AIR QUALITY FEASIBILITY STUDY
STRATEGIC CASE

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Please note, of the options outlined within government's Clean Air Zone Framework and tested to date, a charging CAZ level D would bring about the greatest improvement in ground level concentrations of nitrogen dioxide by 2021 on the local roads government has identified. Of those tested, it is this CAZ level that would get the relevant limit values closest to compliance by 2021. As such, at this stage, we have ensured our Outline Business Case considers the implications and outlines the impacts of a Charging CAZ (class D) by 2021, while our consultation will also give consideration to charging levels, geographic scope, and other measures that may be required but which are subject to further analysis as outlined below.

However, based on the results of the current modelling, no form of charging CAZ would enable the Central Motorway and the approach to Central Station to meet air quality limits by 2021, nor indeed the A1 Western Bypass. Consequently, further measures that may help accelerate our ability to deliver cleaner air in the shortest time possible are currently being analysed. At this stage, we are exploring the following options further and these will form part of the public consultation:

- **Other means of charging certain road users such as tolls on the city centre bridges including consideration of variable charging levels;**
- **A low emission zone where lorries, buses and taxis that do not meet minimum emissions requirements could be banned from entering Newcastle City Centre at certain times with a timeframe for such a measure to be determined following consultation;**
- **A ban on use of the Central Motorway between the Tyne Bridge and Coast Road in the peak hours (07:00 – 10:00 and 16:00 – 19:00) for HGVs and LGVs;**
- **Junction changes to alter access on / off Central Motorway and the Tyne Bridge;**
- **Walking and cycling infrastructure measures which enable modal shift toward more sustainable modes of transport; and**
- **Local abatement of poor air quality through infrastructure provision (such as moss walls).**

Our assessment of a charging CAZ highlights significant concerns about the impact on particular segments of the community. This case also includes details of the mitigation measures required to ensure a proposed option does not disproportionately affect small businesses, including taxi drivers and firms, or lower income households and areas of deprivation within our community. At this stage, this case assumes that the following mitigation measures would be funded through this process and these will form part of our consultation:

- **Retrofit / scrappage of cars, taxis, HGVs and LGVs to ensure various types of vehicles travelling in any zone are compliant;**
- **Travel credits for people on lower incomes commuting within the impacted area to ensure there are realised options for alternative ways of getting around;**
- **A public campaign to encourage behaviour change; and**
- **Exemptions for certain types of vehicles of users such as emergency service vehicles and blue badge holders.**

There are also a number of other measures which could result in improved air quality and that we wish to consider through our consultation but which could not be delivered by 2021. These measures would align with the objectives of government's Transforming Cities Fund and will be outlined through the consultation to enable us to consider longer term plans in addition to the focus on shorter term compliance.

1. STRATEGIC CASE

1.1 Introduction

1.1.1 This Strategic Case introduces the issues caused by transport and air pollution in Newcastle, Gateshead and North Tyneside and sets out the three Authorities' plans to meet the Government's Direction to tackle this. This section outlines the current situation, identifies the change required to tackle nitrogen dioxide (NO_2) exceedances, and describes how the Plan fits with wider local and national government policies and objectives.

1.1.2 Outdoor air pollution is a major risk to human health. Based on national estimates, it is estimated that poor air quality is responsible for around 360 deaths each year across our Authorities. Related causes of death include circulatory disease, respiratory disease and cancer.

1.1.3 To compound this issue locally, people in the North East of England live shorter lives and have shorter healthy life expectancy than the rest of England. This burden of preventable ill health contributes to the increasing pressure on social and health care. There is no safe level of exposure to air pollution, the effects of which build up over a lifetime. High exceedances can also be linked to acute episodes of illness such as asthma. England's Chief Medical Officer has stated *"it is time for policy makers to take seriously the threat to health posed by pollution"* (Department for Health and Social Care, 2017).

1.1.4 We are mindful of our statutory duty to improve and protect the health of our people, so are taking this threat of ill health seriously and in this Outline Business Case we will set out the way different approaches, based on the framework outlined by government, will impact on the quality of air for people living, working and visiting the area.

1.1.5 One of the biggest causes of air pollution is road traffic. The serious consequences of poor air quality on health means the problem must be targeted 'at source' by getting the most polluting vehicles off the road and reducing road traffic. Our role as Local Authorities is to plan and provide the environment to encourage people to change their behaviour.

1.1.6 Action to address air pollution will also encourage use of other forms of travel, including walking, cycling and public transport, and this will help address the challenges to health caused by low levels of physical activity. As such, certain ways of improving air quality would have the added benefit of also addressing wider societal problems and public health issues.

1.1.7 Despite these clear potential benefits to health, when developing the Plan to tackle air pollution, our Authorities are mindful that one of the major determinants of health is economic wellbeing. The North East already experiences high levels of poverty and inequality, which are major drivers of poor health and early mortality. As such, our Air Quality Plan must protect people, ensuring that changes do not exacerbate existing issues and balance the health benefits of improvements in air quality against the wellbeing impacts of the measures taken to achieve the improvement.

1.1.8 At this point it is also important to highlight the level of uncertainty which underpins the evidence being used by government to determine the focus of the legal direction and by us within the timescale to inform a decision on what measures will be most effective within the timescales. The Government's modelling suggests that the roads that have been modelled in

our area will be compliant with air quality standards by 2022 without any local intervention. Our local modelling, which also has significant margins of error but does use more appropriate data, does not support this view.

1.2 Policy Context

1.2.1 European Legislation

1.2.2 Air quality policy is driven by EU legislation; the *2008 Ambient Air Quality Directive (2008/50/EC)* sets legally binding limits for concentrations of air pollutants that impact public health such as particulate matter (PM_{10} and $PM_{2.5}$) and NO_2 (EU, 2008). As well as the direct effects to public health, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) that can be transported great distances by weather systems.

1.2.3 National Legislation

1.2.4 The 2008 Ambient Air Quality Directive replaced nearly all the previous EU air quality legislation and was transposed into English law by the Air Quality Standards Regulations 2010. The EU Limit values for NO_2 in the 2010 Regulations are identified as:

- Annual mean 40µg/m^3 (micrograms per cubic metre); or
- Hourly 200 µg/m^3 which is not to be exceeded more than 18 times a year.

1.2.5 The Secretary of State for Defra has responsibility for securing compliance with the EU limit values in England.

1.2.6 One area of potential uncertainty is with regard to any new Environment Bill and consequent amendments to the regulatory framework after the UK leaves the European Union.

1.2.7 While draft clauses on environmental principles and governance were published in December 2018, the full Bill will not be published until September 2019. However, the UK Government has not announced that it intends to change any aspect of air quality law after the U.K. has left the European Union.

1.2.8 Local Context

1.2.9 The UK Government and the devolved administrations are required to produce national air quality plans. The air quality plan for NO_2 (the *UK Plan for Tackling Roadside NO_2 Concentrations)* was published in 2017. This sets out the national measures to be introduced to improve air quality and reduce NO_2 concentrations.

1.2.10 Within the national air quality plan, some Tyneside roads were forecast by Defra in its Pollution Climate Mapping (PCM) model as being non-compliant with regards to the NAQ objective limit value for NO_2.

1.2.11 Our Authorities were subsequently given a legal direction from the Secretary of State on 27 July 2017. In accordance with this, we are undertaking a Feasibility Study to identify a package of measures to deliver compliance with legal limits for NO_2 in the area for which we are responsible, in the shortest possible time.

1.2.12 We recognise the need to comply with the Direction which has been imposed. However, we believe the main route to changes in air quality is not just through local action, but also national action including elements such as scrappage schemes or national taxation policy. Further, we consider the main way to enable marked improvements in air quality from road transport is through significant changes to travel behaviour which is not something that local authorities can deliver in isolation. Fostering sustainable behavioural changes in transport choice requires a variety of different approaches and a context within which individuals will be enabled to adopt different behaviours.

1.2.13 This requires a more cohesive approach across Departments, which picks up the best available evidence. This should be a longer-term approach, which is not solely focused on arithmetic compliance with a defined standard but takes a more holistic approach and defines measures which will be more effective over the long term, not only in local areas but beyond. The Authorities made this clear to JAQU in correspondence dating back to our initial responses to the original consultation and maintain that this is currently not being reflected in the approach being taken.

1.2.14 Clean Air Zones

1.2.15 A Clean Air Zone (CAZ) is defined as an area where targeted action is taken to improve air quality and shape the urban environment in a way that delivers improved health benefits and supports economic growth. The purpose of a CAZ is to address sources of pollution and reduce public exposure using a range of measures tailored to the location.

1.2.16 CAZs fall into two categories:

- **Non-charging CAZ –** These are defined geographic areas used as a focus for action to improve air quality. This action can take a range of forms and does not include the use of charge-based access restrictions; and
- **Charging CAZ –** These are zones where, in addition to the above, vehicle owners who are driving a vehicle that does not meet the standard for their vehicle type are required to pay a charge to enter, or move within that zone. Defra states that charged CAZs are grouped into classes by vehicle types.

Table 1-1 Charged CAZ Classes

CHARGE CAZ CLASS	VEHICLES INCLUDED
A	Buses, coaches and taxis (including private hire)
B	Buses, coaches, taxis and heavy goods vehicles (HGVs)
C	Buses, coaches, taxis, HGVs and light goods vehicles (LGVs)
D	Buses, coaches, taxis, HGVs, LGVs and cars

1.2.17 Air Quality Management Areas

1.2.18 Local authorities have a duty under the Environment Act 1995 to review and assess local air quality against a set of health-based objectives for specific air pollutants. Where exceedances of the objectives are identified, authorities are required to declare an Air Quality Management Area (AQMA) and to prepare an Air Quality Action Plan (AQAP). These plans contribute to the achievement of air quality limit values at local level.

1.2.19 AQMAs have been declared by Newcastle and Gateshead. All were declared for exceedance of the NO_2 annual mean standard, these are:

- **The Newcastle City Centre AQMA**: made up of the City Centre (NCC, 2004), Quayside (NCC, 2005a), and adjacent to the A1058 Jesmond Road/Cradlewell (NCC, 2005b);
- **The Gosforth AQMA**: made up of Blue House Roundabout (NCC, 2005c) and parts of the A189 to the Haddricks Mill double roundabout, and B1318 Gosforth High Street (NCC, 2008); and
- **The Gateshead AQMA**: Gateshead Town Centre (GC, 2005)

1.2.20 North Tyneside Council does not have any AQMAs and therefore does not have an AQAP.

1.3 Aim and 'Spending Objectives'

1.3.1 Our primary objective within the context of this study is **to produce a Feasibility Study which identifies options with the aim of achieving compliance with Nitrogen Dioxide limit values contained in the *2008 Ambient Air Quality Directive* in the shortest possible time**.

1.3.2 To support the primary objective, we have identified the options to be identified by the Feasibility Study should seek to achieve the following secondary objectives:

- improve public health in our area in the shortest possible time;
- enable future economic growth and sustain jobs and communities in the region; and
- promote a fairer society and not detrimentally impact vulnerable populations.

1.4 Public Health, the economy, and enabling a fairer society

1.4.1 Any options identified should be effective and support our long-term strategic goals, ensuring that short term actions do not detrimentally impact on the longer term ambitions of the area.

1.4.2 Improve Public Health

1.4.3 In addition to the mortality burden arising from outdoor air pollution outlined in paragraph 1.1.2, approximately 56,000 people across our area have respiratory disease, of whom 42,000 have asthma. There are also around 38,000 people known to have circulatory disease. In 2017 there were almost 8,600 emergency admissions for respiratory disease and more than 5,200 emergency admissions for circulatory disease across our Authorities. However, it is difficult to quantify the proportion of disease or health care that is related to air quality as these diseases have other known causes such as smoking prevalence and influenza.

1.4.4 The North East has serious long term public health issues. Around two out of three adults and one in three children are overweight or obese, and around one in five adults are described

as physically inactive. Introducing the report *Health and Wealth – Closing the Gap in the North East* (NECA/NHS, 2016), Duncan Selbie, the Chief Executive of Public Health England explains:

> *"There is no hiding from the fact that health outcomes are poor and that health inequalities within the region are far too great. Closing the healthy life expectancy gap with the rest of the UK over the next decade would add 400,000 additional years of active, healthy life for the people of the region."*

1.4.5 Public health is also affected by physical inactivity. The potential benefits of physical activity to health are huge. Research published in the British Medical Journal suggests that even 20 minutes of exercise per week has significant health benefits.

1.4.6 Influencing daily travel represents the most efficient way of embedding physical activity into everyday routines. Therefore, interventions such as better facilities for cycling and walking, underpinned by effective promotion can deliver a double benefit by improving air quality and increasing activity rates, thereby improving levels of public health.

1.4.7 Enable Future Economic Growth

1.4.8 The North East economy generates over £37 billion each year, contributing 2.2% of national output and jobs for 902,000 people (ONS, 2016). Although employment levels have improved in recent years, there is still a productivity gap with national performance. The North East Local Enterprise Partnership has sought to address these challenges in its Strategic Economic Plan, stating:

> *"We set a direction for our economy rooted in our determination to foster improved opportunities for our residents and businesses in a modern, diverse and entrepreneurial economy. With support from our partners across the region, we outlined a strong ambition – to deliver more and better jobs for the North East. … We know there is no silver bullet to deliver our ambitions, but this work sets a clear direction for our future priorities and programmes: … There is more we can do as part of the global community to secure economic advantage and improve our communities by leveraging our assets in key challenge areas like inequality, health improvement and carbon reduction."*

1.4.9 This goal underpins our ambitions. Ultimately, the objective must be to try to identify options which improve air quality and which also enhance, not damage, the local economy. A healthier workforce will help to improve productivity and thus economic growth.

1.4.10 Newcastle, Gateshead and North Tyneside have strengths in a number of key economic industries. These include professional and financial services, digital, health innovation and education.

1.4.11 The established digital community of the region includes the headquarters of FTSE 100 listed software leader, Sage, shared service centres for Hewlett Packard Enterprise, Accenture, BT and IBM and innovation centres for Ubisoft, ENGIE and Red Hat, alongside over 2000 SMEs.

1.4.12 It is essential to minimise potential damage to the local economy and communities, such as those arising from the implementation of national policy through a series of other local

decisions across the country whose impact may manifest in our region on specific industries. A good example of this is the automotive industry.

1.4.13 The North East is home to leading original equipment manufacturers including Nissan, Hitachi, Komatsu, Caterpillar, The Explorer Group and Cummins, who are cumulatively responsible for producing over 502,000 passenger cars and commercial vehicles, 6,400 non-highway vehicles and over 325,000 engines. The region is home to more than 28 tier one automotive suppliers and has become world renowned for automotive manufacturing.

1.4.14 There are over 240 automotive companies in the North East automotive sector, together generating over £11 billion in sales and exporting over £6.5 billion annually, with a trade surplus of £2.6 billion. Today the sector directly employs 30,000 people and impacts a further 141,000 jobs across the UK. In the last five years 46 projects have resulted in £1.6 billion being invested into the North East automotive sector, future growth and expansion is set to generate an additional 10,000 new jobs in the next five to ten years.

1.4.15 Nissan Sunderland is Europe's most productive car plant and in the top ten across the globe. It accounts for a third of all UK car production. The North East produces 26% of all electric vehicles in Europe and boasts a significant and growing reputation for investment in research and development and in new and emerging technologies such as advanced propulsion, connected and autonomous vehicles and technologies to make vehicles more efficient (including retrofitting technology).

1.4.16 Our Go Ultra Low programme is expanding electric vehicle infrastructure by installing two new electric vehicle filling stations and several cluster hubs of rapid chargers. The intention is to support early adopters of electric vehicles and promote a culture of low emission vehicles.

1.4.17 Given the region's market-leading role in the electric vehicle economy, the potential creation of a series of Clean Air Zones across the country creates significant local economic opportunities as well as supporting the ideal low-carbon economy that improves public health and air quality, whilst helping to safeguard and generate high-skill jobs.

1.4.18 Promote a fairer society

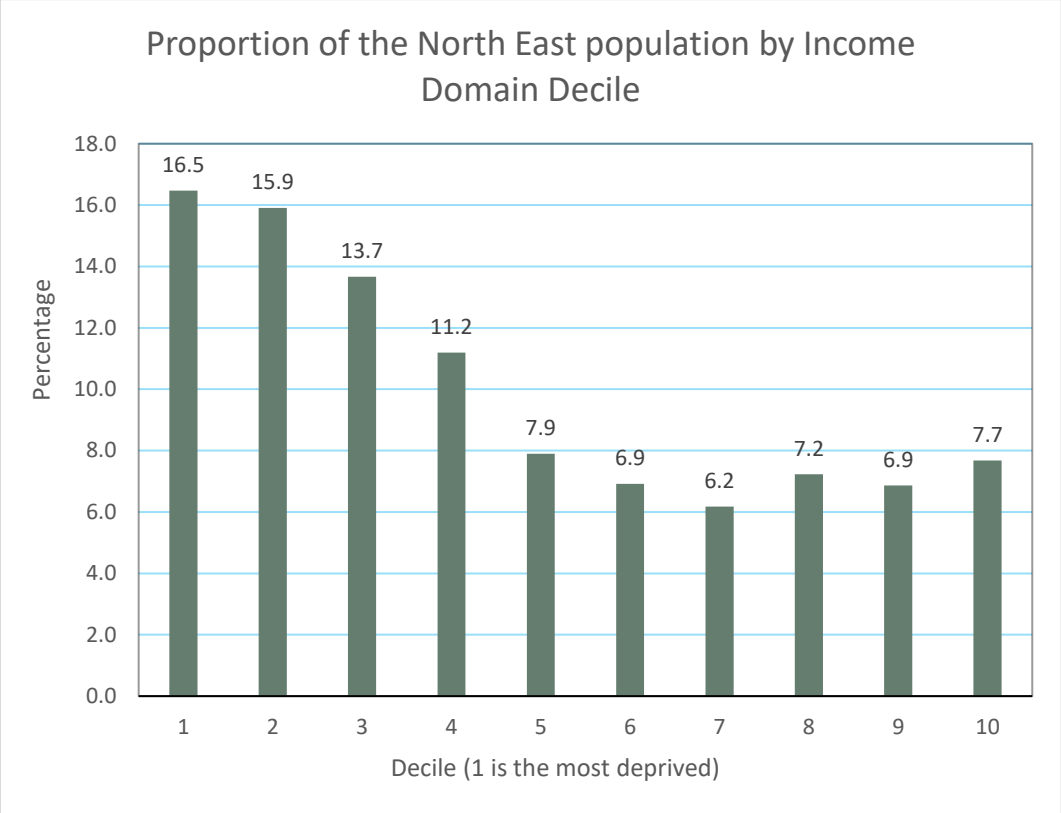
1.4.19 The region's political leaders have emphasised the need to address poverty and social exclusion by reducing income inequalities, both between this region and other parts of the UK, but also within the North East. As one example, Councillor Nick Forbes, Leader of Newcastle City Council, stated in 2017 that:

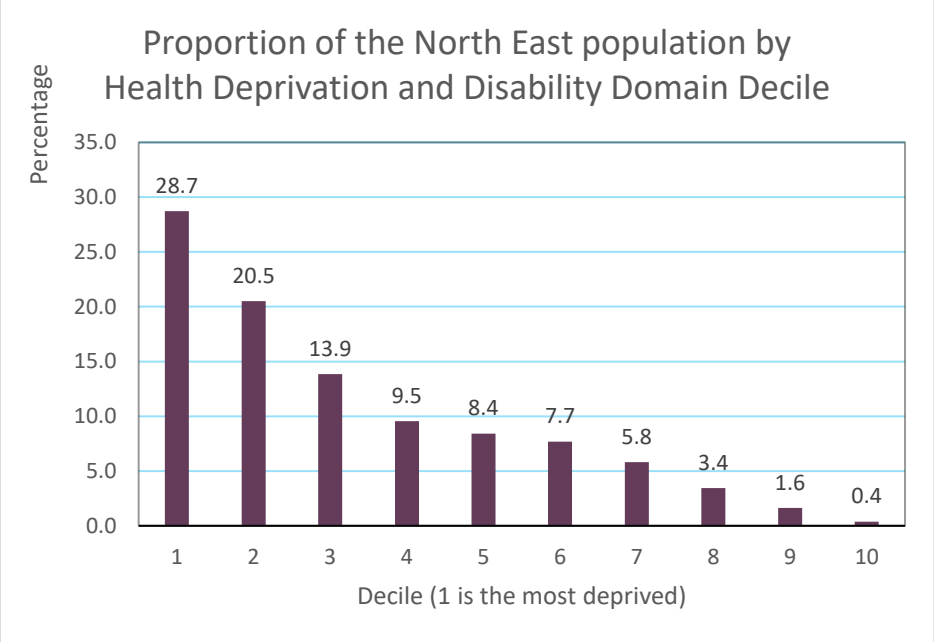
> *"A legacy of industrial change and continuing high levels of unemployment and poor health mean that too many communities across the North East still struggle to access economic opportunity."*

1.4.20 The North East has significant areas of continuing economic challenge. In the North East, residents have lower incomes than national averages. Gross Disposable Household Income (the amount of money that individuals in the household have available for spending or saving after, taxes, social contributions and benefits) for the North East is £15,595 per head. This is 80% of the UK average of £19,432 and the lowest among any UK region.

1.4.21 Differences in income and other characteristics are also represented within the Indices of Multiple Deprivation, a set of Government data which provides estimates on relative deprivation. Over 32% of people in the North East live in areas within the lowest 2 deciles of income, a figure which rises to 49% for Health Deprivation and Disability.

Figure 1-1 North East Population by Income Domain Decile and Deprivation and Disability Domain Decile (data source, IMD 2015)





1.4.22 As noted in 1.4.3, there are significant issues with regards to public health in the region, elements of which relate to poor air quality.

1.4.23 Interventions which improve air quality offer an opportunity to help to address these concerns. Large differences exist in air pollution across communities in England, with areas of high deprivation and ethnic minority groups among the worst affected. Measures to improve air quality may benefit the poorest communities within the region.[1]

1.4.24 The North East has historically low levels of car ownership, with 36.8% of households in Tyne and Wear without access to a car or van, a figure which rises above 70% in some wards[2].

1.4.25 Furthermore, research by University College London underlines the link between car ownership and income (UCL, 2014). 89% of households in the highest income group own one or more cars compared with 52% in the lowest group.

1.4.26 'No access to a car' is associated with an increased likelihood of walking as a mode of transport. The same study showed that people without cars, the disabled, elderly and school children are the most adversely affected by severance caused by the volume or speed of road traffic. This is reinforced by a local study, carried out by the Regional Road Safety Resource in 2016, which showed that people from more deprived parts of the region are more likely to be injured in a road traffic collision than people from less deprived areas.[3]

1.4.27 Therefore, investment in walking and cycling provision will be a key option to improve air quality by securing modal switch from car to walking, cycling or public transport. This type of intervention would benefit residents by:

- Improved air quality and hence better health;
- Health benefits through increased physical activity and increased social connectivity;
- Reduced accidents due to fewer car journeys and safer pedestrian and cycle provision; and
- Greater opportunities and wider travel horizons for residents without access to a car due to improved alternative travel modes.

1.4.28 In summary, with the right package of options, it is considered possible for the Tyneside Authorities to identify measures which would not only to meet air quality objectives but which would also positively influence long-standing regional objectives to achieve better public health, a stronger economy and a fairer society.

1.4.29 It is important at this point therefore to reiterate our position on the limitations of the national CAZ Framework adopted by Government. For example, there are inequities in the CAZ structure it requires to be considered which have emerged both through the framework itself and through stakeholder engagement in Tyneside. Furthermore, the lack of flexibility of the framework inhibits the ability of the Tyneside authorities to resolve these (e.g. requiring the charging of buses before private vehicles). This is despite evidence illustrating that in most cases it is private cars that are causing more pollution.

1 Research by Imperial College London and the National Institute for Public Health and the Environment in the Netherlands, January 2015

2 Analysis of 2011 Census KS404EW - Car or van availability

3 Analysis of the Impact of Deprivation on Road Safety in North East England, 2011 to 2015

1.4.30 As noted elsewhere within the Outline Business Case, we are committed to identifying options which do not simply pursue arithmetic compliance with air quality limits. Such an approach would in all likelihood simply displace problems from one area to another; instead it is crucial to identify solutions which are holistic, rather than simply achieving localised minor improvements on specific road links.

1.5 Alignment with wider schemes, policies and strategies

1.5.1 The importance of air quality and the economy is recognised in Newcastle and Gateshead's key planning document *Planning for the Future Core Strategy and Urban Core Plan* and in the *North Tyneside Local Plan 2017.* All state that to achieve health and wellbeing, preventing negative impacts on residential amenity and public health from poor air quality is essential.

1.5.2 The vision is that by 2030, Gateshead and Newcastle will be prosperous, sustainable and distinctive places where people choose to live, work and visit because everyone can realise their full potential and enjoy a high-quality lifestyle. Our plans recognise the importance of transport for public health and seek to improve the health and wellbeing of communities by supporting cleaner air and more active lifestyles.

1.5.3 Transport related options which support improvements in air quality are in line with local priorities including those set out in the Region's *Transport Manifesto*: good access to workplaces, services, shops and leisure; less road congestion; more sustainable travel; growth in economic activity; better air quality and lower carbon emissions; healthy, active lifestyles; efficient use of transport assets; land use planning that favours sustainable travel; equality of opportunity; a better cycling network; and expanding the public transport network.

1.5.4 The Strategy and Manifesto both build on the third *Tyne and Wear Local Transport Plan (LTP3)* and Air Quality Action Plans which place clear emphasis and action on ensuring that the regional AQMAs are addressed and further AQMAs are prevented.

1.5.5 The forthcoming Transport Plan for the North East will build on the *Transport Manifesto* and *Transport for the North's Strategic Transport Plan*. Partnership working across spatial planning and other departments will ensure developments that promote sustainable travel have health and congestion benefits and can reduce emissions which contribute to poor air quality.

1.5.6 Delivering measures which improve access to sustainable modes through the application of this policy will be important as will the integration of mitigation measures from new development and within authority wide infrastructure plans.

1.5.7 The duty to cooperate is used to maximise the effectiveness of policies for strategic matters in Local Plans. This is evident where significant developments are proposed and working cross boundary between authorities and public transport providers is critical to ensuring that growth can happen in a sustainable way, with high quality motorised and non-motorised transport options available.

1.5.8 By integrating policy on planning and transport, we can ensure the transport network develops in an efficient way. Where sustainability of transport is an integral consideration in the land use planning process, non-car modes of travel become dominant, but where

development proceeds without due regard to transport considerations then car dependence is the outcome (Urban Transport Group, 2011).

1.5.9 This cross-boundary working is evident through the development of this strategy, together with many other major developments in the North East and will continue following the application of the Strategic Transport Plan for the North and Transport Plan for the North East.

1.5.10 In addition, our Authorities have secured funding through the Early Measures Fund and Clean Bus Technology Fund to implement abatement activities before the preferred package is identified through this Feasibility Study.

1.5.11 The authorities intend to utilise the public conversation and consultation around air quality as a means to support and enhance our forthcoming Transforming Cities bid, a national fund with a value of £1.3bn.

1.5.12 Air Quality is an integral part of the Transforming Cities Phase 2 bid, with benefits building on the Phase 1 bid which included elements that are deliverable before January 2021 and proposed to start in March 2019, if awarded.

1.5.13 The potential impacts of these initiatives are not included within any modelling outputs identified in this Study as the funding has not been confirmed and will not be at the time of submission of this Outline Business Case. They include:

- Transforming Newcastle City Centre to improve bus, pedestrian and cycle access;
- Significant investment in cycling infrastructure, particularly to public transport interchanges;
- Large investment in Intelligent Transport Systems to improve traffic flow and public transport priority on key corridors; and
- Consideration of measures such as Workplace Parking Levy

1.5.14 In the longer term, there are also a number of ambitions in the region such as:

- New Metro stations facilitated by extending dual-tracking of the Mtro;
- New Park and Ride and Metro extensions; and
- Removal of major road infrastructure that acts as barriers to movement, including on the A167.

1.6 Local Transport

1.6.1 Overview

1.6.2 The key transport links in the Tyneside region, alongside areas of high population and key employment areas, are shown in Figure 1-1. A summary of the journey by mode percentage split in the Tyneside Authorities is shown in Table 1-2.

Figure 1-2 Key transport links, areas of high population and key employment areas

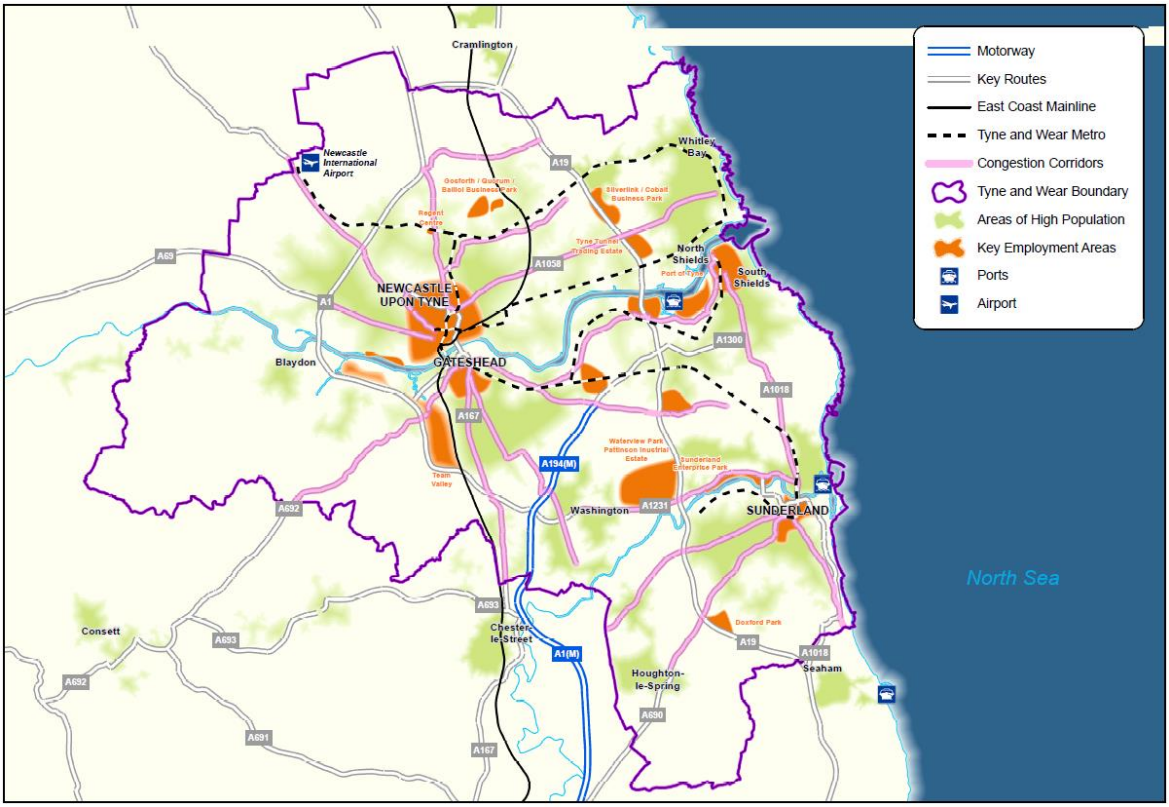


Table 1-2 Mode split for journeys to work in the Tyneside Authorities, source 2011 Census

MODE	MODE SPLIT (%) BY LOCAL AUTHORITY		
	Gateshead	Newcastle upon Tyne	North Tyneside
Walking	8	10	10
Cycling	1	2	2
Public transport	18	29	16
Driving a car or van	64	51	63
All other methods	8	7	9

1.6.3 Traffic volume and movements

1.6.4 High levels of traffic enter and pass through the area. The A1, A19 and A194(M) are the main strategic road links. Traffic on these links is a mix of local traffic and 'strategic' traffic to Scotland, the North West, Tees Valley and the South. The A1 Western Bypass experiences congestion, however, a scheme in Gateshead in 2015/16, introduced increased capacity on this link resulting in improved journey times and slightly lower levels of congestion.

1.6.5 Some of the most congested links in the region are in the urban core of Newcastle and Gateshead with limited numbers of river crossings. Key distributor links in the authorities such as the A167, A19 and A1 funnel traffic across the river (for example the A167(M) Central Motorway, one of the areas having a PCM modelled exceedance, links to the A167 Tyne Bridge, where typical flows are 68,000 vehicles per day).

1.6.6 As the map below demonstrates, the key river crossing of the Tyne Bridge has traffic impacts not only within Newcastle and Gateshead, but also North and South Tyneside, demonstrating the requirements for a joint approach. It can also be seen that key flows are ultimately not only North-South, but also East-West.

Figure 1-3 Origin/Destination of movements Northbound across the Tyne Bridge in the Evening Peak, per hour

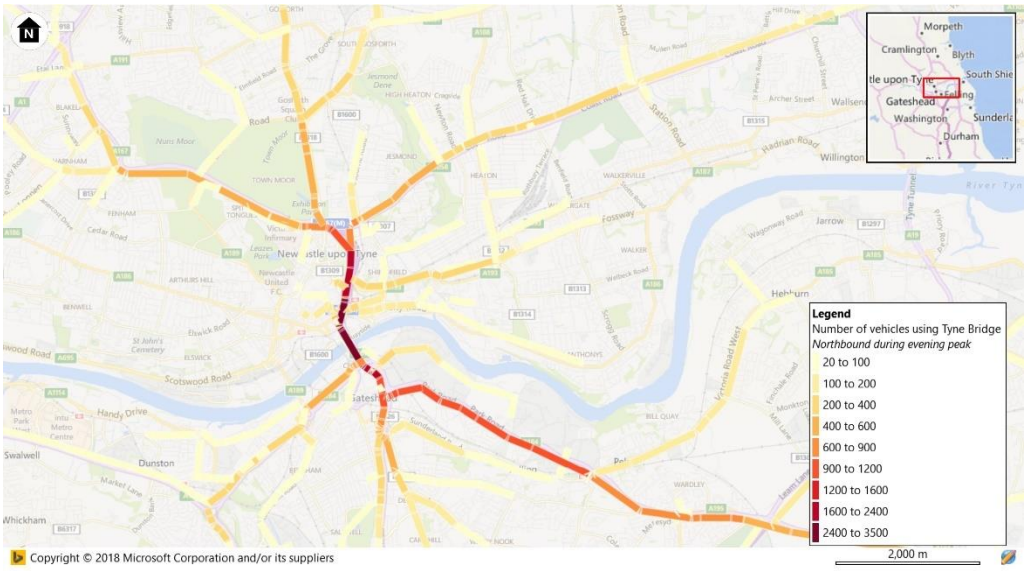
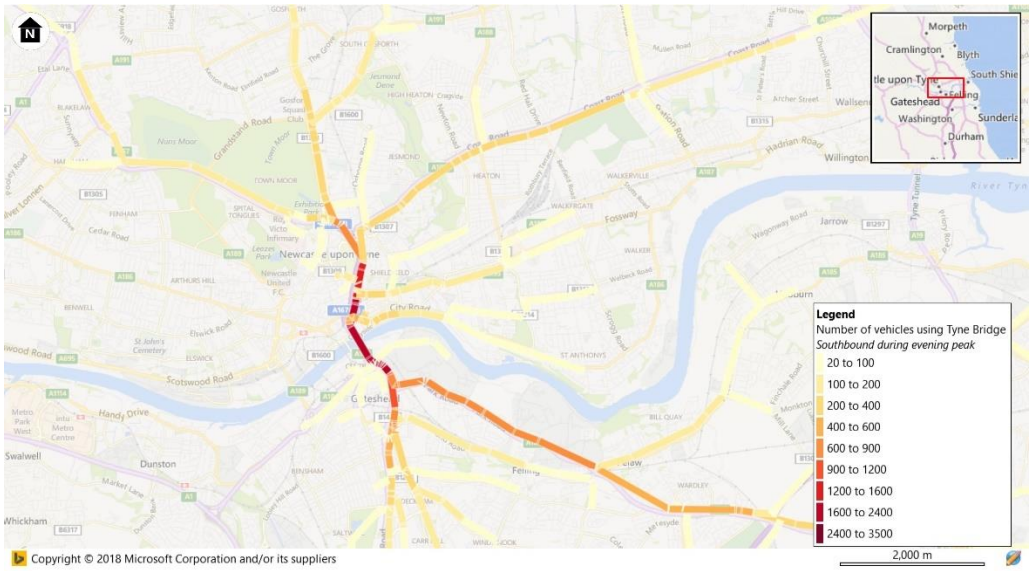


Figure 1-4 Origin/Destination of movements Southbound across the Tyne Bridge in the Evening Peak, per hour

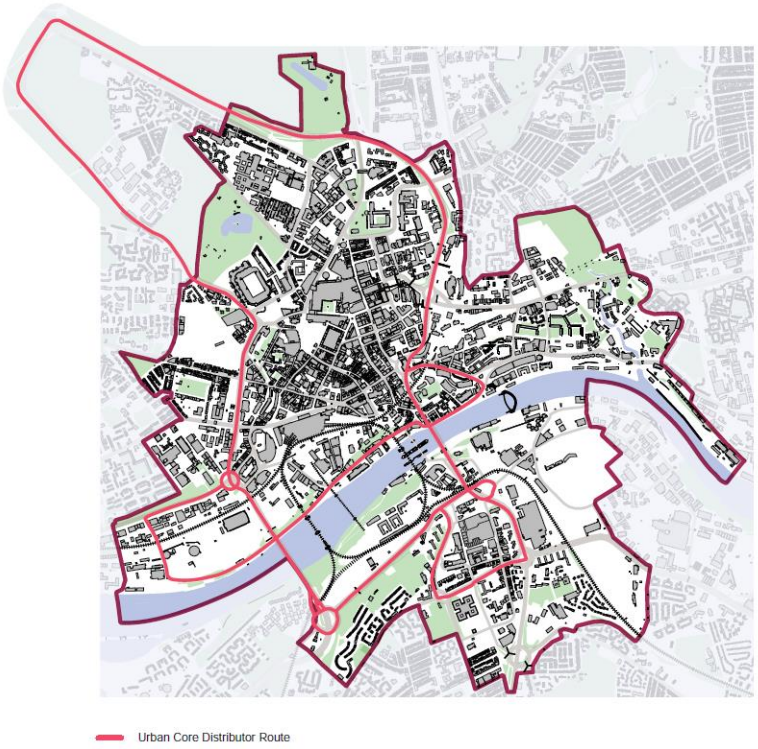


1.6.7 Through their Urban Core Plan, Newcastle and Gateshead jointly have defined the urban core of Newcastle and Gateshead. Vehicle access to and around the urban core is managed to minimise through traffic on the roads within the urban core by Policy UC9. This policy focuses traffic onto the designated Urban Core Distributor Route (UCDR) illustrated in Figure 1-5. The UCDR includes the A189, A167, A184 (Askew Road) that links the A189, and the A167, Skinnerburn Road along the Close /Quayside, Prince Consort Road, Charles Street and A167 Gateshead Highway to Askew Road.

1.6.8 While the specific routes which vehicles are directed on may change, the spirit of the policy is maintained with through trips directed onto key corridors such as the Central Motorway. An outcome of this policy there is a difference between the roles that the UCDR links and other links within the urban core, in terms of purpose of journeys, length of journeys and vehicle class. This is an important consideration when exploring opportunities to improve air quality in the worse affected areas such as the Central Motorway given that our policies seek to route traffic onto this road.

1.6.9 During the morning time period, commuting is the predominate journey purpose, however selected roads perform a wider function with regard to both business travel and goods vehicle movements. The Tyne Bridge serves a greater number of non-car journeys than many other roads in Newcastle city centre. It also serves more journeys overall than most surrounding roads.

Figure 1-5–Urban Core Distributor Road within Newcastle and Gateshead



1.6.10 The approach to the Tyne Bridge southbound from the Central Motorway serves travellers undertaking a wide area of journeys, principally those that cross the city centre and River Tyne. Analysis into travel patterns of journey origin and destination for vehicles using this link shows that commuting patterns are more local while the converse is true for light and heavy goods vehicles.

1.6.11 North of the River Tyne journeys on the Tyne Bridge and Central Motorway spread over a wide area and use the A167 North West Radial, Great North Road and Jesmond Road to either access the city centre via Swan House or cross the river. The majority of these cross the river.

1.6.12 This provides evidence the road users are using the UCDR as stated in the policy, reducing the numbers of vehicles using more minor roads to travel through the central area. While this is good for both traffic and air quality within the UCDR and surrounding residential areas, it concentrates vehicle movements and those vehicles' emissions on the Central Motorway which can exacerbate air quality issues within the corridor.

1.6.13 Local vehicle fleet and deprivation

1.6.14 A comparison of local ANPR surveys and UK projections for 2017 has been reviewed to understand how much of the local vehicle fleet is non-compliant (i.e. does not meet the minimum emission standards required by a charging CAZ). The information is consistent with that used in the National Atmospheric Emissions Inventory, which has a base year of 2013; it is also the data used in the Emission Factor Toolkit (EFT). The split in the national data is based on the proportion of vehicle km as opposed to number of vehicles, and this should be taken into consideration when comparing the values.

1.6.15 The results are shown in Table 1-3. The percentage of non-compliant vehicles in the local area is higher than the national average across all vehicle types. This indicates that the Tyneside area has a higher proportion of older vehicles than the UK average, across all forms of vehicle.

Table 1-3: Compliant and Non-Compliant Vehicle Breakdown, 2017

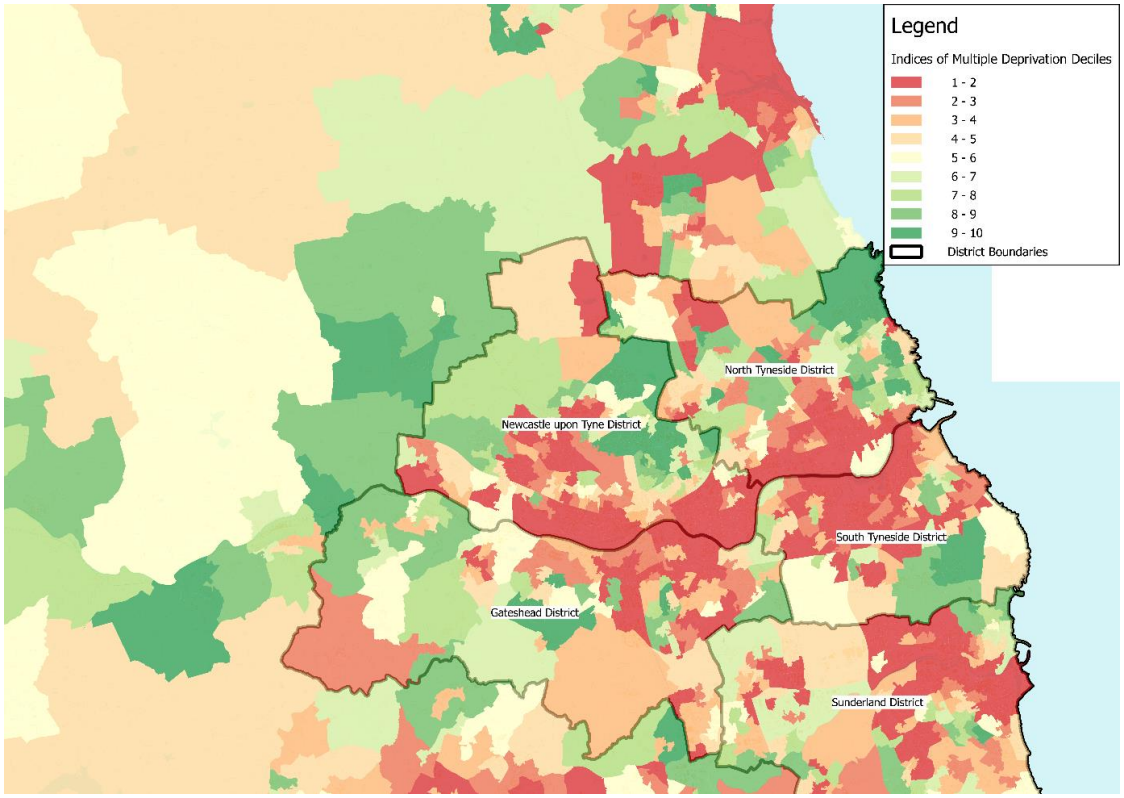
VEHICLE CLASSIFICATION	UK NON-COMPLIANT PERCENTAGE (2013 BASE FOR 2017)*	LOCAL DATA NON-COMPLIANT PERCENTAGE (OBSERVED)
Petrol car	11%	17%
Diesel car	63%	77%
Petrol LGV	27%	37%
Diesel LGV	66%	89%
Bus	60%	84%
Rigid HGV	43%	73%
Arctic HGV	24%	52%

*Based on euro class engine type only. London excluded for LGV, Bus and HGV

1.6.16 As noted in section 1.4, the North East experiences greater levels of deprivation than national averages. The English Indices of Deprivation uses separate indicators and appropriate weights, to calculate the Index of Multiple Deprivation (IMD). This is an overall measure of multiple deprivation experienced by people living in an area and is calculated for every Lower layer Super Output Area (LSOA), or neighbourhood, in England. Every neighbourhood in England is ranked according to its level of deprivation relative to that of other areas.

1.6.17 This is demonstrated below graphically. The results indicate that all three authorities have significant areas which are within the most deprived 10% of the country. However, there are also areas which are within the least deprived 10%. While spatial patterns are more challenging to distinguish, due to the way in which boundaries between areas are calculated, many communities at either side of the Tyne experience deprivation.

Figure 1-6– Index of Multiple Deprivation 2015 deciles in Tyneside and the wider area (1 is the most deprived)



1.6.18 Household affordability analysis was undertaken to understand where the non-compliant vehicles are registered locally and therefore understand potential impacts. Table 1-4 shows ownership of non-compliant cars by deprivation quintile.

1.6.19 The table indicates that low income households are more likely to own older, non-compliant cars. This does not account for differential rates of car ownership between quintiles or different trip-making characteristics, as trip-making increases with income.

Table 1-4 Percentage of non-compliant cars by IMD quintile (1 = most deprived)

IMD QUINTILE	1	2	3	4	5
% cars owned by households in quintile which are NC	48.5	46.4	44.7	42.7	39.3

1.6.20 Further analysis has been undertaken on non-compliant LGVs and household levels of car ownership.

1.6.21 The analysis indicates the following:

- Much of the area within and proximate to the CAZ has between 40% and 60% of its cars currently not compliant with CAZ standards. Correspondingly, the negative impacts of any potential CAZ D would theoretically be amplified in these areas.

- Particularly in Newcastle, in many of these areas the majority of households do not have access to a car. Analysis of 2011 Census Travel to Work data shows that use of buses to travel to work is higher in these areas. However, there are many other reasons that people may wish to use cars and this would not be examined within census data. Furthermore, should bus fares rise to take into account of a CAZ, this may impact these areas.

- The proportion of non-compliant van ownership is high, in line with estimates from the ANPR survey undertaken in the region. Correspondingly, a CAZ C or D would negatively impact van owners, many of whom may be small business owners or sole traders.

1.6.22 Maps showing the location of non-compliant car and LGV ownership and levels of household car ownership are shown in Figure 1-4, Figure 1-5 and Figure 1-6.

Figure 1-7– Non-compliant car ownership – Data source DVLA Data provided by JAQU, 2018

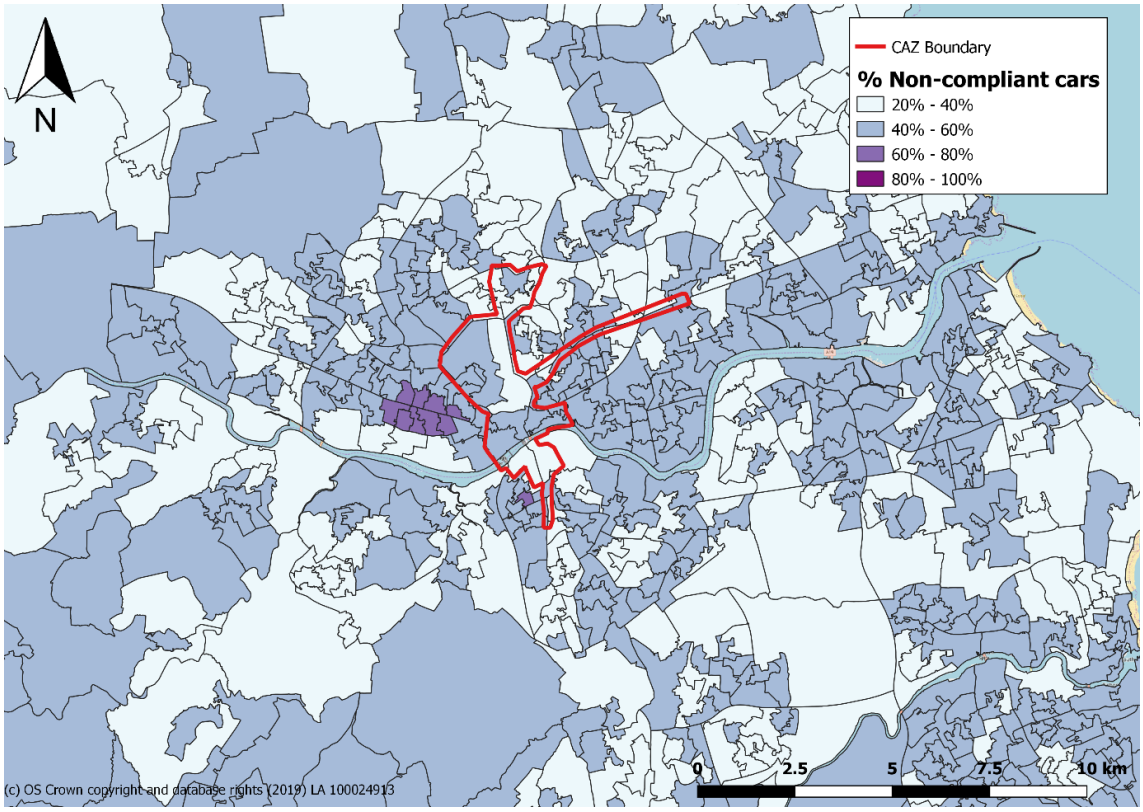


Figure 1-8– Non-compliant LGV ownership- Data source DVLA Data provided by JAQU, 2018

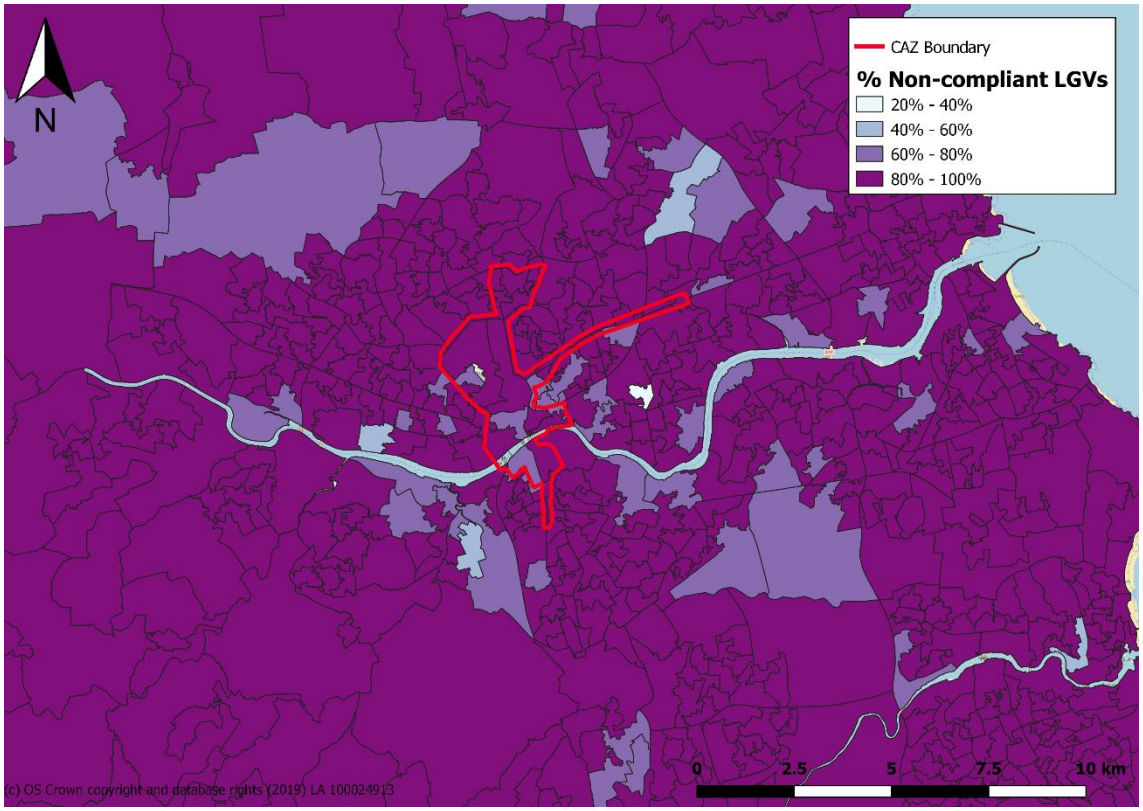
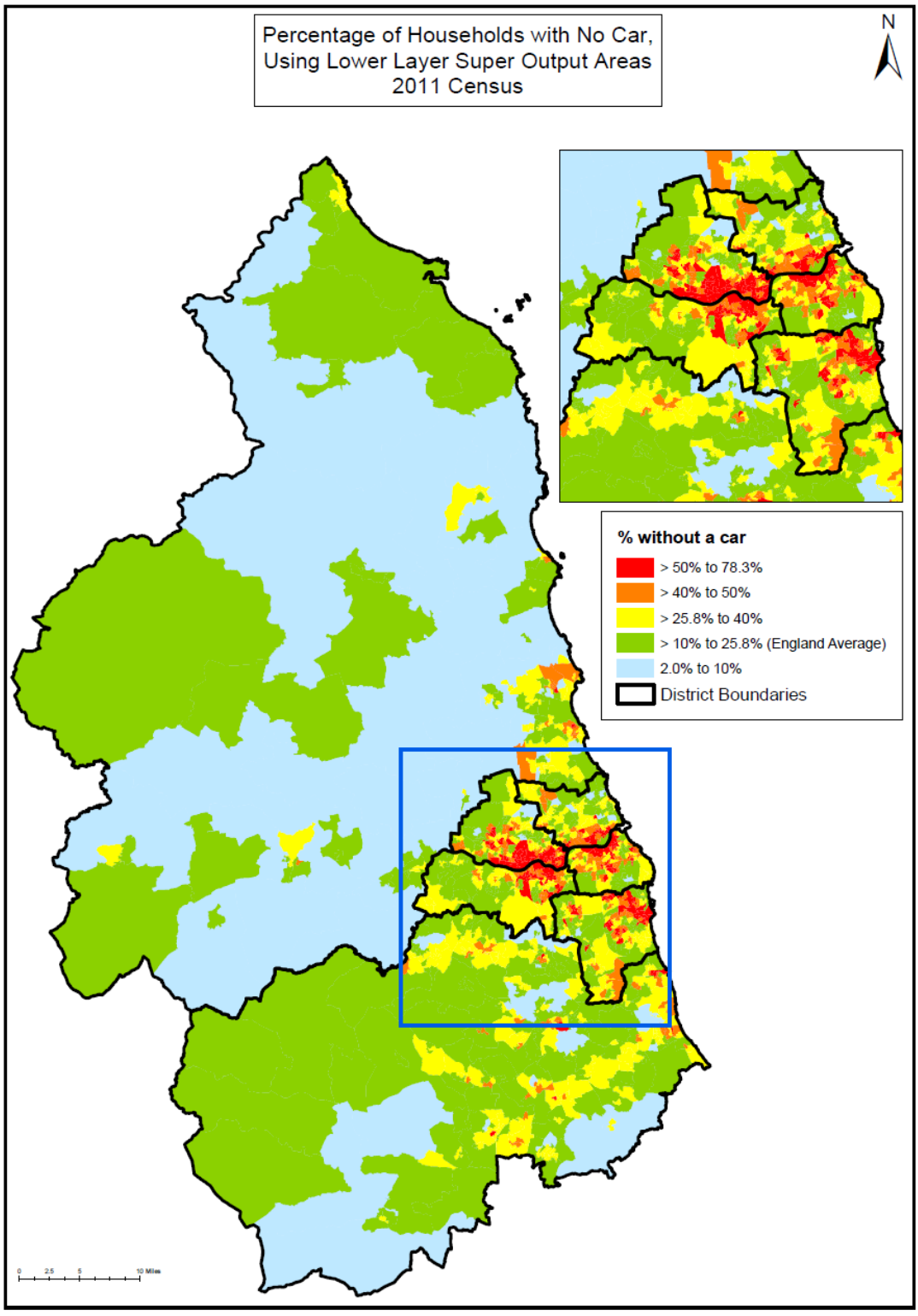


Figure 1-9– Household Car Ownership, by Lower Layer Super Output Area, 2011 Census



1.6.23 Freight

1.6.24 The road freight sector is important to the success of the regional economy but can create significant social and environmental impacts. Nationally, HGVs accounted for 17% of greenhouse gas and 21% of NO_2 emissions from road transport in 2014 while accounting for only 5% of vehicle miles. In the North East, 76 million tonnes of freight are lifted per year, with a further 5.3 million tonnes handled by North East ports.

1.6.25 The industry is currently heavily reliant on diesel vehicles and is yet to achieve widespread availability or take-up of electric or alternatively fuelled freight vehicles. In 2017 nationally 31% of LGVs were EURO6 and 55% of Rigid HGVs were Euro VI (National Atmospheric Emissions Inventory, 2018). Furthermore, there are significant challenges with retrofitting freight vehicles, due to the complexities of the processes involved.

1.6.26 Despite the high number of LGVs (relative to HGVs – 49.6 billion vehicle miles compared to 16.6 billion vehicle miles nationally), less is known about their activity patterns. It is known that the LGV fleet is slightly older than the HGV fleet[4] and has poorer emissions standards than the HGV fleet (Texaco, 2016; SSMT, 2016; Ricardo, 2017). Moreover, Euro VI standards for HGVs came in before those of LGVs (2013 as opposed to 2015) so a greater proportion of the HGV fleet is of the most recent standard.

1.6.27 There has been a significant recent growth in LGVs (4.5% 2016-2017 nationally and other years of growth before this). The HGV fleet reduced nationally by 0.8% from 2016-2017 but trends indicate growth in both vehicle categories although more rapidly for vans. Data at a local authority level is often not available for HGVs. However, data for the wider North East indicates that goods lifted increased from 57 million tonnes in 2013 to 76 million tonnes in 2016 (DfT, 2013:2016).

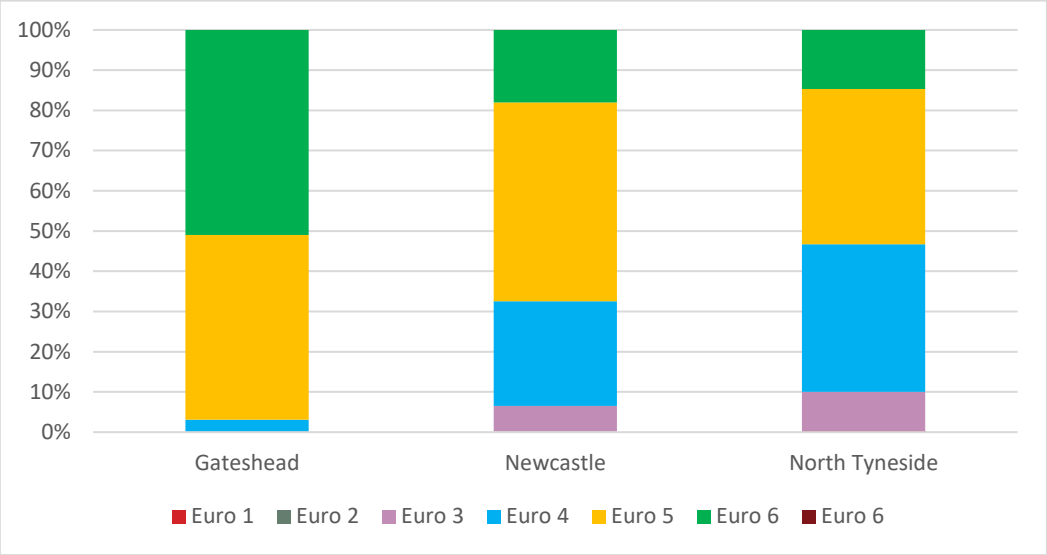
1.6.28 Taxis

1.6.29 Taxis (hackney carriages and private hire vehicles) provide flexible, on-demand transport, available at any time. As such, taxis make a vital contribution to the journeys made in Tyneside. Within the Tyneside Authorities, there are a total of 5,806 driver licences issued, including 3,891 in Newcastle (DfT, 2018). Typically, taxi journeys consist mostly of night-time journeys, and for a cross-section of the community (including elderly and disabled people) who value the door-to-door aspect of taxi travel, and anyone whose travel needs are not catered for by existing public transport (including rural communities). With the emerging popularity of app-based services (such as Uber) and other flexible taxi services, the role of taxis has broadened.

1.6.30 While accurate usage data is not easily available to help us understand taxi operations, Euro classification levels vary between authorities. In Gateshead, over 50% of taxis are Euro 6, as demonstrated in the figure below. The majority of, but not all, taxis are diesel vehicles. Given that the majority of Taxis in North Tyneside and Newcastle are not currently Euro 6, any form of Clean Air Zone would have significant impacts on the trade.

4 The average age of an HGV as 7.5 years, whilst the average age of a van in 2015 was 8.21 years.

Figure 1-10 Taxi classification by Euro Class for Tyneside Local Authorities (2018)



1.6.31 Encouraging the uptake of Euro 6 and low emission vehicles among drivers and operators can help to improve air quality given the high proportion of licenced diesel vehicles. Also, by the very nature of the service, each individual taxi vehicle undertakes multiple trips therefore there is likely to be better value-for-money and impact on air quality per taxi improvement than tackling individuals' private vehicles.

1.6.32 Current criteria for licensing taxis vary across the region and are not based upon emission standards but age and other criteria. Taxis across the region regularly cross from one authority to the next. For this reason, it is clear that we need to work with other Authorities to improve licensing and ensure a consistent approach regionally. This will improve the wider taxi fleet.

1.6.33 Metro

1.6.34 The Metro is one of the UK's busiest light rail systems outside London. It carries around 37 million passengers a year and is the backbone of the area's public transport network. The system covers 78km, is owned and managed by Nexus, and has 60 stations with peak time trains running up to every three minutes in the central Newcastle to Gateshead corridor. It is an integral part of the public transport system in Tyneside, including providing key interchange facilities to bus and heavy rail.

1.6.35 Since opening in 1980 it has been extended to Newcastle Airport (in 1991) and through Sunderland city centre to South Hylton (in 2002). A new fleet of trains, secured through funding in the 2017 Autumn Budget and currently being procured, is scheduled for introduction in 2021. In addition, through a Reinvigoration Programme we are undertaking major maintenance works on lines and stations to ensure added reliability on the network.

1.6.36 There is a Metro station within 800m of 350,000 individuals in Tyne and Wear. Passenger surveys (Nexus Business Intelligence patronage figures, adjusted for the frequency of Metro travel) suggest that approximately one quarter of the Tyne and Wear population use the Metro.

1.6.37 For many medium distance trips across Tyne and Wear, the Metro provides for a viable alternative to car travel. This illustrates its importance to ensuring the continued reduction in air quality exceedances at peak times and is a key reason why Metro and light rail will be at the heart of our Transforming Cities Fund bid.

1.6.38 The Newcastle to Gateshead 'corridor' has the most frequent Metro service and contains the busiest stations in the Metro system (Monument, Haymarket, Central Station and Gateshead). Being an electrified system, the Metro does not generate the same level of emissions as combustion engine road or rail transport and helps reduce commuter traffic.

1.6.39 Integration between the bus and Metro occurs at several key interchanges including Haymarket, Monument, Regent Centre, Four Lane Ends, Gateshead and Heworth. Transfare tickets exist which allow travel on bus and Metro.

1.6.40 Buses

1.6.41 In Tyne and Wear, in 2017/2018 there were approximately 119million bus passengers. The bus network is comprehensive and supports a high proportion of journeys. Tyne and Wear has the fourth highest usage of buses per capita outside London, and the highest of any of the Metropolitan areas with the average person taking 96 bus trips per annum. The network provides many high frequency corridors serving the full extents of the Travel to Work Area. The bus network complements the Metro system and major interchange facilities which further extend the reach of public transport throughout the area.

1.6.42 The bus also provides for a viable alternative to car travel for many medium distance trips across Tyne and Wear. This illustrates its importance to ensuring the continued improvement in air quality at peak times.

1.6.43 Operators have invested significantly in fleet upgrades over the past five years providing passengers with an improved experience. This has included significant investment in bus retrofit technologies, so that more buses are meeting the latest emissions standards.

1.6.44 Currently 18.6%, 15.4% and 9.1% of journeys undertaken in Newcastle, Gateshead and North Tyneside respectively are by bus. Bus patronage has declined by more than the national trend, despite investments made by operators (DfT, 2017). Nevertheless, in some areas of the region up to 50% of commuting trips are undertaken using public transport with 25% travelling by bus.

1.6.45 Increasing, or at least maintaining, the proportion of trips (particularly commuting and education based) using public transport reduces the number of single occupancy vehicles travelling along already congested transport corridors. Although we recognise that buses do contribute to poor air quality, the amount is less per person due to the larger number of passengers typically carried per vehicle, particularly in peak times when congestion and pollution is worse. Considerable progress has been made in improving the bus fleet with cleaner diesel buses and alternatives such as hybrids. Many local buses are also being retrofitted to reduce emissions to Euro VI standard following a successful application for funding from the Clean Bus Technology Fund. Use of buses also promotes active travel by walking or cycling to and from stops / interchanges or onward destinations, as recognised in *Door to Door: A strategy for improving sustainable transport integration*.

1.6.46 Walking and cycling

1.6.47 All three authorities (Gateshead, Newcastle and North Tyneside) have strategies to promote cycling. Newcastle is one of eight Cycling Ambition Cities in the UK and – through the second round of Cycle Ambition – showed how closely the authorities work together to plan transport by extending the funding for routes into Gateshead and North Tyneside.

1.6.48 Our shared aspiration is for cycling and walking to become the natural modes of choice for shorter journeys and to integrate with public transport options. To achieve this, investment in infrastructure is needed alongside revenue support to promote behaviour change. Each Authority is identifying a Local Walking and Cycling Infrastructure Plan which they are aspiring to deliver and will form part of our complementary bid to government from the Transforming Cities Fund.

1.6.49 There are potential benefits of increased walking and cycling such as improvements to air quality, benefits to mental health, physical health and supporting local economies. These benefits are illustrated by the £2.9bn that the DfT estimates was the gross cycling contribution to the UK economy in 2010 and the £128m active commuters have saved the economy per year in absenteeism.

1.6.50 While only 13% of commuting journeys are made by foot or cycle in the three authorities, Newcastle has the highest level of walking and cycling commuting in the region and the 2017 *Bike Life* survey revealed that 50% of households have access to a bike and 7% of people usually cycle to work.

1.6.51 Around a third of the population of Gateshead, Newcastle and North Tyneside live within 800 metres of a Metro Station (circa 225,000 people). Improving walking and cycling routes to Metro stations and improving the interchange experience is a clear opportunity for reducing vehicle borne trips and ensuring both active and sustainable modes of travel are embedded within people's door to door journeys with resultant improvements to air quality and health.

1.7 Air Quality in the Tyneside Area

1.7.1 Monitoring and Historic Trends (NO_2)

1.7.2 Since the mid to late 1990s, a combination of monitoring and modelling has been used to assess pollution levels across our area. This has included using a combination of automatic (continuous) and non-automatic (passive) monitoring for measuring nitrogen dioxide concentrations.

1.7.3 There are ten automatic monitoring sites, three in each authority with an additional Defra operated Automatic Urban Rural Network site (AURN) located close to Newcastle City Centre. All sites monitor NO_2 while eight of the sites also monitor particulate matter (PM). The authorities have worked with Newcastle Urban Observatory at Newcastle University to fit new automatic monitoring sites across the three authorities, to improve understanding of air quality.

1.7.4 Passive monitoring in the form of diffusion tubes is used widely to enhance our knowledge of local air quality. There are approximately 200 diffusion tubes deployed, the majority are in the AQMAs or close to busy roads near residential developments. These are calibrated by co-location with the real time monitoring devices.

1.7.5 It is important to note that local monitoring results do not always align with the modelled results from the PCM models or our own air quality model because of the inherent uncertainty in modelling processes and in input assumptions. The extent and scope of measured and predicted exceedances at links are formalised in the Target Determination report.

1.7.6 NO_2 trends for each local authority are as follows:

- In North Tyneside NO_2 monitoring has shown minor fluctuations up and down each year but no exceedances of the annual mean objectives have been reported and no AQMA declared. Equally there has not been any decrease in the NO_2 levels as any reductions in emissions have been offset by increased car usage.
- In Gateshead, air quality has been improving for around six years with no recorded breach of the NO_2 objectives. Given this trend, consideration had been given to the revoking of Gateshead AQMA in advance of the Secretary of State's July 2017 Direction being issued.
- In the Newcastle AQMAs the annual mean objective for NO_2 was exceeded, or ground level concentrations were within 10% of the objective value at most monitoring locations in 2017. Most monitoring locations in the Gosforth AQMA also recorded NO_2 concentrations in exceedance of or within 10% of the annual mean objective.

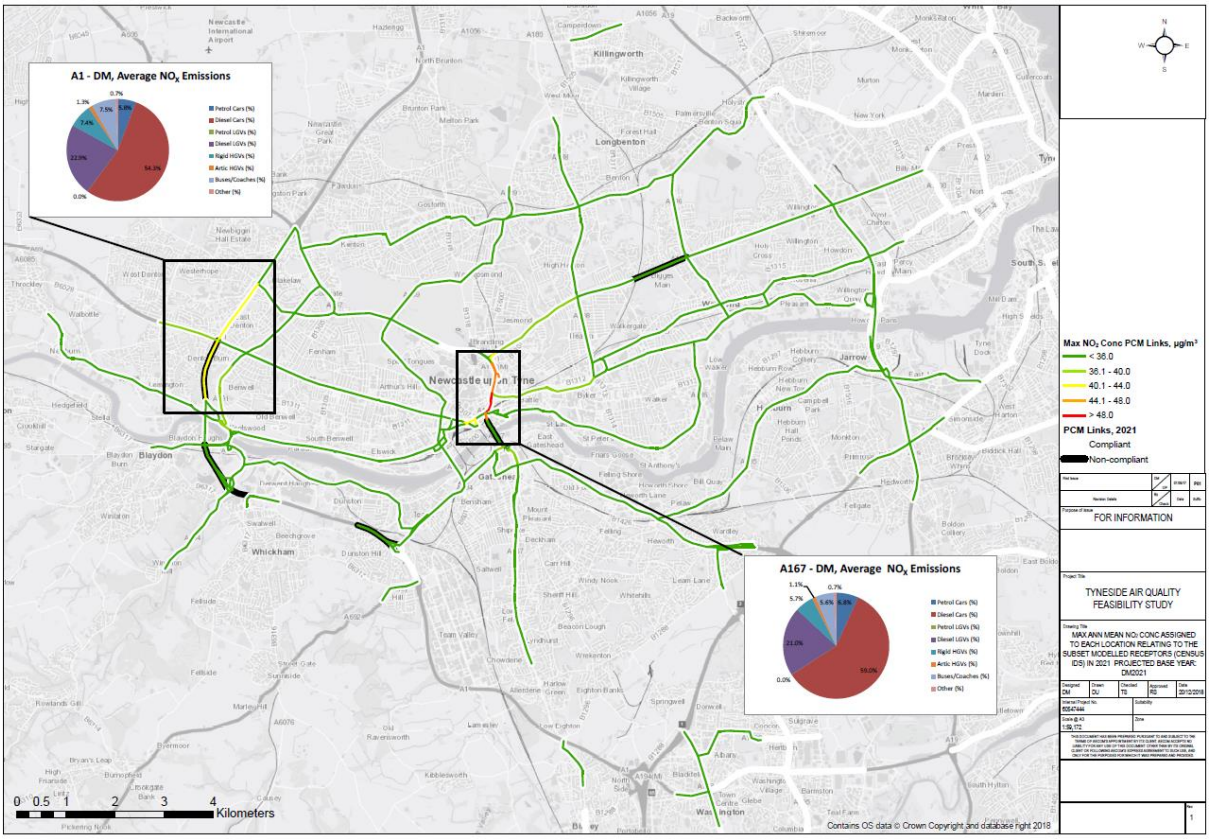
1.7.7 Model Results for Base Year 2017 and Projected Base 2021

1.7.8 Atmospheric dispersion modelling was undertaken to assess the air quality in the projected base year 'Do Nothing' (2021) on the principal roads in the study area. This was used to inform Target Determination, which is detailed in the 'Target Determination Outputs' report submitted to Government and summarised in the figure below. The links marked with a black outline are those that were identified as non-compliant in the PCM modelling.

1.7.9 Based on the local model results, there are predicted to be exceedances of the annual mean limit value in the Base Year 2017 scenario adjacent to the PCM road network, in addition to the Projected Base Year 2021 scenario.

1.7.10 The locations of highest NO_2 concentration assigned to the road links differ at a number of locations in 2021 relative to 2017, due to changes in the traffic flow projections. The Predicted Base Year 2021 highest exceedance is 48.3 µg/m^3 on A167(M).

Figure 1-11 2021 Do Minimum Areas of Exceedance



1.7.11 Source Apportionment

1.7.12 To solve the air quality problem, the Tyneside Authorities had to identify the extent to which different key sources contribute to the air quality exceedances that have been identified, i.e. by means of baseline 'source apportionment'. This will assist authorities to correctly target the most important sources.

1.7.13 Measured annual mean NO_2 concentrations were source apportioned making use of guidance set out in Defra's Technical Guidance (TG16, Box 7.5), and Defra background maps were used to apportion the local (road) contribution from the total annual mean NO_2 concentrations (Defra, 2015).

1.7.14 Road transport is the main contributor of emissions of NOx at roadside locations and is therefore the primary reason for exceedances of annual mean NO_2. Around a third of the UK NOx emissions in 2015 arose from road transport, most of which came from diesel vehicles (NAEI, 2017). Some disparities exist due to the increase in the proportion of NOx

emitted directly as NO_2 (also known as primary NO_2) from the exhausts of modern diesel vehicles, because of emission control systems that aim to reduce total NOx and particulate matter emissions.

1.7.15 In the Do Minimum model for 2021, the majority of the contribution on the A1 and A167 is from diesel cars (54% on the A1 and 59% on the A167). A further significant contributor are Diesel LGVs (23% on the A1, 21% on the A167).

1.7.16 No other major sources of roadside NO_x (e.g. from energy production, domestic combustion or other industrial processes) have been identified within Tyne and Wear, and other sources of NO_x are included in the background concentrations

1.8 Options Development

1.8.1 Critical success factors

1.8.2 Tyneside Authorities have identified a set of Critical Success Factors (CSFs), against which the short-listed options were assessed.

1.8.3 The primary CSF, which has been identified by JAQU, is **to deliver a package of options that leads to compliance with NO_2 limit values[5] in the shortest possible time.**

1.8.4 The primary CSF is the critical measure of success for the potential schemes outlined, and acts as a gateway for options to be considered against other CSFs. As well as the primary CSF, there are a number of strategic considerations to be accounted for when appraising each scheme:

- Value for money;
- Distributional impacts;
- Strategic and wider air quality fit;
- Supply side capacity and capability;
- Affordability; and
- Achievability.

1.8.5 Defining a long list of options

1.8.6 A long list of options were generated within the Strategic Outline Case, identifying a range of options that meet the spending objectives, potential scope and benefits criteria, whilst also considering associated strengths, weaknesses, opportunities and threats.

1.8.7 Measures within the long list were allocated thematically in order to ensure simplicity for the early stage of the option development phase. Further considerations were accounted for during the development of the CAZ options, these are discussed in more detail below. These relate to technical and operational considerations, specifically relating to Clean Air Zones:

5 The NO2 annual value may not exceed 40 micrograms per cubic metre as defined in the air quality directive (2008/EC/50) and as reported in Air Pollution in the UK report (JAQU, 2017).

Table 1-5 Detailed considerations within Option Development

CONSIDERATIONS	KEY POINTS
Scope	The extent to which the CAZ extends – what is the most appropriate geographical area to address CSFs and objectives; Which vehicle class should the CAZ apply to? Can grant schemes speed up fleet turnover, encouraging more sustainable vehicles on the road?
Service Solution	This is the technical means of delivering the appropriate solution for air quality problems – this includes aspects such as complexity of delivery, enforcement or effectiveness of option
Service Delivery	Will the project be delivered internally or externally? Are there sufficient resources available for the delivery, or will technical expertise be required?
Service Funding	The Financial Case within the OBC considers the financial requirement to support the potential schemes. Identification of primary and secondary funding outlined.

1.8.8 As well as the CSFs, the following key strategic issues were considered when sifting the long list of options:

- Will the option provide the opportunity to improve health, reduce levels of obesity among the population or improve road safety within the area?
- Will the option contribute to the creation of new jobs and retention of existing jobs?
- Will the option provide sustainable access solutions to existing and growing development corridors or centres, or support housing growth?
- Will the option ensure capacity and speed of transport links to and within the Tyneside Authorities are maintained and enhanced to increase the attractiveness of the area as a place to do business, boosting inward investment and improving competitiveness of indigenous firms?
- Will the option deliver improved accessibility from residential areas to areas that have employment, education or other opportunities?
- Will the option result in an adverse air pollution impact in an alternative location?

1.8.9 The long list of options was developed in the SOC and subsequently updated as OBC development work progressed. Measures included within the long list of options have been summarised on a thematic basis below:

Table 1-6 Long List of Options Summary

OVERARCHING THEME	KEY POINTS
Enabling the Efficient Flow of Traffic through Links	Reducing congestion / vehicle flow through access restrictions
	Optimising traffic management on key corridors / enabling efficient flow of traffic through key links
	Road space reallocation and to enable the efficient flow of traffic through key links
	Major infrastructure investment
	Speed management
	No idling zones
	Improvements to Signals
Improving the emissions standards of private, passenger and commercial vehicles	Charging restrictions
	Retrofit
	Freight
	Locally-specific abatement
	Fuelling network
Encouraging more people to walk, cycle and use public transport as part of their regular journeys	Increased accessibility of bikes to the public
	Improving cycle and walking routes
	Influencing behaviour change
	Improvements to provision, capacity or reliability of Public Transport
	Improvements to affordability of public transport
	Upgrades / new public transport infrastructure
	Parking Policy
	School Policy
	Non-road transport

1.8.10 The sifting process

1.8.11 The long list developed as part of the Strategic Outline Case provided the initial set of options to evaluate. Additional options were identified by the project delivery team and through engagement with key stakeholders.

1.8.12 To sift the options based on their ability to meet the CSFs, a scoring mechanism was used. Table 1-7 Scoring Matrix summarises the scoring system used.

1.8.13 From the initial sift within the SOC, a shortlist of better performing measures was established for further development.

1.8.14 One of the key constraints was the central Government requirement for delivery and effectiveness by the end of 2020. Many measures which may have had a more beneficial longer-term impact were not eligible for inclusion within the package of options due to not meeting this requirement.

Table 1-7 Scoring Matrix

Score	Description
✓✓	Excellent
✓	Good
-	Satisfactory / no change
X	Bad

1.8.15 Short List of Options

1.8.16 The long list of options identified in the SOC were re-assessed as part of the OBC to ensure that schemes were focussed on delivering successful outcomes within the timeframe set for compliance. This entailed a re-appraisal of the long list and a further shortlisting of options. This included a multi criteria assessment considering likely impacts on traffic, implementation timetables, key risks and legal implications, as well as high level cost estimates. Additionally, impacts on NOx emissions were estimated to provide an early indication of the likely performance of the measure against the Critical Success Factors.

1.8.17 Logic mapping was undertaken for each of the options, considering context, inputs, outputs, outcomes and impacts. Some analysis included quantitative assessment and where information was unavailable, a qualitative assessment was undertaken. Several options were subsequently discounted due to their limited impact in meeting the CSFs.

1.8.18 Taking account of the different levels of available information, their reliability, and the requirements to differentiate between charging only scenarios and combined scenarios, the following scenarios have been quantitatively appraised in this OBC.

- Do Minimum;
- Charge CAZ B;
- Charge CAZ C; and

- Charge CAZ D.

1.8.19 These options are listed in Table 1-8 Do Something scenarios A list of potential complementary measures is also provided. It is expected that any package of options will also include complementary mitigation measures. Specification of the required complementary measures is still under consideration due to the complexities of the impacts and deliverability of each option . This will further be informed as a result of responses from the consultation exercise which it is anticipated will be undertaken. As a result, there are a number of matters that will be tested subsequently to this Report. Examples of potential mitigation measures are shown also shown in Table 1-8.

Table 1-8 Do Something scenarios

OPTION	DETAILS
Inner CAZ B plus complementary mitigation	Introduced in 2021 CAZ applies to HGVs, taxis, coaches and buses 100% taxi compliance assumed
Inner CAZ C plus complementary mitigation	Introduced in 2021 CAZ applies to LGVs, HGVs, taxis, coaches and buses 100% taxi compliance assumed
Inner CAZ D plus complementary mitigation	Introduced in 2021 CAZ applies to Cars, LGVs, HGVs, taxis, coaches and buses 100% taxi compliance assumed
Complementary measures	Access restrictions Grants to upgrade affected vehicles to ensure EURO6 Public behaviour change campaign including business engagement and home working policies (including within the Councils) Personal mobility scheme Local abatement measures to extract harmful pollutants Relevant investment in walking and cycling

1.8.20 CAZ extents

1.8.21 Two geographic boundaries were considered for the CAZ options, an inner and an outer. The figure below is a map of the CAZ areas.

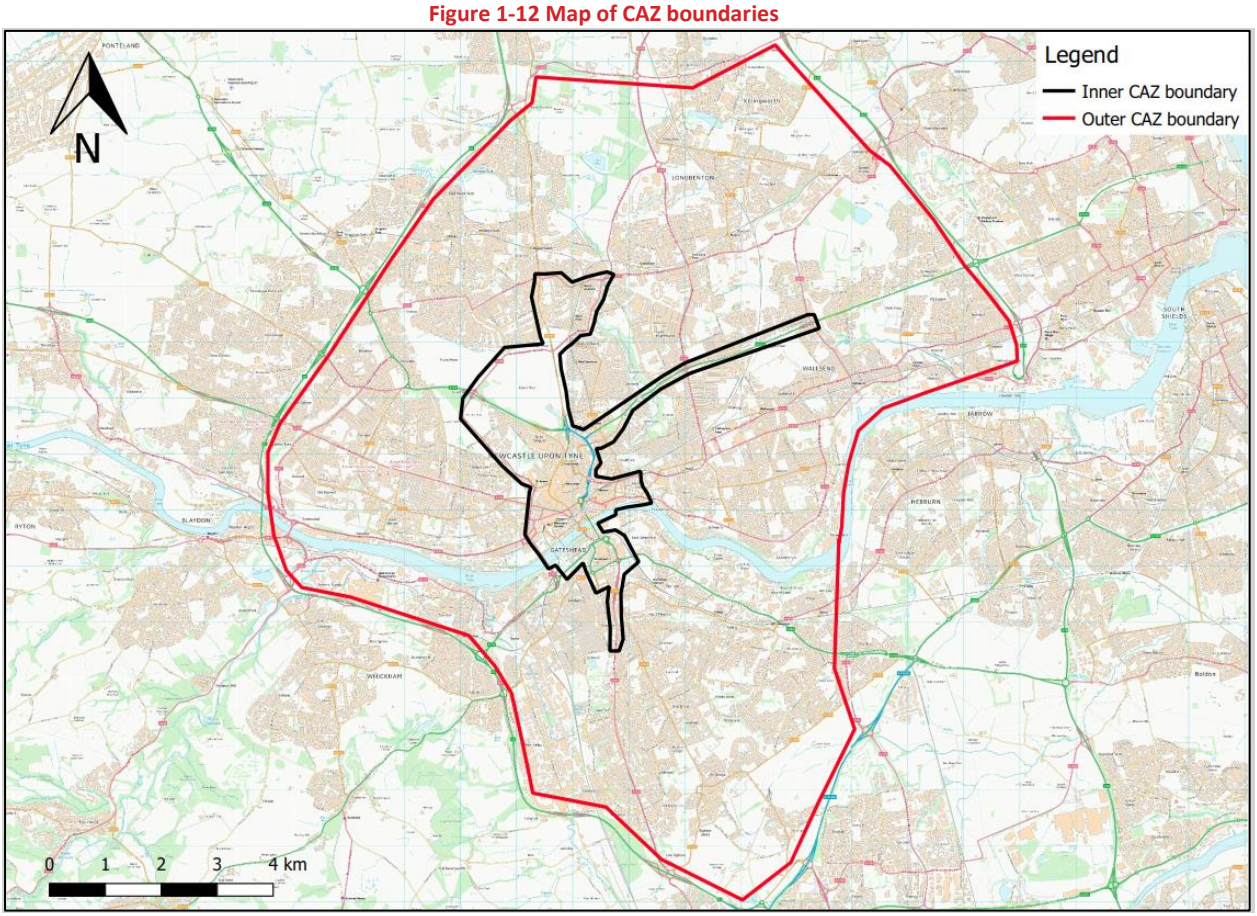
1.8.22 The geographic extent (scope) of the charging zones was based on the initial set of maps provided by JAQU on the extent exceedance links, existing AQMAs, and local knowledge of likely traffic routing and rerouting given the time constraints on this work. This was prior to reaching agreement with JAQU on the Target Determination datasets, achieved in November 2018, and prior to the testing of the Do Minimum scenario.

1.8.23 The inner CAZ covers Newcastle City Centre and Gateshead town centre, extending along Durham Road (the A167). It is bounded by the A167(M), Queen Victoria Road, St James' Boulevard, Redheugh Bridge, Askew Road and Tyne Bridge.

1.8.24 The outer CAZ is bounded by the A1(M), A1056, A19 and A194(M). This option was discounted following target determination in November 2018 and after initial transport model runs suggested transport impacts that were unlikely to lead to air quality compliance.

1.8.25 For the purpose of this report, all test CAZ scenarios cover the inner CAZ boundary.

Figure 1-12 Map of CAZ boundaries



1.9 Option Testing

1.9.1 Do Minimum Scenario

1.9.2 To provide a comparison for the assessment, a 'Do Minimum' scenario has been defined, which consists of schemes within the Early Measures Fund and Clean Bus Technology Fund projects, and other committed and/or fully funded schemes, such as road schemes and junction improvements. Each of the Do Something scenarios have been compared with the Do Minimum to ascertain their performance in relation to the Critical and Secondary Success Factors. Table 8 provides the assumptions included in the Do Minimum Scenario.

Table 1-9 Do Minimum Scenario

OPTION NAME	DESCRIPTION
Do Minimum	Public transport upgrade of buses to Euro6 (+) (retrofit/new) Urban Traffic Management Control on selected corridors

OPTION NAME	DESCRIPTION
	Expansion of Tyne and Wear UTMC Walking & cycling corridors Car park management information ANPR Planned Road Schemes Housing Infrastructure Fund junctions Fully integrated PT ticketing (multi-modal)

1.9.3 Do Something Scenarios

1.9.4 Three packages of measures have been identified for modelling alongside the reference case:

- Charging Clean Air Zone Class B – a Class B charge on the inner zone as illustrated above
- Charging Clean Air Zone Class C – Class C charge on the inner zone as illustrated above
- Charging Clean Air Zone Class D – Class D charge on the inner zone as illustrated above

1.10 Traffic modelling approach

1.10.1 Due to the time constraint resulting from the timescale for response required by the July 2017 Direction, the methodology used has recognised limitations. However, work is ongoing to improve the tools available to assist subsequent stages of reporting and decision making, not least the construction of a new multimodal transport model. The overall methodology was agreed with JAQU.

1.10.2 Existing transport modelling tools were used to appraise the impacts of proposed transport measures to improve air quality. Outputs from the transport modelling were used to inform air quality modelling and appraisal.

1.10.3 The Highways England North Regional Transport Model (NRTM) was used and a number of updates have been carried out on the model to improve its suitability for use in the air quality study. The calibration and validation of the model has been updated to better represent travel patterns in the urban area.

1.10.4 A model suitable for testing a CAZ and other similar measures ideally needs to have the following functionality in terms of trip response to NO_2 problem areas:

- Avoid Zone – this is evident within all assignment modelling based on suppression / distribution responses within a Variable Demand Model
- Pay Charge – assignment of user classes in relation to time, distance and monetary charges for through travel
- Upgrade vehicle – avoiding zonal and routing penalties. This response is not available in current demand modelling and requires external car ownership manipulation. Assumptions about fleet upgrade were assigned based on the change-response assumptions set out in JAQU Options Appraisal guidance.

1.10.5 Forecasting has been undertaken for 2021, which is assumed to be the earliest year that compliance will be achieved. Forecasting for 2026 has also been undertaken to help inform

the appraisal of the measures. Due to the time constraints associated with achieving compliance with the timescales required by the July 2017 Direction and due to resource constraints, no intermediate years between the base year and 2021 have been modelled.

1.10.6 Future traffic growth has been constrained to national (DfT national model and trip forecast) targets. This uses TEMPro (a national model to predict trips) 7.2 and Road Traffic Forecasts 18. Further detail on the traffic forecasting process is outlined in the report *T4_Tyneside_Traffic Forecasting Report*.

1.10.7 Forecasts of the change in compliant and non-compliant vehicles have been calculated using Defra's Emissions Forecasting Toolkit and the 2017 local vehicle information that was collected and processed by the DVLA. The 2021 compliant and non-compliant splits are shown in the table below for each user class in the transport model.

1.10.8 We have engaged in dialogue with JAQU regarding the accuracy of future years in the Emissions Factor Toolkit and will reflect this in the Full Business Case and will further strengthen our appraisal to incorporate sensitivity testing more closely tied to recent diesel sales trends.

Table 1-10 2021 Compliant and Non-Compliant Split for Tyneside Vehicle Classification

	% NON-COMPLIANT	% COMPLIANT
Buses and coaches	46%	54%
Goods –Heavy	28%	72%
Goods –Light	40%	60%
Cars (including Taxis)	22%	78%

1.11 Air Quality Modelling Approach

1.11.1 The transport modelling outputs were input into the CERC's ADMS-Roads v4.1.1 dispersion model. The model simulates the dispersion of vehicle emissions of NO_x from road links included in the model domain. Annual mean NO_2 concentrations were subsequently derived at identified receptor locations through utilising the outputs of the model (road-NO_x) in combination with tools published by Defra.

1.11.2 Further detail on the air quality modelling process and results are outlined in the reports submitted to government, AQ2_*Tyneside_Air Quality Modelling Method* and AQ3_*Tyneside_Local Plan Air Quality Modelling*.

1.12 Results

1.12.1 Our modelling shows that on our local roads, with **only our committed investment (Do Minimum)** the Central Motorway, approach to the Coast Road, approach to Tyne Bridge and roads approaching Central Station would be above the NO_2 limit values in 2021.

1.12.2 Our modelling shows that on our local roads, with a **CAZ B (Buses, Coaches, Taxis and HGVs)**: the Central Motorway, approach to Tyne Bridge and roads approaching Central Station would be above the NO_2 limit values in 2021

1.12.3 Our modelling shows that on our local roads, with a **CAZ C (Buses, Coaches, Taxis, HGVs and LGVs)**: the Central Motorway, approach to Tyne Bridge and roads approaching Central Station would be above the NO_2 limit values in 2021.

1.12.4 Our modelling shows that on our local roads, with a **CAZ D (Buses, Coaches, Taxis, HGVs, LGVs and private cars)**: the Central Motorway and roads approaching Central Station (A186) would remain above the NO_2 limit values in 2021. Our transport modelling also indicates very significant re-routing onto (particularly) the A1 and A19 as well as some local roads.

1.12.5 Based on these model results, we currently believe that no form of charging CAZ in isolation, as tested in the current model, ensures compliance on the Central Motorway or approach to Central Station in Newcastle by 2021.

1.12.6 Our work also shows, however, the positive position that, even without further action beyond committed spending, no local roads in Gateshead or North Tyneside are in exceedance in 2021.

1.12.7 Even with a Class D CAZ, there remain exceedances in Newcastle City Centre (particularly on Percy Street). This is due to the constrained traffic flow in the area and the fact this road handles through traffic as well as access for bus stations, car parks, click and collect and freight delivery locations.

1.12.8 Our modelling also shows that the Class D Charging CAZ would reduce overall traffic on the Central Motorway by 9%, and non-compliant traffic by 70%.

1.12.9 Given that a charge CAZ will not ensure air quality compliance by 2021, further work was undertaken in January 2019 to identify additional appropriate measures and review the best way forward with government and local stakeholders.

1.12.10 These discussions concluded that further assessment of additional options were required. Options which have been explored further are:

- Access restrictions on to the A167(M);
- Low Emission Zone to ensure a minimum emissions standard (EURO VI/6) (and therefore 100% compliance) for buses, HGVs and taxis in Newcastle city centre;
- Tolls on the city centre bridges (Tyne, Redheugh, Swing). The modelling does not assume that tolls would be based on emission standards but would charge HGVs and LGVs more than private cars.; and
- A ban on use of the Central Motorway East and Tyne Bridge between the Coast Road junction and Gateshead in peak hours for HGV & LGVs.

1.12.11 Our early modelling results indicate that these options merit further examination, given that they appear to have traffic impacts which would improve Air Quality and mitigate impacts highlighted in our Integrated Impact Assessment.

Correspondingly, we intend to develop these through our consultation process and further transport, economic and air quality modelling.

Figure 1-14 Do Minimum Results

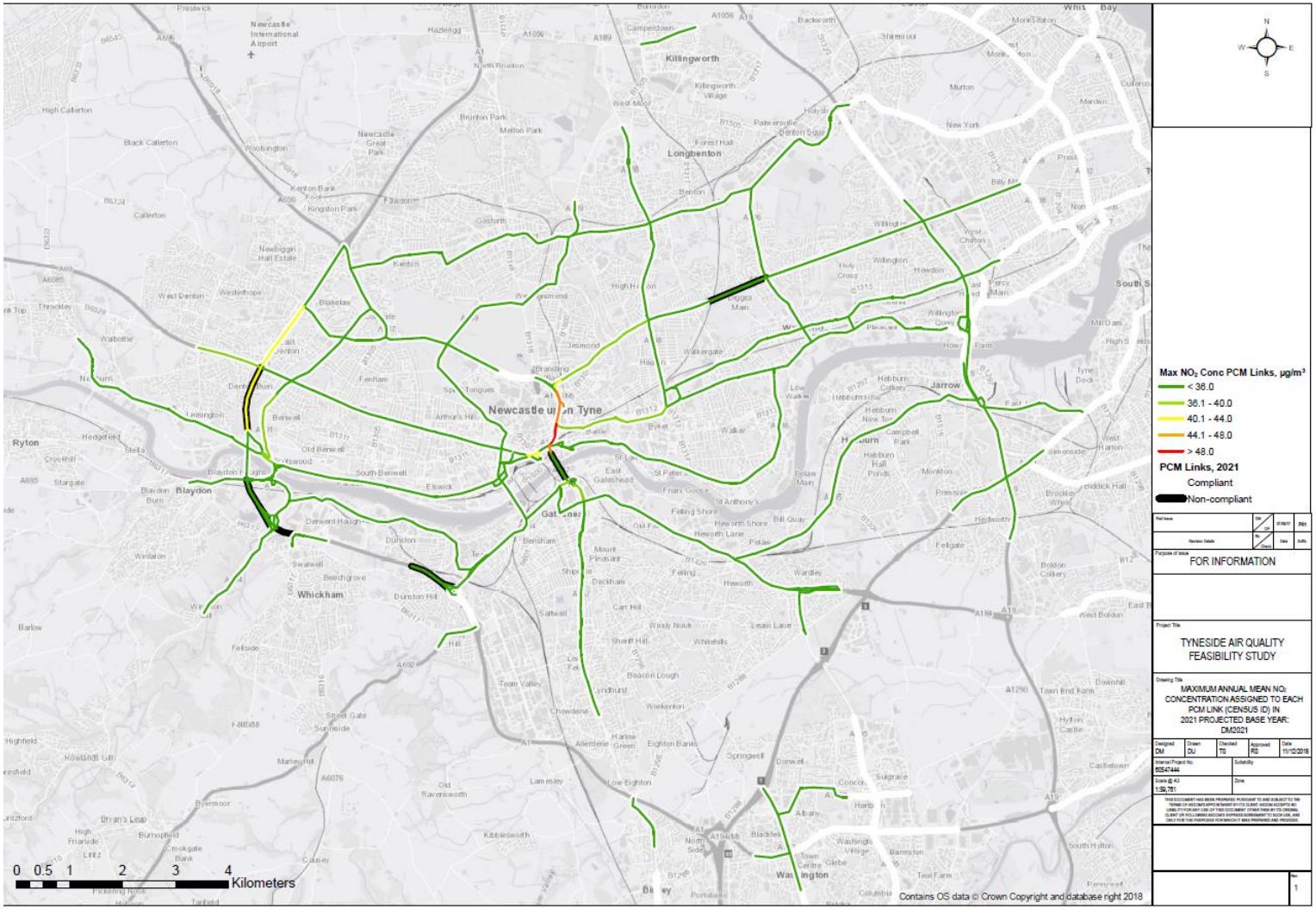


Figure 1-15 CAZ B Results

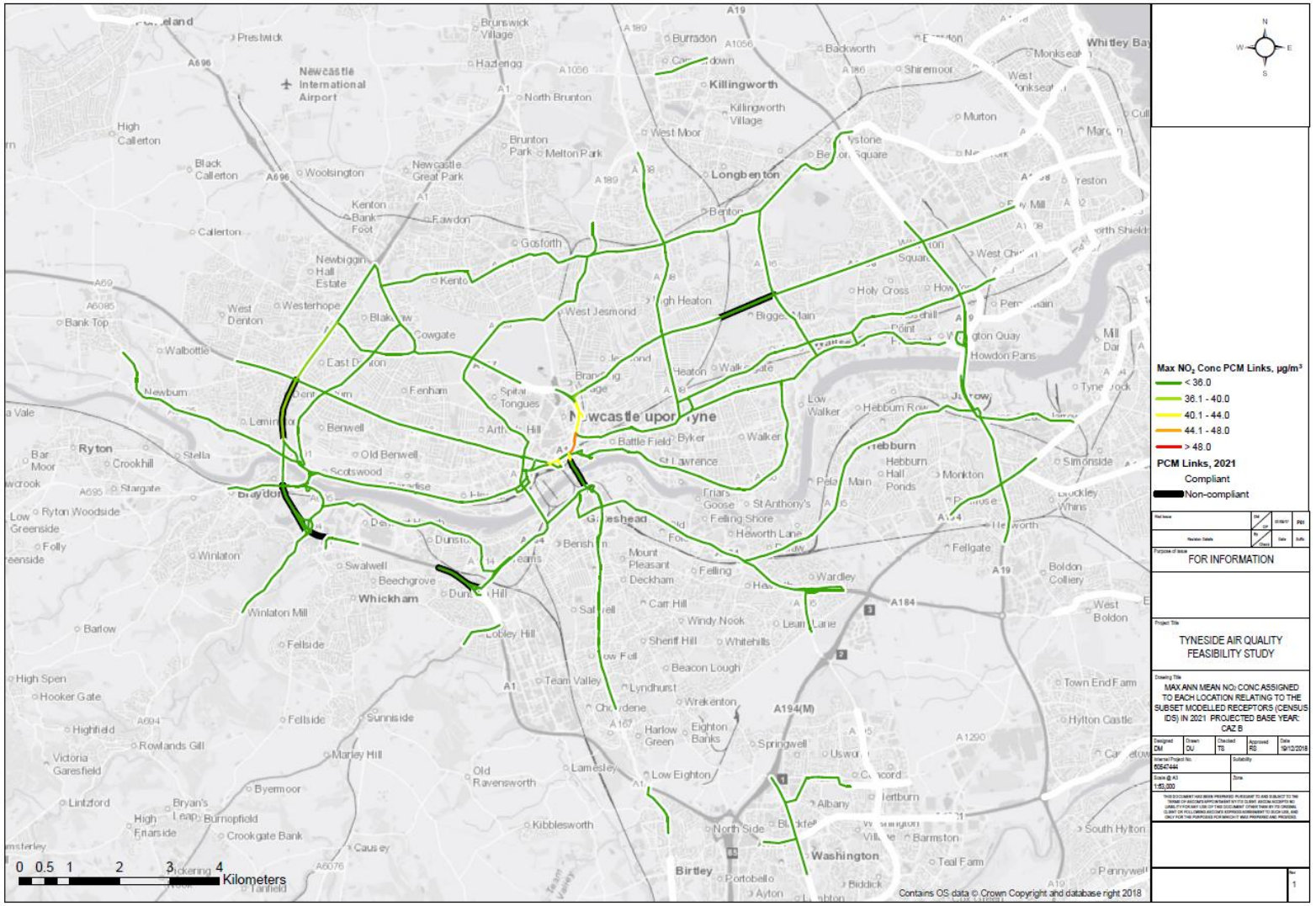


Figure 1-16 CAZ C Results

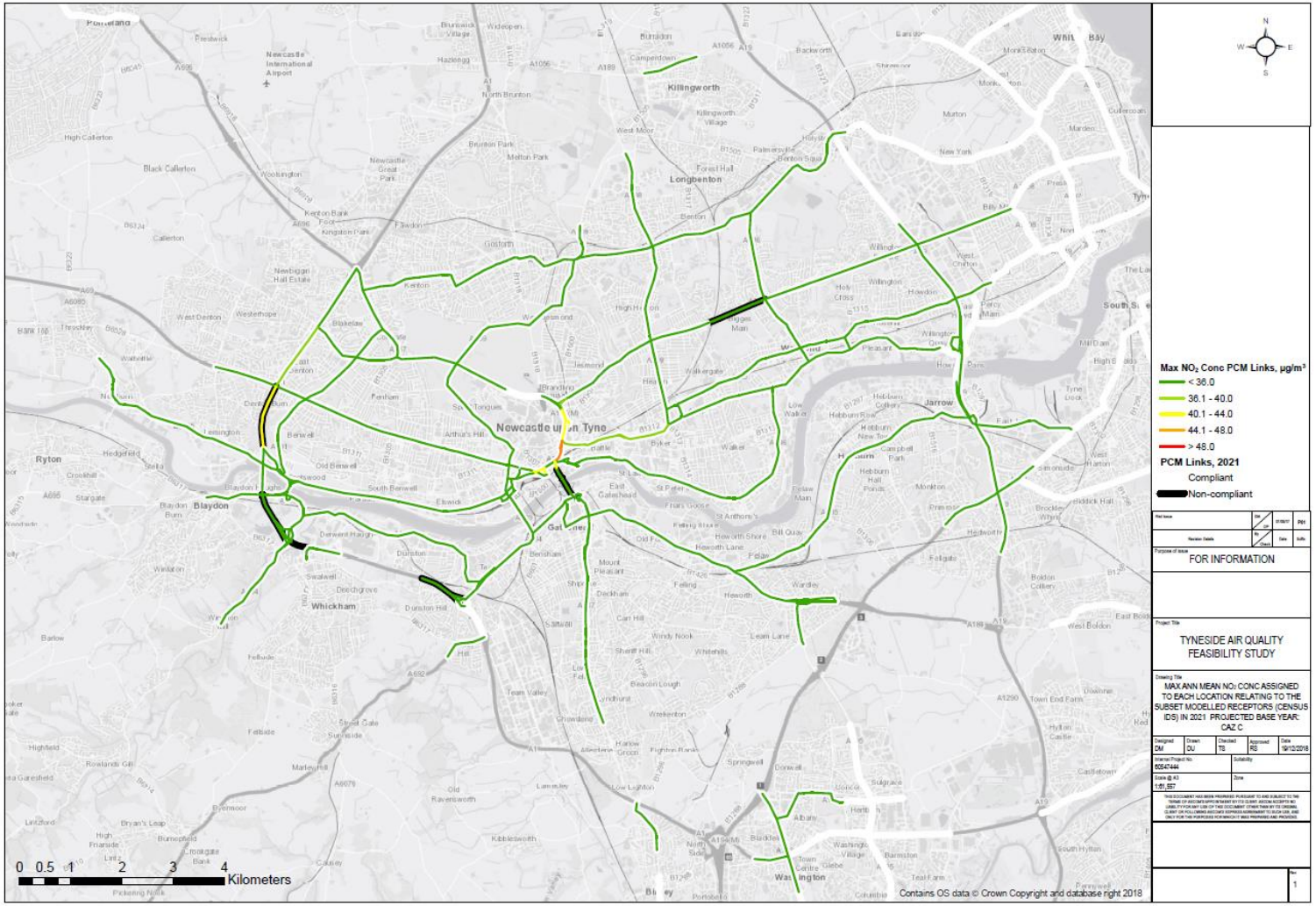
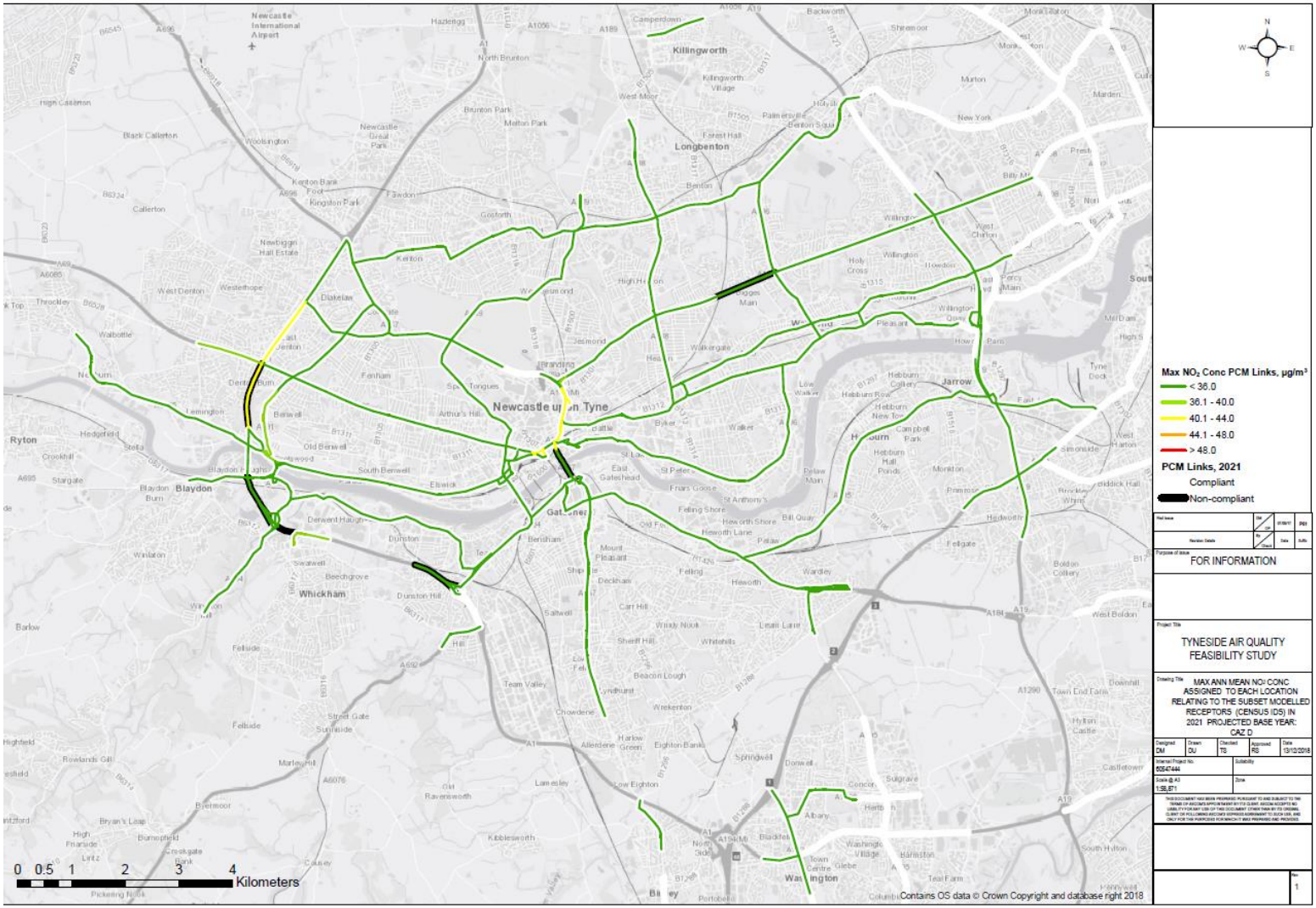


Figure 1-17 CAZ D Results



1.13 Results Analysis – Air Quality

1.13.1 The results indicate, as noted elsewhere, that no charging Clean Air Zone alone would lead to compliance on NO_2 as defined by EU limits by 2021.

1.13.2 All the options, including the Do Minimum, do not show exceedances of PM_{10} or $PM_{2.5}$ at current legal limit values.

1.13.3 For CAZ D, there is rerouting onto the A1, which lowers air quality. This is due to people rerouting to avoid any potential charging zone and causing greater congestion. There are further elements of rerouting onto the A19 and other local roads.

1.13.4 Where there is rerouting away from the CAZ area, additional capacity is created on the roads. This capacity is often filled by additional compliant vehicles, which may still emit significant amounts of Nitrogen Dioxide. For example, a EURO VI HGV at low speeds will emit greater amounts of NO_2 than a EURO 5 diesel car. This means that rerouting does not always bring dramatic improvements in Air Quality.

1.13.5 As noted, there are a number of links which are not on the government's PCM network, but where Authorities wish to improve air quality. This includes a number of roads within AQMAs and near other sensitive receptors. Increasingly restrictive CAZs tend to have positive effects on these receptors. For example, the Leazes Lane/Percy Street junction is estimated to be at 41_{ug} of NO_2 under a 2021 Do Minimum and 34.9 under a CAZ D. However, even with a CAZ D, there remain exceedances off the PCM network.

1.14 Results Analysis – Transport

1.14.1 As noted within the Economic Case, each CAZ option has a negative Net Present Value.

1.14.2 Much of this is due to the rerouting of trips, changes to traffic flow and the costs of vehicles upgrading. The extent of rerouting is very significant given the size of the CAZ area and leads to significant changes in Indirect Tax impact.

1.14.3 There are significant shifts in through-traffic away from the Tyne Bridge, Gateshead Town Centre and central Newcastle in a CAZ D, and smaller effects for other CAZ classes. Correspondingly, the results indicate that there are overall journey time benefits for compliant vehicles (as there is less traffic congestion within the CAZ area). This aligns with the comment in 1.13.4.

1.14.4 Typically, there is rerouting onto the A1 and A19, as these are more strategic roads with available capacity.

1.14.5 Due to the current version of the transport model used, it is considered that public transport demand response is not captured to its fullest extent. Future updates to the model will improve this level of response.

1.15 Integrated Impact Assessment

1.15.1 We commissioned an Integrated Impact Assessment on the charging Clean Air Zone options, due to concerns regarding the impact which these may have on protected groups and any other vulnerable communities.

1.15.2 Some of the high-level results from this are illustrated below. Key findings include:

- Greater proportions of cars in the most deprived quintiles are non-compliant. However, due to differences in levels of car ownership and trip-making, the number of trips made into the CAZ zone is highest by the least deprived quintiles
- Under all CAZ Scenarios, all income quintiles (as classed by IMD), will see an improvement in Air Quality (Nitrogen Dioxide). For a CAZ D, those who are less deprived and areas with fewer children benefit more
- The rerouting away from the CAZ by non-compliant vehicles, most severely in a CAZ D, means that some areas outside the zone experience increases in NO_2. This includes areas which currently experience significant deprivation
- A CAZ has significant household (D) and business affordability (B, C, D) impacts, with indirect regressive costs.
- Potential road safety impacts in more deprived areas – adding traffic into areas which already experience more collisions
- There will be particular challenges faced by public transport operators (B, C, D), small businesses (C, D), taxi firms (B, C, D) and those who operate light (C, D) and heavy (B, C, D) goods vehicles in a CAZ.
- Groups such as the elderly, disabled, pregnant and others may be negatively affected by potential changes in bus and taxi services
- For a CAZ D, there are both beneficiaries and those who experience poorer health impacts due to air pollution, traffic and noise, alongside mental health

1.15.3 These impacts are those experienced without mitigation. Correspondingly, we have developed a comprehensive mitigation package which seeks to reduce any negative impacts and is outlined in the following section.

Figure 1-18 All CAZ Results – Changes in NO_2 Concentration (Map)

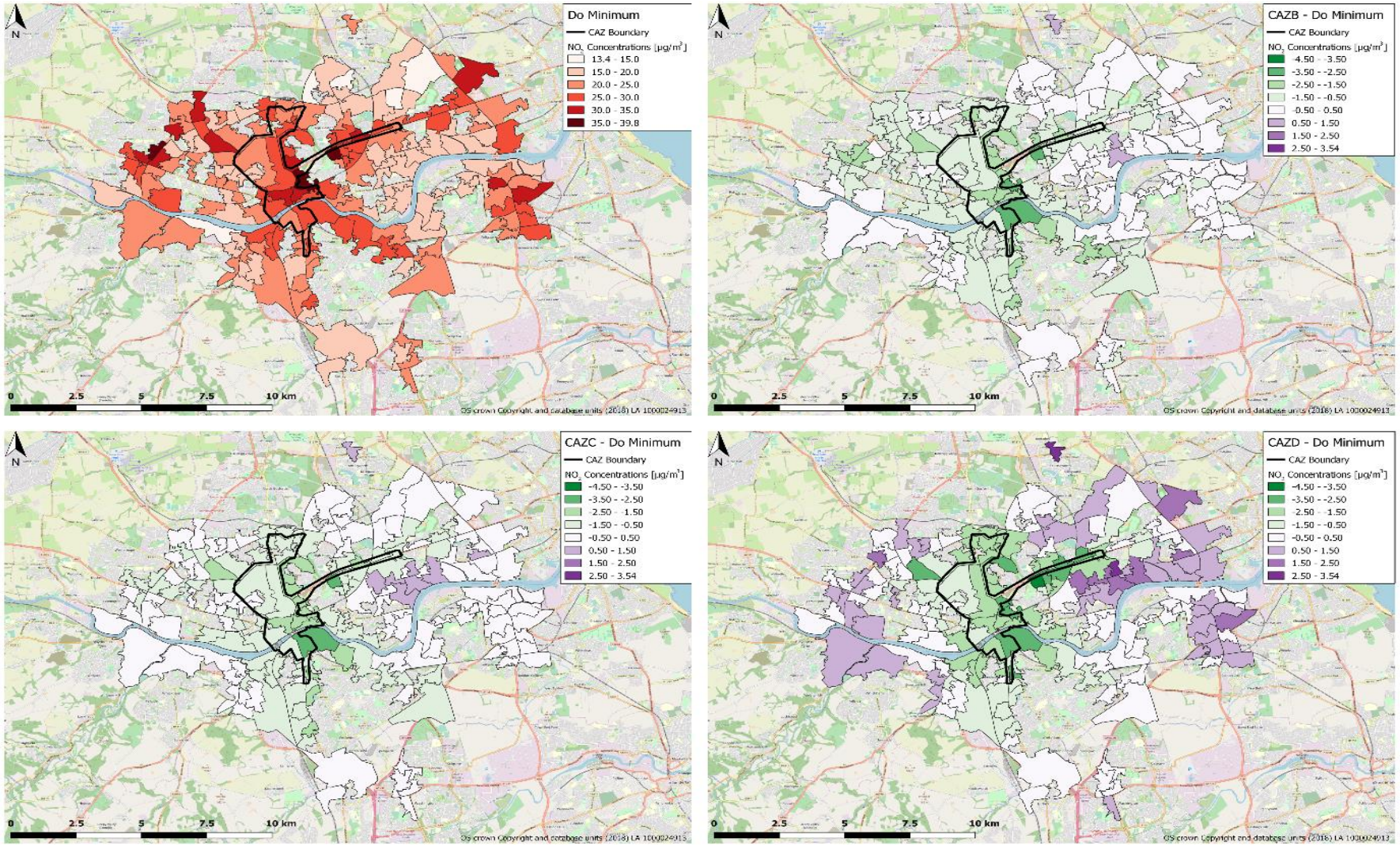


Figure 1-19 All CAZ Results – Changes in NO_2 Concentration (graphical)

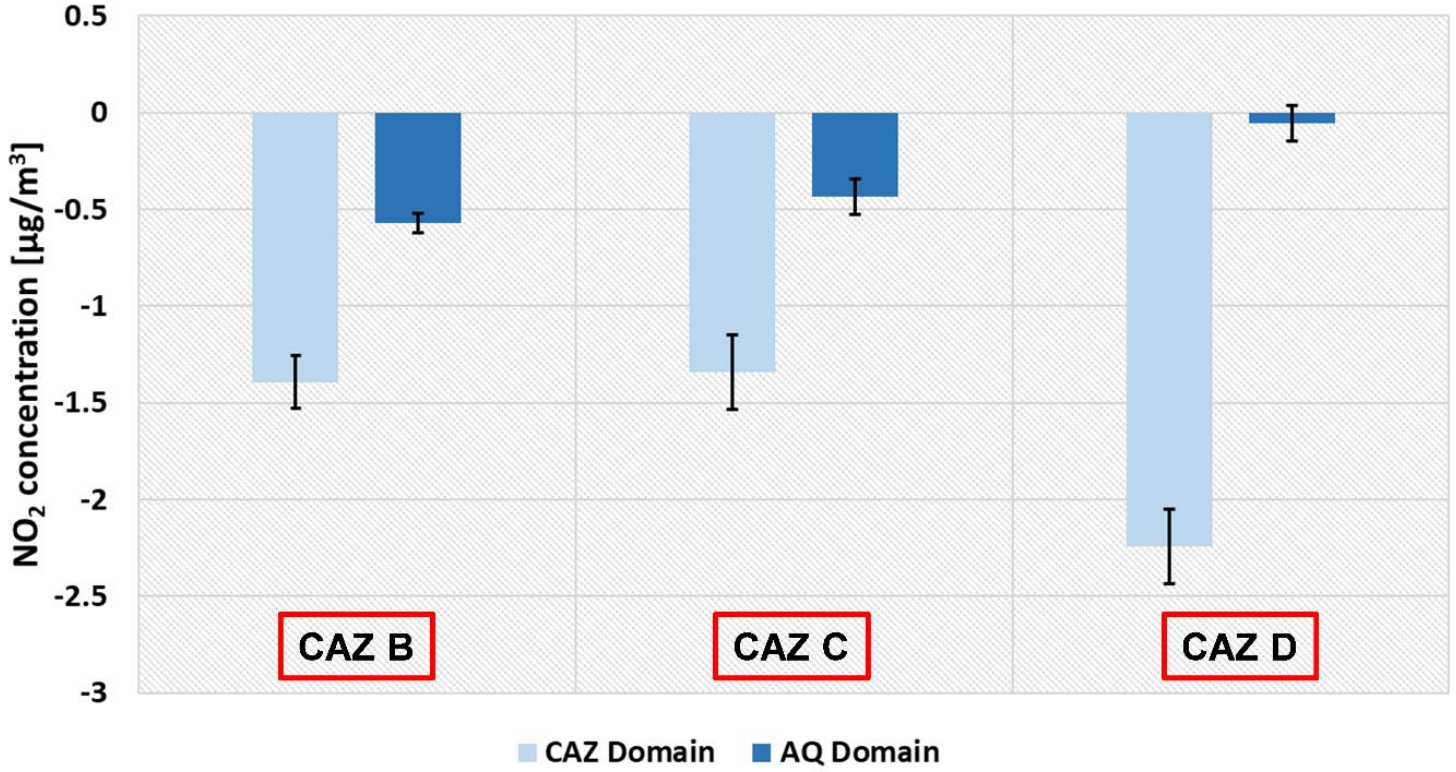


Table 1-11: Number of LSOAs and population with an improvement or a deterioration of NO_2 concentration (relative to baseline), disaggregated by "Under 16" quintile for the domain of study.

Option	Quintile	1	2	3	4	5
		Lowest proportion ←				→ Highest proportion
CAZ B	Number of LSOAs with improved air quality	47	29	33	27	27
	Population with improved air quality	86,096	45,936	53,948	40,777	49,209
	Number of LSOAs with a worsening of air quality	4	4	3	0	3
	Population with a worsening of air quality	5,889	6,629	4,898	0	5,570
CAZ C	Number of LSOAs with improved air quality	46	25	31	24	24
	Population with improved air quality	84,706	40,655	50,998	36,492	44,594
	Number of LSOAs with a worsening of air quality	5	8	6	3	5
	Population with a worsening of air quality	7,279	11,910	9,241	4,285	8,801
CAZ D	Number of LSOAs with improved air quality	38	11	19	15	14
	Population with improved air quality	73,444	19,373	32,396	23,084	27,099
	Number of LSOAs with a worsening of air quality	13	22	18	12	16
	Population with a worsening of air quality	18,541	33,192	27,843	17,693	27,674

Table 1-12: Modelled NO_2 concentration differentiated by IMD quintile (reference whole model domain) for the baseline, the traffic management schema and the charging scheme

	Income IMD	Most deprived ←				→ Least deprived
Option	**Quintile domain**	**1**	**2**	**3**	**4**	**5**
2021 CAZ B	Relative difference in NO_2 concentration to baseline (%)	-2.60	-2.91	-2.80	-3.44	-4.53
2021 CAZ C	Relative difference in NO_2 concentration to baseline (%)	-1.98	-2.24	-2.25	-2.97	-4.09
2021 CAZ D	Relative difference in NO_2 concentration to baseline (%)	-0.15	-1.11	-1.14	-2.66	-5.19

1.16 Mitigation Measures for a CAZ D

1.16.1 It should be noted that, while these mitigations have been costed and presented in the Financial Case, they are not currently represented as a Government Cost within the Economic case due to the uncertainty of funding.

1.16.2 Based on the traffic modelling, air quality modelling and Integrated Impact Assessment, it is clear that there are significant issues which are required to be mitigated for the residents and businesses of Tyneside and beyond and further work is required on this before submission of FBC.

1.16.3 Correspondingly, we have developed the below mitigation in order to ameliorate the impact of any CAZ D Clean Air Zone. Furthermore, given that the fleet composition in Tyneside is not equivalent to that of national assumptions, it is clear that there will be significant investment required in retrofit technologies.

1.16.4 We are clear that this is a list which is subject to extensive public consultation and discussion and will be enhanced and developed for the FBC.

MEASURE	DESCRIPTION	JUSTIFICATION	NUMBER
Grants for HGV upgrade	Grants of up to £16,000 per affected vehicle, subject to a funding competition	**HGVs which are not upgraded are significant causes of poor air quality on a per vehicle basis**	**256**
Grants for LGV upgrade	Interest-free loans of up to £10,000 per affected vehicle, subject to meeting our eligibility criteria	**LGV owners face significant financial challenges to upgrade their fleet and much of the fleet is not currently EURO 6**	**465**
Grants for Hackney Carriages / PHVs upgrade	Interest-free loans of up to £10,000 per affected vehicle, subject to meeting eligibility criteria Or Grants of up to £1,500 per affected vehicle, subject to meeting our eligibility criteria. This would allow around 50% of affected taxis to be upgraded	**Drivers face significant financial challenges to upgrade their fleet and much of the fleet is not currently EURO 6**	**350 loans and 1400 grants**

MEASURE	DESCRIPTION	JUSTIFICATION	NUMBER
Grants for car upgrade	Upgrade grant of up to £1,500 per affected vehicle, subject to meeting our eligibility criteria	**Private vehicles are the largest single cause of NO_2. People living within or travelling to any CAZ may face significant challenges to upgrade**	**3,929**
Mobility Package	£1000 Credit for affected individuals within and travelling to the area, subject to eligibility criteria. There are around 1,200 low income households within the CAZ area	**Affected individuals who would face particular challenges are enabled to continue to travel**	**2,432**
Walking and Cycling Improvements	A package of walking and cycling improvements across the authorities at a number of locations, particularly focusing on routes to bus and Metro. These are: Durham Road, Felling, North Tyneside, Kingston Park, Gosforth – Longbenton, Jesmond, Chillingham Road	**Encouraging modal shift is one of the most effective ways in which to improve air quality and have multiple other beneficial effects such as improved physical and mental health**	**7**
Access Changes	Access changes for junctions accessing the Central Motorway/Tyne Bridge	**Will reduce traffic complexity around the Central Motorway and correspondingly lead to improved air quality due to reduced traffic flow and queuing**	**2**
Local Abatement	Abatement such as moss walls	**In order to reduce emission concentrations at a key exceedance location and demonstrate innovation**	**1 installation**

1.17 Further measures

1.17.1 Given the potential consequences of a Charging Clean Air Zone and that compliance was not achieved in 2021, a further assessment was undertaken of other potential measures which could reduce air quality concentrations on key exceedance links. Given the high baselines of NO_x on exceedance links and background levels, a reduction of up to 30% would be required to achieve compliance.

1.17.2 It is clear that taking action to meet air quality limits requires a complex decision-making process that inevitably involves a number of trade-offs. Our intention throughout the appraisal process has been to find the most appropriate solution for the residents of this area.

1.17.3 A number of potential solutions are being examined, including other means of road user charging across the central Newcastle/Gateshead bridges; a Low Emission Zone for buses, taxis and HGVs; access restrictions for HGVs/LGVs at peaks times; junction changes to reduce complexity and investment in walking and cycling.

1.17.4 Given the knowledge we have of the effectiveness of various measures in isolation, there is a reasonable expectation that they may achieve compliance faster than a CAZ D alone when delivered in combination. Further to this, it may be that a combination of non-CAZ measures delivers compliance faster than a CAZ D alone, with fewer negative impacts. Work is currently underway in order to assess the likely transport, air quality and economic impact of combinations of these measures.

1.17.5 As we have not completed air quality modelling on these measures, the CAZ D is currently the measure which has the lowest NO_2 values on PCM links in 2021.

1.18 Benefits, Risks, Constraints and Dependencies

1.18.1 Benefits

1.18.2 The benefits of his Feasibility Study are that the Councils are developing a much greater understanding of the challenges faced to achieve NO_2 limit values in as shorter time as possible. The ability to do so while also delivering wider benefits is also difficult.

1.18.3 The core benefits of the project relate to the identification of a package of measures which would reduce exposure to NOx and other pollutants. Such a package of measures if implemented could be expected to bring health benefits (including increased physical activity and fitness levels) for those spending time in locations with poor air quality.

1.18.4 Options which meet the secondary objectives will contribute to improving public health, support the local economy and sustain local jobs and services, and our aim is to do so in a way that ensure that no communities are disproportionately impacted by the preferred option.

1.18.5 Risks

1.18.6 The key risks are associated with the Feasibility Study centre around the effectiveness of the package of options identified, public and stakeholder acceptance, economic implications and human resources and traffic and emission impacts. A list of key stakeholders is in Appendix A1.1.

1.18.7 The following risks should be considered when developing the package of options further during public consultation and beyond:

- The Tyneside Authorities and other local public-sector partners do not have sufficient resources to deliver the Plan;
- The problem proves to be 'too difficult' i.e. some locations are found where no deliverable package of measures can be identified to achieve compliant levels of NO_2 'anytime soon' – which may include locations where the predominant source of NOx emissions is not under local authority control, e.g. close to the A1(M);
- Failure to bring various influence stakeholders and the public 'on-side', resulting in significant barriers to the ultimate delivery of the preferred package of measures;
- Flawed decisions and/or inefficient implementation due to the lack of time available to complete the feasibility study and/or deliver the preferred package of measures;
- Poor or incomplete analytical evidence (including transport modelling) that over-estimates future concentrations of NO_2 at some locations, leading to more action and intervention than required to achieve compliance at these locations; and under-estimates future concentrations of NO_2 at some locations, leading to a failure to achieve compliance;
- The appraisal overlooks some significant aspect of cost or dis-benefit, resulting in flawed decisions;
- Developments beyond the control of the local authorities makes the assumptions regarding future traffic and emissions invalid or inaccurate. Examples may include significant step-changes in the petrol-diesel split of the local or national fleets (which may be considered a benefit in terms of compliance), changes in the local fleet due to impacts of changes elsewhere in the UK, or unexpected changes in the emission performance of vehicles (notably Euro 6 standards);
- The potential impacts on the network, displacing traffic going to or through the city centre and re-routing and consequently displacing negative outcomes to other areas of the city; and
- The scale and finance requirements for the effective measures are is disproportionate to the air quality problem in the local area;

1.18.8 Dependencies

1.18.9 Table 1-13 shows the dependencies which represent the biggest risks to achieving compliance in the shortest possible time.

Table 1-13 Project Dependencies

INTERDEPENDENCIES	REASON
Central government	National policies/incentives to support move from diesel across all sectors
Highways England	Potential exceedances on the Strategic Road Network

INTERDEPENDENCIES	REASON
Transport for the North	Development of the Strategic Transport Plan and investment strategy and delivery of strategic transport interventions in the North East which could change travel patterns and emissions.
Joint Transport Committee	Delivery of a regional Transport Plan and accompanying consultation, which could impact on measures for implementation
Bordering local authorities	Adverse distributional impact on neighbouring authorities Neighbouring authorities' taxi licensing policies
Bus companies	Planned upgrades to fleet
Taxi and private hire licensing	Planned upgrades to fleet
Freight	Upgrades to fleet or other measures to reduce adverse impact on air quality
DVLA	Accessing necessary information
JAQU	Approval of the Plan and release of funding
Local population	Changes to use of sustainable modes
Economy	Greater prosperity results in more people owning and using cars. Global economic and political trends affecting fuel prices will impact on the costs of running a car and bus fares. Conversely if Brexit or other events lead to significant economic uncertainty, there will be more sensitivity around charge levels/ability to pay and further inequity.
Motor Vehicle Industry	That improvements which are accounted for in future year emissions due to engine changes are delivered

1.18.10 Constraints

1.18.11 Key constraints upon the delivery and effectiveness of a package of options are shown in Table 1-11.

Table 1-114 Project Constraints

CONSTRAINT	DETAIL
Time	Urgency to implement air quality improvements in the shortest possible time means analysis and decision-making is being undertaken in compressed timescales and likely to be less robust than if time was not a constraint. Urgency to implement air quality improvements in the shortest possible time has resulted in analysis running concurrently rather than as an iterative process. It has also caused the Tyneside Authorities to use the Highways England Regional Transport Model. Limitations of this approach are set out in the Modelling Methodology Report and Analytical Assurance Statement.
Funding	Lack of clarity from JAQU on exact funding available to support the implementation of measures to improve air quality in the shortest possible time. Capital only funding where measures require revenue funding. Shortage of funding available
Innovation	Improving technology may lead organisations to be reluctant to fund or invest in improved Euro standard vehicles as they wait for other upgrades
Contractors	There is a skills, equipment and experience shortage of contractors to deliver some measures. This shortage is worsened by the likelihood that several cities will be requiring services at the same time.
Evidence	Appropriate evidence to forecast the effectiveness of measures is flawed.

APPENDICES

APPENDIX A1.0 – Glossary

Additional Measures	Additional measures are measures which will be funded by any surplus revenue generated by the option that is implemented.
Background Maps	Maps of modelled background concentrations at 1 km x 1 km resolution for a range of pollutants including oxides of nitrogen (NO_x) and nitrogen dioxide (NO_2), provided by JAQU. These will be used principally to define the contribution to ambient concentrations from non-local sources, such that only local sources need be modelled in detail. It is likely that road transport will be the most significant local source, although other local sources can be modelled if relevant.
Baseline	The projected outcomes under a no-action scenario, with no additional measures to improve air quality. This should draw on baseline projections for both air quality and transport models, with an appraisal period of 10 years from the scheme's implementation. Interpolation and/or extrapolation can be used if not all these years have been modelled.
Base year	The year used for validation of the transport and air quality dispersion models against recently collected real-world data (for the Tyneside Authorities it is 2017). Government have noted it is preferable for the same base year to be used in both transport and air quality models. The base year for the transport model should be no more than 5 years old and for the Air Quality model it should be 2015 or later.
Benchmark option	A benchmark option is a policy that is likely to be effective at delivering compliance in the shortest possible time. A benchmark option is therefore an important tool in helping to define what 'shortest possible time' means for each local authority area and provides a tangible illustration of the minimum expected of other potential policy options.
Clean Air Fund	Funding to allow local authorities to bid for additional money to support the implementation of measures to improve air quality. This could include interventions such as improvements to local bus fleets, support for concessionary travel and more sustainable modes of transport such as cycling, or infrastructure changes.
Clean Air Zone	An area where targeted action is taken to improve air quality and resources are prioritised and coordinated in a way that delivers improved health benefits and supports economic growth. Clean Air Zones fall into two categories: 1. Non-charging Clean Air Zones – These are defined geographic areas used as a focus for action to improve air quality. This action can take a range of forms including, but not limited to, those set out in Section 2 of the Framework provided by government but does not include the use of charge-based access restrictions.

	2. Charging Clean Air Zones – These are zones where, in addition to the above, vehicle owners are required to pay a charge to enter, or move within, a zone if they are driving a vehicle that does not meet the standard for their vehicle type in that zone. Clean Air Zone proposals are not required to include a charging zone, and local authorities may consider alternatives to charging such as access restrictions for certain types of vehicle.
Critical Success Factor (CSFs)	Critical Success Factors are important project objectives/considerations, which are used to conduct a high-level assessment of the longlist of options at the strategic outline case stage. The Critical Success Factors should include a pass/fail criterion on whether the proposed option achieves NO_2 compliance in the shortest possible time.
Discounting	A method used to convert future costs or benefits to present values using a discount rate.
Discount rate	The annual percentage rate at which the present value of a £, or other unit of account, is assumed to fall away through time.
Distributional analysis	Distributional analysis looks at the degree to which policies impact upon different groups of people or businesses. Distributional analysis is necessary to understand whether a policy unduly favours or disadvantages groups in society.
Early Measure Funding (EMF)	This funding is to support small, ambitious, good value for money measures that deliver air quality improvements. These are complementary to the feasibility study and larger local plan that delivers compliance. The Tyneside authorities secured £1.7m from this fund.
Economic assessment (cost benefit analysis)	The economic assessment is essentially the detailed appraisal of a policy's value for money, looking at the monetised costs and benefits to society. This looks more widely than simply the direct financial impacts of a measure, considering the wider societal impacts.
Elasticity	Elasticities measure how one variable responds to changes in another. For example, a fuel elasticity of demand shows how the number of vehicle trips taken would change in response to a change in the price of fuel.
Emission Factor Toolkit	A tool to allow calculations of pollutant emissions from road transport, including for NO_x, and other pollutants for a specified year, road type, vehicle speed and vehicle fleet composition.
European emission standards or Euro standards	EU-wide standards for exhaust emissions of air pollutants. Current standards for new vehicles are: 'Euro 6' for light duty vehicles (cars and vans) and 'Euro VI' for heavy duty vehicles.
Evidence Methodology Review	The review of submitted evidence documents from local authorities. This is expected to be before the Strategic Outline Case.
Tyneside Air Quality Feasibility study	The process from the local air quality assessment to the development of a final business case for the Tyneside Air Quality Local Plan.

Full Business Case	Final iteration of the business case and the case that goes for Defra Secretary of State approval. This sets out the final proposed option in detail and includes inputs from any consultation.
Implementation Fund	The Government has set up a £255m Implementation Fund to support local authorities to prepare their plans and deliver targeted action to improve air quality. This funding will support the immediate work to conduct feasibility studies, implement early measures and deliver local plans.
Receptors	The hypothetical points in the air quality dispersion modelling at which the concentrations of NO_2 are calculated. These will include a grid of points across the model domain, and additional points as specified in the evidence package that enable comparisons with the national model and are consistent with the siting criteria defined in the Air Quality Directive.
Review Panel	The Review Panel is the panel that reviews and approves local authority proposals and modelling outputs. It is the process to ensure the evidence for the local plans are robust and consider appropriate measures for the local area.
Initial Evidence Review	The review of air quality and transport modelling deliverables and target determination that ensures there is a robust evidence base to conduct detailed analyses of the options.
Joint Air Quality Unit (JAQU)	JAQU is the joint unit between two Government Departments, the Department of Environment, Food and Rural Affairs (Defra) and the Department for Transport (DfT) which has responsibility to deliver and implement the UK plan for tackling roadside nitrogen dioxide concentrations.
Local authority key milestones	Key stages of the feasibility study related to funding, assurance and review processes that local authorities need to complete. These include: the proposal for a Feasibility Study; Evidence Methodology Submission; Strategic Outline Case; Initial Evidence Submission; Outline Business Case; Consultation (if required); Full Business Case and Implementation.
Tyneside Air Quality Local Plan	The plan local the Tyneside Authorities are developing as part of their feasibility studies. It is the local authorities plan to bring an area of exceedance into compliance required by government and does not refer to any already established local air quality action plans within a local authority area.
Longlist	A broad range of options, created to ensure that all realistic alternatives have been adequately considered, thereby justifying the selection of an option. The list should include a 'do nothing' (baseline) option (which will help to show why taking action is necessary) which is taken forward as the baseline.
Net present value (NPV)	The discounted value of a stream of either future costs or benefits. The NPV is used to describe the difference between the present value of a stream of costs and a stream of benefits.
Optimism bias	The demonstrated systematic tendency for appraisers to be over-optimistic about key project parameters, including capital costs, works duration and benefits realisation.

Options Appraisal	The process of defining objectives, examining options and weighing up the costs, benefits, risks and uncertainties of those options before a decision is made.
Outline Business Case (OBC)	Second iteration of the business case. Provides additional detail and identifies the preferred option based on full analyses. It should set out the likely implementation and procurement route and demonstrate the affordability of the scheme.
Pollution Climate Mapping (PCM)	The PCM model is the UK's national air quality model and provides outputs of pollutant concentrations in the UK at a 1x1 km resolution and at roadside locations for around 9,000 urban major roads (A and M class roads).
Proposed Option	The preferred option is the one that fits the strategic aims of the intervention whilst delivering best value for money. This is from the shortlist of options modelled.
Scenario modelling	Modelling which accounts for the measures proposed in the feasibility study (also known as 'with measures' modelling).
Sensitivity testing	Testing which aims to determine the degree to which a model's outputs vary in response to 'plausible changes in individual assumptions.
Shortlist	A smaller range of options which have been assessed against the critical success factors and judged to be the options most likely to achieve the objectives of the project. The shortlist of options is then taken forward for more in-depth air quality, transport and economic modelling. The shortlist should include a 'do nothing' (baseline) option (which will help to show why taking action is necessary) and a benchmark option.
Spending Objective	Main objective of the project, which the Green Book terms the 'spending objective.'
Strategic Outline Case (SOC)	First iteration of the business case. This presents a strong case for change and will confirm the strategic content of the proposal to do this. Initial analysis should be used to refine a long list to a short list of options to take forward. It should include indicative management, procurement and costs.
Target Area	The area which will be directly impacted by the measures under the Tyneside Air Quality Local Plan. This could be limited to a stretch of road, for individual road-based measures, or the area where implementation occurs, for measures impacting a series of locations.
Target Determination	A process involving comparison of the outputs of the local and PCM air quality modelling, then agreeing the most appropriate concentration assessment to be compared to the limit value. This is needed to understand how big and improvement needs to be made in a location to determine how soon compliance can be achieved.
TG16	Local Air Quality Management (LAQM) Technical Guidance developed by Government to support local authorities in carrying out their duties under the Environment Act 1995, the Environment (Northern Ireland) Order 2002, and subsequent regulations.

The Plan	Government's UK plan for tackling roadside nitrogen dioxide (NO_2) concentrations (the Plan). This set out how Government would bring UK NO_2 concentrations within the statutory annual limit of 40 micrograms per cubic metre (µg/m3) in the shortest possible time. The Plan sets out a number of national and local measures that need to be taken. Local authorities should note the UK plan for tackling roadside nitrogen dioxide (NO_2) concentrations is Government's UK Plan and not Defra's Plan and so should be referred as such throughout the business cases.
Tyneside Authorities	Three local authorities in Tyneside (Gateshead, Newcastle and North Tyneside, collectively the Tyneside Authorities) were named in the UK Plan for Tackling Roadside nitrogen dioxide NO2 Concentrations. This means that some roads in Tyneside were identified by the Department for the Environment, Food and Rural Affairs (Defra) as being currently non-compliant with regards to UK and EU air quality legislation which define a maximum limit for NO2 at locations where there is a risk to public health from exposure. The Tyneside Authorities are therefore subject to a legal direction (Environment Act 1995 (Feasibility Study for Nitrogen Dioxide Compliance) Air Quality Direction 2017) from the Secretary of State for Defra. To adhere to this direction the Tyneside Authorities are undertaking a feasibility study to produce a Local Air Quality Plan. This must identify the preferred intervention (as part of a package of measures also known as a Preferred Option) that will reduce NO2 pollution and deliver local compliance with legal limits in the shortest possible time.
Uncertainty	An estimate characterising the range of values within which the true value of a measurement (or modelled output) lies.
WebTAG	Transport Analysis Guidance that provides information on the role of transport modelling and appraisal.

Appendix A1.1 – Stakeholder List

Public Health/Wider Communities	Public Health Professionals from LAs
	Directors of Public Health
	Public Health England
	Chief Executive and medical directors from Northumbria Uni
	Chief Executive of Newcastle/Gateshead Clinical Commissioning groups
	Paediatricians
	British Heart Foundation
	British Lung Foundation
	Environmental Health Colleagues
Social Inclusion	Disability Groups
	Newcastle Blind Society
	Carers
	Citizen Advice Bureaus
	Credit Unions
	NCC for Voluntary Sector
	Youth Council
	Older People's Forums
	Housing Associations
	Age UK
	Independent Tenant's Voice
Green Lobbying Groups	Friends of the Earth
	Green Peace
	Local Partnerships
	Save Newcastle Wildlife
	Space for …
	Park User Groups
	Newcastle Cycle Campaign
	Living Streets
	Sustrans
	Public Transport User Groups
	Experts within University departments
Economic Generators	NE1
	Chamber of Commerce
	CBI
	FSB
	NELEP
	Developing Consensus
	Bar/Nightclub Representation
	Heads of Economic Development

Large Employer with Big Fleets	Chief Executive Ambulance Trust (fleet operator)
	Chief Executive and medical directors from hospitals
	Council Facilities/fleet managers/ partners
	HMRC
	DWP
	Universities fleet and facilities
	Hauliers
	Royal Mail

	Super Markets
	Intu Eldon Square and Metro Centre
	Cobalt
	Quorum
	Refuse collection companies
	Taxis
	Bus Operators
	Amazon
	DHL
	Yodel
	Hermes
	Freight Transport Association
	Freight Partnership People
	National Holidays
	Megabus
	National Express
	National Association of Wedding Car professionals
	Nissan
	Newcastle Business Parks and other business parks
	Team Valley
	Theatre Royal
	The Sage
	The Baltic
	Cinemas
	NUFC
	Schools and teachers
	Newcastle, Gateshead and North Tyneside Colleges

Appendix A1.2 Tyneside Air Quality Feasibility Study Options Long-list

ENABLING THE EFFICIENT FLOW OF TRAFFIC THROUGH KEY LINKS

- Reducing congestion / vehicle flow through access restrictions
  - **Strategic access restrictions** - Access restrictions relating to strategic / key corridors to accelerate compliance. Could take the form of physical modal filters or enforced / non enforced access restrictions such as weight class / bus lanes / hours of operation
  - **Local traffic restrictions** - Limiting access in certain areas and discouraging rat-running (e.g Streets for People proposals) - could include modal filters and other measures
  - **Peak hour goods access restrictions -** to urban core centres

- Optimising traffic management on key corridors / enabling efficient flow of traffic through key links
  - Phase 1 upgrades and minor civil engineering works - such as signal updates (SCOOT / MOVA, UTMC, UTC) ad small scale civil engineering interventions; minor upgrades to:
    - A167 South Tyne Bridge to A1
    - A184 (Felling bypass) E Tyne Bridge to South Tyneside
    - Old Durham Road - A167 junction to Wrekenton
    - A184 W (Askew Road) - Tyne Bridge to A1
    - West of A1 A692 (Consett Route)
    - West of A1 A694 onto Derwenthaugh Road
    - A695 Scotswood Road
    - A186 Westgate Road
    - A167 N
    - Great North Road
    - Grandstand Road & Jesmond Dene Road
    - A1058 - A167 to A19
    - West of A1 A69
    - West of A1 A696
    - A191 Boundary to A19
    - A1056 - Great North Road to A19
  - Phase 2 Major civil engineering interventions and upgrades - such as junction rebuilds and redesigns or changes to structures on key corridors.
    - A167 South Tyne Bridge to A1
    - A184 E Tyne Bridge to South Tyneside
    - Old Durham Road - 167 junction to Wrekenton
    - A184 W - Tyne Bridge to A1
    - West of A1 A692
    - West of A1 A694 onto Derwenthaugh Road
    - A695 Scotswood Road
    - A186 Westgate Road
    - A167 N
    - Great North Road
    - Grandstand Road & Jesmond Dene Road
    - A1058 - A167 to A19
    - West of A1 A69
    - West of A1 A696
    - A191 Boundary to A19
    - A1056 - Great North Road to A19

- Road space reallocation and to enable the efficient flow of traffic through key links
  - High occupancy lanes on key corridors/bridges
  - Remove bus lanes
  - **Extension of bus lanes** - Extension of bus lanes across Tyneside and re-appraisal to ensure consistency of approach across different authority areas - including A694
  - **Red Routes** - Red routes in key areas within the travel to work area to improve traffic flow for public transport
  - **Traffic Management Act Part 6 (Moving Traffic Offences)** - Allow local authority enforcement of moving traffic offences e.g. yellow box junctions, banned turns etc

- Major infrastructure
  - New vehicular crossing of the River Tyne

- Speed Management
  - **Average speed cameras** - Average speed cameras on certain roads (eg: A1058 and other key corridors, exceedance links)
  - Variable speed management on A1
  - **More 20mph schemes** - Introducing 20 mph speed restrictions to reduce exhaust emissions (fewer acceleration/deceleration events) also reduces tyre and brake wear.

- No Idling
  - Introducing 'no idling' zones in town centre areas or enforcing the provisions of the Road Traffic (Vehicle Emissions) Regulations 2002 - issuing FPNs - Enforcement of engine idling legislation to reduce roadside NOx

- Signals
  - **Full digitisation of signals on all key/congestion corridors with UTMC control** - Further work to ensure this is not a duplication of the corridor lists - UTMC only not civil engineering
  - **UTMC queue relocation on key corridors** - Use of UTMC to specifically relocate queues from exceeding locations and receptors to more open areas
  - **Traffic signals repair** - Increased maintenance programme to ensure loops etc. fully operational, signal plans up to date

IMPROVING THE EMISSIONS STANDARDS OF PRIVATE, PASSENGER AND COMMERCIAL VEHICLES

- Charging restrictions
  - Charged CAZ
    - Class B charged CAZ in Newcastle / Gateshead urban core
      - Zone charge – non-compliant vehicles entering and moving within the zone would be charged
    - Class B charged CAZ in A1 / A19 boundary
      - Zone charge – non-compliant vehicles entering and moving within the zone would be charged
    - Class D inner charged CAZ in Newcastle / Gateshead urban core boundary
      - Zone charge – non-compliant vehicles entering and moving within the zone would be charged
    - Class C inner charged CAZ in Newcastle / Gateshead urban core boundary
      - Zone charge – non-compliant vehicles entering and moving within the zone would be charged
  - Tolling on Tyne bridges
- Retrofit
  - Working with other large public/private sector fleets to convert to low emission
  - **Leases/grants** - to Euro6(+) (retrofit/new)
    - to upgrade LGVs / HGVs for SMEs

        - to upgrade taxis
        - to upgrade buses
    - Taxi policy - All taxis Euro 6+ (NECA wide)
    - **Taxi Licencing** - Unified taxi licensing policy across the region to specify higher emissions standards
    - **Upgrade Council fleets** - not procurement activity for suppliers, is authorities buying new vehicles

- Freight
    - Council fleets - introduce minimum emission spec immediately as part of procurement activity
    - Cycle Logistics scheme - for short distance deliveries and distribution
    - Freight Consolidation
    - Freight re-timing, including Delivery and Servicing Plans - Retiming of freight deliveries for major employment & retail areas

- Locally-specific abatement
    - **Locally-specific abatement -** Investments in specific areas on abatement measures (e.g. green walls)

- Fuelling Network
    - **Pressurised natural gas refuelling (eg: Lamesley / Scotswood)** - Provision of natural gas refuelling stations
    - **Hydrogen refuelling network** – Provision of Hydrogen pumps at existing filling stations
    - Additional roll out and maintenance of EV charging
        - rapid, key public locations
        - standard, public spaces
        - EV charging – buses

ENCOURAGING MORE PEOPLE TO WALK, CYCLE AND USE PUBLIC TRANSPORT AS PART OF THEIR REGULAR JOURNEYS

- Increasing the accessibility of bikes to the public
    - **Enhanced cycle to work scheme or further subsidy for bringing electric bikes into affordable range -** Higher value loan scheme to allow e-bikes to be on scheme (and more expensive bikes through an FCA registered organisation rather than employer
    - **Public Cycle Hire**
    - **Bikes on Metro –** Revise policy allowing bikes to be transported on Metro
    - **Improved cycle facilities at Metro -** Provision of safe, secure and weather proof cycle storage facilities at Metro Stations/Public Transport Hubs
- Improving cycle and walking routes
    - **Introduce key walking and cycling corridors Phase 1 -** Minor walking and cycling improvements to encourage active travel
    - **Walking and cycling routes to public transport interchanges -** Minor walking and cycling improvements to encourage active travel and interchange via Metro (e.g. West of Tyne, Durham Road, Felling Bypass routes)
    - **Active Travel Infrastructure - New developments -** Improved cycling and walking infrastructure on new developments
    - **Metro Green pedestrian/cycle access improvements**
    - **Upgrade key walking and cycling corridors Phase 2 -** Major upgrades, introducing large-scale segregated facilities
    - **Blaydon - Newburn pedestrian and cycle bridge**
    - **Urban core pedestrian routes -** improvements to pedestrian routes

- Influencing behaviour change

- **Active travel (journeys to school focus) -** Targeted interventions around particular schools which have greatest propensity to change and monitoring to include requiring a certain level of mode share at schools through travel plans
- **Behaviour change (employment) -** Programme to incentivise behaviour change with a particular focus on employment sites (to include promoting flexible working …
- **Public campaign -** Campaign to make people think about the health issues of air quality as part of wider behaviour change
- **Changing employment practices -** Implementing wide scale changes to working patterns to enable modal shift and reduced trips

- Improvements to provision, capacity or reliability of public transport
  - **Improved real time information/apps -** Upgrades to RTI both in terms of handheld and communication to the public and also at interchange facilities & public facing UTMC.
  - **Additional metro provision at peak times -** Provision of additional Metrocars at peak times to reduce overcrowding and increase capacity
  - **Additional train provision -** Provision of additional heavy rail train units at peak times to reduce overcrowding and increase capacity
  - **Physical improvements to PT interchanges -** Measures to support operational capability of interchanges and access / egress of different modes. Likely interchanges to include Gateshead, Heworth, Four Lane Ends, Monument, Central Station, Haymarket, Regent Centre.
  - **Mobility as a service –** Integration of various forms of transport service into a single mobility service accessible on demand.

- Improvements to affordability of public transport
  - **Public transport cost -** Review of public transport costs, particularly for short trips and for young adults. Focus also on potential for family tickets, multi-modal, park and ride and smart ticketing options.
  - **All public transport tickets valid to central zone covering Newcastle & Gateshead**
  - **Fully integrated public transport ticketing (multi-modal)**
  - **Integrated park and ride ticketing for Metro (discounting park and ride)**
  - **Public transport integration -** Full review of bus network to improve integration of network with Metro and other sustainable / active travel mode interchanges including secured service funding

- Upgrades / new public transport infrastructure
  - **Metro extensions -** Metro Extensions that could include routes south of the River Tyne (eg Gateshead Quays / Leamside Line / Team Valley, IAMP), north of the River Tyne (eg Cobalt, Northumberland to Newcastle line, housing sites to the west)
  - **Diesel goods train upgrade/replacement**
  - **River Taxis/Ferries -** New public transport uses of the Tyne

- Parking policy
  - Camera enforcement e.g. at schools
  - **Car parking policy -** Car Parking Policy Review change for City Centre urban core, including cost and provision and potential to consider variable permit parking rates for certain types of cars
  - **Enforcing less parking at employment areas -** Enforcing all planning conditions and preventing new employers from having significant parking in the urban core
  - Additional car parking in Gateshead to reduce travel over Tyne bridges to Newcastle - new parking spaces outside exceedance area
  - **Park and Ride -** Park and Ride provision including reviewing parking charges at existing sites
  - **Workplace Parking Levy -** Workplace parking levy on City Centre urban core and key employment sites to reduce circulating traffic and increase public transport usage

- **Planning and development policy -** Making DM24 (Environmental Protection) and other planning policies much stronger

- School policy
  - **School Policy -** Changing school admissions policy to ensure people mostly attend local schools
  - **Changing school start and finish times –** Revise the start and finish times of schools to spread peaks more widely

- Non-road transport
  - **Reduce marine emissions** - Discussions with Port of Tyne re emission standards for maritime vessels on Tyne
  - **Innovation Investment** - Innovation pot to encourage abatement measures from universities or other businesses
  - **Improving efficiency through housing infrastructure** - Improved insulation and energy efficiency for new and old developments to reduce background NOx

Themes Long-list

ENABLING THE EFFICIENT FLOW OF TRAFFIC THROUGH KEY LINKS

- Reducing congestion / vehicle flow through access restrictions
- Optimising traffic management on key corridors / enabling efficient flow of traffic through key links
- Traffic management and priority measures to enable the efficient flow of traffic through key links
- Major infrastructure
- Speed Management
- No Idling
- Signals

IMPROVING THE EMISSIONS STANDARDS OF PRIVATE, PASSENGER AND COMMERCIAL VEHICLES

- Charging restrictions
- Retrofit
- Additional roll out and maintenance of EV charging
- Freight
- Locally-specific abatement
- New refuelling network

ENCOURAGING MORE PEOPLE TO WALK, CYCLE AND USE PUBLIC TRANSPORT AS PART OF THEIR REGULAR JOURNEYS

- Increasing the accessibility of bikes to the public
- Improving cycle and walking routes
- Influencing behaviour change
- Improvements to provision, capacity or reliability of public transport
- Improvements to affordability of public transport
- Upgrades / new public transport infrastructure
- Parking policy
- School policy

- Non-road transport improvements
  - Reduce marine emissions
  - Innovation Investment
  - Improving efficiency through housing infrastructure