Greater Manchester's Outline Business Case to tackle Nitrogen Dioxide Exceedances at the Roadside

E4 Plans
E4.2 – Risk Management Plan

Warning: Printed copies of this document are uncontrolled

Version Status:	DRAFT FOR APPROVAL	Prepared by:	Transport for Greater Manchester on behalf of the 10 Local Authorities of Greater Manchester
Authorised by:	Simon Warburton		
Date:	28th February 2019		

Table of Contents

1 Programme Details and Risk Environment

1.1 TfGM has a comprehensive Risk Management Policy and Strategy. The policy provides assurance that appropriate controls are in place to deliver a securely run organisation. It is part of the delivery mechanism for TfGM strategic objectives and key business priorities. The policy includes the management of strategic, operational, project and programme risks and it is from this that the Risk Management approach for the programme and projects has been defined.

1.2 This Risk Management Plan (RMP) describes the approach and processes to be employed to effectively manage risk on this Programme, its constituent projects and interfaces with other schemes.

1.3 It will illustrate the risk management techniques and standards to be applied to the delivery of this project and the responsibilities for achieving an effective risk management process. The RMP is based on the corporately agreed Risk and Issue Management procedures which are part of the Programme Management Plan (ProgMP) and Project Management Plan (PMP) processes. Further guidance can be found in ProgMP/ PMP sections of the TfGM Projects Group intranet website[1].

1.4 A fundamental element of the Risk Management process is establishing the context, which includes establishing the objectives of the Programme and associated projects.

1.5 The objectives of this Programme are:

- The primary aim of the Greater Manchester Clean Air Plan (GM CAP) is to reduce Nitrogen Dioxide (NO_2) concentrations in Greater Manchester, in the shortest possible time, to below the EU Limit Value.

- The secondary aims are to ensure that the GM CAP strategically fits with Greater Manchester's local strategies and plans; provides Value for Money (VfM); it is Affordable, Acheivable; there is Supply side capacity and capability to deliver; and the Distributional Impact (DI) is understood.
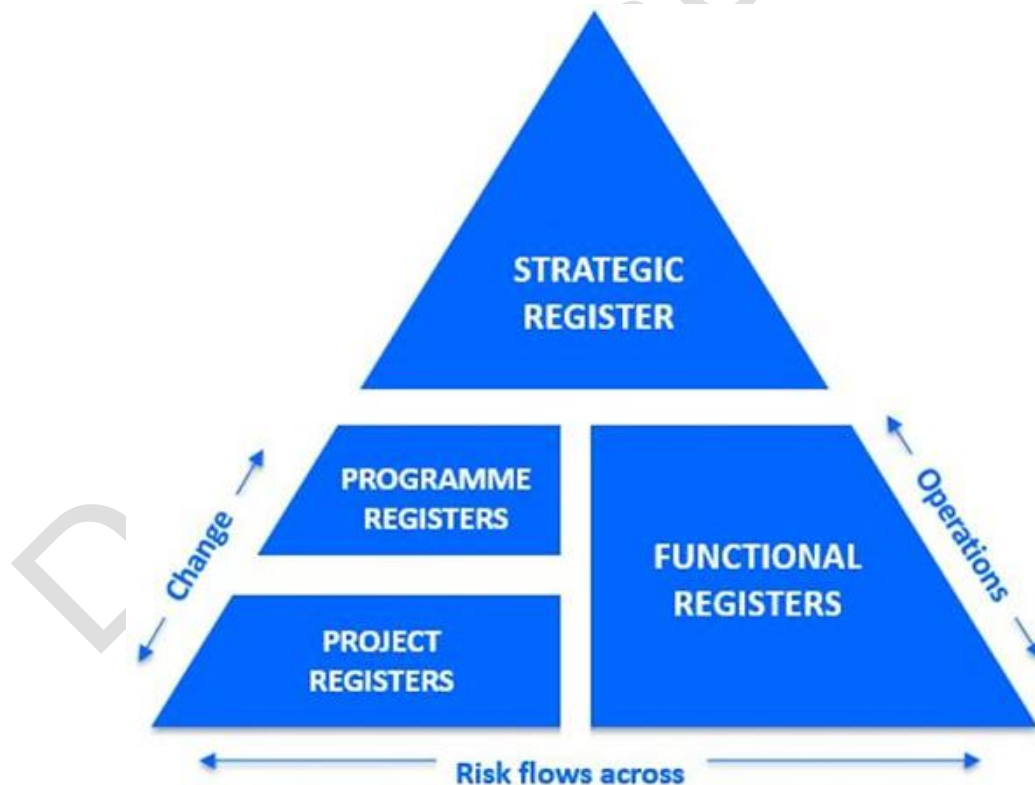
2 Risk Management Process

2.1 In terms of the overall delivery timings and structure of the Programme and projects, a multi-level approach will be required. This is summarised in the following table:

---

[1] Link to ProgMP/ PMP sections of the TfGM intranet website:
https://edrms.tfgm.com:85/departmental/pms/pmo/PMP/Pages/default.aspx

Risk Management Plan Hierarchy	Plan Owner	Risk Management Process
Primary - Risk Potential Assessment	TfGM – Portfolio Office	
Secondary: Programme RMP	TfGM – Programme Manager	
Tertiary TfGM Project RMP	TfGM – Project Manager	
Note: Risks related to Health & Safety are managed in line with the TfGM Integrated Management System (IMS)		

2.2   Identified programme and project risks are captured in the appropriate Risk Register. The relationship between the registers is illustrated in the following diagram:

2.3 The risk management process is in accordance with the guidance in the TfGM Risk Management Policy & Strategy. The high-level Risk Management Process is illustrated in the section above.

2.4 TfGM maintains a central Risk Decisions "Predict! Risk Controller" Risk Management System, which holds the information relating to its project and programme level risks. Each Risk Register is a live document - if necessary, reference to the live information held on Predict! should be made.

2.5 Both a Programme level Risk Register (Appendix E.5.1) and a Project level Risk Register (Appendix E.5.2) for the proposed Measures have been developed. These are currently assessed qualitatively, but will be assessed quantitatively as the programme develops. They will then be modelled using Monte Carlo methods[2] of simulation to provide a Quantified Cost Risk Analysis (QCRA) of risk exposure to both the Programme and Projects. In the interim, appropriate Contingency and allowances for optimism bias have been made within the Commercial and Financial Cases of the Business Case.

3 Risk Identification

3.1 A risk is 'any future event, or set of circumstances that, should it occur, will have a positive (opportunity) or an adverse effect (threat) on the achievement of TfGM objectives'.

3.2 Risk identification is about collating information on relevant threats and opportunities. The test of relevance is the ability of the threat to impact achievements of strategic objectives, finances, services, health & safety, legal requirements and reputation.

3.3 A series of risk workshops have been held in order to identify the programme and project risks. When identifying these risks, the short-term / 'close at hand' risks as well as the longer-term / 'over the horizon' risks have been captured.

3.4 The outcome of these workshops has been a qualitative Programme Risk Register and qualitative Project Risk Registers, which contain all foreseeable risks. The registers have been peer reviewed to ensure there are no obvious omissions and appropriate assessments. The risk registers draw risks and mitigation actions together into a co-ordinated package and enables the review of the adequacy of existing controls.

3.5 Each risk has been assigned a Risk Owner. The Risk Owner is the person ultimately accountable for the mitigation status and eventual outcome of the risk. They will have the ability to command the resources required to mitigate the risk. The Risk Action Owner is allocated responsibility by the Risk Owner for implementing the mitigating actions. There can be several Action Owners assigned to a risk; but only one Risk Owner per risk.

4 Risk Assessment

4.1 For the qualitative Programme and Project Risk Registers a tiered scoring system has been used to assess the potential likelihood and impact of each risk, across a number of impacts, including Cost, Schedule, Reputation & Legal, Service Disruption and Policy/ Benefit Realisation. A standard TfGM Risk Assessment Criteria has been used to ensure a consistent approach has been adopted. Details of the criteria are set out in in Annex 4.5 of this document.

4.2 Assumptions are detailed to underpin the reasoning for the assessment, however the table contained in Annex 4.5 provides an overview of the levels related to a project using TfGM's scoring system.

4.3 Once actions have been identified, the post-mitigation assessment will then take place using the same criteria which will generate a post-mitigation risk exposure score and RAG status, also in line with the risk matrix.

4.4 Any Risks scoring above 13 (the organisation's Risk Tolerance) i.e. 'Critical' or 'High' risks need to be actively mitigated.

Probability	Low	Medium	High	Critical	
Very High	5	10	15	20	25
High	4	8	14	19	20
Medium	3	7	11	15	18
Low	2	6	8	10	17
Very Low	1	2	4	8	13
Impact	Very Low	Low	Medium	High	Very High

The dotted line is the risk tolerance threshold.

---

[2] Monte Carlo method on Wikipedia - https://en.wikipedia.org/wiki/Monte_Carlo_method

5 Risk Treatment

5.1 The approach aims to allocate risk to ensure that it is borne by the organisation that is best placed to monitor and manage it. TfGM will take responsibility for the appropriate programme level risks and will need to minimise the impacts of programme level risks on the associated projects.

5.2 TfGM's approach to risk management is proactive and focuses on avoidance, transfer or taking mitigating action, rather than solely making financial provision for risk impacts. Throughout the Outline Business Case (OBC) stage, risks have been identified, recorded and actively managed. Risk owners have been allocated and tasked with eliminating risks or identifying mitigation measures for residual risks. The same ethos will be taken through to the Full Business Case (FBC), implementation and operational stages of the programme/ projects and any activities to facilitate risk avoidance, transfer or mitigation will be included within the planned activities and incorporated into the appropriate cost-plans.

5.3 If Delivery Agreements are utilised, these will be used to set out risk ownership. This will be determined on a package by package basis as each Delivery Agreement is being drafted. Measures to reduce the overall risk accruing to the scheme promoter via risk transfer will be investigated at the appropriate time.

6 Monitor & Review

6.1 Reviews of the Programme/ Project Risk Registers are undertaken regularly, at a frequency detailed in the Risk Management Plan Annex of this document.

7 Quantitative Cost Risk Analysis (QCRA)

7.1 A QCRA simulation on the risk registers has not yet been undertaken.

7.2 The method of QCRA that will be adopted uses Monte Carlo methods of random number generation to select values of probability and cost (within defined ranges) for each risk. A minimum number of 5,000 model iterations are carried out to develop an overall risk profile for the project. The output from the QCRA model is used to provide an assessment of risk exposure on the Programme/ Project and a measure of the capital risk allowance required.

7.3 Risk exposure outputs are reported at both the 50% confidence level (P50) and the 80% confidence level (P80), for the current state (pre-mitigation) and future state following the implementation of planned actions (post-mitigation).

- The P50 figure represents a risk exposure with a 50% confidence level of not being exceeded.

- The P80 figure represents a risk exposure with a greater confidence level (80%) of not being exceeded.

8 Risk Reporting

8.1 Appropriate and effective reporting arrangements reinforce and support risk management and allow up to date and accurate performance information to be passed to risk owners and senior managers. Risk Reporting follows the TfGM governance arrangements. Further information can be found in the TfGM Risk Management Policy & Strategy.

9 Roles and Responsibilities

9.1 The table below shows the RACI matrix for risk management. These are defined as:

- **Responsible** (R) – The job role that is responsible for producing the product, or undertaking a task. Responsibility for a product or task may be delegated.

- **Accountable** (A) – The job role that is ultimately responsible for a product or task. Accountability cannot be delegated.

- **Consulted** (C) – Job roles that need to be consulted during the development of a product or task. Often this will include both internal and external stakeholders.

- **Informed** (I) – Job roles that need to be informed about the product or task. This will often be in the reporting line for progress on mitigating risk.

Outputs/ Tasks	Project Manager	Risk Owner	Risk Action Owner	Risk Manager	Project Sponsor	Project Board	Internal/ External Stakeholders
Risk Management Plan	R			C	A	I	
Risk Register	A	C	C	R	I	I	C
Risk review workshops through the project lifecycle	R	C	C	C	A	I	C
Delay and Cost Assumptions	A	C	C	R	I	I	C
Qualitative Risk Assessment	A	C	C	R	I	I	C
Quantitative Risk Assessment (QRA)	A	C	C	R	I	I	C
Risk management actions	A	C	R	C		I	C/R 1
Risk escalation	R	C	C	R/C 2	A	I	I
Allocation of Risk Allowance (P80)	R	I		I	A		
Allocation of Contingency	C	I		I	R	A/R 3	

Note[1]: Stakeholders are generally consulted during risk reviews and when developing mitigation actions; they may also be responsible for them. For example, contractors may be responsible for shared risks identified on joint risk registers.

Note[2]: Risk managers are consulted over escalation of risk and are also responsible for updating the risk register.

Note[3]: The Project Board is both accountable and responsible for allocating the risk budget.

10   Risk Escalation

10.1   Where an individual does not have appropriate level of authority to manage a risk, the risk will be escalated in accordance with TfGM procedures.

10.2   A single risk or group of risks may need to be escalated to a higher level if the risk(s):

- exceed an agreed threshold / defined tolerances;

- cannot be controlled / managed within the current level;

- remain very high even after mitigations are implemented;

- will impact on more than one Function / or across a programme; or

- are crosscutting in nature and require further collaboration.

10.3   The escalation levels are illustrated in the diagram below:
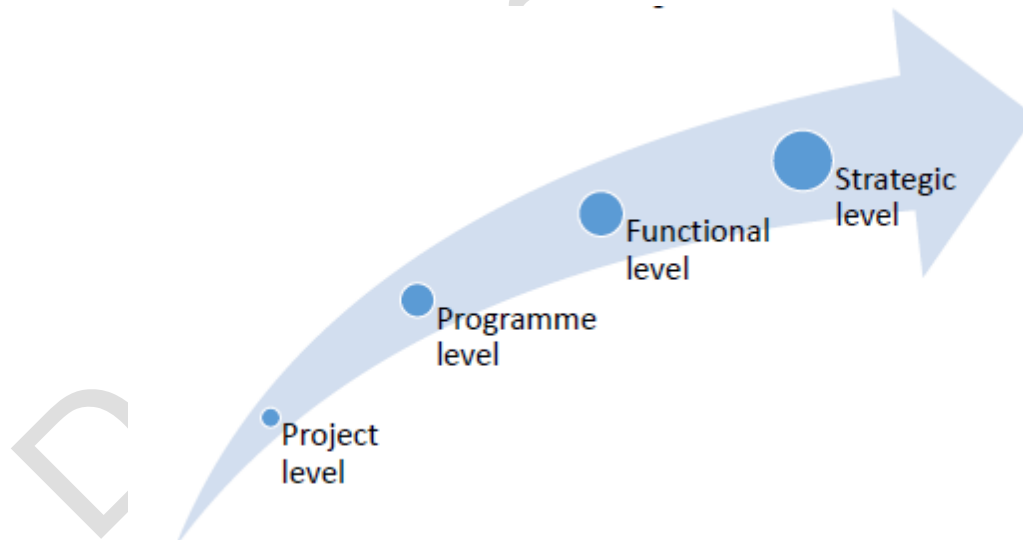
10.4   In most cases risks will be escalated from Project Manager to Programme Manager.

10.5   The exposure level is one of the key factors in escalating risks. The risk score helps to focus attention on risks which are of greatest concern.

11 Issue Management

11.1 The Issue Management process is initiated when an event occurs that is expected will have an adverse effect on the project's ability to meet its objectives within the planned cost and timescales. This is the result of either an existing risk materialising or a new issue not previously identified being raised.

11.2 Issues are held on an issues register within the Risk Report until they have been resolved, which will be primarily through the Change Control process.

11.3 Change Control is conducted through TfGM's Change Control procedures and receiving approval from the Change Control Committee.

11.4 All issues are reviewed at monthly risk review meetings and the status updated as required. As part of the ongoing review, the estimated impact of the issue is updated to reflect the latest information available to ensure accurate forecasting. Resolution plans will be developed and progressed in order to minimise the impact of the issue.

12 Lessons Learned

12.1 At programme closeout, a final review and lessons learned will be undertaken and any operational risks will be transferred out of the projects.

12.2 A risk section will be provided for the appropriate end of project report(s), detailing generic risks (both opportunities and threats) that might affect other similar programmes/ projects, together with responses that have been found to be effective.

13   Risk Management Plan Annex

13.1   The basis for the Risk Management of the Scheme is in accordance with the current TfGM Risk Management Policy and Procedures.

Programme Name	GM Clean Air Plan (CAP)
SAP Reference	PRJ 15927
Functional Board Reported to	Transport Strategy Functional Board
RPA Score	Very High
PMP or PMP Lite	TBC
Programme Lifecycle Stage	Development
Description	The primary aim of the GM CAP is to reduce Nitrogen Dioxide (NO_2) concentrations in Greater Manchester, in the shortest possible time, to below the EU Limit Value. The secondary aims are to ensure that the GM CAP strategically fits with Greater Manchester's local strategies and plans; provides Value for Money (VfM); it is Affordable, Acheivable; there is Supply side capacity and capability to deliver; and the Distributional Impact (DI) is understood. In order to deliver the outputs as described, the Programme requires the delivery of a number of independent projects and work packages within the programme. The Project has close links with the Greater Manchetser Communications and EV Early Measures Project3 and also the Oldham Feasibility Study4
Key Constraints	Key Constraints are set out in the Outline Business Case (OBC) – Strategic Case (section 1.8.9).
Key Milestones	Key Milestones are set out in the OBC – Management Case (Appendix E.3.1).

---

[3] The GM Communications and EV Early Measures Project was funded after a successful bid developed through this project to the JAQU Early Measures Fund.
[4] The Oldham Feasibility Project was commissioned as a Wave 3 National Plan Project after the initiation of this Project.

13.2   Escalation of risk is in accordance with the TfGM Policy and Procedure

Level	Escalating Risk Register	Receiving Risk Register	Inform	Escalation Criteria
2	Project Manager / Programme Manager	Project Sponsor	Risk Manager for the receiving register.	Interface or interdependency risks that affect multiple projects in a programme/ mode. Critical (Zone 1) risks that require the PgM's intervention.
3	Project Sponsor	Strategic Lead	TfGM Head of Risk and Assurance	Interface or interdependency risks that affect projects across multiple programmes. Critical (Zone 1) funding and finance risks. Where mitigating actions need to be ratified e.g. external stakeholder risks. Where mitigation costs are outside the contingency budget and require a drawdown from General contingency.

13.3   The Cost Impact Criteria for the main Programme and projects are set out below:

Programme/ Project	Cost Impact Scoring Criteria
Programme	T4
All other projects and work packages	TBC

13.4   The risk impacts can be defined as follows:

Likelihood criteria	Very Low (VL)	Low (L)	Medium (M)	High (H)	Very High (VH)
	≤5%	6-25%	26-50%	51-75%	>75%
	May occur in exceptional circumstances	May occur in the next 3 years	Likely to happen in the next 2 years	Likely to happen in the next year	Risk is frequently encountered

Impact Criteria	Very Low (VL)	Low (L)	Medium (M)	High (H)	Very High (VH)
Project Cost					
T1 = < £1m	£0 - £5k	>£5k - £10k	>£10k - £30k	>£30k - £50k	>£50k
T2 = £1-10m	£0 - £30k	>£30k - £75k	>£75k - £200k	>£200k - £500k	>£500k
T3 = £10-50m	£0 - £50k	>£50k - £300k	>£300k - £500k	>£500k - £1m	>£1m
T4 = £50-400m	£0 - £100k	>£100k - £400k	>£400k - £1m	>£1m - £5m	>£5m
T5 = >£400m	£0 - £1m	>£1m - £5m	>£5m - £25m	>£25m - £50m	>£50m
Schedule	<2 weeks delay **OR** no impact on end date/ deadline.	2-4 weeks delay **OR** low impact on key activities; no impact on the end date (occurs at development stage and can be accommodated in schedule).	4-8 weeks delay **OR** significant impact to key milestones or activities but no impact on end date (requires changes to schedule to meet end date).	8-12 weeks delay **OR** significant impact to key milestone or activities and delays to the end date. No knock-on effect on other schemes / activities/ revenues.	>12 weeks delay **OR** significant impact significant impact to key milestone or activities and delays to the end date. Knock on effects on other schemes / activities/ revenues.
Health & Safety	Minor injuries; cuts and bruises (First Aid Case).	RIDDOR Reportable (Over Three Day Injury)	Serious Injury (Non Life Threatening)	Major injury (Life Threatening)	Fatality
Reputation & Legal	Isolated local complaints e.g. noise complaints; unlikely to lead to a loss in customer patronage / affect scheme. No legal concerns.	Local complaints by a local group: will reduce affection for TfGM in that locality. Minor legal concerns.	Serious local poor publicity that curtails TfGM's ability to operate effectively in that area without active stakeholder engagement OR region-wide poor publicity from not meeting additional customer expectations (e.g. cleanliness, ticketing & information accuracy); will reduce affection for TfGM network wide. Manageable legal concerns.	Region-wide poor publicity from not meeting minimum customer expectations (e.g. journey times and reliability); will seriously reduce affection for TfGM, gradually erode network patronage or ability to attract funding & customers from other modes (car). Potentially serious legal concerns.	Serious poor publicity and legal concerns: will affect public trust in TfGM, likely to have an immediate impact on customer patronage, or lead to the closure of a route or voiding of a scheme. E.g. serious H&S incident or violation of competition or other laws.
Service Disruption	Up to 1 day disruption to a non-critical route or system outside peak period.	> 2 days disruption to a non-critical route or to an IS system with restricted usage (e.g. SAP Financials) outside peak period.	> 1 day disruption to a restricted IS system or to a widely used but non-critical IS system (e.g. Intranet) during peak period. Up to 3 hours disruption to a critical route outside peak period.	Up to 3 hours disruption to a critical IS system (e.g. Hardrives/ Signalling) during peak usage. Up to 1 hour disruption to a critical route during peak period.	> 3 hours disruption to a critical IS system or > 1 hour disruption to a critical route during peak period.
Policy / Benefit realisation	Minimal delay or interruption to the realisation of a benefit / objective or loss of less than 10% of predicted benefits	Minor delay or interruption to the realisation of a benefit / objective or loss of 10-25% of predicted benefits	Reduces viability/ impacts on efficiency, output, and quality of benefits / objectives or loss of 25-50% of predicted benefits	Major impact on objectives. Serious impact on output and/or quality or loss of 50-80% of predicted benefits	Critical impact on the achievement of objectives and overall performance or loss of more than 80% of predicted benefits

*Reference to TfGM Risk Management Policy and Strategy V1.9

13.5   The timetable below provides details of specific risk meetings and workshops that will be used to manage risk on the programme, projects and work packages. This table will be reviewed and amended as necessary to accommodate additional projects or work packages.

Workshop/ Meeting	Programme	Projects/ work packages
Regular Risk Meetings with core team	Monthly as part of reporting process	TBC
Risk Workshops with Wider team/key stakeholders	As and when required	TBC
Reporting	Monthly as part of reporting process	TBC
Programme Board	Monthly as part of reporting process	TBC
Qualitative Risk Scoring	Monthly as part of reporting process	TBC
Quantitative Cost Risk Analysis (QCRA)	TBC	TBC
Quantitative Schedule Risk Analysis (QSRA)	If and when required	TBC

13.6   Approved Risk Allowance

	Date	Risk Allowance Contingency (£k)	Contingency (£k)
Approved Budget	26/03/2018	0	0
Rebaseline #1			
Rebaseline #2			
Rebaseline #3			
Rebaseline #4			

13.7   This issue log is to be reviewed bi-annually with any risks which have materialised to later inform the Close Out Report.

Date	Risk ID	Risk Name	Management of the Risk	Lessons Learnt