

# NORTH STAFFORDSHIRE LOCAL AIR QUALITY PLAN

UNAPPROVED OUTLINE BUSINESS CASE

APPENDIX 19 - Quantified Risk Assessment - Benchmark  
CAZ D



# BENTLEY

PROJECT MANAGEMENT



## QUANTITATIVE RISK ASSESSMENT REPORT

Clean Air Zone

# BENTLEY

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Version	Date	Author	Comments
00	04 March 2020		
01	27 April 2020		Updated due to Councils comments

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Appendices

Appendix A: Qualitative Risk Register

Quantitative Data

Quantitative Output

## 1. Executive Summary

- 1.1 A quantitative risk assessment of cost was undertaken by the delivery team, facilitated Bentley Project Management.
- 1.2 At this early stage in the project it would be beneficial to use the 85<sup>th</sup> Percentile. This would result in a risk allowance of £11,690,000.
- 1.3 It is recommended that the team update the risk register on a regular basis.
- 1.4 The QRA should be re-run when more detail is known.

## 2. Introduction

- 2.1 Bentley Project Management were commissioned to undertake a quantitative assessment of cost risks for the Clean Air Zone in Stoke-on-Trent, Newcastle-under-Lyme, and Staffordshire. The project is at a pre-planning stage and is in the process of submitting the outline business case.
- 2.2 The project is to enforce a Clean Air Zone in parts of Stoke-on-Trent, Newcastle-under-Lyme, and Staffordshire. This will include installing signage and ANPR cameras. It is intended that the Clean Air Zone will reduce air pollution within the areas of Stoke-on-Trent, Newcastle-under-Lyme, and Staffordshire where there is an illegal level.
- 2.3 Stoke-on-Trent City Council, Newcastle-under-Lyme Borough Council, and Staffordshire County Council working together to bring the Clean Air Zone into force.

## 3. Objectives

- 3.1 The objective of the commission was to produce a qualitative risk register and quantitative cost risk assessment for the scheme.

QRA should

- Support the business plan;
- Be integrated with planning and cost management processes;
- Take account of both uncertainty and risk;
- Used to inform project affordability;
- Be integrated with risk management processes;
- Be reviewed by the project team on a regular basis.

## 4. QRA Methodology

- 4.1 Inputs into the QRA model are gained through identifying risk and uncertainties at risk workshops.
- 4.2 Probability of occurrence is modelled using Binomial distribution. Cost impacts are modelled depending on the nature of each risk, with highly uncertain risks modelled by Triangular distributions, whilst highly disruptive risks modelled by Pert distribution. Cost uncertainties should be modelled by Triangular distribution only.
- 4.3 The cost risk exposure should be modelled and analysed using Monte Carlo modelling technique, to provide a range of potential outcomes. The number of iterations (e.g.10,000) will be selected with reference to the number of inputs being modelled and hence the number necessary to reach a stable result.
- 4.4 The data for the risk register was collected with the project team in three risk workshops held in February 2020.

## 5. Systems and Tools

- 5.1 The QRA will be produced using bespoke, Monte Carlo software, developed by Bentley Project Management.

- 5.2 Bentley Project Management facilitated three workshops. The first workshop was a group exercise to produce a qualitative risk register. The second workshop reviewed actions and agreed mitigations. The third workshop agreed the maximum, minimum and most likely cost for each risk.
- 5.3 Following the workshop, the data was reviewed by Bentley Project Management and the model was run to ensure that it produced a stable result.
- 5.4 The qualitative risk register and data was then reviewed by Stoke-on-Trent City Council, Newcastle-under-Lyme Borough Council, and Staffordshire County Council.
- 5.5 Following the feedback process, the model was run again by Bentley Project Management.

## 6. Results

6.1 The QRA results are as follows:

Percentile	Risk Allowance
50%	£7,150,000
85%	£11,690,000
90%	£11,340,000
99%	£11,340,000

	Risk Allowance
Mean	£8,360,204
Median	£7,160,000
Mode	£6,930,000
Iterations	10,000

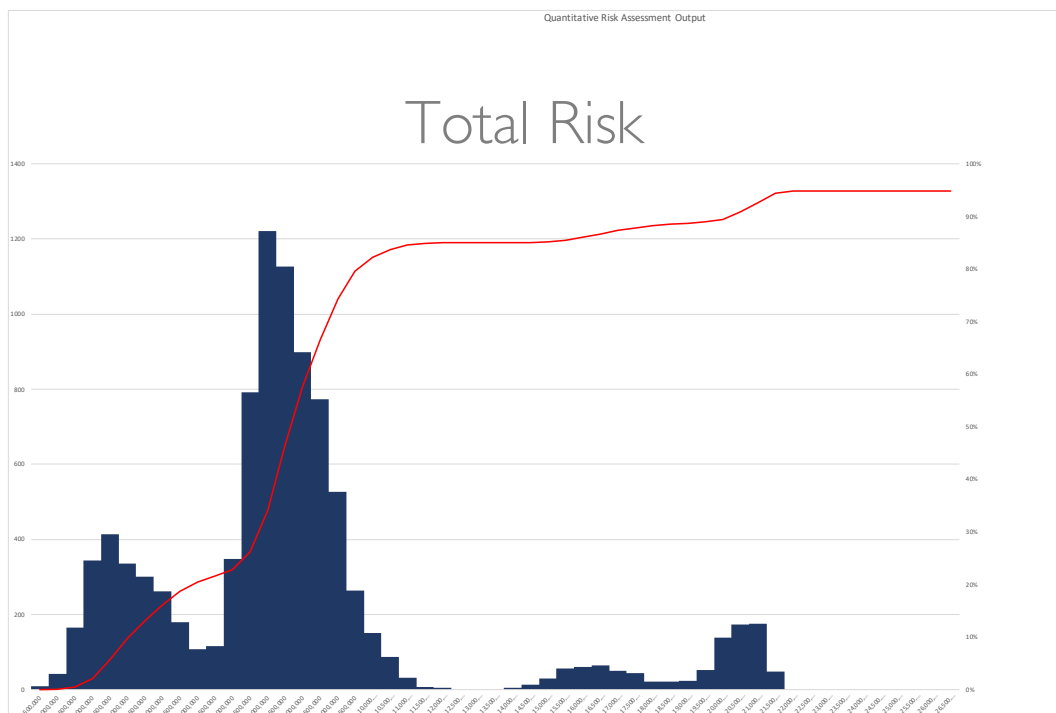
The Bentley Project Management Quantitative Risk Assessment Tool  
Project Title: Clean Air Zone Document Owner: M Morrell Update: 21 April 2020

Results

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	Risk Allowance
Mean	£8,360,204
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6.2 At this early stage in the project it would be beneficial to use the 85<sup>th</sup> Percentile. This would result in a risk allowance of £11,690,000.

6.3 The top risk identified on the project are:

Risk ID	Risk Title	Risk. There is a risk that..	Mitigated Probability	Mitigated Impact	Mitigated Risk
2.001	Local Government Act	Court Cases - Local Government Act causes delay	3	4	12
2.035	Skills shortage	Skills shortage in operating organisation results in system failure	3	4	12
2.036	High workload	Non-compliant vehicle numbers higher than anticipated resulting in workload issue for supplier	3	4	12
2.030	IT	Data storage capacity and flexibility, hosting issues	3	3	9
2.037	Coronavirus	Design build and procurement risk to Coronavirus	3	3	9
2.013	Turn-key insolvency	Risk of 'turn-key' supplier going into insolvency	2	4	8
2.034	Resilience	ICT network / comms infrastructure will need to be very capable with built in resilience	2	4	8



6.4 The top financial risks are noted in the table below:

Risk ID	Risk Title	Risk. There is a risk that..	Minimum	Most Likely	Maximum	%
2.031	ECI	Very little ECI on project and lack of input from turn key supplier	£2,000,000	£10,000,000	£20,000,000	10%
2.035	Skills shortage	Skills shortage in operating organisation results in system failure	£1,000,000	£4,000,000	£8,000,000	10%
2.001	Local Government Act	Court Cases - Local Government Act causes delay	£1,000,000	£2,000,000	£10,000,000	75%
2.013	Turn-key insolvency	Risk of 'turn-key' supplier going into insolvency	£500,000	£1,000,000	£2,000,000	5%
2.033	H/A D/R	System will need H/A and D/R with guarantee of high up-time	£600,000	£840,000	£1,200,000	5%
2.034	Resilience	ICT network / comms infrastructure will need to be very capable with built in resilience	£600,000	£840,000	£1,200,000	50%
2.038	Changes due to Coronavirus	A change in national policy as a result in the changes in travel behaviour caused by the Coronavirus	£250,000	£750,000	£1,000,000	10%
2.019	Income	Income estimation inaccurate	£100,000	£500,000	£1,000,000	75%
2.030	IT	Data storage capacity and flexibility, hosting issues	£250,000	£500,000	£1,000,000	75%
2.032	4G	The cameras do not run off 4G and need to be wired	£100,000	£250,000	£500,000	5%