

Technology program

Outage Management

PUBLIC

Program Brief

Table of Contents

1	Document Background	3
1.1	Purpose of this document	3
1.2	References	3
1.3	Document History	3
1.4	Approvals	3
2	Executive summary	4
2.1	Program summary	4
3	Context.....	9
3.1	Background	9
3.2	Current limitations.....	11
3.3	Objective(s).....	11
3.4	Customer outcomes	12
3.5	Business drivers	12
4	Options	13
4.1	Overview	13
4.2	Option #1 Data Quality Improvement.....	13
4.3	Option #2 Extend Process Automation (RECOMMENDED).....	16
4.4	[C-I-C].....	21
5	Assessment and recommended option	25
5.1	Assessment of the options.....	25
5.2	Recommended option.....	26
6	Attachment 1 – Risk level matrix.....	29

Program Brief

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 Services' Technology EDPR submission.

1.2 References

Document	Version	Author
AusNet Services FY19-FY23 Technology Plan	V1.00	AusNet Services

1.3 Document History

Date	Version	Comment	Person
	V0.1	Initial document	Greta Kaehne
	V1.0	Released for 1 st Review	Greta Kaehne
12/09/2018	V2.0	2 nd Cut Final Issue	Greta Kaehne
19/03/2019	V2.1	Consistency workshop	John Hancock, David Jilla, Samantha Scanlon, Janine Perri
29/03/2019	V2.2	Consistency edits	Janine Perri
15/04/2019	V2.3	Minor edits	Janine Perri
24/07/2019	V3.0	Cost and narrative updates, NPV	Emily Pong, Jackson Shen
15/08/2019	V3.1	Post AN review	Emily Pong
29/10/2019	V4.0	Draft issued to Regulation team for review	Samantha Scanlon
19/11/2019	V4.1	Incorporated feedback comments	Samantha Scanlon

1.4 Approvals

Position	Date
Technology Leadership Team	

Program Brief

2 Executive summary

2.1 Program summary

The table below provides a summary of the program discussed in this brief. Additional information is provided following the table and throughout the brief.

Program Brief

Table 2-1 Summary table

Key objective(s) of the program		To reduce the impact of planned outages on customers to a minimal level, by using advanced analytics and automation across the workflow to improve process efficiency for planned works.		
Key benefits to customers		<ul style="list-style-type: none"> • Ability to accurately inform customers as to works affecting their area in line with the distribution code obligations, and be able to provide status and estimated completion times • Improved data quality which accurately links a customer's location to network substations, improving customer service • Reduced impact of planned outages, in terms of inconveniencing customers and minimising effort for employees • Enhanced streamlined processes for planned outage management, creating efficiency benefits through automation of previously manual processes, and data modelling enabling informed decision making 		
Cost allocation	Electricity Distribution	100%	Electricity Transmission	0%
	Gas Distribution	0%		
Program type	Recurrent			<input type="checkbox"/>
	Non-Recurrent			<input checked="" type="checkbox"/>
	Client Devices			<input type="checkbox"/>
Program timings	Program duration:	5 years		
Expenditure forecast	[C-I-C]			
Estimated life of system	N/A as the first stage of this program is to identify whether the business outcome can be achieved using existing systems.			
Customer Engagement	<p>As the first DNSP in Australia to trial the New Reg process, we held deep dive workshops with stakeholders, including the Customer Panel, on ICT. In that engagement we described the importance and need for ICT expenditure to meet our customers' evolving needs and to support compliance with regulatory and legal obligations. Material associated with all our deep-dives is available on AusNet Services' website.</p> <p>A key theme of our engagement with the Customer Forum was the need for us to provide clarity on what we were proposing and what the expected customer benefits were. We acknowledge this feedback and have taken it into consideration when proposing the most appropriate option for this business case.</p>			

Program Brief

The distribution network is undergoing significant change driven by increasing customer expectations, and the evolution of the grid to encompass distributed energy. With the technological advancements in monitoring and information dissemination, and ever-increasing use of smart phone and online communications in all customer service industries, electricity customers are expecting more of their service providers – such as current, accurate information about changes to the services that impact them. This is particularly important for AusNet Services’ outage management processes.

Accurate data and streamlined processes underpin AusNet Services’ ability to adapt in a changing environment. From an asset perspective, it is increasingly important for AusNet Services to understand how the network is being utilised in a distributed energy environment to reduce potential negative impacts on the grid. DER is beneficial when accurate measurement of load and consumption can be monitored, however an oversupply of energy generation can affect safety and reliability of the network. As such, monitoring and planning is crucial for utilities. Specifically, when generation exceeds the grid’s hosting capacity, the transmission system becomes overburdened, and a system operator may limit any further incoming power from distributed generators.

The Electricity Distribution Code mandates customer notification obligations, and customers expect timely outage notification standards to be upheld. Further to that, being able to provide the status of works and estimated time to restore power enables customers to plan accordingly and reduces customers’ opportunity cost of the loss of supply.

In the current period, emphasis has been placed on consolidating data sources and establishing a baseline visual of the network at low voltage level. Accurate static visuals of the low voltage network underpin AusNet Services’ ability to perform meaningful and timely analysis and predictions, informing planned network related works. Siloed tactical initiatives to create efficiencies in the short term have led to a proliferation of workarounds that keep day-to-day operations functioning. To consolidate these solutions, a strategic approach is required in the FY2022-26 regulatory period, as previous investments have focussed on tactical solutions to solve the immediate needs of different business functions.

For the FY2022-26 regulatory period, a number of automation solutions will be considered including; automation through updated applications/systems, robotics process automation (RPA) and cognitive automation. An enterprise Robotics Process Automation (RPA) platform will have the capability to mimic the actions of a human user, to interact with AusNet Services’ existing systems. That is, the RPA platform will be able to improve AusNet Services’ operational efficiency and allow AusNet Services to deliver more effective and efficient services to customers.

The workflows discussed in this brief will build on foundational automation projects underway in CY2016-20 for network access planning. This will involve detailed process opportunity analysis to determine the most cost-effective tool for automation. The FY2022-26 program of work covers the technology costs required to deliver an efficient planned outage management process and to improve the capability of the workflow including:

- | |
|---------|
| [C-I-C] |
|---------|

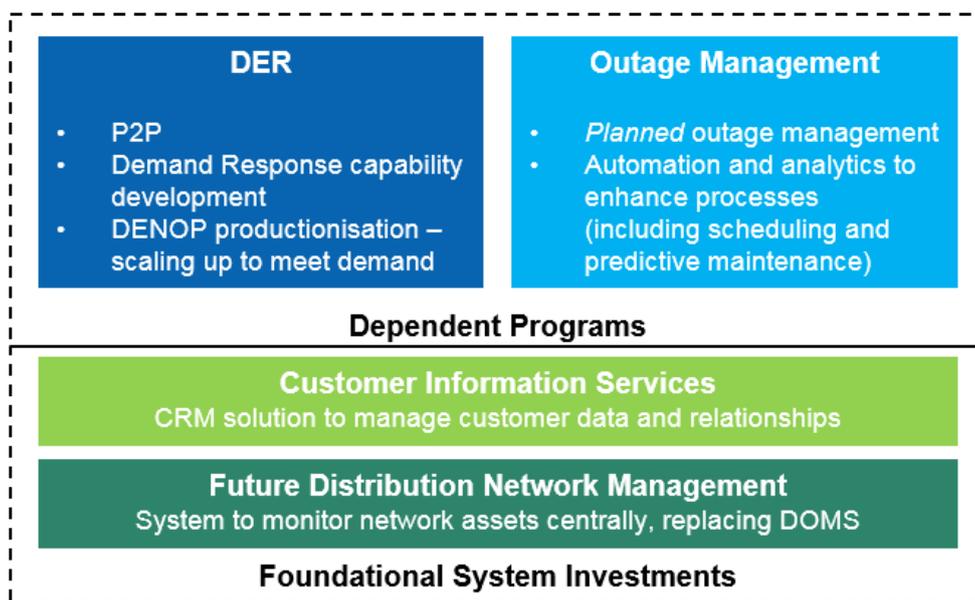
Having accurate network information will enable AusNet Services to make informed decisions around network related works and the future requirements of the grid throughout the FY2022-26 regulatory

Program Brief

period. To enable improvements to customers’ experience of outages, an integrated approach is required covering works planning through to work order completion.

The solution will include elements of automation to reduce effort of Access Coordinator/s in cross checking multiple systems, shortening the outage time of planned works and allowing data to be more efficiently utilised by central teams for informed decision-making. This will reduce the risks associated with current manual process and enable AusNet Services to take advantage of future industry and technological developments in order to better serve its customers and stakeholders.

The objectives outlined in this program of work are heavily dependent on investments outlined in both Future Distribution Network Management System (FDNMS) and Customer Information Services briefs. These foundational pieces will ensure network and customer data are captured accurately and consistently across the business. This data will underpin advanced analytics and automation tools, resulting in improved operational efficiency, decision making, and customer relationships.

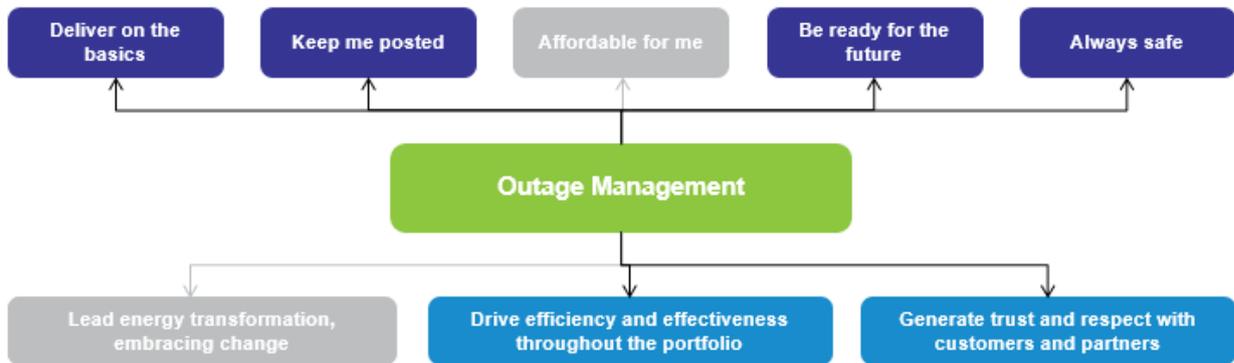


This program will primarily address the customer benefit of ‘deliver the basics’ as an improved process around network related works will in turn enhance the resilience of the network and ensure consistent power supply. Secondly, the brief will also deliver ‘Keep me posted’ by delivering timely and accurate information on works and completion status.

From a business perspective, automated processes and greater capability for analytics will allow AusNet Services to ‘drive efficiency and effectiveness throughout the portfolio’. Improvements in the underlying customer and asset data ‘generate trust and respect with customers and partners’ as they are informed with accurate communications.

Program Brief

Figure 2-1 Summary of customer and business drivers of this program



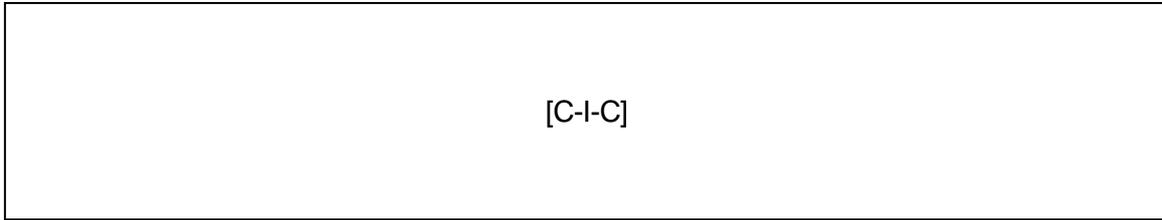
Alignment with AER ICT expenditure assessment framework

In accordance with the framework outlined in the AER’s Consultation paper – ICT Expenditure Assessment of [C-I-C], we have categorised this program of work as non-recurrent expenditure, on the basis that it relates to new capabilities through investment in AusNet Services’ outage management infrastructure. As such, we have undertaken an NPV analysis to weigh the costs and benefits of each option to address the need for investment, and consistent with AusNet Services’ internal practices, we have also developed a detailed business case in support of the chosen option.

Program Brief

3 Context

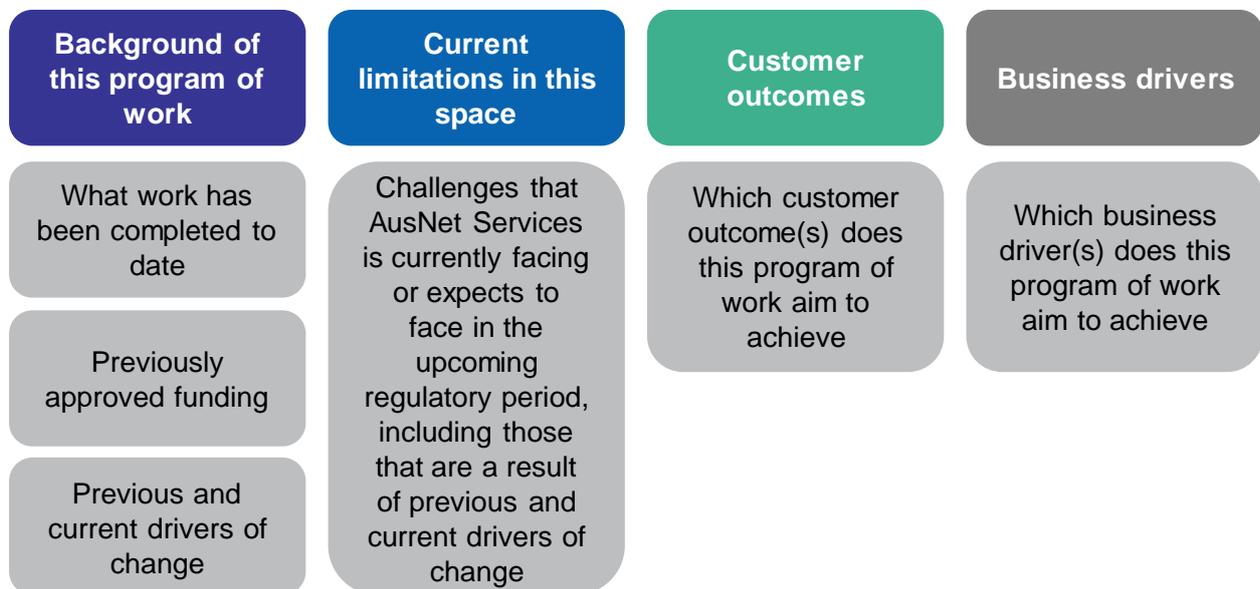
This program of work includes investments related to the processes associated with planned outages, from planning work through to generation of switching instructions.



To achieve efficiencies throughout the process, a number of technical improvements and modifications are required over the period.

Investments in the recommended program of work would result in the following outcomes by the end

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



3.1 Background

In order to provide reliable electricity distribution services across the network, AusNet Services must perform ongoing works on all assets and equipment. These works fall into three categories:

1. Asset maintenance;
2. Customer requests; and
3. Network augmentations.

For all three categories of works; outage plans are developed to highlight areas of the network requiring maintenance and the methods by which it will be switched off to allow the works to be completed. Visibility of accurate data in creating these plans is crucial in minimising network downtime and limiting disruptions to supply.

The Planning, Performance and Operations team are responsible for the ongoing planning of these works as network related tasks are carried out daily by field staff. To complete works, power must be turned off and rerouted via an alternate path for the duration of the works period. Once works are

Program Brief

complete, switching instructions direct the power back to restore the amended section of the network. Prior to any alterations at nominated sites, the following must occur:

1. Work planning & scheduling – plan the area in which network works is required and schedule based on available staff;
2. Network access - Apply for access to the network, and seek approval for planned works;
3. Identify assets to be taken offline - using GIS, mark out substations / feeders associated with the works;
4. Generate switching instructions for the planned outage - switching instructions; and
5. Identify / notify customers associated with given assets - based on existing substation data map customers expected to be affected by the network related works for both metered and unmetered sites.

In the 2016-2020 regulatory period, a number of internal AusNet Services workshops were held with both Network Planning and Scheduling and Customer Emergency Operations Team (CEOT) teams, to begin planning what the future of electricity distribution will look like and the capabilities required. Automation was a common theme across all recommendations. An assessment of the process owned by these teams highlighted a number of candidates for automation.

A proof of concept (PoC) for Network Access Planning has demonstrated the potential application of robotics process automation (RPA) to the end-to-end function. A number of dependencies surrounding data and integration with core systems require further assessment before extending the PoC's further.

Consolidation of planning and outage scheduling onto a single dashboard also commenced in the current regulatory period. This will continue into the 2022-2026 period to realise the following benefits:

- Consolidated view of all outages and access planning requests via a smart dashboard;
- Work clashes easily identified and managed;
- Graphical representation of an outage area; and
- Ability to use logic to minimise impact of repeated outages.

AusNet Services has also completed a consolidation of key asset management systems into the existing EAM / ERP platform, this will be leveraged in the program of work for the next regulatory period as a single source of asset information and financials to develop business rules for work orders and notifications, and support resource demand planning, financial planning and capacity planning.

This program brief for the 2022 to 2026 regulatory period proposes three different options to further improve operational efficiencies and recommends the option that best addresses these challenges given the associated costs, benefits, risks, and impacts on customer outcomes and business drivers. This analysis is discussed in sections 4 and 5.

Investments in the recommended program of work would result in the following outcomes by the end of the regulatory period, all of which improve AusNet Services' ongoing and future capability on delivering on customer needs and outcomes:

- Significant improvements in customer data quality, and an ongoing solution to accommodate data received from the field;
- An ability to visualise the assets in spatial and schematic views, and utilise asset performance data for analytics;
- An ability to perform predictive analysis to optimise works planning and scheduling, improving network related works; and
- Significant uptake of automation across the workflow creating process efficiency and reducing risk of manual error.

Program Brief

3.2 Current limitations

Despite improvements over the previous and current regulatory periods, the current network related works process has the following limitations:

- **Lack of integrated asset and customer data** – AusNet Services receives limited end-customer information from retailers, therefore when changes are made in homeownership or network configuration is adjusted, an accurate record of customers is not immediately received. AusNet Services is therefore unable to notify customers, with accuracy, when an outage is planned that will affect them, and to optimise maintenance and delivery of network related works in line with customer priorities.
- **Lack of integrated third party data** – Additional data sources could be included in the planning process to more accurately predict work completion and avoid rescheduling e.g. weather data to plan around rain / lightening, success factors to ensure staff with the correct skills are scheduled on the job etc.
- **Manual and disparate processes** – AusNet Services currently utilises multiple systems to complete all tasks associated with planned outages (work planning, scheduling, asset performance/ maintenance and access to the network etc.). This introduces a risk of human error in processing, limiting the ability for Access Coordinator/s and operations teams to make informed decisions.
- **Manual field processes** – many data quality issues arise from poor input quality. Upon arrival at fault locations, field crews must perform a number of manual paper-based tasks in order to complete their work. Field workers are also unable to access real time information on network assets and so rely heavily on paper-based documentation, thus reducing efficiency.
- **Limited ability to optimise works planning** - When outages occur within the network, field crews are dispatched using limited real-time information within the CEOT. There is an opportunity for efficiency improvements in dispatching teams to fault locations using real time information on field crew location, and work completion status.
- **Limited ongoing tracking of asset information** – Unable to gain visibility of asset performance specifically at an LV level, therefore lacking the ability to proactively plan at short notice or on a rolling basis and provide efficient service response.

3.3 Objective(s)

The limitations above will be addressed by the following objectives proposed in the Outage Management program of work including:

[C-I-C]

Program Brief

3.4 Customer outcomes

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

- Delivering basic services – “deliver on the basics”;
- Keeping customers informed – “keep me posted”;
- Affordable services – “affordable for me”;
- Adaptability – “be ready for the future”; and
- Safety – “always safe”.

Additional information on each of these customer outcomes is provided in the overarching Technology 2022-2026 submission. This research has been further validated through the ICT deep drive presented to the customer forum.

All expenditure programs identified and proposed by AusNet Services will have regard to the customer outcomes and can be directly linked to at least one of these five outcomes.

We consider that this program of work will be relevant to most of these customer outcomes, however most relevant to ‘**deliver the basics**’ by ensuring maintenance is completed where required reducing the potential for unplanned outages. Secondly this program will ‘**keep me posted**’ as the current systems have limitations around correct customer notification, notification of unmetered sites and predicting accurate estimated time to restore figures. We will further explore this further in the discussions of each of the options.

3.5 Business drivers

In the face of significant industry disruption resulting in a period of substantial uncertainty and increasing complexity across the industry, AusNet Services has selected three key business drivers, which set the direction for the business.

These business drivers are:

- Lead energy transformation, embracing change;
- Drive efficiency and effectiveness throughout the portfolio; and
- Generate trust and respect with customers and partners.

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

We consider that this program of work will be most relevant to ‘**generate trust and respect with customers and partners**’ as we ensure data of customers and assets is utilised in a way that adds value to the services provided, and aids operations teams in making informed decisions leading to efficient processes. We will further explore this in the discussions of each of the options.

Program Brief

4 Options

4.1 Overview

This section provides an overview of a select number of options, which will feasibly alleviate the current limitations. Each option represents a combination of initiatives, fitting within the broader program of work.

Table 4-1 Brief overview of the options

Brief overview of each of the options	
Option 1	<p>Data Quality Improvement This option centers around maintaining current systems with mandatory technical upgrades only and investing in foundational work to improve accuracy of both customer and asset data used to formulate and execute planned outages.</p>
Option 2 (Recommended)	<p>Process Automation Utilising data to create accurate models and incorporate these into automations based on opportunity assessments of all processes, commencing with highest value based on cost and customer impact. In order to deliver process efficiencies, Option 1 must be completed in conjunction with Option 2.</p>
Option 3	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;">[C-I-C]</div>

4.2 Option #1 Data Quality Improvement

As outlined above, AusNet Services manages an ever-increasing volume of data. It is also facing new customer expectations around being informed about outages and planned works. We must ensure that the available data is utilised to deliver value for customers. Our ability to ensure that the value of available data is maximized is currently limited by the capacity of AusNet Services' current technology systems that are used to monitor the LV network and communicate with customers. As such, 'Do Nothing' is not an acceptable option for addressing planned outages over the next regulatory period.

At a minimum, a foundational project for both initiatives below will create an improved data set to be utilised during planning and notification of planned works. This option does not look to expand any of the automation opportunities identified in the current period.

Customer Substation Mapping

Data quality must be assessed and remediated, with a future strategy to maintain data integrity going forward (refer to the Analytics program briefs for data integrity capability.) A data mapping exercise to correctly attribute customers (both metered and unmetered) to substations is necessary prior to any new system selection/ data migration. This is critical to delivering on customers' increasingly high expectations around communication and notifications.

Program Brief

Asset Outage Identification

For planned outages, a visualisation of the network will allow operations teams to correctly identify assets within a planned outage area, to notify customers appropriately. Being able to accurately plot geographically the exact assets and areas impacted by planned works, gives operations teams confidence when notifying customers. This may require additional sensors and/or monitoring devices particularly for areas including life support customers or areas with increased distributed energy contributions.

Alignment to objectives

We do not believe that this option achieves all of the intended objectives of this program of work, as shown in the table below.

Table 4-2 Objectives analysis of option 1

Objective		Comments
Customer and asset data mapping to improve integrity and completeness and correctly attribute customers to substations	✓	This option will improve both customer and asset data integrity, allowing analysis to occur based on consistent data across systems.
A solution to maintain the ongoing data quality input by field workers	✗	N/A
An ability to perform predictive analysis to optimise works planning and scheduling, improving asset maintenance	✗	N/A
Increase automation of the end to end process	✗	N/A

Costs

The largest category of expenditure in this program is for asset outage identification, due to the number of additional data points (sensors etc.) which will be required on the network.

Table 4-3 Costs of option 1

[C-I-C]

Program Brief

Benefits

This option will deliver the following benefits:

- Improved outage management through increased oversight and monitoring of asset performance gives the ability to maintain assets based on real time information
- Improve accuracy and safety for both Life Support and Sensitive customers through improved notifications
- Improved customer experience through accurate notification and progress of work updates
- Improved output quality of Access Coordinator/s and Access Planner/s by improving process and information flows.

Risks

There are a number of risks associated with this particular 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 4-4 Risks of option 1

	Risks	Consequence	Likelihood	Risk rating
R1.1	Poor customer and asset data quality / data integrity	Level 3: Limited ability to utilise existing data to inform decision making	Possible	C
R1.2	Inadequate capacity to cater for growth of applications and user data volume	Level 3: Increased operating cost due to time spent on mapping and consolidating data manually	Almost Certain	B
R1.3	Lack of real-time spatial and connectivity information	Level 2: limited visibility of field crews location and estimated completion	Likely	C
R1.4	Insufficient and inaccurate customer communications	Level 3: Decreased customer satisfaction metrics	Likely	B
R1.5	Static information on work status and limited integrated data for works planning functions	Level 2: Suboptimal scheduling and dispatching of field crews	Likely	C

As we have identified a number of risks with major consequences associated, we consider that overall, this option is rated high risk.

Alignment to customer related drivers of expenditure

As discussed in Section 3.4, five key customer outcomes have been identified through discussions with customers. The table below highlights the how this option will achieve these outcomes.

Program Brief

Where we consider that a customer outcome is not directly achievable by the option or irrelevant, 'N/A' is applied.

Table 4-5 Customer related drivers of option 1

Customer outcome	How this program achieves this
Deliver on the basics	Inform customers when power will be unavailable and provide updates as to work progress
Keep me posted	Timely information on works for both metered and unmetered sites
Affordable for me	N/A
Be ready for the future	N/A
Always safe	N/A

Alignment to business related drivers of expenditure

As discussed in Section 3.5, there are three business drivers that AusNet Services has identified, and is focussing on 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 4-6 Business related drivers of option 1

Business drivers	How this program achieves this
Lead energy transformation, embracing change	N/A
Drive efficiency and effectiveness throughout the portfolio	Automation enable operating efficiencies across the end-to-end workflow.
Generate trust and respect with customers and partners	Ensure data of customers and assets is utilised in a way that adds value to the services provided, and enables communication to all customers

4.3 Option #2 Extend Process Automation (RECOMMENDED)

Option 2 involves an extension of the objectives achieved in Option 1 and therefore includes activities to not only improve data quality, but also to improve asset maintenance modelling and forecasting capability and enhance the ongoing input of field data. It then looks to utilise that data for automated processing of the end-to-end workflow, with the exception of switching instructions.

Improving data quality in scheduling, planning and within the Customer Emergency and Operations Team (CEOT) is critical to delivering the process efficiency outcomes sought by this program of work. This option involves remediating long-term data quality issues between the field and back office (i.e. work completed data errors) by improving the technology that is used by field workers to input data. It also includes basic process automations to perform matching processes between disparate systems to improve responsiveness and efficiency of operations and field staff. To ensure data is consistently accurate, field workers should be prompted to update customer information following completion of scheduled jobs.

Program Brief

Data from the LV network can then be utilised by the Planning, Scheduling and Performance Operations team to create a more proactive work schedule, by identifying anomalies and targeting assets where outages are predicted to occur. Based on insights, automations can collate data to populate templates and systems for work planning and scheduling and network access.

Following approval of submitted plans, an automation can match customer data with an outage area identified for maintenance. Notifications sent to the identified customer will be handled by operations teams, along with exception scenarios where changes are made to the list of affected customers.

In addition to outcomes outlined in Option 1 above, the activities included in Option 2 are outlined below in relation to tasks within the workflow.

Data improvement

Customer and asset data mapping to improve integrity and completeness and correctly attribute customers to substations

Longer-term strategic solution to enable field workers to update work status as well as customer and work order details in a central system using a mobile device.

Additional data points added to the network to aid completion of the network view

Enhancing analytic capability for asset maintenance

An ability to utilise data to perform predictive analysis to optimise works planning and scheduling, improving asset maintenance

Automated process

Automation to streamline works planning processes by consolidating and integrating multiple data sources (GIS network data, asset maintenance and performance data, resource skillsets and qualifications).

This includes enabling the CEOT to match relevant field work team skills and competency to the type of jobs required on a rolling daily basis. This will enable work scheduling to be adapted throughout the day as priorities change and emerge; and allow the grouping of work orders in close proximity. The CEOT will be able to reallocate field workers as required during the day, where jobs are completed faster or slower than anticipated. All of these improvements will deliver increased efficiency in work scheduling and reduce the length of outages for customers.

- Increase automation of;
 - Works planning based on asset maintenance information
 - Asset and outage area identification
 - Customer notifications based on existing substation data map customers expected to be affected by the maintenance for both metered & unmetered sites

Alignment to objectives

This option achieves the all intended objectives of this program of work, as shown in the table below.

Program Brief

Table 4-7 Objectives analysis of option 2

Objective		Comments
Customer and asset data mapping to improve integrity and completeness and correctly attribute customers to substations	✓	This option will improve both customer and asset data integrity, allowing analysis to occur based on consistent data across systems.
A solution to maintain the ongoing data quality input by field workers	✓	This option will include a solution to improve the input quality of field data going forward through an existing application
An ability to perform predictive analysis to optimise works planning and scheduling, improving asset maintenance	✓	Building on the accurate data foundations, this option will utilise the data provided to improve decision-making and efficiency of processes across the workflow.
Increase automation of the end to end process	✓	This option will put forward use cases for further opportunity assessment and automation in the following areas; <ul style="list-style-type: none"> • Works planning & Scheduling • Asset and outage area identification • Customer notifications for both metered & unmetered sites

Costs

The larger category of expenditure is for the works planning and network access planning automations, it is assumed the automation platform will be established prior to FY2022 and these operational areas will be use cases going forward.

Greater expenditure in the initial years of the next regulatory period is required to incorporate the data quality enhancements outlined in option one and to conduct opportunity analysis across all process areas of the function. This will determine if robotic process automation, or integration of a system/product upgrade will be most cost efficient.

Table 4-8 Costs of option 2

[C-I-C]

A feature of option 2 is the use of a cloud service for Cognitive Automation which AusNet Services does not currently subscribe to. This would result in a \$[C-I-C] per annum step change to opex.

Program Brief

Benefits

This option will deliver the following benefits to customers:

- **Reduced unplanned outages** through improved asset management and outage planning
- **Improved customer satisfaction** through asset, network and service reliability and accurate notification and progress of work update
- **Improved insights** into unplanned outages, so that AusNet Services can reduce the number and impact of future unplanned outages, increasing customer satisfaction
- **Improved insights** into reasons jobs are cancelled
- **Increased oversight and monitoring of asset performance**, giving AusNet Services the ability to maintain assets based on real time information and provide customers with accurate real-time updates
- **Improved asset utilisation and increased asset life**, due to optimised maintenance schedules, **reducing AusNet Services' costs**
- **Additional analytics** (i.e. a planners and schedulers workbench) that support planning processes needed to respond to multiple concurrent customer and business priorities and rapidly changing internal and external (i.e. DELWP, DHHS) needs across AusNet Services' broad geography
- Ability to perform more detailed scenario analysis to **prevent the risk of failure of assets**, as performance is known and tracked allowing for reconfiguration of the network to support optimum asset performance
- **Improve accuracy and safety** for both Life Support and Sensitive customers through improved notification capability
- Improves output quality of Access Coordinator/s and Access Planner/s by **improving process and information flows**
- Significantly reduce number of cancelled, rerouted jobs, **improving customer experience**
- **Increase reliability** in staffing field worker skills with maintenance required.

Risks

There are risks associated with this particular 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 and red (order of severity). See Attachment 1 – Risk level matrix for additional information on this rating system.

Table 4-9 Risks of option 2

	Risks	Consequence	Likelihood	Risk rating
R2.1	Poor customer and asset data quality / data integrity	Level 3: Limited ability to utilise existing data to inform decision making	Unlikely	D
R2.2	Inadequate capacity to cater for growth of applications and user data volume	Level 3: Increased operating cost due to time spent on mapping and consolidating data manually	Unlikely	D
R2.3	Lack of real-time spatial and connectivity information	Level 2: limited visibility of field crews location	Possible	D

Program Brief

		and estimated completion		
R2.4	Insufficient and inaccurate customer communications	Level 3: Decreased customer satisfaction metrics	Unlikely	D
R2.5	Static information on work status and limited integrated data for works planning functions	Level 2: Suboptimal scheduling and dispatching of field crews	Possible	D

As we have identified several low risks associated with this option, we consider that overall this option is rated low risk.

Alignment to customer related drivers of expenditure

As discussed in Section 3.4, 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 4-10 Customer related drivers of option 2

Customer outcome	How this program achieves this
Deliver on the basics	Delivering this option would mean that AusNet can continue to provide outage information to their customers and ensure outage issues are remediated as soon as possible through an end-to-end workflow system.
Keep me posted	Improves the accuracy and depth of information provided to customers regarding works affecting their area, such as being able to provide status updates and estimated completion times. Also reduces the impact of planned outages in terms of inconveniencing customers.
Affordable for me	N/A
Be ready for the future	Create a greater ability to monitor the network and accurately predict the impact of outages. This options enables AusNet to forecast and better prepare for future outages through enhanced data reporting meaning lower outage time and occurrences for customers.
Always safe	Monitor assets to ensure safe and resilient power supply, reducing risks of harm to customers and staff. With the increased quality of maintenance and service data, operation teams have more information to make safer decisions.

Alignment to business related drivers of expenditure

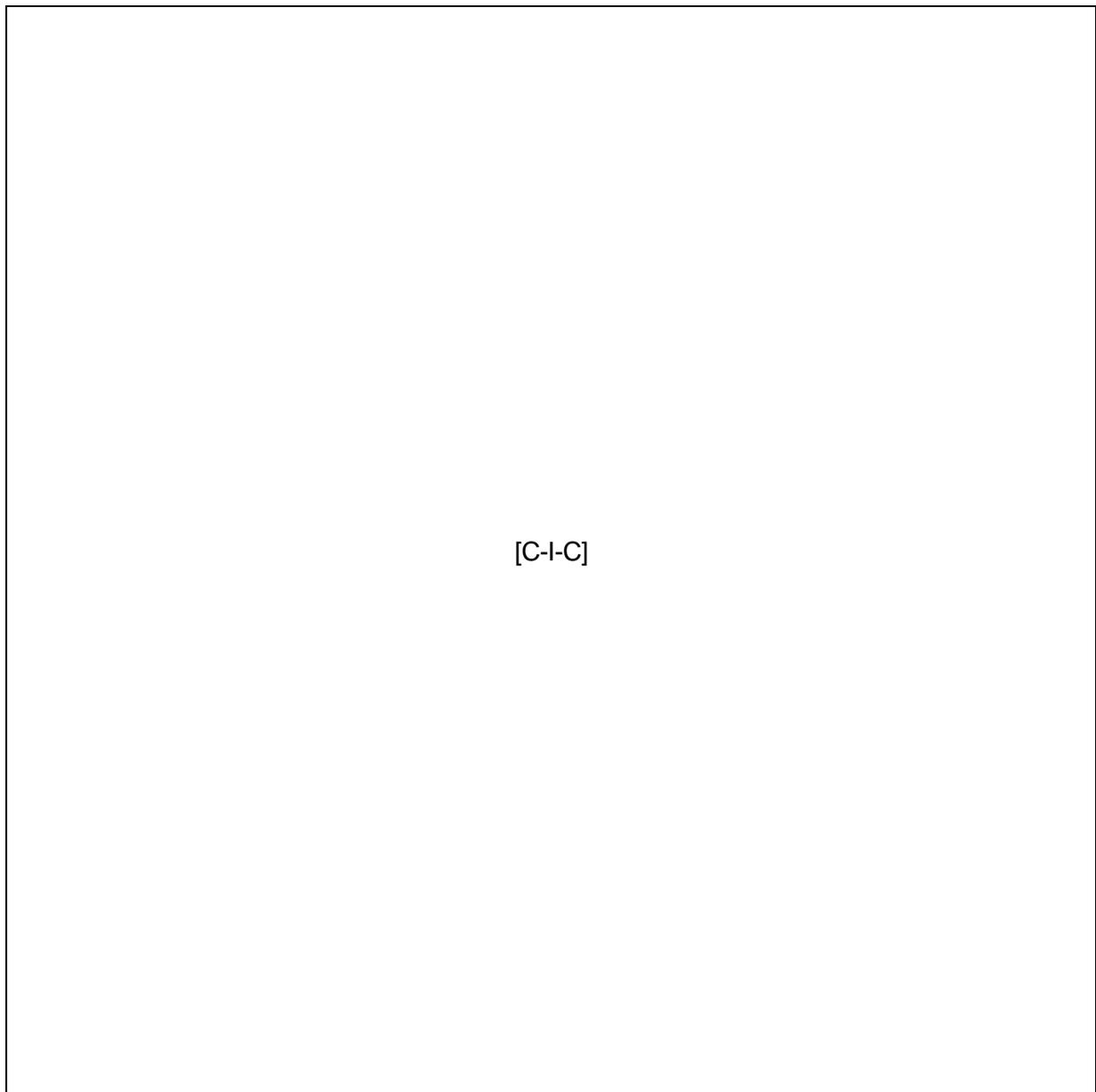
As discussed in Section 3.5, there are three business drivers that AusNet Services has identified, and is focussing on over the next regulatory period. The table below highlights how this option will input into the drivers where relevant. Where we consider that a business driver is not directly relevant to the option, 'N/A' is applied.

Program Brief

Table 4-41 Business related drivers of option 2

Business drivers	How this program achieves this
Lead energy transformation, embracing change	N/A
Drive efficiency and effectiveness throughout the portfolio	Automation enable operating efficiencies across the end to end workflow.
Generate trust and respect with customers and partners	Ensure data of customers and assets is utilised in a way that adds value to the services provided, and enables communication to all customers

4.4 [C-I-C]



Program Brief

Alignment to objectives

[C-I-C]

Table 4-12 Objectives analysis of option 3

[C-I-C]

Costs

Table 4-13 Costs of option 3

[C-I-C]

Benefits

[C-I-C]

Program Brief

[C-I-C]

Risks

[C-I-C]

Table 4-14 Risks of option 3

[C-I-C]

Alignment to customer related drivers of expenditure

[C-I-C]

Table 4-15 Customer related drivers of option 3

[C-I-C]

Alignment to business related drivers of expenditure

[C-I-C]

Table 4-5 Business related drivers of option 3

[C-I-C]

Program Brief

5 Assessment and recommended option
5.1 Assessment of the options

To identify a recommended option for this program of work, we have selected a number of criteria to assess each of the options. We consider that these criteria represent a comprehensive view of each option, in achieving AusNet Services' business and customer objectives as well as requirements of the AER in ensuring that any 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

[C-I-C]

Based on this assessment, Option 2 is the recommended option as it delivers the outcomes required, reducing AusNet Services exposure to risks, while remaining realistic based on the number of dependent projects required to deliver extensive automations.

Option 1 does not provide enough additional capability to allow AusNet to efficiently deliver services to customers. While Option 3 also delivers the outcomes required it's a more complex and costly approach. We would however expect to explore these options in subsequent EDPR periods.

NPV analysis

As defined in the AER Consultation Paper – ICT Assessment Approach, the AER is refining its approach to ICT assessment, requiring a disaggregation of ICT expenditure into recurrent and non-recurrent ICT expenditure.

As this program includes 100% non-recurrent expenditure, Table 5-2, below shows the NPV analysis results for this program, further demonstrating the cost effectiveness of Option 2, the recommended option.

Table 5-2 NPV analysis (\$FY21m)

[C-I-C]

Program Brief

We have captured two primary benefits for this program:

- Customer value of reduced outages
- Improved employee productivity.

We consider that Option 2 and Option 3 will reduce the overall amount of time that AusNet Services' network spend relating to outages by [C-I-C]% and [C-I-C]% respectively, between [C-I-C] and therefore, will reduce the cost to customers' inconvenience more than Option 1. This is related to the investment in outage related process automation (Option 2) and extension to [C-I-C] described in Option 3.

Furthermore, we consider that improved outage management will improve the ability of field staff to respond to outages (i.e. improving employee productivity due to enhanced network models). We consider that Option 1, as it only includes minimal data upgrades, will only improve employee productivity by [C-I-C]% between [C-I-C], whereas Option 2 and Option 3, which involve more significant changes, and are estimated to result in more significant improvements to productivity of [C-I-C]% between [C-I-C] respectively.

Option 2 have a lower cost than Option 3 and therefore based on our NPV analysis, Option 2 results in a greater NPV, and is therefore our recommended option.

5.2 Recommended option

As discussed above, the recommended option for Outage Management over the 2022-26 period creates opportunities for AusNet Services to operate their network more efficiently and reduce the manual effort associated with much of their operations.

Table 5-3 Confirmation of scope of recommended option

In scope	Out of scope	Dependencies
Data Remediation	Integration with Data lake (assumed costs included in IM briefs for additional integrations will cover the systems required)	Base Analytics (IM) <ul style="list-style-type: none"> • Data cleanse of all existing customer substation data should be completed prior to changes in managing data quality going forward
Enhanced forecast and modelling capability	Additional analytics products (assumed existing tools and visualizers, analytics referenced in IM briefs can be access and models built within)	Corporate Communications <ul style="list-style-type: none"> • Similar Lifecycle and upgrades will be necessary as increased number of connected devices and sensors require the Communications network to transfer data.

Program Brief

Field solution for input quality, changes made to existing system not a new application	Hardware for field, e.g. mobile devices (assumed mobile devices are included as part of Modern Tools)	Security <ul style="list-style-type: none"> Similar Lifecycle and upgrades will be necessary as increased number of connected devices and sensors require security platforms to extend 'to the edge'
Opportunity assessment based on processes included in options	No build for establishing RPA Platform, the platform is enabled and accepting use cases prior to the program kick off	HV LV Network Management Solution
Automation build for identified processes		CIM <ul style="list-style-type: none"> System required to accurately store data once substation mapping has been performed
		Modern Tools <ul style="list-style-type: none"> OT mobile devices
		[C-I-C]

Below in **Table 5-4**, we have identified techniques or actions to mitigate the risks identified for this option.

Table 5-4 Option 2 risks and mitigation actions

	Risk	Consequence	Likelihood	Rating	Mitigation
R2.1	Poor customer and asset data quality / data integrity	Level 3: Limited ability to utilise existing data to inform decision making	Unlikely	D	This risk will be alleviated by implementation of option 2 however should be tracked going forward.
R2.2	Inadequate capacity to cater for growth of applications and user data volume	Level 3: Increased operating cost due to	Unlikely	D	This risk will be alleviated by implementation of option 2 however

Program Brief

		time spent on mapping and consolidating data manually			should be tracked going forward.
R2.3	Lack of real-time spatial and connectivity information	Level 2: limited visibility of field crews location and estimated completion	Possible	D	This risk will be alleviated by implementation of option 2 however should be tracked going forward.
R2.4	Insufficient and inaccurate customer communications	Level 3: Decreased customer satisfaction metrics	Unlikely	D	This risk will be alleviated by implementation of option 2 however should be tracked going forward.
R2.5	Static information on work status and limited integrated data for works planning functions	Level 2: Suboptimal scheduling and dispatching of field crews	Possible	D	This risk will be alleviated by implementation of option 2 however should be tracked going forward.

Program Brief

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

		Consequence				
		1	2	3	4	5
Likelihood	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