Investment Evaluation Summary

Market Systems – Meter Data Management System Replacement

Version Number: 0.11

Date: November 2018

1.   Executive Summary

This document provides TasNetworks' analysis and justification for the replacement of its Meter Data Management system (MDMS) and for the capital costs of doing so.

Whilst the AER accepted the need for replacement of the MDMS, it questioned the justification put forward for the capital cost. As can be seen in the table below, the imperative for replacing its MDMS and the forecast costs for the preferred solution have evolved since it was first proposed in 2016 for the 2017-19 regulatory period.

Date	Regulatory Period	Imperative/proposal	Forecast total capital cost
2015	RP 2017-19	No immediate – proposal to maintain compliance of existing system. Estimate for **upgrade** to Gentrack v4 post 2019	██████████
2017	RP 2019-24	Anticipated end-of-life of mData21. **Replace** through integration with existing ERP, estimates for external costs due to limited engagement with potential vendors.	██████████
2018	RP 2019-24 (revised)	Confirmed end-of-life of mData21. **Replace** through integration with existing ERP, firm estimates for external costs following detailed engagement with potential vendors.	██████████

The preliminary estimate for update of the MDMS was a high level estimate based on little to no information from vendors as it was not anticipated to be an immediate need for the business. It should also be noted that, at this stage, a like-for-like **upgrade** of the Gentrack system, which did not contain any market interface capability, was being considered. In 2017 the solution had been developed to include Business to Market (B2M) and Business to Business (B2B) functionality. ████
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The strategy and estimates changed for the initial proposal for the 2019-24 period as the technical end-of-life of the Gentrack system was now expected, although notification of the end-of-life date had not yet been received. At this time, detailed engagement with potential vendors also proved difficult. Without an agreed scope, only one of the proposed vendors was able to provide a broad 'order of magnitude' estimate range, whilst the second would not provide an estimate at all.

Since submission of the initial TasNetworks proposal for 2019-24 and subsequent receipt of the AER draft determination, a full re-evaluation of the options has been conducted as the scope has been refined and detailed engagement with vendors has now been possible. Key issues raised by the AER in the draft determination have now been addressed and a firm and reasoned justification put forward in this document for replacement of the MDMS:

- The prudent replacement of the MDMS is clearly justified, given the risks posed by continuing with the current platform

- Through refinement of the exact scope of the project and prudent planning of the timescale of the project, the proposed capex for 2019-24 has fallen significantly from the initial proposal

- The best NPV of the options evaluated has been chosen

- Specific external costs have been provided by the primary vendors (SAP & Gentrack) after detailed discussion of scope and timescale

- The level of accuracy of the estimates has been significantly enhanced through vendor engagement and detailed internal resource planning such that no contingency amount is included in the estimated costs

- The chosen solution provides the potential for further process cost efficiencies at virtually no additional extra cost over the non-preferred option, and

- The lowest 2019-24 cost option for replacement has been chosen ████████████████

It is TasNetworks' firm position that the risks to the business and to the quality of service it provides to Tasmanian consumers makes replacement of the current MDMS a non-negotiable need. The longer term costs and potential impacts of system failure far outweigh the immediate costs of replacement which can be expected to provide significant efficiencies in operations going forwards.

1.1   Background

In 2005 TasNetworks completed the implementation of Gentrack version 3 (mData21) as its MDMS. Since its implementation mData21 has been deliberately insulated from many regulatory changes, such as market transaction schemas, through TasNetworks' use of Brave's "Bravo" solution. In order to minimise the need for complex customisations in mData21, a number of manual processes are performed and the more complex scenarios are catered for in Bravo. Processes that reflect market transactions are configured through Bravo in a further attempt to minimise mData21 customisation.

Whilst this strategy of limiting the customisations to mData21 has proved successful in mitigating technology risks to TasNetworks, aging technology culminating in the end of support for a range of systems, including mData21, has put the business at risk. mData21 has aged to the point where it will soon no longer be supported therefore placing its link to vital business and customer systems in jeopardy.

TasNetworks' version of Gentrack (mData21) does not have the functionality required to act as a sole MDMS solution as B2B and B2M functions were not part of their offering in 2005 when Gentrack was selected. TasNetworks filled this gap with the Bravo product suite. ████████
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████████ Bravo performs the business to market and business to business

transactions, provides an interval data store, distribution billing and provides the market gateway. MVRS is the mobile tool utilised by meter readers to capture basic meter reads and is interfaced with mData21. TVD CSC is used to manage service orders and is also interfaced with mData21.

In addition to mData21 functional deficiencies outlined above, TasNetworks received an end-of-life notice from Gentrack on 31 August 2018, after submission of its original regulatory proposal. The end-of-life notice stated that support of mData21 will cease on 25 June 2020.

Gentrack has offered to provide additional support, at increased cost, for one year post this date but will subsequently offer support on a reasonable endeavour basis only, that is, assuming resources with the relevant skillsets are available. The end-of-life notice poses significant operational and compliance risks for TasNetworks.

> *TasNetworks' regulatory obligations and operational capacity requires the replacement of its MDMS in order to remain operationally viable and compliant.*

Receipt of the formal end-of-life notice (which had been anticipated but had not been confirmed prior to the original submission), together with an increased willingness by potential vendors for a new MDMS to engage with TasNetworks, has enabled further analysis and refinement of the options available.

Workshops have been held with the key vendors to understand the detailed functional scope and technical requirements for their replacement systems and to enable more accurate costs to be provided by them. These vendor costs along with refined estimates of the internal resources required for the considered options have informed development of this revised investment case.

2.   Reasons for system replacement

There are number of significant factors resulting in the need for TasNetworks to replace its MDMS solutions and these are described below.

2.1   System end of life/support

On 31 August 2018, after TasNetworks original submission to the AER, Gentrack issued an end-of-life notice stating that as at 25 June 2020, mData21 will be officially unsupported. However, the vendor has indicated that extended support will be offered for one year at additional cost and that support will increase in cost and decrease in availability in subsequent years. Whilst this has been anticipated at the time of the initial submission, it had not been confirmed by Gentrack and in line with AER policy was therefore not taken into account in the options assessment.

Without guaranteed continued support, the existing system will rapidly become unable to cope with the increased data volumes and required functionality associated with five minute settlement rules, global settlement rules and the steady increase expected in the use of roof-top PV systems. This poses a risk to a wide range of customer facing services that depend on the current mData21

functionality, including but limited to: customer moves, life support, connections and field safety. The attendant risk is the likely significant cost of emergency rectification and manual processes and workarounds.

2.2   Aging Technology

It has been 13 years since the initial implementation of mData21. The mData21 application is based on 1990s technology that has not been materially updated. This has made enhancements difficult and increased reliance on other supporting systems such as Bravo for market interfaces and interval data storage and management. It is not possible to simply upgrade mData21 to a new version of the Gentrack solution (Velocity). Gentrack has superseded the technology upon which mData21 is based, meaning an upgrade is not possible and a full replacement is required.

In addition, the age of the technology in which the application is coded means that it must be hosted on a Microsoft 2008 SQL server for compatibility reasons. Microsoft 2008 SQL server will in itself become unsupported from August 2019[1]. This not only increases the threat of instability and disruption to business and customer facing processes it also leaves TasNetworks more susceptible to cyber threats[2].

In response to the Finkel Review recommendation 2.10 and in recognition of the challenge of securing the power grid from cyber-attack, AEMO has developed a tailored cyber-security framework (The Australian Energy Sector Cyber Security Framework (AESCSF)). It is currently assessing the maturity of market participants against this framework with the inaugural annual report due by the end of 2018[3]. The aging infrastructure supporting TasNetworks' MDMS will have a material impact on its ability to meet AEMO's expected level of maturity in guarding against cyber threats.

The latest technology more easily supports current and future functional requirements and is maintained by vendors to combat emerging threats as they arise, better helping TasNetworks manage its risk exposure.

Taken together, the lack of support and aging technology results in the need to replace mData21 with a new MDMS that is capable of meeting regulatory and business requirements and better mitigating cyber threats.

2.3   Other MDMS Initiatives

TasNetworks is not the only electricity distributor in the market that is looking to perform an upgrade or replacement of their MDMS.

As per their respective regulatory proposals for the 2019 to 2024 period, both Evoenergy[4] and Power and Water Corporation (PowerWater)[5] are seeking to upgrade their MDMS. We note that their existing technology allows them to upgrade their current systems as opposed to replacing their MDMS as TasNetworks are required to do.

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[1] https://blogs.msdn.microsoft.com/sqlreleaseservices/end-of-mainstream-support-for-sql-server-2008-and-sql-server-2008-r2/
[2]

Common SQL Server Security Issues and Solutions - TechNet – Microsoft https://technet.microsoft.com/en-us/library/2009.05.sql.aspx
https://www.zdnet.com/article/the-top-ten-most-common-database-security-vulnerabilities/
https://www.itprotoday.com/business-resources/risks-running-windows-server-2003-beyond-end-life-its-time-act-whats-your-action
[3] http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Cyber-Security
[4] Evoenergy (ActewAGL) – Determination 2019-24, "*Appendix 5.9: ICT expenditure proposal*"
[5] Power and Water Corporation – Determination 2019 – 2024, "*Attachment 8.1: PowerWater ICT Strategy*"

In addition, from discussions with other DNSPs, TasNetworks understands that significant investments are planned in MDMS upgrades to manage the five minute and global settlement rule changes.

These examples of MDMS projects indicate that DNSPs are investing in non-network information technology to maintain compliance and to maintain efficient processes. The significant investments will be utilised to upgrade their existing MDMS whereas, with a comparable level of investment, TasNetworks will perform a major replacement of its MDMS suite.

2.4 Metering Assumptions

As part of TasNetworks' transformation roadmap[6], TasNetworks aims to provide customers with greater choice in their energy supply. TasNetworks projects that, by the end of 2025, 120,000 customers will have advance meters (representing 40% of all customers). This enables customers to have a greater understanding and take greater control of their power consumption. This take-up of smart meters will drive increasing volumes of (interval) data.

It is noted that in its draft determination, the AER, referring to its consultant's (Arup) report on the matter, noted that with the deregulation of meter reading services, a slow but steady drop in customers aligned to TasNetworks as their Meter Data Provider (MDP) is expected over the next 10 years. Regardless of the drop in customers, meter reading data will still be required by TasNetworks for the purposes of distribution billing. Therefore, Arup's statement that the exact level of decline within TasNetworks' quoted range of 30%-60% "... would have a material effect on the validity of the project" is incorrect. This decline does not reduce the need for a new MDMS nor reduce the scale of the implementation. Even with the highest potential level of customer drop-off, a new system with contemporary functionality will still be required.

TasNetworks is seeing a steady increase in the use of roof-top PV systems and as battery technology[7] becomes more affordable, will no doubt see that increase substantially as well. With these new distributed generation and storage technologies ('Distributed Energy Resources' – DER) comes an increase in interval meter reading and advanced control technologies required to manage a grid on two-way electricity flows. This requires a new MDMS as the existing mData21 system does not have the required functionality.

It should also be noted that any new solution must be able to cater for the 60% or more of customers that remain on basic meters as well as those on modern interval meters.

2.5 Technology Consolidation

In its option assessment, TasNetworks has consistently checked alignment against its own strategies ████████████████████████. This strategy has been developed after TasNetworks' experience and exposure to multiple small vendors. The risk and challenges associated with managing a broad vendor portfolio became increasingly apparent after the transmission and distribution businesses were amalgamated. ██
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[6] TasNetworks – Transformation Roadmap 2025 – Final – January - 2018
[7] https://www.tasnetworks.com.au/customer-engagement/tariff-reform/consort-bruny-island-battery-trial/

Consolidation of ERP platforms with market facing solutions is a consistent theme in the Utilities sector. DNSPs such as Ausgrid[8], Jemena[9] and SA Power Networks[10] are a few of the Australian examples consolidating their SAP platforms. Consolidation of corporate and market systems has enabled DNSPs to prudently manage their licenses and drive efficiencies within their information technology systems.

Similar to TasNetworks, these organisations are embracing SAP to consolidate multiple systems into SAP's ERP. This aims to reduce the IT environment's complexity, support the adoption of shared business processes, data sets and systems across the organisations and maximise the value from their investment in SAP.

The number of DNSPs utilising SAP in Australia enables TasNetworks to leverage the experience gained across the industry to cost effectively respond to the market and regulatory changes. This also enables SAP to 'productise' its core offerings in this area so reducing costs for shared changes across the industry.

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[8] Ausgrid – Determination 2019-24, "*Attachment 5.18: ICT Technology Plan*", "*Attachment 5.19: ICT Project Justifications*"
[9] Jemena – Determination 2016-2020, "*Attachment 7-7: IT Asset Management Plan (2016 – 2020)*
[10] SA Power Networks – Determination 2015 -2020, "*Attachment 20.32: Information Technology Investment Plan 2015 – 2020*"

3. Business Options Considered

In TasNetworks' initial submission, four options, including the Do Nothing option, were assessed. At that time, TasNetworks had incomplete information in regards to vendor costs and unconfirmed view of the end-of-life expectation for the current MDMS solution (mData21).

In continuing its assessment of the options after its original submission, TasNetworks undertook a market scan of relevant products and assessed them for their potential fit to the defined requirements. Factors such as installed user base, TasNetworks' own past experience of the vendor and the vendor's capability, footprint and future strategy were taken into account.

Based on this analysis, the two practical options were evaluated against the Do Nothing option:

1 Replacement with SAP: expand on the existing implementation of SAP by adding the SAP IS-U and related modules to the installed system, and

2 Replacement with Gentrack (Velocity): replace the obsolete mData21 with their current Velocity system.

A key factor in identifying these potential solutions was the vendor's knowledge of TasNetworks and conversely TasNetworks' experience of the vendors. It was considered too high a risk and not practical to go with an unknown vendor for such a business critical system. As such, the third option proposed in the TasNetworks' initial proposal, to undertake an open RFQ process, has been removed.

The options considered in this investment case are detailed below.

3.1 Do Nothing

This option retains the existing capabilities that are a part of the current suite of MDMS solutions including Gentrack, Bravo, MVRS and TVD CSC. As the current Gentrack system (mData21) is approaching end-of-life and will be unsupported, its continued use represents an unacceptable risk to the business (refer to section 2 of this document).

This option poses the highest risk of the options considered as it puts TasNetworks in an almost certain position of compliance and service level breaches.

3.2 Replacement with SAP

The SAP option includes implementation of SAP IS-U (Industry Specific Solution for Utilities) creating a MDMS module within TasNetworks' Enterprise Resource Planning (ERP) platform. ██████████

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This approach is one referred to by Gartner as a 'Postmodern ERP' where back-office administrative functions are integrated with operational systems. Gartner notes that asset-intensive industries

such as utilities "...can realize benefits from the integration between administrative and operational capabilities, for example, where operational transactions that have a financial impact are reflected directly in the financial modules".[11]

Implementing this option would allow TasNetworks to have an MDMS solution that is fully supported by a globally recognised Vendor within the utilities industry. It is also recognised that the number of DNSPs utilising SAP in Australia enables TasNetworks to leverage the experience gained across the industry to cost effectively respond to the market and regulatory changes.

3.3   Replacement with Gentrack (Velocity)

This option leverages the current Gentrack vendor relationship which involves a clear understanding by Gentrack of TasNetworks' business. As outlined in section 2, there is no possibility of upgrading mData21 and a full replacement (Velocity) is required.

Similarly to the SAP option, this option results in replacing a range of capabilities embedded within other products throughout the MDMS suite. The Velocity solution will be fully supported and will enable TasNetworks to remain compliant with regulatory changes over the next and future regulatory periods.

3.4   Recommended Option

The recommended solution is ███████████████████████████████

3.4.1   Option justification

It is clear that, as a prudent operator, TasNetworks has to replace its current Gentrack MDMS solution due to the extreme risk it represents as it becomes unsupported in an ever changing technological and regulatory environment. The cyber vulnerabilities of the aging software and its platform together with its inability to cope with the increasing volumes of data make its replacement a necessity.

The key justifications for ███████████████████████████████

- Best NPV over the long-term

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- Comparable capital costs to ██████████████████████████████ and

- Options to leverage distribution billing capabilities within a fully integrated solution.

3.4.2   Timescale

The timing of the MDMS replacement project has been planned over two regulatory periods (2019 to 2024, 2024 to 2029) for two key reasons:

- In order to balance risk and customer and regulatory obligations, an assessment over the current state of the applications that make up the entirety of the MDMS solution revealed an immediate

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[11] https://www.gartner.com/it-glossary/postmodern-erp

necessity to replace the TVD (service order management) solution. The TVD CSC solution has a high risk of vendor failure and there is no upgrade path with the current vendor. The failure of TVD CSC will impact a number of customer facing processes such as connections, re-energisations/de-energisation, special and billing re-read and connection alterations.

- Because Gentrack has agreed to continue to support mData21 post its official end-of-life (June 2020) TasNetworks is able to delay the commencement of the MDMS replacement project until Q3 2022. This manages the risk associated with the existing system whilst efficiently spreading the capital cost of implementation over two regulatory periods.

The above strategy has been incorporated in TasNetworks project roadmap[12]. The timing of the MDMS replacement project has been planned over two regulatory periods (2019 to 2024, 2024 to 2029) as illustrated below.
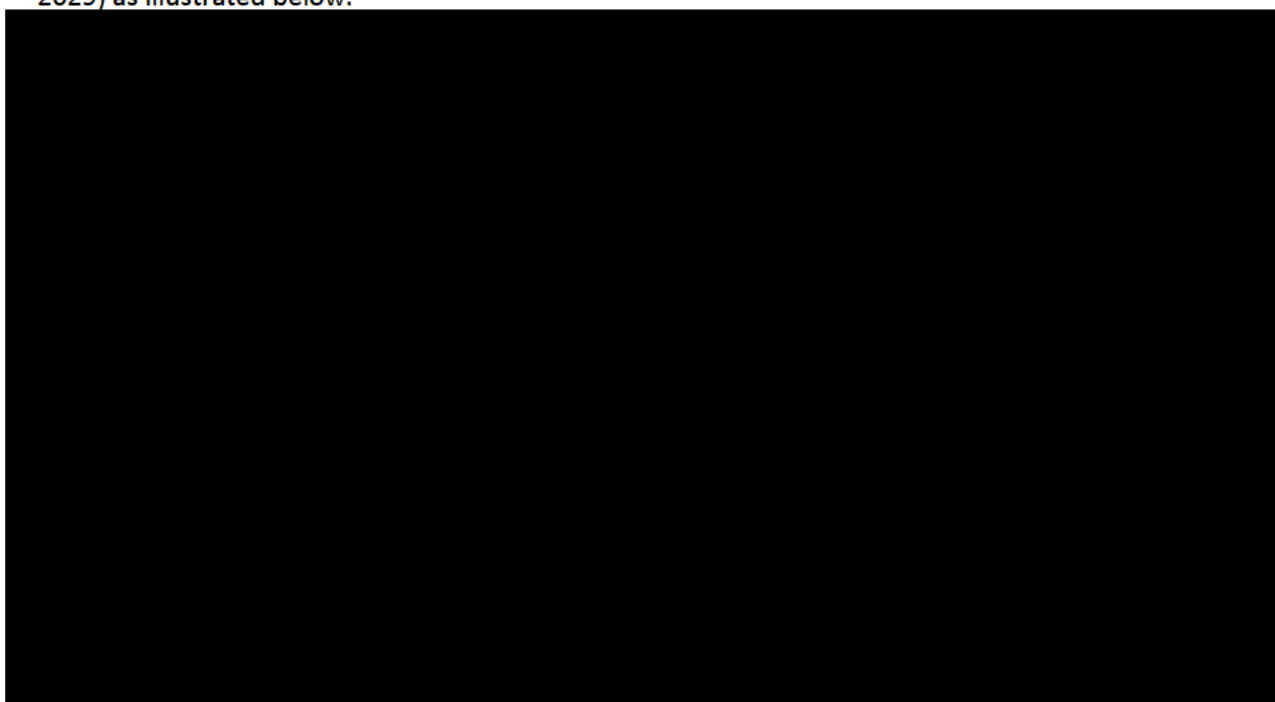
3.4.3   Cost Estimates

The capital cost for the 2019-24 regulatory period is ▮▮▮▮ (Real 2018/19).

SAP Cost Summary								
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	TOTAL

The total cost estimate of ▮▮▮▮ is based upon a mix of vendor provided estimates and detailed internal project resource plans.

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[12] TasNetworks – Market Systems Roadmap

3.4.4   Investment Appraisal

The key benefits ▮▮▮▮▮▮ ▮▮▮▮▮ are the expectation of improved efficiencies in business processes, data storage and access as well as the ability to leverage industry specific enhancements at a lower price. These will be realised over the longer term being the 2024-29 regulatory period and beyond.

Options Net Present Value analysis		
	Option 1 - SAP	Option 2 - Velocity
NPV Capital Expenditure	▮	▮
NPV Total Benefits	▮	▮
Total NPV	▮	▮

4.   Objectives

4.1   Relationship to strategies

The following table highlights how the initiative will assist in achieving TasNetworks' Strategy for 2025.

Strategic Goal	Contribution
▮	▮
Business Productivity – "Optimise our program of work and emergency response capability delivering on our promise"	TasNetworks will provide the business with the business applications it needs to operate efficiently and effectively. User interfaces will be contemporary and easy to use, providing a satisfying end user experience for the business that supports improvement to team member engagement. Impact of change to the business is primarily restricted to the market services group.
Network Capability – "Our network continues to meet demand and power system security systems requirements while accommodating the changing use of our network"	This initiative supports key processes in the network, in that it manages information about every exit point of the distribution grid. This information is vital to downstream processes such as Outage and Restoration Management.

Strategic Goal	Contribution
Voice of the Customer – "Delivering valued services"	*This initiative supports this goal by ensuring customer records are maintained and available to all customer facing processes and touchpoints, which support our goals of 'demonstrating we care and make our customer experience easier'.* *The TasNetworks MDMS will remain fit for purpose and meet business requirements. This initiative supports other initiatives, including 'Digital Customer Engagement' (Phases 1 and 2), 'ORM 3' and 'Enterprise CRM'.* *TasNetworks will maintain its position as fully compliant with all regulatory requirements and applicable industry standards.*
Changing Role of the Grid – "Facilitate customer led technologies and provide complementary services"	*This initiative will enable TasNetworks to focus on capitalising on opportunities through adopting proven technologies in network support systems.*
Culture and Capability Program – "Value chain optimisation and change capability"	*This solution will support TasNetworks processes by further optimising our value chain, and ensuring our staff can work as efficiently and effectively as possible.* *The use of internal resources to apply this solution will maximise the opportunity of corporate knowledge being retained after project completion.*
Business Transformation – "Realise our business transformation"	*The MDMS as a core system is pivotal to many transformational initiatives. Updating the system to contemporary technologies ensures it is adaptable to the needs of emerging and transformational initiatives.*

4.2   Relationship with the NER Expenditure objectives

National Expenditure Objectives	Contribution
Meet or manage expected demand over the period	*The proposed expenditure seeks to implement changes to systems of TasNetworks post AEMC's five minute settlement rules. Given the anticipated exponential growth in the volume of metering data, this replacement will enable TasNetworks to store and maintain large volumes of interval data as the use of smart meters grows throughout the state.*

National Expenditure Objectives	Contribution
Comply with regulatory obligations	*The MDMS is central to the processes that provide quality meter data to market participants. The performance of the MDMS directly affects TasNetworks' ability to meet the AEMO compliance measures. The current solution represents a significant risk of non-compliance in the future due to its un-supported status and aging technology base.*
Maintain the quality, reliability and the security of the distribution system, or the supply of standard control services	*The current state MDMS solution has been issued an end-of-life date which will affect application currency outside of vendor support. The server that the current MDMS solution is at end-of-life and in combination to the solution pending end-of-life yields great security risks. The implementation of a new MDMS solution would address these risks.*
Maintain safety obligations	*The proposed options will deliver improved safety through enhanced communication for example receiving communications in regards to energising and de-energising connections.* *If the MDMS is not maintained, the current system could yield risks to field crews as result of not receiving vital data such as hazard information.*

4.3   Relationship with the NER expenditure criteria

National Criteria	Activity
Efficient cost of achieving objective(s)	*Allowing the MDMS to become unsupported at end-of-life will result in significant additional operational costs and the real potential for major compliance breaches and the associated rectification costs and regulatory fines.* *The long term cost of replacing/upgrading the existing system with a modern, supported system will be less than that incurred through retaining the existing solution.*
Cost of a prudent operator	*The longer the time period that the current Gentrack MDMS is unsupported, the greater the risk of major non-compliance and significant additional costs being incurred for rectification and regulatory upgrades. Reliance on the 'reasonable endeavours' of the vendor to support the system, at significant additional cost, represents too high a risk to the organisation and its continued ability to operate and maintain compliance with the Rules.* *To prudently manage the level of risk associated with this system, it is necessary to undertake a full replacement of the functionality provided by the current mData21 system.*

National Criteria	Activity
Realistic expectation of forecast and cost impact	*Third party vendor costs have been obtained through detailed vendor consultations which costed line details of the required specifications.* *Timeframes that allow for the necessary level of testing and integration have been agreed with the vendors and the business.* *An existing model for the budgeting of internal resourcing of major IT projects, which has been successfully used in the past, has been used and which has contributed to TasNetworks winning a number of awards for project management[13]. The reasonableness of the resource estimates has been discussed with an external consultant. The daily rates applied to the resource estimates are the standard ones used within TasNetworks and are provided by the finance team.*

5. Scope

5.1 Scope of Need

TasNetworks has identified six areas of functionality[14] required for the replacement of its MDMS. The following summarise the requirements in-scope for the MDMS replacement:

- **Installation Management**: covering installation creation, static installation data, date effective installation data and installation data updates.

- **Customer Data Management**: customer data management functionality and capabilities including the ability to capture customer data through market transactions, manual inputs and the ability to review full date effective history.

- **Meter Management**: includes supporting basic meters, interval meters and logical meters (used for UMS), register configuration, data stream configuration and metering standing data updates.

- **Metering Provider (reading collection) (MPC) Obligations**: reading routes, calendar/cycle management, route sequence management, download management, upload management, outstanding read management and reporting.

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[13] Winner Best ICT Project 2014 Asia Pacific (APFPM) - Beijing 2014
  Full Retail Contestability – AIPM State Award – Project of the Year 2014
  Power of Choice: AIPM State award - Best Small Project 2018
  Power of Choice: TASICT - Best Project / Program Management 2018
  Ajilis Release 2 - Transforming Assets & Works Management – AIPM National Winner 2018, ICT/Telecommunications 2018
[14] TasNetworks – MDMS Replacement High Level Scope – V9

- **Metering Data Provider (MDP) Obligations**: basic reading processing, basic reading substitution, reading validation, reading storage and processing performance.

- **Unmetered Supply (UMS) Management**: includes inventory maintenance, standing data administration, and interval data management, processing performance, configuration, and logical data entities and reporting.

- **Market Integration**: There are two key areas of market integration that are in-scope for the MDMS replacement which extends to support of business to market transactions and business to business transactions. The MDMS will need to support B2M transactions such as CAT transactions, retailer transfers and role changes and MSATS synchronisation. B2B transaction support includes service order management, meter data provider support, customer notifications/requests and one-way notifications.

5.2   Scope of exclusions

TasNetworks has explicitly stated that various functions within the MDMS suite will be considered out-of-scope[15]. The following items are considered to be out-of-scope:

- **Market Gateway:** The market gateway functionality that is currently facilitated through Bravo is considered out-of-scope. The market gateway leads to AEMO's transaction hub for B2M and B2B transactions.

- **In-field Work Order Management:** The system used for scheduling, allocation and execution of In-field Work Orders is not in scope for this project. The current system will be replaced under a separate initiative replacing TVD CSC.

- **In-field Route Based Meter Reading Collection:** The process of in-field meter reading through the bulk process of walking a route will not be considered for replacement in this project. The current tool MVRS along with the associated handheld computing devices will interface to the new MDMS solution.

- **Distribution Billing:** The replacement of the Distribution Billing capability is in a separate initiative and is not in scope for this project. As a result the capabilities around tariff and invoice management, market NSW billing protocol support and unbilled energy are considered out-of-scope.

- **Distributed Energy Resources (DER) Trading:** Capabilities around managing bids, tracking dispatch and coordinating billing and settlement are considered out-of-scope. Functionality specification such as integration with DER billing systems and an interface to the national market platform are also considered out-of-scope.

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[15] TasNetworks – MDMS Replacement High Level Scope – V9

6.   Business Options

6.1   Option 0: Do Nothing

The 'Do Nothing' option retains the current state. TasNetworks does not undertake an initiative to replace and implement a new MDMS and remains with its current solution, Gentrack's mData21 with attendant supporting solutions.

6.1.1   Current State

The 'Do Nothing' option will result in no changes to the current state logical architecture. The current state logical architecture is depicted below:
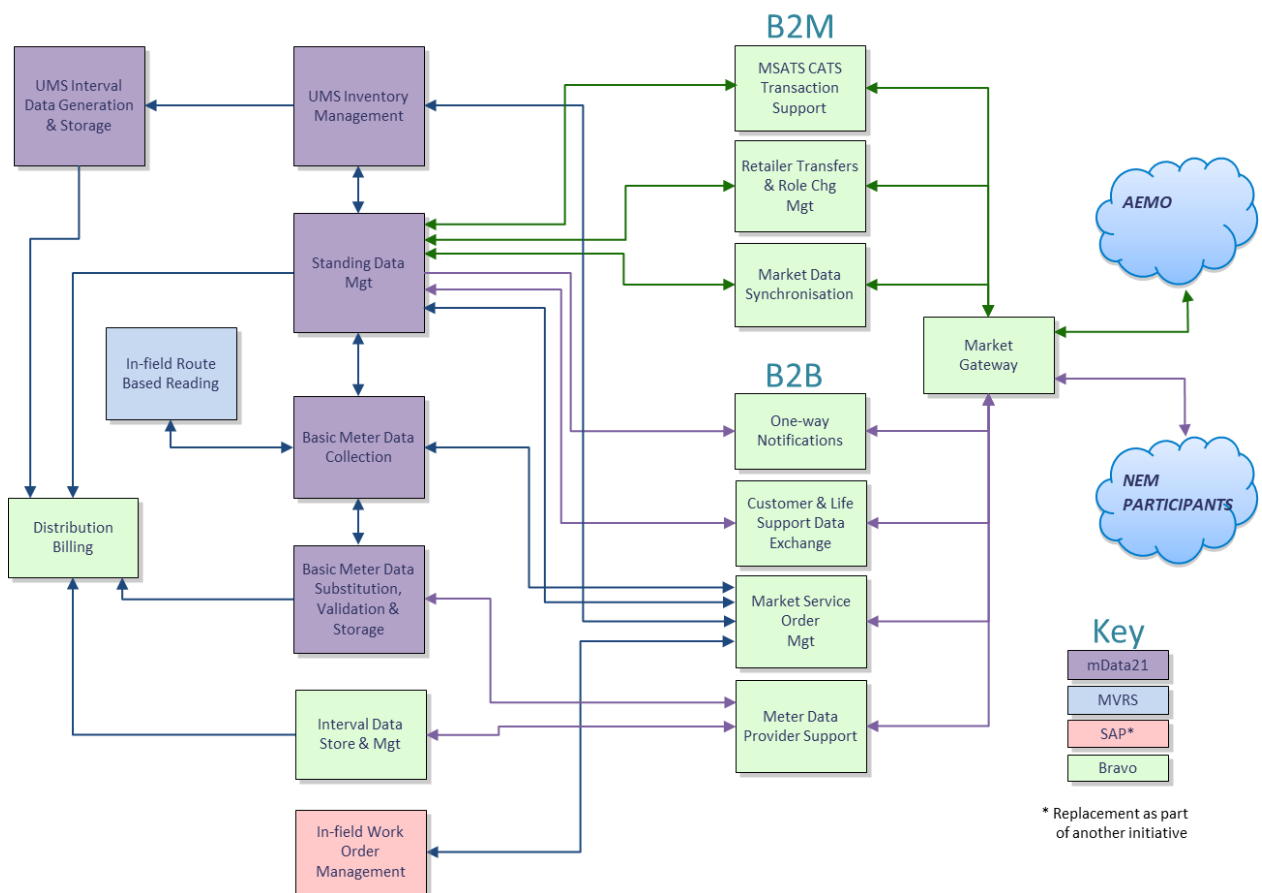
The current state logical architecture presents a framework of four interfaced solutions. Gentrack's mData21 provides standing data management functionality for installation and customer information.

Bravo is responsible for handing B2M and B2B transactions and interfaces with the in-field work order management solution (TVD CSC). Interval data and management functionalities are also embedded in the Bravo solution. Bravo acts as the gateway between TasNetworks and the market place.

6.1.2   Benefits

The benefit of this option is that TasNetworks will not incur any capital costs over those required for immediate regulatory compliance (e.g. 5-minute and global settlement).

6.1.3   Costs

Whilst this options incurs no additional CAPEX up front, TasNetworks will incur additional OPEX for the support provided by Gentrack post the end-of-life date of 25 June 2020. The extended support will result in support charges of 125% of current rates in the first year and 150% in subsequent years.

As time progresses, increasingly significant costs will likely be incurred on manual workarounds and rectification as the system ceases to cope with the volume of interval meter reads and future regulatory changes. The potential for major failures in meter management and billing and regulatory fines increases significantly.

6.1.4   Risks

There are a number of key risks associated with option 0 – Do Nothing.

| Reference	Description	Consequence	Likelihood
0-1	System failure – there is a significant risk associated with operating a major business system that is out of official support and for which only a 'reasonable endeavours' approach can be obtained. Any issues experienced with the system or need for regulation imposed changes, will represent an increasing risk of system failure as availability of the necessary technical resources becomes scarcer.	Severe	Possible
0-2	Noncompliance – the continuous pace of change in regulatory requirements together with the increasing difficulty in updating an aging, out of support system, seriously increases the risk of non-compliance with market obligations.	Severe	Possible
0-3	Cyber threats – as an aging system on old technology, the current Gentrack system is not considered secure enough in the face of increasing cyber threats and the requirements for security over critical infrastructure.	Severe	Possible

6.1.5   Timescale

The 'Do Nothing' option has no timeline. The key date for this option relates to the end-of-life support at 25 June 2020.

6.2   Option 1: Replacement with SAP

Option 1 is an initiative to implement the SAP MDMS solution, consolidating and enhancing TasNetworks' current SAP Enterprise Resourcing Planning (ERP) platform with industry specific modules. Implementing the MDMS components of SAPs industry specific modules allows TasNetworks to prudently manage licenses and drive efficiencies within the consolidated corporate and market systems.

Consolidating multiple systems into SAP's ERP reduces the IT environment's complexity, supports the adoption of shared business processes, data sets and systems across the business and seeks to maximise the value from the investment in SAP.

By implementing a MDMS module within the current ERP and revising interfaces across platforms, the future logical architecture would be structured as below:
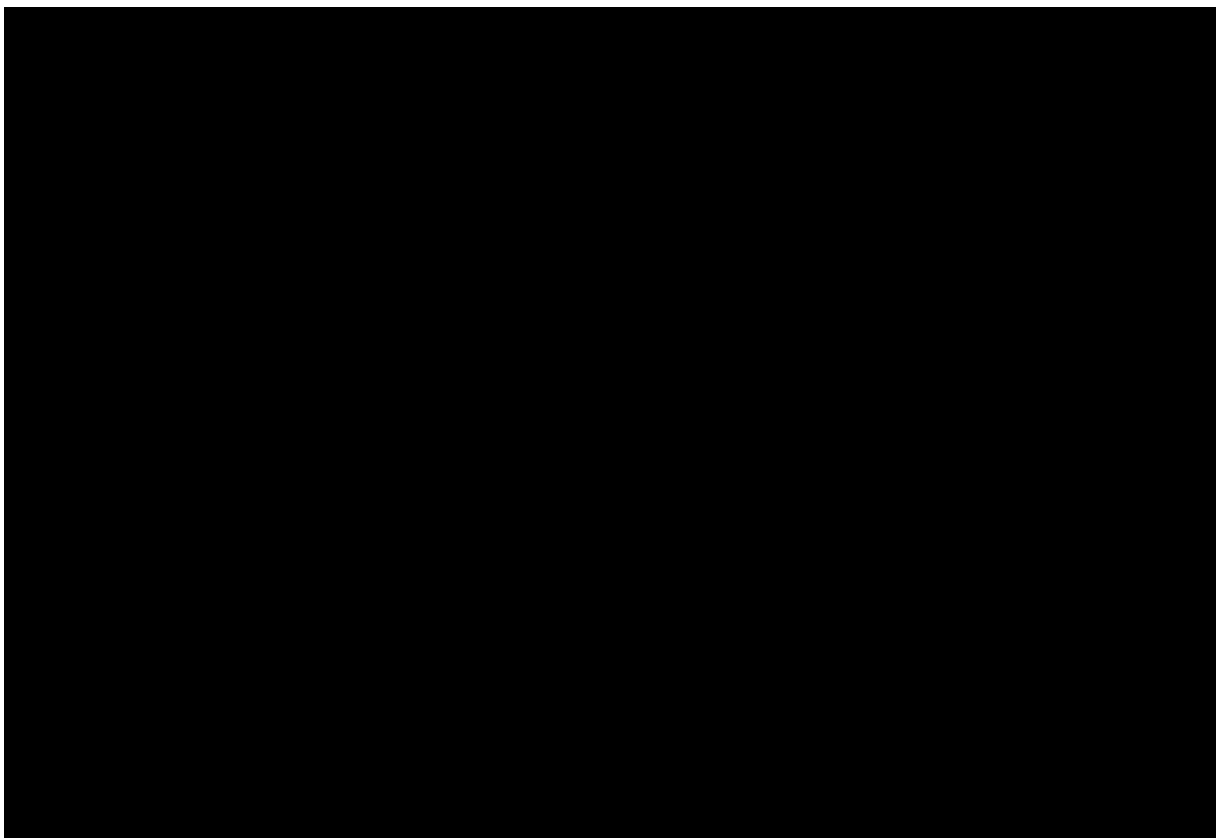
The future state for Option 1 varies greatly from the current state as an integrated SAP solution will replace multiple other vendor modules. TasNetworks will need to maintain an interface to market systems (Bravo) and the meter reading system (MVRS).

It is assumed that the meter interval data store, distribution billing and the market gateway will continue to be developed by Bravo and will need to interface with SAP modules.

6.2.1   Benefits

By undertaking this initiative the following benefits can be obtained:

Tangiblity	Benefit Type	Description	Value
▆▆▆	▆▆▆	▆▆▆▆▆▆▆	▆▆▆
▆▆▆	▆▆▆	▆▆▆▆▆▆▆	▆▆▆▆▆▆▆▆▆
▆▆▆	▆▆	▆▆▆▆▆	▆▆▆
▆▆▆	▆▆▆	▆▆▆▆▆	
▆▆▆	▆▆	▆▆▆▆▆▆	
Intangible	Strategic	SAP is a fully supported industry leading global solution with a strong Australian market footprint.	
▆▆▆	▆▆	▆▆▆▆	

6.2.2   Costs

The capital cost for the 2019-24 regulatory period is ▆▆▆▆ (Real 2018/19).

SAP Cost Summary								
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	TOTAL
▆▆▆	▆▆▆	▆▆▆	▆▆▆	▆▆▆	▆▆▆	▆▆▆	▆▆▆	▆▆▆

The total cost estimate of ████████ is based upon a mix of vendor provided estimates and detailed internal project resource plan (FTEs by role by daily rate per grade) that have been collated to derive the projection outlined above.

6.2.3   Timescale

The timing of the MDMS replacement project has been planned over two regulatory periods (2019 to 2024, 2024 to 2029) for two key reasons:

- In order to balance risk and customer and regulatory obligations, assessment over the current state of the application that make up the entirety of the MDMS solution revealed an immediate necessity to replace the TVD (service order management) solution (▲). The TVD CSC solution has a high risk of vendor failure and there is no upgrade path with the current vendor. The failure of TVD CSC will impact a number of customer facing processes such as connections, re-energisations/de-energisation, special and billing re-read and connection alterations.

- Because Gentrack has agreed to continue to support mData21 post its official end-of-life (June 2020) TasNetworks is able to delay the commencement of the MDMS replacement project until Q3 2022. This manages the risk associated with the existing system whilst efficiently spreading the capital cost of implementation over two regulatory periods.

The above strategy has been incorporated in TasNetworks project roadmap[16].

The implementation schedule covering two regulatory periods is illustrated below.
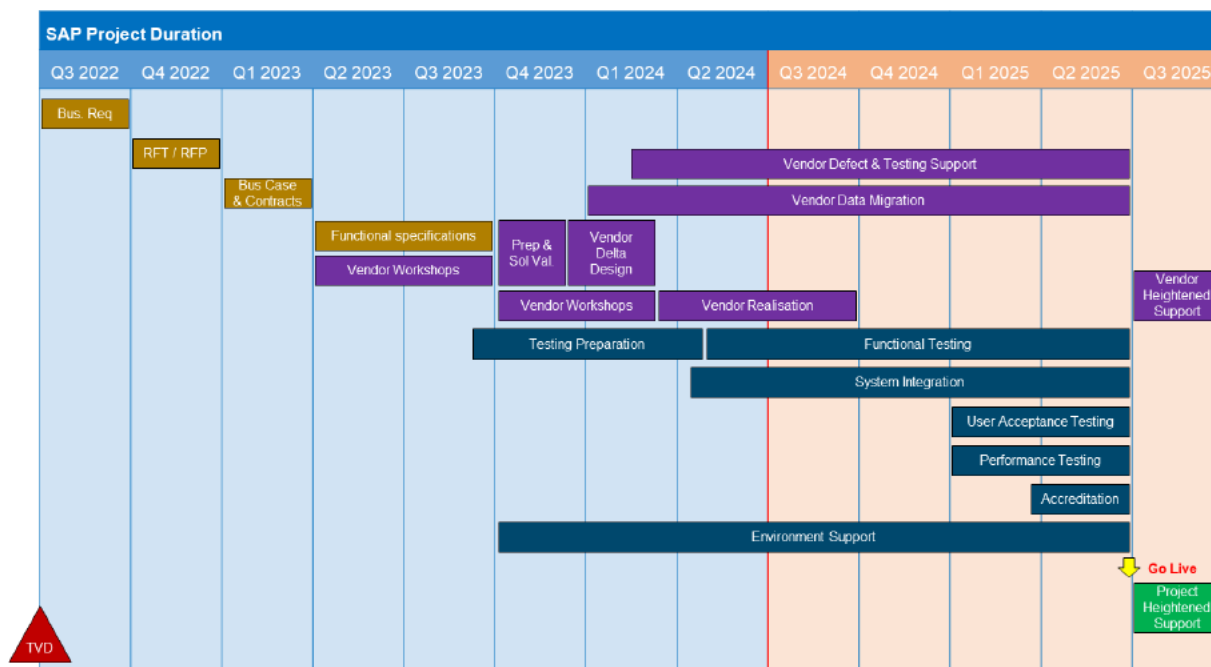
6.2.4   Risks

There are a number of key risks associated with Option 1 – Replacement with SAP.

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[16] TasNetworks – Market Systems Roadmap

Reference	Description	Consequence	Likelihood
1-1	SAP implementations have a reputation in the market place for going over budget. However, TasNetworks has successfully managed this risk in the past, as evidenced by the successful Ajilis project.	Minor	Possible
1-2	There is a risk that the project will extend beyond its three year timeframe and therefore increasing risks associated with operating mData21 beyond of end-of-life.	Moderate	Unlikely

6.3 Option 2: Replacement with Gentrack (Velocity)

Option 2 is a replacement of the current MDMS with the Gentrack solution Velocity. The replacement will result in an overhaul of the base technology currently in place.

The changes in the technology will result in changes in the underlying logical architecture as shown below:

██
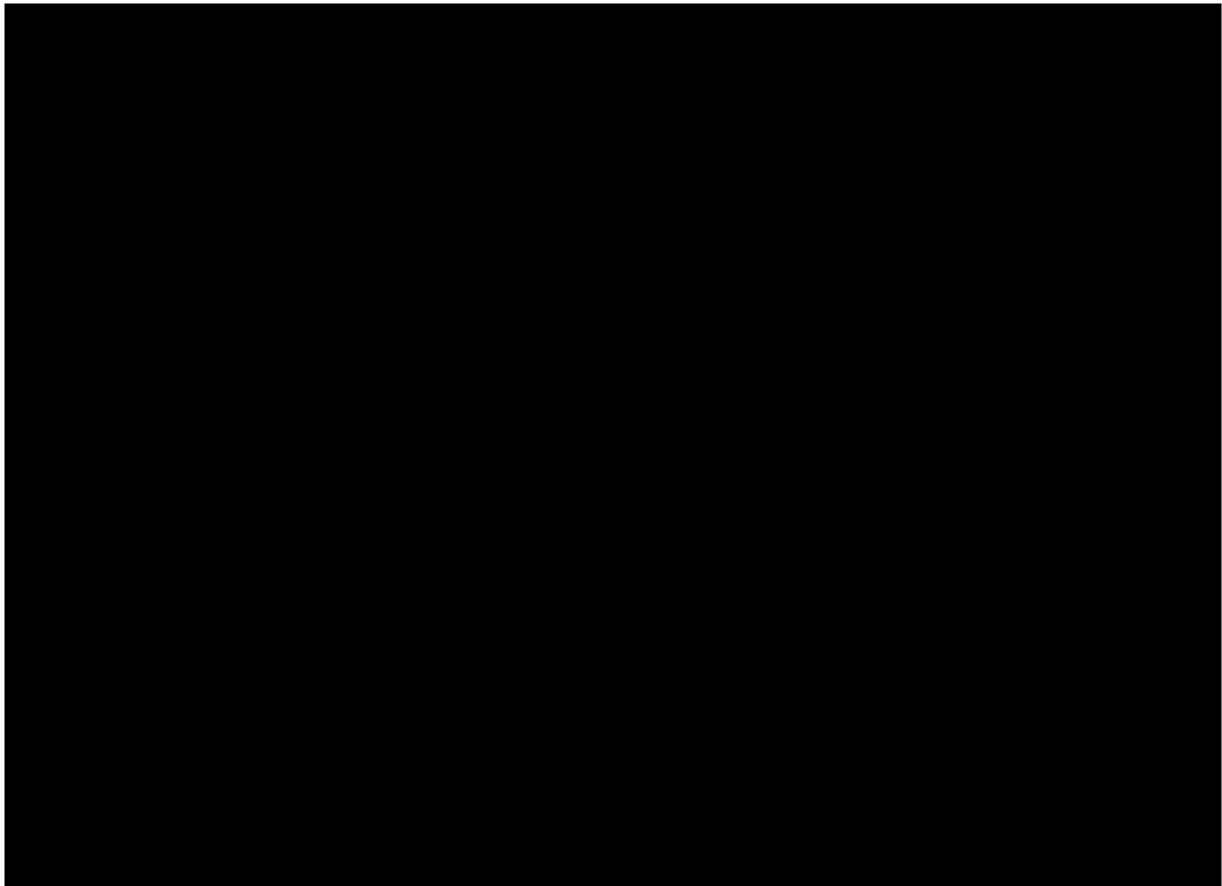
Velocity will be required to interface with the Bravo gateway, interval data store, the in-field work order management tool and the in-field route based reading management tool which remain with their current vendors.

6.3.1 Benefits

By undertaking this initiative the following benefits can be obtained:

Tangibility	Benefit Type	Description	Value
██████	██████	████████████████████ ████████████████████ ████████████████ ████	████████
██████	██████	████████████████████ ████████████	██████ ██
Intangible	Strategic	A long history of working constructively with this vendor has enabled a full and frank relationship to develop.	

6.3.2 Costs

The capital cost for the 2019-24 regulatory period is ██████ (Real 2018/19).

Velocity Cost Summary								
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	TOTAL
██								

Reg. Period Totals	████████	████████

The total cost estimate of ████████ is based upon vendor provided estimates together with a detailed internal project resource plan (FTEs by role by daily rate per grade) that have been collated to derive the projection outlined above.
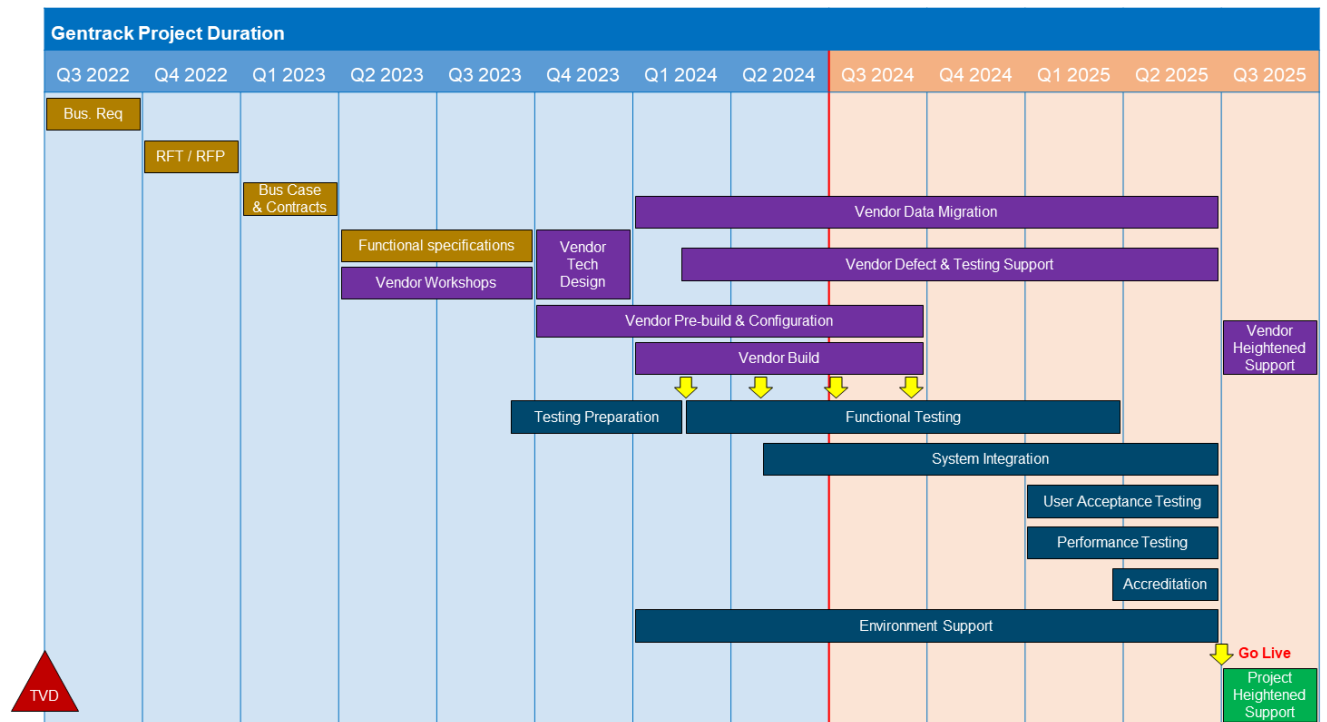
6.3.3 Risks

There are a number of key risks associated with Option 2 – Replacement with Gentrack (Velocity).

Reference	Description	Consequence	Likelihood
2-1	████████████████████████████████████ ████████████████████████████ ████████████████████████████ ████████████████████	Moderate	Possible
2-2	There is a risk that the project will extend beyond its three year timeframe and therefore increasing risks associated with operating mData21 beyond of end-of-life.	Moderate	Possible
2-3	Point-to-point integrations as suggested by Gentrack can become unmanageable and brittle, thereby limiting the ability to meet business needs and introducing instability to the network.	Moderate	Possible
2-4	████████████████████████████████████ ████████████████████████████████ ██████████████████████ ████████	Minor	Possible

6.3.4 Timescale

The diagram below illustrate the timeframe under which the Velocity implementation would be undertaken (over two regulatory periods).

Appendix – Risk Management Framework

LIKELIHOOD		CONSEQUENCE				
		1 NEGLIGIBLE	2 MINOR	3 MODERATE	4 MAJOR	5 SEVERE
• ≥ 99% probability • Impact occurring now • Could occur within "days to weeks"	5 ALMOST CERTAIN	MEDIUM	MEDIUM	HIGH	VERY HIGH	VERY HIGH
• 50% - 98% probability • Balance of probability will occur • Could occur within "weeks to months"	4 LIKELY	LOW	MEDIUM	HIGH	HIGH	VERY HIGH
• 20% - 49% probability • May occur shortly but a distinct probability it won't • Could occur within "months to years"	3 POSSIBLE	LOW	LOW	MEDIUM	HIGH	HIGH
• 1% - 19% probability • May occur but not anticipated • Could occur in "years to decades"	2 UNLIKELY	LOW	LOW	MEDIUM	MEDIUM	HIGH
• ≤1% probability • Occurrence requires exceptional circumstances • Only occur as a "100 year event"	1 RARE	LOW	LOW	LOW	MEDIUM	MEDIUM