

Multi Occupancy Buildings Safety Re-opener Submission

January 2024

Classification: Confidential

Table of Contents

1	Ofgem Requirement.....	3
2	Point of Contact	5
3	Exec Summary.....	6
4	Alignment with our RIIO-GD2 Business Plan, business strategy and future price controls	8
4.1	RIIO-GD2 Alignment.....	8
4.2	RIIO-GD3 Alignment.....	11
5	Problem Statement and Needs Case	12
5.1	Scope, triggers and needs case.....	12
6	Options Analysis and Preferred Option	15
6.1	Options considered.....	15
6.2	Methodology for selection	16
6.3	Preferred option.....	17
7	Cost and Benefits.....	19
7.1	Cost information	19
7.2	Cost efficiency and uncertainty	27
7.3	Cost benefit analysis and engineering justification.....	30
8	Delivery of Preferred Option.....	31
8.1	Delivery methodology	31
8.2	Delivery plan.....	33
8.3	Technology considerations	33
8.4	Governance.....	34
8.5	Risks and Dependencies	34
9	Stakeholder Engagement.....	35
9.1	Customer Engagement.....	35
9.2	HSE Engagement.....	36
10	Appendices.....	37
	Supporting Documents	37
	Appendix 1 – Glossary of Terms	37
	Appendix 2 – Detailed Cost Calculations	38

1 Ofgem Requirement

The table below outlines where each chapter of this application relates to Special Condition 3.21 of our Gas Transporter licence as well as Ofgem’s requirements as set out in Special Condition 9.4.

Ofgem requirement	Application chapter
GT licence – Special Condition 3.21 Multiple Occupancy Buildings safety Re-opener (MOBs)	
Circumstances for applying to Ofgem for Re-opener (Para 3.21.4)	Chapter 4 - Alignment with our RIIO-GD2 business plan, business strategy and future price controls Chapter 5 - Problem Statement and Needs Case
Application requirements (para 3.21.6, 3.21.8)	Chapter 3 – Exec Summary Chapter 4 - Alignment with our RIIO-GD2 business plan, business strategy and future price controls Chapter 5 - Problem Statement and Needs Case Chapter 6 – Options Analysis and Preferred Option Chapter 7 – Costs and Benefits Chapter 8 – Delivery of Preferred Option
RIIO-GD2 Re-opener Guidance and Application Requirements Document: Version 3 (Feb 2023)	
Introduction (value and justification of adjustment) (para 3.1)	Chapter 3 – Exec Summary
Gas Distribution Sector (para 3.6)	Chapter 3 – Exec Summary Chapter 7 – Costs and Benefits
Materiality threshold (para 3.7)	Chapter 3 – Exec Summary Chapter 7 – Costs and Benefits
Alignment with overall business strategy (para 3.10)	Chapter 4 - Alignment with our RIIO-GD2 Business Plan, business strategy and future price controls
Demonstration of needs case / problem statement (para 3.11, 3.12)	Chapter 5 - Problem Statement and Needs Case
Consideration of options and methodology for selection of the preferred option (para 3.13)	Chapter 6 – Options Analysis and Preferred Option
Preferred option (para 3.14)	Chapter 6 – Options Analysis and Preferred Option
Delivery of preferred option (para 3.15)	Chapter 8 – Delivery of Preferred Option

Stakeholder engagement and whole system opportunities (para 3.16, 3.17, 3.18)	Chapter 9 – Stakeholder Engagement
Cost information (para 3.19, 3.20, 3.21)	Chapter 7 – Costs and Benefits
Cost benefit analysis and EJPs (para 3.22, 3.23)	Chapter 7 – Costs and Benefits

2 Point of Contact

The table below provides a point of contact for this Re-opener application should you wish to discuss any elements of it or have further questions. To ensure any correspondence is picked up in a timely manner, should the point of contact be out of office, please also copy in our mailbox referenced below.

Name	Position	Email	Telephone
[personal information]	[personal information]	[personal information]	[personal information]

3 Exec Summary

This paper is Cadent's application to the Authority requesting an adjustment to our RIIO-GD2 allowances under the Multiple Occupancy Buildings safety Re-opener mechanism due to changes to an approved MOB Safety Works Programme.

In our RIIO-GD2 Business Plan submission we agreed a risk-based programme of surveys for Medium Rise Buildings (MRBs), High Rise Buildings (HRBs), Complex Distribution Systems (CDSs) as well as a small set of sample surveys for Large Diameter Services and Meter Banks. We also made a commitment to eliminate 90% of all building faults found by our ongoing survey programme prior to 31 April 2026. The drivers for surveying and resolving identified faults are primarily the provision of a reliable gas supply, keeping our customers safe, and legal and regulatory compliance.

To complete this work, as part of our RIIO-GD2 Business Plan submission, we requested £98.6m for "MOBs maintenance" which includes Medium Rise Building (MRB) Surveys, MRB Fault Resolution, HRB Surveys, HRB Fault Resolution, CDS Inspections, Meter Bank Surveys, Meter Bank Fault Resolution, Large Diameter Service Surveys, and Large Diameter Service Fault Resolution. The allowed revenue was set at £39.4m for all Cadent networks through Final Determinations. This was due to "serious concerns about the significant increases in proposed baseline costs in RIIO-GD2 and the company's ability to resource the increased workloads, particularly in London". However, given the acknowledged importance of the work in question, Ofgem "decided to put in place a common Re-opener for MOBs safety, which includes MOBs safety related maintenance". This Re-opener trigger relates specifically to the cost of surveys and fault resolution within MRBs (Multiple Occupancy Buildings between 3-5 floors).

We have considered several options from "do nothing" to an "accelerated identification and repair" programme. We have made the decision to continue with the proposed survey and fault resolution approach from our original Business Plan submission, however with more efficient triage around which faults require resolution, and more efficient fault resolutions. This will allow us to mitigate fault safety risks and will allow us to meet our commitment to fix 90% of faults identified through surveys within RIIO-GD2.

We have assumed the costs associated with the other items within the "MOBs maintenance" allowance (HRB surveys, HRB Fault Resolution, CDS Inspections, Meter Bank Surveys, Meter Bank Fault Resolution, Large Diameter Service Surveys, Large Diameter Service Fault Resolution) were not disallowed at Final Determinations as they are not within the scope of the Re-opener. Our total forecasted cost for the RIIO-GD2 regulatory period is [cost data] across all of our networks. Baseline allowance is £39.4m, therefore [cost data] additional funds are needed to deliver on this commitment, which exceeds the materiality threshold across all our networks.

	Total expected spend (£m)	Allowance (£m)	Incremental spend (£m)	Materiality Threshold (£m)	Requested Value (£m)
EN	[cost data]	6.6	[cost data]	[cost data]	[cost data]
NL	[cost data]	24.1	[cost data]	[cost data]	[cost data]
NW	[cost data]	5.6	[cost data]	[cost data]	[cost data]
WM	[cost data]	3.2	[cost data]	[cost data]	[cost data]
	[cost data]	39.4	[cost data]		[cost data]

Table 1 – Summary of Re-opener funding request

This funding is primarily required to increase our resourcing and accelerate our fault resolution.

We have a duty to maintain the reliability of our network and keep our customers safe and warm. Therefore, there is a need to identify and resolve faults as soon as possible before any minor faults become more critical, for example a corroded pipe will continue to corrode unless it is repaired, carrying out repair avoids future work that will be more expensive. This emphasises why it is important to invest now and not delay additional required expenditure in to RIIO-GD3.

This application will demonstrate:

- A robust forecast of survey and fault volumes.
- That the resolution of each fault type is necessary.
- The deliverability of the number of surveys/resolutions.
- That we are efficient in terms of cost per resolution.

4 Alignment with our RIIO-GD2 Business Plan, business strategy and future price controls

4.1 RIIO-GD2 Alignment

In our RIIO-GD2 Business Plan submission we agreed a risk-based programme of surveys for MRBs, HRBs, CDSs as well as a small set of sample surveys for Large Diameter Services and Meter Banks (see section 8.1 for an explanation of our risk-based survey approach). We also made a commitment to eliminate 90% of all building faults found by our ongoing survey programme prior to 31 April 2026.

The key investment drivers for surveying and resolving identified faults are:

- **Keeping our customers safe:** For customers and other building occupants, it is critical that we minimise the health and safety risks caused by failure of our pipes or gas assets. Failure can result in an uncontrolled escape of gas and a risk of fire or explosion. In addition, minor faults that do not impact on pipeline integrity can put people at risk e.g., a missing electrical continuity bond between gas and water pipes. Table 2 details the risks associated with each specific fault type.
- **Providing a reliable gas supply:** We recognise that in addition to distress and inconvenience, gas-supply interruptions can cause customer welfare issues. Our customers rely on their gas supply to heat their homes, cook food, and have access to hot water for washing and cleaning. A gas supply interruption therefore limits a customer's ability to keep warm, have access to hot food and hot water and other important daily functions. There are also potential risks to health e.g., not washing properly, impacting food preparation, or not having the ability to have a hot shower or bath. During supply interruption customers do not receive the gas transportation service that they are paying us for through their gas bill.
- **Legal and regulatory compliance:** We have various legal obligations in relation to ensuring the safety of our pipes, from the Health and Safety at Work Act 1974 to the Pipeline Safety Regulations (PSR) (1996). For example, Regulation 13 of the PSR requires us to ensure "the pipeline(s) are maintained in an efficient state, in efficient working order and in good repair".
- **Providing value for money to our customers:** We must provide the most efficient and cost-effective long-term solutions to minimise customer bills. Hence, by proactively rectifying minor faults, we will reduce the number of risers that need to be replaced by preventing them from deteriorating into costly, significant safety issues.
- **Providing wider benefits to society:** We recognise that gas leaks also have an environmental impact (gas is a greenhouse gas) and therefore minimising these will have a positive impact on the environment.

The types of faults we expect to identify through the survey programme and their corresponding risks are outlined below in Table 2:

#	Fault Type	Risk	Need for expenditure
1	Severe corrosion	Risk of pipe failure and gas leak.	To rectify corrosion.
2	Identification of buried pipe (DR4)	Risk of future damage by third parties. We have obligations to record the location of our mains and make these available to persons excavating to enhance their safety. However, approach mains to MOB's <=2" were not historically recorded.	To record asset data.
3	PIV Faults	Risk that PIV is not accessible to enable rapid isolation if there is a building emergency such as a fire.	To ensure accessible and operational PIV.
4	Missing Brackets	Risk that if brackets are missing or broken stresses can be placed on the pipes potentially damaging joints.	To ensure appropriate support.
5	Venting, Pipe Compartmentalisation, Fire Stopping	Risk of ineffective ventilation and inappropriate riser boxing, reducing ability to slow the impact of fire. Risk that if the location a pipe penetrates from one fire compartment to another is not sealed, it will not prevent the spread of fire or smoke.	To make the building owner aware of venting, pipe compartmentalisation and fire stopping issues.
6	Non-gas related fault incl. open ended and decommissioned apparatus	Various risks - Electrical continuity bonding issues, unprotected apparatus in proximity to sole means of escape, presence of decommissioned apparatus that is not marked as decommissioned or which breaches fire compartment and is not capped adequately.	To rectify any non-gas related faults.
7	ECV Operability & Meter Location	Risk that every customer cannot operate their emergency control so that they can isolate their gas supply if there is an emergency such as a gas escape on an appliance. HSE have required that when work is completed on a riser pipe meter points not in compliance with GSIUR should be moved or protected.	To ensure ECV operability and meter location compliance.
8	Illegal Connections	Risk of theft of gas, which will have a negative impact on billpayers.	To rectify illegal connections.
9	Missing Network Diagrams	Risk that emergency responders do not know which pipe supplies which customers and cannot locate isolation valves.	To ensure appropriate network diagrams.

10	Pipe & Valve Labelling	Risk that personnel are unable to identify valves that may need to be operated in emergency.	To ensure appropriate pipe and valve labelling.
11	3rd party issues (note: this is an additional fault type identified post RIIO-GD2 Business Plan submission)	Risk that 3rd party interference causes issues with gas infrastructure (for example cable ties being added to pipes damaging pipes, or preventing access as required)	To make building owner aware of 3rd party issues.

Table 2 – Fault types and associated risks

To complete this survey programme, and to resolve the faults identified, we requested £98.6m from Ofgem for “MOBs maintenance”. In addition to MRB Surveys and MRB Fault Resolution, this funding request also included HRB Surveys, HRB Fault Resolution, CDS Inspections, Meter Bank Surveys, Meter Bank Fault Resolution, Large Diameter Service Surveys, Large Diameter Service Fault Resolution. The allowance Ofgem provided in the RIIO-GD2 Final Determinations was £39.4m (i.e., a reduction of £59.2m) across all our networks. This was due to “serious concerns about the significant increases in proposed baseline costs in RIIO-GD2 and the company's ability to resource the increased workloads, particularly in London”. The result of these concerns was “[an adjustment of] Cadent's submitted MOBs maintenance costs based on the historical ratio between MOBs maintenance costs and MOBs Repex workloads”.

However, given the acknowledged importance of the work in question, Ofgem “decided to put in place a common Re-opener for MOBs safety, which includes MOBs safety related maintenance”. This is detailed within 3.21.4 of our Gas Transporter licence. This Re-opener application relates to Trigger 2 within the Re-opener:

The licensee may apply to the Authority for a direction to adjust the value of the MOBSt term for any Regulatory Year during the Price Control Period where there have been changes to an Approved MOB Safety Works Programme.

Where an *Approved MOB Safety Works Programme* is defined as “a programme of safety related works, including maintenance, repairs and surveys in Multiple Occupancy Buildings between 3-5 floors developed in agreement with the HSE”.

And *Multi Occupancy Buildings* are defined as “buildings containing a minimum of three individual premises, each with a separate supply point and supplied via an internal or external riser, and where at least one of those premises is more than two floors above ground level. The premises may be domestic, non-domestic, or a combination of the two. Buildings where all premises on the third floor or above are supplied through individual pipes, with the meter and emergency control valve located at a lower level, are not included. MOBs are categorised as medium-rise (3 – 5 floors), high-rise (6 – 9 floors) or high risk (10+ floors).

4.2 RIIO-GD3 Alignment

We will continue to survey our MOB's portfolio and identify and resolve faults as we progress into RIIO-GD3 and beyond. Therefore, our RIIO-GD3 submission will be aligned with our survey and fault resolution volumes and run rate.

- Surveys are expected to continue at their current run rate.
- Given the focus on fault resolution and the number of faults that will have been resolved by the end of RIIO-GD2 we assume that the level of fault-repair workload will reduce in RIIO-GD3 compared to the volume of faults resolved in RIIO-GD2 (this is despite ongoing deterioration of assets as they age).

More broadly, given that we have only been surveying a sample set of our portfolio of Large Diameter Services and Meter Banks in RIIO-GD2, we expect increased volumes of surveys and faults identified and resolved in RIIO-GD3.

We are currently reviewing our RIIO-GD3 submission in relation to MOB's, and identifying potential work requirements, which includes the PE riser replacement programme. Buildings greater than 18 meters in height are not permitted to have PE risers under current building regulations. This will result in workload to resolve this in RIIO-GD3 which we will address in the business plan submission.

5 Problem Statement and Needs Case

5.1 Scope, triggers and needs case

Problem Statement

Cadent have been completing a risk based MRB survey programme, as proposed in our original RIIO-GD2 Business Plan submission (see section 8.1). Our survey frequencies are supported by the HSE and are required for us to meet industry good-practice and remain compliant with PSR. The level of faults being identified is broadly in line with original forecasts. We have completed 42,930 MRB surveys and identified 192,981 faults thus far. We expect to complete 78,214 surveys and identify 363,418 faults over the RIIO-GD2 period, and currently do not have the funds available to meet these anticipated volumes.

Based on these volumes, and to enable Cadent to meet our commitment of 90% fault resolution, we are requesting an additional allowance of [cost data] in RIIO-GD2. We have a duty to maintain the reliability of our network and keep our customers safe and warm. Therefore, there is a need to identify and resolve faults as soon as possible before any minor faults become more critical, for example a corroded pipe will continue to corrode unless it is repaired, carrying out repair avoids future work that will be more expensive. This emphasises why it is important to invest now and not delay additional required expenditure in to RIIO-GD3.

Needs Case

We bring gas to 11 million homes and businesses throughout the North West, West Midlands, East Midlands, East of England and North London and transport gas to circa 500,000 MOB connected customers. We're committed to keeping customers safe and warm. In our RIIO-GD2 Business Plan submission, we agreed a risk-based programme of surveys for MRBs, HRBs, CDSs and Large Diameter Services and Meter Banks. We also made a commitment to eliminate 90% of all building faults found by our ongoing survey programme prior to 31 April 2026.

To complete this "MOBs maintenance" work, which includes Fault Resolution, we requested £98.6m as part of our RIIO-GD2 Business Plan submission. The allowance Ofgem provided in the RIIO-GD2 Final Determinations was £39.4m.

Cadent have been completing the risk-based survey programme, as proposed in the original Business Plan submission (See section 8.1), and the level of faults being identified is broadly in line with this (we originally forecast 328,000 faults identified over the period for MRBs and are now forecasting 363,418).

Our fault resolution process has been streamlined by assessing the resolution approach for all fault types and therefore implementing improvements across various elements of our resolution policy, which ensures the most cost-effective delivery of workload. For example:

- We are now including a risk assessment for all brackets, and for all PIVs smaller than 2 inches in diameter. This means that in many cases we do not need to complete a full replacement. Our original proposal was to complete a full replacement in all instances.
- We have also done significant work to reassess the most efficient fault resolution process and have managed to materially reduce the average cost of resolving several fault types. Overall, we have reduced the number of instances that fault resolution is required, and the average duration/materials cost of the proposed resolution.

Assuming no change to the other items within the “MOBs maintenance” workload (HRB surveys, HRB Fault Resolution, CDS Inspections, Meter Bank Surveys, Meter Bank Fault Resolution, Large Diameter Service Surveys, Large Diameter Service Fault Resolution) we forecast an overall requirement of [cost data]. Therefore, to enable Cadent to meet our commitment of 90% fault resolution for MRBs, we are requesting an additional allowance of [cost data].

	Total spend (£m)	Allowance (£m)	Incremental spend (£m)	Materiality Threshold (£m)	Requested Value (£m)
EN	[cost data]	6.6	[cost data]	[cost data]	[cost data]
NL	[cost data]	24.1	[cost data]	[cost data]	[cost data]
NW	[cost data]	5.6	[cost data]	[cost data]	[cost data]
WM	[cost data]	3.2	[cost data]	[cost data]	[cost data]
	[cost data]	39.4	[cost data]		[cost data]

Table 3 – Summary of Re-opener funding request

We have currently been prioritising critical fault resolutions such as corrossions. We will need to increase our resources to resolve other fault types and therefore require additional funding to meet our commitments and obligations.

The key risks associated with non-resolution / non-compliance are:

- Safety (as detailed in Table 2), it is critical that we minimise the health and safety risks cause by failure of our gas assets or risks posed by the buildings they are situated in. Failure can result in an uncontrolled escape of gas and a risk of fire or explosion.
- Risks to reliable gas supply, of which breaches Cadent's purpose of keeping people warm whilst protecting the planet, as we are responsible for ensuring the safe and reliable flow of energy.
- Environmental, gas leaks have a negative environmental impact (gas is a greenhouse gas) and minimising leaks will have a positive impact on the environment.
- Risk of non-compliance with the legislation and regulation detailed in section 4.1 can also lead to costly and time-consuming legal disputes. Legal disputes can also have negative impacts on the company's reputation and should be avoided at all costs. Cadent also have a duty to comply with our obligations to building owners who are becoming more active and insistent that we put things right.
- Reputation damage, losing the trust of our customers, stakeholders, partners, and investors could have long-term effects on Cadent. We want to continue to be trusted within our communities, and with our charity partners, where we continue to support our customers who find themselves in vulnerable circumstances.

Table 4 details the total number of properties, risers (assets), and supply points (customers) which have had MRB surveys completed and faults resolved over the RIIO-GD2 period.

	Total properties	Total risers	Total supply points
EN	14,486	26,134	112,050
NL	44,826	95,025	458,402
NW	11,743	19,739	82,592
WM	7,159	13,460	61,656

Table 4 – Total number of properties, risers (assets), and supply points (customers) which have had MRB surveys completed and faults resolved over the RIIO-GD2 period

Affected customers and assets

Cadent aspires to provide a safe and reliable gas supply to customers and must understand and mitigate the risks posed by operating pipes within or attached to a building.

By having a targeted approach to resolve 90% of faults identified, we expect to reduce risk exposures and reduce the number of interruptions in a cost-effective way that minimises impact on customers.

6 Options Analysis and Preferred Option

6.1 Options considered

In our original RIIO-GD2 Business Plan submission we proposed the following options:

- **Option 1** - Minimal work: In this option we continue as we have done in RIIO-GD1, and continue with the proposed survey programme, but only resolve major faults and some types of minor faults within HRBs. This avoided operating costs in the short term but would leave our assets non-compliant with legislation and does not mitigate the safety risk caused by the faults identified. It would also lead to an increasing number of interruptions and major interventions when risers must be replaced.
- **Option 2** - Recover located faults over the RIIO-GD2 period: in this option we continue our scheduled inspections and recover the faults over the RIIO-GD2 period. This is the least cost option and allows us to continue to comply with our statutory requirements and obligations.
- **Option 3** - Complete fault repair at an aspirational fault outstanding time: the HSE have maintained that they expect faults to be fixed in days to weeks of being identified, with the deadline based on the risk that they pose. However, this is not always a mandatory requirement, and were we to adopt this for outstanding faults, we would require higher resource levels, significantly increasing our costs and customer bills.
- **Option 4** - Accelerated identification and repair, where inspections due in RIIO-GD3 are brought forwards to RIIO-GD2. Our inspection plan will complete improved inspections of around 70% of buildings by the end of RIIO-GD2. The remaining 30% were last inspected before we improved our processes to include the location of a wider range of fault types. These buildings will not be due for inspection again until RIIO-GD3. Therefore, we could bring forwards the inspection and thereby accelerate the identification of any faults that are associated with such buildings.

Option 2 was chosen in our original RIIO-GD2 Business Plan, and we committed to eliminate 90% of all building faults found by our ongoing survey programme prior to 31 April 2026.

Upon receiving an allowance of £39.4m at Final Determinations versus the proposed £98.6m we reflected and reassessed whether any new options presented themselves. This led to the creation of option 2b:

- **Option 1** Minimal work (Option 1 from above, do nothing / do minimum)
- **Option 2a** Recover located faults over the RIIO-GD2 period (Option 2 from above)
- **Option 2b (Preferred Option)** Building on option 2 from above but reassessing the specific fault resolutions to ensure compliance and resolution of the issue, at the most efficient cost. For example, we are now using an indicative diagram to resolve missing network diagram faults, rather than a diagram specific to each building. This is a more efficient solution and provides a better outcome for customers through lower bills.

- **Option 3** Complete fault repair at an aspirational fault outstanding time (Option 3 from above)
- **Option 4** Accelerated identification and repair where inspections due in RIIO-GD3 are brought forwards to RIIO-GD2 (Option 4 from above)

We have not included a market-based option in our submission as the nature of these works lend themselves to our aspired “fix on find” methodology that we are currently using via Cadent field force. Although several faults will never be possible to resolve on discovery, we continue to aspire to resolve as many as we can when found. This methodology would not be possible under a fault resolution contracted arrangement.

6.2 Methodology for selection

We considered these options against 3 criteria:

1. Mitigation of safety risks and legislative compliance
2. Deliverability
3. Impact of the cost of the work on customers

	Option 1 Minimal work	Option 2a Recover located faults over the RIIO-GD2 (1)	Option 2b Recover located faults over the RIIO-GD2 period (2)	Option 3 Complete fault repair at an aspirational fault outstanding time	Option 4 Accelerated identification and repair where inspections due in RIIO-GD3 are brought forwards to RIIO-GD2
Legislative compliance	Legislatively non-compliant, and does not mitigate the safety risk caused by the faults identified	Legislatively compliant and mitigates safety risk caused by faults identified	Legislatively compliant and mitigates safety risk caused by faults identified	Legislatively compliant and mitigates safety risk caused by faults identified	Legislatively compliant and mitigates safety risk caused by faults identified
Deliverability	Most deliverable	Deliverable	Deliverable (higher deliverability than 2a)	Low deliverability given finite resources	Least deliverable
Cost impact to customers	Lowest cost to customers	Medium cost to customers	Low cost to customers	High cost to customers	Highest cost to customers

Table 5 – Options assessment

The process used to select the options was internal, with Option 2a previously agreed through our RIIO-GD2 Business Plan submission. Following our Final Determination outcome and the subsequent period of reflection, given the commitments to our risk-based survey approach and 90% fault resolution, we believe that the core ethos of Option 2 is correct. Option 1 leaves us non-compliant with legislation and does not mitigate the safety risk caused by faults identified. Option 3 and Option 4 would add to customer cost and reduce deliverability.

Given funding constraints, and an evolving understanding of possible fault resolution requirements, we were able to identify and suggest Option 2b. This is in line with the original Option 2 but with the

potential for more efficient resolutions, resulting in a better customer outcome. Therefore, it was agreed that Option 2b would be taken forward as the preferred option for the RIIO-GD2 period.

6.3 Preferred option

In our needs case we set out the need for additional funding to undertake an approved programme of works relating to MRB surveys and follow-on fault resolution work. We are required to complete this work in line with our duties under the PSR and our business priorities to keep our customers safe and maintain a reliable network.

Option 2b will allow us to remain legally and regulatory compliant and mitigate the safety risks detailed in Table 2 (e.g., risk of gas leak due to severe corrosion), allowing us to meet our commitment to fix 90% of faults identified through surveys within RIIO-GD2.

Table 6 details the specific resolutions agreed in Option 2b.

#	Type Of Fault	Description/Reason for Work	Resolution Description
1	Severe Corrosion	Treat Severe Corrosion and coat pipe to prevent pipe failure and extend Asset Life.	Each area of severe corrosion rectified
2	Identification of buried pipe (DR4)	Identify precise location and other details of buried pipe e.g., PIV and Update Asset Records.	Each Supply Pipe with a PIV or solely a PIV resolved by DR4 Process
3	PIV Faults	Dig out of PIV and install new frame and cover, install new PIV, clear PIV chamber. Must ensure all PIV's can be located and operated in event of emergency.	Risk Assessment for each PIV fault with a <2" supply pipe for an MRB. Each PIV Rectified is defined as a resolved fault.
4	Missing Brackets	Replace missing or damaged Brackets to prevent unnecessary stress being placed on Joints and/or pipes.	Risk Assessment for each bracket fault of: <ul style="list-style-type: none"> • Red – Pass to design to determine Action. • Green – No further action Each bracket subject to Risk Assessment constitutes a fault. Both action / no action constitutes a fault resolution.
5	Venting, Pipe Compartmentalisation, Fire Stopping	Ensure the effectiveness of ventilation and that risers are appropriately boxed in to slow the impact of fire upon them.	Letter to building owner constitutes resolution of the fault.

		Ensure that pipes that pass-through walls, floors, or ceilings are sealed to prevent the passage of fire or smoke.	
6	Non-gas related fault incl. open ended and decommissioned apparatus	Electrical Bonding, unprotected apparatus in proximity of sole means of escape. Presence of decommissioned apparatus that is not marked as decommissioned or breaches fire compartments is not capped adequately.	Removal of assets, capping of open-ended pipes, labelling of decommissioned pipes, cross bonding decommissioned pipes.
7	ECV Operability & Meter Location	Restore ECV operability such that customers can turn off their supply in the event of an escape of gas.	Fit an ECV handle and split pin. Replace ECV. Relocate ECV to a position that it can be operated by the customer.
8	Missing Network Diagrams	Ensure that every Riser has a schematic diagram fitted to the wall near to the point where the supply enters the building. Required such that Emergency Service workers can identify which pipe supplies what properties and the location of Isolation Valves.	Fixing a diagram for each riser will count as resolution of a fault. Generic schematics can be used where appropriate.
9	Illegal Connections	Identified Theft of Gas to be passed into relevant process.	Report Theft of Gas through established process.
10	Pipe & Valve Labelling	Install missing labels to pipes and valves to identify as Gas Assets to prevent damage and identify Valves that may need to be operated in and emergency.	Labelling each Riser or PIV will count as one resolution per fault.
11	3rd party issues (note: this is an additional fault type identified post RIIO-GD2 Business Plan submission)	Ensure that 3 rd party issues (e.g., cables tied to pipes by building inhabitants) do not affect the accessibility or functionality of our assets.	Letter to building owner constitutes resolution of the fault.

Table 6 – Resolution by fault type

Where appropriate we have risk assessed some faults and at this time deem that no action is required, but we will continue to monitor through future surveys. Faults will be re-assessed and actioned if the risk is deemed to have increased.

Option 2b allows us to meet our customers' expectations by proactively resolving faults as they arise, providing a myriad of safety benefits outlined in section 7.3.

7 Cost and Benefits

7.1 Cost information

In determining the overall cost of the programme, the key variables are:

1. Volumes (of surveys and faults), as detailed in 7.1.1 and further details in Appendix 2.
2. Unit costs (of survey and resolution by fault type), as detailed in section 7.1.2 and further details in Appendix 2, are comprised of:
 - a. Time cost to complete each job.
 - b. Fully loaded FTE rate.
 - c. Materials cost to complete each job.

7.1.1 Volumes

Table 7 and Table 8 show the total number of MRB surveys and faults expected to be raised over the whole RIIO-GD2 period. Data is based on actuals until August 2023. Forecast surveys are based on future survey dates from asset data stored in our ESRI software and building data stored on XOSERVE. Forecast faults are based on survey forecasts and average faults identified per survey. An external consultancy has been brought in to support reconciliation of these datapoints.

It is worth noting that these volumes include surveys for buildings which we originally believed to be MRBs, but instead were demolished, had no gas, meter banks, or were less than 3 stories etc. We have included these figures given that visiting these buildings is part of the overall process of servicing MRBs. In exceptional circumstances, we will resolve faults following these surveys where we find corrosions or other high criticality fault types, these have also been included.

#	Job type	EN	NL	NW	WM	Total
A	MRB survey	14,486	44,826	11,743	7,159	78,214
	Total					78,214

Table 7 - MRB survey volumes over total RIIO-GD2 period split by network

#	Job type	EN	NL	NW	WM	Total
1a	Severe corrosion	207	1,613	210	95	2,125
1b	Severe corrosion (non-refurbishable)	126	979	127	58	1,290
2	DR4	6,693	4,874	4,048	3,864	19,479
3a	PIV Install	131	150	0	18	299
3b	PIV Remediation	14,360	10,141	15,148	14,599	54,248
4	Missing Brackets	16,456	14,725	8,433	8,739	48,353
5	Venting & Compartmentalisation / Fire Stopping	20,439	58,839	11,985	18,187	109,450
6a	Non fully decom pipes	0	21	0	0	21
6b	Open ended pipes	66	315	85	44	509
7	ECV Operability & Meter Location	684	2,863	370	523	4,440
8	Illegal Connections	2	52	5	7	65

9	Missing Network Diagrams	12,623	0	11,651	7,995	32,269
10	Pipe & Valve Labelling	21,685	46,876	11,535	7,725	87,821
11	3rd party issues	504	1,999	163	383	3,049
	Total					363,418

Table 8 - MRB fault volumes over total RIIO-GD2 period split by network

As this Re-opener specifically relates to MRBs, data for the below “MOBs maintenance” components are assumed to be as per our original Business Plan/ Final Determination:

- HRB Surveys
- HRB Fault Resolution
- CDS Inspections
- Meter Bank Surveys
- Meter Bank Fault Resolution
- Large Diameter Service Surveys
- Large Diameter Service Fault Resolution

Recent analysis has suggested that we are spending more than expected across HRB Surveys and HRB Fault Resolution. However, the remaining MOBS maintenance components are likely to be in line with previous expectations.

7.1.2 Unit costs

Table 9, Table 10 and Table 11 detail the unit costs for MRB surveys and subsequent fault resolutions. These are primarily based on historic data with input from business experts for some fault types. Table 10 and Table 11 differ as we plan to complete more “fix on find” for faults from April 2024, increasing our efficiency and reducing travel time. Both figures have been used to calculate the overall costs in 7.1.3.

As this Re-opener specifically relates to MRBs, data for the below “MOBs maintenance” components are assumed to be as per our original Business Plan Final Determinations:

- HRB Surveys
- HRB Fault Resolution
- CDS Inspections
- Meter Bank Surveys
- Meter Bank Fault Resolution
- Large Diameter Service Surveys.
- Large Diameter Service Fault Resolution

#	Job type	Job duration (mins)	Fully loaded FTE rate (£/min)				People per team	Materials costs (£)	Conversion to 18/19	Total cost per job (£)			
			EN	NL	NW	WM				EN	NL	NW	WM
A	MRB survey	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]

Table 9 – MRB survey costs split by network – Pre and Post April 2024

#	Job type	Job duration (mins)	Fully loaded FTE rate (£/min)				People per team	Materials costs (£)	Conversion to 18/19	Total cost per job (£)			
			EN	NL	NW	WM				EN	NL	NW	WM
1a	Severe corrosion	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
1b	Severe corrosion (non-refurbishable)	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
2	DR4	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	2	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
3a	PIV Install	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	2	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
3b	PIV Remediation	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	2	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
4	Missing Brackets	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
5	Venting & Compartmentalisation / Fire Stopping	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
6a	Non fully decom pipes	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
6b	Open ended pipes	[duration data]]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]

7	ECV Operability & Meter Location	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1 Your Gas Network	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
8	Illegal Connections	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
9	Missing Network Diagrams	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
10	Pipe & Valve Labelling	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
11	3rd party issues	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]

Table 10 - MRB fault resolution costs split by network – Pre April 2024 – Note that Non Fully Decommissioned Pipes and Illegal Connections have not been costed given extremely low volumes

#	Job type	Job duration (mins)	Fully loaded FTE rate (£/min)				People per team	Materials costs (£)	Conversion to 18/19	Total cost per job (£)			
			EN	NL	NW	WM				EN	NL	NW	WM
1a	Severe corrosion	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
1b	Severe corrosion (non-refurbishable)	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
2	DR4	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	2	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
3a	PIV Install	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	2	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
3b	PIV Remediation	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	2	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
4	Missing Brackets	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
5	Venting & Compartmentalisation / Fire Stopping	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
6a	Non fully decom pipes	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
6b	Open ended pipes	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
7	ECV Operability & Meter Location	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
8	Illegal Connections	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
9	Missing Network Diagrams	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]

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10	Pipe & Valve Labelling	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1 Your Gas Network	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]
11	3rd party issues	[duration data]	[cost data]	[cost data]	[cost data]	[cost data]	1	[cost data]	0.798	[cost data]	[cost data]	[cost data]	[cost data]

Table 11 - MRB fault resolution costs split by network – Post April 2024 – Note that Non-Fully Decommissioned Pipes and Illegal Connections have not been costed given extremely low volumes

7.1.3 Overall cost

Table 12 details the overall cost split by network. The overall Re-opener funding request is [cost data] and we meet the materiality threshold within all networks.

		EN	NL	NW	WM	Total
	BP Submission	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	Allowance	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
Scope of Re-opener	MRB Survey Completed (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	MRB Survey Remaining (incl. Forecast) (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	MRB Fault Resolution Completed (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	MRB Fault Resolution Remaining (incl. Forecast) (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
Wider "MOBs Maintenance Pot"	HRB Survey BP / FD (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	HRB Fault Resolution BP / FD (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	CDS BP / FD (£m) *	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	Meter Bank Survey BP / FD (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	Meter Bank Fault Resolution BP / FD (£m) *	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	Large Diameter Service Survey BP / FD (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	Large Diameter Service Fault Resolution BP / FD (£m) *	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	Total expected spend (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	Submission value (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
	Materiality threshold (£m)	[cost data]	[cost data]	[cost data]	[cost data]	

Table 12 – Overall expected "MOBs Maintenance" Spend and value of submission (* Note that these items have been pro-rated across the networks based on the ratios of the overall BP Submission as it was not clear from the original submission what the split was across each network)

	-2020	2021	2022	2023	2024	2025	Total
EN (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NL (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NW (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
WM (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
Total	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]

Table 13 – MRB Survey cost expected breakdown by year

	-2020	2021	2022	2023	2024	2025	Total
EN (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NL (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NW (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
WM (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
Total	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]

Table 14 – MRB Fault resolution cost expected breakdown by year (note 1: this is based on faults identified rather than faults resolved, therefore not all faults identified in previous years are completed) (note 2: this is based on 90% completion of faults within RIIO-GD2) (note 3: “-2020” relates to faults raised prior to RIIO-GD2 which need to be resolved in RIIO-GD2)

	-2020	2021	2022	2023	2024	2025	Total
EN (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NL (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NW (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
WM (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
Total	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]

Table 15 – MRB Survey cost completed breakdown by year

	-2020	2021	2022	2023	2024	2025	Total
EN (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NL (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NW (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
WM (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
Total	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]

Table 16 – MRB Fault resolution cost completed breakdown by year

To establish and understand our fault workload, we have captured them at the point the survey was completed, in the year that they were identified and raised. There are a number of faults that were raised against surveys completed in RIIO-GD1 that were not actioned within that period and will be rectified during RIIO-GD2.

Timing of fault resolution depends on its criticality, and not all faults can be rectified in the year that they were identified. We have also done work on what resolution of a fault looks like which has impacted on the timing of resolution.

For simplicity we have included actual costs incurred relating to faults resolved within Years 1, 2, and part of year 3, and included a forecast the remainder of assumed costs to resolve across the remainder of the period. Not all actual costs incurred within Years 1 and 2 will relate to faults identified within year, a proportion will relate to resolving faults in previous years.

	-2020	2021	2022	2023	2024	2025	Total
EN (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NL (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
NW (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
WM (£m)	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]
Total	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]	[cost data]

Table 20 – MRB Fault resolution cost phasing

7.2 Cost efficiency and uncertainty

There are 5 key variables in driving cost efficiency and uncertainty. Table 17 details our assessment of each of these drivers against uncertainty and controllability / efficiencies.

#	Cost driver	Uncertainty	Controllability / Efficiencies
1	Volume of surveys	<p>Low - Given we have already agreed the risk-based survey methodology, which forecasts a regular cadence of surveys based on a buildings risk score (See 8.1), there is a high degree of certainty around the number of surveys expected.</p> <p>Some uncertainty can be driven by backlogs (e.g., due to Covid accessibility issues) or due to surveys coming from outside of the cadence (e.g., a Local Authority flags the need for a survey due to a specific issue). However, this is limited.</p>	<p>Low - Given we have already agreed the survey methodology (See 8.1) the volume of surveys has a low level of controllability.</p>
2	Volume of faults	<p>Medium - The number of faults that are identified / need to be resolved is a function of:</p> <ul style="list-style-type: none"> • The number of surveys – There is low uncertainty. • Our definitions of faults – There is low uncertainty as generally our definitions have been consistent over the period, with some minor changes. • Our policy on fault resolution – There is medium uncertainty as we have updated our approach to fault resolution during the period (e.g., adding a risk assessment to ensure that we only resolve PIV and missing bracket faults where necessary) • Our processes and data – Historically, there has been medium uncertainty due to process and system discrepancies between networks. This has been mitigated using a 3rd party consultancy to assure our data 	<p>Low - Given we have already agreed the survey methodology (refer to risk based diagram) and in general the number of faults is a function of number of surveys, there is a low level of controllability.</p> <p>We could look to resolve less fault types but have already committed to 90% resolution of the list flagged in the Business Plan submission.</p>

		It is also being mitigated by ongoing process and systems improvements (see 8.3).	
3	Job duration	Medium - There is some uncertainty in our calculation of job duration, this is primarily due to the high number of variables within different job types (whilst one corrosion could take 1 hour, another could take 8). We have sought to provide suitable averages where possible. Where historic job duration data has been found to be unsuitable (e.g., given inconsistent use of [system] start and end times), we have used an estimate agreed with all MOBs network leads.	High - In identifying and assessing option 2b we significantly drove down the proposed job duration of several resolutions. We believe that there is limited further scope for efficiencies without effecting the efficacy of the solution or risking our compliance with legislation. See Table 18 for further details. We also plan to reduce job duration by completing more jobs at the point of survey (eliminating travel time), see section 7.1.2 for further details.
4	Fully loaded FTE rate	Low - There is low uncertainty as this data is held by finance.	Low - Limited controllability due to challenging labour market.
5	Materials cost	Medium - Per "job duration", in many instances' materials costs are relatively negligible versus FTE costs/job duration.	Medium - Per "job duration", in many instances' material costs are relatively negligible versus FTE costs/job duration.

Table 17 - Assessment of cost drivers against uncertainty and controllability / efficiencies

Table 18 shows that the fault resolution process has been made significantly more efficient since our initial submission, whilst maintaining legal/regulatory compliance and mitigating the safety risks associated with each fault type.

#	Fault Type	Pre Apr 24 duration (mins)	Post Apr 24 duration (mins)	Original BP duration (mins)	Difference
1a	Severe corrosion	333	333	General Severe Corrosion = 440	N/A
1b	Severe corrosion (non-refurbishable)	1499	1499		N/A
2	DR4	592	567	1920	Have amended approach to a more risk-based approach based on case-by-case variables (e.g., in appropriate instances using assumed routes)
3a	PIV Install	340	340	Missing PIV = 960 Trip Hazard	IGEM G5 no longer requires mandatory PIV install where below 2" on MRBs. We have

				(PIV Lid) = 480	implemented a risk assessment to adhere to this. New duration is weighted average inclusive of instances where no PIV install is required.
3b	PIV Remediation	90	64		N/A
4	Missing Brackets	37	12	440	We have introduced the use of risk assessment tool to assess on a case-by-case basis whether a bracket is required. New duration is weighted average inclusive of instances where bracket is required.
5	Venting & Compartmentalisation / Fire Stopping	0	0	15	This has been outsourced to 3 rd party. No job duration on Cadent side.
6a	Non fully decom pipes	N/A given low volumes			
6b	Open ended pipes	18	18	60	N/A
7	ECV Operability & Meter Location	79	54	60	N/A
8	Illegal Connections	N/A given low volumes			
9	Missing Network Diagrams	6	6	300	We have switched to a label detailing indicative layout rather than original submission for a custom engraved diagram.
10	Pipe & Valve Labelling	6	6	440	Pipe and valve labelling now undertaken whilst completing survey rather than as a separate exercise.
11	3rd party issues	0	0	N/A	Not part of original submission.

Table 18 – Assessment of job duration efficiencies since original BP submission by fault type

7.3 Cost benefit analysis and engineering justification

The benefits associated with the preferred option (Option 2b) are:

1. Reduced time off gas due to more proactive fault resolutions. Leading to reductions in inconvenience, distress, health risks (e.g., lack of heating). In 2018/19 the average interruption for a MOB's customer who lost gas was 959 hours (1943 customers). In 2022/23 this was 367 hours (1841 customers) as per reported in the annual RRP submission.
2. Safety benefits such as reductions in risk of gas escape, fire, or explosion. See section 4.1 for further details of safety risks associated with minor faults.
3. Reduced environmental impact (gas is a greenhouse gas).
4. Better customer experience due to potential safety benefits, potential reduction in time off gas, and visibility of proactive work being completed by Cadent.
5. Potential reduced whole life costs due to increased proactive resolution, and therefore less reactive resolution.
6. These benefits disproportionately affect vulnerable customers given the higher proportion of vulnerable customers within MOB's.

The costs associated with the preferred option (Option 2b) are:

1. Potential increased costs to customers versus Option 1. However, Option 2b is less expensive than Option 2a, Option 3 and Option 4.

8 Delivery of Preferred Option

8.1 Delivery methodology

To maintain legislative compliance, it is critical that we routinely survey all our multiple-occupancy gas-riser systems. We subdivide our asset portfolio between 'high', 'medium' and 'low' pipe integrity risk categories using risk-score thresholds. The risk score thresholds are set in respect of HRBs and applied universally and correspond to 210,000 and 100,000 modelled relative risk points respectively. The high category corresponds to the highest risk 10% of HRBs, in statistics this is known as the top decile: the medium category to the second to top decile.

- High-risk buildings (i.e., those scoring over 210,000 points) are surveyed annually to ensure we identify and monitor any ongoing deterioration and it is from this group that we will be carrying out proactive major intervention in RIIO-GD2. Our plans are designed to ensure we will mitigate risk in all high category buildings during RIIO-GD2 and RIIO-GD3.
- Medium-risk buildings (those scoring between 100,000 and 210,000 points) are surveyed every five years, we do not expect to do proactive major intervention in RIIO-GD2 in respect of these buildings.
- Low-risk buildings (those scoring less than 100,000 points) are surveyed every ten years, and around 80% of HRBs and 90% of MRBs are low risk. MRB risk scores are on average lower due to the scale of hazard and lower likely incident frequency. HRBs are used to set the threshold levels resulting in a lower proportion of MRBs being in high and medium pipeline integrity risk categories.

These survey frequencies are supported by HSE, required for us to meet industry good-practice, and remain compliant with PSR. They ensure that buildings that cause concern are monitored appropriately and that lower risk buildings are surveyed at an interval that is not unreasonably long, given that building change, including: an owner refurbishing a building, asset damage and vandalism may occur in addition to deterioration. Around 80% of HRBs and over 90% of MRBs are low-risk buildings and surveyed at a 10-year frequency.

To complete these surveys, surveyors are sent out to the building. They log faults as they complete the survey. 'Follow on Jobs' are raised where faults are identified. These Follow-on Jobs are then scheduled as separate jobs and operatives are sent out as required and resolutions are completed. As per section 7.1.2, post April 2024 we intend to complete additional fault resolutions at point of survey.

Figure 1 and Figure 2 provide further details on this overall process.

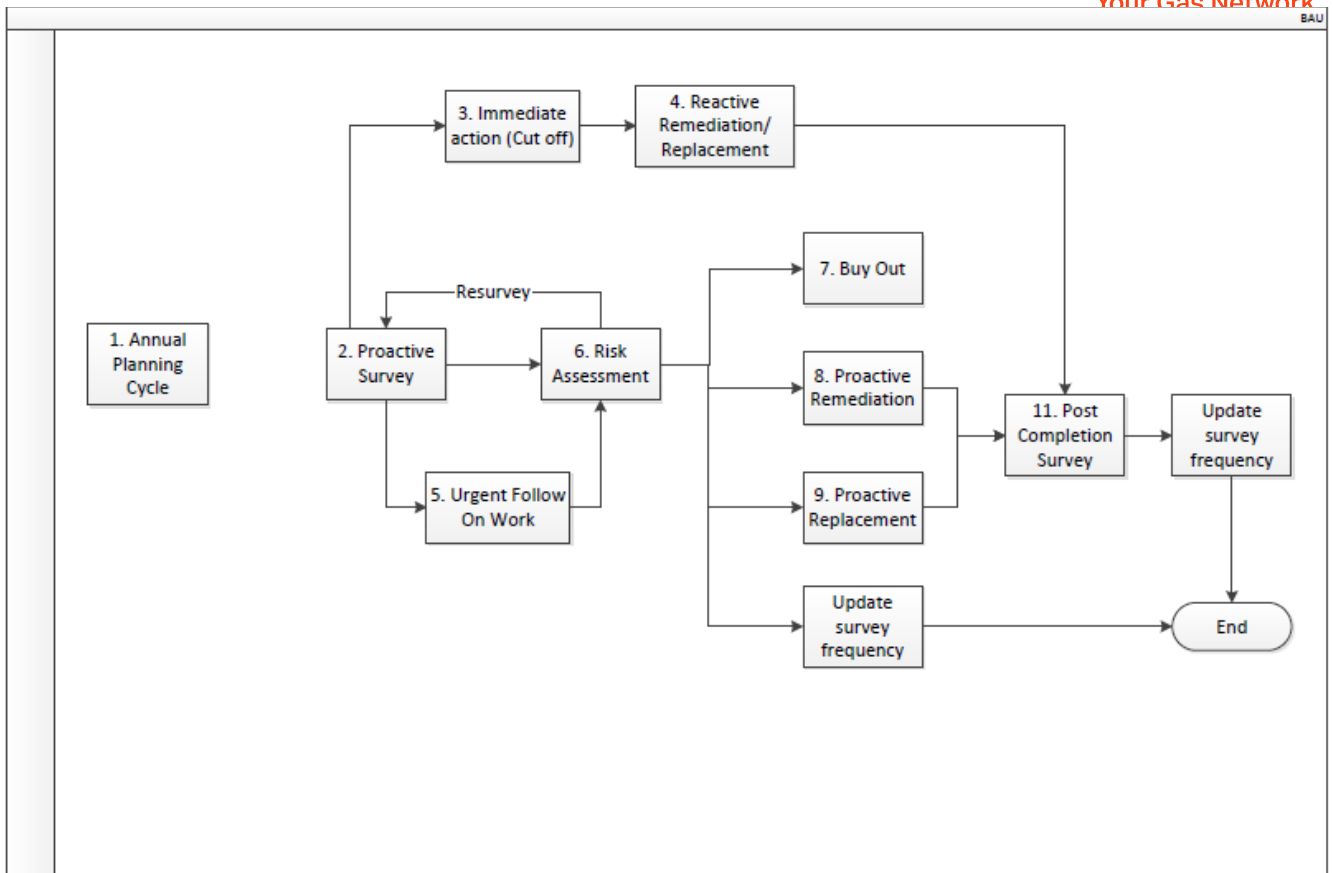


Figure 1 – HRB/MRB end to end process

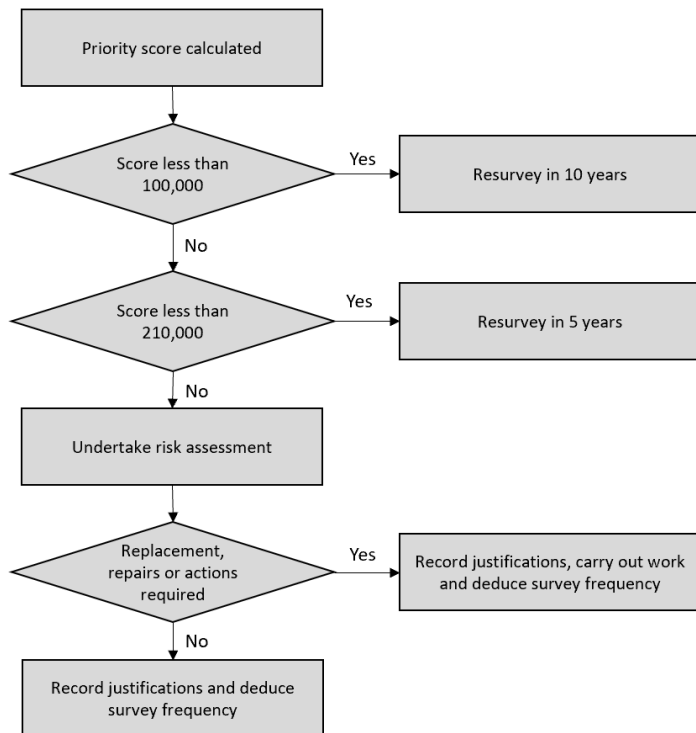


Figure 2 - Process flow detailing HRB/MRB survey cadence

8.2 Delivery plan

Funding secured through this Re-opener will allow us to hire additional resources to deliver our commitment to resolve 90% of faults identified in MRBs through our ongoing survey programme prior to 31 April 2026.

Our delivery ability is evidenced by the below:

- We have shown, specifically in North London, the ability to utilise contractors to supplement our in-house workforce.
- We have completed all surveys carried over from the Covid period. This has freed up capacity within the existing workforce.
- Post April 2024 we aim to complete as many fault resolutions as possible at point of survey. This will free up capacity within the existing workforce.
- It can be seen from Table 18 that the overall job duration of fault resolutions is much lower than previously expected at original Business Plan submission (this means less overall resource required, however is offset by higher than expected FTE rates).

Our workload forecast for surveys and fault resolutions has been built into our strategic plan for the remainder of the RIIO-GD2 period. We will monitor delivery against this plan through monthly network review meetings and at relevant performance committees.

8.3 Technology considerations

In general, this work (completion of surveys and fault resolution) is highly operational in nature and the technical ability of the proposed solution is proven, given we have been successfully resolving faults since year 1 of RIIO-GD2.

However, in line with our continuous improvement mindset and to ensure effective completion of work, there are process and technology dependencies. We are currently undertaking work to improve and streamline the MOB's survey and fault resolution process including consolidation of systems and standardisation of processes across networks. We are specifically working hard to ensure our data capture is standardised, allowing us a more consistent view of jobs completed and job durations across networks.

To provide additional assurance around the robustness of our data we have engaged [third party], a transformation consultancy that specialise in data and AI, to undertake third party analysis of our data. This included process mapping, data validation and data modelling, leveraging Cadent's source systems, and analysing data. The methodology and volumes were agreed in collaboration with business experts. This has ensured that we have put forward a consistent view of our data across networks to underpin the work we have delivered and forecast to deliver.

8.4 Governance

Table 19 details the key MOB's survey / fault resolution governance forum. We track our performance and review the volumes of completed surveys and fault resolutions monthly.

Forum	Cadence	Level	Covers
Cadent Operational Performance Committee (OPC)	Monthly	Board level	<ul style="list-style-type: none"> • Survey completion performance
Network investment review meeting	Monthly	Network director level	<ul style="list-style-type: none"> • Survey completion performance • Fault resolution performance

Table 19 - Key MOB's survey / fault resolution governance fora

8.5 Risks and Dependencies

#	Type	Description	Likelihood	Severity	Mitigation
1	Risk	Potential future policy changes mandating us to resolve these faults on an alternative timeline.	L	H	Close engagement with key stakeholders such as the HSE.
2	Risk	Survey outcomes and fault resolutions are highly dependent on building accessibility. In general, this is a known quantity, and it is expected that accessibility will be a challenge, and this is built into processes and forecasts. However, incidents such as Covid-19 show that accessibility challenges may not remain constant over time.	L	M	Challenges with accessibility are built into our planning process.
3	Dep	Processes and systems – The resolution of MRB faults is a relatively new process and therefore we are continually evolving our approach. There is a dependency on the NOIT Re-opener as we look to consolidate and streamline systems to allow for effective recording of survey outcomes, job raising, job completion etc.	M	M	Close alignment and monitoring of NOIT progress.

9 Stakeholder Engagement

9.1 Customer Engagement

MOB customers rely on us to provide the energy they need to heat their home, to cook and to wash. Customers should always have access to the energy that they need, and confidence that if there is a problem it will be resolved quickly and efficiently with as little impact on them as possible.

When preparing our RIIO-GD2 Business plan we completed a structured engagement programme in which we spoke with customers about their priorities and how our services might be changed to meet their needs. To ensure that MOB customers were adequately represented we met separately with groups of MOB customers who have experienced an interruption. We combined the information obtained through these meetings with information we have obtained through routine meetings with MOB stakeholders e.g., building owners and through the consultation we conducted in 2018 in relation to developing our energy exchange programme.

We also put forward alternative investment priorities to MOB customers to gain feedback in respect of what they believed was most important. We did this by describing possible investment scenarios with projected outputs and customer bill impact. In keeping with the feedback, we received from the general customer population, safety was the most important consideration for MOB customers, with supply security in second place. In a second workshop customers were asked to provide their view of how we should balance our plan between safety and supply security and cost. The consensus was that we should adopt a plan that ensures safety, which was seen as an obligation we should simply comply with, whilst balancing improved customer service against delivery cost.

Our business plan followed five steps, shown in the diagram below, to move from a clear articulation of customer needs through options development and analysis to develop performance commitments that set standards that our customers will love as well as appropriate regulatory treatment.



We believe that these customer priorities are still applicable and thus continue upon delivering our inspections and fault resolution programme that we are now requesting funding for.

9.2 HSE Engagement

To maintain legislative compliance, it is critical that we routinely inspect all our multiple-occupancy gas-riser systems. These inspection frequencies are supported by HSE and are required to maintain industry good-practice and remain compliant with PSR. These inspections ensure that buildings of concern are monitored appropriately, and lower risk buildings are inspected at an interval that is not unreasonably long; given that building change (e.g., an owner refurbishing a building), and asset damage (e.g., vandalism) may occur in addition to deterioration. We regularly engage with the HSE to ensure our compliance with regulations.

We are obliged to inspect our assets in buildings to ensure compliance with the Pipeline Safety Regulations (1996). In 2018 we received an improvement notice because we had not inspected all our buildings in line with good practice. Therefore, this plan assumes that inspections remain comprehensive and continue at their current frequency to ensure we remain compliant with Pipeline Safety Regulations.

We commissioned an independent 3rd party study to support the reduced requirements around pipeline isolation valves. IGEM G5 no longer requires mandatory PIV installations below 2" on MRBs. We have implemented a risk assessment to adhere to this. The result of this engagement was agreed by the HSE and ultimately saves the customer money whilst ensuring safety.

10 Appendices

Supporting Documents

- **Appendix 01:** Glossary of Terms
- **Appendix 02:** Detailed Cost Calculations

Appendix 1 – Glossary of Terms

Acronym	Description
BP	Business Plan
CDSs	Complex Distribution Systems
ECV	Emergency Control Valve
HRBs	High Rise Buildings
HSE	Health and Safety Executive
IGEM	Institution of Gas Engineers & Managers
MOB	Multi Occupancy Building
MRBs	Medium Rise Buildings
NOIT	Non-Operational IT
PIV	Pipeline Isolation Valve
PSR	Pipeline Safety Regulations
RRP	Regulatory Reporting Pack

Term	Definition
Complex Distribution Systems	Commercial and industrial equivalent to Multi Occupancy Buildings.
Large Diameter Services	A service pipe is a connection from a main to supply a maximum of 2 supply meter installations with no other potential connections. A large diameter service is any service pipe that supplies a meter greater than U6 size and capacity within a Multiple Occupancy Building.
Meter Banks	A meter bank has two or more primary meter points in a single ventilated compound/enclosure. The meter points are supplied from a manifold at the end of a main and can be located internally or externally. Individual meter points located in outside meter boxes, and which are supplied by individual services does not constitute a meter bank.
Approved MOB Safety Works Programme	A programme of safety related works, including maintenance, repairs, and surveys in Multiple Occupancy Buildings between 3-5 floors developed in agreement with the HSE.
Multi Occupancy Buildings	Buildings containing a minimum of three individual premises, each with a separate supply point and supplied via an internal or external riser, and where at

	<p>least one of those premises is more than two floors above ground level. The premises may be domestic, non-domestic, or a combination of the two. Buildings where all premises on the third floor or above are supplied through individual pipes, with the meter and emergency control valve located at a lower level, are not included. MOB's are categorised as medium-rise (3 – 5 floors), high-rise (6 – 9 floors) or high risk (10+ floors).</p>
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Appendix 2 – Detailed Cost Calculations

See separate file.