



# Local Plan to Improve Air Quality in Nottingham



Nottingham  
City Council

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## 1 INTRODUCTION

- 1.1 The following Business Case makes the case for change, and provides an analysis of the current situation, with regard to Nottingham City Council's clean air strategy for Nottingham. It identifies the required changes, the outcomes that are expected, and how these fit with local requirements - as well as wider policies and objectives.
- 1.2 An initial Strategic Outline Business Case (SOBC) identifying how air quality will be improved in Nottingham was submitted in March 2017. A subsequent Outline Business Case (OBC) was then submitted in July 2018 . This document forms the Final Business Case (FBC) and sets out progress and developments since the previous submission of the outline business case in earlier this year. The FBC describes the progress made to date, summarises Nottingham City Council's analyses, and identifies our preferred option for the reduction of Nitrogen Dioxide in Nottingham

### Background

- 1.3 In December 2015 the Department for Environment Food and Rural Affairs (DEFRA) released draft plans to improve air quality in the UK "Tackling Nitrogen Dioxide in our towns and cities". The document also contained the results of DEFRA's analysis, which concluded that concentrations of Nitrogen Dioxide (NO<sub>2</sub>) in six UK cities, including Nottingham, were above the legal levels set by the EU First Daughter Directive on air quality (99/30/EC) and the UK Air Quality Strategy 2000. The document concluded that modelled levels of NO<sub>2</sub> (in Nottingham) along the Ring Road and around Crown Island would exceed the legal limit of 40µg/m<sup>3</sup> until (and including) 2023 without additional action being taken.
- 1.4 The document identified road traffic as a major source of NO<sub>2</sub> and, as a result, DEFRA asked Nottingham City Council to prepare a plan aimed at reducing the level of Nitrogen Dioxide in the city. The plan was expected to consider the implementation of a Clean Air Zone, which would charge a fee for the most polluting vehicles to enter the zone. The aim of this approach was to reduce concentrations of Nitrogen Dioxide such that they would be brought into compliance with the Air Quality Directive in the shortest possible time and by the year 2020 at the latest.
- 1.5 The 2015 plan was challenged in the High Court by Client Earth and in October 2016, and the high court ruled that the plan was not sufficient to meet the aims of the Air Quality Directive. The High Court then quashed the plan and ordered that DEFRA produce a revised plan. Subsequently, in May 2017, Government released its Clean Air Zone Framework. This outlined four classes of Clean Air Zone, each of which charge non-compliant vehicles of different types for entry into each classified Zone. Vehicles would be compliant, and therefore not charged to enter the Zone, depending on their emission standard (i.e. Euro 6 or higher for Diesel, or Euro 4 or higher for petrol). The vehicle types within each class of clean air zone are as follows:

- Class A – Buses and Taxis (inc private hire)
- Class B – Buses, Taxis & HGV's
- Class C – Buses, Taxis, HGV's and light vans
- Class D – Buses, Taxis, HGV's, light vans and private motor cars

### **Clean Air Zone**

A Clean Air Zone (CAZ) defines the area where targeted action is taken to improve air quality to improve health benefits while supporting economic growth. A key objective of a mandated Clean Air Zone scheme is to reduce the levels of Nitrogen Dioxide concentrations to levels of 40µg/m<sup>3</sup> compliant with EU directive 2008/50/EC.

- 1.6 In July 2017 DEFRA and the Department for Transport (DfT) jointly released the "UK Plan for Tackling Roadside Nitrogen Dioxide Emissions". This plan again named Nottingham and a number of other Local Authorities areas as having persistently high levels of Nitrogen Dioxide. Shortly after the release of the plan, the Secretary of State for Environment directed that Nottingham City Council produce a local plan, to be submitted by 15th September 2018. This Document now forms our Final Plan and shows how compliance with the air quality directive will be reached before 2020. Government strongly advised that, when preparing, their plans Local Authorities should consider all measures aimed at achieving compliance with the directive, with charging for access into Clean Air Zones considered necessary only if other measures failed to achieve compliance.
- 1.7 The July 2017 plan again showed that, according to the government's national analysis, the areas within Nottingham with highest concentration of Nitrogen Dioxide are on the Ring Road and at Crown Island. The City Council carries out its own monitoring of Nitrogen Dioxide levels as part of the Local Air Quality Monitoring (LAQM) process. Results from this monitoring show that the areas of highest Concentration of Nitrogen Dioxide are located in the City Centre. Levels of NO<sub>2</sub> are particularly high around Canning Circus, Maid Marian Way and London Road.

### **Policy Context**

- 1.8 The following section outlines the national and local policy contexts that underpin the need to improve Air Quality.

#### *National policy*

- 1.9 As indicated above, National Policy consists of two main documents; the UK plan for tackling roadside emissions and the Clean Air Zone Framework, both of which were published in 2017. These make very clear the national emphasis on improving air quality in our urban areas, and the need for local authorities to take urgent action where concentrations are most significant.

## *Local Policy Extent*

### *Nottingham City Council Local Transport Plan 2011-2026*

- 1.10 The Nottingham Local Transport Plan 2011-2026 sets out five key objectives through which transport can improve the lives of citizens living and working in Nottingham:
  - World class sustainable transport system
  - Low carbon and resilient transport system
  - Access to key services, employment and training
  - Improving quality of life and transforming Nottingham's neighbourhoods
  - Safe, independent and active healthy lifestyles
- 1.11 The objective around "Safe, independent and active healthy lifestyles" has a particular focus upon air quality. This presents the benefits of supporting and encouraging more people to undertake a larger number of journeys by active modes, (i.e. walking and cycling), ultimately benefiting their health and wellbeing. This objective also sets out the need to create safer streets and environments; emphasising the City Council's role in minimising poor air quality and noise impacts from transport. This links to the objectives relating to a low carbon and resilient transport system, and creating a world-class sustainable transport system. The implementation of the LTP strategy has resulted in an increased use of sustainable transport measures and a reduction in the volumes of road traffic in Nottingham, evidence of which is documented in Appendix A.
- 1.12 Nottingham City Council will use the evidence generated during the development of this clean air strategy to produce its own air quality plan. This plan will look to align the clean air strategy with the existing Local Air Quality Management methodology and will be produced later in 2018.

## The Case for Change

### *The Health Impacts of Poor Air Quality*

- 1.13 Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society - notably children and older people, and those with heart and lung conditions. There is also often a strong correlation with equality issues, because areas with poor air quality are also often less-affluent areas with higher levels of deprivation. As such air pollution can also be seen as a matter of social injustice, given the most deprived 20% of neighbourhoods in England have higher air pollution levels than the least deprived neighbourhoods. Those communities that are both most polluted and that emit the least pollution tend to be amongst the poorest in Britain.
- 1.14 Despite great improvements in air quality in the UK since the Clean Air Act of 1956, current background levels of air pollution still pose a significant risk to health. Long-term exposure to air pollution at the levels experienced in many urban areas in the UK is now known to

cause respiratory and cardiovascular disease and lung cancer. Short-term exposure to episodes of high air pollution also leads to a worsening of symptoms for those with existing asthma, respiratory or cardiovascular disease, and can trigger acute events such as heart attacks in vulnerable individuals.

- 1.15 In 2008, the Department of Health's Committee on the Medical Effects of Air Pollutants estimated that particulate air pollution brought forward, or contributed to, the early deaths of up to 29,000 people each year in the UK. Throughout 2015 and 2016 these estimates have been reviewed and increased, since it is recognised there is likely to be an overlap in the health burden associated with the ambient concentrations of particulate matter and nitrogen dioxide. The health impacts of 'air pollution' are now often reported as '40,000 deaths brought forward in the UK each year'<sup>1</sup> In Nottingham City, 6.4% of all adult mortality (150 deaths) was attributable to long term exposure to human-made particulate air pollution in 2010.
- 1.16 There are two Air Quality Management Areas in Nottingham City, one aligned with the main arterial routes of the City Centre, and the other at Beeston Road, Dunkirk, where levels of nitrogen dioxide (NO<sub>2</sub>) exceed nationally set air quality objectives. One of the Key drivers of high NO<sub>2</sub> levels is the use of diesel engine vehicles. In addition, background (ambient) particulate matter (PM2.5) levels exceed World Health Organisation guidelines across the majority of Nottinghamshire County and Nottingham City. Further reductions in levels of PM2.5 and NO<sub>2</sub> are required to protect human health. AQMA's also exist on the City-County Boundary notably at Trent Bridge and on Mansfield Road at the north of the Ring Road. These areas have large amounts of traffic traveling through them into Nottingham City Centre (and as the most direct North-South route across the City) it is likely that the measures to improve air quality will have beneficial effects on these AQMA's.
- 1.17 There are cost-effective, achievable local actions that can be taken to address air quality. In Nottingham, considerable emphasis has been placed on encouraging a shift towards greater use of active travel (walking and cycling), public transport and cleaner low and ultra-low emission vehicles over a sustained period. These actions also produce benefits across local priorities, including reduction in hospital admissions, increase in physical activity and healthy lifestyles and tackling climate change.
- 1.18 In Nottingham, there have also been a number of initiatives aimed at improving air quality and minimising the impacts of air pollution:
  - **Health and Wellbeing Strategy 2016-2020** - The Joint Health and Wellbeing Strategy sets out the problems facing our citizens with regard to health. Our Ambition, as set out in the strategy, is to create an environment in which people can live their lives with a greater sense of wellbeing as this is hugely significant to reducing health inequalities.

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<sup>1</sup> Royal College of Physicians (2016) *Every Breath We Take*. Available at: <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>

The strategy highlights the need to create an environment that encourages walking and cycling as a way in which its objectives can be achieved. It also highlights the need to reduce air pollution levels in Nottingham.

- **Joint Strategic Needs Assessment** - The Joint Strategic Needs Assessment (published in May 2015) acts as a local assessment of our current and future health and social care needs. The document contains a number of recommendations on how the City Council and its partner organisations could work to improve air quality. These measures include promoting the use of public transport, walking and cycling together with anti-idling campaigns, mobile phone alerting systems and measures that would help to reduce exposure to poor air quality.
- **Air Quality Action Plan** - It has been recognised that the current Air Quality Action Plan (embedded within the Local Transport Plan) is focussed solely on reducing emissions from road transport. The Air Quality Action Plan is therefore currently being revised to reflect that air quality is also affected by emissions from fixed sources and that technological advances now allow emissions from a wider range of sources to be reduced or negated altogether. In 2016, Nottingham City Council successfully obtained funding from JAQU to investigate and trial the feasibility of replacing natural gas fired boiler plant with zero NO<sub>2</sub>/NO<sub>x</sub> emission fuel cell technology. This project is currently underway.

### *The Economic Impact of Poor Air Quality*

- 1.19 In addition to environmental and health impacts, air pollution also carries an economic cost. In the last 5 years, the estimates of costs to public health have been revised several times (in light of new health impact studies) to account for the impact on health of particles and nitrogen dioxide both separately and combined (but assuming the effects are completely independent), and if there is an overlap in health impacts.
- 1.20 The national economic impacts have been derived, calculated and revised following research and an approach recommended by COMEAP and detailed in: 'Valuing impacts on air quality: Updates in valuing changes in emissions of Oxides of Nitrogen (NO<sub>x</sub>) and concentrations of Nitrogen Dioxide (NO<sub>2</sub>) September 2015'.
- 1.21 The impacts are presented in two forms:
  - A damage cost per tonne of emission change
  - An annual social cost based on health impacts (data from 2013)

**Table 1-1: Damage costs/tonne by pollutant, location and source (2015 prices)**

<b>NOx Damage Costs by Location and Source</b>	<b>Central Estimate</b>	<b>Sensitivities</b>	
		<b>Low Central Range</b>	<b>High Central Range</b>
Transport average	£25,252	£10,101	£40,404
Transport urban large	£36,617	£14,647	£58,587
Transport urban medium	£28,788	£11,515	£46,061

**Table 1-2: Social cost and Health Impact from NO<sub>2</sub> (2013)**

	<b>Central (2.5%)</b>	<b>Low (1%)</b>	<b>High (4%)</b>
Annual Equivalent attributable deaths	23,500	9,500	38,000
Annual Social Cost	£13.3bn	£5.3bn	£21.4bn

- 1.22 The methodology detailed in part 5 of the guidance and amended in 'National data inputs for Local Economic Models (DEC2017)' will be used in conjunction with detailed modelled NOx reductions to calculate the Damage Cost in Nottingham and the Conurbation.
- 1.23 Nottingham City Council has, for many years, promoted sustainable transport with the aim of supporting economic growth, reducing congestion and improving air quality. Significant investment has been made to improve public transport; including in the tram network, the electric and gas powered bus fleet, integrated ticketing and bus information systems, and the implementation of a Workplace Parking Levy that seeks to both deter commuter car use and generate additional revenue to pay for these transport improvements. The Council is also implementing a range of measures to incentivise the use of cleaner vehicles, and has invested heavily in its cycle network in recent years. These measures have already gone a long way to creating a cleaner city, but it is recognised that further measures are needed to reduce levels of NO<sub>2</sub> to meet legal limits in the shortest possible time.
- 1.24 The remainder of this document details the Final Business Case in the specific context of the above policies, and the needs of Nottingham city.

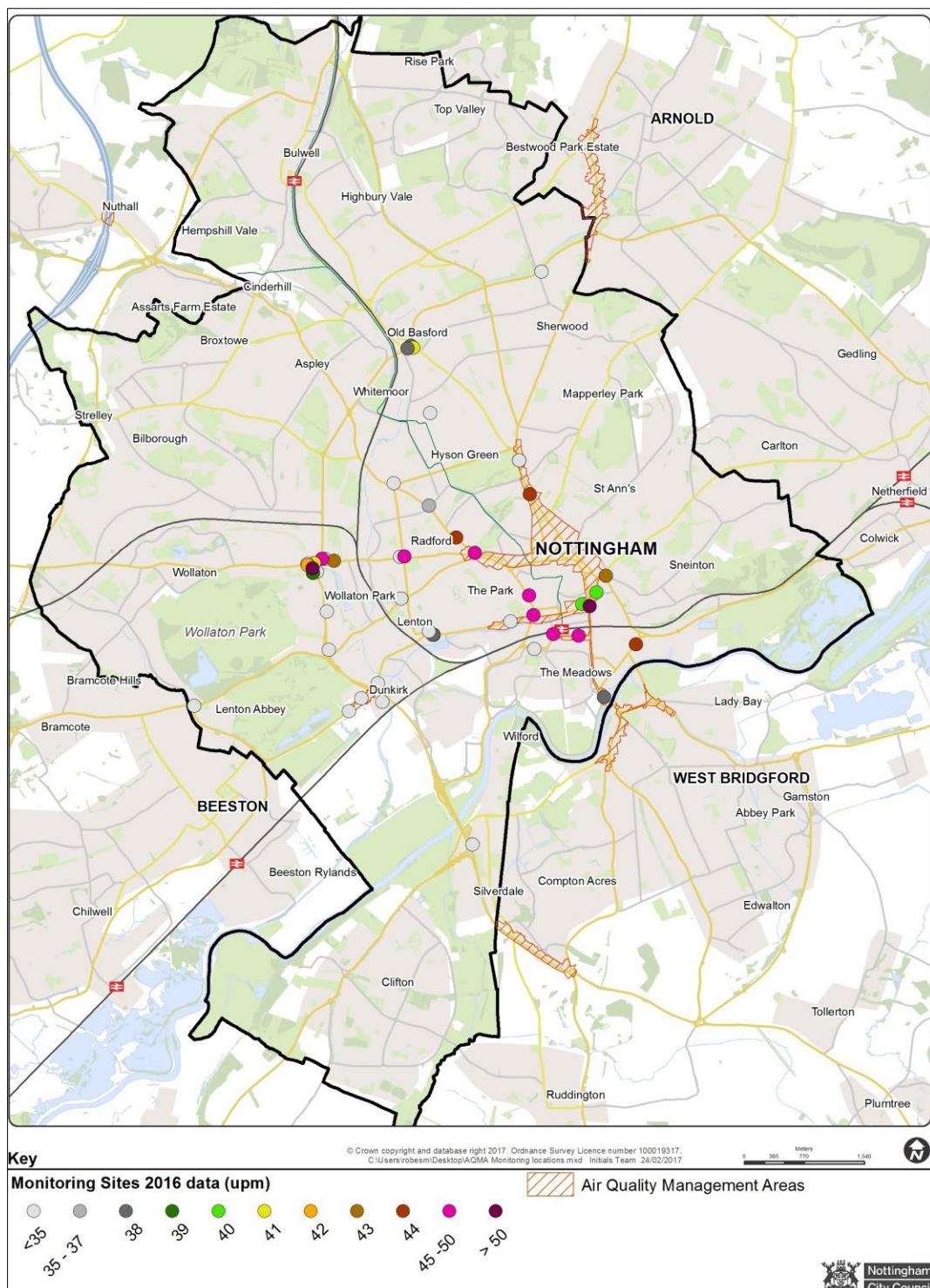
## 2 STRATEGIC CASE

- 2.1 The following Strategic Case provides our analysis of current air quality problems in Nottingham, the actions already in place to address these, and proposed additional measures that are required to further improve the current situation.

### Analysis of Air Quality Problems in Nottingham

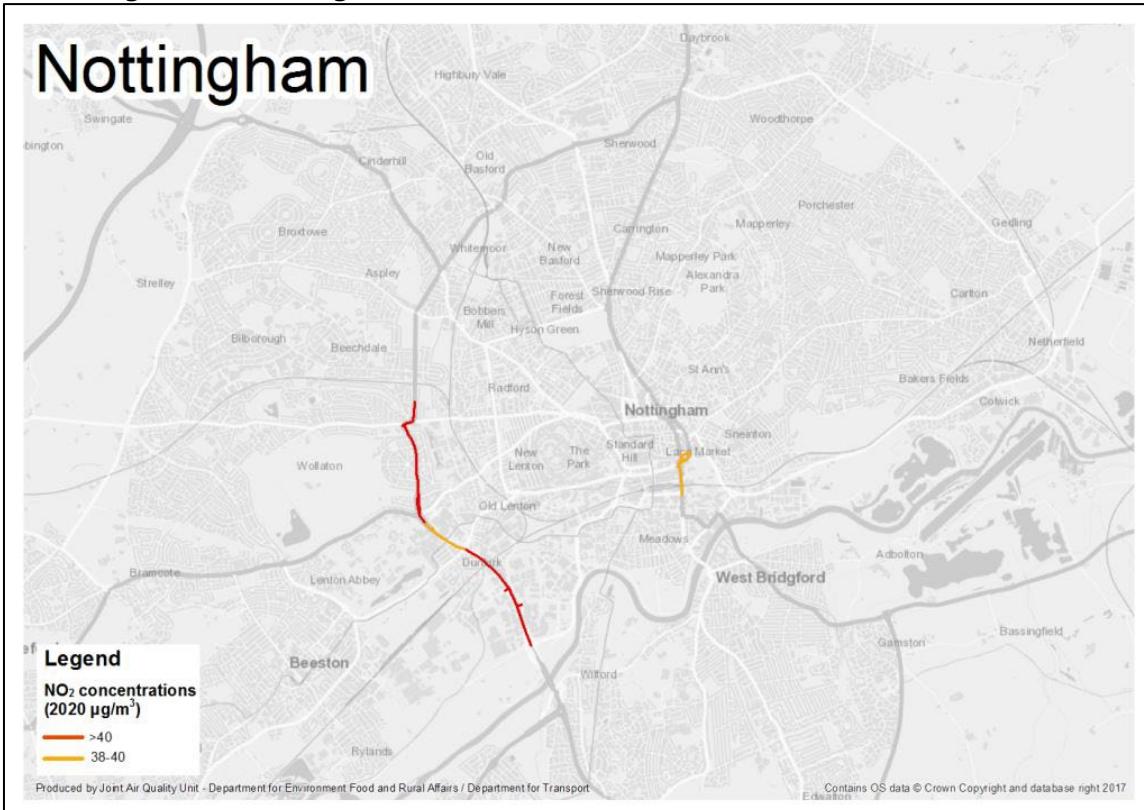
- 2.2 The Local Air Quality Management (LAQM) process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely, the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) that defines the measures it intends to implement to pursue the objectives. This Annual Status Report (ASR) is a requirement showing the strategies employed by Nottingham City Council to improve air quality and any progress that has been made.
- 2.3 Nottingham has two Air Quality Management Areas, both for Nitrogen Dioxide, where measurements have demonstrated that the Nitrogen Dioxide annual mean objective of 40 µg/m<sup>3</sup> is being, or was likely to be, exceeded. These two AQMAs were designated primarily due to Nitrogen Dioxide emissions from traffic, although NOx from gas-fired boilers, (commercial and domestic heating and cooking) also contribute to ambient NO<sub>2</sub> concentrations in the City area.
- 2.4 Figure 2-1 shows the areas where regular monitoring shows exceedances of the limit value for NO<sub>2</sub>. The areas of exceedance are predominantly located on the most heavily-trafficked routes within the city centre, and on Ilkeston Road and Crown Island to the west of the city centre. Monitoring on the Ring Road to the south of Crown Island has shown that Nitrogen Dioxide levels have reduced to below 40 µg/m<sup>3</sup>.

**Figure 2-1: Air quality monitoring Sites and Areas of exceedance, Nottingham City area**



2.5 Analysis carried out by Government ahead of the release of the 2017 UK plan for the reduction of roadside Nitrogen Dioxide indicated that the worst areas in Nottingham for Nitrogen Dioxide concentrations are located on the ring road. Figure 2-2 shows the areas where concentrations are above annual mean limit of 40µg/m<sup>3</sup> in red and where concentrations are below but close to the limit in yellow.

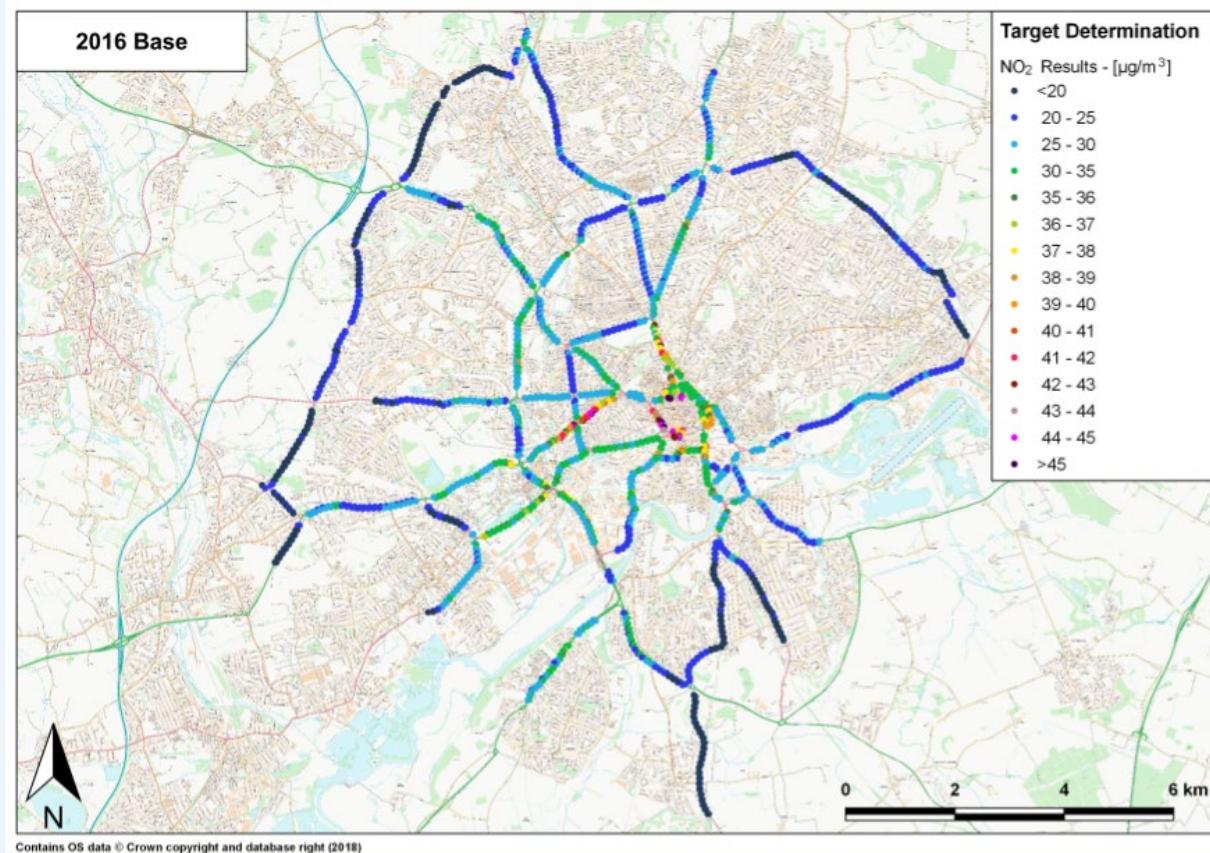
**Figure 2-2: Outputs from Pollution Climate Mapping (PCM) model showing areas of Nottingham Exceeding limit value for NO<sub>2</sub>**



- 2.6 The evidence from our LAQM process appears to show a degree of variation from the evidence derived from the Pollution Climate Mapping (PCM) model. The LAQM monitoring data appears to show the higher levels of Nitrogen Dioxide towards the centre of the city whereas the PCM model results show a particular problem on the ring road.
- 2.7 As part of the NO<sub>2</sub> plan Government required Nottingham City Council to carry out a feasibility study to further assess the air quality challenge in Nottingham and what measures could be taken to deliver compliance in the shortest possible time. Figure 2-3 shows the outputs from the base 2016 model run which forms part of the feasibility study. It shows high concentrations of NO<sub>2</sub> in the centre of the city with additional exceedances along Derby Road and at Crown Island. There is a strong correlation between the LAQM monitoring results and the locally produced modelling used to inform the analysis contained within this report. The difference between local modelling and the PCM is due to fact that there is a larger amount of locally derived air quality data used to develop the local model. In addition, the local model made use of locally derived traffic flows. The PCM model uses the five AURN sites around Nottingham together with nationally derived traffic flows. The result is that the local model has a greater degree of granularity and therefore more accurately represents the levels of NO<sub>2</sub> in the City.

**Because of this analysis, efforts to tackle the air quality problems were largely informed by the local model and were focussed on the city centre.**

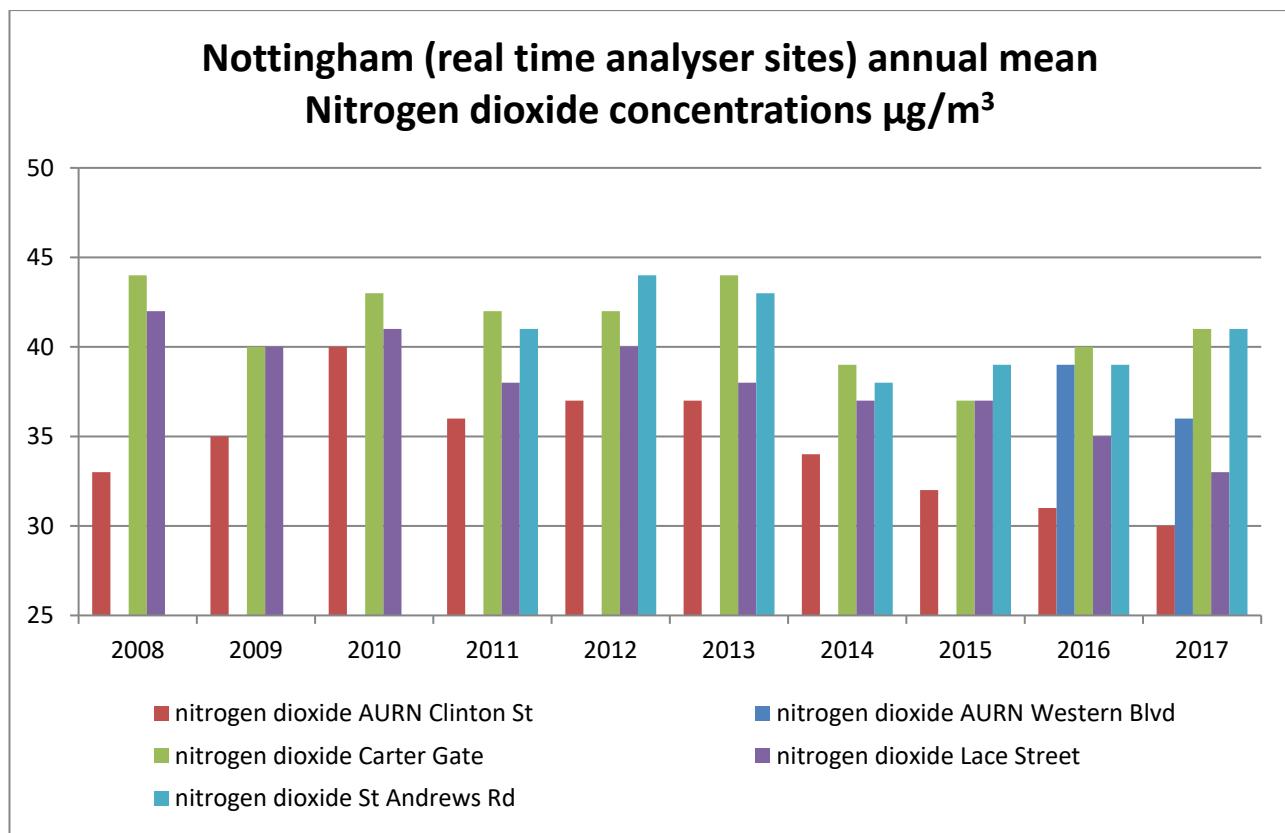
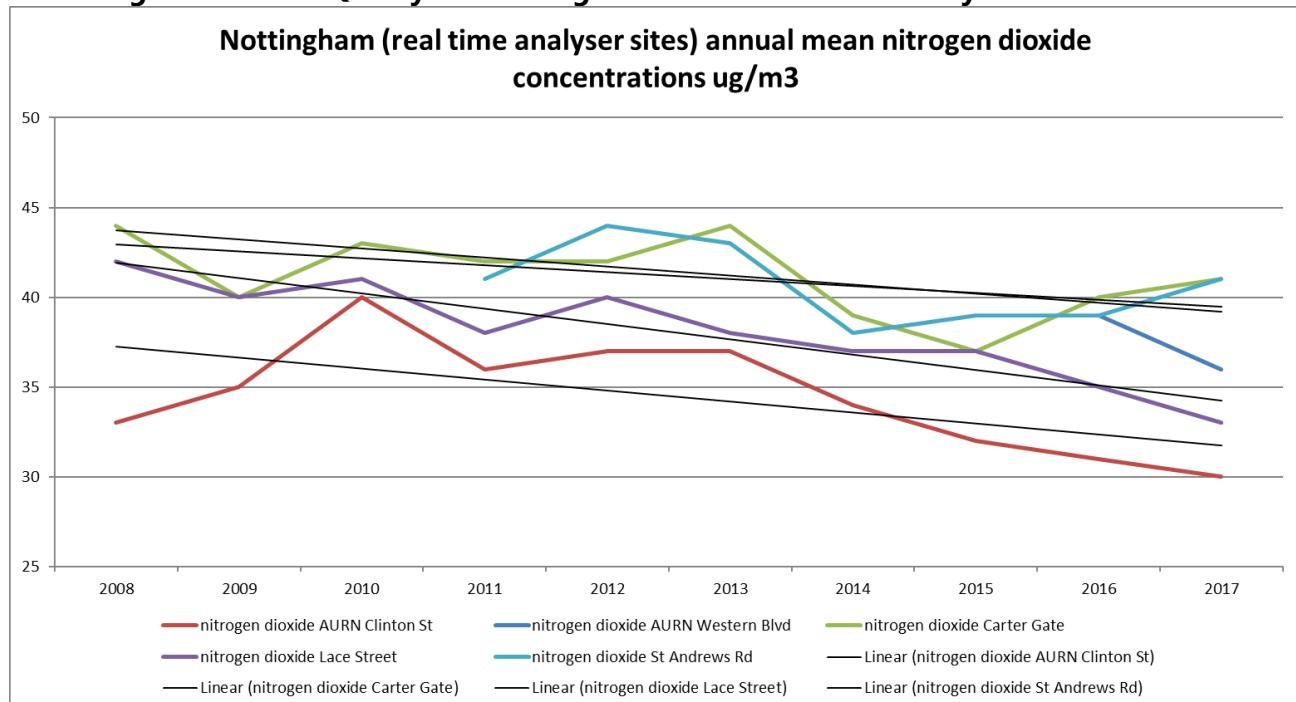


**Figure 2-3: Model output 2016 base model results (Target Determination)**

### Current Air Quality Trend

- 2.8 Nottingham City Council carries out regular monitoring of air quality as part of the LAQM process. The vast majority of monitoring is undertaken using over 40 diffusion tubes to provide cost effective monitoring with respect to the spatial distribution of Nitrogen Dioxide across the City. The data is reported as average monthly mean concentrations and the diffusion tubes supplement three City Council owned/operated Real Time Analysers which provide accurate, precise and temporally resolved monitoring data within the Air Quality Management Areas. There are also two DEFRA-funded Automatic Urban Rural Network (AURN) real time analysers that collect data on Nitrogen Dioxide levels and particulate matter. The locations of these monitoring sites are shown in Appendix B.
- 2.9 The data collected from the five real-time analysers is shown in Figure 2-4 and 2-4a. The average level of Nitrogen Dioxide across the sites can be seen to be reducing from around 42µg/m<sup>3</sup> in 2010 to approximately 36µg/m<sup>3</sup> in 2016. All five of the real time analyser sites monitored at or below 40 µg/m<sup>3</sup> in 2016. 2017's monitoring data shows an increase (1 µg/m<sup>3</sup>) in levels at St Andrews Road and Carter Gate (the reasons for this are considered in the Annual Status Report 2018) however the other sites do show a downward trend.

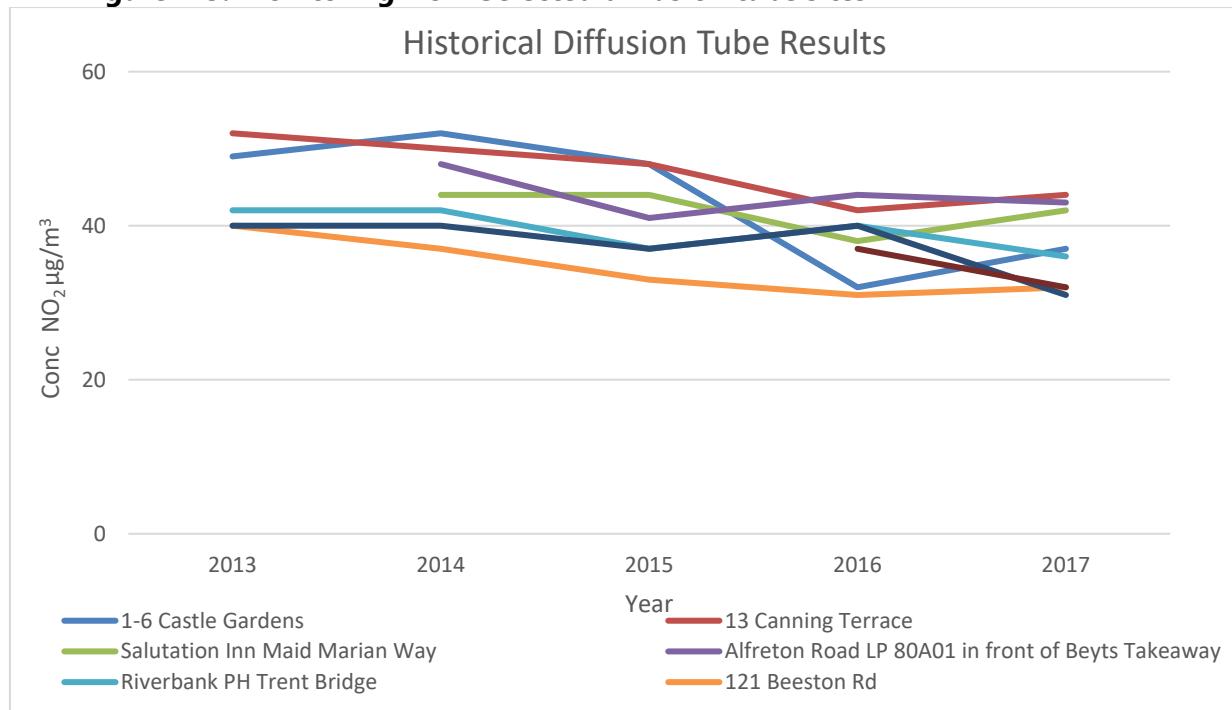
**The Data shown in Figure 2-4 and Figure 2-4a allows us to conclude that overall the levels of Nitrogen dioxide are falling in Nottingham.**

**Figure 2-4: Air Quality monitoring results from AURN sites****Figure 2-4a: Air Quality monitoring results from real time analyser sites**

- 2.10 A similar picture is shown with our diffusion tube data. Figure 2-5 shows data from selected locations with the highest Nitrogen Dioxide levels. Monitoring data for most of the sites dates back to 2013, which allows us to look at the picture over time up to 2017.

**This graph also shows that, across all locations, the levels of Nitrogen Dioxide are falling over time in Nottingham.**

**Figure 2-5: Monitoring from Selected diffusion tube sites**



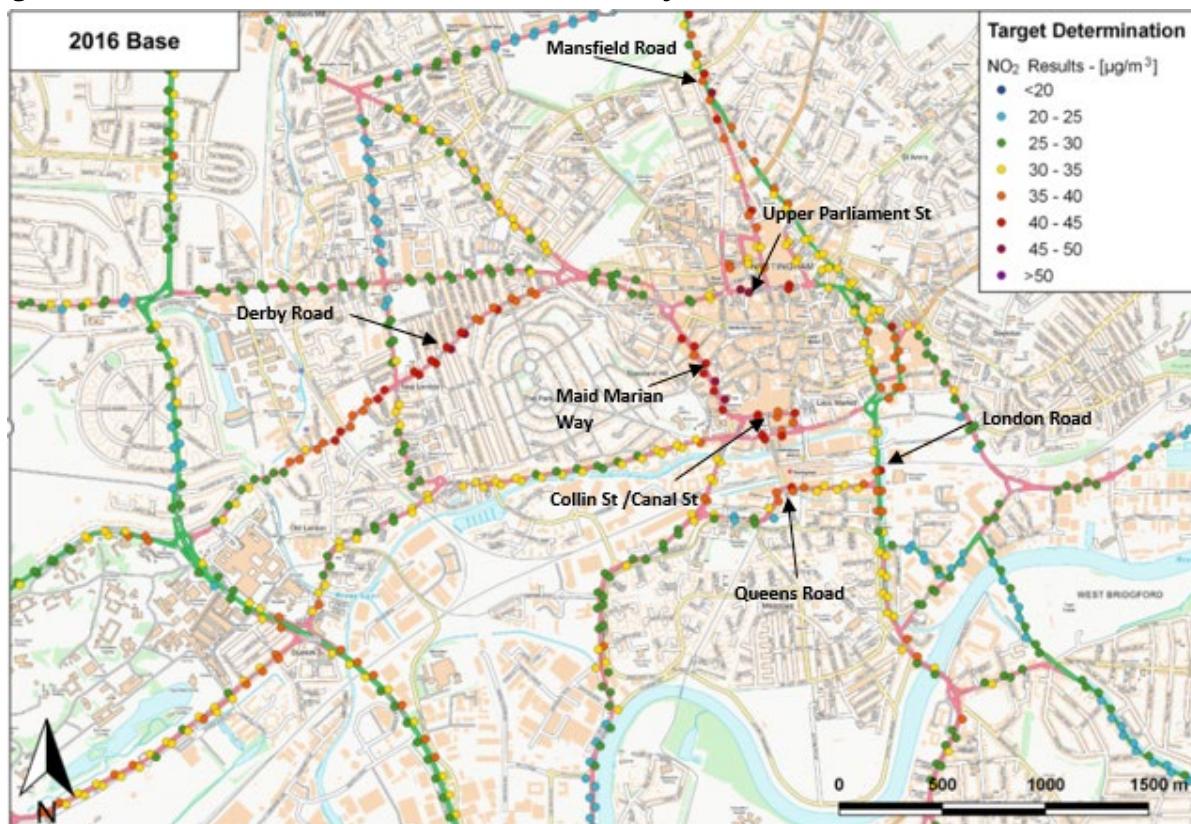
- 2.11 One site of particular interest is 87 Castle Boulevard (navy blue on the above Chart); which is located close to our Western Cycle Corridor Scheme. The scheme has provided a high quality segregated cycle route from the City Centre out to the west of the city serving a number of key sites including business parks, the QMC hospital and the University of Nottingham. The scheme was completed in October 2016 allowing a full year of air quality in 2017. The 2017 data shows a sharp drop in the level of Nitrogen Dioxide since the cycle corridor was introduced.

## Future Air Quality Trends

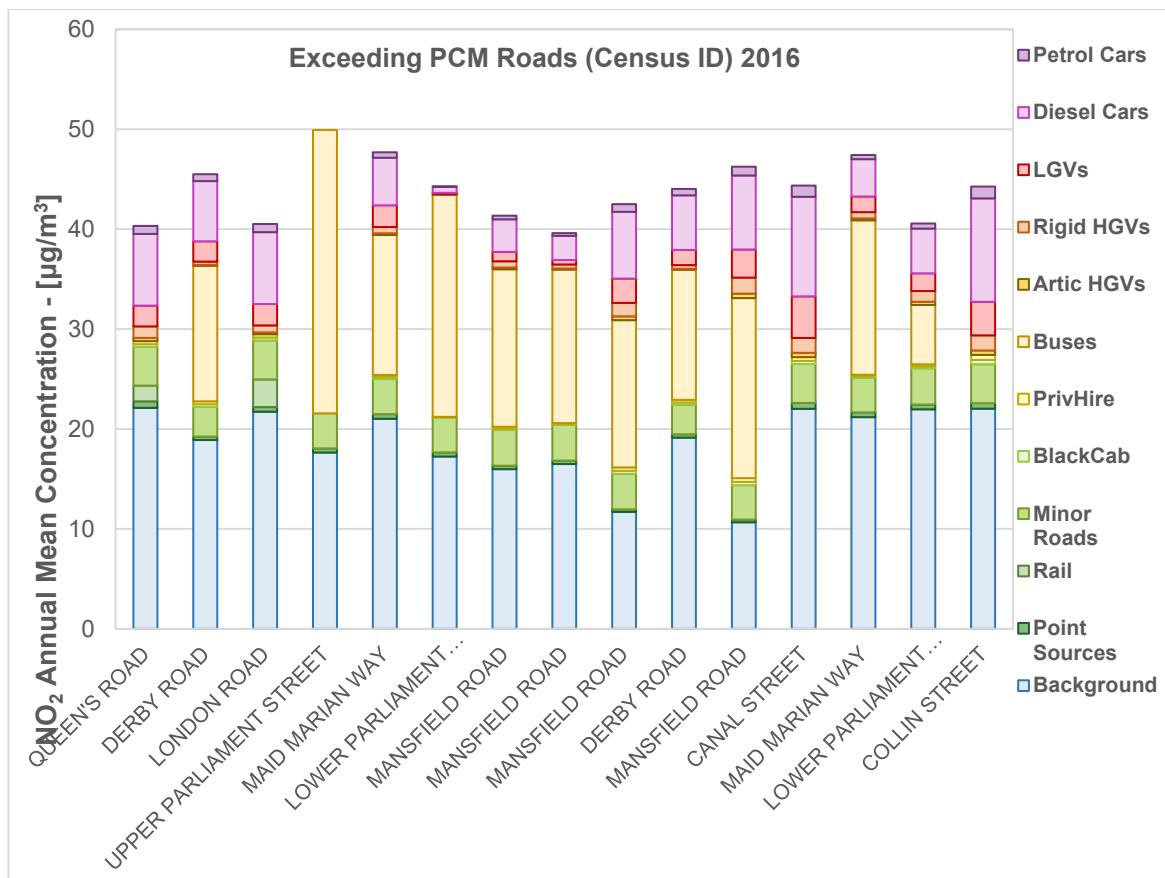
- 2.12 A key test of our plan to improve air quality is that we meet compliance with the Air Quality directive levels for nitrogen dioxide as soon as possible. The plan has therefore required detailed modelling of a number of future years in order to forecast air quality trends for the city. APPENDIX E (AQ3) contains the detailed results of this analysis and the following section provides an overview of the results. 2016 was chosen as the base model year with 2018 modelled as an interim year and 2020 being the final year. The intention was to show trends up to 2020 with and without measures aimed at improving air quality

2.13 While figure 2-3 (page 10) shows the results of the base model for the entire extent of the model domain. Figure 2-6 shows all locations modelled to be over 40µg/m<sup>3</sup> in 2016. AS previously stated local modelling and measurements concluded that all exceedance locations were close to the city centre

**Figure 2-6 modelled 2016 Base (no measures) City Centre**



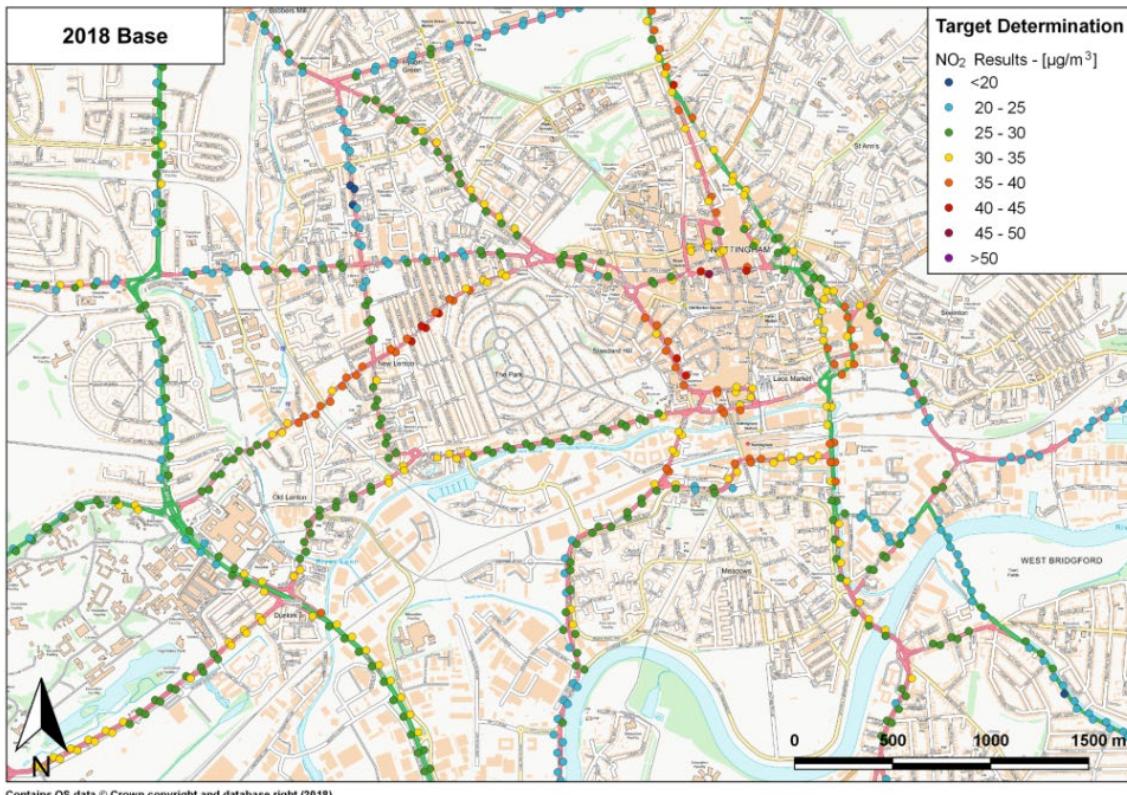
A source apportionment exercise was carry out on the road links in exceedance of the directive levels. The results of this exercise is shown in Figure 2-7 below

**Figure 2-7 Source apportionment on exceedance links**

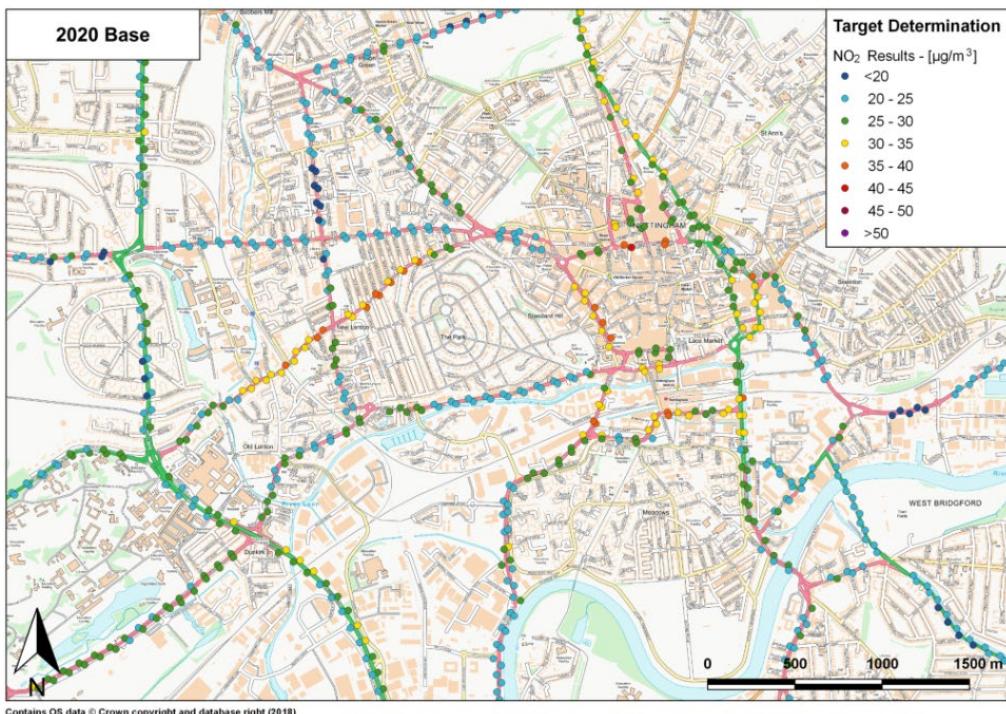
- 2.14 Figure 2-7 shows a breakdown of the sources of nitrogen dioxide on the modelled road links exceeding the air quality directive. For most exceedance locations the majority of nitrogen dioxide emissions came from background sources however, the analysis also showed that in most locations buses were a major contributor to concentrations of nitrogen dioxide.
- 2.15 The vast majority of the bus routes in Nottingham run on radial routes between the centre and the outskirts of the city. The largest bus operator in Nottingham, NCT, operates a high frequency service on most its routes. This results in a large number buses traveling through key routes in the city centre. In order to manage the smooth flow of buses through the city centre a number of traffic regulation orders are in place. These restrictions form part of the Clear Zone, which is shown in Figure 2-11. Certain routes in the city centre, such as Upper Parliament Street, are restricted to bus only meaning that the overwhelming majority of vehicles on these roads are buses operating on high frequency routes.
- 2.16 The high volume of bus traffic is reflected in the source apportionment. Figure 2-7 shows that a large proportion of the nitrogen dioxide at roadside on many routes in the city centre comes for buses. The problem is particularly acute at Upper Parliament Street
- 2.17 Assumptions used in the modelling predict that vehicles on Nottingham's roads will become cleaner over time as older more polluting vehicles leave the fleet and are replaced by newer cleaner types (emissions factor tool kit). In order to assess the impact of this trend an interim

year of 2018 was modelled. Figure 2-8 (below) shows the results of the 2018 base model with no measures in place aimed at improving air quality. The figure shows that reduction in nitrogen dioxide levels have occurred in some locations but three roads (Maid Marian Way, Upper Parliament Street and Derby Road) remain above the directive limit for nitrogen dioxide.

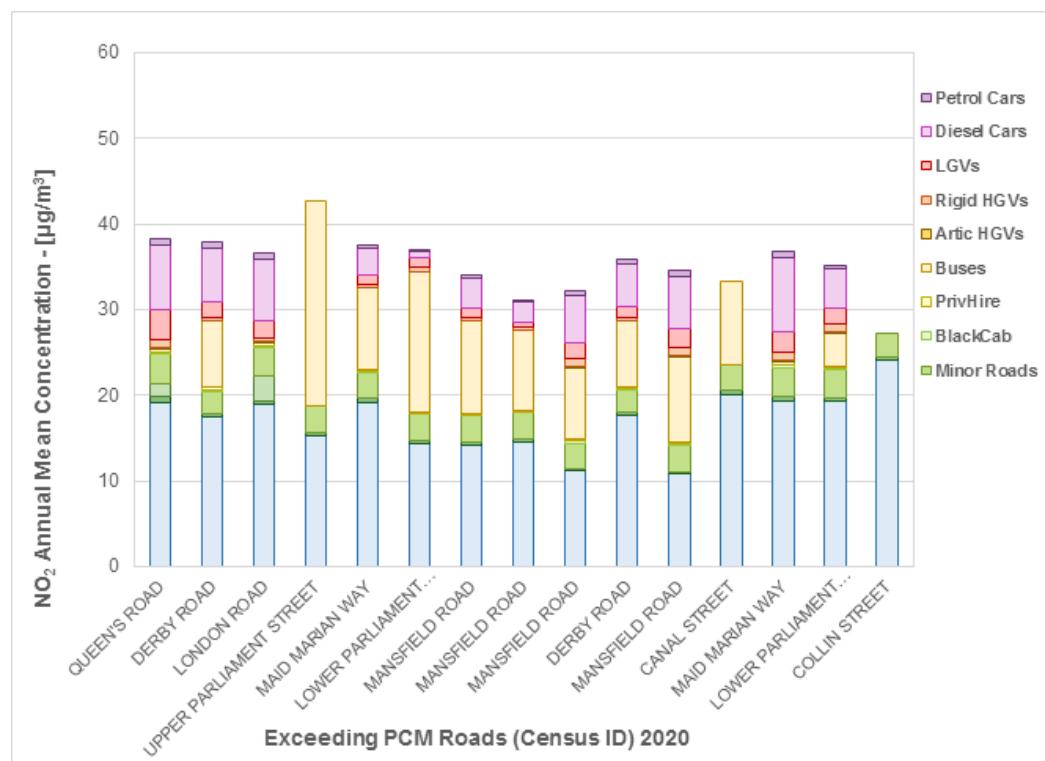
**Figure 2-8 Modelled 2018 Base (no measures).**



- 2.18 Figure 2-9 (below) shows the levels of nitrogen dioxide concentrations in Nottingham city centre in 2020 (base) also without any measures aimed at improving air quality. The figure shows that in 2020 Upper Parliament is the only location that has concentration of nitrogen dioxide above 40 µg/m<sup>3</sup>.

**Figure 2-9 modelled 2020 Baseline (no measures)**

- 2.19 Figure 2-10 below shows an analysis of source apportionment in the 2020 baseline scenario. It confirms that the majority of nitrogen dioxide emissions at Upper Parliament Street come from buses.

**Figure 2-10 Source apportionment 2020 baseline (no measures)**

## **Actions to Improve Air Quality**

### Current Actions to Improve Air Quality

- 2.20 Nottingham's primary approach to reducing Nitrogen Dioxide concentrations from road traffic thus far has been to implement schemes that encourage the use of alternative modes of transport to the private car, supported by encouraging take up of low emission vehicle technologies. There are several initiatives currently in place where Nottingham City Council and partners are actively working to increase the use of sustainable modes of transport to reduce the reliance on the private car as well as the take up of cleaner vehicles. These include:

#### *Integrated public transport system*

- 2.21 Nottingham City Council recognises that public transport is a major part of the solution to poor air quality and therefore has developed a comprehensive strategy to improve the public transport offering to citizens and businesses. For the last 15 years Nottingham City Council has been developing an integrated public transport system, in partnership with local operators, which offers a viable and high-quality alternative to car travel. The bus and tram network has grown from 67 million (2004) and currently carries over 78 million passenger journeys annually.
- 2.22 Investment has seen the development of the Nottingham Express Transit tram network, now spanning three lines with associated park and rides serving the key junctions of the M1 motorway. In summer 2015, two new lines opened serving the south and south-west corridors of the conurbation and key employment destinations such as the Queens Medical Centre, University of Nottingham, Boots and the NG2 Business Park, along with the city centre via Nottingham Railway Station. Nearly 18 million passenger journeys are taking place per year on the system and approximately 30% of users previously made their journeys by car or public transport.
- 2.23 Nottingham has a strong history of promoting bus travel through close partnership working. In 2010, the country's first city-centre-wide Statutory Quality Partnership Scheme (SQPS) was introduced to deliver competitive and attractive bus services by specifying the standards of quality of local services. The Council has invested in modern, illuminated shelters with electronic real-time information displays at the 96 city centre stops. Operators using the facilities are meeting quality standards of service, with all vehicles being accessible low floor variants that comply with low emission standards.
- 2.24 Following the introduction of the Bus Services Act (2017), negotiations are currently underway with all local bus operators over the implementation of a new partnership arrangement. This will further regulate departures from on-street city centre bus stops, where all local services terminate within the city's main Air Quality Management Area

(AQMA). By 2019-20, it is intended a Euro VI minimum entry standard will be in place across the full local authority area for all bus services.

- 2.25 The implementation of this will further support a reduction in bus-derived emissions through a decrease in bus mileage and higher entry standards for all buses that operate into the city and throughout Greater Nottingham. These entry standards will also be applied to key high frequency routes which pass through a number of AQMAs in Greater Nottingham, and which sit within Nottinghamshire County Council's administrative area. This means that a reduction of NOx emissions in these additional hotspots with problematic concentrations of roadside NO<sub>2</sub> will also be achieved, significantly extending the benefits of this project beyond Nottingham City Council's boundary.
- 2.26 Coupled with the enhancements to the core bus service provision, investment is being made to transition the bus fleet to low and ultra-low emission vehicles. The City Council runs a subsidised Linkbus network to plug the gaps in the commercial network. Interchanging with key destinations such as city centre, the two hospitals, park and rides, major shopping centres and out of town employment sites. The fleet of 58 buses is fully electric with a series of Optare and BYD electric buses in operation. The fleet of 45 Optare buses has now travelled 1 million miles and has saved 15 tonnes of Nitrogen Dioxide.
- 2.27 In April 2016, the City Council introduced the Robin Hood Card smart card for use on bus and tram services. The smartcard offers unlimited multi-operator travel across all services in the urban area. The network is supported by on-street ticket vending machines located at tram stops, city centre bus stops across the conurbation along with a network of Payzone outlets at 175 shops and improved retail website.

#### *Contactless Payments on public transport services*

- 2.28 Nottingham City Council successfully secured £2.4m funding from the National Productivity Investment Fund that will enable the use of contactless payments across the public transport network. This will reduce passenger loading times and improve journey time reliability on all routes. Nottingham will be the first city outside London where payments for bus and tram journeys can be made by contactless bank card or phone, with a daily cap to give best value fares.

#### *Go Ultra Low Nottingham*

- 2.29 Nottingham City Council was successful in its bid for over £6m to help fund a range of innovative measures that will deliver the uptake of an additional 8,000 ULEVs on our roads by 2020. It is the first project of its scale to invest in measures to incentivise the use of cleaner commercial and private vehicles. These include:
- Funding the installation of up to 230 fast and rapid charging points across the Nottingham, Derby Derbyshire and Nottinghamshire areas

- The Workplace Travel Service, offering grants for electric vehicle charging infrastructure, employer events, a fleet try before you buy scheme and fully funded fleet reviews
- ULEV promotions and ride and drive events showcasing the benefits of ULEVs and their performance
- A business to business knowledge sharing network (called Low Emission Vehicle Enterprise and Learning) providing workshops, events and conferences on a range of subjects relating to low carbon vehicle technologies
- Support for the Daleside Road ULEV priority lane (see below)
- Conversion of the City Councils Fleet and supporting other public sector organisation to make the shift.

2.30 Further details regarding the programme can be found at [www.goultralownottingham.org.uk](http://www.goultralownottingham.org.uk)

2.31 The Go Ultra Low programme will deliver benefits across the whole D2N2 Local Enterprise Partnership area.

### *Hackney Carriage and Private Hire Vehicle Strategy*

- 2.32 Hackney Carriages and Private Hire Vehicles are an important part of Nottingham's integrated transport system. They are a useful, often vital component to completing journeys and may form part of a more sustainable longer distance multi modal trip or be used where no convenient alternative is available. The service is demand responsive and often operates on a year round 24 hours a day 7 days a week basis. It is one of the most flexible elements of the transport system yet still operates on a completely commercial basis.
- 2.33 In Nottingham taxis and private hire vehicles are integral to supporting the businesses to thrive by transporting people and goods/ packages. The services can be a primary mode of passenger transport for many people for whom mainstream public transport is not an option or suitable, due to lack of public transport availability. Whilst fully compliant taxis help support many disabled and vulnerable people to live more independent lives. They also play an important part in the city's night time economic well being, providing a safe and secure mode of transport for many people. A thriving, efficient and affordable taxi service contributes to the local economy and benefits both local residents and visitors to Nottingham.
- 2.34 The taxi and private hire industry in Nottingham is facing challenges: not only in the type of service it needs to deliver to continue to adapt to changing demographics of a growing, ageing and high student population but also in how it delivers its services due to technological advancements e.g. App bookings, new business operating models i.e. Uber and low emission vehicles.
- 2.35 The City Council is committed to ensuring the taxi and private hire sector remains integrated in our sustainable transport network and for them to continue to move passengers to destinations safely, whilst contributing to the economy with minimal environmental impact.

- 2.36 The City Council launched its new Taxi Strategy on 7th February 2017. The strategy has a number of key objectives to modernise the taxi fleet, which tie into the overall strategy of improving air quality and enhancing the public transport offer.

**The most important of these objectives is the target that every Hackney Carriage in Nottingham should be an ultra-low emission vehicle (ULEV) by 2025, with at least 40% of the fleet an ULEV by 2020.**

- 2.37 Furthermore, the Council introduced its new Age and Emissions Policy in January 2018 which will only licence taxis that are Euro 6 or better (i.e. ULEV) from 2020. This will deliver further air quality benefits in the city, supplementing those delivered by the bus retrofitting programme, with the requirement for all 411 vehicles to be replaced in the next 15 months. While the retrofit programme is a robust and realistic approach to achieving compliance in the shortest possible time, the taxi strategy creates a further buffer between Nottingham's NO<sub>2</sub> concentrations and the legal limit and locks in our long-term transition to a sustainable transport system and vehicle fleet.
- 2.38 The full taxi strategy document is contained in Appendix C. It additionally aims to support the taxi trade with the development of app partnerships and other innovations to help operators remain competitive in the face of pricing and service competition from private hire operators. An example of this can be seen through the introduction of the My Taxi app booking facility in March 2018.
- 2.39 As part of a project enabled by the Early Measures Fund, Nottingham is purchasing up to five ULEV hackney carriages that will be hired back to drivers at a set rate (covering the costs of administering the trial) in order to counteract the high initial cost of such vehicles and make them affordable to the trade. The aim of this ULEV Taxi Trial is to act as a demonstrator, or "try before you buy", for how a ULEV taxi fleet could operate, helping to dispel misconceptions about the flexibility or operational feasibility of the new propulsion technologies
- 2.40 In addition to the physical measures, we are already exploring other barriers to the uptake of ULEV taxis. The majority of taxi operators are practising Muslims. The Islamic faith prohibits certain loan and other financial arrangements, which given the significant purchase costs of ULEV hackney carriages, can act as a barrier to existing taxi operators. Nottingham City Council has commissioned research on how these issues can be resolved.

### *Daleside Road ULEV Corridor Scheme*

- 2.41 The scheme has created a low emission corridor that benefits from lengths of new bus lanes, junction alterations, bus stop/shelter upgrades and real-time information. The corridor connects settlements to the east of Nottingham with the City Centre, the Racecourse park

and ride site, and Waterside Regeneration area. ULEVs are permitted to use the new bus lanes along this corridor, which are the first of their kind in the UK.

- 2.42 In addition to investment in an integrated public transport system and cleaner vehicles, the City Council has expanded the sustainable transport offer to provide more choice and availability. This has included:

### *Cycle Ambition Programme*

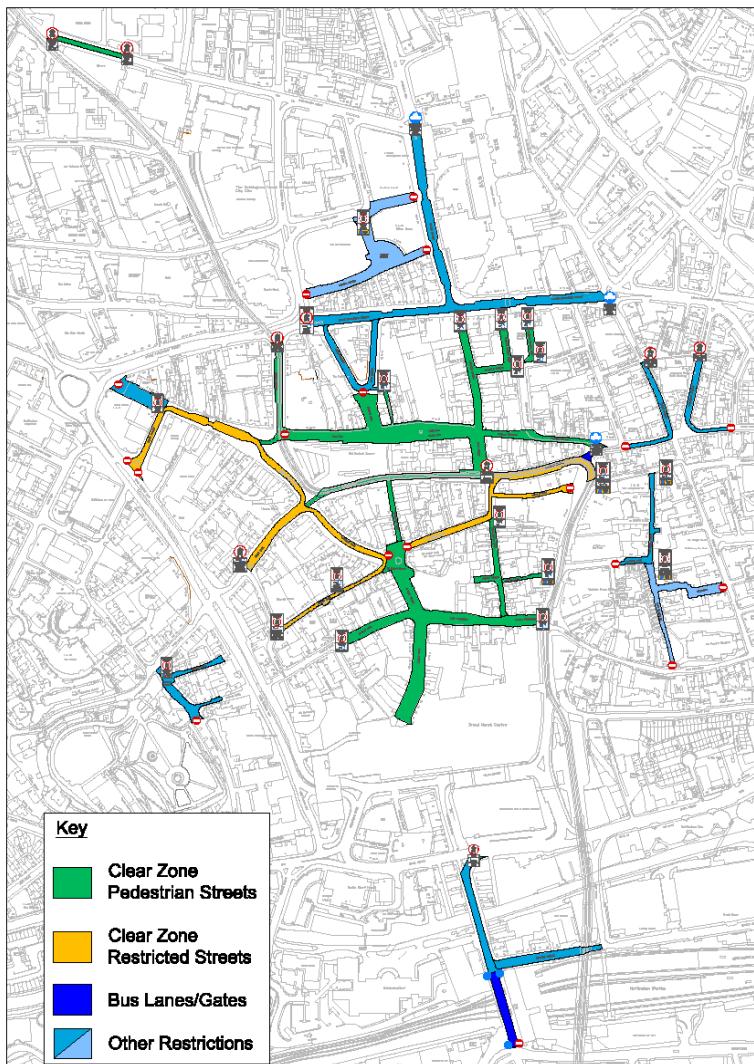
- 2.43 The City Council secured £6.1m through the Local Enterprise Partnership to kick-start an overhaul of Nottingham's cycling facilities. The aim of the programme has been to increase the number of people cycling on a regular basis by 10% by 2025. To do that the City Council has built a series of cycle routes, with four main cycle corridors into the city centre, these have achieved high quality routes based on Transport for London best practice and segregated from traffic where possible. The development of a high quality city centre cycle hire facility is also an important component of this strategy.

### *Behaviour Change Programme*

- 2.44 Nottingham City Council was recently successful in winning £2.7m funding from the DfT's Access Fund to deliver a programme of behaviour change activities working with households and businesses to promote sustainable travel options to improve air quality, including support for cycling. A broad range of initiatives are being delivered across Nottingham and beyond.
- 2.45 Access Fund monies received from the Department for Transport (alongside funding from WPL, Go Ultra Low and some DEFRA monies) are being used to offer an integrated Workplace Travel Service. This service provides support for public, private sector and voluntary organisations to help save money, reduce staff travel costs, improve staff health, fitness and wellbeing, reduce local road congestion and improve air quality.

### *Clear Zone*

- 2.46 The Clear Zone encompasses a number of restrictions that prevent general traffic from accessing the largely pedestrianised central core of the City Centre, though special access permits are issued by the Council to allow loading and unloading between 10am and 4.30pm.
- 2.47 Figure 2-11 shows the extent of the existing Clear Zone and the type of restrictions currently in place across the zone. The City Council is currently in the process of revising the Clear Zone policy, it is intended that the Clear Zone restrictions will be extended to operate over a 24-hour period. The zone itself will cover a larger geographic area. New restrictions on parking and waiting will be aligned with emissions criteria. Together these proposals will act to restrict the most polluting types of vehicles within the zone it will also protect the investment by operators in low emissions vehicles.

**Figure 2-11: Clear Zone area and restrictions**

### *Workplace Parking Levy WPL*

- 2.48 A Major aspect of Nottingham City Council's Approach to promoting sustainable transport is the Workplace Parking Levy (WPL). The WPL scheme is a congestion charge designed to encourage employers to reduce the number of free workplace parking places they provide to staff and switch to alternative modes of transport.
- 2.49 Nottingham's WPL was introduced in October 2011, with the charging commencing in April 2012. The levy works as a demand management tool focusing on commuter parking, which is pertinent given commuters account for about 70% of congested peak hour traffic in Nottingham. Congestion costs Nottingham £160m every year and over half of this cost falls directly on businesses, who are the main beneficiaries of the Levy.
- 2.50 The WPL is an annual charge levied on all employers within Nottingham City Council's administrative boundary who provide 11 or more liable workplace parking places. The scheme is largely administrative with employers managing their own account online. Since charging began in 2012 over £44 million of revenue has been generated with 100%

compliance from liable employers, and over 99.9% of potential revenue has been collected. The WPL team operates at less than 5% of revenue cost, and their prevailing ethos is about achieving compliance rather than taking enforcement action.

- 2.51 WPL revenues are ring-fenced for spending on transport initiatives contained within the City Council's Local Transport Plan. It has facilitated a step-change in transport infrastructure; providing the funding to more than double the size of the city's tram network through extensions, redevelop the city's mainline railway station, and support our award-winning fully electric Link bus network.
- 2.52 It has also contributed towards the development of Nottingham's integrated pay-as-you-go Robin Hood smartcard, its extensive real time information system with over 1,500 displays, refurbished bus stations and technology for priority and late running buses at key signalised junctions. It is also partly financing a new bus station within the ongoing redevelopment of the Broadmarsh area of the City Centre.
- 2.53 Significantly, the WPL revenue is used as local match funding to enable the City Council to bid for external funds from the Department of Transport and elsewhere, shown in Table 2-1.

**Table 2-1: WPL match funding**

	<b>WPL local contribution (£M)</b>	<b>External funds (£M)</b>
Tram extension	199	371
Train stations	12	48
Electric buses	5.8	9.2
Bus stations	1.7	1.3
Smartcard system	1.1	1.0
Real time info system	1.2	1.0
<b>TOTAL</b>	<b>220.8</b>	<b>431.5</b>

- 2.54 This investment of over £650m has led to a 4.5% patronage increase in bus/tram usage since 2013/14 from an already high level of 75m passengers per annum. Nottingham has the highest level of bus/tram usage per head outside of London, with customer satisfaction levels continuing to rise across all areas to over 95%.

### **Results of preferred options**

- 2.55 Taken together, these measures have contributed to traffic volumes in Nottingham dropping as more people make use of the city's public transport and sustainable transport offer (see Appendix A for more detail on this). This is in contrast to the national average assumptions deployed in the PCM which project substantial traffic growth over the next few years. Our local modelling corrects for this discrepancy and confirms that ongoing measures are already having a positive impact in Nottingham, meaning that the air quality challenge is not as severe as suggested by the PCM. However, while ongoing measures have reduced air pollution already, additional action is required to deliver compliance with legal limits in the

shortest possible time and deliver the health, environmental and economic benefits that flow from cleaning up our air.

2.56 The Economic Case within this business case sets out three options for improving air quality:

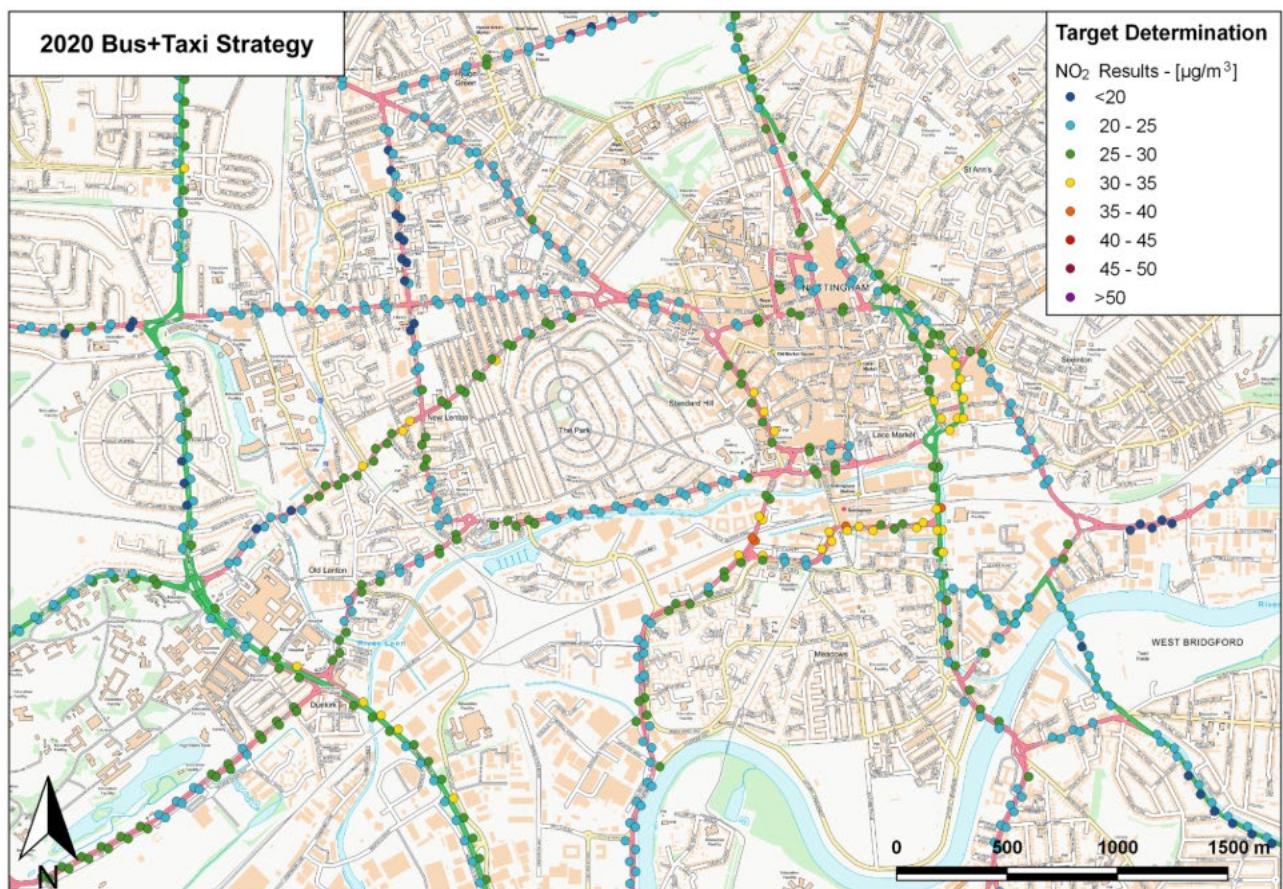
- Baseline (Do minimum including bus retrofitting with Taxi Age and emissions policy)
- Revised Clear Zone permit scheme
- Charging Class B Clean Air Zone

Of the three options it was found that the Baseline option would achieve compliance with the air quality directive in the soonest possible time and is therefore the preferred option.

The main measures to be implemented as part of the preferred option are the Bus Retrofitting programme and the Taxi Age and Emissions Policy other measures to be implemented as part of the Baseline option are outlined in paragraphs 2.20 to 2.55.

Figure 2-12 shows the results of modelled nitrogen dioxide levels in 2020 with those measures in place. The results of this model run show that there are no roads with exceedances of nitrogen dioxide in 2020.

**Figure 2-12 2020 with Baseline + Bus and Taxi Strategy (Age and Emissions Policy)**



## Additional Measures to Improve Air Quality

- 2.57 Following the release of DEFRA's 2015 plan to improve air quality a number of funding sources were made available to cities with proven air quality issues. Nottingham City Council bid for funding from the Government's Clean Bus Technology Fund as well as for funding for early measures from the Implementation Fund. The following section describes the additional action supported through these funds to deliver compliance in the shortest possible time.

### *Support for early measures from the Implementation Fund*

- 2.58 In July 2017, Government made £1m of early measures funding available for each of the five cities named in the 2015 plan as having to take additional action. The funding was aimed at improving cycling facilities and encouraging the uptake of low emission vehicles. The City Council was successful in bidding for funding for a project to purchase a number of ULEV taxis, which would then be leased to the operators by Nottingham City Council. Cycling Infrastructure improvements have also been funded, along with a series of research initiatives aimed at encouraging the use of battery electric vehicles.
- 2.59 The early measures funding was then extended in March and the City Council's bid was aimed at transitioning the City Council's own fleet of vehicles away from diesel to battery electric vehicles. £1.5m funding was received and this will enable the purchase of 10 electric Sweepers, 15 electric Cage Tippers, the conversion of three 18 tonne refuse collection vehicles, and the purchase of one fully-electric 26t refuse collection vehicle.
- 2.60 The transition of the city council's fleet to electric vehicles will provide an immediate contribution to the improvement of air quality in and around the centre of Nottingham.

### *Clean Bus Technology Fund*

- 2.61 Nottingham City Council sees public transport as part of the solution to tackling poor air quality in the city. Historic investment in our bus fleet means that Nottingham City Transport (NCT) has a relatively modern fleet of mainly Euro 5 diesel buses the oldest of which is just over 7 years. Nottingham has set ambitious targets of having one of the least polluting bus fleets in the country. The city council saw retrofitting NCT's fleet of Euro 5 buses as a way of achieving this.
- 2.62 In 2017 The City Council applied for £2.7m from the Clean Bus Technology Fund. The fund would enable the retrofit of a 161 Euro V buses to Euro VI standard by NCT (in addition 5 Euro III training vehicles would also be retrofitted to Euro VI standard) and 5 Vehicle Euro V vehicles operated on our contracted Locallink service would be retrofitted to Euro VI standard. The retrofitting programme is summarised in table 2-2

**Table 2-2: Bus fleet for Euro VI retrofitting**

Vehicle Type	Euro Rating	Average Age (as of 31.03.18)	Routes Served	Accredited Tech
50 x Scania OmniDekka	V	7 yrs	35,48,49,100,UoN,A1/A2	Baumot BNox
62 x ADL E400	V	3yrs, 6 months	1,4,34,56,57,59,78,79	Baumot BNox
16 x Optare Solo SR	V	6 yrs, 2 months	30,31,41,70,71,72	Baumot BNox
5 x Optare Solo SR	V	7 yrs 5 months	L10, L11, L14	Baumot BNox
22 x ADL E200 (10.2m)	V	4yrs, 8 months	15,16,46,47,87,88	Baumot BNox
11 x ADL E200 (11.3m)	V	4 yrs, 6 months	39,40,42,53	Baumot BNox
5 x Scania Omnicity	III	14yrs,6 months	Driver Training Vehicles	Baumot BNox

- 2.63 The retrofit programme has now started and the first of the upgraded buses are already operating on routes out to Clifton. By early 2019, the conversion of the above vehicles will help deliver Euro VI NOx compliance across 70% of the Nottingham City Transport (NCT) fleet this will include 53 Biomethane powered Double Decker buses, which are already in service with NCT.
- 2.64 Upon completion of the retrofit programme, Euro V Diesel buses' NOx emissions savings of 63,411kg and PM savings of 488kg will be achieved.

**Modelling analysis contained within the economic case (see section 3) evidences that these measures alone will be sufficient to bring Nottingham into compliance with the air quality directive by 2019.**

- 2.65 Furthermore, funding of this retrofit project will enable NCT to concentrate their capital reserves on a bid into the next round of the Ultra-Low Emission Bus Scheme (ULEBS). The capacity of Nottingham City Transport's biomethane fuelling infrastructure will be doubled if the bid is successful. This will enable the size of NCT's biomethane double decker fleet to grow from 53 to 120 buses by mid 2019.
- 2.66 The remainder of the fleet, 185 Euro V midi and double deckers (inclusive of buses in the county area) will be retrofitted via funding from the clean bus technology fund to Euro VI emission standard, creating a 100% Euro VI compliant operation.

**This strategic plan is a central pillar in the package of measures that Nottingham City Council is delivering to ensure that exceedance of NOx is brought to within legal limits by 2019.**

- 2.67 This investment will further enable NCT to continue its journey towards becoming the UK's first carbon-neutral bus company. The 67 additional biomethane double deckers which will enter service as a result of the investment in the fuelling infrastructure will replace 67 existing Euro III and Euro IV diesel double deckers. Furthermore, this investment will enable NCT to realise its medium term strategy to develop a full low and ultra low emission bus fleet. From 2022 onwards, as the diesel buses retrofitted via the Clean Bus Technology Fund begin to life expire, the company intends to begin the transition to full electric bus operation for both

double and single decker buses as it is felt that the battery technology will be mature enough at this stage to fulfil the operational requirements of the company.

## Future Measures

- 2.68 The modelling work carried out as part of this business case shows that the implementation of the bus retrofit programme will deliver compliance in the shortest possible time, with NO<sub>2</sub> concentrations becoming compliant with legal limits in [2019].
- 2.69 However, the City Council has ambitious plans to further improve air quality by reducing other pollutants such as particulate matter. In addition, measures taken to improve air quality may result in distortions to local taxi markets and changes to fleet operator behaviour that would not be beneficial to the economy of Nottingham. The public consultation exercise has identified a clear desire on the part of stakeholders to do more to tackle air quality problems, particularly those resulting from taxi and busses.

### Buses

- 2.70 As previously stated Nottingham City Council is engaged in negotiations with Bus Operating companies to extend and enhance the current Statutory Quality Partnership Scheme. The Extended Partnership Scheme will add to measures taken to improve air quality in Nottingham. The main measures will be to reduce the number of bus stops in the city centre and to impose waiting and idling restrictions on buses these measures will help to increase the efficiency of bus movements in the centre of the city thereby improving journey times. It will also regulate to ensure that only Euro 6 Diesel, Gas and Electric buses can operate within the area.
- 2.71 The scheme is set up in partnership with bus operating companies and so their cooperation is required to implement the changes to these regulations. Bus companies operating in Nottingham have benefited from grants to help with the cost of retrofitting their vehicles in order to ensure they are compliant with the local air quality requirements. However, implementing the retrofit is onerous for bus operating companies as each bus must be taken out of service for at least two days and there are ongoing costs associated with the retrofit that will not be covered by the grants (such as increased maintenance and fuel costs). It is therefore necessary to incentivise the operating companies to complete the retrofitting programme.

### *Nottingham Taxi and Private Hire Vehicle Strategy*

- 2.72 The City Council has put in clear policy levers through the Taxi Strategy and Age and Emissions policy to ensure only clean modern vehicles can operate in Nottingham. No licenses will be issued to Hackney Carriages below Euro 6 from mid-2019. In light of this all 411 hackney carriages will be Euro 6 or above by end-2019. The age and emissions policy was consulted on heavily with the trade and the Council adopted a two-year lead in time (January 2018-January 2020) to not "squeeze" the trade too hard given concerns raised with

the high upfront purchase cost of the new vehicles and a lack of understanding on the new ULEV technologies. Anecdotally through engagement with the trade, many drivers have confirmed they are working to save a deposit in order to change their vehicles in 2019. After 2025, no new internal combustion engined vehicles will be licensed to operate as taxis in the city of Nottingham with the Council opting for ULEV only vehicles. .

2.73 These measures place the onus for upgrading vehicles onto the taxi operators themselves. In the case of hackney carriages, the costs associated with upgrading vehicles and renewing licenses for those vehicles is borne by the taxi drivers.

2.74 In the recent independently commissioned taxi study, which tested the perceptions and attitudes of the local drivers, 100% said the purchase price of the new ULEV taxis was a barrier, whilst 90% supported test drive opportunities, 82% stated a try before you buy scheme would "very likely" and "likely" incentivise them to adopt ULEV taxis. The top three incentives very likely and likely to incentivise the uptake of ULEVs were:

- Reduced licensing fees
- ULEV taxi try before you buy
- Increased charge point infrastructure

2.75 The Council is seeking to introduce measures to assist taxi operators to switch to newer vehicles. These measures will take the form of the measures identified by drivers are most needed plus an additional measure proposed by the Council to offer ULEV only priority. The details of these measures are outlined in the commercial case. The City Council will be bidding for additional funding of up to £994k in order to ensure these measures are implemented.

### *Other measures*

2.76 Nottingham City Council is also currently exploring a number of other potential schemes and measures that would also positively affect local air quality. These measures do not yet have funding, but the City Council will continue to petition central government to make funding available for their implementation:

- ❑ Extensions to the NET Tram system to link the proposed HS2 Station at Toton, with consideration for a potential link through to Derby.
- ❑ Working closely with Highways England to explore ways the trunk road network can be altered to encourage further the use of buses and other forms of sustainable transport.
- ❑ Using the evidence from our Clean Air Zone Analysis to create a detailed Air Quality Action Plan and review existing AQMA's.
- ❑ Electrification of the Midland Mainline Railway between Nottingham and London.

## Public Consultation

- 2.77 An initial informal public consultation was carried out in May 2018. The consultation lasted for 8 weeks and served as an engagement and communications exercise. No details of the preferred scheme were included in the initial consultation. The results of which are detailed in the Management Case of this business case. Headline results from the initial consultation are outlined as follows:
- 81% of respondents were aware of the Government requirements to tackle air pollution
  - 88% of respondents believe improving air quality should be a priority for Nottingham
  - 57% of respondents believe Nottingham City Council is committed to tackling air pollution
  - 60% of respondents were confident that Nottingham City Council schemes will reduce air pollution
  - 72% of respondents believe a clean air zone would be a good idea for Nottingham
- 2.78 The full results of the public consultation exercise are included in Appendix D.
- 2.79 A second more detailed Public consultation exercise has now taken place. This consultation ran between August and September 2018. This consultation contained details of our proposals as outlined in the management case .

## **Summary and Conclusions**

- 2.80 This Strategic Case has outlined the position on Air Quality in Nottingham, including the specific problems experienced in Nottingham and how we intend to tackle them.
- 2.81 This business case provides evidence that there is a significant difference in the monitoring of Air Quality in Nottingham compared to the modelling results taken from the PCM model. This disparity is evident both in terms of the concentrations of Nitrogen Dioxide and in terms of the locations of the worst affected areas.
- 2.82 The Strategic Case sets out evidence that Nottingham's approach to dealing with the Air Quality issues thus far has been to encourage the use of sustainable modes of transport and, through the Workplace Parking Levy, proactively discourage commuter car use through pricing. We have also shown that this approach is having a positive impact on Air Quality particularly. Although some problems remain, monitoring is showing a general improvement in the concentrations of Nitrogen Dioxide in the worst affected areas. We expect this improvement to continue and accelerate as more projects aimed at improving Air Quality come into effect. Projects such as Go Ultra Low Nottingham, taxi demonstrator projects and the bus retrofitting project are either not yet started or in the early stages of development.
- 2.83 The following Economic Case goes further in analysing the beneficial impact of these additional measures. It concludes that, when they are fully implemented, Nottingham City Council will meet its air quality directive obligations, and concentrations of Nitrogen Dioxide will be reduced to below 40µg/m<sup>3</sup> in the shortest possible time. From an air quality

perspective, this is good news, however in achieving this target, the City Council will be required to implement measures that could have adverse impacts on certain aspects of its economy. The changes will create distortions in the local taxi market and adversely affect taxis licensed in Nottingham. For this reason the city is seeking further support for taxi drivers to incentivise the uptake of ULEV taxis.

### 3 ECONOMIC CASE

#### Introduction

- 3.1 To ensure the optimum solution for Nottingham is delivered, so as to achieve compliance with air quality targets whilst minimising the socio-economic impacts on both residents and businesses, a comprehensive modelling process was required to evaluate all possible options. Options which did not meet the compliance threshold were discarded straight away when reducing a long list of options to a shortlist. Subsequently, a range of secondary success criteria, such as minimising socio-economic impacts, were used to arrive at a shortlist and then a preferred option.
- 3.2 The Economic Case detailed in this section evaluates all proposed options (including charge-based access restrictions) identified by the City Council to reduce air pollution levels in Nottingham. This analysis supports the identification of our preferred option for bringing about compliance with the EU Air Quality Directive in the shortest possible time, which is focused on reducing the emissions of Nottingham's bus and taxi fleets.
- 3.3 This section contains:
  - An assessment of the critical success factors for assessing options;
  - An outline of an initial long-list of potential options;
  - Assessment of the long-list using "Strengths Weakness Opportunities and Threats" (SWOT) analysis to refine it to a shortlist;
  - Assessment of the benefits, costs and distributional impacts of the shortlisted options.
- 3.4 The detailed write up of the underlying economic assumptions and calculations are described in the Economic Appraisal Methodology Report (Appendix E). The detailed write up of the underlying assumptions and calculations relating to the distributional impact assessment are described in the Distributional impact assessment methodology report ([Appendix E](#))

#### Critical success factors

- 3.5 We have identified the following set of critical success factors (CSFs) which the preferred option should achieve as part of the FBC. All options are assessed against these criteria:
  - Primary critical success factor
    - Impact (Pass / Fail)** – Is the proposed option likely to result in the achievement of limit values for Nottingham in the shortest possible time, and no later than 2020?
  - Secondary critical success factors
    - Minimise socio-economic impacts** – Is the proposed option likely to result in significant disruption to the economy of Nottingham or likely to impact disproportionately on people living in more deprived areas of Nottingham? Many of

the most deprived areas in Nottingham are near the city centre. The potential option should be designed to reduce the impact on people living in those areas.

- Maximise value for money** – The preferred charging option should represent the best value for money.
  - Complement Workplace Parking Levy** – any preferred option should be complementary with the operation of the Workplace Parking Levy.
- 3.6 The first CSF, related to impact, acts as a go/no-go gateway before any option is considered against the remaining factors.

## **Short listing of potential options**

- 3.7 A long-list was created based on development options and CAZ classifications. This long list was considered against the critical success factors (CSFs) and tested through a SWOT analysis. The SWOT analysis also served to reduce the number of options to a shortlist. This shortlist was then taken forward for detailed analysis using traffic and air quality models.

### Defining a Long List of options

- 3.8 The generation of the long-list of options originated from the key requirement to achieve compliance with air quality standards alongside the wider considerations presented in Table 3-1. Key questions around scope, technical issues, delivery and implementation were considered, together with ensuring the defined area is understandable for the public. Together this determined a wide range of options which would be relatively simple to develop and enforce. In coming up with potential options we considered a range of both non-charging and charging CAZ options, consistent with the Government's CAZ framework.

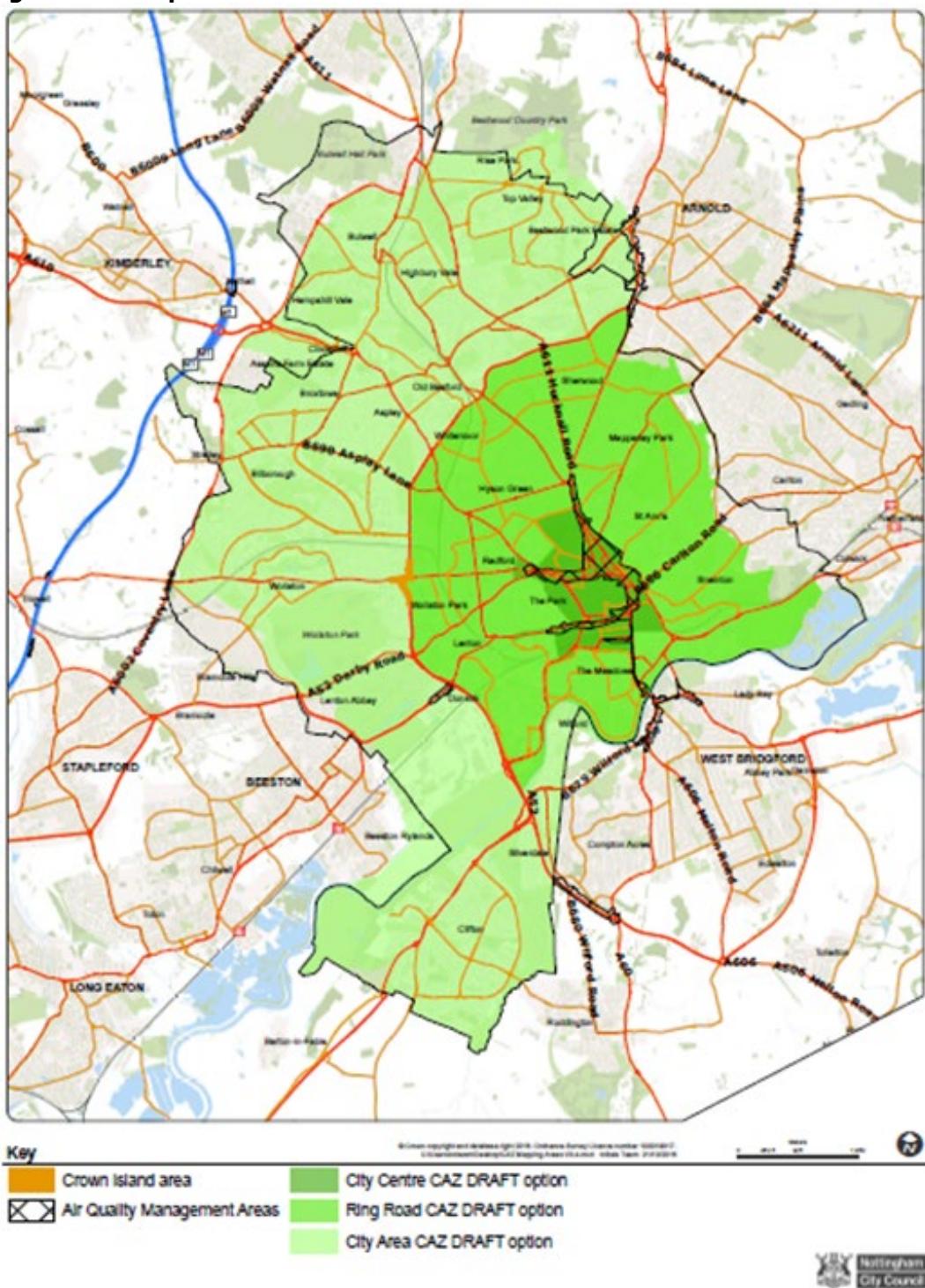
**Table 3-1: Wider considerations in development of options**

Considerations	Key Points
Scope	<ul style="list-style-type: none"><li>• Would the measure suffice to deliver compliance in line with CSF1.</li><li>• How far should the measure extend, what is the most appropriate geographical location in order to minimise impact, but deliver compliance in line with CSF1?</li><li>• Which class of vehicle to apply to each option? The option will consider the strengths and weaknesses of including, or omitting each category of vehicle.</li><li>• Can implementation over a particular area and inclusion of each category of vehicle be supplemented by additional measures, for example ULEV uptake, transport mode shifts?</li></ul>
Technical Issues	<ul style="list-style-type: none"><li>• The technical aspects of the options. This may consider the complexity of an implementation in terms of enforcement, communication, or technological elements.</li></ul>

Considerations	Key Points
Delivery	<ul style="list-style-type: none"><li>• Will the options be delivered through internal resource; will external resource be considered or required? Is there sufficient technical, economic, modelling, planning or management resource internally? Will expertise be required?</li><li>• Options will be assessed with dependencies and stakeholders considered in terms of how key partners may support delivery elements of a scheme.</li></ul>
Implementation	<ul style="list-style-type: none"><li>• The timescales for delivery, this is likely to be one of the main challenging elements of options and may be one of the deciding factors in terms of preferred options. Timescales are already short, with significant challenges in place. Options will have to be fixed to the shortest feasible timeline; however, this limits opportunity and restricts the ability to implement more significant additional measures.</li></ul>
Funding	<ul style="list-style-type: none"><li>• Sources of funding are a crucial element of the scheme. The Financial Case considers the requirement to support potential schemes and whether funding has been secured to-date for work on feasibility and scoping of each potential measure. Identification of primary and additional funding for the options will be vital if the authority is to deliver the required scheme within available timeframes.</li></ul>

3.9 In defining options for the preferred scheme, the proposed approach was to aim for a scheme that achieves compliance in the shortest time possible and with the lowest level of cost to both the City Council, transport operators and members of the public in the city. For options including a charging Clean Air Zone, three initial boundary options were considered (shown in Figure 3-1):

- A Clean Air Zone with a City-Centre boundary.
- A Clean Air Zone with its outer boundary based on arterial routes to the outer ring road.
- A Clean Air Zone with its outer boundary based on the City Area and extension into borough arterial road links.

**Figure 3-1: Proposed CAZ boundaries**

- 3.10 All options modelled were based on the classes detailed in the CAZ classification table, to ensure that there is clarity and consistency of approach and compliance with the National Framework. The long list of options presented in Table 3-2 was considered. This reflects the wide range of options that was put forward previously in the March 2017 submission to Government. The long list of options has been considered against the CSFs and if an option did not meet CSF1, it has not been considered further.

**Table 3-2: Long list of CAZ options**

Option	CAZ Class	Boundary	Description	Anticipated to meet CSF 1	Timescales for implementation	Funding required	Minimise Economic Impact/ Distributional Analysis	Adverse secondary outcomes?	Shortlisted
1	Baseline	N/A	This includes ongoing measures (such as WPL) as well as committed but not yet fully implemented measures, notably the Local Taxi Strategy and the Clean Bus Technology Fund retrofitting programme.	Yes	2019	N/A	Low to Medium. Taxi drivers required to drive Euro 6 vehicles by 2020 face transition costs.	Will give Taxis licensed outside of Nottingham an unfair advantage as they are not subject to requirements of the taxi strategy	Yes
2	Baseline + with Clean Air Fund CAF measures	N/A	This includes ongoing measures (such as WPL) as well as committed but not yet fully implemented measures, notably the Local Taxi Strategy and the Clean Bus Technology Fund retrofitting programme. It also has a transition support package for taxi drivers.	Yes	2019	Yes (See financial Case)	Low. Taxi drivers required to drive Euro 6 vehicles by 2020 face additional costs but will have access to support package lowering operational costs and making it easier to test new, ULEV vehicles.		Yes
3	Do something multi zone option		Option 3 is described as a multi zone option. The purpose of this would be to tailor the intervention to impact specific vehicles in specific areas. One example could be a Class D CAZ in the inner central area of the city with a Class B in the outermost area of the city with a Class C in the middle area. The intention would be to minimise the impact of the CAZ on the outermost residential areas of the city while tackling commuting to the central core of the City.	No (time for delivery +3 years)	2021+	Yes	Medium to High impact	Displacement	No. The baseline modelling showed that the main issue is buses within the city centre and to a smaller extent HGVs. Time frame for implementation would go beyond 2020

## TACKLING ROADSIDE NO<sub>2</sub> EMISSIONS

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Option	CAZ Class	Boundary	Description	Anticipated to meet CSF 1	Timescales for implementation	Funding required	Minimise Economic Impact/ Distributional Analysis	Adverse secondary outcomes?	Shortlisted
4	Class B	City Centre	Mostly affecting HGV as all non-compliant buses hackney carriages and private hire Taxis are already captured under option 1	Yes	2020	Yes	Low	No	No  *This option was originally shortlisted as the air quality modelling showing the improved situation in Nottingham was not yet ready when the first version of the shortlist was put together. It has subsequently been superseded by the retrofit and taxi measures options.
5	Class B	Ring Road	Mostly affecting HGV as all non-compliant buses and hackney carriage taxis are already captured under option 1	Yes	2020	Yes	Medium	No	No. The baseline modelling showed that the main issue is buses within the city centre and to a smaller extent HGVs.
6	Class B	City Boundary	Mostly affecting HGV as all non-compliant buses and hackney carriage taxis are already captured under option 1	No	2021	Yes	Medium	No	No. The baseline modelling showed that the main issue is buses within the city centre and to a smaller extent HGVs. Doubt as to whether it can be implemented in full by 2020.
7	Class C	City Centre		Yes	2020	Yes	Medium	Displacement	No. The baseline modelling showed that the main issue is buses within the city centre and to a smaller extent HGVs.
8	Class C	Ring Road		Yes	2020	Yes	Medium	Displacement	No. The baseline modelling showed that the main issue is buses within the city centre and to a smaller extent HGVs.
9	Class C	City Boundary		No	2021	Yes	Medium - High	No	No. The baseline modelling showed that the main issue is buses within the city centre and to a smaller extent HGVs. Doubt as to whether it can be implemented in full by 2020
10	Class D	City Centre		Yes	2020	Yes	Medium - High	Displacement	No. The baseline modelling showed that the main issue are buses within the city centre and to a smaller extent HGVs.

## TACKLING ROADSIDE NO<sub>2</sub> EMISSIONS

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Option	CAZ Class	Boundary	Description	Anticipated to meet CSF 1	Timescales for implementation	Funding required	Minimise Economic Impact/ Distributional Analysis	Adverse secondary outcomes?	Shortlisted
11	Class D	Ring Road		<b>Yes</b>	2020	Yes	High	Displacement	No. The baseline modelling showed that the main issue are buses within the city centre and to a smaller extent HGVs.
12	Class D	City Boundary		No	2021	Yes	High	No	No. The baseline modelling showed that the main issue are buses within the city centre and to a smaller extent HGVs. Doubt as to whether it can be implemented in full by 2020.
13	Revised Clear Zone (NCCAZ)		Covering non Euro VI HGV's only. All HGV's entering the Clear Zone, a subset of the city centre, will have to have a permit in order to enter the Zone. The permit will only be issued to HGVs that are Euro VI.	<b>Yes</b>	2020	Yes	Low	No	No.  *This option was originally shortlisted as the air quality modelling showing the impact of the bus retrofit and taxi measures was not yet ready when the first version of the shortlist was put together. It has subsequently been superseded by the retrofit and taxi measures options.

## Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis and further refinement of the options

- 3.11 The longlist provided an initial set of options to evaluate. The time-intensive nature of modelling necessitated further refinement of the options to allow more comprehensive analysis of fewer options. A SWOT analysis was performed to facilitate this process on the basis that detailed modelling would be undertaken for the shortlisted options. The detailed SWOT analysis is presented in Appendix G and draws on the CSF criteria outlined previously.
- 3.12 Initially, options that could not be implemented by the 1st January 2020 were discarded without further appraisal as this was when the first option delivering compliance in the shortest possible time (a class B charging CAZ) would have been implemented. Any measures implemented after this would therefore by definition not have delivered in the shortest possible time. This timeframe includes consultation, submission of the full business case and funding approval, procurement and implementation of the network, and allowing sufficient time for vehicle owners to both order and receive vehicles or alternatively to retrofit their existing models. Any of the additional measures that require major works i.e. city-wide packages were not expected to be deliverable by 2020, so were not considered in the context of this Final Business Case but may have scope to deliver longer-term air quality benefits should they be required in future.

**Options 3, 6, 9 and 12 all have an implementation timescale longer than 3 years, so these options would fail to achieve a reduction in the NO<sub>2</sub> concentration in the shortest time possible. These four options were discarded immediately.**

- 3.13 Subsequently, with the air quality and transport modelling results showing a more positive situation in Nottingham, reflecting ongoing action to improve air quality, it became clear that the bus retrofitting and taxi measures implementable by 2019 would deliver compliance. Therefore, options not deliverable to these timescales (charging Clean Air Zone, revised Clear Zone) were discarded.
- 3.14 One of the key unwanted secondary impacts identified is the potential for displacement of traffic from the ring road scenarios to residential areas. This would be unacceptable from both an air quality point of view, as well as the associated road safety and noise issues that would be displaced into areas of Nottingham with higher levels of deprivation. However, ring road options have been discarded for the reasons outlined in paragraph 3.13 above.
- 3.15 The requirement for funding was also considered. A smaller scheme will cost less in terms of camera infrastructure than a larger scale CAZ. However, the higher the class of CAZ the greater the requirement for more comprehensive support packages.
- 3.16 The summary scores of the SWOT analysis are presented in Table 3-3.

**Table 3-3: Summary overview of SWOT analysis**

<b>Option</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
Scope	Baseline (includes ongoing schemes and schemes currently being implemented such as the Local Taxi Strategy and the Clean Bus Technology Fund)	Baseline + with Clean Air Fund (CAF) measures	Multi-zone CAZ, differing vehicle classes, over City Centre/City area	Class B City Centre Zone	Class B Ring Road Zone	Class B City Boundary Zone	Class C City Centre Zone	Class C Ring Road Zone	Class C City Boundary Zone	Class D City Centre Zone	Class D Ring Road Zone	Class D City Boundary Zone	Revised Clear Zone (HGVs only)
Service Solution	Local Taxi Strategy and the Clean Bus technology fund	Local Taxi Strategy and the Clean Bus technology fund + CAF	Multiple zoned, ANPR enforced areas	City Centre ANPR enforced area	Inside Ring Road ANPR enforced area	City-wide ANPR enforced area	City Centre ANPR enforced area	Inside Ring Road ANPR enforced area	City-wide ANPR enforced area	City Centre ANPR enforced area	Inside Ring Road ANPR enforced area	City-wide ANPR enforced area	City Centre permit enforced area for unloading of goods
Service Delivery	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract	Framework contract
Implementation	1-2 years	1-2 years	3+ years	2 years	2-3 years	3-years	2-3 years	2-3 years	3-years	2-3 years	2-3 years	3-years	2 years
Funding	all measures already fully funded	Publicly funded, Low Cost	Publicly funded, High Cost	Publicly funded, Low Cost	Publicly funded, Medium Cost	Publicly funded, Medium Cost	Publicly funded, Low Cost	Publicly funded, Medium Cost	Publicly funded, Medium Cost	Publicly funded, Low Cost	Publicly funded, Medium Cost	Publicly funded, Medium Cost	Publicly funded, Low Cost
<b>Total Score</b>	<b>54</b>	<b>60</b>	<b>19</b>	<b>41</b>	<b>33</b>	<b>22</b>	<b>30</b>	<b>28</b>	<b>24</b>	<b>9</b>	<b>8</b>	<b>0</b>	<b>41</b>

- 3.17 The options from the long-list that have not been considered for further assessment have been identified as not suitable on the basis of their failure to satisfy the primary success factor – delivering compliance in the shortest possible time. Secondary CSFs such as complexity, uncertainty or potential cost have been used to distinguish between options that meet this primary success factor, the gateway success factor that we must achieve.
- 3.18 The initial result of this analysis was a refinement of the list of options, leaving two potential options for detailed modelling and further consideration:
- Option 4 – a city centre wide CAZ B; and,
  - Option 13 - a Revised Clear Zone.
- 3.19 Subsequently, this shortlist was revised as completed air quality and transport modelling showed that compliance could be delivered even earlier with the following;
- Option 1 – baseline (includes ongoing schemes and schemes currently being implemented such as the Local Taxi Strategy and the Clean Bus technology fund) ; and,
  - Option 2 – baseline + with Clean Air Fund measures

### Modelling and identification of the short-list

Local transport and air quality modelling has been undertaken to perform an assessment of each of the 4 options above, summarised in Table 3-4. Option 1 is the 2020 Do Minimum baseline used for the economic assessment, and as such has not been assessed further.

**Table 3-4: Shortlist options initial ranking (prior to full economic analysis)**

Rank	Option	Rationale
1	Do-Minimum (Baseline )	<ul style="list-style-type: none"><li>• Achieves air pollutant emission reductions by 2020 or sooner</li><li>• Minimises additional funding required</li></ul>
2	Base Line + Clean Air Fund Measures	<ul style="list-style-type: none"><li>• Achieves air pollutant emission reductions by 2020 or sooner</li><li>• Reduces negative impacts on vulnerable groups particularly taxi drivers</li></ul>
3	Charging CAZ B City Centre	<ul style="list-style-type: none"><li>• Option meets CSF 1, achieving compliance in shortest time possible and no later than 2020</li><li>• Would achieve further reductions in NO2 compared to baseline</li><li>• Requires significant additional funding</li></ul>
4	Revised Clear Zone	<ul style="list-style-type: none"><li>• Option meets CSF 1, achieving compliance in shortest time possible and no later than 2020</li><li>• Would achieve further reductions in NO2 compared to baseline</li><li>• Requires additional funding</li></ul>

## Economic Appraisal

### Overview of approach and key assumptions

- 3.20 This section provides an overview of our approach to the economic analysis. A methodology paper is provided in Appendix E that provides a more detailed guide to the analysis.
- 3.21 JAQU has provided detailed guidance regarding the appraisal of suitable options. This provides a steer for many of the key data inputs and assumptions that have framed our analyses. The key documents that have provided this guidance include:
- Options Appraisal – Guidance (2017) (and preceding versions of this guidance)
  - National data inputs for Local Economic Models (2017)
- 3.22 The analysis is also underpinned by the following general assumptions:
- Each impact associated with each option is assessed relative to a 'Do Minimum' baseline;
  - All impacts are presented in real terms with a Price Year of 2018;
  - A lifetime approach has been adopted (rather than an annualised approach) and all impacts are assessed over a 10-year appraisal period from 2020-30;
  - All impacts are discounted to 2020 applying Green Book discount factor of 3.5%.
- 3.23 The methodology developed has been designed to be consistent with the JAQU guidance.

### *Scenarios*

- 3.24 The options assessed as part of the Economic Case are set out in Table 3-5. Do Minimum baseline scenario includes only measures which have already been funded and are now in the process of being delivered. Further economic appraisal of these measures is therefore not necessary. The baseline and Clean Air fund measures contains elements which are not yet funded and have been included in order to help offset the negative impacts (on taxi operators) of the baseline measures.

**Table 3-5: Short-listed options assessed**

Option	Details (all introduced in 2020)
Baseline + CAF Measures	<ul style="list-style-type: none"><li>• Includes Taxi strategy, bus retrofitting and biomethane buses</li><li>• Also includes measures funded through the Clean Air fund to incentivise the uptake of lower emissions taxi's through licensing incentives leasing schemes and additional infrastructure</li></ul>
Charging CAZ B City Centre	<ul style="list-style-type: none"><li>• Introduced by 2020</li><li>• CAZ operating within city centre</li><li>• only HGVs and out town bused and taxi's affected as local taxis/buses assume to comply by 2020</li></ul>

	<ul style="list-style-type: none"> <li>Assumes no behavioural change– as not modelled due to small zone area and assumed market response (see Appendix E).</li> </ul>
Revised Clear Zone	<ul style="list-style-type: none"> <li>Introduced by 2020</li> <li>Permit scheme operating within Clear Zone, a subset of the city centre</li> <li>only HGVs affected as taxis/buses assume to comply by 2020</li> <li>All HGVs entering the zone have to have a permit in order to load/unload goods. Permits are only granted to HGVs Euro VI and therefore it is assumed that 100% of HGVs entering the zone will be compliant.</li> </ul>

### Cost Benefit Analysis (CBA)

3.25 This section provides a summary of the cost benefit analysis carried out on the shortlisted options. Appendix E contains a detailed description of the economic appraisal the final options.

**Table 3-6 Headline results of Economic Analysis**

Option	AQ impacts	Upgrade costs	Implementation costs	Opex costs	Fuel consumption	CO2 emissions	NPV
<b>CAZ B City Centre</b>	2.5	-5.1	-13.9	0.6	2.2	1.1	-12.6
<b>Revised Clear Zone</b>	2.6	-11.6	-1.3	1.5	4.9	2.4	-1.5
<b>Base line +CAF measures</b>	0.6	-4.5	-0.8	0.7	1.2	1.2	-1.4

3.26 The economic analysis conducted on the shortlisted options assesses the costs and benefits of the option and monetisation of impacts. In parallel there has been a qualitative assessment of the benefits not captured by the core analysis and a distributional analysis exploring how the impacts may fall across different groups in society (See Distributional Impacts section below).

3.27 The key criteria for determining the preferred option is that it delivers compliance with the Air Quality directive in the shortest possible timeframe. The Strategic Case has shown that the do minimum baseline delivers compliance before all other options, and table 3-6 above shows that the base line also presents the best Net Present Value (NPV) of the three options.

3.28 The addition of the CAF funded measures to the baseline will help to mitigate the impacts of the baseline option on the taxi trade.

## Baseline and Clean Air Fund (CAF) measures - analysis

### *Appraisal and Results*

- 3.29 Air Quality modelling have been undertaken by Ricardo E&E, and the modelling approach presented in the Target Determination report (Appendix E). The baseline reference already includes measures on taxis and buses, such as a 100% Euro 6 Hackney Carriage fleet in 2020. The results presented in this section are based on the assumptions that 40% of the taxi fleet would be composed of ULEV vehicles.
- 3.30 No additional Air Quality run has been undertaken to quantitatively assess the impact of a taxi fleet composed of 40% of ULEV in comparison to all taxis being Euro 6 vehicles in the baseline scenario in 2020. However, an approximate air quality impact of this change in the Hackney Carriages fleet can be derived from the baseline results. Assuming that only electric taxis will be replacing Diesel Euro 6 in 2020, total emissions from Hackney Carriages can be reduced by 40%. From the source apportionment results (included in the Target Determination Report in Appendix E), reducing NO<sub>2</sub> concentrations at the PCM receptors to account for the additional ULEV taxis will lead to a decrease in total NO<sub>2</sub> concentrations of 0.04 µg/m<sup>3</sup> in comparison of the do-minimum baseline scenario. The largest decrease (0.21 g/m<sup>3</sup> in comparison of 0.53 g/m<sup>3</sup>) is found on the A6514 outside the City Centre. This approach provides a rough estimate of the impact of increasing the proportion of electric vehicles in the taxi fleet.

## Distributional Impacts

- 3.31 As indicated above, JAQU has provided detailed guidance regarding the appraisal of CAZ options. With respect to distributional analysis, the JAQU guidance strongly leans on supporting WebTAG guidance issued by DfT<sup>2</sup>.
- 3.32 The methodology used to undertake the distributional analysis is based on JAQU guidance. In some cases, we have sought alternative methods, or elaborated additional steps and assumptions where the study team felt that such approaches were warranted to facilitate or improve the analysis. In particular, this is the case where additional output metrics were deemed useful to convey the distributional impacts of the options.
- 3.33 As such, our approach has adopted and followed the three steps defined by WebTAG: screening, assessment and appraisal. A detailed description of the underlying assumptions, methodology and results can be found in the Distributional Analysis Methodology Report (Appendix E).

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<sup>2</sup> DfT (2015): 'WebTAG: TAG unit A4-2 distributional impact appraisal, December 2015'; <https://www.gov.uk/government/publications/webtag-tag-unit-a4-2-distributional-impact-appraisal-december-2015>

3.34 Upgrading the taxi fleet with 40% electric vehicles is not expected to change the behavioural response of taxi drivers or their response in traffic, in comparison with the do-minimum scenario. An ULEV hackney carriage business model assessment delivered for Nottingham City Council in June 2018 states that the average daily mileage of taxis of 53 miles is in line with the current capability of electric vehicles and therefore is not expected to restrict their usual habits. The WebTAGquintile analysis would therefore be representative of the population within the Air Quality domain and with an Air Quality improvement in terms of NO<sub>2</sub>.

3.35 Tables 3.7 and 3.8 below summarise the benefits to the local population by reducing emissions through the introduction of additional ULEV vehicles. The information is presented on the basis of the geographical location (based on the Index of Multiple Deprivation) and for under 18's.

**Table 3-7 Income IMD Results Overall**

Income IMD	Most deprived					Total
	0%-20%	20%-40%	40%-60%	60%-80%	80%-100%	
Taxis	1	2	3	4	5	
Number of population with improved air quality	193,314	97,511	70,915	64,851	76,624	
Number of population with no changes	0	0	0	0	0	
Number of population with deteriorating air quality	0	0	0	0	0	
Net winners/losers	193,314	97,511	70,915	64,851	76,624	
Total number of winners across all groups						503,215
Net winners/losers in each area	38.42%	19.38%	14.09%	12.89%	15.23%	
Share of the total population in the impact area	38.42%	19.38%	14.09%	12.89%	15.23%	
Assessment	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	

**Table 3-8 Income IMD Results for Under 16's**

Under 16 Taxis	Lower proportion					Higher proportion	Total
	0%-20%	20%-40%	40%-60%	60%-80%	80%-100%		
	1	2	3	4	5		
Number of population with improved air quality	128,680	53,253	94,737	104,146	122,399		503,215
Number of population with no changes <sup>3</sup>	0	0	0	0	0		
Number of population with deteriorating air quality	0	0	0	0	0		
Net winners/losers	128,680	53,253	94,737	104,146	122,399		
Total number of winners across all groups							
Net winners/losers in each area	25.57%	10.58%	18.83%	20.70%	24.32%		
Share of the total population in the impact area	25.57%	10.58%	18.83%	20.70%	24.32%		
Assessment	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓		

3.36 The Webtag analysis of a 40% share of ULEV taxis show an overall improvement in the Air Quality for the population, assessed as "Moderate Beneficial" according to the JAQU WebTAG analysis. Again, as no Air Modelling runs have been undertaken these results are indicative only.

#### Sensitive Receptors

3.37 The Sensitive receptors in Nottingham are divided into 11 categories based on the TAG unit A4.2 Distributional Impact Appraisal as follows:

**Table 3-9 Sensitive receptors**

Acronym	Sensitive Receptors	Total in the DA Domain
CC04	Public and Village Halls	188
CE02	Nursery/Creche	109
CE03	Primary, Junior, Infants or Middle School	327

<sup>3</sup> For this category it has been assumed a difference in NO<sub>2</sub> concentration between the modelled CAZ scenario and the baseline to be 0.

<b>CE04</b>	Secondary School	154
<b>CM03</b>	Medical, Hospital and Hospices	66
<b>LP01</b>	Public Parks and Gardens	23
<b>LP02</b>	Public Open Spaces and Nature Reserves	34
<b>LP03</b>	Playgrounds	105
<b>RI01</b>	Care/Nursing Homes	192
<b>RI02</b>	Communal Residences	157
<b>RI03</b>	Residential Education	356

With an assumed general decrease in NO<sub>2</sub> concentrations due to a 40% uptake of ULEV taxis, this will also lead to an improvement in air quality on sensitive receptors. A new air quality modelling run would give quantitative values for the different receptor categories.

#### *Summary*

- 3.38 Assuming no behavioural response in traffic, then an increase in the number of ULEV Hackney Carriages to achieve a 40% share will lead to a moderate beneficial overall improvement in Air Quality. For the most deprived wards and for children, on average all quintiles see an improvement in air quality in terms of NO<sub>2</sub> concentrations
- 3.39 Looking at sensitive receptors, the majority experience a small decrease in air pollutant NO<sub>2</sub> concentration relative to the baseline, with both scenarios showing similar responses A summary of the distributional impacts is shown in table 3-5

**Table 3-10 Summary Assessment**

Scenario	Summary assessment
Taxis	<span style="color: green;">✓✓</span> <ul style="list-style-type: none"> <li>• All LSOAs are expected to see an improvement in air quality when assuming an overall decrease in NO<sub>2</sub> concentrations</li> <li>• As no new Air Quality runs have been modelled, the impact on population follow the general distribution in the Nottingham AQ domain.</li> </ul>

#### *Affordability for businesses*

- 3.40 In this section, only the effects on taxi owners and companies are included. The current fleet of 411 taxi vehicles is composed of 24 Euro 6 Hackney Carriages and 2 Low Emission Vehicles. The do-minimum scenario already assumes that all Hackney Carriages will be Euro 6 by 2020. Therefore, the impact of the uptake of 40% of ULEV taxis as part of the 2020 taxi fleet needs to be considered in this section.
- 3.41 . The ULEV Hackney Carriages Business Model Assessment report commissioned by the City Council provides useful information on taxi driver behaviour and perception of electric vehicles. From a questionnaire submitted by 14 drivers (therefore 3.4%, a very small fraction of the fleet), 69% travel less than 2 miles before taking their first fare and no drivers more than 10 miles. Therefore an overnight charge of electric vehicles would not change the start of their shift. It should be noted from the survey that 79% of drivers have off street parking

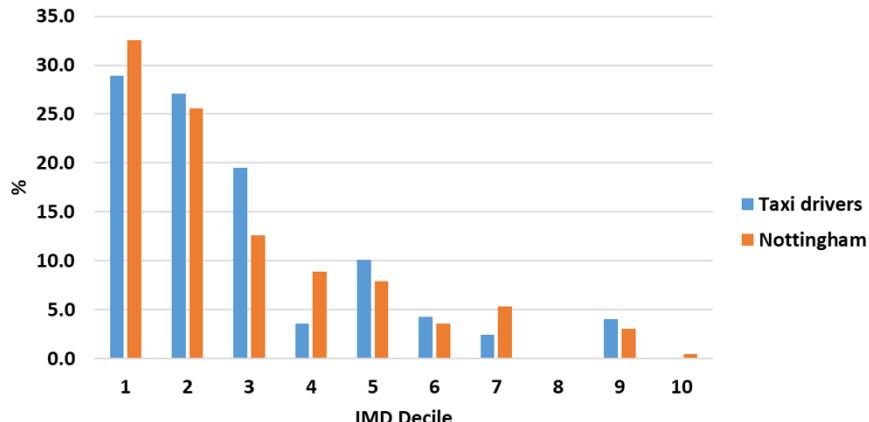
and 64% of vehicles have an overnight access to an electric supply point. The average daily mileage has been calculated as 53 miles based on this report, and an annual operation of 15,000-20,000 miles. The average driving time is 3.6 hours per day. These figures confirm that current usage is compatible with the capability of an ULEV vehicle. However, taking time out to charge a vehicle during the day would have an impact on taxi drivers, although limited as 67% (with the range extended electric LEVC TX) and 97% (with the battery electric Dynamo Nissan eNV2000) of the total mileage would be covered with one overnight charge only.,

- 3.42 Upgrading to electric vehicles would have an impact on costs. The existing fleet is on average 13.6 years old and 57% of the drivers own cars with more than 250,000 miles. Thus, there is a need to change and/or upgrade the vehicles. The purchase price being too high is the main concern for ULEV taxis based on the survey. However, test drive opportunities and low cost leasing options are perceived by taxi drivers as positive incentives.

*What type of businesses will be affected?*

- 3.43 Unlike other modes, taxis tend to be owned/operated by single driver, rather than larger businesses. Hence the cost burden of upgrading to an electric vehicle is faced by an individual, rather than a business. This has two impacts:
1. An individual inherently has less potential to spread any cost burden across multiple operations or revenue streams
  2. The impacts on taxi operators will impact directly on household income, rather than business revenue, and hence will likely be more keenly felt by those affected. Indeed, the London ULEZ impact assessment recognized that virtually all taxi drivers are self-employed and therefore would need to bear the cost of a new vehicle themselves.
- 3.44 Matching taxi license data to LSOAs and assessing the demographic data associated with the LSOA showed that the distribution of taxi drivers across the IMD appears slightly more skewed towards the more deprived deciles than the general population of Nottingham. The first 3 quintiles, representative of the most deprived population, include 75.4% of the taxi drivers and 70.7% of the population of Nottingham. The difference is mainly due to a higher proportion of taxis drivers in quintile 3 (19.5% against 12.6%).
- 3.45 Hence taxi drivers are likely to be amongst the lowest earners in society. As such, the costs associated with an upgrade to ULEV standard are being faced directly by some of the more vulnerable households in society.

Figure 3-3



- 3.46 The ULEV Hackney Carriages Model Assessment evaluated the savings when acquiring an electric vehicle by including the major purchasing and running costs. For at least 15,000 miles driven per year, all taxi drivers would have savings after at least 4 years of ownership when acquiring a Nissan Dynamo BEV, and at least 8 years for a LEVC TX (REEV) Hackney Carriage. These results should encourage the acquisition of an ULEV vehicle at the next purchase, however current take up would suggest taxi drivers are not responding in this way.
- 3.47 The survey suggests that 49% of the taxi drivers would acquire a new diesel vehicle at their next acquisition, with 23.5% opting for electric and 29.4% plug-in vehicles. Therefore further incentives are likely to be required to encourage taxi owners to purchase ULEV vehicles.

Other specific issues affecting taxis include:

- In some circumstances, taxis are also subject to other operator and consumer demands. E.g. Uber London drivers must use hybrid or electric by 2020. Hence taxi operators may be facing other requirements which impact on their vehicle operation and upgrade behaviour.
- There is not a large second-hand market for second-hand hybrids and additional demand on this market may inflate prices.

#### *How Many Businesses will be affected*

- 3.48 Out of a total 411 vehicles currently registered as Hackney Carriages, only 26 (6.3%) would presently be compliant and at least Euro 6 standards or Ultra Low Emission Vehicles. Assuming 40% of the fleet to be ULEV by 2020, 163 vehicles would need to be upgraded.

#### *Impacts on Business and affordability risk*

- 3.49 Upgrading to an ULEV vehicle might be a risk as taxi drivers also own their vehicles. The purchase price of electric Hackney Carriages such as LEVC TX (£55,599) or Dynamo (£42,500) is considered as high by the taxi drivers from the ULEV Hackney Carriage Business Model Assessment Report. As already mentioned purchasing an electric vehicle might lead to savings after 4 to 10 years in comparison with a diesel vehicle depending on the mileage

and the type of electric vehicle. The risk is therefore mainly for taxi owners, with the main risk for taxi drivers with annual mileage lower than 15,000 miles.

- 3.50 However, if taxi owners choose to 'upgrade to a ULEV vehicle, it could be assumed that they can afford the associated costs at least in the short run. These responses will carry additional direct costs for taxi's, but they are deemed 'affordable' as either businesses can:

1. Pass through to customers
2. Can internalise the costs with limited risk to the ongoing viability of the business

- 3.51 However, as the business management report highlights (see Appendix I) the possibility of passing the purchasing costs to customers and internalising the costs is very unlikely.

Measures defined by the Nottingham City Council to help taxi drivers acquiring ULEV hackney carriages would help to achieve the 40% target in 2020 Table 3-11 highlights the ability of taxis to pass though costs to customers when acquiring an ULEV hackney Carriage or if they can internalise costs

- 3.52 Taxi drivers owning their own vehicles are more likely to face affordability risks than taxi companies. In addition, the survey from the ULEV Hackney Carriage Business Model Assessment indicates that 57% of taxi drivers also use their taxis for personal use. Upgrading to an electric vehicle would therefore also affect both the business and personal activities of a taxi owner and they would need to consider both aspects when upgrading to a new vehicle.

#### *Summary and Requirement for Mitigation measures*

The survey information suggests that upgrading a taxi vehicle to an ULEV Hackney Carriage is a valid option for approximately half of taxi owners, although the purchasing price is considered as high. Savings can be achieved after at least 4 years if a mileage of 15,000 miles is considered (also depending of the type of vehicle). The purchase impact is likely to be greater for taxi drivers who own their own vehicles. As taxi drivers are primarily within the most deprived group of the population, purchasing a new electric vehicle cannot easily be afforded by a significant number most of taxi drivers. In addition, costs for taxi drivers will directly hit the take-home income of a cohort who tend to be lower on the income distribution.

#### **Taxi Mitigation Measures**

- 3.53 The City Council has identified several proposed support measures to help taxi drivers to upgrade their vehicles. Currently the Hackney Carriage fleet is composed of 411 vehicles and 600 taxi drivers. The target is that 40% of Hackney Carriages to be ULEV taxis by 2020.
- 3.54 To achieve this target, NCC are proposing a taxi experience vehicle scheme to help taxi drivers familiarize themselves with an ULEV vehicle. According to the ULEV Business Model Assessment this measure is considered as very popular among the taxi drivers

- 3.55 Charging infrastructure will be developed in the city centre and outside. 230 charging points for ULEVs will be implemented across Nottingham and Derby to facilitate taxis drivers to charge their vehicles. In addition, the City Council will provide 5 rapid charging points. The City Council will also provide a ULEV Licensing reduction offer as well as an ULEV only taxi rank.
- 3.56 These measures will significantly assist taxi drivers with converting to ULEV vehicles and reduce the costs by reducing taxi licences. Improving the charging points network also facilitate the purchase of ULEV vehicles for taxi drivers. Financial assistance will directly reduce the burden of upgrading taxis.
- 3.57 There is precedent for providing assistance to taxi operators: In order to mitigate the compliance burden on London taxi drivers who are required to replace their vehicle earlier than expected due to recent changes in the licensing policies, TfL has implemented a taxi delicensing scheme. The scheme offers a payment of between £1,200 and £5,000 to delicense a taxi aged from 10 to 15 years.

#### *Summary Assessment*

- 3.58 All LSOAs observe an improvement in air quality when including a fleet of 40% of ULEV taxis, with an overall assessment of a 'moderate benefit.' All impacts on businesses, i.e. taxi companies, is significant. Taxi owners would need to upgrade or purchase an ULEV vehicles considered as a high cost, albeit allowing them to save money after 4 to 10 years depending of the chosen vehicle type and the annual mileage. The impact is also significant for Nottingham since taxi companies are very small and quite often a one-man company, thus a vehicle purchase directly impacts a taxi driver's income. In addition, taxi drivers belong to the most deprived part of the population in most cases. For larger taxi companies the risk will be lower due to their ability to balance the upfront costs of purchasing a ULEV taxi. Measures defined by the City Council such as licencing discount or improving the charging infrastructure, will help support smaller and larger firms alike and help overcome the obstacles identified to achieve the target of having 40% of the fleet being ULEV taxis by 2020.

## 4 MANAGEMENT CASE

- 4.1 This Management Case sets out the framework through which the delivery of the air quality improvement measures will be managed. The City Council is acutely aware of the importance of scheme delivery and is pleased to report a proven record of accomplishment of effective delivery as a leading transport authority. For over a decade, Nottingham's key strength has been an integrated planning and transport arrangement, adding value to the way solutions are proposed and delivered.

### Deliverability and track record

As lead authority, the City Council will provide a clear and coordinated strategic approach to the management and delivery of the programme using PRINCE2 project management processes and will act as the central budget holder responsible for financial management.

**Nottingham City Council is an award-winning authority** (Local Transport Authority and City of the Year, National Transport Awards 2012 and was again shortlisted Local Authority of the Year 2015). Success of this is demonstrated through recent externally funded programmes won through competitive bidding, including the successful £16m Local Sustainable Transport Fund and the £10m Better Bus Areas Fund programmes. Our clear transport vision has helped Nottingham to reinforce its position as a leader in sustainable, low emission and low carbon transport and supported the economic growth of the city: essential for improving quality of life, as more people travel on buses, trams and trains and walk and cycle to get to their places of study or work.

The City Council has become adept at designing, testing and implementing a range of highly innovative transport solutions, all within tight delivery timescales and meeting funding requirements. Nottingham is also unique in having implemented its own Workplace Parking Levy (WPL) to tackle problems associated with traffic congestion. The WPL both provides funding for major transport infrastructure initiatives and acts as an incentive for employers to manage their parking provision. Nottingham City Council also runs its own Bus Lane Enforcement Scheme; the revised Clear Zone will share some of the back office systems already used by the bus lane enforcement.

### Project Plan

- 4.2 Appendix H sets out timelines for the development of the feasibility study to Full Business Case stage during 2018 in readiness for delivery from mid-2019. The Project Plan forms a 'live' document and as such will regularly be reviewed and updated by the Programme Manager in consultation with the delivery leads during the course of the revisions to the taxi measures. Progress/variations will be reported to the Delivery Board via the Programme Manager.

### *Critical path and key dependencies*

- 4.3 Appendix H also includes key dependencies are noted relating to the measures that, if missed or not realised in time, could affect the delivery programme tolerances of cost, time or quality. Impacts may be felt in delays to implementation, compromised quality outputs, resource not in place in time to realise maximum benefits or missed opportunities.

### Governance and delivery arrangements

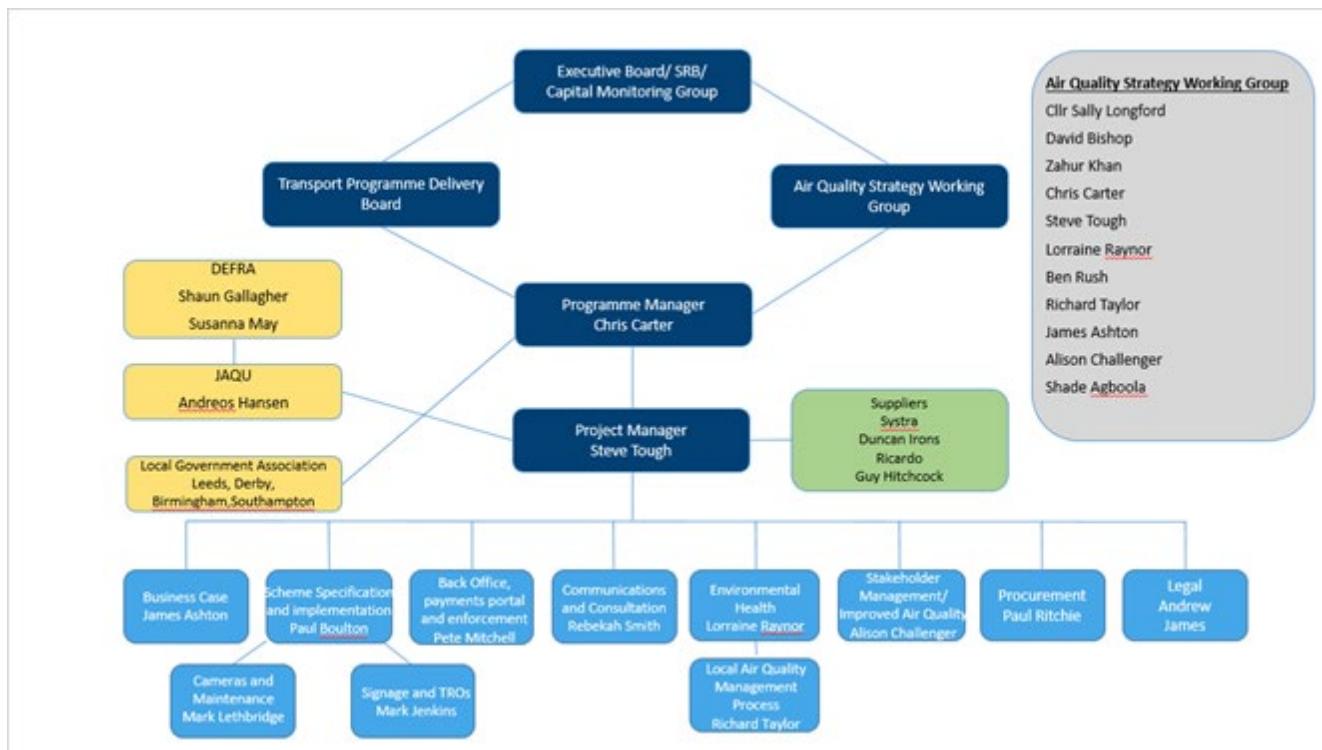
- 4.4 Our delivery approach is supported by a lean delivery framework; effective project/programme management processes based on PRINCE2 methods, comprehensive financial and risk management approaches, smart procurement and collaborative communications and monitoring arrangements.
- 4.5 Established governance and decision-making arrangements are in place for the LTP, Better Bus Areas and behaviour change programmes, which will roll on and oversee the delivery of this programme. The established governance and management arrangements will be fully utilised to oversee delivery:
- **Strategic overview and direction:** this is comprised of the key senior groups that will endorse delivery, make decisions and provide input and overview in the wider planning and transport context, in particular to achieve economic growth and reduce carbon emissions;
  - **Management:** this is comprised of the day-to-day project management, coordination and liaison, which will be led by the City Council's Transport Strategy team and will provide an interface between the strategic bodies and delivery teams. Responsibility for procurement/contract management and monitoring and evaluation activities are also with this team;
  - **Delivery:** this comprises of the key delivery teams responsible for executing the activities in line with the mandate set by the transport strategy team, escalating any issues and reporting progress/monitoring outcomes. This is strengthened by a number of delivery teams already in place and ready to go e.g. WPL Business Support teams, Clear Zone and Bus Lane Enforcement scheme.

- 4.6 Figure 4-1 illustrates the governance and delivery arrangements. The responsibilities of the key parties involved and how decisions will be made are covered by:

- The **Air Quality Strategy Working Group** (AQSWG) will have overall decision-making responsibility for ensuring the programme meets its wider objectives and delivers against the desired outcomes. Overseeing the development of the Air Quality Strategy and business case delivery to time, budget and quality, the AQSWG is responsible for the success of the proposals and owns the business case, provides leadership, manages relationships with partners/stakeholders and recommends opportunities to optimise

cost/benefits. The AQSWG meets on a fortnightly basis and is attended by the Council Portfolio holder for Air Quality and corporate directors.

- **JAQU & NCC Progress Meetings** This meeting is weekly by conference call. Representatives Form JAQU and the City Council attend it. The main function of this meeting is to report on the progress of the City Council's plans to improve Air Quality. The meeting also maintains an open dialogue between JAQU and the City Council.
- The existing **Transport Programme Delivery Board** has primary responsibilities for providing overall direction, management and assurances. The Board acts as the overarching programme management governance for all transport projects and programmes developing and informing the emerging new transport vision for Nottingham and surroundings. Membership of the Board includes the: Director for Traffic and Transport, Director of Major Projects, Head of Finance, Transport Strategy Manager and others as required (e.g. Chair of Greater Nottingham Transport Partnership). This Board will be further expanded to include senior representatives from partner authorities.
- The **Programme Manager (PM)** with previous experience of delivering the successful LSTF programme will oversee the day-to-day delivery of the programme workstrands on behalf of the Delivery Board, ensuring it delivers to the required quality standards and within the specified tolerances of time, costs and resources. The PM is well placed to oversee delivery of the programme in collaboration with the wider partnership and can interact regularly with leads on the Bus and Taxi strands, which complement the proposals contained in this bid. The PM oversees the change control and risk management functions; is responsible for approving commissioning activities; financial management; reporting of progress to the Board and other stakeholders;
- The **Project Delivery team** will consist of specialist skilled staff responsible for delivery of the specified initiatives within the programme and of reporting project deliverables and other outputs to be fed into the overall evaluation activities. The delivery teams will be fully constructed once suppliers are appointed through new tendering exercises (in some cases). The team will meet formally through a monthly Air Quality Strategy Working group to discuss and inform the operational arrangements of programme delivery against baseline objectives and timescales. Regular liaison will take place with the PM and progress is reported back to Management Group meetings. For significant divergences to timescales, costs or any other variations, these changes are captured by the PM and where necessary escalated to the Board/SRO for resolution.

**Figure 4-2: Nottingham Governance and Delivery Chart**

4.7 Key members are identified in Table 4-1.

**Table 4-1: Nottingham Air Quality Strategy Team Members and their roles**

Name	Role
Councillor Longford, Portfolio Holder for Energy and Environment	Project Sponsor
David Bishop, Deputy Chief Exec, Corporate Director Development Growth	Senior Responsible Officer
Zahur Khan, Director for Traffic and Transport	Quality Assurance
Chris Carter, Head of Transport Strategy , Nottingham City Council	Programme Lead
Steve Tough Project Manager	Project Manager
Duncan Irons, Systra	Supplier Lead
Guy Hitchcock, Ricardo AEA	Supplier Lead
Andreas Hansen JAQU	Nottingham key contact
Richard Wellings	Public Transport and Retrofit Lead
James Ashton, Transport Strategy Manager	Business Case Lead
Paul Boulton, Head of Traffic	Traffic and Safety and TRO's
Rebekah Smith, Transport Communications Lead	Communication Lead
Simon Dale, Principal Officer Highway Metrics	Evaluation
Paul Ritchie, Lead Procurement Officer	Procurement
Richard Taylor Environmental Health Manager	Air Quality Lead
Andrew James Lead Legal officer	Legal
Rasita Chudasama, Principal Transport Planner	Taxi Measures Lead
Mark Daly, Charge Point Project Manager	Taxi Charge Point Lead

## Risk Management

- 4.8 Risks are tracked in accordance with the City Council's corporate risk management principles, which draw upon the PRINCE2 methodology. This strategy requires the identification and recording of risks, an evaluation of their likelihood and any mitigation actions. This approach ensures that all risks are captured and processed in a consistent manner. The risk log attached in Appendix F includes risks that relate to political, financial and operational issues. Without mitigation, these could result in increased costs to the programme, reductions in the quality of outputs and slippages in timelines, all affecting the overall benefits and outcomes the business case seeks to deliver. Ownership of the risk register falls with the Programme Manager. These risks will be subject to on-going monitoring and mitigated through effective programme management and partnership working.

### **Bus retrofit programme to Euro VI – management progress**

As described in Strategic Case, Nottingham City Council through consultation with the Nottingham Bus Quality partnership is in the process of retrofitting Euro VI engines to 161 Euro V vehicles. This has followed a successful grant fund bid for £2,696,517 provided through the DEFRA clean bus fund.

A legal grant funding arrangement has been drawn up between Nottingham City Council and Nottingham City Transport (NCT), which includes clawback provisions in the unlikely event of the operator not delivering the required retrofit project. This has enabled NCT to directly procure and appoint Baumot as their CVRAS-accredited technology supplier.

An order has been placed with Baumot by NCT and a launch event of the first retrofitted midi bus happened on June 25th to kick off a public awareness campaign of the bus retrofit project.

The retrofit programme is currently on track to deliver on time or ahead of schedule.

### Management of Key Measures to Achieve Compliance.

- 4.9 The Retrofitting of buses funded by the Clean Bus Technology Fund forms a key part of the City Council's Plan to improve air quality in Nottingham. NCT and Nottingham city council are working closely to ensure that this key measure is delivered. The following section outlines the management of the retrofit project.
- 4.10 Nottingham City Transport is the biggest transport operator in Nottingham with 330 buses. It was formed in 1986 and is owned by two shareholders: Nottingham City Council owns 86% of the company and Transdev a multi-national public sector operator owns the remaining 18%. Both shareholders have representatives on the board of the company. Shareholders involvement is limited to strategic and business planning level.

- 4.11 NCT board meetings are held quarterly, reports on the progress bus retrofitting programme are being presented to the board. In addition Monthly progress reports are submitted to JAQU
- 4.12 The Retrofit programme is also overseen by the City Council's Public Transport Team. The Public Transport and Retrofit Project Lead is responsible for engaging with NCT to ensure that the Programme is running according to plan. The City Council's Public Transport lead attends regular meetings with NCT to discuss the progress of the retrofit project. The Retrofit programme is funded through the DEFRA administered Clean Bus Technology Fund(CBTF). The City Council is regularly reporting the progress of the project to JAQU as a condition of the CBTF. The City Council will ensure that all buses using the city centre will adhere to the highest emissions standards through the Enhanced Bus Quality Partnership described in Strategic Case.

## Stakeholder management

- 4.13 Key Stake holders for the plan have been identified and are shown in Table 4-1
- 4.14 Their power of influence and requisite levels of interest have been considered to maximise the consideration of their needs and influence on the success throughout the programme. This framework of stakeholder management and engagement will be continued throughout the programme to inform the communications and dissemination activities. Offering a flexible approach, activities will be directed to involve and communicate with stakeholders to become more interested if it can add to the success of the project.

**Table 4-2: Key Stakeholders in the project**

Influence	High	<b>Keep satisfied, meet needs</b> - Residents - Citizens, including commuters	<b>Key player, engage closely</b> - Nottingham City Transport - Community Transport for Nottingham - Trent Barton - Taxi operators/drivers, including private hire - Councillors - Environmental action groups - Road transport organisations - Major employers, businesses and business groups - Schools/pupils/parents
	Low	<b>Minimal</b> - NET (tram)	<b>Consider, keep informed</b> - Staff - Local, regional and specialist media - Employers and businesses
		Low	High
			Interest

## Communications and dissemination strategy

- 4.15 The key to achieving a good level of engagement, and ultimately introducing successful measures, will be **raising awareness and understanding** of air quality and the impact of air pollution on health. This will be done through provision of information, engagement and consultation, particularly with audiences most likely to be affected by the changes to taxi measures.
- 4.16 A public consultation exercise is scheduled to take place in August 2018 and will run to early September.

### **Key messages:**

- Air pollution has serious implications for public health, including increased chance of developing respiratory problems
- The council is committed to improving air quality so its citizens can live healthier lives
- The City Council has undertaken a number of measures over recent years to reduce air pollution, including starting to convert its own vehicle fleet to Ultra Low Emission Vehicles (ULEVs), achieving funding to provide one of the UK's largest electric bus fleets and introducing the Workplace Parking Levy, which has reduced congestion and allowed investment in expanding the tram network
- The council offers support for businesses to convert to less polluting modes of travel through its Workplace Travel Service, and supports taxi and private hire businesses in particular through a new Taxi Strategy
- Thanks to existing citywide efforts, falling levels of air pollution have been seen in the city, and latest modelling shows compliance will be reached by 2020, meaning a Clean Air Zone is no longer under consideration
- However, transport emissions continue to contribute to poor air quality, and the council is proposing further measures for cleaner air, most importantly in the interests of public health
- This consultation is an opportunity for anyone who lives or works in the city and wider area to let the council know their thoughts on whether it is taking the right measures to address air quality, what more it could do and the impact of the proposed changes

## Consultation

- 4.17 The Following section provides a summary of the public consultation exercise carried out by the council between the 3<sup>rd</sup> August and the 10<sup>th</sup> September the full results of the consultation are contained in Appendix D
- 4.18 The consultation was hosted online and promoted through a variety of methods, including social media, newsletters, local community and environmental groups and internal channels.

Key stakeholders, including bus operators and hackney carriage drivers, were notified directly.

4.19 A total of 662 responses were received to the online consultation, with six written responses from CEMEX, Client Earth, Friends of the Earth, Nottingham Friends of the Earth, the builders merchants federation and sustrans. Within the online responses, groups such as the road haulage association and Breathe Easy (British Lung Foundation) were also represented.

#### 4.20 Key Results

- 94% of respondents said poor air quality concerned them to either some or a great extent
- More than 90% of respondents support each of the measures to improve air quality in Nottingham
- 77% agreed these measures would be sufficient to tackle air pollution
- 82% supported further action to enforce anti-idling legislation
- 70% supported a proposal to revise the existing Clear Zone to include emissions criteria
- A total of 84% believed the council should aim to implement further measures

#### Summary

4.21 Responses showed a majority of people were concerned about air quality to a great extent, mainly due to the risk to public health, and strong support for the measures proposed by the council was clear appetite for more to be done, including behaviour change and education, with many comments reflecting a desire for the council to be more ambitious in the timing and scope of its activities. At the same time, many responses expressed concerns around how proposals might affect businesses, and to ensure bus operators, taxis and other impacted parties were given enough time and support to meet the new standards. Many cited the volume of traffic, particularly in the city centre, as a root cause.

4.22 Action to tackle idling, through enforcement and education, received notably strong support throughout the consultation, with schools and taxi ranks being the most popular locations to address this. The consultation also invited further comments on what more the City Council could do to tackle air pollution. These views will be analysed further and will be used to form future policy.

#### Key Themes

4.23 The following section gives an analysis of the responses to each question and some of the key themes

##### 1) *To what extent does poor air quality concern you?*

63% said poor air quality concerned them to 'a great extent', with a further 31% agreeing 'to some extent' (94% total)

The most common comments in answer to this question were concern over the risk to

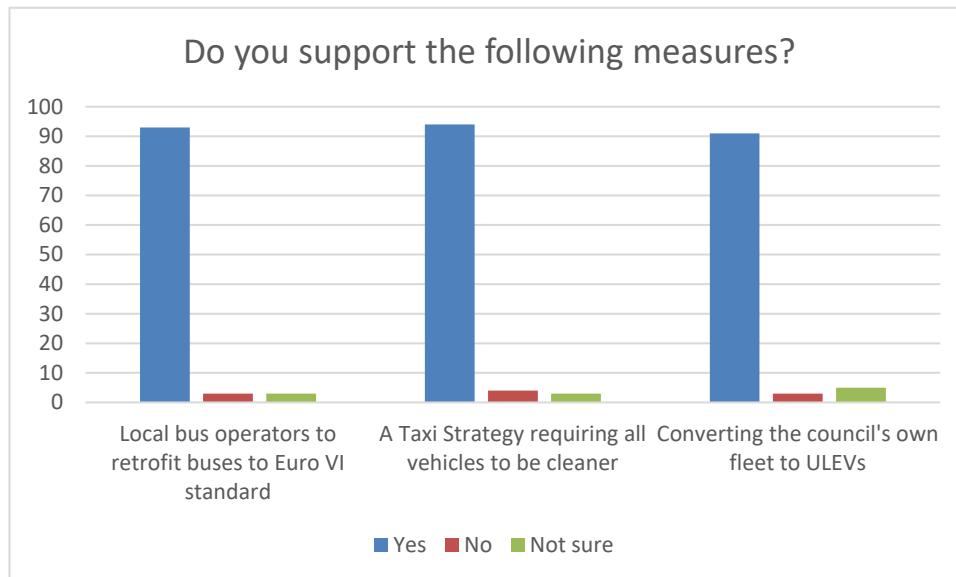
- Risk to public health – many comments relating to worsened asthma, COPD etc, and in particular risk to children's health

- Ban higher emission vehicles, including 'dirty diesel'
- Poor traffic flows/high congestion contributes to the problem

2) *Do you support the following measures?*

Figure 4-2 below shows that the vast majority of respondents support the proposed measures

- Bus operators to retrofit buses to Euro VI standard – 93%
- Taxi Strategy requiring all vehicles to be cleaner – 94%
- Converting the council's fleet to Ultra Low Emission Vehicles (ULEVs) – 91%



Common comments underneath this question were calls for action against idling, particularly taxis. Calls to be more ambitious especially in terms of timescales and the scope of activity and a need to reduce the number of vehicles in the city centre.

3) *How strongly do you agree or disagree these measures are sufficient?*

Of the responses, 39% strongly agreed these measures would be sufficient, with a further 38% agreeing. Therefore a total of 77% agreed or strongly agreed that the measures were sufficient.

4) *Do you support the following measures?*

Of the responses to this question 82% sought to ensure adequate enforcement for potential anti-idling legislation In addition 70% supported plans to revise the city centre Clear Zone to include emissions criteria – 70%

5) *How strongly do you agree or disagree the City Council should aim to implement further measures?*

Respondents to this question conveyed a strong preference that the city council should go further in its response to the air quality challenge 55% strongly agreed the council should implement further measures, with a further 29% agreeing a total of 84%

Further comments included more calls to take action against idling. Ensuring businesses wouldn't suffer as a result of measures and suggestions that improve traffic flow, such as rephrasing traffic lights might also be effective.

The Clear Zone proposal is at a very early stage and further consultation will be required, targeted at impacted businesses and stakeholders, around a more detailed proposal. Feedback given in this consultation will help to inform the Clear Zone Review..

The consultation went on to seek views on a proposal to amend the existing Air Quality Management Area.

*6) Do you agree with the proposed variation and extent of AQMA?*

Again respondents showed a clear preference that the AQMA should be revised and extended 69% said yes, with 19% not sure.

*7) How strongly do you agree the City Council should seek and use additional legal powers to issue FPNs to drivers who unnecessarily idle vehicle engines?*

61% strongly agreed, with a further 20% agreeing – total 81%

Responses showed the highest priority for respondents was to enforce this outside schools, while taxi ranks also featured highly.

## **Conclusion**

The Results of the consultation show that the measures proposed by Nottingham City Council are supported by the vast majority of respondents. I would also appear that there is an appetite among respondents to go further than the proposals outlined in the plan.

## 5 COMMERCIAL CASE

- 5.1 The purpose of the commercial case is to provide evidence of the commercial viability of the proposals and set out the intended approach to procurement.

### Capability and Skills of the Nottingham Delivery Team

- 5.2 Nottingham City Council has a proven track record for delivery of large transport schemes through effective partnership working with a range of organisations across the public, private and third sectors. Evidence of successful partnership delivery includes:

- ❑ Turning Point - a £12m suite of public realm, bus and highway improvements aimed at revitalising the north of the city centre, delivered in 2006
- ❑ Ring Road Major Scheme - £15m programme of improvements on Nottingham's ring road.
- ❑ Delivery of the existing LSTF programme of £15.3 million comprising Key Component and Main Bid elements that resulted in significant travel behaviour change outcomes;
- ❑ Nottingham LTP programmes valued over £10m per annum and includes PTEG joint procurement approaches e.g. Better Bus Areas/Green Bus Fund packages;
- ❑ Go Ultra Low programme team managing over £10m funded activities ranging from, buses, taxis and fleets. The team have significant expertise of ULEV technologies and in commissioning and procuring innovative solutions.
- ❑ With private sector organisations through delivery of major infrastructure projects including NET Line One, the development of NET Phase Two and the Nottingham Station redevelopment;

- 5.3 These examples demonstrate the significant knowledge and expertise the in-house teams hold in delivery of both large-scale infrastructure and specialist service improvements. Furthermore, the advantages of taking forward the strongest elements of an existing programme mean that there will be minimal set up required in terms of procurement and recruitment processes as governance arrangements and working relationships with local delivery partners are already established. Skilled individuals are already in post and have undertaken all the exploratory work needed and have built up local knowledge, expertise and contacts that would be hard to replicate for alternative providers and would most likely result in added costs to the project.

### Additional Measures

- 5.4 Nottingham City Council has a longstanding policy of encouraging the use of sustainable transport to tackle congestion climate change and air quality problems. The strategic case outlines the current measures the City Council has been taking to address issues with Air Quality.

5.5 The City Council has also taken advantage of more recent sources of funding made available by Government to continue to reduce Nitrogen Dioxide levels in the city. These Additional Measures are outlined as follows:

- Bus Retrofitting Programme – The scheme will retrofit Euro 5 and Euro 3 diesel busses operating in Nottingham. All funding will help to achieve a conversion to cleaner Euro 6 standards buses. £2.7m Funding was provided through the Government's Clean Bus Technology Fund.
- The ULEV taxi trial funded by Government to the tune of £300K is closely aligned to the City Council's Taxi Strategy and Age and Emissions policies.
- NCC fleet change programme – early measures funding also enabled a programme of replacing older diesel fleet vehicles with new ULEV vehicles. The Programme is aimed at replacing Cage Tipper Vehicles, Small Vans and Refuse Collection Vehicles and valued at £2.8m with £1.5m Government grant and £1.3m local match.
- The early measures funding also enabled £200,000 of funding for new cycling infrastructure aimed at linking existing cycle route to creating comprehensive network .

## **Proposals to Improve Air Quality**

5.6 As outlined in the Strategic Case, Nottingham City Council is proposing a range of measures aimed at reducing Nitrogen Dioxide levels in the city. Most measures are already funded and programmes have started to deliver benefits. However, Nottingham City Council is seeking further funding from the Clean Air Fund for a transition support package for taxi drivers consisting of the following elements:

- Funding to assist hackney carriage drivers with licensing costs, a critical element to supporting the trade financially.
- Funding to extend the ULEV Taxi Trial to support nearly 50% of local drivers through the experience of driving an ULEV taxi.
- Funding to extend the charging infrastructure through the creation of a flagship rapid charging hub for taxis only and support through a home charge scheme for drivers with off street parking as a coherent offer.
- Funding for the creation of a ULEV only taxi rank as an added incentive to those ULEV taxi drivers as part of the Broadmarsh Shopping Centre redevelopment.

5.7 This commercial case outlines how each of these measures is to be delivered.

5.8 For the subsequent measures that follow, it is worth iterating the Council's definition of an ULEV. The Council is adopting the term "Ultra Low Emission Vehicle" defined by HM Treasury as "a vehicle that emits less than 75g of carbon dioxide emissions per kilometre travelled and can drive a minimum of 10 miles in zero emission range". This includes all battery electric vehicles and some but not all hybrid vehicles. The London Electric Vehicle (LEVC) TX5 meets this definition, as does the Dynamo Nissan ENV200 hackney carriage conversion. This

definition has been used in the legal Orders for the Daleside Road bus lane, through which the new ULEV taxis are exempt from driving.

### ULEV Taxi Licensing Incentive

- 5.9 The Strategic Case outlines the need to encourage change in our existing hackney carriage fleet. Due to the City Council's new age and emissions criteria for licensing new hackney carriages, this places a financial burden on drivers and operators licensed within Nottingham to change their vehicles by 2020. This burden is not faced by taxis licensed outside of Nottingham as they are free to compete for trade alongside Nottingham licensed taxis. This places Nottingham taxis at a financial and competitive disadvantage, and the specific issues underlying this are outlined in the distributional impacts section of the economic case. In short, the Nottingham taxi trade tends to operate older fleets (the average age of the Nottingham taxi is 14 years) primarily within the areas of the city where air quality is found to be worst, and has a culture of replacing these vehicles less often than private hire competitors. Their smaller cash reserves and difficulty in accessing capital makes it challenging for these operators to fund the purchase of Euro 6 and ULEV vehicles. As such the planned change to taxi licensing restrictions in Nottingham is expected to place some operators under financial pressure.
- 5.10 Despite previous attempts to secure funding from the Government to provide financial assistance, these proposals have been rejected either due to state aid concerns or value for money. It is worth reiterating, providing some level of financial assistance as other local authorities e.g. Transport for London, Southampton, Bristol, Coventry are doing and Sheffield (propose) is a key priority to the Council as it is the only measure the drivers and trade representatives both agree is vital to achieving a shift to ULEVs, which is lacking from the Nottingham offer.
- 5.11 In order to redress the balance, the City Council proposes to introduce a licensing incentive for the first 240 drivers (40% target by 2020) who licence a new ULEV taxi with the authority. The scheme is based upon the successfully Government funded Bristol taxi licensing redemption scheme. Officers have modelled the approach and shared learning with the Head of Licensing in Bristol to inform the way the incentive will be delivered.
- 5.12 The incentive will offer drivers a redemption on their licensing fees covering a three year period. The costs to the licensing team within the Council of financing the licensing scheme over 3 years is £308,000.. The City Council will seek funding from the Clean Air Fund in order to finance the scheme. A breakdown of this estimate is contained in the Financial Case. The funding will cover the costs of driver medical exams and checks, together with the costs of driver and vehicle licensing which the driver is liable to pay the City Council licensing team. The scheme will be administered by the City Council's established taxi licencing team who are fully supportive of the proposals. Administering the scheme is not expected to be resource intensive, the Council has (for a similar grant scheme) developed an online portal

through which requestors can submit an application and append all relevant information for it to be reviewed internally. Information submitted will be verified and if all in order the payments will be issued. Transport Strategy will assist in the creation of the online portal for drivers to ensure the necessary declarations are included e.g. state aid, examples of appropriate evidence of fees paid etc.

- 5.13 This proposal does not affect state aid (as the financial value falls below de minimis) and is decoupled from the cost of the vehicles thus not presenting any issues with the General Block Exemptions negotiated by Government on the ULEV vehicle purchase price. The scheme has received internal legal clearance. The redemption agreements will seek confirmation that drivers are not in receipt of any other state aid and if so need to declare it for verification, similar to what is done on the Workplace Travel Service grants application form: <https://info.nottinghamcity.gov.uk/workplace-travel-service/workplace-grant-application/>
- 5.14 Only Hackney Carriage licenced drivers will be eligible for the scheme (excludes private hire). Furthermore, the Council proposes the following eligibility criteria for the incentive:
- Drivers must have a current valid Hackney Carriage plate/licence
  - Drivers must first pay all relevant fees (at the relevant frequencies) before being able to redeem the licensing costs
  - Drivers must produce a copy of an official record of ownership of an ULEV taxi i.e. V5/log book
  - Drivers will be expected to sign an agreement to remain in the trade for three years (if they do not the Council reserves the right to claw back the incentive funds)
  - Fees can only be redeemed on ULEV taxis that meet the Council's vehicle licensing definitions i.e. be 100% wheelchair accessible and ULEV (as defined above)
  - The fees (once paid initially) can be redeemed upto 90 days after payment was made to the Council
  - The Council will reserve the right to deny the release of any redemption fees should it find the requests non-compliant with the eligibility criteria set out. The scheme will strictly operate on a first come first serve basis, however the Council commits to monitoring progress and making any necessary amendments as required in order to maximise the benefits of the scheme that fit with the overall objectives.
- 5.15 The Government funding is being used to offset the loss of licensing fees received from the drivers over a three year period. The Council will manage the scheme inhouse and therefore no procurement or commissioning activities are required to support this measure.

## ULEV Taxis Trial Scheme Expansion

- 5.16 Nottingham City Council received funding from DEFRA through the early measures fund to set up a try before you buy ULEV taxi scheme. The scheme proposes to offer drivers access to ULEV vehicles on a trial basis initially with the option to enter into a longer-term lease of the vehicle (the latter is still in development).
- 5.17 The justification of this measure is to support drivers with exposure to ULEV vehicles in order to inform their purchase decisions. The Council has received funding to purchase up to five ULEV taxis, however due to the availability of vehicles in the market, only three LEVC vehicles have been procured thus far via a dispensation to direct award to a local dealership. The approach therefore is to launch the trial in October once the vehicles are received.
- 5.18 The trial to drivers will cover a 12 calendar day period. Drivers will be expected to hand in their keys and plate to their existing vehicle and then be issued with a trial vehicle. In order to maximise the weekend patronage, drivers will be issued with a vehicle trial starting on a Wednesday (day 1) and returning on a Monday (day 12). This will allow the drivers almost two weeks worth of fuel usage comparison (against their existing vehicle) and allow drivers sufficient time to test the operational benefits of the vehicles. The vehicles will be valeted over the Monday and Tuesday by fleet management in advance of the next booking.
- 5.19 Following an OJEU compliant procurement, Drive Electric (<https://www.drive-electric.co.uk/>) was contracted to deliver an ULEV "try before you buy" scheme to local businesses. This "ULEV Experience" is funded through OLEV's Go Ultra Low City funding. The scheme focuses on giving businesses the opportunity to trial ULEV cars and vans to assess the vehicles operational use. Drive Electric specialise in electric vehicle leasing to consumers and fleets and they are deploying a fleet of 10 ULEVs to be offered to businesses on a one-month trial as part of the ULEV Fleet Experience. Drive Electric will administer the bookings, vehicle delivery/collection and provide support to the drivers around vehicle familiarity and charging advice. The Council is progressing a variation to the contract with Drive Electric for them to also operate the ULEV taxi trial in partnership with the Council.
- 5.20 For the ULEV Fleet Experience, the vehicles have started arriving since August 2018. The first loans are planned for late September 2018 so evaluation data is not currently available. The Council does however, have robust monitoring arrangements in place in the contract with Drive Electric and so this data will be available to us once the trial starts. The vehicles will also be provided with electronic tracking devices to measure where the vehicles go and how much they are being used.
- 5.21 The benefit of the Council operating the trial in collaboration with Drive Electric (and not doing it entirely in house) is that Drive Electric have experience in issuing hire agreements to the drivers of this nature. The fleet team will issue the vehicles and service and maintain them, once the taxi licensing team verify the driver has produced the correct insurance for the trial vehicle. Drive Electric will perform the following functions:

- Manage the bookings (the Council and the taxi driver representatives will refer interested parties to Drive Electric),
  - Complete a questionnaire before the vehicle is issued to capture perceptions about the ULEV taxis
  - Refer the booking to Fleet Management for issuing the vehicle
  - Provide a driver pack on how to use and charge the vehicle
  - Provide after care support once the vehicles are out on trial
  - Complete and after-trial questionnaire once the vehicle is returned to re-test perceptions
- 5.22 For the purposes of the trial, Drive Electric will provide Motor Vehicle Insurance on the Council owned ULEV taxis. Drivers will have to insure the vehicles whilst it is in their ownership. This will comprise Public Liability insurance and Hire and Reward insurance. The driver will be asked to pay a small financial contribution to participate in the trial (the fee is still being finalised but will be less than £150 for 12 days), so as to cover the costs of administering the scheme. Drivers understand there are costs to offering a trial and do not see paying to access the trial as a barrier. As many as 50 drivers have already expressed an interest in participating. Should the driver like the vehicle, they will be offered the opportunity to take the vehicle on a longer-term lease (e.g. 5 years) at a competitive rate via Drive Electric. The taxi leasing element is currently being developed by Drive Electric to work on the same basis, so that the use of purchased vehicles are maximised beyond the ULEV trial period.
- 5.23 The scheme will be live in October 2018 with three LEVC vehicles. These vehicles have been purchased from Paul Rigby Ltd (the local LEVC dealer). The Council will be launching an Alternatively Fuelled Vehicle Framework procurement in November in order to conveniently and efficiently purchase a range of fleet vehicles needed. Currently no frameworks exist, particularly for the light ULEV vehicle supply and so initiating a procurement with a lot for ULEV taxi purchase will enable the Council to procure the latest range of vehicles.
- 5.24 Should the funding for an additional five vehicles be secured, the framework will be used to procure these. A further two vehicles will be added to the fleet by March 2019 utilising the remaining Early Measures grant funding through this route.
- 5.25 Drive Electric have already been competitively procured so beyond the vehicle procurement, no other commissioning activities are required for this proposal.
- 5.26 Due to the timescales involved, the Council wishes to accelerate the opportunity for drivers to access the vehicles, test them out and commit to purchasing one, by adding more trial vehicles into the fleet. Excluding the current LEVC taxi drivers, 407 potential drivers may well be interested in this scheme. With three vehicles offering 12 day hires at any point in time, this means only 78 drivers would benefit from the trial between October to October 2019..

- 5.27 With three vehicles the trial will support 78 drivers, representing just 19% of the trade. If the Council were able to double the fleet from five vehicles to ten vehicles, then over the 12 months until October 2019, upto 194 drivers may be supported through the trial, representing 47% of the total fleet (exceeding the target of 40%). The split is detailed below:

**Table 5-1 ULEV Trial**

Vehicles	Oct – Dec 2018	Jan – Mar 2019	Apr – Jun	Jul- Sept	Oct 2019	Total
3 LEVCs	18	18	18	18	6	78
5		22*	30	30	10	102
10		36**	60	60	20	194

\*assumes two additional vehicles are available from the beginning of March 2019

\*\*assumes ten vehicles in the fleet (five additional vehicles) are available from beginning March 2019

### Dedicated ULEV Taxi Rapid Charging Infrastructure

- 5.28 Nottingham City Council is currently engaged in delivering the main elements of the Go Ultra Low project, which is aimed at encouraging the switch to Ultra Low Emission Vehicles (ULEVs). The £2m public network will deliver a network of 230 charging points for ULEVs across the Nottingham and Derby conurbations and surrounding counties and integrate with the national charge point provision. In addition, the City Council secured £700k from the OLEV taxi fund a dedicated charge point network for ULEV taxis. The council has a 10-year contract with BP Chargemaster to build, operate and maintain both networks.
- 5.29 The need for dedicated taxi charging points was highlighted as one of the main concerns of local drivers in the Cenex Taxi Business Model (see Appendix I).
- 5.30 Site visits are currently underway for a number of sites across the city to support the trade. Most of the taxi chargers will be aligned near to existing taxi ranks across the city, with the following locations currently being considered:
- Canal St – near station
  - Station Street
  - Queens Medical Centre
  - County Hall (Nottinghamshire)
  - Beeston Station
  - In addition, £100k DEFRA funding is installing two rapid chargers at Eastcroft Depot (for the ULEV trial vehicles)
- 5.31 The Taxi Study also found that the majority of taxi operators were practicing Muslims and therefore the City Council is in the process of looking at providing charging stations at car

parks near mosques throughout the city. The OLEV taxi funding was bid for on the basis of installing charge points at key destinations along key routes that drivers take. These were based on a feasibility study conducted by Energy Savings Trust (a requirement of the bidding process). The work done by Energy Savings Trust did not include pricing up the enabling and electrical connections work. So whilst £700k has been awarded to provide up to 32 connection points at up to 8 city locations, the sites are being prioritised on the basis of value for money due to the costs involved in the electrical supply to these sites.

- 5.32 Nottingham City Council has plans to dramatically transform and regenerate the Broadmarsh area of Nottingham city centre. The entrance to the city centre from the south is currently uninspiring and in need of a facelift. To do this, a £250 million programme of works is underway to transform the area into a great entrance into the south of the city centre with improved shopping, leisure and restaurant facilities in a vibrant new environment. An opportunity has arisen where a dedicated ULEV only rank supported by a rapid charging hub can be installed at the heart of the city centre, for which £188k DEFRA funding is sought.
- 5.33 This project will allow for the creating of a rapid charging hub with five 50Kw Chargemaster Ultrachargers in one single location adjacent to Melville Street as part of the Broadmarsh development. 25% match funding is also being provided by BP Chargemaster of £63k. The quotation from Chargemaster is shown in Appendix J. A dedicated hub will offer drivers the opportunity to top up charging, before, during or after a shift in a convenient city centre based location.
- 5.34 A competitive tendering exercise was carried out for the charge point concessionaire (Chargemaster). The contract covers public and taxi infrastructure. As such the existing framework can be used to deliver the Melville Street charging hub using the existing project team.

### ULEV Taxi Home Charge Grants

- 5.35 To offer a complete incentive package for drivers, the Council also intend to offer up to 40% of taxi drivers at-home charging facilities, which is estimated to cost approximately £100,000 to implement. Many drivers have off street parking and overnight charging facilities will be ideal for many.
- 5.36 Up to £400 will be offered per driver as a contribution towards the costs of installing a home charge point, if the driver has access to off street parking. The Council is working in partnership with Chargemaster to deliver this element of the project.
- 5.37 An online charge point application form will be designed (modelled on the existing Workplace Travel Service application form). Drivers will have to supply evidence of an ULEV taxi purchase and home address. The inhouse Go Ultra Low team will verify the form details and then refer the request to Chargemaster for proceeding with the installation.

- 5.38 The Council intend the scheme to operate separately from the OLEV Home Grant scheme which is in place. As a Go Ultra Low City, through the Workplace Travel Service, the Council is offering an added incentive to local businesses for up to £25,000 to fund charge points at workplaces. This operates separately to the OLEV Workplace grant scheme. The Council is seeking to operate a taxi grant scheme in the same manner, i.e. as a standalone grant scheme as an added incentive to Council licenced taxi drivers and also make the application process much simpler to the driver as they apply to the Council who then refer the driver to Chargemaster to follow up on the request. Given the Go Ultra Low projects cover the D2N2 LEP area, any drivers who live outside of the city boundary will be picked up as part of the ongoing charge point work, and benefit from this scheme.
- 5.39 The scheme will be offered on a first come first serve basis. As with the licensing scheme, if the take up is too high (more than 240 drivers apply), the Council will review the approach and potentially reduce the financial contribution to spread the funding more widely.
- 5.40 As stated, the Council has a contract with Chargemaster for public and taxi infrastructure. It is proposed to utilise this contract.

### Contribution to the creation of a ULEV only taxi rank

- 5.41 In March 2018, the City Council introduced the UK's first bus lane, which provides an exemption to ULEVs. The scheme is operating well, with high compliance and is acting as an added incentive for ULEV drivers. ULEV taxis are also able to use this lane.
- 5.42 As part of the Broadmarsh redevelopment and the Melville Street rapid charging hub, the Council are considering dedicating the taxi rank as an ULEV-only taxi rank as an added incentive to ULEV taxi drivers. , £65,000 funding is sought to cover the costs of the highway works around the creation of the Hub and the adjacent rank. The ULEV only taxi rank provides an ideal opportunity to:
- Increase the profile of ULEV taxi vehicles to accelerate take up amongst the trade
  - Encourage passenger use through offering a dedicated area where customers can make a conscious choice to opt for a clean taxi
  - Demonstrate the benefits to other taxi drivers of the case for ULEV vehicles
- 5.43 The costs have been quoted for internally by the Highways team and will comprise:
- £1.5k Traffic Regulation Order costs to produce and publish
  - £3.5k signs and lining costs of the rank
  - £60k contribution to highway services towards the road construction works
- 5.44 The costs have been quoted for internally by the highways and traffic management team, therefore no procurement or commissioning activities are required.

## 6 FINANCIAL CASE

- 6.1 The purpose of this Financial Case is to evidence a robust estimation of the package costs, set out the local contributions that will add value and illustrate the commitment of the project partners. The Financial Case sets out the basis on which the cost estimates have been derived.

### Taxi Licensing Scheme

- 6.2 In order to encourage the uptake of ULEV Taxis Nottingham City Council is planning to remove the cost associated with acquiring driver and vehicle licenses for those operators who make the switch to Electric Taxis.
- 6.3 Table 6-1 below outlines the current costs associated with acquiring a new driver and vehicle license, set by the Council.

**Table 6-1: Licensing costs for a hackney carriage driver and vehicle**

Driver Costs	Driver License	£145.67 per year
	Medical exam	£50.00 per year
	Enhanced DBS check	£44.00 per year
Annual Total		£239.67

Hackney Vehicle	Initial plating cost	£303.00 1st year
	Annual renewal cost	£273.00 per year
	Annual Total	
		£273.00

- 6.4 There are currently 2,000 taxi driver licenses in operation, however Nottingham City Council's taxi driver license allows the holder to operate either a private hire or a hackney cab. It is estimated that around 600 drivers operate hackney cabs exclusively. The incentives will be offered on a first come first serve basis up to a maximum of 240 drivers/vehicles (representing the 40% target set out in the Taxi Strategy).

- 6.5 The cost of the Council absorbing driver licensing fees is:

$$240 \times £240 = £57,600 \text{ per year}$$

- 6.6 There are currently 411 hackney carriage vehicles licenses, 40% of which is 165 vehicles. To cover the cost of licensing this equates to:

$$165 \times £273 = £45,045 \text{ per year}$$

- 6.7 Therefore, to cover the costs of relicensing both driver and vehicle licenses for three years:

$$(\text{£}57,600 + \text{£}45,045) \times 3 \text{ years} = \text{£}307,935$$

6.8 The City Council is therefore bidding for £308,000 to fund the taxi licensing initiative to deliver the following outputs:

- £1,539 reduced (vehicle and driver) licencing fees per driver over a 3 year period
- 240 drivers supported in total, representing 40% of the taxi fleet

### Expanded ULEV Taxi Trial

6.9 Nottingham City Council received funding from Government through the early measures fund to set up a try before you buy ULEV taxi scheme utilising £270k funding. The scheme proposes to offer drivers access to ULEV vehicles on a trial basis initially with the option to enter into a longer-term lease of the vehicle.

6.10 The justification of this measure is to support drivers with exposure to ULEV vehicles ahead of the council's new Age and Emissions Policy coming into effect. From 1st January 2020, only Euro 6 compliant or ULEV hackney carriages will be licensed. This means all 411 taxis need to have changed over. Currently 15 taxis have been switched to Euro 6 and four to LEVC taxis, demonstrating more support is needed to encourage drivers into the electric cabs.

6.11 The City Council has procured 3x LEVC taxis at the cost of £58,833 each. A copy of the quotation shown in Appendix J to this report. The additional vehicles will be procured through a new tender.

6.12 It is proposed to bid to the Clean Air Fund for £280k additional funding to increase the number of vehicles available through the Try Before You Buy initiative from five to ten.

6.13 Given each driver has the opportunity to trial the vehicle for 12 days, with five vehicles the scheme can currently support a maximum of 78 drivers over the course of a 12 month period. We are keen to offer the opportunity to as many drivers as possible, and in the Taxi Study conducted by Cenex (Appendix I) the drivers indicated that access to a try before you buy scheme is one of the top three most important incentives the City Council could invest in. With 10 vehicles the scheme would support 194 drivers over 12 months.

6.14 The City Council is therefore bidding for £280,200 to double the number of taxi drivers who can trial an ULEV taxi as part of the Try Before You Buy initiative to deliver the following outputs:

- 10 ULEV taxis offered a 12 day trial
- 194 drivers supported in total, representing 47% of the taxi fleet

## Charging Infrastructure

- 6.15 The need for dedicated taxi charging points was highlighted as one of the main concerns of local drivers in the Cenex Taxi Business Model (see Appendix I).
- 6.16 A 40kW LEVC taxi takes approximately 30-minutes to charge up to 80% of its battery. To give drivers confidence in the ULEV taxis and to support the growth in taxis, the ability to invest in multiple rapid chargers is essential.
- 6.17 The City Council has an ideal opportunity linked to a major transformation to the south of the city centre to create a flagship rapid charging taxi hub. The costs of this project is £250k. The Council is seeking £188k from DEFRA to match the £63k provided by Chargemaster to deliver this scheme.
- 6.18 In addition, the taxi study showed 40% of drivers have access to off-street parking. We intend to offer home charging points for ULEV taxi owners to charge their vehicles overnight or while they are off duty. Assuming we are targeting 240 drivers (40%) with 7.5kw charge points at £400 each this equates to a request for £96,000. This proposal is similar to that offered by Sheffield City Council.
- 6.19 The City Council is therefore bidding for £285,000 to fund more widespread provision of rapid chargers and home charging facilities for taxi drivers to deliver the following outputs:
  - Creation of a flagship rapid charging hub with five 50kW rapid chargers
  - Home charge grant of up to £400 per driver, supporting 240 drivers in total

## Contribution to the creation of a ULEV-only taxi rank

- 6.20 In March 2018, the Council introduced the UK's first bus lane which provides an exemption to ULEVs. The scheme is operating well with high compliance and is acting as an added incentive for ULEV drivers. ULEV taxis are able to use this lane only.
- 6.21 The City Council is considering dedicating a taxi rank in the city centre, adjacent to the Melville Street taxi hub, as an ULEV only taxi rank as an added incentive to ULEV taxi drivers.
- 6.22 The DEFRA funding will contribute towards the creation of this rank, TROs, signing and lining works that will be required.
- 6.23 The City Council is bidding for £56,000 for this project to deliver the following output:
  - Creation of a dedicated ULEV only taxi rank in the heart of the city centre to accelerate the take up of ULEV vehicles
- 6.24 An additional £60,000 is required to provide administration support over three years to this programme.

## Conclusion

6.25 The City Council is bidding for the following funding in order to implement our package of measures to achieve compliance:

- £308,000 for the licensing scheme from the Clean Air Fund
- £280,200 for an extension to the ULEV taxi try before you buy scheme from the Clean Air Fund.
- £284,700 for the ULEV charging infrastructure (rapid hub and home charge grant).
- £65,000 for the creation of a ULEV only taxi rank.
- £60,000 for programme administration support

Our total funding bid is for **£997,900**

## 7 SUMMARY

### 7.1 In summary:

- The **Strategic Case** outlines how the existing measures being taken by NCC will be sufficient to bring Nottingham into compliance with the air quality directive before 2020. With some additional funding, these benefits can be even greater.
- The **Economic Case** shows through modelling that all viable alternative options to the do minimum will have significant impact on the local economy, meaning the focus should be on the bus and taxi measures outlined.
- The **Management Case** demonstrates how the delivery team at NCC have a proven track record of successful delivery, and all best practice and experience will be given to further funded air quality measures.
- The **Commercial Case** provides evidence for the commercial viability of the proposed taxi measures for which we are seeking additional funding.
- The **Financial Case** provides a robust estimation of the package of costs.

### 7.2 The City Council's air quality modelling has shown no need for a CAZ in order to achieve air quality compliance by 2020, this will continue to be monitored carefully by Nottingham City Council alongside the impact of measures proposed. The proposed package of measures for which we are seeking funding for are:

- £308,000 for the licensing scheme from the Clean Air Fund
- £280,200 for an extension to the ULEV taxi try before you buy scheme from the Clean Air Fund.
- £284,700 for the ULEV charging infrastructure (rapid hub and home charge grant).
- £65,000 for the creation of a ULEV only taxi rank.
- £60,000 for programme administration support

Our total funding bid is for **£997,900**

### 7.3 Nottingham City Council will deliver these projects, with support from project delivery partners that are already engaged through the city's Go Ultra Low and other programmes.