
Almost Certain	C	C	B	A	A
Likely	D	C	B	B	A
Possible	E	D	C	B	A
Unlikely	E	D	D	C	B
Rare	E	E	D	C	C

Consequence Rating	
5	Catastrophic
4	Major
3	Moderate
2	Minor
1	Insignificant

Overall Risk Rating	
A	Extreme
B	High
C	Medium
D	Low
E	Very Low