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CABINET AGENDA

Tuesday, 26 February 2019 at 10.00 am in the Blaydon Room - Civic Centre

From the Chief Executive, Sheena Ramsey

Item	Business
1	**Apologies for absence**
	Key Decision
2	**Air Quality Plan for Gateshead, Newcastle and North Tyneside** (Pages 3 - 180) Report of the Acting Strategic Director, Communities and Environment

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Date: Monday, 18 February 2019

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Gateshead Council

REPORT TO CABINET
26 February 2019

TITLE OF REPORT: Air Quality Plan for Gateshead, Newcastle and North Tyneside

REPORT OF: Tony Alder, Acting Strategic Director, Communities and Environment

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Purpose of the Report

1. This report outlines a proposed response to the Secretary of State's legal direction dated 27 July 2017 requiring Gateshead, Newcastle and North Tyneside Councils to produce a feasibility study to identify the option which will deliver compliance with legal limits for nitrogen dioxide in the Councils' administrative areas in the shortest possible time. It illustrates the issues faced in developing this study within constrained timescales set by government and recognises that decisions of this magnitude should not be taken without due consideration of the impact on specific and more vulnerable communities. Having undertaken this study jointly with Newcastle City and North Tyneside Councils, approval is sought to commence public consultation across the area on a package of potential measures.

Background

2. Outdoor air pollution is a major risk to human health. Based on national estimates, poor air quality is considered to be responsible for around 360 deaths each year across Gateshead, Newcastle and North Tyneside and around 40,000 across the UK. Related causes of death include circulatory disease, respiratory disease and cancer. As a comparison, there are around 11 deaths per year caused by road traffic collisions across the three local authorities.

3. The most recent UK Plan for tackling roadside Nitrogen Dioxide concentrations identified a number of areas across the country that, based on government modelling, would not be compliant with EU limit values for Nitrogen Dioxide (NO2) by 2021.

4. As part of the UK Plan, many Councils including Gateshead, Newcastle and North Tyneside, were subject to a Direction (a legal order) dated July 2017 from the Secretary of State to "Undertake, as part of the UK plan for tackling roadside nitrogen dioxide concentrations, a Feasibility Study in accordance with the HM Treasury's Green Book approach, to identify the option which will deliver compliance with legal limits for nitrogen dioxide in the area for which the authority is responsible, in the shortest possible time". The Outline Business Case presented here for approval, is the result of the study.

Proposal

5. Gateshead, Newcastle and North Tyneside authorities have undertaken a joint Feasibility Study in recognition of the complex and interlinked travel patterns in the region. As a whole, the authorities' monitoring and modelling shows that Air Quality is generally below legal limits across the three local authorities, particularly in residential areas. However, there are some areas where air pollution exceeds the

legal limits for nitrogen dioxide. It is important to note that much of the evidence about air quality and its impact on public health makes it clear there is no safe limit for exposure and that other pollutants such as particulate matter also cause significant public health issues. These areas of exceedance are typically in proximity to major roads or in Newcastle City Centre, where there are topographical issues and where there are complex demands made of the city's road network.

6. The modelling shows that the Central Motorway in Newcastle is the most difficult road to bring into compliance. This is a key road for both traffic travelling to Newcastle City Centre and as a through route for traffic acting as part of the Newcastle inner ring road and leading directly to and from the Tyne Bridge. Both Newcastle City Council's policies and those shared with Gateshead Council as part of the Joint Core Strategy have sought to restrict traffic travelling through residential areas and the city centre and to use the Central Motorway instead. Balancing the need to achieve air quality limits in the vicinity of the Central Motorway, with the need for it to continue fulfilling its role as the authorities' preferred route for through traffic, does not lend itself to a simple solution. The authorities have been mindful throughout the process of considering options of the need to avoid simply 'shifting' air quality problems from one location to another. The authorities have sought to ensure the analysis leads us to solutions that do not conflict with existing policy objectives wherever possible.

Clean Air Zones

7. As part of its *UK Plan* the Government has published a framework that sets out the principles for the establishment and maintenance of 'Clean Air Zones' (CAZs) in the UK. CAZs can take the form of 'charging' or 'non-charging' zones. The guidance is clear that any non-charging measures have to be tested against the effectiveness of implementing a charging Clean Air Zone, and that the measure that brings compliance in the shortest possible time is to be preferred. Charging CAZs mean that vehicles which do not comply with emissions requirements and enter a defined zone are charged a set amount by the local authorities. In order to avoid a charge, vehicles must be EURO 4 or later for petrol vehicles (most new car registrations after 01 January 2006) and EURO 6/VI for diesel vehicles (most new car registrations after 01 September 2015). The framework also indicates that there are four different classes of CAZ to consider, as specified by government, defined by reference to the type of vehicles to be subject to charges:

8.

CAZ class	Vehicles included
A	Buses, coaches and taxis
B	As A with the addition of heavy goods vehicles (HGVs)
C	As B with the addition of light goods vehicles (LGVs)
D	As C with the addition of private cars and the option to include motorbikes and mopeds

Developing options addressing government's approach to Clean Air Zones (CAZs)

9. The results of the modelling indicate that no form of charging CAZ would enable areas in Newcastle on the Central Motorway and the approach to Central Station to meet Air Quality limits in 2021. All areas in Gateshead and North Tyneside would be in compliance.

10. The authorities' assessment of the charging CAZs also highlights significant concerns about the impact such measures would have on particular communities. The Integrated Impact Assessment undertaken clearly shows that a CAZ D would be likely to affect a significant number of people but would also be likely to have a disproportionate effect on lower income households and areas of deprivation. Furthermore, it is likely that a CAZ D would have a disproportionate effect upon smaller businesses, including taxi drivers/firms.

Further measures identified locally to improve Air Quality

11. As explained above, having considered the charging CAZ options it was recognised that none of the Charging CAZ options would deliver compliance with EU Limit values by 2021. Having established that, the authorities have re-examined the options to determine which further measures could be delivered and would meet the authorities' aims of fairness, improving health and protecting the economy. The authorities are therefore considering additional and/or alternative measures that would help to accelerate the ability to deliver cleaner air in the shortest time possible and are undertaking additional transport and air quality modelling of a range of options.

12. It is clear that taking action to meet air quality limits requires a complex decision-making process which inevitably involves a number of trade-offs. The authorities' intention throughout the appraisal process has been to find the most appropriate solution for the residents of this area. The additional measures being considered upon which the authorities wish to consult the public are listed below:

- A Low Emission Zone to ensure a minimum emissions standard (EURO VI/6) for buses, HGVs and taxis in Newcastle City Centre. This would be a smaller area than the area modelled for the CAZ and would be focused on the City Centre with an option to implement a similar LEZ in Gateshead Town Centre;

- Other means of charging certain road users that would not focus solely on older vehicles and therefore could be seen to be more equitable. By applying to a wider range of vehicles than government's approach this option could also be set at a lower level in order to remain effective. These options include tolls on city centre bridges that could be set at the same level as those for the Tyne Tunnel (£3.40 for HGVs, £1.70 for LGVs / cars). Under such a scenario it would be proposed that public transport (buses and taxis) and ultra low emission vehicles would be exempt from charges. Options such as variable charging (e.g. where charges during peak hours are more than off peak times) will also be considered as part of the 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 HGV & LGVs;

- Significant investment in cycling infrastructure, particularly to public transport interchanges;

- Junction changes to restrict access on and off A167/(M); and

- Local measures to improve air quality by removing pollutants from the atmosphere, one example is moss walls.

13. Depending on the measures taken to change infrastructure to improve air quality it is considered likely that certain individuals or communities may be disproportionately impacted. Therefore, in addition to the measures outlined in paragraph 28 the authorities also propose to consult on a range of measures to support those most impacted, these include:

- Grants for upgrades/scrappage for older more polluting vehicles if owned by people meeting certain criteria;

- A public behaviour change campaign that incorporates engagement with businesses and schools to look at implementing new working/commuting practices and ways to get around. This is particularly important given that the larger reduction we can see in single occupancy car trips, particularly in peak hours, the better the area's transport network will function and the cleaner our air will be;

- Travel credits for people on lower incomes living within the impacted area to ensure there are realistic options for alternative ways of getting around; and

- Exemptions for certain types of vehicles or users such as emergency service vehicles and blue badge holders.

Recommendations

14. It is recommended that Cabinet:

(i) Approves the submission of the Outline Business Case (annexed to this Report) to the Government's Joint Air Quality Unit thereby meeting the requirements of the Secretary of State's legal direction of 27 July 2017;

(ii) Agrees that consultation take place with the public and stakeholders on the potential measures to be implemented to deliver compliance with legal limits for nitrogen dioxide in the Council's administrative area in the shortest possible time and that the consultation will take place during a pre-election period;

(iii) Delegates the approval of the final form of the appropriate consultation materials to the Chief Executive in consultation with the Portfolio Holder for Environment and Transport;

(iv) Agrees that officers be authorised to undertake further detailed analysis of a range of measures that might be implemented including non-charging measures and, where appropriate, those highlighted as a result of the

consultation process in order to inform a final decision as to which measures to implement;

(v) Notes that responses received as a result of the consultation process will be considered and further analysis will be undertaken. This will then feed into the preparation of a Full Business Case which will then subject to Cabinet approval at that time, be submitted to government; and

(vi) Notes that Newcastle City and North Tyneside Councils have been asked to approve cabinet reports with the same recommendations.

For the following reasons:

(i) To fulfil the legal direction from the Secretary of State dated July 2017; and

(ii) To enable further consideration of options with a view to improving air quality in Gateshead, Newcastle and North Tyneside.

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APPENDIX 1

Policy Context

1. The government has repeatedly been taken to court and lost a number of legal challenges relating to its obligations to ensure that measures are taken in order to reduce nitrogen dioxide to levels below the limits required. In particular, it has been established that the government is now under an obligation to take measures to achieve these limits in the shortest possible time. The recent *UK Plan for tackling roadside Nitrogen Dioxide concentrations* identified a number of areas across the country that, based on government modelling, would not be compliant with legal limits for roadside Nitrogen Dioxide (NO_2) by 2021.

2. In July 2017 the Secretary of State issued legal directions to local authorities where modelled emissions exceed the standards required by law. These directions required local authorities to carry out feasibility studies to identify options to deliver compliance with EU limit values in the shortest possible time. The Tyneside authorities received such a direction.

3. In developing their response to the direction, the Tyneside authorities have been mindful of the context of the following policy documents:

- The Tyne and Wear Local Transport Plan;
- The Core Strategy and the Urban Core Plan;
- Making Gateshead a Place Where Everyone Thrives
- The corporate visions and plans of Newcastle City and North Tyneside Councils

Background

4. Outdoor air pollution is a major risk to human health. Based on national estimates, poor air quality is considered to be responsible for around 360 deaths each year across Gateshead, Newcastle and North Tyneside and around 40,000 across the UK. Related causes of death include circulatory disease, respiratory disease and cancer. As a comparison, there are around 11 deaths per year caused by road traffic collisions across the three local authorities.

5. The recent UK Plan for tackling roadside Nitrogen Dioxide concentrations identified a number of areas across the country that, based on government modelling, would not be compliant with legal limits for roadside Nitrogen Dioxide (NO2) by 2021.

6. As part of the UK Plan, many Councils including Gateshead, Newcastle and North Tyneside were subject to a Direction (a legal order) from the Secretary of State dated 27 July 2017 to “undertake as part of the UK plan for tackling roadside nitrogen dioxide concentrations 2017, a Feasibility Study in accordance with the HM Treasury’s Green Book approach, to identify the option which will deliver compliance with legal limits for nitrogen dioxide in the area for which the authority is responsible, in the shortest possible time”. The Outline Business Case presented here for approval, is the Feasibility study which has been produced in response to this Direction.

7. A number of measures to bring forward improvements in air quality, have already been delivered, or are being delivered through funding from other sources. These include:

- Cycling infrastructure on Durham Road in Gateshead and in Newcastle City Centre;
- Improvements to traffic signals on Newcastle Quayside;
- Providing real-time occupancy data for car parks in Newcastle City Centre; and
- Retrofitting buses to the latest engine standards in all three authorities.

Proposal

8. While it is important to recognise that air quality is improving, so too is the authorities' understanding of the serious public health implications of poor air quality on people. Since the Government issued the Direction significant progress has been made on developing and testing measures to improve air quality in the area. The authorities' aim has been to identify measures that seek to deliver compliance with EU limit values fairly and in a way that supports the local economy and improves public health, rather than focusing solely on certain roads, or certain groups of road users.

9. As councils, we have consistently highlighted our concern regarding the need to undertake this work within constrained timescales and resources, and with a focus on specific pollutants in particular areas. The timescale set by government stems from a series of legal challenges and has resulted in a specific legal direction being made in relation to us and 25 other local authorities. While it is not specifically required by government, it is clear that our success will be measured by whether or not we achieve sustainable changes in air quality and in travel behaviour for the long-term rather than just delivering compliance in the short-term

10. This report presents the findings from the ongoing feasibility study and sets out a proposed set of measures for consultation with the public and wider stakeholders. It needs to be stressed that at this time the Council remains in a formative stage of its decision-making process. No decisions have been made as to what measures it will be appropriate to adopt to address air quality; rather the decision-making process will be informed by consultation on a set of measures that officers have identified to be appropriate for consideration by the public at this stage. All responses received as a result of the consultation process will be considered and further analysis will be undertaken. This will then feed into the preparation of a Full Business Case which will then be submitted to government.

11. After receiving the Direction from Defra, Gateshead, Newcastle and North Tyneside authorities have undertaken a joint Feasibility Study in recognition of the complex and interlinked travel patterns in the region. The Study has been funded by central government which is also responsible for ensuring that funding is made available to implement resultant measures to improve air quality (through the Implementation Fund) and to mitigate the impact of implementation (through the Clean Air Fund).

12. This Study has been overseen by a Steering Group incorporating representation from Chief Executives, and officers from Transport, Public Health and Environmental Protection along with wider partners including Highways England.

Regular discussions have also taken place with the Leaders, Elected Mayor and Cabinet Members across the authorities to ensure the views of democratically elected Councillors are taken into account throughout the process. It is also important to note that the authorities have consistently sought to extend their focus beyond a narrow compliance with Defra requirements and recognise that it is not only nitrogen dioxide that has an impact on public health. The authorities have sought to ensure that the authorities' work delivers outcomes that will improve public health as a whole, support our economy and protect vulnerable communities.

Air Quality in Tyneside

13. Local authorities have obligations in relation to air quality as a result of the regime set out in the Environment Act 1995. It has to be stressed that this regime is separate from the obligation falling upon the Secretary of State to ensure compliance with EU limit values arising out of the Air Quality Standards Regulations 2010. The regime under the Environment Act 1995 has resulted in a comprehensive local monitoring regime with one existing Air Quality Management Area (AQMA) in Gateshead and two in Newcastle. Over several years of monitoring in Gateshead, a sustained reduction in concentrations of NO2 below the air quality objective has been seen. These reductions have been achieved through measures introduced by the local authority as well as significant improvements in vehicle engine/exhaust technology. The Gateshead AQMA is under review in accordance with LAQM requirements and pending the outcomes of the Clean Air Zone Feasibility Study. Indeed, whether to retain the Gateshead AQMA was under review even before the July 2017 Direction was received. Every year, Gateshead and Newcastle Council report on air quality monitoring relating to existing AQMAs; these reports are available on the Councils' websites.

14. In order to have a greater understanding of air quality across the whole area, the authorities have developed computer models that aim to illustrate the position now, and what it would be like in the future if certain decisions were taken with regards to how the highways network is managed and maintained. Unlike the national model used by central government, these models have used local monitoring and data to underpin their assumptions and outputs. The results of these modelling exercises are summarised later in this report and in Appendix 2.

15. As a whole, the authorities' monitoring and modelling shows that Air Quality is generally below legal limits across the three local authorities, particularly in residential areas. However, there are some areas where air pollution exceeds the legal limits for nitrogen dioxide. It is important to note that much of the evidence about air quality and its impact on public health makes it clear there is no safe limit for exposure and that other pollutants such as particulate matter also cause significant public health issues. These areas of exceedance are typically in proximity to major roads or in Newcastle City Centre, where there are topographical issues and where there are complex demands made of the city's road network.

16. The government's model identified three areas that it considered required attention:

- the approach to the Tyne Bridge from the north and the south and the Tyne Bridge itself;

- a stretch of the Coast Road in North Tyneside; and
- parts of the A1 Western Bypass (which is the responsibility of Highways England).

17. The authorities' more locally focussed approach has included consideration of these areas. However, following the modelling, the particular area of concern has been identified to be the Central Motorway in Newcastle.

18. This is a key road for both traffic travelling to Newcastle City Centre and as a through route for traffic acting as part of the Newcastle inner ring road and leading directly to and from the Tyne Bridge. Both Newcastle policies and those shared with Gateshead as part of the Joint Core Strategy have sought to restrict traffic travelling through residential areas and the city centre and to use the Central Motorway instead. Balancing the need to achieve air quality limits in the vicinity of the Central Motorway, with the need for it to continue fulfilling its role as the preferred route for through traffic, does not lend itself to a simple solution. The authorities have been mindful throughout the process of considering options of the need to avoid simply 'shifting' air quality problems from one location to another. The authorities have sought to ensure our analysis leads us to solutions that do not conflict with existing policy objectives wherever possible.

Clean Air Zones

19. As part of its *UK Plan* the government has published a framework that sets out the principles for the establishment and maintenance of Clean Air Zones (CAZs) in the UK. CAZs can take the form of 'charging' or 'non-charging' zones. However the government's guidance is clear that any non-charging measures have to be tested against the effectiveness of implementing a charging CAZ, and that government requires that the measure that brings compliance in the shortest possible time is to be preferred.

20. Charging CAZs mean that vehicles which do not comply with emissions requirements and enter a defined zone are charged a set amount by the local authorities. In order to avoid a charge, vehicles must be EURO 4 or later for petrol vehicles (most new car registrations after 01 January 2006) and EURO 6/VI for diesel vehicles (most new car registrations after 01 September 2015). The framework also indicates that there are four different classes of CAZ to consider, as specified by Government, defined by reference to the type of vehicles which would be subject to charges:

21.

CAZ class	Vehicles included
A	Buses, coaches and taxis
B	As A with the addition of heavy goods vehicles (HGVs)
C	As B with the addition of light goods vehicles (LGVs)
D	As C with the addition of private cars and the option to include motorbikes and mopeds

Developing options addressing government's approach to Clean Air Zones (CAZs)

22. The three local authorities have conducted a detailed process in order to appraise various potential options, each of which were made up of a number of sub-measures. This process is detailed in the Outline Business Case at Appendix 2. The *"Critical Success Factor"* for this work was defined by the government and was "*whether a measure had an impact on air quality in the shortest possible time and was deliverable by 2021 at the latest."*

23. Measures considered at the initial longlisting stage included, amongst other things: upgrading various junctions or road corridors; implementing a Workplace Parking Levy; removing existing bus lanes; making changes to parking; cycling facilities and amendments to school hours in addition to charging CAZs. A full list of measures is incorporated within the Appendix to the Strategic case of the authorities' Outline Business Case in Appendix 2. During the process of determining the measures, and their deliverability, the authorities undertook an engagement exercise with a group of key stakeholders that included representatives from the Freight Transport Association, public transport operators, transport user groups and the Newcastle Hospital NHS Foundation Trust in addition to independent consultancies working with us on this project.

24. Due to the pressing timescales of the study, the time required to build the necessary transport and air quality models, and the need to compare all measures against charging CAZs, the options that were shortlisted to be tested in the transport model in the first instance were:

- Do Minimum (i.e. only committed investment and schemes);
- CAZ Class B at both a 'wide' area (using the A1 and A19 as an outer boundary) and one focused on an 'inner' area (focused on Gateshead Town Centre and Newcastle City Centre stretching onto the A1058 and including the Gosforth Air Quality Management Area);
- CAZ Class C at the 'inner' level referenced above;
- CAZ Class D at the 'inner' level; and
- A non-charging option (all measures that were considered to be deliverable by 2021 but that did not involve financial charging).

Analysis of air quality modelling on CAZs

25. The intention behind the modelling work was to use best practice techniques to determine how effective certain measures would be in delivering air quality improvements. As part of this, the authorities needed to determine a proposed charging regime. In order to ensure consistency of approach the authorities liaised with Birmingham and Leeds who had also been given a legal direction to undertake this work around a year before us. Notwithstanding an expressed intention to do so, government has not yet defined minimum and maximum charging levels. It is important to note that a number of local authorities who have been subject to directions have altered both their proposed charging regimes and the geographical

spread of potential CAZ areas following public consultation. The charges that were tested are outlined below:

26.

Vehicle Class	Daily Charge for Non-Compliant Vehicles
Buses/Coaches	£50
HGVs	£50
Taxi and Private Hire	£12.50
Light Goods Vehicles	£12.50
Private Car	£12.50

27. The results of the modelling concluded that no form of charging CAZ as outlined in the government's framework would enable areas in Newcastle on the Central Motorway and the approach to Central Station to meet Air Quality limits in 2021. All areas in Gateshead and North Tyneside would be in compliance. The A1 Western Bypass in Newcastle would have areas that would not be compliant, however the local authorities have no powers to implement changes to the A1. Despite local authorities being mandated to implement charges if required, the government have confirmed no such changes will take place on the national road network. Rather, the Government has indicated that it is Highways England that is responsible for measures on the strategic highway network.

28. Of the options outlined within government's CAZ framework tested to date, the CAZ Class D with a series of additional or mitigating measures would get us closest to complying with the legal limits by 2021. The Class D charge tested would cover the "inner" geography described in paragraph 24 above and illustrated in Appendix 2, though such an area could be altered following consultation. A number of elements are included in this option, such as:

- HGV Retrofit/Scrappage, in order to ensure that HGVs travelling within the zone are compliant;
- LGV Retrofit/Scrappage, in order to ensure that LGVs travelling within the zone are compliant;
- Taxi (by this we mean Hackney Carriages and Private Hire Vehicles) Retrofit/Scrappage, in order to ensure that vehicles travelling within the zone are compliant.

29. The authorities' assessment of the charging CAZs also highlights significant concerns about the impact such measures would have on particular communities. The Integrated Impact Assessment undertaken clearly shows that a CAZ D would affect a significant number of people but also does so disproportionately in lower income households and areas of deprivation. Furthermore, it is clear that the charging framework also disproportionately affects smaller businesses, including taxi drivers/firms.

Further Measures to improve Air Quality

30. Having satisfied the direction with regards to considering charging CAZ options to improve air quality to legal limits it was seen that none would ensure complete compliance by 2021. Following that, the authorities are re-examining the shortlist to

determine which further measures could be delivered and would meet the authorities' aims of fairness, improving health and protecting the economy. The authorities are therefore considering alternative measures that would help to accelerate our ability to deliver cleaner air in the shortest time possible and are undertaking additional transport and air quality modelling of a range of options that the authorities wish to seek the public's views on.

31. It is clear that taking action to meet air quality limits requires a complex decision-making process which inevitably involves a number of trade-offs. The authorities' intention throughout the appraisal process has been to find the most appropriate solution for the residents of this area. The additional measures being considered and that the authorities wish to consult the public on are listed below:

- A Low Emission Zone to ensure a minimum emissions standard (EURO VI/6) for buses, HGVs and taxis in Newcastle City Centre. This would be a smaller area than the area modelled for the CAZ and would be focused on the City Centre with an option to implement a similar LEZ in Gateshead Town Centre;

- Other means of charging certain road users that would not focus solely on older vehicles and therefore could be seen to be more equitable. By applying to a wider range of vehicles than government's approach this option could also be set at a lower level in order to remain effective. These options include tolls on city centre bridges that could be set at the same level as those for the Tyne Tunnel (£3.40 for HGVs, £1.70 for LGVs / cars). Under such a scenario it would be proposed that public transport (buses and taxis) and ultra low emission vehicles would be exempt from charges. Options such as variable charging (e.g. where charges during peak hours are more than off peak times) will also be considered as part of the 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 HGV & LGVs;

- Significant investment in cycling infrastructure, particularly to public transport interchanges;

- Junction changes to restrict access on and off A167/(M); and

- Local measures to improve air quality by removing pollutants from the atmosphere, one example is moss walls.

32. Depending on the measures taken to change infrastructure to improve air quality it is considered likely that certain individuals or communities may be disproportionately impacted. Therefore, in addition to the measures outlined in paragraph 28, the authorities also propose to consult on a range of measures to support those most impacted, these include:

- Grants for upgrades/scrappage for older more polluting vehicles if owned by people meeting certain criteria;

- A public behaviour change campaign that incorporates engagement with businesses and schools to look at implementing new working/commuting practices and ways to get around. This is particularly important given that the

larger reduction we can see in single occupancy car trips, particularly in peak hours, the better the area's transport network will function and the cleaner our air will be;

- Travel credits for people on lower incomes living within or commuting to the impacted area to ensure there are realistic options for alternative ways of getting around; and

- Exemptions for certain types of vehicles or users such as emergency service vehicles and blue badge holders.

33. There are also a number of measures which could result in improved air quality and could be funded from either the Clean Air Fund or alternative funding sources if successfully bid for, and that the authorities wish to consider through our consultation. The principal source of funding for larger measures is considered to be the Transforming Cities Fund, where the North East has been shortlisted to submit a bid by November 2019. The types of measures the authorities are considering in this bid are also focused on enabling sustainable and active ways of travelling in the area. These measures include:

- Transforming Newcastle City Centre to improve bus, pedestrian and cycle access;

- Potential removal of major infrastructure such as the Gateshead Highway flyover;

- Investment in Intelligent Transport Systems and other measures to improve traffic flow and public transport priority on key corridors;

- Consideration of measures such as a Workplace Parking Levy;

- Improved public transport interchanges;

- New Metro stations in areas such as North Tyneside, adding another Metro track east of Pelaw and upgrades to interchanges; and

- New Park and Ride facilities and Metro/light rail extensions/improvements.

Consultation

34. The key recommendation of this report is to carry out a public consultation in order to seek the views of the public, businesses and other organisations on proposals and options to deliver improved air quality.

35. In the development of the Outline Business Case officers from the three authorities have carried out informal stakeholder engagement with key sectors.

36. The Leader and Cabinet Member for Environment and Transport have been consulted on the proposal.

The Outline Business Case takes account of the Tyne and Wear Local Transport Plan which was subject to public consultation during its development.

Alternative Options

37. To comply with the legal Direction, the Council must submit the Outline Business Case to the Secretary of State Defra.

38. Following the consultation, the intention is to take into account the consultation responses in moving forward with the identification of a Full Business Case which identifies the package of measures that Government may require to be implemented in order to achieve its duty to secure compliance with EU limit values in the shortest possible time.

39. Non-compliance with the legal direction could result in the implications set out below in the Risk Management Implication section.

Implications of Recommended Option

What impact will this proposal have

40. The first impact this proposal will have is to fulfil the legal requirement to produce a Feasibility Study to identify an option to deliver compliance with legal limits for nitrogen dioxide in the Council's administrative area in the shortest possible time. It will also enable the Council to consult on the potential options to deliver this compliance objective. The potential improvement in NO_2 concentrations at the areas of greatest exceedance are summarised in Appendix 2 although again it must be noted that we also need to address more issues than just nitrogen dioxide. They can also be seen on the plans showing the outputs of the modelling of NO_2 levels in a number of scenarios within Appendix 2.

41. The proposal is to consult on a package of measures that would make up a potential option for implementation. A decision as to the final package would be made after consultation with the public and further discussions with government.

42. As identified elsewhere in this report, the three authorities have identified a number of key secondary objectives to be met through this work. Correspondingly, success will also be measured through:

- Impacts on public health;
- Impacts on the economy; and
- Impacts on people, particularly the most vulnerable, in our society.

43. The ways in which these will be measured, and more, is set out in a comprehensive Monitoring and Evaluation Plan in the Management case part of the Outline Business Case in Appendix 2. This complies with both JAQU (Defra) guidance and the Government Magenta Book.

44. If implemented, the measures tested would result in significant impacts on particular sectors within the community. While there would be some mitigation achieved through the measures set out in 25-33 above, these are not eliminated. The consultation and further analysis of communities' requirements will be needed to inform the Full Business Case and any bid to the Clean Air Fund.

What is the timetable for implementation

45. The Legal Direction to which the Council is subject only currently requires the submission of a Feasibility Study, rather than the implementation of any plan. However, in recent correspondence it has been made clear that central government is likely to make a further Direction which will require the identification of a final package of measures to achieve compliance with limits values in the shortest possible time and then the implementation of that package.

46. The UK Government is working toward achieving compliance in the shortest possible time, ideally by 2021, and this is the timescale to which local authorities have been required to work.

47. Timescales to deliver the package of measures when a further Direction is received, differ due to the range of measures considered. This will also be dependent on the outcome of the consultation and a Full Business Case. This is reflected in the project plan.

48. The option which would be likely to take the longest time to implement would be that of the charging Clean Air Zone. This is due to the complexity of the installation and integration of local databases and the proposed national charging system.

49. It is considered that the measures would be able to be implemented by January 2021, if consultation were to proceed as recommended and as many procurement elements as possible were to occur in parallel with this. No decision would be made until all necessary approvals were in place and views arising through consultation had been considered.

50. It is proposed that the public consultation exercise set out in this Report would run from March 6th to May 17th 2019, enabling the public and stakeholders sufficient time to engage in the process. Views would primarily be sought through the use of a questionnaire with supporting information provided to ensure respondents can make representations with sufficient information to enable intelligent consideration of the issues and respond accordingly. To supplement this, targeted work is proposed to be done with specific stakeholders including business representative groups and representatives of groups identified within the Integrated Impact Assessment.

51. Major stages of the timetable to implementation include:

- Submission of Outline Business Case to JAQU – 26 February 2019
- Completion of Consultation – 17 May 2019
- Submission of Final Business Case to JAQU and confirmation of funding award – To be confirmed after consultation but as soon as possible and subject to Cabinet approval
- Issue and award tender documents for preferred option elements – As soon as possible 2019
- Begin implementation of final option – As soon as possible

- Installation of relevant infrastructure if required – 2020
- System operational if required – January 2021

Legal implications

52. The Council is required to submit a Final Plan Feasibility Study identifying the preferred option for delivering compliance with legal limits for nitrogen dioxide in the shortest possible time pursuant to the Air Quality Direction 2017.

53. The Council has the power to create a Clean Air Zone, as set out in the Transport Act 2000 and Local Transport Act 2008, subject to carrying out public consultation and giving consideration to the necessity of holding a public inquiry.

54. Other measures set out in this report are within the powers of the Council, subject to consultation and the relevant statutory procedures and the making of Traffic Regulation Orders.

55. The Council has fulfilled its duties under the Public Sector Equality Duty by undertaking an initial Integrated Impact Assessment on the Charging Clean Air Zone Classes, including the level D option. Further impact assessment will also be undertaken to inform future decision-making.

Resources

a) Financial Implications

56. Funding for the Tyneside Feasibility Study has been provided to the three authorities by Defra through a grant process. Newcastle City Council are acting as lead authority. The total funding awarded thus far is £1,350,000 and a further grant request has been submitted in order to cover expenditure up to Final Business Case, including costs for consultation.

57. The three authorities have also received already £1,700,000 in Early Measures Funding to deliver early infrastructure improvements relating to Air Quality.

58. The recommendations in this report do not have direct financial implications for the Council.

59. As and when the Council's progress to the implementation phase, capital works which would be required to implement any preferred option, including a charging Clean Air Zone, would be funded by the Government through the Implementation Fund, which is needs based. The current estimate for funding from the Implementation Fund if a charging CAZ D is introduced is £13,491.

60. Capital and revenue funds which would be required in order to mitigate the impacts from any preferred option, including a potential Clean Air Zone, would be funded by the Government through the Clean Air Fund, which is competition-based. Elements of an initial submission to that fund are incorporated within paragraphs 25-33 above of this report, and the attached Outline Business Case. The current estimate for funding from the Clean Air Fund if a charging CAZ D is introduced is £21,090,000.

61. Details of the final costs of the preferred option will be included with the Full Business Case when it is submitted and will be agreed with Defra. This will comply with the Council's financial regulations.

62. Currently, it is estimated that the total cost to implement a charging CAZ D over 5 years is £3,772,555, including the relevant optimism bias, proposed to be funded from the Implementation Fund as set out in 59.

63. The operating costs are heavily driven by the expected traffic flows within the network. It is considered that there is a 'fixed' operational expenditure of £7,425,938 over 5 years and all other costs are related to traffic flows and consequent vehicle number plate checks.

64. As identified in paragraph 28, the authorities' work to date indicates that of the Charging CAZs tested, a Charging CAZ D is the option which brings the local authorities closest to the legal limit by 2021. The authorities are required by government to consider the impact on our local area and this includes a number of elements that are not felt directly by people or the local economy, such as carbon emissions or additional journey times. Our current analysis is that government's CAZ D approach would have a significant negative impact that is forecast to be in the region of £140million over a five-year period from 2021-2026. It is important to note that this is not a cost that would be directly borne by the local economy and represents estimates about the impact of factors that are not monetised.

65. It is also important to consider that the local authorities are currently only legally required to deliver a study identifying the option that delivers compliance in the shortest time and while we are yet to receive a formal direction to implement such an option, government have been clear that in doing so it will override other considerations, including the impact on the local economy.

66. The authorities' estimates of net revenue raised by the government's CAZ D approach is an average of £43million per year over five years. This estimate does not consider potential exemptions and is based on a geographical area and charge levels that are likely to change following consultation. As a comparison, the estimated revenue from an alternative approach of tolls as identified in paragraph 31 would be an average of £17.5million over the same period. All net surplus funding would be reinvested into the area's transport network.

b) Human Resources Implications

67. To deliver the recommendations there are no human resource implications.

68. To deliver air quality measures as set out in the Outline Business case would require human resources. This is likely to be through existing Council staffing or through joint procurement of specialist expertise. The Outline Business Case takes account of requirements.

c) Property Implications

69. There are no property implications.

d) Procurement Implications

70. There are no direct procurement implications of this report. Newcastle City Council has led on procurement on behalf of the three authorities for the Feasibility Study and it is proposed that this arrangement continues.

71. Officers undertook pre-market engagement with potential suppliers for solutions in Autumn 2018, in order to assist in the development of the Outline Business Case and to determine the procurement strategy.

72. In order to meet the shortest possible time order and begin the operation of any preferred scheme by 1st January 2021, it will be necessary to undertake a number of procurement activities, including advertising potential tenders while the consultation is ongoing. Delaying procurement processes could delay implementation of measures and may expose the authorities to continuing legal risk.

73. This will not prejudge the responses to any consultation as tender documents will:

- Have sufficient flexibility that requirements could be met in more than one way
- Not be signed before the conclusion of consultation and submission of a Final Business Case

Risk Management Implication

74. Failure to comply with the legal Direction is set out in the legal section above. By agreeing to the recommendations, the Council will mitigate any risks posed by action by the government or a non-governmental organisation under the Direction.

75. The key risk is to the public health of the people of the area. Poor air quality is impacting on people's lives and needs to be addressed. The Council has made a number of improvements in recent years but needs to continue to do so through this plan and engaging with people about their travel choices.

76. A further fundamental risk is failure to achieve compliance with air quality standards as defined in EU directives, which have also been incorporated into UK law. While it is unclear what the exit from the EU might mean in terms of the implications if targets are not met. As it stands, it is possible that failure would mean significant infraction fines could be incurred. If the authorities were not to take action to reach compliance, the government could impose a solution on the city. In order to address this risk the authorities have sought advice from external legal counsel.

77. With such significant policy changes, one key risk is causing significant adverse impact on the residents or protected groups. In order to identify and mitigate this risk, the authorities have undertaken impact assessments and identified appropriate mitigations to be funded through the Clean Air Fund.

78. The methodology required modelling of transport and air quality. This has resulted in the adaptation and development of these tools to carry out the study within the short timescales. Whilst proportionate updates and calibrations have been undertaken with models in order to reduce risk, all models have limitations and no model is 100%

accurate. The authorities are continuing to develop updated transport and air quality models to better represent interventions.

79. A further risk relates to the availability of funding at a sufficient level to implement a solution. While the authority is required to submit business cases to government, it is not guaranteed to receive funding. Development of the Full Business Case will enhance estimates for implementation and increase confidence levels in government of funding levels required for deliverability.

80. Risks associated with procurement in the shortest possible time will be mitigated by building on early supplier engagement with potential providers and will continue to develop specifications where possible in advance of the Final Business Case. The authorities are expecting to receive a further Direction from government to deliver measures that bring compliance in the shortest possible time and preparing procurement of different options will reduce the risks in this regard.

Equality and Diversity Implications

81. There are no implications at this stage however mindful of the possible implications on equality and diversity the authorities have completed an Integrated Impact Assessment which forms part of the Outline Business Case. The outcome has shown that more deprived communities are more likely to own non-compliant vehicles. Charged CAZ measures that place a charge on these vehicles entering the CAZ will place additional burdens on finances and the ability to pay, the alternative may involve a longer journey. Also, measures may cause re-routeing of traffic to areas of high deprivation if they lie along alternative routes. This would increase the public health risks as a result of poor air quality from diverting non-compliant vehicles. Scrappage type arrangements are proposed to some categories of vehicle user to support upgrading to a compliant vehicle.

Crime and Disorder Implications

82. None

Health Implications

83. Air pollution is a major risk to human health. Based on national estimates, poor air quality is considered to be responsible for around 360 deaths each year across Gateshead, Newcastle and North Tyneside and around 40,000 across the UK. Related causes of death include circulatory disease, respiratory disease and cancer. As a comparison, there are around 11 deaths per year caused by road traffic collisions across the three local authorities. If the measures are implemented and are successful an improvement in health would be expected.

Sustainability Implications

84. The authorities are mindful of the benefits of more sustainable transport including active modes (walking and cycling) on both air quality, physical and mental health. The Direction from government has required the authorities to focus on minimising NO2 pollution at specific locations of exceedance which requires addressing non-compliant vehicles. However the authorities have sought to include measures that

increase use of sustainable modes in the Outline Business Case and will include this as an element of the Consultation.

Human Rights Implications

85. None

Area and Ward Implications

86. The measures addressed in the Outline Business Case include a charging CAZ which includes Gateshead Town Centre however, if implemented, re-routeing impacts of the measures would be wide ranging and include most areas within the geography bounded by the A1 and A19 to some extent.

Background Information

87. The Outline Business Case is attached as Appendix 2

88. The following documents are available on request:

- Newcastle and Gateshead Core Strategy and Urban Core Plan
- The DEFRA Air Quality Plan July 2017
- DEFRA Clean Air Zone Framework

Gateshead Council | Newcastle City Council | North Tyneside Council

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

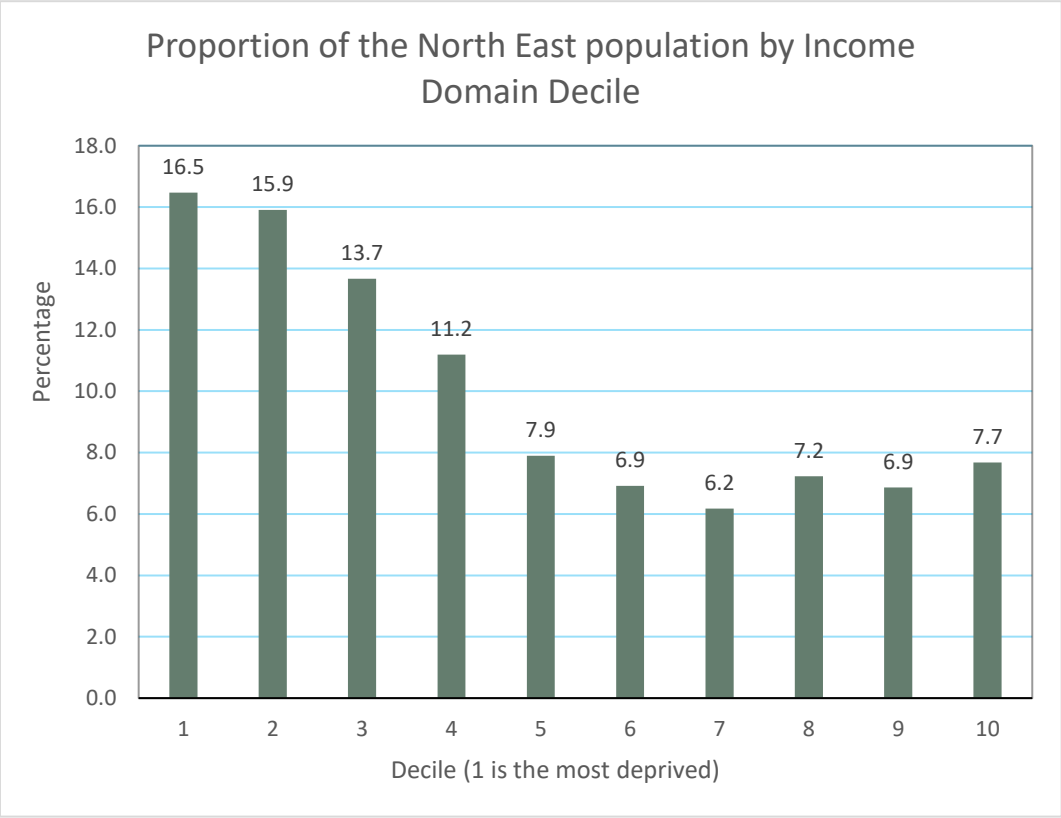
1.4.19 The region's political leaders have emphasised the need to address poverty and social exclusion by reducing income inequalities, both between this region and other parts of the UK, but also within the North East. As one example, Councillor Nick Forbes, Leader of Newcastle City Council, stated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

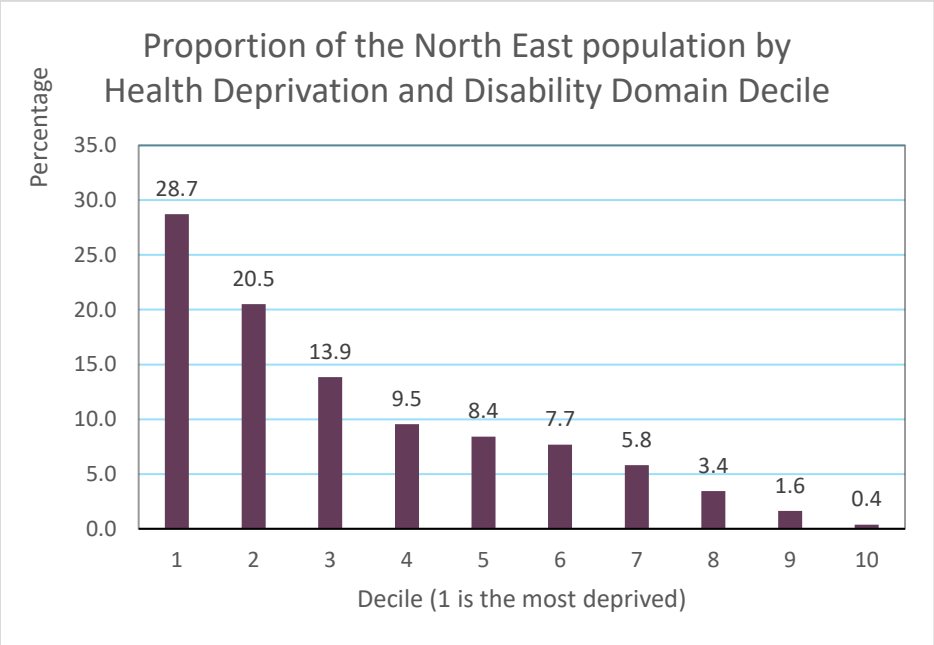
> *"A legacy of industrial change and continuing high levels of unemployment and poor health mean that too many communities across the North East still struggle to access economic opportunity."*

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

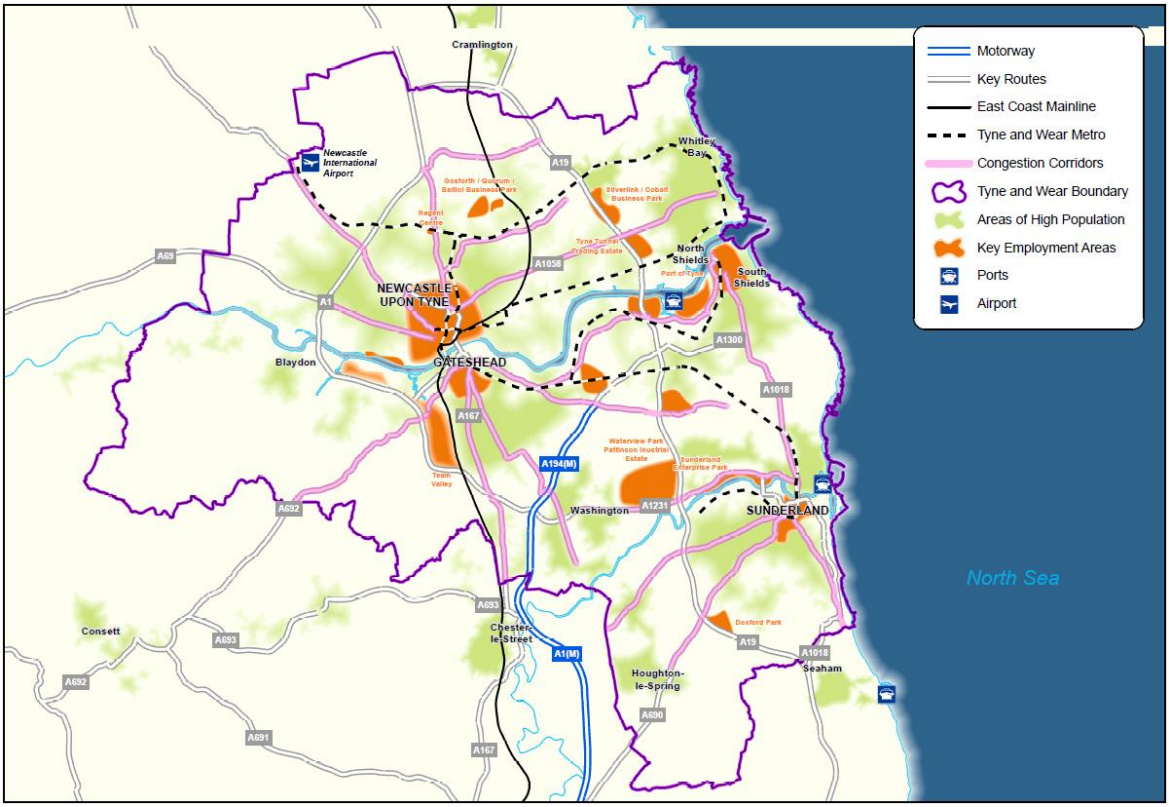


Table 1-2 Mode split for journeys to work in the Tyneside Authorities, source 2011 Census

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

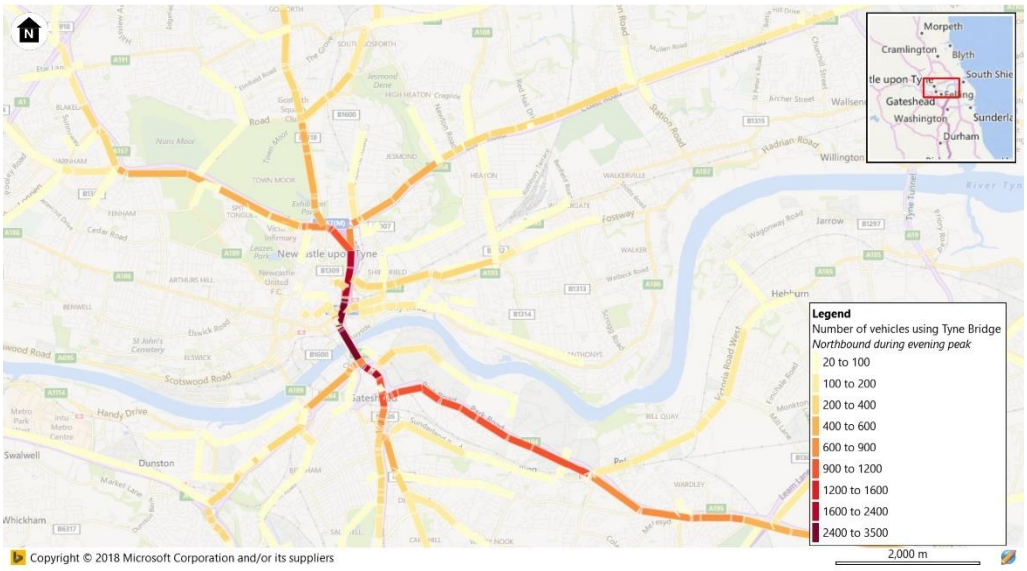
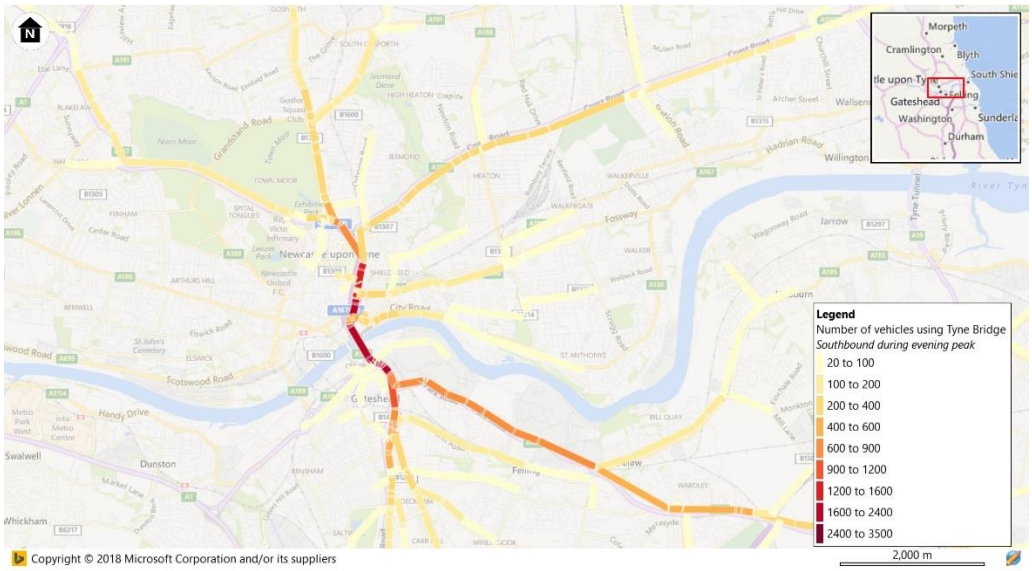


Figure 1-4 Origin/Destination of movements Southbound across the Tyne Bridge in the Evening Peak, per hour

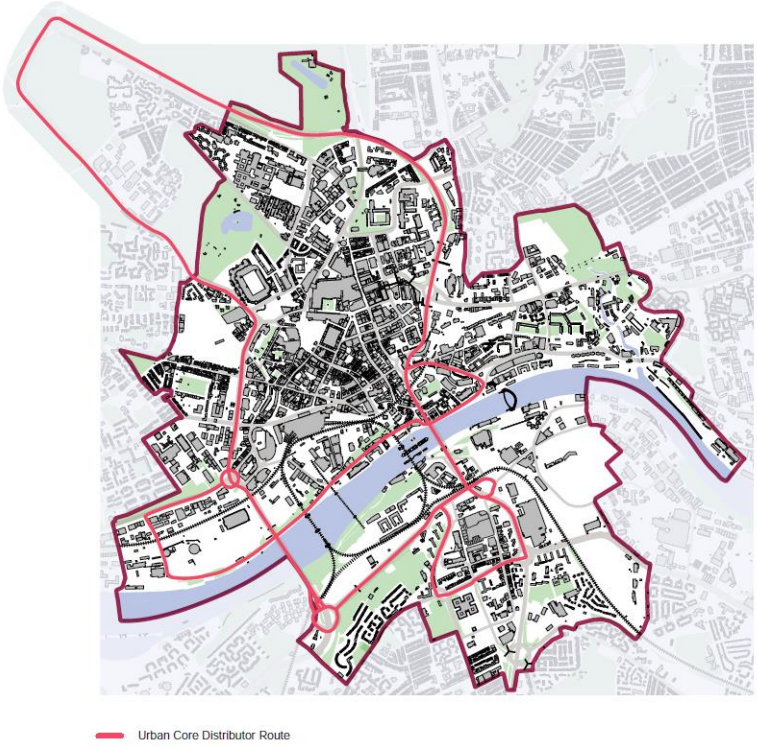


1.6.7 Through their Urban Core Plan, Newcastle and Gateshead jointly have defined the urban core of Newcastle and Gateshead. Vehicle access to and around the urban core is managed to minimise through traffic on the roads within the urban core by Policy UC9. This policy focuses traffic onto the designated 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

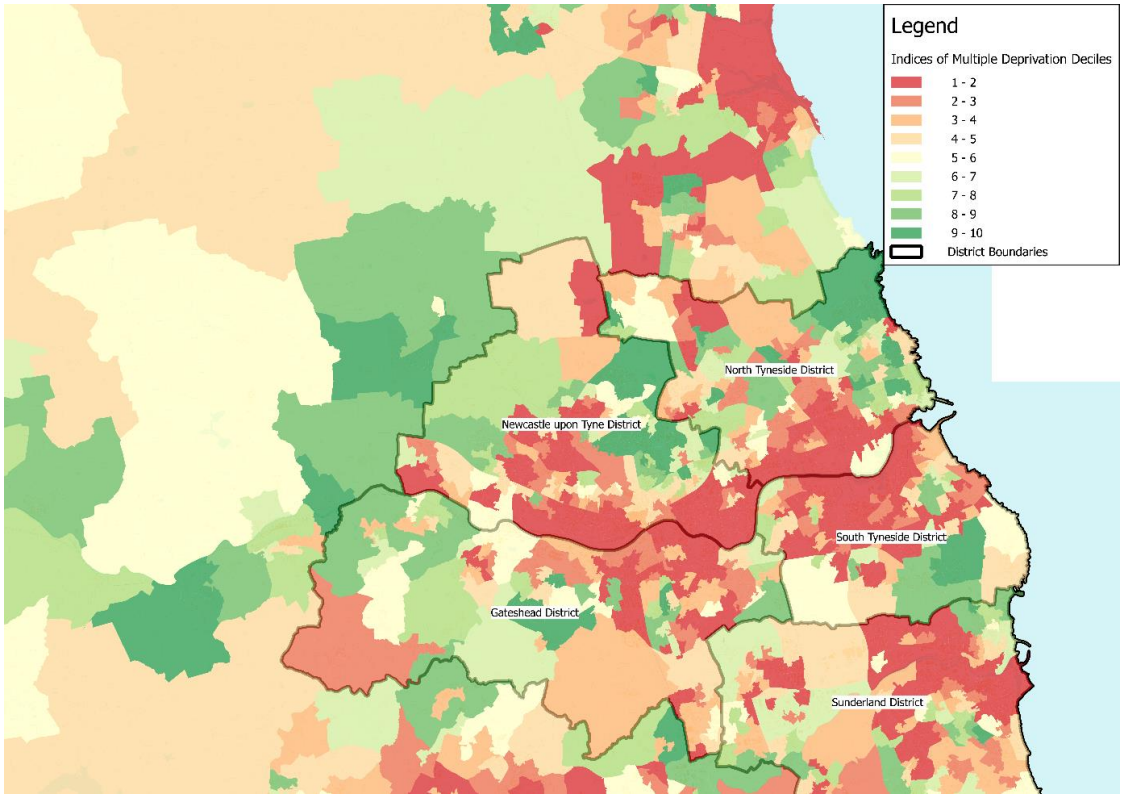
VEHICLE CLASSIFICATION	UK NON-COMPLIANT PERCENTAGE (2013 BASE FOR 2017)*	LOCAL DATA NON-COMPLIANT PERCENTAGE (OBSERVED)
Petrol car	11%	17%
Diesel car	63%	77%
Petrol LGV	27%	37%
Diesel LGV	66%	89%
Bus	60%	84%
Rigid HGV	43%	73%
Arctic HGV	24%	52%

*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

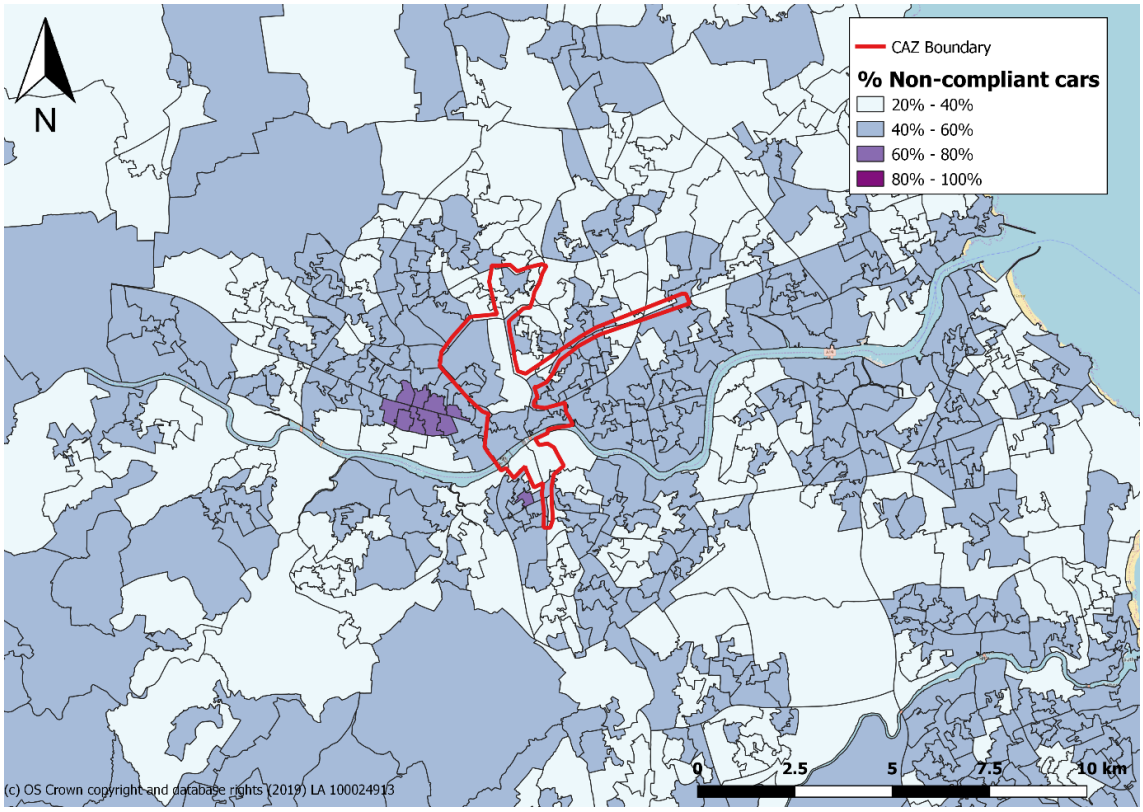


Figure 1-8– Non-compliant LGV ownership- Data source DVLA Data provided by JAQU, 2018

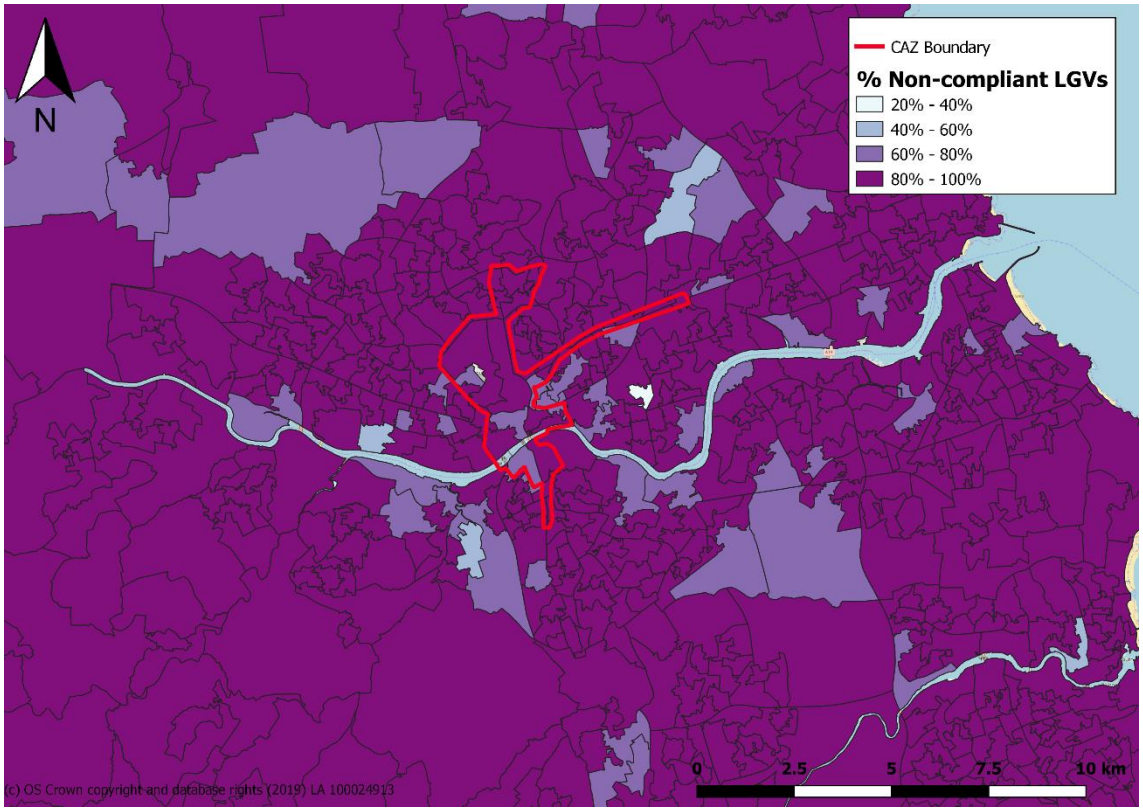
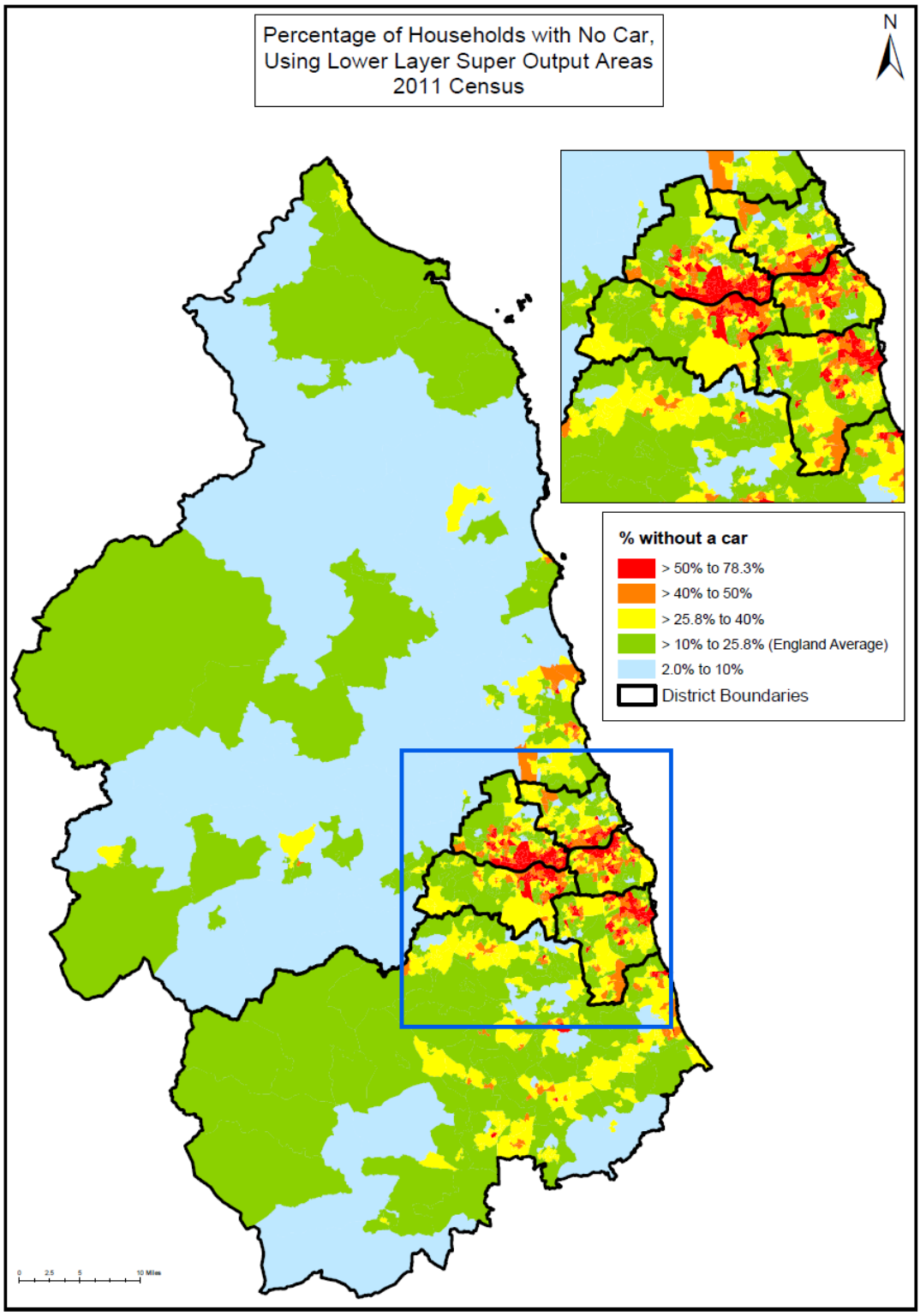


Figure 1-9– Household Car Ownership, by Lower Layer Super Output Area, 2011 Census



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).

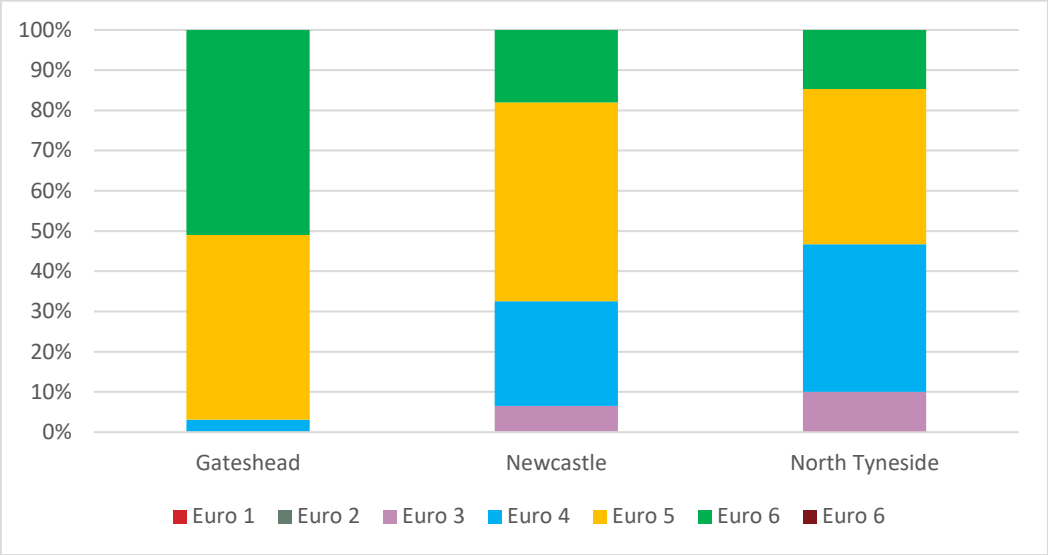
1.6.28 Taxis

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.

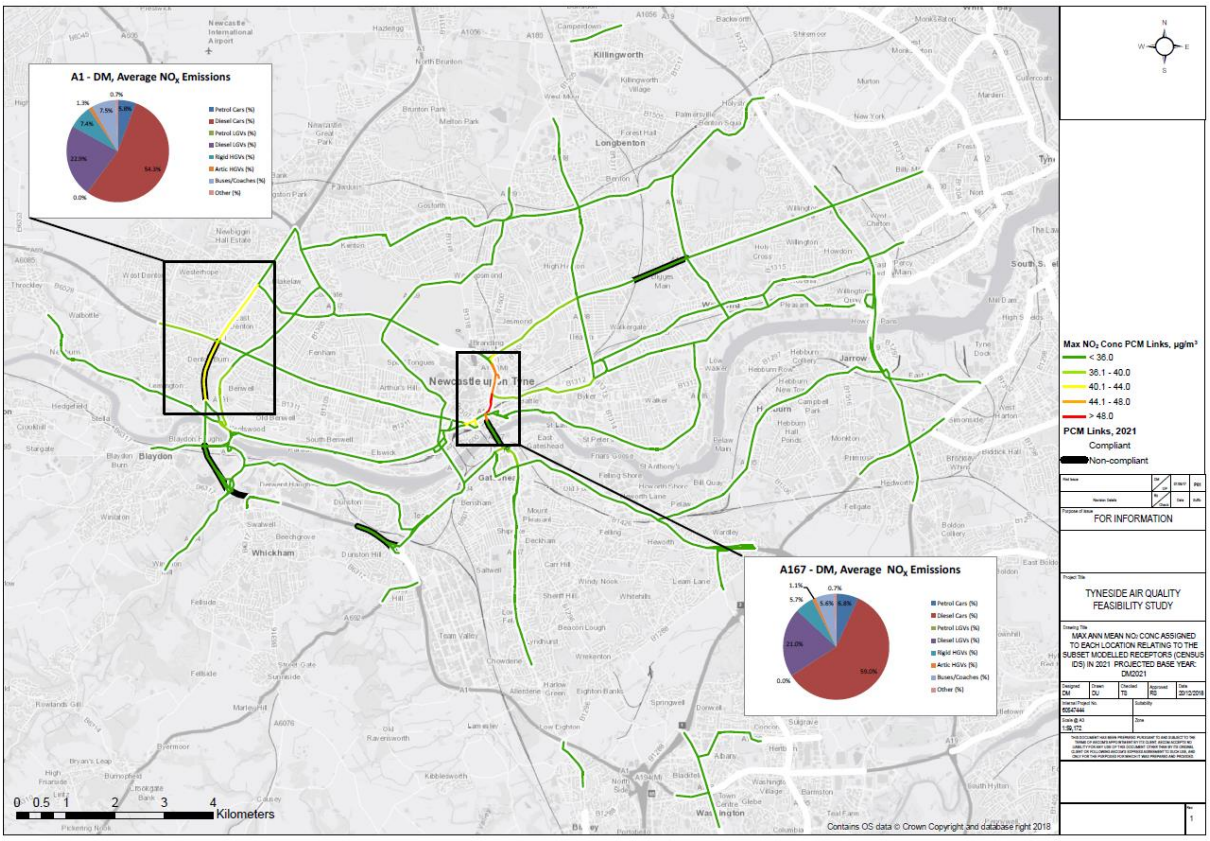
1.7.7 Model Results for Base Year 2017 and Projected Base 2021

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.

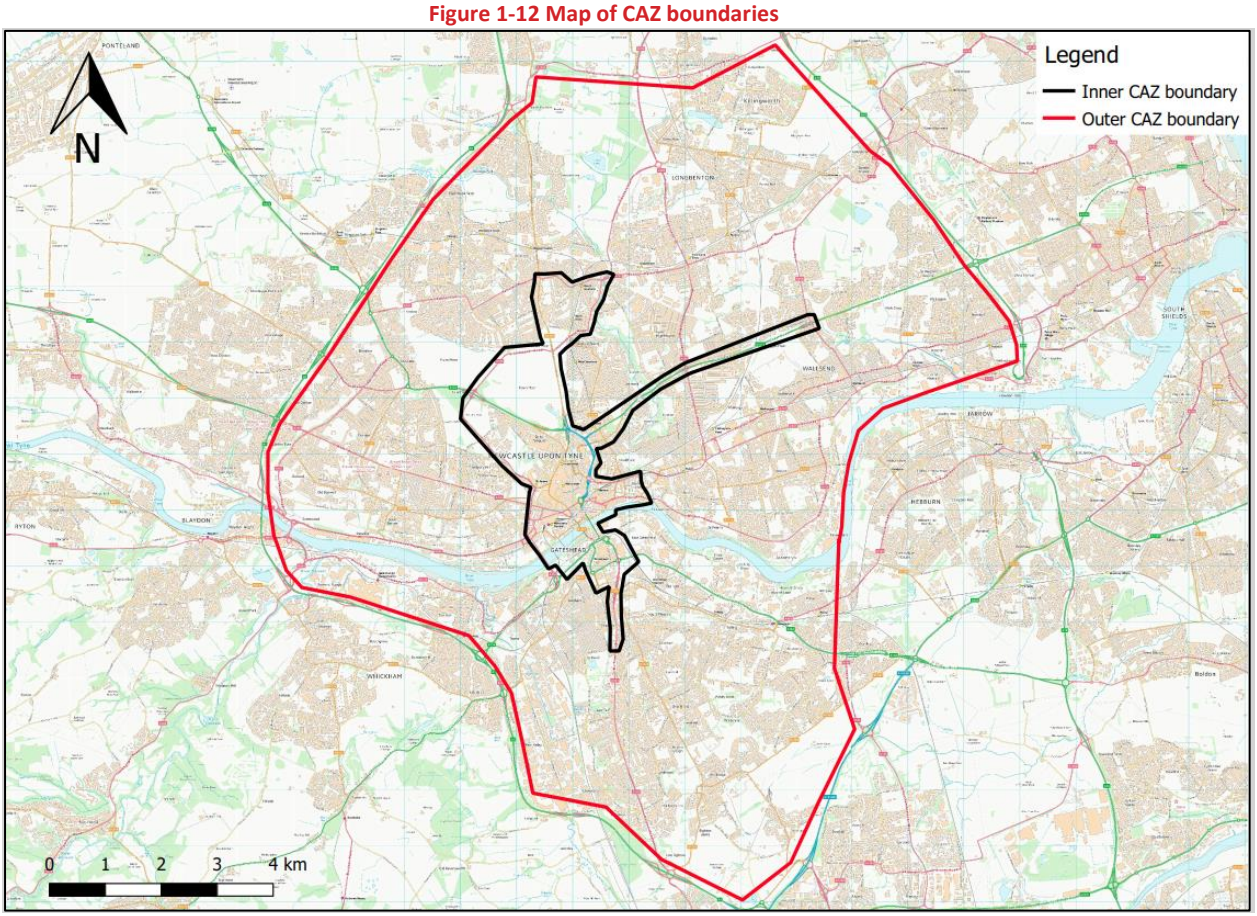
1.8.22 The geographic extent (scope) of the charging zones was based on the initial set of maps provided by JAQU on the extent exceedance links, existing AQMAs, and local knowledge of likely traffic routing and rerouting given the time constraints on this work. This was prior to reaching agreement with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

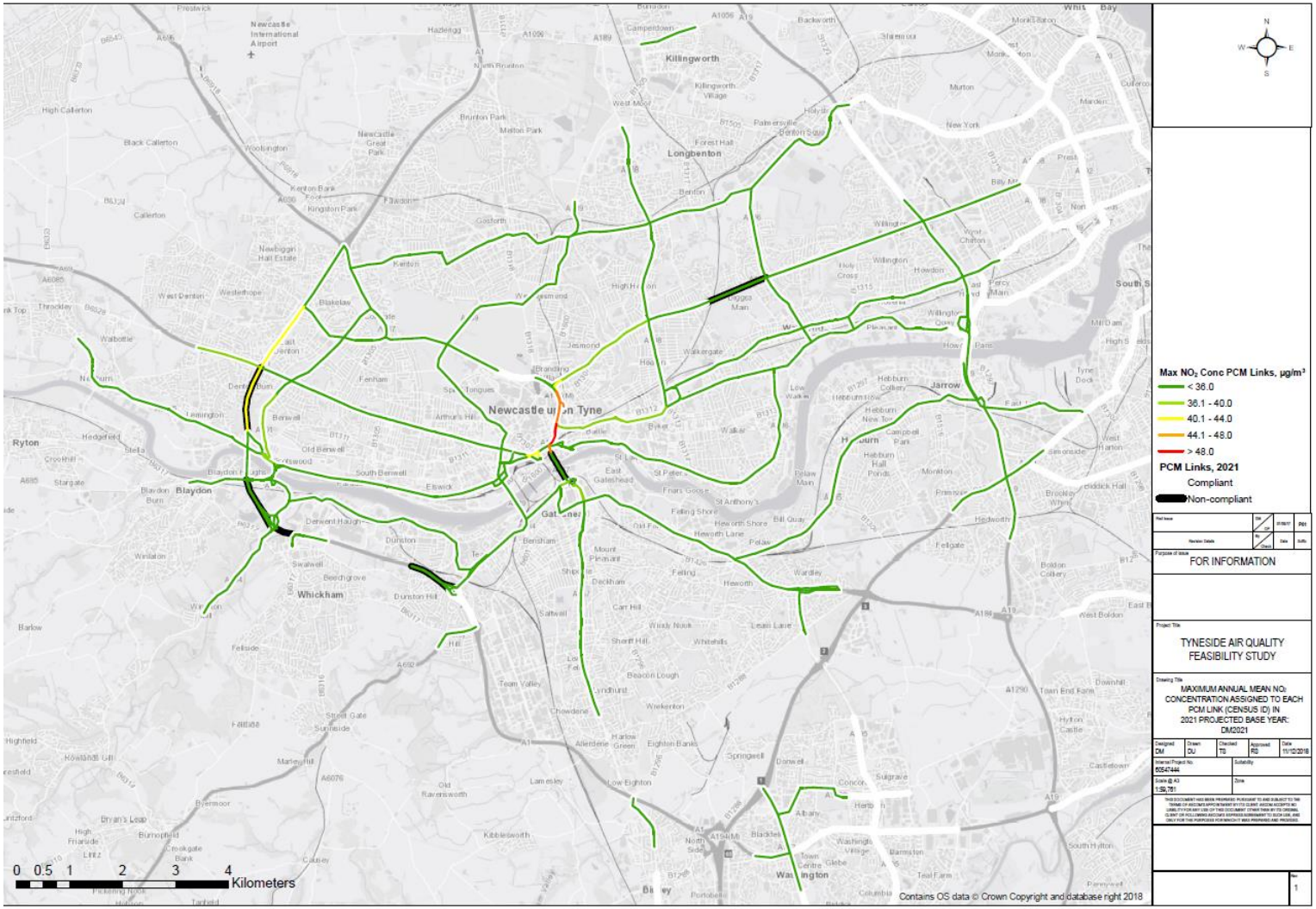


Figure 1-15 CAZ B Results

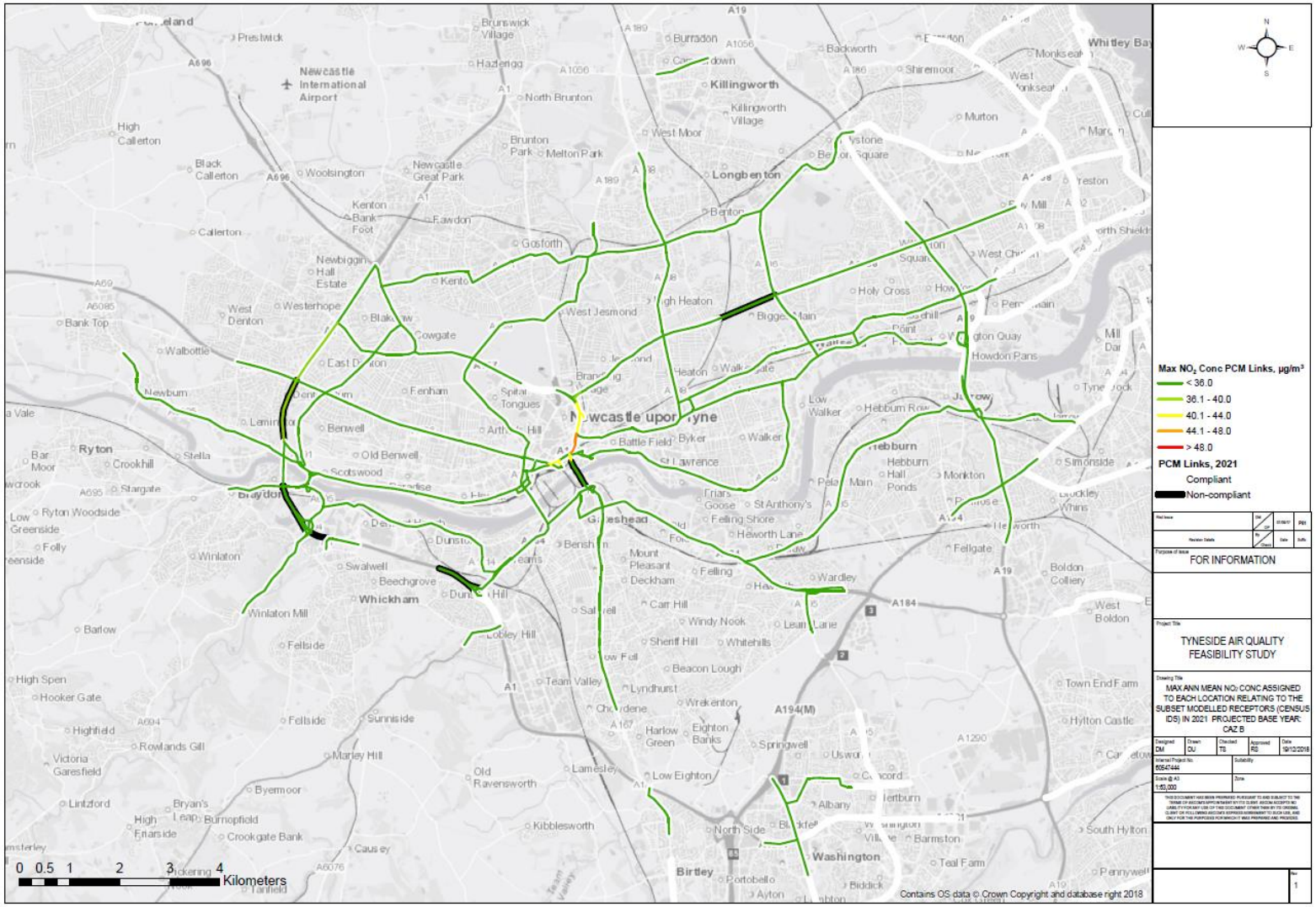


Figure 1-16 CAZ C Results

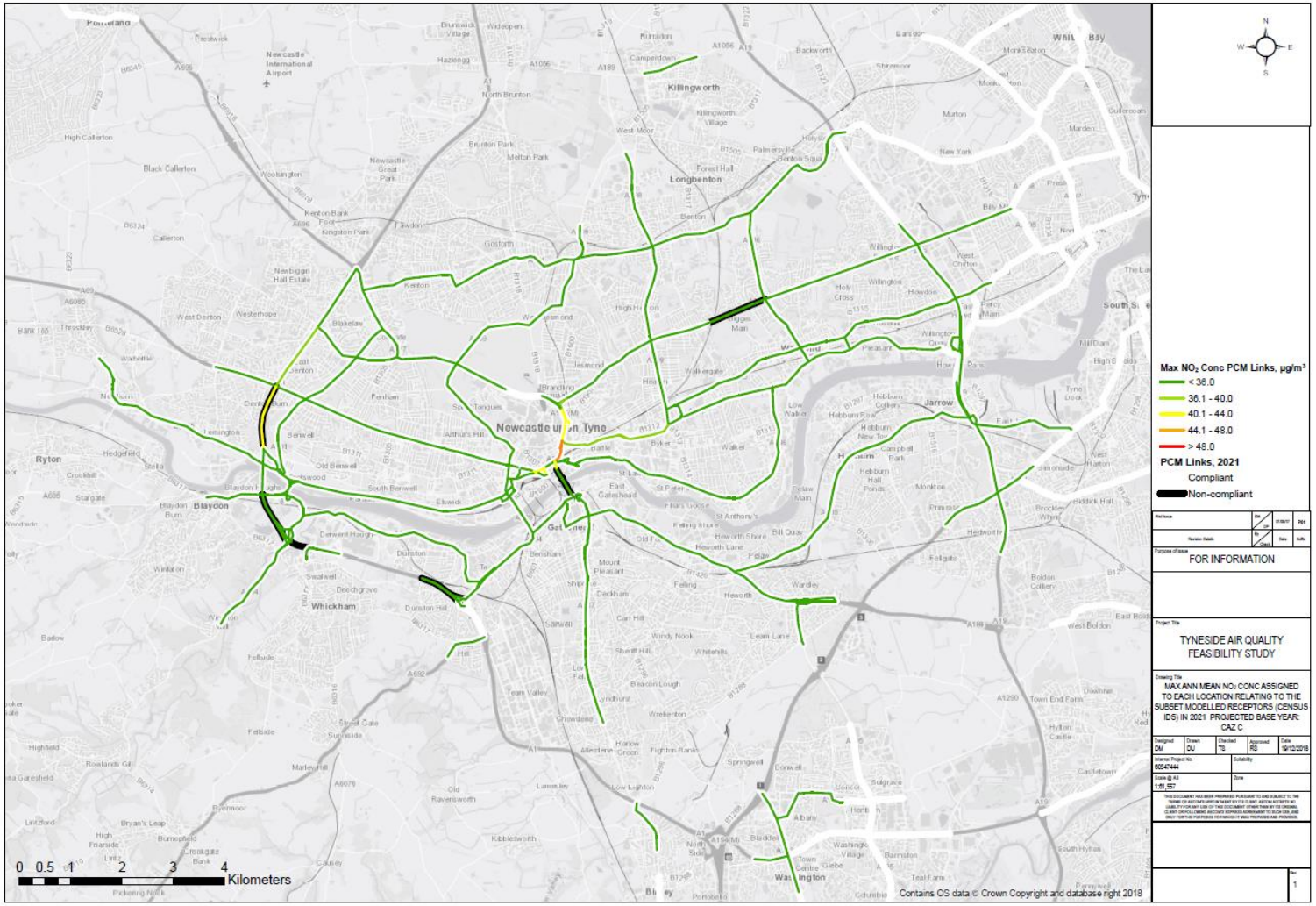
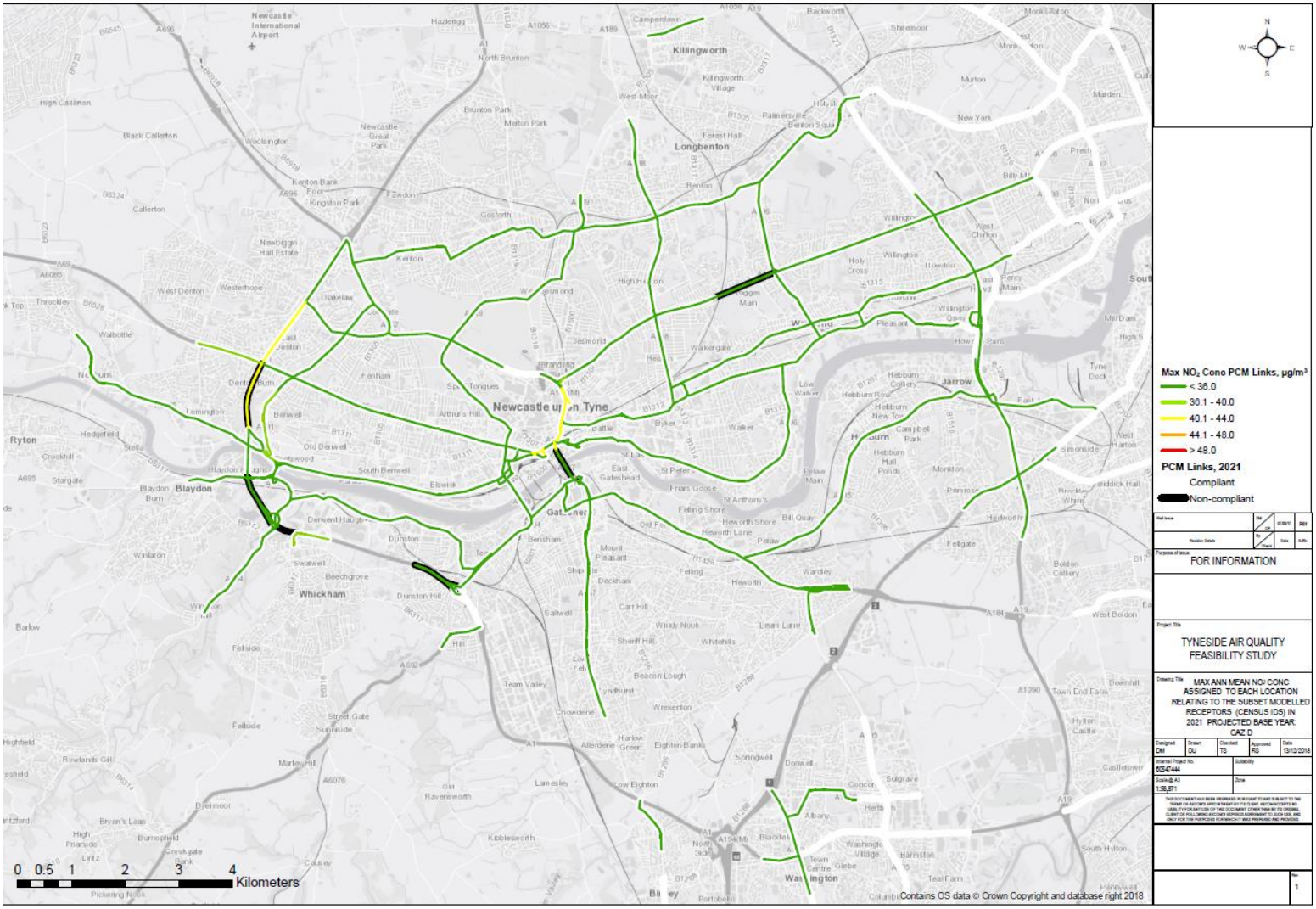


Figure 1-17 CAZ D Results



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)

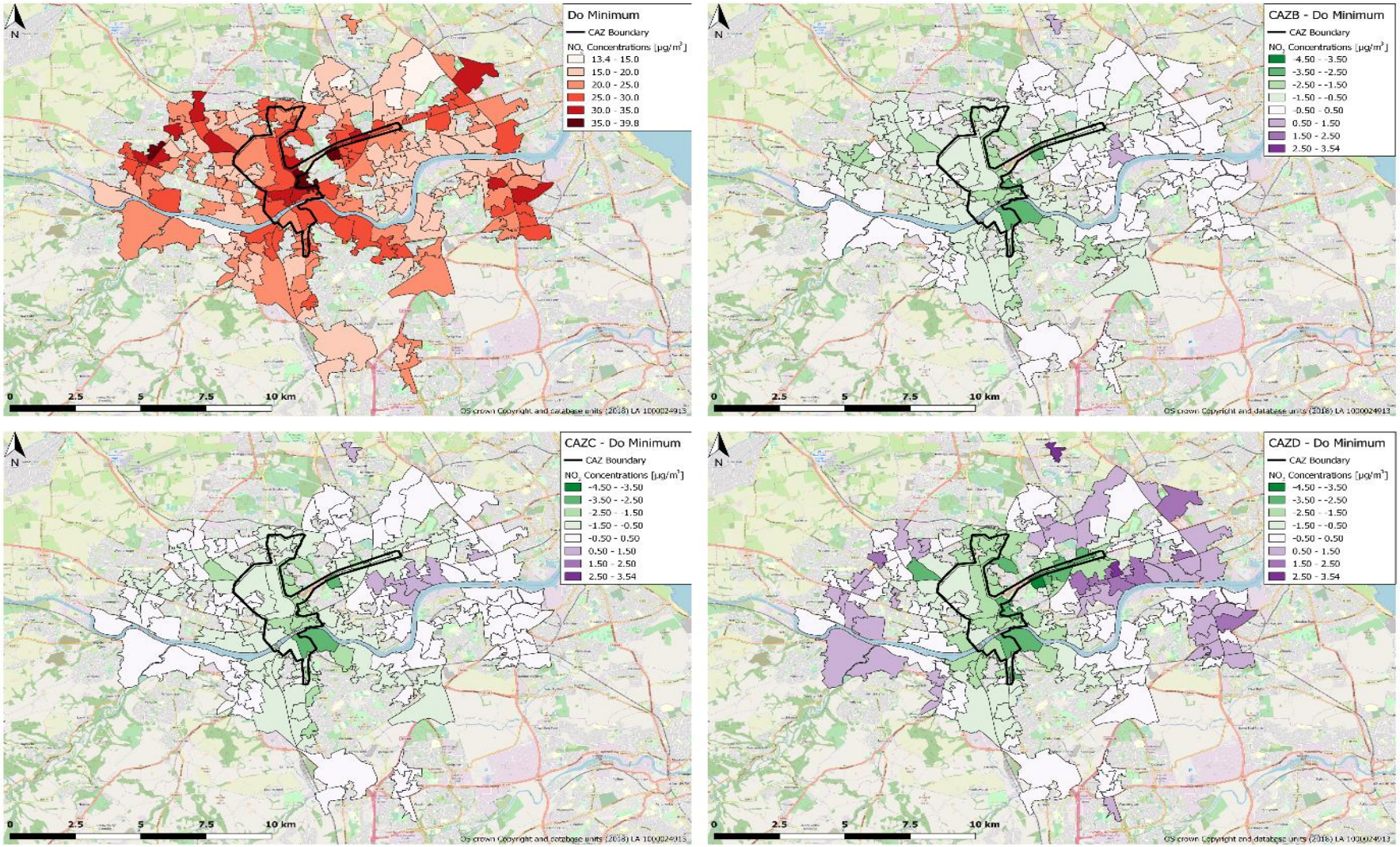


Figure 1-19 All CAZ Results – Changes in NO_2 Concentration (graphical)

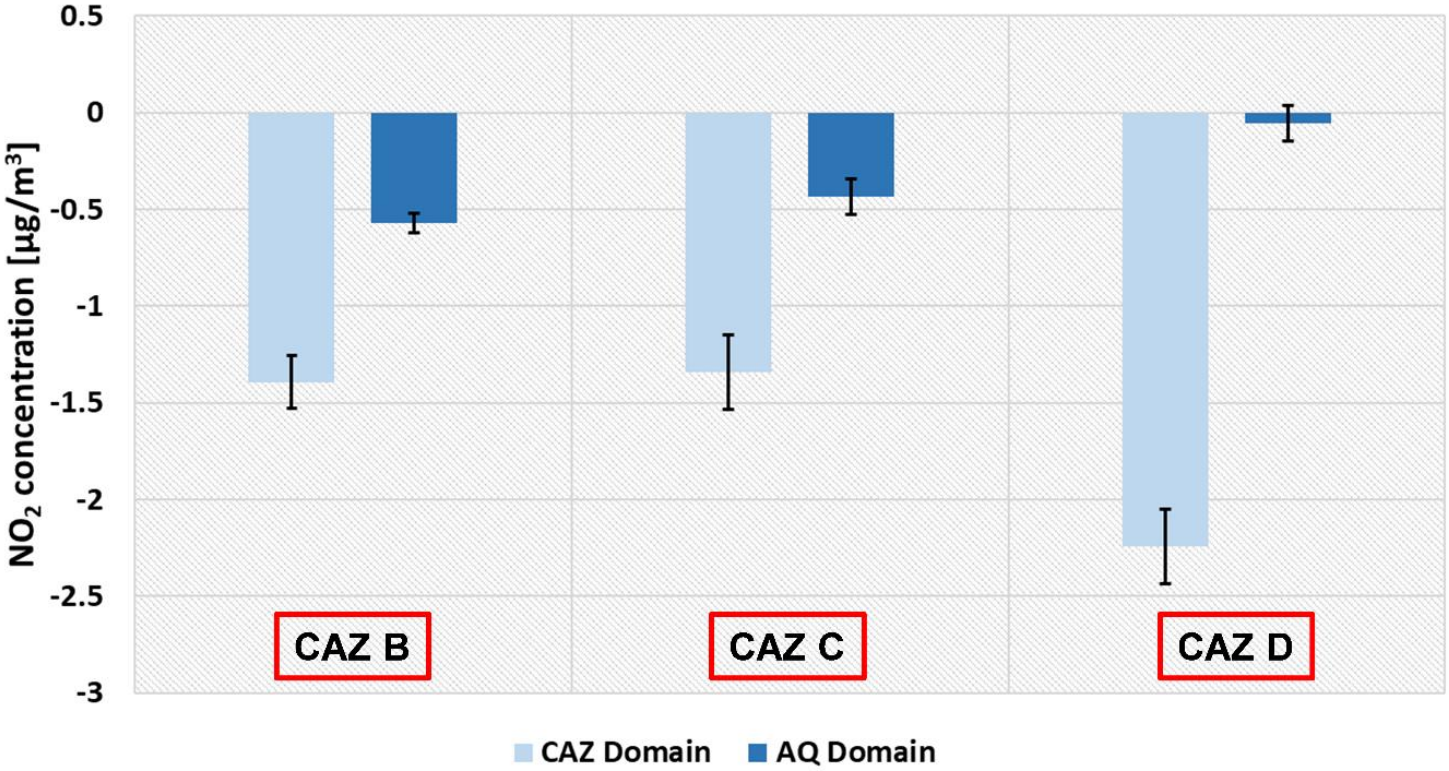


Table 1-11: Number of LSOAs and population with an improvement or a deterioration of NO_2 concentration (relative to baseline), disaggregated by "Under 16" quintile for the domain of study.

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

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AIR QUALITY FEASIBILITY STUDY
ECONOMIC CASE

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2. ECONOMIC CASE

Please refer to the summary position provided by the Tyneside Authorities within the Strategic Case regarding the current modelled option that achieves compliance in the shortest time.

2.1 Introduction

2.1.1 This Economic Case assesses options to identify all their impacts, and the resulting value for money. The economic, environmental, social and distributional impacts of a proposal are all examined, using qualitative, quantitative and monetised information.

2.1.2 To ensure that the most effective solution is implemented efficiently within the Tyneside Authority areas, a comprehensive modelling process was required to assess and evaluate all of the options considered. At this stage, the appraisal tools have been developed in a very short timescale and are subject to future verification through the development of a more robust set of appraisal tools. It is acknowledged that a Preferred Option would be one that achieves compliance to EU standards, whilst minimising the overall impact on residents and businesses.

2.1.3 This Economic Case evaluates the performance of the CAZ options taken forward to the 'short-list' within the SOC and assesses the overall benefits and costs to identify the impacts of each option. The *E1_Tyneside_Economic Appraisal Methodology Report* provides detail in relation to the methodology used for economic appraisal. The *E2_Tyneside_ Economic Model* provides the full set of data sources and assumptions applied in the study, as well as presenting the summary of economic impacts.

2.1.4 The methods applied within the appraisal of each of the CAZ schemes are consistent with the JAQU guidance. In order to ensure results are comprehensive, alternative methods and additional steps have been undertaken to encompass all factors associated with each parameter of the scheme. These are set out in the *E1_Tyneside_Economic Appraisal Methodology Report* .

2.1 Scope of impacts assessed

2.1.1 The CAZ options will have an impact on the economy, environment and society. The economic assessment of each of the schemes seeks to quantify and monetise impacts which will be affected as a result of the implementation of the CAZ schemes. Impacts which have been assessed are set out as follows.

2.1.2 Health and environmental – Changes in NO_x, PM and CO_2

2.1.3 The air quality impact upon the population as a result of changes in emissions such as NO_x and PM. To calculate the economic impact of changes in harmful emissions, an air quality and transport model are used to provide outputs based on the parameters of each CAZ option for CO2, NOx and PM_{10}. As well as harmful emissions resulting from road traffic, results generated by the air quality model are used to calculate the morbidity savings resulting from a scheme.

2.1.4 Upgrade costs

2.1.5 The impact on those vehicle owners which respond to the CAZ scheme by replacing their existing vehicles with a EURO 6 compliant vehicle. These encompass the costs associated with owners switching from a non-compliant to a compliant vehicle, including scrappage costs, transaction costs and consumer welfare impacts, as outlined within the JAQU guidance.

2.1.6 Government costs

2.1.7 As well as costs incurred by road users resulting from the implementation of a CAZ scheme, there will also be costs associated with the implementation and enforcement of a scheme by the authority. This will be based around estimates developed for the Financial Case within the OBC, which presents detailed implementation costs.

2.1.8 Fuel switch costs

2.1.9 Savings or additional costs associated with the implementation of a CAZ scheme. Analysis of transport systems suggests that when a scheme is implemented, road users may choose to change fuel type. This includes any changes in fuel consumption, as well as in operating and maintenance costs.

2.1.10 Greenhouse gas (GHG) impacts

2.1.11 Changes in traffic composition, and the number of vehicles upgrading or cancelling their journeys will have an impact on fuel consumption, which in turn affects the quantum of GHG emissions. This takes into account re-routing of non-compliant traffic, and assesses the impact within the study area and model wide.

2.1.12 Consumer welfare impact

2.1.13 Where road users avoid the charging zone, cancel their journey or switch mode, there will be a cost associated with having to choose alternative modes or routes. Thus, where a trip is cancelled, the road user loses value in the trip that would have been gained if they were able to continue with their original choice of trip. It is assumed that the average cost is therefore equal to half of the charge value, as outlined within JAQU guidance.

2.1.14 Indirect taxation

2.1.15 Indirect tax revenues accrue to the government which perceives those revenues in the factor cost unit amount.

2.1.16 Traffic flow impact

2.1.17 The implementation of a CAZ scheme will have an impact on traffic flow, subsequently impacts road user travel times – this affects the monetisation of road user times. Where vehicles cancel a trip, or are forced to reroute in order to avoid the charging zone, this can lead to re-distribution of traffic elsewhere on the network which can reduce or increase journey times. This is encompassed within the Transport Modelling economic assessment using TUBA, which adheres to WebTAG guidance in the monetisation of benefits, or otherwise, as a result of the scheme.

2.1.18 Impacts not assessed

2.1.19 Given the stage of the study, some economic impacts were not assessed, these include:

- Safety;
- Reliability; and
- Wider economic impacts.

2.2 Tools and data sources

2.2.1 In the analysis of the impacts assessed, as listed above, a number of tools and data sources have been utilised to provide an understanding of the performance of each of the schemes. An overview of tools and data used in the assessment is provided below.

Table 2-1 Tools and data sources used within the analysis

IMPACT	OUTPUTS GENERATED	ECONOMIC VALUES
Health and environment	Outputs for air quality emissions of each option generated using the EfT toolkit.	$PM_{2.5}$ and NOx damage costs are provided within the JAQU guidance documents.
GHG emissions	Combining the number of vehicle upgrades with the vkm (vehicle kilometres) travelled per annum with emission factors provided.	BEIS carbon prices used.
Traffic flow improvements	Flow difference plots across the scenarios, as well as user time benefits resulting from scheme implementation.	Input data such as Value of time provided within the WebTAG databook.
Consumer welfare impact	Traffic flow data showing the number of vehicles impacted within and around the charging zone.	By calculating the number of vehicles that avoid, cancel their journey, or switch mode (unique vehicles), this can be multiplied by half the charge to generate the welfare loss.
Fuel switch costs	Changes to vehicle fleet composition combined with vkm travelled per annum and fuel consumption per km, captured within TUBA.	Fuel prices provided by BEIS and Fuel Consumption from WebTAG databook.
Costs associated with fleet change	Traffic data and JAQU behavioural responses used to define the number of vehicles upgrading from non-compliant to compliant	Vehicle prices and depreciation rates provided within JAQU guidance.
Government costs	Capital and operational costs.	Unit costs associated with the implementation of the scheme.

2.3 Scenarios

2.3.1 The options tested as part of the OBC included a Do Minimum Scenario and three shortlisted CAZ scenarios.

2.3.2 Do Minimum scenario

2.3.3 To provide a comparison for the assessment of the various measures proposed, 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 been compared with the Do Minimum to ascertain their performance in relation to the Critical and Secondary Success Factors. Table 2-2 provides the assumptions included in the Do Minimum. Further detail can be found in the *E2_Tyneside_ Economic Model*.

Table 2-2 Do Minimum scenario

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

2.3.4 Do Something scenarios

2.3.5 The CAZ options considered within the economic appraisal for the OBC are set out in Table 2-3. Note, it is not expected that any CAZ will be delivered in isolation. Specification of the complementary measures are still under consideration due to the complexities of the impacts and deliverability of each scheme and it is expected that this will be tested in the Full Business Case, both in isolation, and with a CAZ scenario.

Table 2-3 Do Something scenarios

OPTION	DETAILS
CAZ B	Introduced in 2021 CAZ applies to HGVs, taxis, coaches and buses 100% taxi compliance assumed
CAZ C	Introduced in 2021 CAZ applies to LGVs, HGVs, taxis, coaches and buses 100% taxi compliance assumed
CAZ D	Introduced in 2021 CAZ applies to Cars, LGVs, HGVs, taxis, coaches and buses 100% taxi compliance assumed

2.4 Detailed analysis

2.4.1 Government costs

2.4.2 The table below shows the capital expenditure (CAPEX) and operational expenditure (OPEX) for each scenario. CAPEX costs comprise inception costs and roadside costs associated with the implementation of a CAZ scheme. Inception costs includes aspects such as marketing and communications, while roadside costs encompass infrastructural requirements such as ANPR cameras and signage. Operational costs comprise the back-office staff, client interface, management of estate, and management of penalty charge notices.

2.4.3 As noted within the Strategic Case, mitigation has not been factored in due to the uncertain funding environment. These would increase Government costs.

Table 2-4 CAPEX and OPEX Costs for CAZ Operation (£s)

CAZ	COSTS	TOTAL
B	Capital expenditure	£3,592,600
	Operational expenditure	£6,941,324
C	Capital expenditure	£2,842,600
	Operational expenditure	£19,568,797
D	Capital expenditure	£2,842,600
	Operational expenditure	£27,875,224

[1], [2]

2.4.4 Health and environmental appraisal

2.4.5 Air quality emissions

2.4.6 Based on emission concentrations, the table below summarises the cumulative changes in levels of both NO_x and PM_{10}. The below table shows that only CAZ B and C achieve reductions in NO_x. For CAZ D, there is an increase in NOx, likely to be due to the increase in vehicle kms travelled by drivers choosing to avoid the charge and take different routes to get to their destination. This is also represented in the increase in Greenhouse Gases for CAZ D (Table 2-8). All CAZs result in a reduction of PM_{10} tonnes per year.

[1] The costs outlined in the table above have been generated using 2018 prices, in accordance with the JAQU guidance. All benefits, which are summarised in the subsequent section, are also in 2018 prices adapting a consistent approach in the appraisal of each of the schemes.

[2] *Note: C = Capital Expenditure (CAPEX) & O = Operational Expenditure (OPEX)*

Table 2-5 2021 Air quality cumulative effect (tonnes per year)

	NO_X	PM_{10}	NO_X CHANGE (2021)	PM_{10} CHANGE (2021)
Do Minimum	1137.12	114.27	-	-
CAZ B	1126.42	113.57	-10.70	-0.70
CAZ C	1107.97	113.58	-29.15	-0.69
CAZ D	1157.53	112.49	20.41	-1.78

2.4.7 The cumulative air quality changes per tonne per year in 2021, as shown above, have been quantified in terms of monetised benefits using the Defra air pollution valuation tool recommended by JAQU, which accounts for damage costs and calculates figures into 2018 prices based on data entries.

2.4.8 Changes in PM_{10} results are summarised below showing that all three CAZ scenarios have positive benefits, with CAZ D showing the greatest benefit.

Table 2-6 Particulate matter valuation (£s)

CAZ	2021	2022	2023	2024	2025	2026	TOTAL
CAZ B	£61,257	£53,382	£44,946	£36,564	£28,739	£21,825	**£246,714**
CAZ C	£60,037	£52,319	£44,051	£35,835	£28,166	£21,390	**£241,798**
CAZ D	£154,878	£134,967	£113,638	£92,445	£72,661	£55,180	**£623,768**

2.4.9 For NOx, both CAZ B and CAZ C have economic benefits, however CAZ D has a negative impact. This can be attributed to the vehicle mileage, as commercial vehicles are not able to avoid the CAZ as a destination, whereas private vehicle operators respond differently in terms of mode and destination due to increased flexibility in their choices.

Table 2-7 Nitrogen Oxides valuation (£s)

CAZ	2021	2022	2023	2024	2025	2026	TOTAL
CAZ B	£52,434	£45,694	£38,473	£31,298	£24,600	£18,681	**£211,179**
CAZ C	£142,853	£124,488	£104,815	£85,267	£67,019	£50,895	**£575,338**
CAZ D	-£100,021	-£87,163	-£73,389	-£59,702	-£46,925	-£35,635	**-£402,835**

2.4.10 Across each of the scenarios, CAZ C has the most benefits when combining both PM_{10} and NO_x as air quality impact indices. Across both measures of air quality, **CAZ C** has a total of **£817,136** worth of benefits when forecasted over an appraisal period between 2021-2026. **CAZ D** demonstrates £220,933 worth of benefits between 2021-2026.

2.4.11 Greenhouse gas impacts

2.4.12 Changes to people's travel behaviour, including modal shift and vehicle type has an impact on the levels of Greenhouse Gas (GHG) emissions resulting from untraded carbon emissions. The table below presents the cumulative difference in GHGs between the 'Do Minimum' scenario and each of the CAZ schemes.

Table 2-8 2021 GHG cumulative effect (tonnes per year)

	CO2	CHANGE (2021)
Do Minimum	516,917.70	-
CAZ B	512,636.65	-4,281.05
CAZ C	514,824.82	-2,092.88
CAZ D	520,547.67	3,629.96

2.4.13 Based on outputs derived from air quality modelling, CAZ B and C are expected to demonstrate a decrease in CO_2 tonnage per year in 2021 when compared with the 'Do Minimum' scenario. These quantum changes in CO_2 emissions therefore represent a decrease in GHG emissions being within the Tyneside study area.

2.4.14 The changes in carbon tonnes per year outlined with the table above are monetised using the Department for Business, Energy and Industrial Strategy (BEIS) central carbon price per tonne in 2021 (**£69.20**).

2.4.15 When comparing the CAZ options, CAZ B has the most positive economic impact on carbon reductions within the Air Quality Modelled area, with CAZ D resulting in a disbenefit. As with NOx, this disbenefit is likely to be caused by a larger number of non-compliant private vehicles choosing to re-route to avoid the CAZ, increasing the amount of carbon emissions across the network.

Table 2-9 CO_2 valuation (£s)

	2021	2022	2023	2024	2025	2026	TOTAL
CAZ B	£311,604	£271,545	£228,634	£185,994	£146,189	£111,018	**£1,254,983**
CAZ C	£152,334	£132,750	£111,772	£90,927	£71,468	£54,273	**£613,523**
CAZ D	-£264,213	-£230,247	-£193,861	-£157,706	-£123,956	-£94,133	**-£1,064,117**

2.4.16 Transport economic appraisal

2.4.17 Upgrade costs

2.4.18 Upgrade costs comprise vehicle scrappage costs and transaction costs associated with the upgrade of a vehicle by a road user.

2.4.19 As part of the process of upgrading to a compliant vehicle, it is assumed the existing vehicles will be scrapped in order to purchase a newer vehicle. This has been derived by estimating the price of vehicles purchased and scrapped using the depreciation rates, based on the assumption that upgrades resulting from implementation of the CAZ will be made immediately prior to its introduction and realised in 2021 figures. For vehicle owners who purchase a new vehicle, there is a supplementary cost associated with the time and resource expended searching for it. Market inefficiencies including intermediary (dealer) profits are also included. The values have been derived from the data provided by the JAQU.

Table 2-10 Scrappage and transaction costs by vehicle class (£000s)

CAZ	VEHICLE TYPE	SCRAPPAGE COSTS	TRANSACTION COSTS
CAZ B	Car	-	-
	LGV	-	-
	HGV	-£2,819.00	-£0.68
CAZ C	Car	-	-
	LGV	-£1,417.89	-£3.87
	HGV	-£2,819.00	-£0.68
CAZ D	Car	-£12,090.88	-£15.2
	LGV	-£1,417.89	-£3.87
	HGV	-£2,819.00	-£0.68

Table 2-11 Cumulative scrappage and transaction costs (£000s)

CAZ	SCRAPPAGE COSTS	TRANSACTION COSTS
CAZ B	-£2,819.00	-£0.68
CAZ C	-£4,236.89	-£4.55
CAZ D	-£16,327.78	-£19.76

2.4.20 Table 18 and 19, demonstrate upgrade costs associated with a CAZ scheme up to 2021, they summarise that all options result in a negative impact.

2.4.21 Fuel switch costs

Table 2-12 Fuel switch costs

IMPACT	CAZ B	CAZ C	CAZ D
Fuel Switch Costs	-£1,760.08	-£4,120.39	-£8,856.06

2.4.22 The change in fuel switch costs reflects the change in vehicle operating costs to the user. The above table illustrates the costs of switching fuel types based upon the CAZ charging scheme.

2.4.23 The most substantial change in switching of fuel occurs within the CAZ D scenario, because all non-compliant vehicles are charged.

2.4.24 Consumer welfare impacts

2.4.25 In the Do Something models with a clean air zone charge, a number of vehicles choose to re-route to their destination, alter their destination or transfer to rail/metro in order to avoid having to pay the charge. This traffic flow reflects the overall welfare disbenefit as these users are adversely affected by the establishment of the charge. Welfare loss is calculated by subtracting the do minimum flow (i.e. reference scenario with no charge) from do something flows and multiplying by half the CAZ charge (rule of half). This calculation is performed for each Do Something scenario, reflecting the application of charge to the relevant vehicle type. Transfer payments (user toll costs and government revenues) are excluded.

Table 2-13 Consumer welfare loss – behavioural impacts and travel pattern changes

IMPACT	DM	CAZ B	CAZ C	CAZ D
Daily vehicles entering the CAZ (2021)	59,738	58,839	52,486	18,921
Daily vehicles entering the CAZ (2026)	20,958	20,809	18,719	6,633
Welfare loss (vehicles cancelling/avoiding the CAZ) (2021-2026)	NA	-£6,885	-£27,833	-£105,821

2.4.26 Indirect taxation

2.4.27 Indirect taxation Is shown below.

Table 2-14 Indirect taxation (£000s)

IMPACT	CAZ B	CAZ C	CAZ D
Indirect taxation	£848.45	£1,963.17	£24,435.02

2.4.28 The benefits described in Table 2-14 may be a result of increased fuel consumption for longer distance travelled to avoid the charge for non-compliant vehicles.

2.4.29 Traffic flow impact

2.4.30 TUBA has been used to assess the impact of each of the options of traffic flow. The table below summarises impacts on Journey time benefits.

Table 2-15 Aggregated traffic flow impact (£000s)

IMPACT	CAZ B	CAZ C	CAZ D
Traffic Flow Impact	-£1,039.50	-£6,953.07	-£31,502.42

2.4.31 Although each of the CAZ options has an overall disbenefit, when disaggregated into 'compliant' and 'non-compliant' vehicles, there are journey time benefits for compliant vehicles, albeit significantly lower than the disbenefits experienced by non-compliant vehicles.

Table 2-16 Disaggregated Traffic Flow Impact (£000s)

IMPACT	CAZ B		CAZ C		CAZ D	
	Compliant	Non-Compliant	Compliant	Non-Compliant	Compliant	Non-Compliant
2021	-£616.78	-£419.71	-£717.57	-£2,265.54	-£992.87	-£8,616.87
2022	-£344.49	-£326.44	-£323.43	-£1,881.93	-£484.40	-£7,264.47
2023	-£84.24	-£236.18	£52.65	-£1,520.89	£0	-£5,985.78
2024	£163.97	-£150.43	£412.19	-£1,176.40	£463.34	-£4,768.76
2025	£401.66	-£67.70	£756.68	-£846.94	£907.12	-£3,605.91
2026	£630.32	£10.53	£1,089.14	-£531.03	£1,335.86	-£2,489.69
Total (2021-2026)	£150.43	-£1,189.93	£1,269.66	-£8,222.73	£1,229.05	-£32,731.47

2.5 Results of analysis

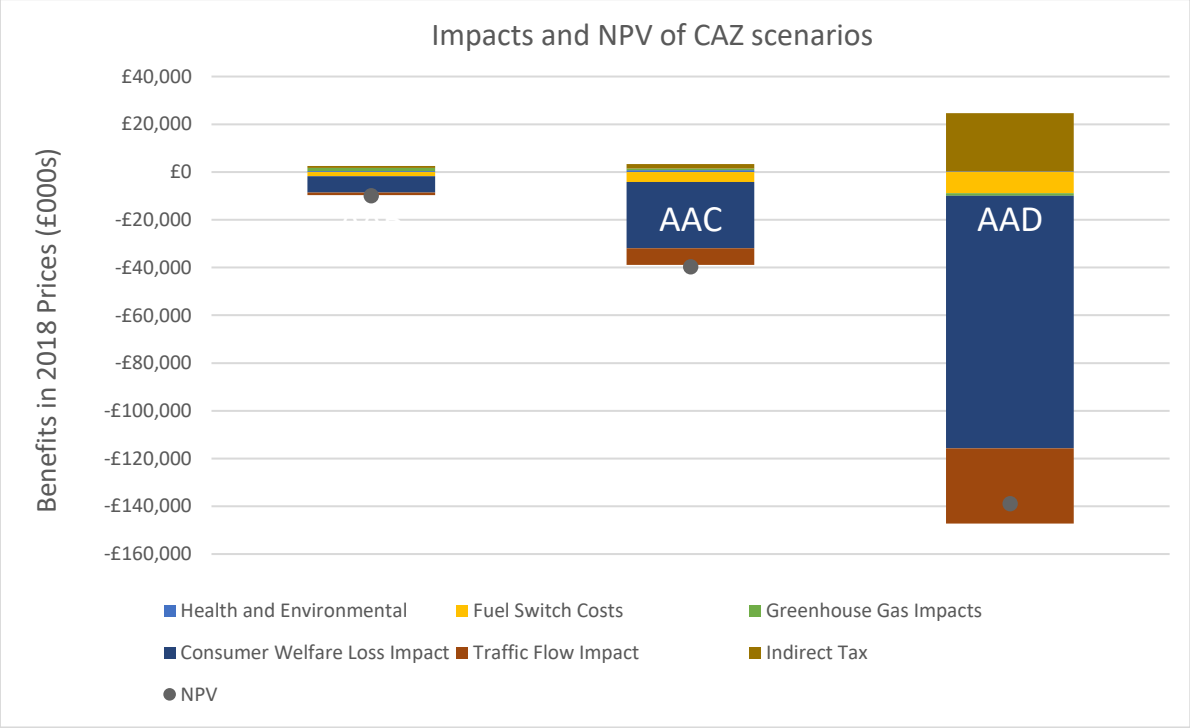
2.5.1 The monetised benefits for each of the CAZ scenarios are summarised within Table 2-17 and Figure 2-1 below. These are estimates of the cumulative benefits accrued over the appraisal period, between 2021 (scheme implementation) and 2026, with the exception of 'upgrade costs' which relate to disbenefits realised prior to the introduction of the scheme.

Table 2-17 Summary of calculated benefits in 2018 prices (£m)

IMPACT	CAZ B	CAZ C	CAZ D
Government costs	6.9	19.6	27.9
Health and environment	0.5	0.8	0.2
Upgrade costs	-2.8	-4.2	-16.3
Fuel switch costs	-1.8	-4.1	-8.9
Greenhouse gas impacts	1.3	0.6	-1.1
Consumer welfare loss impacts	-6.9	-27.8	-105.8
Indirect tax	0.8	2.0	24.4
Traffic flow impact	-1.0	-7.0	-31.5
NPV	**-9.9**	**-39.8**	**-138.9**

**Government Costs not included in NPV or in Figure 2-1*

Figure 2-1 Comparison of the options



2.6 Distributional and equality impact analysis

2.6.1 A *E3_Tyneside_Distributional Analysis Methodology Report* details the methodology and process used to undertake the distributional impacts analysis.

2.6.2 The report discusses the impacts specifically on air quality, businesses and households.

2.6.3 Air quality

2.6.4 The charging options deliver an overall reduction in NO_2 concentrations, with CAZ D showing the highest impact within the CAZ domain. However, due to rerouting outside the CAZ boundary, the CAZ D also shows the lowest reduction in air pollutant concentrations across the full modelled domain, and the largest number of Lower Super Output Areas (LSOAs) with a deterioration in air quality. This effect has important distributional implications for the options.

2.6.5 CAZ B and C could initially be observed to have a progressive impact: greater numbers of LSOAs and population see an improvement in air quality for the lowest income domain (IMD) quintile. However, it is difficult to pick out a defined trend of winners and losers given that the number of LSOAs vary between quintiles: e.g. indeed for IMD, the lowest quintile sees the greatest number of LSOAs and population with improving air quality, but also the greatest numbers observing worsening air quality. The WebTAG quintile analysis adds further insight here as it considered the proportion of winners and losers relative to the proportions in the overall population. For CAZ B and C, no distributional impact is observed as the populations that benefit are in line with their proportion of the population as a whole. This is the case for both IMD and proportion of children.

2.6.6 However, looking within these results, a trend does emerge: the improvement in air pollution appears to be higher for less deprived LSOAs and those with fewer children. Hence CAZ B and C are unlikely to have a regressive impact (as most LSOAs see an improvement), but they do not deliver a progressive impact either.

2.6.7 Conversely, CAZ D appears to have a regressive impact:

- In terms of a simple LSOA and population count, there are a greater number of LSOAs and population in the lowest IMD quintile (most deprived) and highest children quintile (most children) that observe a worsening of air quality, rather than an improvement;
- Under the quintile analysis, there is a lower proportion of net winners in the poorest IMD quintiles and the quintiles with the greatest numbers of children, relative to the share of those quintiles of the overall population, i.e. under CAZ D, poorer LSOAs and LSOAs with greater numbers of children are proportionally worse off; and
- Again where improvements are observed, the size of the air quality improvement is higher for those in less deprived LSOAs and those with fewer children.

2.6.8 Impacts on businesses

2.6.9 The extent to which businesses will be affected by the CAZ will depend on the type of business, its location, size and price sensitivity. The majority of the actions that businesses can take in order to meet the new regulations will incur a cost. Smaller firms and sole traders

are usually more price sensitive and therefore are likely to be the most affected, as a result of the CAZ charge.

2.6.10 Under a CAZ D, all vehicle types will be impacted, however, a CAZ B and C will directly impact businesses rather than households. All vehicles will see a rise in operating costs as a result of the charge. Upgrading or retrofitting vehicles will be an action taken by many businesses, whilst other, generally larger firms, might redistribute their fleet.

2.6.11 Smaller HGV firms in general will be impacted more than larger firms. This is due to their limited financial resources and size of area in which they operate. Larger firms could redistribute their fleet to areas where there is no CAZ, whereas smaller firms might only operate within the CAZ and so will be subject to upgrading their fleet or paying the charge. Smaller firms usually upgrade their fleet less often than larger firms. Upgrading vehicles before they might usually do so will impose a significant additional cost to these firms and will impact heavily on firm's profitability.

2.6.12 Tyneside Authorities have successfully secured the Clean Bus Technology Funding (CBTF), which will minimise the impact on local buses following the implementation of the CAZ. Meanwhile, Gateshead Metropolitan Borough Council has also secured funding from the Air Quality Grant Fund, part of which will assist taxi drivers in reducing their emissions. Self-employed taxi drivers may still be negatively affected by the charge if they personally do not receive this government funding, as their cash availability to upgrade their vehicle is minimal. If they don't upgrade or retrofit their vehicle they will not be able to compete as effectively in the market place against rival taxi firms.

2.6.13 There is a risk that some firms might reduce their activity within the CAZ or even cease trading as a result of the additional costs placed on them. Firms who simply move their business away from the CAZ may simply be contributing to a displacement in emissions from the CAZ to more suburban areas; ultimately making no difference to air quality itself within the wider local area. However, within the context of a CAZ, it is expected that most businesses, utilising government funding wherever possible, will look to upgrade their vehicles and business activity to lower emission options. The type of CAZ implemented will ultimately determine the extent to which businesses will be impacted and the level to which air quality might improve.

2.6.14 Impacts on households

2.6.15 All CAZ options will have some regressive impacts on households through CAZ compliance costs. All options place costs on:

- Buses: which are used more so by poorer households, the young (0-16) and the elderly (60+)
- Taxis: which are often relied upon by disabled persons who are unable to drive, and hence could also face a disproportionate share of any costs passed through.

2.6.16 In addition, the CAZ D will have a direct impact on household affordability through charges placed on cars.

2.6.17 Some level of cost will fall on all LSOAs. That said, poorer households tend to own older vehicles and so are more likely to have a non-compliant car. However, both the quantitative

analysis and the WebTAG quintile analysis illustrates that the direct impacts of the CAZ D will fall greatest on:

- the least deprived population (quintile 5 of IMD), with costs then decreasing as one moves up the IMD quintiles;
- lowest proportion of under 16s (i.e. LSOAs with an older adult demographic);
- lowest ratio of "non-white" people; and
- highest ratio of persons with disabilities.

2.6.18 In this case, the groups which experience greater effects mirrors those demographic groups which make a greater number of trips to the CAZ area, those living north-west of Newcastle city centre.

2.6.19 It is important to note that even if costs are smaller for the most deprived quintile of the population, those costs might represent a greater proportion of budget and therefore a greater impact. Furthermore it is important not to overlook a narrative regarding 'potential' trips: the reason poorer households are less affected under this analysis is they make less trips to areas of employment in the centre of the city. This is potentially due to lower employment rates in more deprived areas, or lower employment rates in higher salaried jobs in the city centre. The CAZ could present a further barrier preventing achievement of employment (or higher paid employment) in the city centre.

2.6.20 Equality Impact Assessment

2.6.21 An Equality Impact Assessment (EqIA) was also carried out and is included in the *E3_Tyneside_Distributional Analysis Methodology Report.* It found that the impacts from the CAZ charge might negatively affect some vulnerable groups, such as the elderly, young and disabled. This could be due to some taxis and public transport services passing on the additional costs from the charge to their customers; or they may even cease operation within the CAZ altogether. These more vulnerable individuals rely on these services to help them move from place to place and so with a higher charge for the service or the removal of services completely, these individuals will have their ability to move freely, stifled. It is suggested that the Tyneside Authorities invest in affordable, sustainable transport, as well as delegating the various government funds to public transport and taxi operators, in order to try and prevent this increased cost and possible reductions in services.

2.6.22 Overall, the policy will not discriminate against any particular group, as an improvement in air quality will not benefit one group more than others. The CAZ scheme will take any necessary steps to ensure the equality of opportunity in regard to affordability, accessibility and availability of transport options, irrespective of age, race, sex, religion, sexual orientation, marriage, pregnancy or disability.

2.7 Risk and uncertainty

2.7.1 There are delivery risks associated with the options presented, that have the potential to limit their effectiveness or act as a barrier to their implementation. These risks largely fall into the following categories:

- Public and political acceptability
- Co-operation with other bodies
- Procurement
- Unrealistic cost estimates
- Land take
- Environmental constraints, such as archaeology, biodiversity and landscape issues
- Legal challenge

2.7.2 The possible risks for the CAZ and non-CAZ options have been identified and then assessed based on their likelihood and impact, in both time and monetary costs. Each risk has been scored on a scale of 1 to 5 for both likelihood and impact, and the product of these values provided the overall risk grade. Relevant mitigation measures that are proportionate to the risk have also been proposed. This information is detailed in the relevant risk registers, which are provided in Appendix A2.2.

2.7.3 The most significant risks associated with non-CAZ options are:

Table 2-18 Non-CAZ Key Risks

RISK	RISK TYPE	DESCRIPTION
Public and political acceptability	Project Programme Environmental	Scheme design. Education about alternative modes / supporting measures to reduce impact.
Full Business Case	Project Programme	Early resolution of any procurement procedures for production of FBC, continued development of FBC while awaiting feedback from JAQU on OBC.
Procurement	Programme Project	Detailed procurement strategy required.
Exceedances remain	Project	Continued monitoring / evaluation. Review of the scheme, sensitivity tests to ensure that objectives are met across a variety of scenarios.
Legal challenge	Project Programme	Seek independent legal advice throughout the process - including during OBC & FBC.

2.7.4 The most significant risks associated with CAZ charging options are:

RISK	RISK TYPE	DESCRIPTION
Legal challenge	Project Programme	Seek independent legal advice throughout the process - including during OBC & FBC.

RISK	RISK TYPE	DESCRIPTION
Scheme costs based on outline scheme and market estimate	Cost	Understanding from other authorities' likely costs. Work up design of scheme.
Public and political acceptability of queue relocation	Project Programme Environmental	Scheme design. Education about alternative modes / supporting measures to reduce impact.
Full Business Case development	Programme Project	Early resolution of any procurement procedures for production of FBC, continued development of FBC while awaiting feedback from JAQU on OBC.
Procurement	Programme Project	Detailed procurement strategy required.
Exceedances remain	Project	Continued monitoring / evaluation. Review of the scheme, sensitivity tests to ensure that objectives are met across a variety of scenarios.

2.8 Project dependencies

2.8.1 The main risk associated with the project is represented in trying to achieve compliance in the shortest time possible. As the CSF is to deliver a scheme that will improve air quality across the Tyneside Authorities in the shortest time possible, there are a number of dependencies around which the project is based – Table 26 summarises these dependencies:

Table 2-19 Project Dependencies

DEPENDENCY FACTOR	REASON
Central Government	National polices/incentives to support move from diesel across all sectors.
Highways England	Potential exceedances on the Strategic Road Network.
Transport for the North	Development of the Strategic Transport Plan and investment strategy and delivery of strategic transport interventions in the North East that could change travel patterns and emissions.
Bordering local authorities	Adverse distributional impact on neighbouring authorities.
Bus companies	Upgrade to fleet.

DEPENDENCY FACTOR	REASON
Taxi and private hire licencing	Upgrades to fleet.
Freight	Upgrades to fleet or other measures to reduce adverse impact on air quality.
DVLA	Accessing necessary information.
JAQU	Approval of AQ Plan and release of funding.
Local population	Changes to 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 also bus fares.

2.8.2 There are a number of committed interventions which should be coordinated in a way which avoids any disproportionate disruption to traffic. The committed schemes summarised in Table 2-20 below are assumed to be delivered prior to the expected 2021 implementation date of the scheme within this OBC paper.

Table 2-20 Committed schemes across the Tyneside Authorities

LOCAL AUTHORITY	JUNCTION IMPROVEMENT	STATUS
North Tyneside	A189 Salters' Lane Improvement Scheme	
	NBotT - A193 Tynemouth Road / Churchill Street	Under construction
	A191 Holystone Bypass (inc B1505 Rbt and ASDA Rbt)	Under construction
	A189 / A1056 Weetslade Roundabout	Programmed for April 2019 start and November completion
	A186 Station Road Corridor	Programmed to Start in early 2019 once A19 Silverlink is complete
	A19 Silverlink	Under construction
	A1056 Rotary Way / Great North Road	Estimated 2020 end date

LOCAL AUTHORITY	JUNCTION IMPROVEMENT	STATUS
	Murton Gap - Main Access (A191 between Park Lane and Norham Road)	Programmed for 2019 start linked to HIF funding
	Murton Gap - Secondary Access (limited to 250 units)	Programmed for 2019 start linked to HIF funding
	Murton Gap - Link Road connection (A186)	Estimated 2022 end date
	Killingworth Moor - Northern Access (A1056)	Programmed for 2019 start linked to HIF funding
	Killingworth Moor - A19 Killingworth Interchange	Programmed for 2020 start linked to HIF funding
	Killingworth Moor - B1505 Access (Forest Gate)	Programmed for 2019 start linked to HIF funding
	Killingworth Moor - B1505 Great Lime Road approach to A191 Rbt	Programmed for 2020 start linked to HIF funding
	Killingworth Moor - Link Road (southern section)	Estimated 2022 end date
	Killingworth Road	Expected to start in Summer 2018
Newcastle	Killingworth Road Improvements	Under Construction
	Stamfordham/A1 Junction (9)	Detailed Design and Implementation
	Brunton Lane/Brunton Road Junction (22)	Detailed Design and Implementation
	Blucher Interchange (38)	Detailed Design and Implementation
	Stamfordham Road / Pooley Road Junction (41)	Detailed Design and Implementation

LOCAL AUTHORITY	JUNCTION IMPROVEMENT	STATUS
	Stamfordham Road / Springfield Road Junction (42)	Detailed Design and Implementation
	Ponteland Road / Station Road Junction (52)	Detailed Design and Implementation
Gateshead	Blaydon roundabout	Under Construction
	Watermark junction	Complete
	Sunderland Road Link	Under Construction
South Tyneside	A194 / B1306 Mill Lane Roundabout Improvement Scheme (NPIF)	Funding from DfT
	A19 / A194 to A19/A185 Lane Gain/Lane Drop Arrangement (NPIF)	Funding from DfT
Sunderland	Sunderland Strategic Transport Corridor Phase 2	Under Construction/Complete
	Northern Spire Bridge	Complete
	Northern Gateway	Under Construction

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3. FINANCIAL CASE

Please refer to the summary position provided by the Tyneside Authorities within the Strategic Case regarding the current modelled option that achieves compliance in the shortest time.

3.1 Introduction

3.1.1 The purpose of the financial case is to determine the cost of measures within the constraints of the JAQU guidance and time available. It sets out the funding arrangements and technical accounting issues, presenting the financial profile of the Proposed Option.

3.1.2 The financial case provides detail on how much the project will cost, who is paying for it, what types of costs are expected, what the financial risks or dependencies are and what the accounting implications are.

3.1.3 There will be financial impacts for the Tyneside Authorities for designs, installing, operating, monitoring and decommissioning the Proposed Option. This section sets out what those impacts are and how they will be mitigated and managed.

3.1.4 The Proposed Option is split into:

- Delivery of a Charging CAZ; and
- Supporting mitigation measures.

3.2 Cost

3.2.1 The costs for 'goods' and 'works' are mostly calculated with a per item cost applied to an estimated required quantity. Per item costs are taken from similar schemes and optimism bias is applied. 'Services' costs are estimated based on professional judgement and market testing.

3.2.2 These costs are indicative and will be refined through market testing and procurement (outlined in our Commercial Case) as the scheme progresses towards FBC.

3.2.3 Some costs are calculated from traffic model outputs. The actual responses to the implementation of a charged CAZ may differ from the forecast values.

3.2.4 A summary of total capital and operating costs for the charging CAZ is summarised in Table 3-1 and Table 3-2. Appendix A3.1 details the assumptions which underpin the CAZ capital and operating costs.

Table 3-1 Charging CAZ Capital Expenditure Summary

COSTS	COST (£)	OPTIMISM BIAS (%)	OPTIMISM BIAS (£)	TOTAL
Charge CAZ – Implementation Costs				
Design / Support				
Integration / Management				
CAZ systems IT and communications	500,000	44%	220,000	720,000
System Integration to other systems				
Internal / external resource				
Cameras and installation	946,000	44%	416,240	1,362,240
Local databases	80,000	44%	35,200	115,200
Enforcement / PCN processing	20,000	44%	8,800	28,800
Signs	102,000	13%	13,260	115,260
Marketing, communications & behaviour change	1,000,000	13%	130,000	1,130,000
Charge CAZ - decommissioning				
	209,066	44%	91,989	301,055
Total	**2,857,066**			**3,772,555**

Table 3-2 Charging CAZ Operating Expenditure Summary- Fixed

COSTS	COST (£)	OPTIMISM BIAS (%)	OPTIMISM BIAS (£)	TOTAL
Charge CAZ - Operation & Monitoring (annual costs)				
Sign maintenance	10,200	13%	1,326	11,526
Camera maintenance	88,688	13%	11,529	100,217
IT Support & Maintenance	5,000	200%	20,000	25,000
Internal resourcing – Year 1	962,500	13%	125,125	1,087,625
Internal resourcing – Years 2 -5	862,500	13%	112,125	974,625
Office accommodation	72,000	13%	9,360	81,360
Governance & Compliance	80,000	13%	10,400	90,400
Depreciation	209,600	13%	27,248	236,848
Lifecycle replacement costs	£0	N/A	N/A	
Sinking Fund	157,200	44%	69,168	226,368
Annual Total Year 1				1,859,344
Annual Total Years 2-5				1,746,344

Table 3-3 Charging CAZ Operating Expenditure Summary- Variable Costs

	2021	2022	2023	2024	2025	TOTAL
Additional staff at launch	100,000	0	0	0	0	100,000
Digital Portal - Card Payment Transaction Fees	745,701	623,641	501,580	379,520	257,459	2,507,901
Digital Portal - Collection Fees	1,491,402	1,247,281	1,003,160	759,040	514,919	5,015,802

	2021	2022	2023	2024	2025	TOTAL
DVLA Lookup Fees	1,455,079	727,539	727,539	727,538	727,538	4,365,232
Delinquent Payments - DVLA Look Up	49,780	41,721	33,661	25,602	17,543	168,307
Delinquent Payments - Other Enforcement Costs	4,525,462	3,792,798	3,060,134	2,327,470	1,594,806	15,300,669
Totals	**£9,852,611**	**£7,918,167**	**£6,811,261**	**£5,704,358**	**£4,597,452**	**£34,883,849**

This uses the following assumptions:

- Digital Portal - Card Payment Transaction Fees-Assume 1% based on a daily charge
- Digital Portal - Collection Fees-Assumed to be 2% of transaction value
- DVLA Lookup Fees (for class & emissions)-Reduced DVLA Look-up charge due to JAQU solution
- Delinquent Payments - DVLA Look Up (for keeper details)-Assume 8% of non-compliant vehicles will be delinquent payments. DVLA charge 11p per look-up
- Delinquent Payments - Other Enforcement Costs-Assume 8% of non-compliant vehicles will be delinquent payments. Assume £10 as cost of enforcing each delinquent payment (printing letters, legal costs etc.)

3.2.5 A summary of total capital and operating costs for the mitigation measures is summarised in Table 3-3 and Table 3-4 and each measure is discussed in greater detail within the Strategic Case. These all have the appropriate level of optimism bias applied. In all cases barring local abatement, this is 13%. For Local Abatement, a greater level of optimism bias has been applied due to the fact that the technology is relatively untested.

Table 3-3 Mitigation Measures Capital Expenditure Summary

COSTS	COST (£)	OPTIMISM BIAS (%)	OPTIMISM BIAS (£)	TOTAL
Grants for HGVs retrofit	£4,096,000	**13%**	£532,480	£4,628,480
Grants for LGV upgrade	£4,650,000	**13%**	£604,500	£5,254,500
Grants for taxis / PHVs upgrade	£5,600,000	**13%**	£728,000	£6,328,000

COSTS	COST (£)	OPTIMISM BIAS (%)	OPTIMISM BIAS (£)	TOTAL
Grants for car scrappage	£5,893,500	**13%**	£766,155	£6,659,655
Walking and Cycling Improvements	£3,325,000	**13%**	£432,250	£3,757,250
Access Changes	£355,806	**13%**	£46,255	£402,060
Local Abatement	£550,000	**44%**	£242,000	£792,000
Total	**£24,470,306**		**£3,351,640**	**£27,821,945**

Table 3-4 Mitigation Measures Operational Expenditure Summary

COSTS	COST (£)	OPTIMISM BIAS (%)	OPTIMISM BIAS (£)	TOTAL
Mobility Package	**£2,432,000**	**13%**	**£316,160**	**£2,748,160**

3.3 Revenue

3.3.1 Charging CAZ schemes are based on charging an entry fee to vehicles that do not meet the required emission standards. Therefore, the expected revenue forecasts are from charging non-compliant vehicle registered keepers who enter the CAZ.

3.3.2 The charges are set at different levels for different vehicle types to reflect the contribution each type of vehicle makes on a per-vehicle basis to air pollution and to ensure that vehicles with the highest emissions are incentivised to comply with the standard. This is inline with guidance issued by government.

3.3.3 The daily charges for a potential Charged Clean Air Zone are not yet determined given a single option has not been agreed. This section will be completed when an option is arrived at.

3.3.4 For the purposes of modelling, the authorities have assumed the charge levels used by other similar cities at this stage in their modelling, and that the charge levels would remain constant in current prices (i.e. £12.50 in 2021 and £12.50 in 2025). The charge is planned for the purposes of modelling as a daily charge. The charges we tested are £12.50 per day for cars, taxis and LGVs, while buses, coaches and HGVs would face a £50 charge.

3.3.5 It is important to recognise that the traffic model outputs traffic flows, not unique vehicles, however as it is possible that any vehicle may make multiple trips within the zone in a given time, estimates were required regarding the number of unique vehicles operating in the zone.

3.3.6 To generate the unique vehicles the road assignment model has been analysed using a standard modelling technique called sub-area analysis. This analysis uses the same CAZ cordon as used in the CAZ option test to extract demand to / from each charged link and zone within the cordon.

3.3.7 This process outputs demand matrices for each vehicle type, for each time period of the transport models. This is then converted to all vehicles using the following formula:

Daily All Vehicles = 3 * AM Vehicles + 6 * Inter Peak Vehicles + 3 * PM Vehicles + 12 * Off Peak Vehicles

3.3.8 The assumption applied is that each vehicle makes two journeys per day and hence the above 'Daily All Vehicles' is divided by two to yield the unique vehicles.

3.3.9 Traffic estimates do not include any provision for exemptions, discounts and/or sunset periods at this point in time i.e. it is assumed that all non-compliant vehicles within a class are subject to the full charge from day one though based on further modelling and the consultation these matters could be subject to change.

3.3.10 The split of compliant versus non-compliant vehicles has been calculated by taking the baseline figure and estimating percentage improvements per class per year of scheme operation.

3.3.11 In the absence of buses and coaches from our traffic model as specific vehicles, it has been agreed to assume that buses would all be compliant by 2021 while data on coach traffic will be gathered during the FBC.

3.3.12 It is also assumed that all locally-registered taxis (by this we are referring to hackney carriages and Private Hire Vehicles) will be compliant by 2021 therefore are exempt from the charge for the purposes of the modelling. Data on non-local PHVs (which may be subject to the charge) will be incorporated as part of the FBC. Due to the underlying modelling assumptions, these figures are not an accurate forecast of traffic and any resultant cost/revenue calculations are purely high-level indicative totals.

3.3.13 Table 3-5 displays the number of non-compliant unique vehicles operating in the charge CAZ.

Table 3-5 Non-compliant unique vehicles by class and year

	2021	2022	2023	2024	2025
Buses & Coaches	0	0	0	0	0
HGVs	343	276	208	141	74
Taxis & PHVs	0	0	0	0	0
Large van / Minibus	4,154	3,453	2,752	2,051	1,350

	2021	2022	2023	2024	2025
Small van / light commercial	1,176	989	802	615	427
Private Vehicles	13,183	11,086	8,989	6,891	4,794
Total by year	**18,856**	**15,803**	**12,751**	**9,698**	**6,645**

3.3.14 The number of non-compliant vehicles entering the CAZ is expected to reduce over time as older, non-compliant vehicles are exchanged at the normal replacement rate with compliant vehicles.

3.3.15 As a result, the revenues collected are expected to decrease. The revenue analysis was conducted for opening year (2021) and factors applied to each subsequent year to account for this decrease.

3.3.16 Penalty fees are charges paid by users who do not pay the daily CAZ charge within a pre-determined timeframe. It has been assumed that these users are subject to a penalty charge notice (PCN) and would be required to pay a fine.

3.3.17 The assumed penalty charge rates are in keeping with the PCNs issued, with discount penalty charge rates applicable if the penalty is paid within a pre-determined timeframe.

3.3.18 The predicted revenue associated with the Proposed Option as currently defined (i.e. using the charges specified in is shown in Table 3-6.

Table 3-6 Charge CAZ D Revenue by year £(000s)

	2021	2022	2023	2024	2025
Annual CAZ Charges	67,113	56,128	45,142	34,157	23,171
Penalties	7,457	6,236	5,016	3,795	2,574
TOTAL	**74,570**	**62,364**	**50,158**	**37,952**	**25,746**

3.3.19 Given the scale of potential impact on local people, it was considered appropriate to sensitivity test a number of alternative charging scenarios from a financial perspective, while keeping assumptions regarding behavioural responses static. This work will be developed for the FBC and through the consultation.

3.3.20 Three further CAZ D scenarios were tested, two with charges at half and a third of those modelled in the core scenario and no other assumed changes and a further test with revised assumptions. These were that:

- A greater proportion of non-compliant cars and LGVs would cross the zone boundary more than once. This was set at 2.5 times for Cars and 4 times for LGVs;

- There would be a greater level of fleet upgrade for 'cross-city' movements. By this we considered trips that began and ended outside the CAZ area but passed through it. The assumed fleet upgrade was 22% car, 25% LGV, and 44% HGV; and

- There would be a 10% reduction in goods vehicle trips crossing the zone due to increased consolidation and more efficient loading.

3.3.21 The results from these tests are set out below:

Table 3-7 Charge CAZ D Sensitivity Test 1 (Half) Revenue by year £(000s)

	2021	2022	2023	2024	2025
Annual CAZ Charges	33,557	28,064	22,571	17,079	11,586
Penalties	3,729	3,118	2,508	1,898	1,287
TOTAL	**37,285**	**31,182**	**25,079**	**18,976**	**12,873**

Table 3-8 Charge CAZ D Sensitivity Test 2 (Third) Revenue by year £(000s)

	2021	2022	2023	2024	2025
Annual CAZ Charges	22,371	18,709	15,047	11,386	7,724
Penalties	2,486	2,079	1,672	1,265	858
TOTAL	**24,857**	**20,788**	**16,719**	**12,651**	**8,582**

Table 3-9 Charge CAZ D Sensitivity Test 3 - Trip reduction for goods vehicles and greater fleet replacement Revenue by year £(000s)

	2021	2022	2023	2024	2025
Annual CAZ Charges	42,828	37,282	31,736	26,190	20,644
Penalties	5,353	4,660	3,967	3,273	2,580
TOTAL	**48,182**	**37,282**	**31,736**	**29,464**	**23,225**

3.4 Financial Profile

3.4.1 Based on the above costs and revenue generated for the central case, the financial profile for the Proposed Option is set out in Table 3-7.

Table 3-9 Financial Profile Charging Clean Air Zone Implementation £(000s)

COSTS	2019	2020	2021	2022	2023	2024	2025	TOTAL
OPEX	0	0	11,712	9,665	8,558	7,451	6,344	43,728
CAPEX	1,153	1,729	0	0	0	0	0	3,773
REVENUE	0	0	74,570	62,364	50,158	37,952	25,746	250,790

Table 3-10 Financial Profile - Mitigation £(000s)

COSTS	2019	2020	2021	2022	2023	2024	2025	TOTAL
OPEX	0	0	2,748	0	0	0	0	2,748
CAPEX	9,763	15,831	2,219	0	0	0	0	27,820

Table 3-11 Financial Profile – Implementation and Mitigation (£000s)

COSTS	2019	2020	2021	2022	2023	2024	2025	TOTAL
OPEX	0	0	14,460	9665	8558	7451	6344	46,476
CAPEX	10,916	17,560	2,219	0	0	0	0	31,593
REVENUE	0	0	74,570	62,364	50,158	37,952	25,746	250,790

3.5 Funding

3.5.1 The Tyneside Authorities do not have funds available internally to deliver a Proposed Option and it is also clear that government should be funding the implementation of measures that they are going to be mandating the delivery of. Furthermore, it is appropriate to recognise the impact on specific people and communities therefore we will require full funding support from the Implementation Fund and from the Clean Air Fund. The funding profile is shown in Table 3-8. The funding requested includes provision of capital and operational expenditure.

3.5.2 It is expected that, in line with the relevant legislation, any revenue generated by a charge CAZ or road user charging scheme using the Transport Act 2000 is ring-fenced and reinvested in measures to further support transport improvements in the area. Decisions regarding how surplus revenue will be reinvested into 'additional measures' will be determined according to the governance structure set out in the Management Case and be detailed in the Full Business Case.

3.5.3 Further to this, as noted within the Management Case, there are costs which relate to monitoring and evaluation. These are primarily revenue costs, which are incurred as follows and it is proposed would be funded through the Implementation Fund:

Table 3-12 Resource Requirements for the Tyneside Clean Air Zone Monitoring and Evaluation (£)

ELEMENT	2019	2020	2021	2022	2023	2024	2025	2026
Nitrogen Dioxide monitoring	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Particulate Monitoring	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Pedestrian and Cycle Counts	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Business Surveys	10,000	0	0	10,000	0	0	0	10,000
Traffic counts	10,000	0	0	10,000	0	0	0	10,000
Staff time for monitoring	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Re-running of models	0	0	0	10,000	0	0	0	10,000
Report Writing	0	0	0	40,000	0	0	0	40,000
Total	**30,000**	**10,000**	**10,000**	**80,000**	**10,000**	**10,000**	**10,000**	**80,000**

Table 3-13 Funding Profile (£000s)

FUND	2019	2020	2021	2022-26	TOTAL
Implementation Fund - Taxis/PHV Upgrade	2,109	4,218	0	0	6,328
Implementation Fund – CAZ Implementation	1,886	1,886	0	0	3,773
Implementation Fund – Mobility scheme	0	0	2,748	0	2,748
Implementation Fund – Monitoring & Evaluation	30	10	10	190	240

FUND	2019	2020	2021	2022-26	TOTAL
Implementation Fund – Access Changes	0	402	0	0	402
Implementation Fund Total	**4,025**	**6,516**	**2,758**	**190**	**13,491**
Clean Air Fund- HGV Upgrade	1,542	3,084	0	0	4,628
Clean Air Fund- LGV Upgrade	1,751	3,502	0	0	5,254
Clean Air Fund – Car Upgrade	2,219	2,219	2,219	0	6,659
Clean Air Fund – Walking and Cycling	1,878	1,878	0	0	3,757
Clean Air Fund – Local Abatement	264	528	0	0	792
Clean Air Fund Total	**7,654**	**11,211**	**2,219**	**0**	**21,090**
TOTAL	**11,679**	**17,727**	**4,977**	**190**	**34,581**

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4. COMMERCIAL CASE

Please refer to the summary position provided by the Tyneside Authorities within the Strategic Case regarding the current modelled option that achieves compliance in the shortest time.

4.1 Introduction

4.1.1 The purpose of the commercial case is to determine commercial viability by understanding the procurement and commercial arrangements relating to services and assets that are required to implement a Proposed Option.

4.1.2 The commercial case details the procurement strategy, which is informed by the strategic and economic cases and feeds into the costs, risk management and programme aspects of delivery, as set out in the financial and management cases.

4.1.3 As the project evolves from inception through to detailed awareness of design, implementation and operation, the commercial format will mature. This chapter details the commercial arrangements to ensure the successful delivery of the: Tyneside Clean Air Zone (CAZ) Implementation (Implementation, Operation and Monitoring Stage) in advance of entering into formative consultation.

4.1.4 The commercial case provides detail on the actions that need to be taken by the Tyneside Authorities to deliver the project across all stages; what the contracting and procurement strategy is, how will risks be transferred, how the procurement approach was determined, whether there is a developed market for the procurement approach and what mechanisms are going to be in place to incentivise performance (positive and negative).

4.1.5 The procurement specifications will:

- Minimise the overall programme for the delivery of the Proposed Option, supporting the requirement to improve air quality in the shortest time practical;
- Increase certainty of delivery through the selection of appropriate Contracts at the procurement stage;
- Ensure supply chain input into the costs required for the delivery of the Proposed Option, this will ensure the funding requests are appropriate;
- Enable risk management and mitigation through supply chain input to address interface risks and reduce the overall level of delivery and operational risk; and
- Ensure supply chain input into the delivery sequence and programming of the actual construction works to ensure full co-ordination between civil construction related works and the technology works.

4.2 Output based specification

4.2.1 CAZ

4.2.2 The Tyneside Authorities have identified the 'Types of Purchase' for each potential deliverable. These are broadly split into:

- **Goods and services** – Items that need to be purchased and actions which need to be completed to deliver the Proposed Option; and
- **Works** – installation or construction of physical aspects of the Proposed Option in the built environment. This encompasses all civil works.

4.2.3 A key element of the option that gets us closest to compliance by 2021 (of those we have tested) is the Charging CAZ. A list of the charge CAZ output requirements is shown in Appendix A3.1.

4.2.4 The charge CAZ requirement categories include both goods and services and works deliverables. These are itemised in Appendix A3.1. A summary of these requirements is shown in the below requirement categories:

- Design;
- Integration and project management;
- Cameras and installation;
- System IT and communications (wi-fi / fibre);
- Integration with Council systems, systems and databases;
- Integration with external and internal databases;
- Integration with government systems;
- Enforcement and Penalty Charge Notice (PCN) processing;
- Signs;
- Marketing and communications;
- Professional resource;
- Monitoring; and
- Decommissioning.

4.2.5 Public campaign

4.2.6 A summary of the requirements for the public campaign is as follows:

- Design;
- Marketing and communications plan;
- Professional resource;
- Monitoring; and
- Decommissioning.

4.2.7 Access restriction for HGVs and LGVs on the CME during peak periods

4.2.8 A summary of the requirements for the access restrictions is as follows:

- Design;
- Marketing and communications;
- Traffic Regulation Orders (TROs);
- Signs; and
- Monitoring.

4.2.9 **Access changes**

4.2.10 A summary of the requirements for the junction changes Street is as follows:

- Design;
- Marketing and communications;
- Construction (materials);
- Construction (services);
- Signs; and
- Monitoring.

4.2.11 Local measures to improve air quality by removing pollutants

4.2.12 A summary of the requirements for the local measures to improve air quality by removing pollutants on the CME is as follows:

- Design;
- Materials and installation;
- Maintenance; and
- Monitoring.

4.2.13 Scrappage or retrofit of vehicles

4.2.14 A summary of the requirements for vehicle scrappage or retrofit is as follows:

- Design;
- Marketing and communications;
- Administration;
- Construction (services);
- End-of-life vehicles; and
- Monitoring.

4.2.15 Travel Credits

4.2.16 A summary of the requirements for issuing travel credits is as follows:

- Design;
- Marketing and communications;
- Administration;
- Monitoring.

4.3 Procurement strategy

4.3.1 Background

4.3.2 Centrally coordinated procurement across cities implementing air quality feasibility studies was explored, however no tangible options have been identified by the Tyneside Authorities. It is therefore assumed that the Tyneside Authorities will procure applicable deliverables independently of other cities undertaking CAZs.

4.3.3 As the current option which is closest to compliance includes a charging CAZ which traverses more than one Council boundary, each Authority (Gateshead Borough Council, Newcastle City Council and North Tyneside Council) will approve procurement specifications before they are released to the market. The procurement will be undertaken by Newcastle City Council (NCC) on behalf of the three Authorities. This responsibility is listed in the Terms of Reference for CAZ Implementation Governance. Governance is explained within the Management Case.

4.3.4 To inform and develop the procurement strategy, the Tyneside Authorities undertook market testing between 12th November 2018 and 19th November 2018 with five suppliers. The Tyneside Authorities have also sought advice and guidance from Local Partnerships and JAQU as part of collaboration during the Tyneside Air Quality Feasibility Study.

4.3.5 Assessment Criteria

4.3.6 To ensure successful delivery, the right balance of the following criteria is essential:

- Time (including time certainty);
- Cost (including cost certainty); and
- Quality (including functionality certainty).

4.3.7 In adherence with the ministerial direction and subsequent guidance from JAQU, the primary spending objective for this study is to achieve compliance in annual exceedance of NO_2 in the shortest possible time. To achieve this, all aspects of delivery must be undertaken efficiently and with maximum effect on air quality. Therefore, the procurement emphasis for the Proposed Option is 'time' and 'quality', all procurement tenders will include weighting criteria in keeping with this strategy. Weighting criteria is anticipated to be 70% quality and 30% cost; however, this would be finalised as part of the drafting and sign-off of procurement pack of tender documents.

4.3.8 To avoid prolonged delivery timescales and minimise delivery complexity, the Tyneside Authorities will request 'tried-and-tested' goods and services where possible as part of the procurement strategy. This will improve the time and functionality certainty of delivery. This may include, where possible, learning from infrastructure deployed in 'Phase 1' cities.

4.3.9 Procurement Methods

4.3.10 Goods and services, and works can be delivered internally (within the Local Authority remit) or externally (by third party contractors). To enable maximum project control and quickest route to delivery, the Tyneside Authorities are also proposing to maximise the amount of work which is delivered internally.

4.3.11 Deliverables which cannot be delivered internally will be procured through appropriate mechanisms. To procure new contracts, the Tyneside Authorities will undertake an appropriate tendering process using existing frameworks.

4.3.12 Approval Process

4.3.13 The procurement strategy will need to be developed by the CAZ Implementation Group (see Management Case for Governance Structure and Terms of Reference).

4.3.14 A summary of the procurement activities which require approval are as follows:

- Procurement strategy – signed off by the Steering Group;
- Procurement pack of tender documents – signed off by Procurement Commissioner from Newcastle City Council following input from legal, finance and technical officers;
- Response evaluation – tender evaluation undertaken by a selected evaluation panel decided by the CAZ Implementation Group. The evaluation panel will include technical specialists who understand the service / works / products being procured and who had involved in the preparation of the procurement pack. The evaluation panel will determine who has won the procurement exercise.
- Contract award - the award of the contract will need to be approved following a confidential Key Delegated Decision for contracts over £100,000. Contracts over £2million will need approval through Cabinet. Note, the approval is simply to award or not (it is not Cabinet / approver changing or choosing a provider).

4.4 Sourcing options

4.4.1 As stated in the procurement strategy, delivery will be internal where possible. Requirements which need to be delivered externally will be procured through appropriate sourcing mechanisms.

4.4.2 Some '**Works'** will be delivered internally. The Tyneside Authorities have access and appropriate mechanisms and frameworks in place with the existing Regional Traffic Signals Group and also have local Highways Maintenance departments who can:

- Install camera columns / mounting;
- Enable power supply (with support from Northern Powergrid);
- Deliver other street works / equipment installation;
- Undertake traffic management;
- Install local signs; and
- Deliver civil engineering works including minor works to road, kerbs or pavements.

4.4.3 Some '**Goods and services'** can also be delivered internally:

- Design: Overall solution plan and planning and traffic regulations
- Management: Programme Management / Steering Group and Project Management - CAZ Implementation Manager
- Support staff: Enforcement staff, appeals, queries and complaint handling (except payment system queries which will be held centrally by UK Government[1]) and technical, IT, legal and procurement services
- Delivery of communications activities
- Office costs and postage

[1] A central payment system is being supplied by the UK Government. It is also assumed that UK Government will supply a central database for taxis.

- Monitoring activities

4.4.4 In order to administer grants for vehicle retrofitting or scrappage, or travel credits for people on lower incomes living in the impacted area, additional recruitment would be required to manage the processes. Furthermore, a CAZ Implementation Manager and additional enforcement staff would be required to operate any charged CAZ PCN processing system. A new office location and supporting IT will also be required to operate a charged CAZ if this was to be the option progressed after consultation.

4.4.5 The Tyneside Authorities do not have the capability to deliver the following '**Goods and services'**:

- Camera install (including communications), supply and operation. The Tyneside Authorities have considered the existing contracts that are in place for ANPR cameras and operation. These contracts have been discounted as there is not sufficient contract flexibility to add on an additional task of this quantity or duration. Therefore, a contract for camera supply and operation will have to be procured.
- CAZ system (core design and delivery) and integration (local systems and central systems):
  - Image processing / filtering system
  - PCN processing system
- Communications strategy and design works
- Retrofit vehicles
- Supply and install local measures to improve air quality by removing pollutants from the atmosphere, such as moss walls
- Decommissioning of CAZ systems

4.4.6 The above deliverables have been amalgamated into the following proposed / potential contracts:

Contract 1: Camera supply, operation and CAZ look-up system to initially filter vehicles.

Contract 2: PCN processing system.

Contract 3: Communications strategy and design.

Contract 4: Local measures to improve air quality, such as moss walls.

4.4.7 Sourcing options were explored and evaluated as follows:

- Open market and OJEU - would not fit with the *"as quick as possible"* approach from government. There is a higher risk of receiving poorer standard tenders and added complexities for suppliers. However, this option is suitable for implementation of measures that are niche or specialised.
- Framework - ensures that some elements of quality assurance have been undertaken before procurement.

4.4.8 It was concluded that the approach of utilising an existing framework is a simplified and quicker route to market.

4.4.9 It is the intention that Contract 1 and 2 will be published to Traffic Management Technology 2 (TMT2) Crown Commercial Services framework reference RM1089, which is currently in place until 31 October 2020. These contracts will be in place for up to five years.

4.4.10 Contract 3 will be via NCC framework 005431 – Corporate Design Contract. This contract will be in place for up to one year.

4.4.11 Contract 4 will be via the open market as this is a niche market and the Tyneside Authorities are not aware of existing frameworks which are suitable.

4.4.12 The procurement pack of tender documents for each Contract will contain:

- Specification;
- Tender Response Form;
- Pricing Schedule;
- Call – off details;
- NEC3 Contract (draft); and
- Other supporting documents.

4.4.13 The draft procurement specifications for each contract have been drafted and are included in Appendix 4.3.

4.4.14 After the procurement specification and response frameworks have been drafted, legal and finance colleagues, technical officers and procurement specialists will meet to select and amend components of the NEC Contract. Key components which will need to be considered are:

- Core clauses;
- Main Option Clauses;
- Secondary Option Clauses; and
- Z Clauses.

4.4.15 Change control, adherence to appropriate regulations and treatment of intellectual property rights will all be covered by clauses that will be included in the NEC3 contract.

4.4.16 Risk

4.4.17 There is some risk regarding market capacity and capability (i.e. will the likely suppliers be able to cope with demand given other authorities will be wanting the same kind of products on a similar timescale).

4.4.18 To minimise this risk, early engagement with the market has been undertaken and will continue through to FBC. Informal feedback from the market is that there is sufficient capacity in the market to deliver charging CAZs in the areas currently undertaking Air Quality Feasibility Studies, particularly as the FBC completion is in tranches with a year between tranche one and tranche two. The capability of the market to deliver these charging CAZs in the shortest possible time is dependent on swift procurement, finalisation of the FBC and prompt funding award to allow contract signing to take place. Furthermore, it is important to note that an alternative charging regime to a CAZ would also require the same equipment (though perhaps in different quantities) so risks are minimised by following this approach.

4.5 Payment mechanisms

4.5.1 Payments will be linked to performance and contractors will be paid after delivery of milestones as set out in the procurement specification. The terms of these payment mechanisms will be finalised as part of the contract signing, but will be expected to adhere to those typically outlined in Local Authority procurements. Performance measures and quality attributes will be determined as part of the drafting of the procurement pack of tender documents.

4.5.2 Allocated risks will be tied-in to the payment approach: payments will be withheld if deliverables are not met and contractors will be required to hold appropriate levels of insurance provision in case of risks being realised.

4.5.3 The Tyneside Authorities will ensure value for money by requesting a pricing schedule which covers the duration of the Proposed Option. This will ensure that costs are confirmed for the delivery period and will mean that a decision can be made from the offset about value for money.

4.5.4 It is anticipated that it will be a Priced Contract with an activity schedule. The activity schedule will be set out in the procurement documents and will remain in place unless changed in accordance with the NEC3 contract.

4.5.5 The contractor will be expected to provide regular information which shows how the activity on the activity schedule relates to operation of their programme. Again, this will be finalised as part of the procurement pack of tender documents.

4.6 Pricing framework and charging mechanisms

4.6.1 Until the package is operational, the Tyneside Authorities do not know for certain what level of change-response will be triggered (i.e. vehicle upgrades, mode shift, re-routing, pay the charge). This makes the incentivisation of a zone which will achieve air quality compliance in the shortest possible time very difficult; the contractors will be implementing a measure which they have had little input into its design. For this reason, the Tyneside Authorities do not intend to incentivise delivery by impact on air quality.

4.6.2 Instead, the Tyneside Authorities will set KPIs which the contractors must achieve. If the contractor fails to meet these KPIs, consequences terms will be set out clearly in the contract Terms and Conditions.

4.6.3 It is the intention of the Tyneside Authorities to deliver very prescriptive specifications for Contract 1 and 2. More allowance for innovation will be made in Contracts 3 and 4.

4.6.4 Contractors will be expected to provide unit rates for goods. Due to the framework approach, resource rates will be set. Contractors will be asked to provide a lump sum by task and will be expected to provide resource breakdowns for how this lump sum was determined.

4.7 Risk allocation and transfer

4.7.1 Consideration has been given regarding how risk will be apportioned between the public and private sector. The general principle is to allocate risks of the agreement between the parties

to mitigate or manage them, including the consequence should a risk event arise. The degree to which risk may be transferred largely depends on the specific proposal under consideration.

4.7.2 A summary of the risks which we plan to contractually transfer, and risks which are likely to remain with the Authority are shown in Table 4-1[2]. This table is likely to change when more is understood about the dependencies of various deliverables for implementation.

4.7.3 The area of risk allocation which will require the greatest development between OBC and FBC is that of transition and implementation. While implementation risk is weighted toward Local Authorities, it is clear that greater work will be required in order to understand the levels of risk around implementation. This will be explored further during the preparation of the FBC.

4.7.4 To manage all project risks, the CAZ Implementation Manager and contractors (internal and external) will be asked to produce detailed priced risk registers which will be reviewed regularly.

Table-1 Risk Allocation Table

RISK	RISK ALLOCATION (%)		COMMENTS
	Public	Private	
Design	50	50	The Authority will hold responsibility to achieving NO_2 reductions. Contractors will be responsible for achieving the output.
Construction and works	50	50	
Transition and implementation	25	75	Authorities must enable the implementation. Contractors must deliver the requirement.
Availability and performance	50	50	Authorities must deliver the resource to operate the system. Contractor must deliver the system.
Operating	50	50	Authorities must deliver the resource to operate the system. Contractor must deliver the system.
Variability of revenue	100		Authorities must monitor the revenue from the Charge CAZ and respond accordingly.
Termination	100		Authorities must hold the risk for contract termination.

[2] Except deliverables outside of Authority or Contractor control: central payment system, taxi database, central payment customer service.

RISK	RISK ALLOCATION (%)		COMMENTS
Technology and obsolescence		100	For the duration of their contract, the contractor controls the risk of technology changes.
Residual value risks	100		Authorities must monitor the residual value of the Proposed Option and determine the benefits/costs of operation.
Financing risks	100		Although funded by the Implementation Fund, ongoing management of finance is the responsibility of the Authority by liaising with JAQU.
Legislative risks	75	25	Both authorities and contractors must ensure the Proposed Option is in accordance with legislation.

4.8 Contract length

4.8.1 Contract 1 and 2 will be in place for up to five years. Break clauses will be considered during the drafting of the NEC3 contract.

4.8.2 Contract 3 will be in place for up to one year. Break clauses will be considered during the drafting of the NEC3 contract.

4.8.3 Contract 4 will be in place for up to 5 years. Break clauses will be considered during the drafting of the NEC3 contract.

4.9 Human Resource

4.9.1 Some '**services'** are to be delivered internally. Staff requirements are summarised in Table 4-2. Grades are estimated using the Newcastle City Council Employment scales. New posts will undergo a job evaluation from Human Resources specialists.

Table 4-2 Internal human resource requirements (Charging CAZ D estimate)

ROLE	GRADE	FTE	DURATION (YEARS)	COST PER YEAR PER FTE (£)	TOTAL COST (£)
CAZ Implementation Manager	N11	1	5 years	63,000	315,000
Charge CAZ design	N8	0.25	1 year	46,500	11,625

ROLE	GRADE	FTE	DURATION (YEARS)	COST PER YEAR PER FTE (£)	TOTAL COST (£)
Image Review	N5	12	5 years	25,000	1,500,000
IT	N7	1	5 years	37,500	187,500
Customer Service	N5	8	5 years	28,125	1,125,000
Enforcement	N5	1	5 years	28,125	140,625
Supervisor	N7	1	5 years	37,500	187,500
Procurement	N7	0.25	2 years	37,500	18,750
Legal	N11	0.1	5 years	63,000	31,500
Total					3,508,125

4.10 Contract Management

4.10.1 The responsibility of procurement associated with the implementation of any CAZ will be undertaken by NCC on behalf of the Tyneside Authorities. This responsibility is listed in the Terms of Reference for CAZ Implementation Governance, this can be found in the Outline Business Case Management Case.

4.10.2 Once appointed, the contractor will be appointed by NCC, therefore contract legalities and management will be directly controlled by NCC on behalf of the Tyneside Authorities. One of the primary responsibilities of the CAZ Implementation Manager will be managing Contracts 1, 2 and 3. Specialist support from NCC Procurement will be provided to support the CAZ Implementation Manager. The amount of procurement support required is shown in Table 4-2.

4.10.3 The effectiveness of the package will be monitored in accordance with the monitoring plan set out in the Management Case. If there is a failure on the part of the service provider to deliver the contracted services on time, to specification and price, the contract management will intervene. It is anticipated that any contract failures to deliver will be investigated thoroughly.

4.10.4 There is a required for arbitration through NEC3. Arrangements for the resolution of disputes and disagreements between the parties will be undertake in accordance with the arbitration process set out in the NEC3 contract.

4.10.5 If responsibility is found to be with the contractor, they may be required to offer some form of recompense such as a reduced fee or some form of service credit. This will be finalised as part of the NEC3 contract drafting.

4.10.6 If there are persistent failures by the Contractor, the Tyneside Authorities may terminate the contract and procure through a new tendering process. This is expected to be unlikely given the procurement strategy is to go to organisations on recognised frameworks; while these organisations must have fulfilled a required standard to be on the framework, the ability to deliver will be an integral part of tender formulation and assessment. This will correspondingly reduce the risk of persistent failure.

4.10.7 During the consultation period in 2019, a full review will be undertaken of the terms under which existing suppliers have been procured across the three authorities, in order to assess whether there is any risk of these suppliers seeking redress for the imposition of any preferred option.

APPENDICES

APPENDIX A4.1 – Charge CAZ Procurement Requirements

	Requirements	*Type of Purchase*	*Internal/ External*	*Framework*
1	**Design / design support**			
a	Overall solution / area plan	Goods and services	Internal/External	Structure: Internal To LA, Delivery:TMT2 CCS
b	Technical specs / interface requirements	Goods and services	External	TMT2 CCS
c	Planning and traffic regulations	Goods and services	Internal	LA
d	CAZ core system design	Goods and services	External	TMT2 CCS
e	CAZ core system project management	Goods and services	Internal	LA (CAZ Implementation Manager & IT)
2	**Integration / management**			
a	Integration of camera and installation (3) and CAZ system (4)	Goods and services	External	TMT2 CCS
b	Integration of 3&4 with 5-8	Goods and services	External	TMT2 CCS
c	Integration of 3&4 with 9	Goods and services	External	TMT2 CCS
d	Overall management of 3-11	Goods and services		CAZ Implementation Manager
e	Overall programme management 1-16	Goods and services		Steering Group/ /CAZ Implementation Manager
3	**Cameras and installation**			
a	CAZ Cameras (supply / maintenance)	Goods and services	External	TMT2 CCS
b	Camera columns / mounting	Works	Internal	Traffic Signals Group (North East)
c	Camera installation	Works	Internal	TMT2 CCS
d	Monitor cameras	Goods and services	External	TMT2 CCS
e	Power supply	Works	Internal/External	Traffic Signals Group (North East)/Northern Powergrid
f	Other equipment (street works, cabinets etc.)	Works	Internal	Traffic Signals Group (North East)/Highways Maintenance
g	Mobile camera (including vehicle)	Goods and services	External	TMT2 CCS
h	Minor works / traffic management	Works	Internal	Highways Maintenance/Traffic Management

i	Integration and management	Goods and services	External	TMT2 CCS
j	Location design	Goods and services		LA & TMT2CCS
k	Location project management	Goods and services	Internal	CAZ Implementation Manager
4	**CAZ system IT and communications**			
a	Camera links / communications (WIFI, fibre links)	Goods and services	External	TMT2 CCS
b	Other equipment	Goods and services	Internal	LA
c	CAZ control room	Goods and services	Internal	LA
d	CAZ system back office	Goods and services	External	TMT2 CCS
e	Licences	Goods and services	External	TMT2 CCS
f	Local and central back-up	Goods and services	External	TMT2 CCS
5	**IT - CAZ system integration to council back-office or other systems**			
a	Integration to council back office (e.g. finance/payments)	Goods and services	External	TMT2 CCS
b	Link to notice processing / bus lane system	Goods and services	External	TMT2 CCS
c	Link to central databases	Goods and services	External	TMT2 CCS
d	Link to LA online/web platform	Goods and services	External	TMT2 CCS
e	Link to back-up systems	Goods and services	External	TMT2 CCS
6	**Local database(s) - set-up, access and links**			
a	Local database(s)	Goods and services	External	TMT2 CCS
b	Feed/link to central payment infrastructure database	Goods and services	External	TMT2 CCS
	Link/uploads to or from DVLA / other databases	Goods and services	External	TMT2 CCS
7	**IT - integration to central payment infrastructure**	Goods and services		
a	CAZ system link to central system	Goods and services	External	TMT2 CCS
b	LA website links to central system	Goods and services	External	TMT2 CCS
8	**Enforcement and PCN / payment processing**			
a	Enforcement staff	Goods and services	Internal	LA

b	Mobile enforcement staff	Goods and services	Internal	LA
c	Office costs	Goods and services	Internal	LA
d	Stationary	Goods and services	Internal	LA
e	Postage	Goods and services	Internal	LA
f	Appeals, queries and complaints handling	Goods and services	Internal	LA
g	Central payment system fees	Goods and services	External	TMT2 CCS
h	DVLA query costs	Goods and services	External	TMT2 CCS
i	Payment system set-up/licences	Goods and services	External	TMT2 CCS
j	Traffic Penalty Tribunal fees	Goods and services	Internal	LA
k	Enforcement system set-up/licences	Goods and services	Internal	LA
l	Foreign vehicle enforcement	Goods and services	External	TMT2 CCS
m	Other enforcement resources	Goods and services	External	TMT2 CCS
9	**Signs**			
a	Local sign design	Goods and services	Internal	National Standard – LA will follow design set by JAQU
b	Local sign supply (main)	Goods and services	Internal	LA
	Local sign supply (minor)	Goods and services	Internal	LA
c	Local sign installation, including power	Works	Internal	Traffic Signals Group
d	Highways England / Strategic Road sign supply	N/A	N/A	N/A
	Highways England sign installation	N/A	N/A	N/A
e	Minor works to roads / kerbs / pavements	Works	Internal	Traffic Signals Group
10	**Marketing and communications**			
a	Development of communications plan	Goods and services	External/Internal	NEPO Framework / LAs
b	Local media / advertising	Goods and services	Internal	LA
c	National / regional media	Goods and services	Internal	LA
d	Direct engagement awareness	Goods and services	Internal	LA

e	Mail campaign(s)	Goods and services	Internal	LA
f	Social media	Goods and services	Internal	LA
g	Other awareness	Goods and services	Internal	LA
h	Website updates	Goods and services	Internal	LA
i	General CAZ enquiry handling / customer service	Goods and services	Internal	LA
11	**Any External resourcing**			
a	technical	Goods and services	External	TMT2 CCS
b	IT	Goods and services	External	TMT2 CCS
c	legal	Goods and services	External	External chambers / advisors
d	procurement	N/A	N/A	N/A
12	**Any internal resourcing for LA activities**			
a	technical	Goods and services	Internal	LA
b	IT	Goods and services	Internal	LA
c	legal	Goods and services	Internal	LA
d	project management	Goods and services	Internal	LA
e	procurement	Goods and services	Internal	LA
13	**Decommissioning activity**	Works		
14	**Linked monitoring activities**	Goods and services		
a	CAZ scheme monitoring	Goods and services	Internal	LA
b	Air quality	Goods and services	Internal	LA
c	Traffic levels	Goods and services	Internal	LA
d	Economics / benefits	Goods and services	Internal/External	LA
e	Other	Goods and services		N/A

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AIR QUALITY FEASIBILITY STUDY
MANAGEMENT CASE

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5. MANAGEMENT CASE

Please refer to the summary position provided by the Tyneside Authorities within the Strategic Case regarding the current modelled option that achieves compliance in the shortest time.

5.1 Introduction

5.1.1 The purpose of the management case is to determine whether the proposal is deliverable in the timescales. It sets out the project planning, governance structure, risk management, communications and stakeholder management, benefits realised and assurance.

5.1.2 As the project evolves from inception through to implementation and operation, the management format will change. This chapter focuses on the detailed arrangements to ensure the successful delivery of any Tyneside Clean Air Zone Implementation (Implementation, Operation and Monitoring Stage) or associated measures. Although where appropriate reference is made to the development and management of the FBC and the Tyneside Air Quality Feasibility Study which is informing the business case development.

5.1.3 The management case provides detail on the actions that need to be taken by the Tyneside Authorities to deliver the project across all stages; what needs to be done, why, when and how, with plans in place to identify and manage any risks. The management case also sets out the plan to ensure that benefits stated in the economic case are realised and will include measures to assess and evaluate this.

5.2 Project Management

5.2.1 Project management is central to the implementation of any Tyneside CAZ to ensure planning, delegating, monitoring and control of all aspects of the project. Project Management instils motivation of all project parties, and is the communicative link between governance structure and workstreams to ensure all parties understand their objectives, performance targets, scope, cost and deliverables.

5.2.2 Project Management is the control of: Costs; Timescales; Quality; Scope; Benefits; and Risk. Project management will be undertaken in line with PRINCE2 (Projects IN Controlled Environments) principles. The project will therefore apply the following principles:

- Business justification –Tyneside Authorities are required to undertake a feasibility study following a mandate by the Government. In keeping with the spending objectives, the Tyneside Authorities must improve air quality (in particular NO_2 annual exceedances in the shortest possible time).
- Learn from experience – Lessons are sought, recorded and acted upon throughout the life of the project. Tyneside Authorities are liaising with JAQU, other local authorities and key suppliers to understand emerging best practice.
- Defined roles and responsibilities – see Governance and Organisation (section 5.3)
- Manage by stages – The project is planned, monitored and controlled through the programme planning at each stage (section 5.4)
- Manage by exception – The tolerances of change to cost, time, quality, scope, benefits and risks are all managed through the Working Group and ongoing liaison with JAQU.

Tolerances of change for the CAZ Implementation will initially be the responsibility of the CAZ Implementation Group. Some of these responsibilities will be filtered to workstream leads. This will be finalised following procurement and submission of the FBC.

- Focus on products –Products required as part of the CAZ Implementation will be finalised following procurement and submission of the FBC.
- Tailored to suit the project – size, complexity, team capability, risk and environment are all factored into the ongoing project management.

5.3 Governance and organisational structure

5.3.1 CAZ Implementation Governance

5.3.2 After submission of the OBC, practical arrangements for how the implementation will be governed (see Figure 5-1) will commence. This additional governance structure will oversee the design, implementation and operation of the Proposed Option and will run alongside and interact with the Tyneside Air Quality Feasibility until the FBC submission.

5.3.3 The governance structure in Figure 5-1 is responsible for measures within the Proposed Option which are to be funded through the Implementation Fund. Delivery and governance of complementary measures (funded through the Clean Air Fund) will remain the responsibility of the Tyneside Air Quality Feasibility Study until FBC submission. More detail on future governance of these measures will be provided in the FBC.

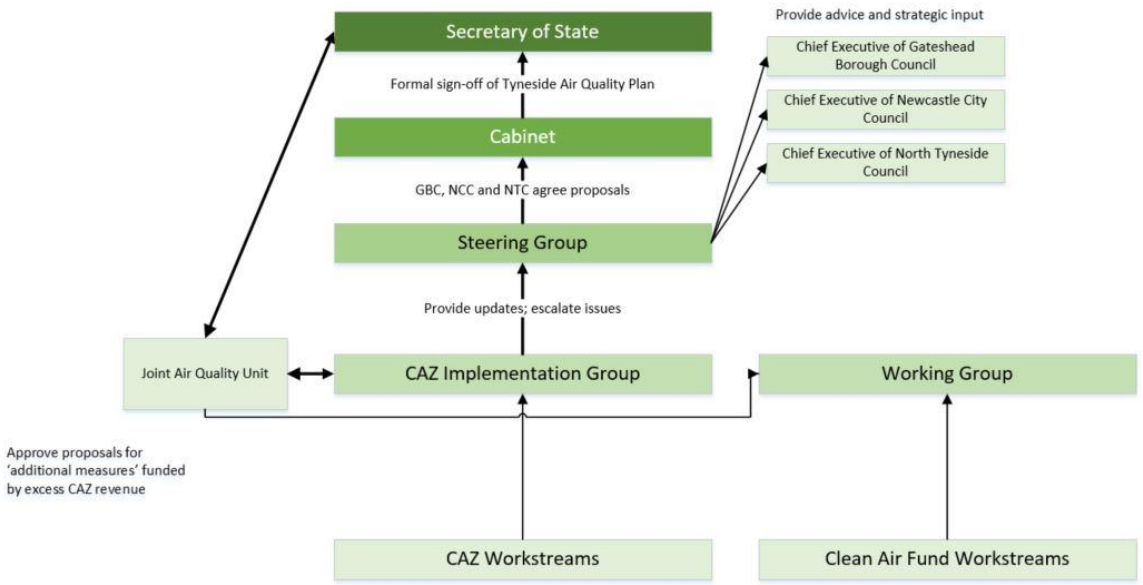
5.3.4 The CAZ Implementation Governance will continue to run after the FBC is submitted and will supervise the operation and monitoring of the Proposed Option.

5.3.5 The approval of the Proposed Option (including the approval of funding for the Proposed Option) is the duty of the Secretary of State. Any subsequent approval for the delivery of additional measures using surplus revenue from any charge CAZ must also be approved by the Secretary of State. The effectiveness of the Proposed Option and additional measure will continue to be fed back to JAQU and the Secretary of State.

5.3.6 The groups shown in Figure 5-1 each have terms of reference (Appendix A5.1), which are aimed at monitoring progress, change, risks, issues, opportunities, decisions and providing agreements to proceed.

5.3.7 As the Tyneside Authorities are undertaking a joint Tyneside Air Quality Feasibility Study, it is expected that JAQU will submit a single approval order for the three Authorities to deliver the measures set out in the FBC. As the current option of those tested which is closest to compliance includes a charging CAZ which traverses more than one Council boundary, each Cabinet (Gateshead Borough Council, Newcastle City Council and North Tyneside Council) will approve proposals for how any surplus revenue will be spent before this is formally submitted to the JAQU. The responsibility for budgets therefore lies through the Cabinets of the Tyneside Authorities. If options are identified in the future which do not traverse boundaries, this will be amended accordingly.

Figure 5-1 Governance Structure for CAZ Implementation (Between OBC – 1 January 2021)



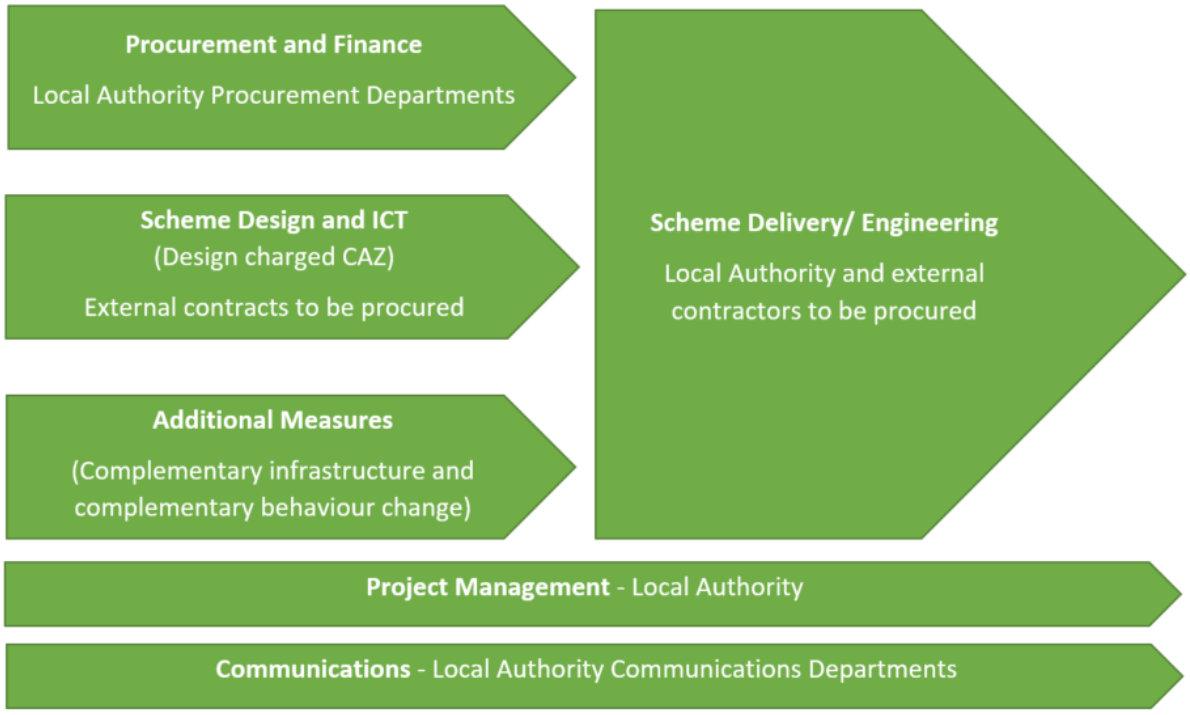
5.3.8 CAZ Implementation Workstreams

5.3.9 Potential CAZ Implementation has been devised into several workstreams, with each workstream delivering the agreed required outputs. Workstream outputs include the necessary information to inform the design, implementation, operation and monitoring of the current Proposed Option.

5.3.10 The Implementation programme consists of several key workstreams and each workstream consists of projects with critical deliverables.

5.3.11 In Figure 5-2 the breakdown and hierarchy of the programme and the leads for each workstream are identified. At this stage, any external workstream leads for Implementation are to be determined. These elements will be undertaken in accordance with the procurement strategy set out in the Commercial Case.

Figure 5-2 CAZ Implementation Workstream leads



- **Project management** – This workstream oversees scope, timescales, costs, risk, and change and reporting.
- **Procurement and finance** – This workstream monitors the spend profile for the duration of the project. This workstream covers the procurement and implementation of the Proposed Option.
- **Scheme design and ICT** – This workstream will undertake detailed design of the Proposed Option. The scheme will be designed in a way which maximises value for money whilst also ensure that the deliverables of the Proposed Option are realised.
- **Communications** – This workstream ensures that sufficient communication is undertaken to ensure acceptability of the Proposed Option. A Communications Plan of the Proposed Option will be incorporated into the FBC. This activity will be supported by specialist suppliers when required.
- **Scheme delivery / engineering** – This workstream will oversee the operation and monitoring of the Proposed Option.
- **Additional measures / mitigation** – This workstream refers to additional measures funded through surplus revenue generated from the Proposed Option. Specialist professionals from internal departments will be required to design, implement and operate additional measures.
- **Scheme delivery / engineering** – This workstream will oversee the operation and monitoring of the Proposed Option.

5.3.12 The above workstreams and governance structure will regularly interact with the Tyneside Air Quality Feasibility Study governance. It is expected that the Steering Group for both governance structures will remain consistent.

5.4 Programme Plan

5.4.1 Key Milestones

5.4.2 The key milestones for the Tyneside Air Quality Feasibility Study are summarised in Table 5-1. Milestones 1-3 are the responsibility of the governance structure for the Tyneside Air Quality Feasibility Study (Figure 5-2). Milestones 4-5 are the responsibility of the CAZ Implementation governance structure (Figure 5-4).

Table 5-1 Programme Key Milestones

MILESTONE	FORECAST DATE
SOC	March 2018
Evidence Submission	November 2018
Draft OBC	December 2018
OBC	February 2019
FBC	As soon as possible following OBC
Implementation/scheme opening for some measures	January 2020 (Also see Appendix A5.3)
Benefits realisation	January 2021

5.4.3 Tyneside Air Quality Feasibility Study Project Plan

5.4.4 The Tyneside Air Quality Feasibility Study project plan is shown in Appendix A5.2. Key deliverables for the Tyneside Air Quality Feasibility Study are the submission of the SOC, OBC and FBC (and associated appendices). The following tasks are on the critical path for a punctual delivery of the FBC:

- receiving funding from JAQU to complete the feasibility study;
- receiving prompt feedback and responses from JAQU regarding the study;
- gaining Cabinet approval to enter consultation;
- gaining approval from the Secretary of State for any Proposed Option;
- undertaking public consultation in Spring 2019;
- revising the option design of the Proposed Option based on consultation feedback and analysis;
- assessing effectiveness using the new Tyneside transport model and the Tyneside air quality model;
- analysing the value for money and impacts on the economy, society and public health; and
- ensuring political acceptability and sign-off by governing officials.

5.4.5 It is also expected that procurement of any Proposed Option will be at a point by August 2019 to ensure prices have been returned to inform the FBC, based on market engagement undertaken by officers. The contract awards will be issued following the approval of the FBC.

5.4.6 CAZ Implementation Project Plan

5.4.7 The Implementation project plan is shown in Appendix A5.3.

5.4.8 Measures can be broken down into two categories:

- **Compliance measures** which are intervention-focused and must ensure compliance with air quality exceedances; or
- **Mitigation measures** which are intervention-neutral and outcome-focused against distributional impacts of the measures which induce compliance. These can be community-wide measures such as road layout changes, changes to cycling or walking infrastructure, improved public transport, park and ride schemes, promoting car clubs, vehicle retrofit; or better travel planning services. They can also be behaviour change measures aimed directly at supporting individuals or businesses such as local travel discounts (which could be linked to smart ticketing), cycle to work schemes, local scrappage schemes or support for upgrading to a new vehicle (including ultra-low emission vehicles).

5.4.9 Funding for compliance measures will be sought from the Implementation Fund. Funding for the mitigation measures is from the Clean Air Fund and is a competitive process.

5.4.10 The plan demonstrates that the compliance measures will be operational by the end of 2020. This means it will have a measurable impact on air quality in 2021. Any compliance measures in the longlist which did not demonstrate deliverability in this timeframe were sifted out during the options prioritisation process.

5.4.11 Mitigation measures which are designed to support individuals or businesses must be in place before the charging CAZ is operational. This will allow local businesses and residents to change their vehicle or method of travel before incurring any charges.

5.4.12 Mitigation measures which are community-wide can be delivered alongside CAZ implementation.

5.4.13 The public campaign must also be in place before a charge CAZ is operational. This will ensure that local businesses and residents are prepared for the Proposed Option and again, can act accordingly by changing their vehicle or method of travel.

5.4.14 The following tasks are on the critical path for a punctual delivery of the implementation of any CAZ:

- receiving prompt confirmation of funding from JAQU;
- undertaking procurement by late Summer 2019;
- installation of equipment, signage and systems;
- public campaign to inform vehicle users of the impacts of the CAZ;
- testing the systems to ensure accuracy and usability; and

- ensuring appropriate complementary measures are in place before the charging begins to allow sufficient time for local businesses and residents to access these measures.

5.5 Assurance and approvals

5.5.1 Turner and Townsend are the Project Management team for the Tyneside Air Quality Feasibility Study which includes the development of the business case. As part of this role a weekly review of the project programme is undertaken with workstream leads feeding in progress and expected progress and identifying risks to programme. This process provides a regular health check of the programme. This is regularly communicated to JAQU.

5.5.2 Table 5-1 shows the agreed programme assurance milestones for the delivery of the Tyneside Air Quality Feasibility Study and CAZ Implementation.

5.5.3 Approvals follow a strict hierarchy and governance structure. Utilising appropriate legal, financial and technical advice from internal and external partners, the Working Group, liaising with JAQU, investigate the options and make recommendations to the Steering Group. After sign-off from Steering Group, approvals are then sought from each Cabinet (Gateshead Borough Council, Newcastle City Council and North Tyneside Council). At the same time, approvals are also sought from JAQU and the Secretary of State.

5.5.4 Given the project time constraints, it was not possible to seek the three Cabinet's approvals before draft submission to JAQU. Instead, approval has been sought for the final Outline Business Case. This represents a key risk for the project which must be managed carefully. The approval timescales for both Cabinet and JAQU has been factored into the Project Plan.

5.5.5 Other decisions which are made via delegated decisions from Cabinet are:

- Commissioning of work to complete the FBC. This is anticipated to be future Project Management support from OBC to FBC, and future options appraisal and business case writing for the FBC. This work will be commissioned in Spring 2019 using the existing NEPO procurement framework.

5.5.6 During operation of the current proposed option, each Cabinet (Gateshead Borough Council, Newcastle City Council and North Tyneside Council) would have to approve proposals for how any surplus revenue (i.e. excess revenue generated by the CAZ over and above the operation costs) would be spent before this is formally submitted to the JAQU. The responsibility for budgets therefore lies through the Cabinets of the Tyneside Authorities.

5.5.7 Regular reviews of how the Proposed Option is being delivered will be undertaken. A monitoring plan is set out in Appendix A5.6. Reviews will be undertaken in accordance with the following programme milestones:

- Data collection for *One Year Post-Opening Summary* in January 2022
- Publication of *One Year Post-Opening Summary* in June 2022
- Begin data collection for *Five Year Post-Opening Summary* in January 2027
- Publication of *Five Year Post-Opening Summary* in June 2027

5.5.8 If anticipated benefits are not realised by the end of 2021, the CAZ Implementation Group will liaise with JAQU and the Steering Group to determine what further action is required.

Table 5-2 Programme Assurance Key Milestones

	Milestone	Forecast Date	Forum
1.1	OBC Completion Public Consultation Plan	See Project Plan	Working Group
1.2	OBC Approval Public Consultation Approval	See Project Plan	Steering Group
1.3	OBC Approval Public Consultation Approval	See Project Plan	Cabinet
1.4	Approval OBC	See Project Plan	JAQU / Secretary of State
2.1	FBC Completion Procurement Plan	See Project Plan	Working Group
2.2	FBC Approval Procurement Approval for CAZ Implementation	See Project Plan	Steering Group
2.3	FBC Approval Procurement Approval for CAZ Implementation	See Project Plan	Cabinet
2.4	FBC Approval Funds Granted	See Project Plan	JAQU / Secretary of State
3.1	Additional Measures[1] Plan	See Project Plan	CAZ Implementation Group[2]
3.2	Approval of Additional Measures	See Project Plan	Steering Group[1]
3.3	Approval of Additional Measures	See Project Plan	Cabinet
3.4	Approval of Additional Measures	See Project Plan	JAQU / Secretary of State

5.6 Communication and Engagement

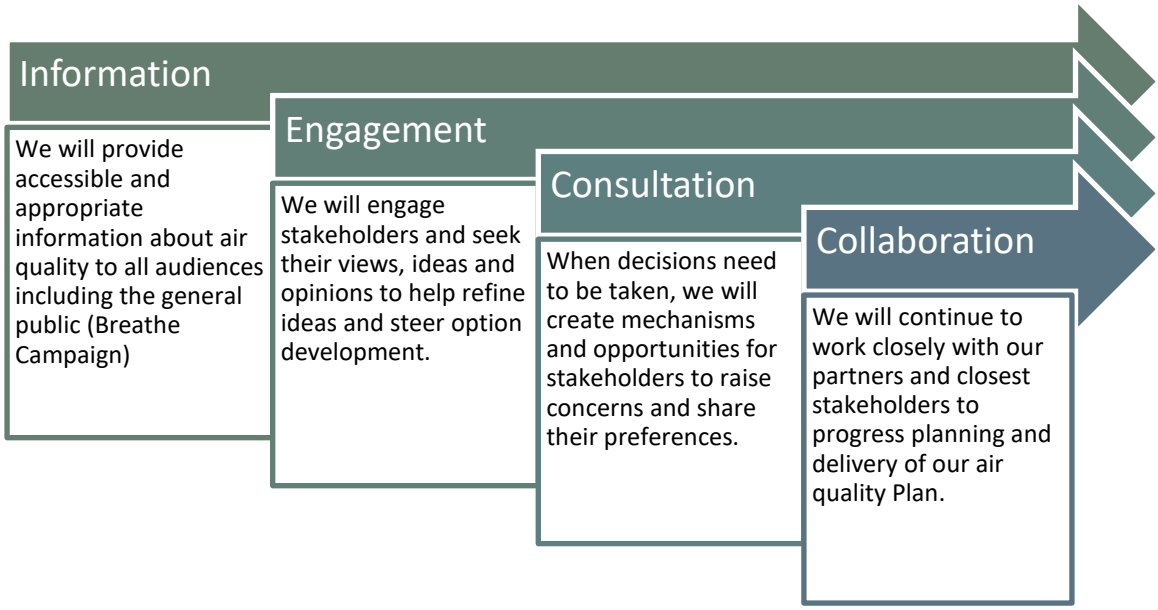
5.6.1 Stakeholder Management and Engagement

5.6.2 Our approach to engagement in transport initiatives and investments is based on our ladder of participation as shown in Figure 5-5. More detail on the Engagement Strategy to inform the Tyneside Air Quality Feasibility Study is shown in Appendix A5.4.

[1] Additional measures are measures which will be funded by any surplus revenue generated by the Proposed Option.

[2] As shown in Figure 5-4 governance structure.

Figure 5-3 Communication and engagement approach



Stakeholder engagement to inform this OBC includes:

- June 2017 – Transport Forum Open Meeting[3] – A 'World Café' Event that sought to enable members of the public and key stakeholders to have the opportunity to develop a response to Defra's Air Quality Consultation about their proposed set of measures to improve air quality.
- Air quality is discussed as a regular item on all of Newcastle City Council's Transport Forum agendas since the aforementioned open meeting last year. The forum has closely followed the progress of the regional working group in their efforts to work towards the Tyneside Air Quality Plan.
- A key stakeholder workshop to inform options shortlisting undertaken on 4th June 2018 which included representation from bus operators, NHS Trust in Newcastle, Freight Transport Association and public user groups.
- Input from air quality campaigning groups initially in Gosforth (Safe Pedestrian and Cycling Environments – SPACE for Gosforth) who have collected evidence about poor air quality, raising public awareness and challenging transport policies to help improve air quality in their area.
- Local initiatives around active travel in the inner-city suburbs in Newcastle (Streets for People) has also led to the establishment of a number of groups dedicated to improved sustainable travel environments and we benefit from their work in terms of sustainable travel and the school run and Air Quality data collection around schools.
- Newcastle Urban Observatory provide academic and practical support for data collection and interpretation and have provided links to PhD and MSc researchers whose research methods have led to air quality work in three primary schools in Streets for People areas.

[3] Newcastle's Transport Forum is an established group of representatives of public transport providers, civic and business leaders, community and campaigning groups who meet quarterly to debate issues and opportunities affecting the city's transport networks.

This includes significant installations of Emote, high-precision and AQMesh real time Air Quality sensors.

- Transport Forum October 2018 – stakeholder engagement event with local businesses, community groups, charities, councillors, public transport operators, air quality and transport professionals and young people.
- Stakeholder consultation events in November 2018 – engagement by the three Tyneside Authorities with public health, community groups, inclusion groups, green lobbying groups, large employers, taxi drivers and transport and air quality specialists.
- Engagement with Council Leaders, Elected Mayor and Cabinet members alongside wider briefings by all three Tyneside Authorities on emerging options.

5.6.3 Public Communications and Engagement

5.6.4 Engagement with the public has already began through the 'Breathe' Campaign, which has run through Autumn and Winter 2018.

5.6.5 Formal consultation is planned for a period from late February / Early March 2019, after the approval of this OBC by Cabinet.

5.6.6 Prior to submission of the FBC, the public will be regularly engagement through the 'Breathe' campaign to ensure awareness of air quality is increased.

5.6.7 Before implementation of the Proposed Option, a lead-in public awareness campaign will be undertaken. The objectives would be as follows:

- Inform the public of the Proposed Option and how that might affect them.
- Provide information sources for advice or support

5.6.8 This campaign would be funded by JAQU and is a requirement for the implementation of a proposed option.

5.7 Project Reporting

5.7.1 To monitor the business case progress, risk, issues and opportunities a fortnightly briefing note is produced by workstreams and submitted to the Project Management team. The Project Management team collate information and present a summary to the Working Group during weekly meetings. The Working Group provide updates to the Tyneside Air Quality Steering Group during monthly meetings.

5.7.2 Key reporting deliverables are required as part of the business case development. These are:

- Strategic Outline Case
- Economic Appraisal Methodology Report (E1)
- Economic Model (E2) and any linked documents
- Write-up of the economic appraisal and results
- Distributional analysis methodology (E3)
- Local Plan Air Quality Modelling Tracking Table (AQ1)
- Local Plan Air Quality Modelling Methodology Report (AQ2)
- Local Plan Air Quality Modelling Report (AQ3)
- Local Plan Transport Modelling Tracking Table (T1)

- Local Plan Transport Model Validation Report (T2)
- Local Plan Transport Modelling Methodology Report (T3)
- Local Plan Transport Model Forecasting Report (T4)
- Target Determination Outputs
- Analytical Assurance Statement
- Outline Business Case
- Final Business Case

5.7.3 To monitor implementation, the CAZ workstreams will report risk, resource trackers, programme progress and financial monitoring. Regular reports will be required as part of any contracts which are let to the supply chain.

5.8 Contract Management

5.8.1 The Tyneside Authorities are committed to investing the necessary level of resource to ensure effective contract management.

5.8.2 Management of future external services and suppliers for the CAZ Implementation will be the responsibility of the future Project Management resource. It is anticipated that this will be an external resource which is yet to be appointed. More detail regarding Contract Management will be provided in FBC when CAZ Implementation governance and workstreams are in place. These specialists will be able to provide advice and guidance regarding the CAZ Implementation.

5.9 Risk Management Strategy

5.9.1 All projects are subject to risk and opportunity. The objective of the risk management strategy is to minimise the impact of risks, whilst allowing maximum advantage to be taken of any opportunities. The earlier that risk management is applied to a project, the more opportunity there is to influence the outcome.

5.9.2 The Tyneside Authorities have extensive experience in delivering complex schemes in isolation and in partnership. The Risk Management Strategy identifies, and records risks, identifies potential mitigation to eliminate or reduce risk and allocates or transfers risk to the relevant parties that are best able to deal with them. The Risk Management Strategy allows for the ongoing review of risks as they progress through the planning and delivery stage.

5.9.3 A copy of the Tyneside Air Quality Feasibility Study risk management strategy is shown in Appendix A5.5, along with a copy of the most recent risk register. To inform the Tyneside Air Quality Feasibility Study risk management, one risk workshop was undertaken for the study as a whole in July 2018 and one for measures implementation on 15th October 2018 with key workstream representatives. In addition, each workstream submits their individual project risks every two weeks.

5.9.4 Risks are identified by any workstream and compiled by the Project Management team. Each risk is categorized and rated, a mitigation technique identified, a risk owner assigned, and a risk cost estimated. These are detailed in the risk register.

5.9.5 The current top five risks for the Tyneside Quality Feasibility Study are:

- Technical modelling accuracy;
- Political and public acceptability of the Proposed Option;
- Completing the FBC in the shortest possible time;
- Risk of legal challenge; and
- National air quality strategy not being accepted.

5.9.6 In addition, the Tyneside Authorities are also managing the risks associated with the implementation of the CAZ. Each individual measure within the package has its own associated risks.

5.9.7 The CAZ Implementation risk management strategy and risk register are shown in Appendix A5.5. Risks have been identified and compiled by the Options Development Workstream. Each risk is categorized and rated, a mitigation technique identified, a risk owner assigned, and a risk cost estimated. These are detailed in the risk register. It is expected this risk register will be amended significantly when CAZ Implementation workstreams are in place.

5.9.8 As noted above, to inform the CAZ Implementation risk management, a risk workshop was undertaken on 15th October 2018 with Options Development workstream and members of the Working Group. A revised CAZ Implementation workshop will be undertaken using key representatives from the CAZ Implementation governance structure after submission of the OBC.

5.9.9 The current top five risks for the CAZ Implementation are:

- Risk of Legal Challenge
- Option costs based on outline option and market estimate
- Timescales for Procurement and delivery
- The Option not meeting objectives and exceedances remaining
- Public Acceptability

5.9.10 Notably, risk registers are live documents which change through the lifetime of the project. Risks will continue to be reviewed and assessed and the outputs will be distributed to the appropriate teams. Risks are regularly reviewed by the Project Management team and the Working Group. Key risks are escalated to the Steering Group for analysis and decision-making. The Steering Group are ultimately accountable for the oversight of the Tyneside Air Quality Feasibility Study. The new Steering Group (Figure 5-4) will be accountable for the oversight of the CAZ Implementation.

5.9.11 The allocation of risk and transfer of risk elements will be assigned to the organisation best placed to manage that risk. In many cases, the CAZ Implementation risks will be transferred to contractors as part of the procurement process and contractual agreements in place. The transferring of risk to relevant parties is explained in the Commercial Case.

5.9.12 Early focus for delivery will be made on those interventions which are considered low risk. Schemes which require lengthy consultation; extensive or complex design; input from external parties; use of new technology or demonstration through pilots may be considered to generate too much risk unless outweighed by the opportunity.

5.9.13 Contingency has also been applied to the delivery of the CAZ.

5.10 Benefits Realisation

5.10.1 Benefits will be realised once the measures are implemented and operational. Benefits realisation is a key strand of implementation, operational management and a key part of the management case.

5.10.2 Details of the anticipated benefits and how they will be measured are shown in the benefits register shown in Appendix A5.6. Approval of the benefits register will be requested via Steering Group and then Cabinet.

5.10.3 All benefits of the Proposed Option must be tracked efficiently and reported back promptly. This will ensure that feedback can be given quickly so that contingency plans can be implemented should the Proposed Option prove to be ineffective.

5.10.4 Measures within the Proposed Option will be implemented as quickly as is feasible to ensure realisation of benefits in the shortest possible time. Any additional measures which can be implemented following successful delivery of a charge CAZ will also be identified.

5.10.5 Flexibility during CAZ Implementation is essential. The Tyneside Authorities will ensure there is the ability to alter measures (such as changing the geographical scope of the CAZ, changing the classification of the CAZ or changing the CAZ charges) during the consultation and approval process. This will ensure that the Tyneside Authorities have a CAZ with limited adverse impact on local individuals and businesses, but still achieves the required impacts on air quality.

5.10.6 All benefits will be regularly tracked and fed back through the CAZ Implementation governance structure. Real-time air quality monitors are required to efficiently track the levels of pollution on exceedance links before and after implementation.

5.11 Monitoring and Evaluation

5.11.1 The Tyneside Clean Air Zone Monitoring and Evaluation Plan is shown in Appendix A5.6.

5.12 Contingency

5.12.1 As noted in the Commercial Case, the Authorities will, as part of their procurement strategy, endeavour to ensure that all elements are delivered on time in order to enable delivery and impact in the shortest possible time.

5.12.2 However, if service implementation were to be delayed then the authorities will follow a number of options in order to enable delivery:

- Pursue contractual remedies against suppliers in order to ensure delivery, including structure of contracts
- Ensure that JAQU are informed of any issues with delivery, where it may impact timescales in order that resources can be more effectively allocated
- Follow a risk-based approach with contractors, with regular reporting intervals and a 'no surprises' policy enshrined within contractual terms

APPENDICES

APPENDIX A5.1 - CAZ Implementation Governance Terms of Reference

CAZ Implementation Group

Role: The day-to-day implementation group for the Study, responsible for developing, procuring and implementing the Proposed Option identified by the Working Group and providing the support function for the Steering Group and liaison with JAQU after the submission of the Full Business Case and until 1 January 2021.

In line with established procedure at the Working Group, this group is chaired by an officer of Newcastle City Council and will be supported by further project management resource who will co-ordinate papers and support delivery of the various workstreams.

Responsibilities:

- Attendance of meetings
- Comment by email on specific documents may also be required between meetings.
- Providing liaison to other departments within the relevant authority as appropriate
- Undertaking specific tasks to implement the CAZ and Additional Measures
- Agreeing draft reports for the Steering Group including regular updates on Procurement and delivery
- Commenting on and agreeing outputs from workstreams and collation of these into reports
- Oversight of specific budgets and spend in the implementation of the Proposed Option
- Making decisions relevant to the implementation of the Proposed Option including appointing additional resource where required

Membership:

Lead Officer for CAZ Implementation (Chair)	To be confirmed
Representative from Procurement	NCC Officer
Representative from LA Transport Officers	To be confirmed
Representative from Legal	To be confirmed
Representative from Finance	To be confirmed
Representative from Communications Department	To be confirmed
Representative from IT	To be confirmed
Representative for Additional Measures	To be confirmed
Representative from Highways England	To be confirmed
Individual workstream leads	As appropriate
Project Management Support	As contracted

Substitutes: Where members are not available to attend meetings, they can send a nominated substitute, who is empowered to make decisions at the relevant level

Frequency: It is planned for meetings to be held weekly, or otherwise based around key milestones for implementation of the Proposed Option. Papers will be circulated at least two days in advance. Meetings may also be held 'virtually', with papers agreed in advance.

CAZ Operations Team

Role: The Team responsible for the operations of the Clean Air Zone from 1 January 2021 onwards. This group will primarily be Operations-focused.

Responsibilities:

- Attendance of meetings
- Comment by email on specific documents may also be required between meetings.
- Providing operational support to the CAZ or Additional Measures
- Providing liaison to other departments within the relevant authority as appropriate
- Agreeing draft reports for the senior officer and political groups including regular updates on delivery and operations
- Commenting on and agreeing outputs from workstreams and collation of these into reports
- Oversight of specific budgets and spend particularly financial reporting
- Making decisions relevant to the Operation of the Proposed Option

Membership:

Lead Officer for CAZ Implementation (Chair)	To be confirmed
Representative from Procurement	NCC Officer
Representative from Finance	To be confirmed
Representative from CAZ Operations team	To be confirmed
Representative for Additional Measures	To be confirmed
Representative from Highways England	To be confirmed
Project Management Support	As contracted
Representative from Communications Department	To be confirmed

Substitutes: Where members are not available to attend meetings, they can send a nominated substitute, who is empowered to make decisions at the relevant level

Frequency: It is planned for meetings to be held fortnightly, or otherwise based around key milestones for operations of the Proposed Option. Papers will be circulated at least two days in advance. Meetings may also be held 'virtually', with papers agreed in advance.

APPENDIX A5.2 - Public and Stakeholder Engagement Strategy

Before new measures are put in place, the Tyneside Authorities need to raise awareness and understanding about the extent of the air quality problem and its health implications. The Tyneside Authorities have begun to raise awareness through the 'Breathe' campaign.

The aim of the campaign is to raise awareness amongst the public that they need to play a part in improving air quality. The communication objectives from the campaign are to:

- Raise awareness amongst people in the North East of the issues surrounding air pollution;
- To make people in the North East aware that action needs to be taken to reduce that air pollution;
- That air pollution is not just a 'problem for the local authorities' and that we are all responsible; and
- To communicate a call to action for people in the North East.

The campaign duration will run in the following stages:

Stage 1 – Awareness raising campaign

Newcastle and Gateshead Councils have created a campaign that bring the air quality concern to the awareness of the public. During this stage, informal information will be delivered to stakeholders and the public. The views of stakeholders will be collected to inform the feasibility study. A key objective will be to ensure people are better informed about air quality in advance of planned informal and formal engagement and consultation.

The animated artwork will be using individual hashtags which will help track engagement and monitor conversations on social media, where most of the activity will be focused. These will be #BreatheNewcastle and #BreatheGateshead.

Examples of the static artwork are shown below:

Public awareness will be raised using the following platforms:

- Short messages will also be used on Variable Messaging Signs next to roads.
- Web content on individual local authorities webpages
- Social media
- Press and media activity

Standard questions and answers forms have been prepared to ensure clear and consistent messaging. This stage ran in the Autumn and Winter of 2018 in the authorities.

Stage 2 – Undertake formal consultation

The Tyneside Authorities will undertake a formal consultation of the proposed solution. The feedback from formal consultation will inform the final Proposed Option and FBC.

Formal consultation is planned in the Spring of 2019.

Stage 3 – Awareness Raising Campaign for the Proposed Option

Lead-in public awareness campaign for the implementation of the Proposed Option. The objectives would be as follows:

- Inform the public of the Proposed Option and how that might affect them.
- Provide information sources for advice or support

Public awareness will be raised using the following platforms:

- Short messages will also be used on Variable Messaging Signs next to roads.
- Web content on individual local authorities webpages
- Social media
- Press and media activity

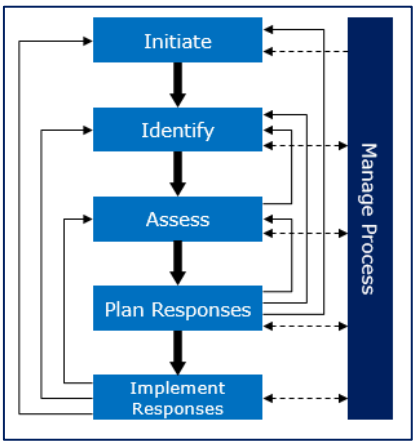
Standard questions and answers forms have been prepared to ensure clear and consistent messaging.

APPENDIX A5.3 - Risk Strategy and Registers

Risk Management is the responsibility of the appointed Project Manager. Risk management is the proactive identification, analysis and management of threats and opportunities that help make better investment decisions, improve delivery certainty and enhance operational performance.

The process of managing risk can be deployed at any point in the project life cycle (inception, optioneering, delivery, etc.), but the earlier the deployment the greater the benefit.

The approach set out by APM is to identify, assess and respond to the key threats and opportunities that have the potential to impact the study objectives. This will ensure that uncertainty is managed throughout the delivery of the programme lifecycle. The methodology directly with the APM risk management process, which is recognised as industry best practice: This process is identified below.



The benefits of a proactive risk management process are as follows:

- Identifies and allocates responsibility to the best risk owner.
- Demonstrates a responsible approach to customers (inspired confidence)
- Supports the build-up of statistical information
- Enables better informed plans, schedules and budgets
- Increases the likelihood of a project adhering to its schedules and budgets
- Improves the quality of decision making
- Focuses project management attention on the real and most important issues
- Facilitates greater risk taking, thus increasing benefits gained

Managing risk encourages the project team to identify and pre-empt the things that might affect the project. A risk specialist will facilitate risk workshops during the Tyneside Air Quality Feasibility Study and the CAZ Implementation to capture project risks.

A risk register is then created to help proactively manage and reduce the likelihood of the risk occurring. An action owner is assigned and mitigation actions are allocated to help reduce the probability of the risk being realised, or lessen its impact. Finally, it is vital that the risk management process is an iterative documents which is continually reviewed at prescribed intervals.

APPENDIX A5.4 - Monitoring and Evaluation Plan

Introduction

As part of the Outline Business Case (OBC) for the Tyneside Air Quality Feasibility Study, Local Authorities are required to put in place a *Tyneside Clean Air Zone Monitoring and Evaluation Plan*. This is not only a requirement from JAQU but also a requirement for good management of public money and of the Green and Magenta Books.

The Tyneside Authorities benefit from an existing comprehensive monitoring system and national centres of best practice in urban data collection, air quality monitoring and evaluation from local academic partners.

Correspondingly, the Tyneside Authorities propose to not only undertake the 'do minimum' levels of monitoring to JAQU but also to undertake a local evaluation of the impacts of the Proposed Option. Given the scale of public investment and the potential impacts of the Proposed Option, this is the only feasible solution. In addition to what is set out below, Authorities will abide by the requirements set out in the JAQU Monitoring and Evaluation note to report data to JAQU every 3 months where available.

JAQU and Local Responsibilities

The Tyneside Local Authorities and JAQU will have differing and complementary roles for the delivery of monitoring and evaluation for national and local air quality studies.

Specifically, the central national evaluation will:

> Aim to understand the impacts of interventions introduced through a local authority's local plan and ensure that local authorities are on track to reduce NO2 concentrations in the shortest possible time. The central evaluation will utilise existing local and national monitoring. Therefore, local authorities should maintain their current monitoring sites (on NO2 concentrations or traffic flows) for the length of the evaluation.
>
> Local authorities will be required to share the data produced by this monitoring, as well as any other data collected (for instance, on the number of cycle trips, bus trips or similar) every three months. To support further analysis as part of rapid reviews or case study work, local authorities may also need to share additional data when necessary. Therefore, local authorities should plan for some resource to engage with the central evaluation.
>
> (JAQU Monitoring and Evaluation Note, October 2018)

In contrast, the Tyneside Authorities are expected to:

> Monitor the AQ outcomes in relevant areas but may choose to conduct further monitoring activity or evaluate the wider impacts of their measures in more detail. This could range from maintaining (and sharing) the existing monitoring to implementing new monitoring or undertaking a detailed local evaluation. JAQU would anticipate a monitoring and evaluation section to be included in the OBC, including details on any associated costs.

This guidance has shaped the approach of the *Tyneside Clean Air Zone Monitoring and Evaluation Plan*.

Principles of Local Authority Monitoring and Evaluation

The Tyneside Authorities are subject to a number of monitoring and evaluation requirements for previous, current or future transport schemes. These include:

- Local Growth Fund Monitoring and Evaluation (North East LEP Assurance Framework & NECA Post Opening Evaluation Guidance)
- National Productivity Investment Fund Monitoring
- Highways Maintenance Challenge Fund Monitoring
- Cycle City Ambition Fund Monitoring and Evaluation
- Regional Growth Fund Monitoring
- Single Investment Fund Monitoring and Evaluation (North of Tyne Combined Authority Assurance Framework)
- Defra Early Measures Fund Monitoring

In developing this *Tyneside Clean Air Zone Monitoring and Evaluation Plan*, the Tyneside Authorities have considered 'lessons learned' from previous monitoring and evaluation frameworks and the unique challenges posed by the *Tyneside Air Quality Feasibility Study*.

The following principles are proposed for the monitoring and evaluation to be undertaken as part of the *Tyneside Air Quality Feasibility Study* and the Clean Air Zone Implementation. The source of the principle is shown in brackets.

- Forward plan evaluation at the appraisal stage, including using a logic model framework and storing and collecting appraisal data for an appraisal handover pack (DfT guidance and best practice)
- The preferred methods of monitoring will be through secondary (i.e. existing) data sources where possible, given that these are extensive within the Tyneside area (Best practice and lessons learned in minimising ongoing costs)
- Additional primary monitoring costs will be proportionate to the benefit to be accrued from the measurement of the indicator (Best practice and lessons learned from other funding streams)
- A Post Opening Evaluation will be conducted one-year and five-years after the project has been completed (DfT Guidance and best practice in the use of public money)
- Where possible, more than one pre-implementation year will be used as a baseline (DfT Guidance and lessons learned from other funding streams)
- Outcome metrics will not only be sourced from those typically used in transport schemes, but also encompass environmental, public health and economic outcomes (JAQU and DfT guidance and the wide-ranging nature of the scheme)

Tyneside Air Quality Feasibility Study

The Tyneside Air Quality Feasibility Study has been prepared in accordance with guidance received from the Joint Air Quality Unit (JAQU) and the Department for Transport (DfT) WebTAG or HM Treasury Green Book as appropriate.

Evaluation is an integral part of understanding the impact of interventions or policy initiatives. It can demonstrate the effectiveness of an intervention in delivering its stated goals, the accuracy of appraisal undertaken to justify its implementation and to justify the expenditure of public money. It can also help in informing future policymaking, whether at the local, regional or national level.

Given the scale of the potential levels of public investment and the importance of this area of public policy, this plan will seek to go beyond the 'do minimum' requirements of simply monitoring and set out in greater detail an evaluation plan which seeks to examine the impact of the chosen Proposed Option for the Air Quality Feasibility Study.

The Tyneside Air Quality Feasibility Study is one of a number being undertaken over 2017 and 2018 to fulfil the requirements set out in the Air Quality Ministerial Direction of August 2017.

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 Proposed Option) that will reduce NO_2 pollution and deliver local compliance with legal limits in the shortest possible time.

Key Milestones

Table 0-1 Programme Key Milestones

Milestone	Forecast Date
Implementation / scheme opening	January 2020
Begin data collection for *One Year Post-Opening Summary*	January 2022
Publication of *One Year Post-Opening Summary*	June 2022
Begin data collection for *Five Year Post-Opening Summary*	January 2026
Publication of *Five Year Post-Opening Summary*	June 2026
Benefits realisation	January 2021

Scheme Objectives and Outcomes

The scheme has one primary objective and three secondary objectives. Elsewhere, these have been referred to as 'Critical Success Factors'.

Box 1. Objectives

The Primary objective is:

- Achieving compliance in a location where emissions of NO_2 exceed legal limits in the shortest possible time

The Secondary objectives are:

- Improving public health in the Tyneside Authority areas in the shortest possible time;
- Enabling future economic growth and sustaining jobs and communities in the region; and
- Promoting a fairer society and does not detrimentally impacting vulnerable populations.

These objectives have guided the development of the OBC and also the development of this Monitoring and Evaluation Plan.

The objective of the evaluation is to answer the research questions shown in 0.

Research Questions

RQ1: Has the implementation of the Proposed Option resulted in compliance with legal limits for NO_2? If so, was this achieved in the shortest possible time?

RQ2: Has the implementation of the Proposed Option had a positive impact on public health in the Tyneside Authority areas and within the Clean Air Zone?

RQ3: Has the implementation of the Proposed Option had a negative economic impact on the area within the Clean Air Zone?

RQ4: Has the implementation of the Proposed Option resulted in detrimental impact to any vulnerable groups?

RQ5: Has the implementation of the Proposed Option had a negative impact on the transport networks of the Authorities?

RQ6: What lessons can be learned from the delivery of the Proposed Option and were the tools used for the appraisal of the Proposed Option appropriate and what recommendations could be made for future appraisal of similar schemes?

It is intended that RQ1-5 are used for Impact Evaluation and RQ6 is used for Process Evaluation and is designed to address wider public policy questions around appraisal and evaluation.

Logic Map

Below is a Logic Map for a potential Clean Air Zone. Additional logic maps have been developed for complementary measures and will be inserted when a proposed option is identified.

Logic Mapping has been an integral part of the Option Development process.

Figure 0-1 Logic Map

CONTEXT	INPUTS	OUTPUTS	OUTCOMES	IMPACTS
Potential charged Clean Air Zone				
Non-compliance with NO2 limit values Timescale to address exceedances Poor health indicators Level of knowledge and perceptions of residents in relation to air quality Evidence which has shown a proven link between poor air quality and poor health	Establishing: • Zone Cordon - vehicles within the designated would be charged if not compliant with the relevant EURO standard for their vehicle • Capital investment and ongoing resource costs	Implementation of roadside infratech and central back-office systems. Enforcement processes needed to ensure compliance.	Will be effective for reducing traffic on the Tyne Bridge and other exceedance links. Divert high-polluting traffic away from targeted areas / reduce vehicle idling time by increasing traffic flow / encourage modal shift. Traffic flows / emissions will be improved in a short space of time. Public will witness at first hand the benefits of smoother traffic flows. Improved Air Quality	Better air quality/reduction in NO2 values Less congestion on some links Improved health through improved AQ or increased active travel Improved accessibility of key services Increased public transport patronage due to modal shift Changes to CO2 emissions and indirect taxation Consequential changes in areas such as road safety and improving journey times.

Outputs and Outcomes

The authorities propose to monitor the following Outputs and Outcomes as set out below. They are sourced from BEIS, DfT and other Monitoring and Evaluation metrics and are designed to ensure that all key appraised elements can be quantified through monitoring:

Inputs	Unit	Data Source	Frequency of monitoring	Dates to be collected	Geography of monitoring	Primary or Secondary data	Additional cost to collect	Research Question	Preferred Direction of travel
Implementation Expenditure	£	Project Team	Quarterly	2019-2026	All involved authorities	Primary	Within project costs	6	
Clean Air Fund Expenditure	£	Project Team	Quarterly	2019-2026	All involved authorities	Primary	Within project costs	6	
In-kind resources provided	£	Project Team	Quarterly	2019-2026	All involved authorities	Primary	Within project costs	6	
Outputs									
Total length of new footways	Metres	Responsible LA Transport Officer	Annual	2019-21	Scheme-specific	Primary	Within project costs	6	
Total length of new cycle ways	Metres	Responsible LA Transport Officer	Annual	2019-21	Scheme-specific	Primary	Within project costs	6	
Total number of ANPR Cameras deployed	Number	Project Team	Annual	2019-26	All involved authorities	Primary	Within project costs	6	
Number of retrofits delivered	Number	Project Team	Quarterly	2019-26	All involved authorities	Primary	Within project costs	6	
Number of CAZ number plate reads	Number	Project Team	Monthly	2021-26	Within CAZ	Primary	Within project costs	6	
CAZ Income	£	Project Team	Monthly	2021-26	Within CAZ	Primary	Within project costs	6	
Outcomes									
Commercial floorspace occupied	m^2	LA/LEP data	Annual	2018-26	Within CAZ	Secondary	No	3	Increase
Employment	Number	BRES via NOMIS	Annual	2018-26	Within CAZ	Secondary	No	3	Increase
Number of new housing starts	Number	LA Planning Officers	Annual	2018-26	Within CAZ	Secondary	No	3	Increase
Commercial rental values	£/m2	LA/LEP data	Annual	2018-26	Within CAZ	Secondary	No	3	Increase
Annual Average daily traffic by peak/non peak periods	Number	Traffic count data & UTMC ANPR data	Annual	2018-26	Routes into CAZ and diversionary routes	Secondary	No	5	Decrease
Average AM and PM peak journey time per mile on key routes	Minutes	UTMC ANPR data & Trafficmaster data	Annual	2018-26	Routes into CAZ and diversionary routes	Secondary	No	5	Decrease
Day-to-day travel time variability	Minutes	Std. dev. Of travel time using ANPR data	Annual	2018-26	Routes into CAZ and diversionary routes	Secondary	No	5	Decrease
Accident/ Casualty rate	Number	Traffic Accident and Data Unit	Annual	2018-26	Within CAZ, routes into CAZ and diversionary routes	Secondary	No	2, 5	Decrease
Nitrogen Dioxide concentrations	$\mu g/m^3$	Automatic monitoring stations and diffusion tubes	Annual	2018-26	Within CAZ, routes into CAZ and diversionary routes	Primary	Yes	1, 2, 4	Decrease
Particulate concentration levels	$\mu g/m^3$	Automatic monitoring stations	Annual	2018-26	Within CAZ, routes into CAZ and diversionary routes	Primary	Yes	1, 2, 4	Decrease
Annual average daily passenger boardings	Number	Nexus/Public Transport Operators	Annual	2018-26	All involved authorities	Secondary	No	5	Increase

Pedestrians counts on new/existing routes	Number	Responsible LA Transport Officer	Annual	2018-26	Scheme-specific	Primary	Yes	2, 5	Increase
Cycle journeys on new/existing routes (#)	Number	Responsible LA Transport Officer	Annual	2018-26	Scheme-specific	Primary	Yes	2, 5	Increase
Business surveys	Various	Bespoke surveys	Three	2018, 2022, 2026	Within CAZ	Primary	Yes	3,4,5	Positive
People walking for travel at least 3 days/week	%	Public Health England Physical Activity Profile, indicator	Annual	2018-26	3 LAs	Secondary	No	2	Increase
People cycling for travel at least 3 days/week	%	Public Health England Physical Activity Profile, indicator	Annual	2018-26	3 LAs	Secondary	No	2	Increase
Adults meeting CMO recommendations for physical activity	%	Public Health Outcomes Framework, indicator 2.13 (i)	Annual	2018-26	3 LAs	Secondary	No	2	Increase
Adults that are physically inactive	%	Public Health Outcomes Framework, indicator 2.13 (ii)	Annual	2018-26	3 LAs	Secondary	No	2	Fall
Mortality considered preventable from all cardiovascular diseases (incl. heart disease) in those aged <75	Rate per 100,000	Public Health Outcomes Framework, indicator 4.04 (ii)	Annual	2018-26	3 LAs	Secondary	No	2	Fall
Mortality considered preventable from all respiratory diseases in those aged <75	Rate per 100,000	Public Health Outcomes Framework, indicator 4.07 (ii)	Annual	2018-26	3 LAs	Secondary	No	2	Fall

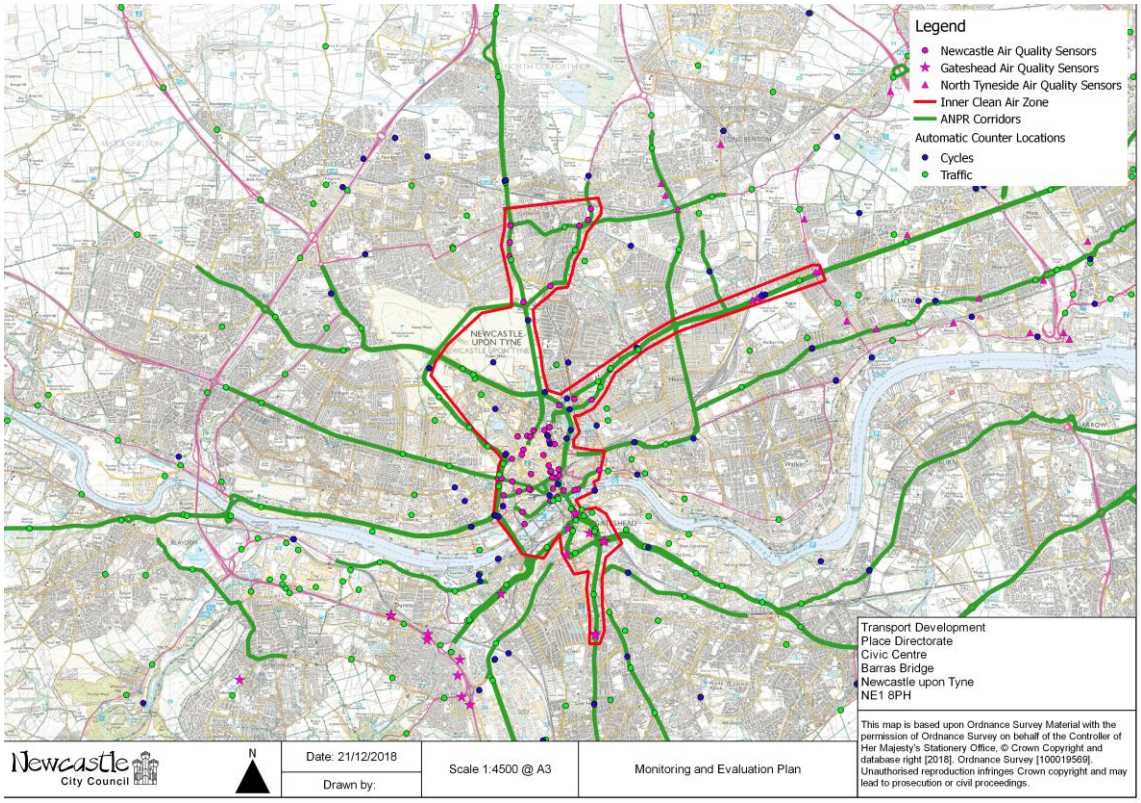
Additional Detail on Data Sources and Collection methodologies

A number of data sources in the table above are discussed in more detail below:

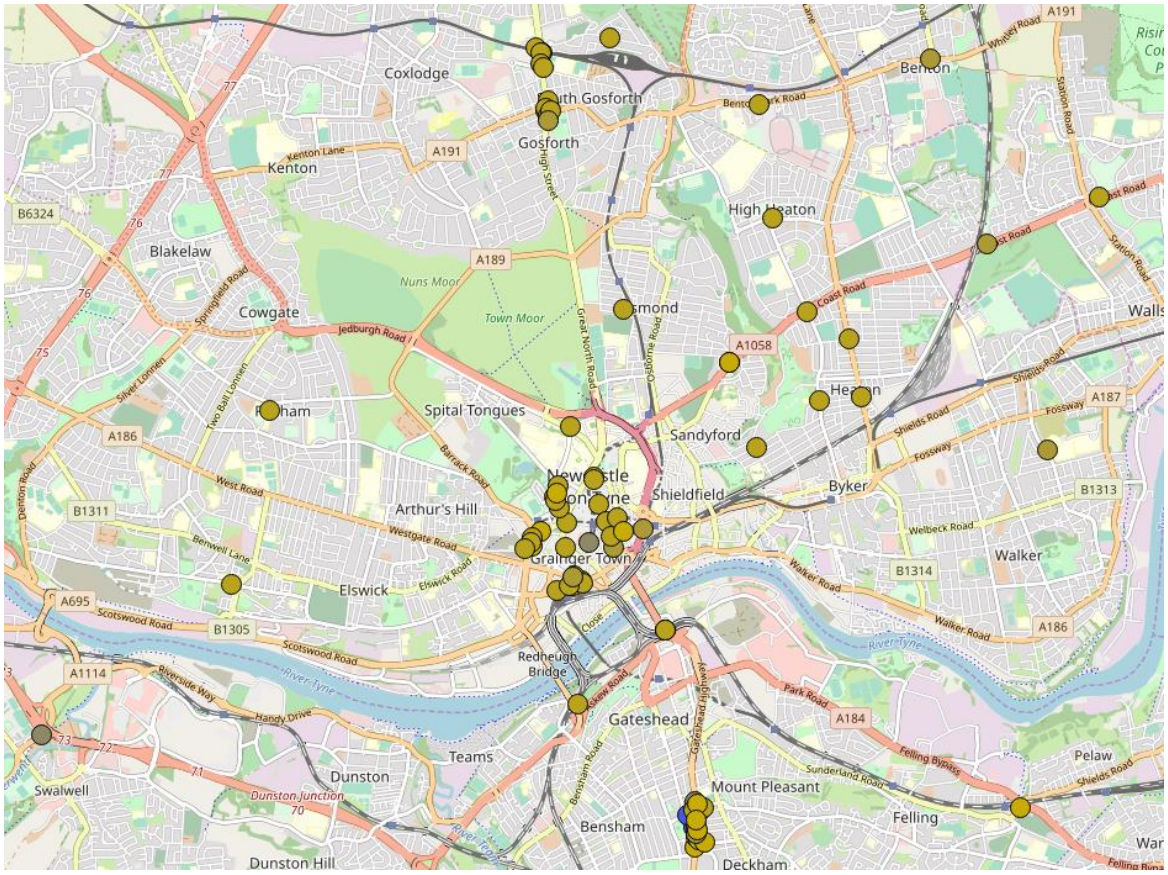
Data Type	
Employment Data	This will be sourced from the Office for National Statistics Business Register Employment survey, which is published on an annual basis. This data is available at a Medium Super Output Area level. This will be used to understand changes in employment at smaller geographies, both within the CAZ and, as a comparison, elsewhere. This data is available and free to access, including historic data.
Trafficmaster Data	Trafficmaster data is used to identify journey time data, which will enable authorities to understand changes in average speeds on links in and outside the CAZ. The data is generated through in vehicle GPS trackers. The Data is GPS sourced and is obtained from the DfT. GPS data is disaggregated and assigned to links on the network, these links are divided into 15minute segments across the data collection period. This data is currently provided to the North East Combined Authority on behalf of all 7 authorities within the North East. Newcastle City Council currently process and analyse this data on behalf of all 7 authorities.
Automatic Traffic & Cycle Count Data	This data will be used in order to understand changes in traffic and cycle flow both within and outside the CAZ. Permanent ATCs will be used in order to minimise potential bias caused by short sample periods and also to enable more accurate comparison to the baseline. Currently, the Tyne and Wear Traffic Accident Data Unit collects this data on behalf of all Tyneside local authorities, including a large amount of data from previous years.
Manual Traffic Count Data	It is recognised that the Automatic Traffic Count data may not provide complete coverage of all roads within or around the CAZ. The existing Automatic Traffic Count dataset focuses primarily on larger roads and Authorities are conscious that they wish to account for potential rerouting effects. Correspondingly, provision has been made for additional bespoke traffic count data to be undertaken before, one year after and five years after.
ANPR Data	This data will be used to understand day to day travel time variability both within the CAZ and on routes approaching it. Tyne and Wear has a comprehensive network of Automatic Numberplate Recognition cameras, which are used by the Urban Traffic Management and Control centre, based at Newcastle University. This data is freely available and can include pre-CAZ baselines.
Pedestrian and Cycle Counts	This data will be used to understand the impact of any additional pedestrian and cycling infrastructure invested in as part of the Proposed Option. This data will be collected through bespoke surveys on the new routes created as part of the Proposed Option and as part of existing automatic cycle monitors. It is proposed that these are annual in order to have the best understanding of the impact of the infrastructure investment. These surveys will typically be single day surveys on an annual basis.
Business Surveys	This data will be used to understand the economic impacts of the CAZ on a qualitative basis. Previous Local Growth Fund projects have established the principle of qualitative surveys to understand the impact of infrastructure investment. Business surveys in potentially affected areas (which will include the LSOAs within and proximate to the CAZ) before, one year after and five years after the implementation of the CAZ will assist in understanding these impacts. These surveys will be conducted by specialist Local Authority officers from Economic Development departments.
Nitrogen Dioxide and Particulate Monitoring	The Authorities will using existing data from diffusion tubes, high-precision automatic sensors and other automatic monitors (AQMesh and Emote) in order to understand the impact of the proposed option. At the Full Business Case stage, a further assessment will be made regarding any potential requirement for further automatic sensors.

Locations to be monitored

The Authorities are cognisant of the fact that potential impacts of any CAZ will not just be felt within the CAZ area but also on routes into the CAZ and diversionary routes. Correspondingly, they have set out the below locations to be monitored:



For clarity, the above map does not include automatic sensors deployed by the Urban Observatory at Newcastle University, which are displayed below and are a mix of AQMesh, Emote and high-precision stations:



The combination of sensor types and locations will enable the Authorities to monitor the impacts in not only the CAZ area but beyond, including the potential areas of rerouting which were identified by Transport Modelling.

Governance

After submission of the OBC, practical arrangements for how the CAZ Implementation will be governed (see Figure 5-3) will commence. This additional governance structure will oversee the design, implementation and operation of the Proposed Option and will run alongside and interact with the Tyneside Air Quality Feasibility until the FBC submission. The CAZ Implementation Governance will continue to run after the FBC is submitted and will supervise the operation and monitoring of the Proposed Option.

The groups shown in Figure 5-3 each have terms of reference (Appendix A5.1) which are aimed at monitoring progress, change, risks, issues, opportunities, decisions and providing agreements to proceed.

As the Tyneside Authorities are undertaking a joint Tyneside Air Quality Feasibility Study, it is expected the three Authorities will monitor and evaluate the Proposed Option as one.

The Tyneside Monitoring and Evaluation Plan will be delivered by the in-house Project Management team using information supplied by the Scheme Delivery workstream. There will be a designated Lead Officer for the monitoring and evaluation, who will report directly to the Lead Officer for the CAZ Implementation.

Resourcing

As established in JAQU guidance, the resourcing of monitoring and evaluation activities will in the first instance be met from Clean Air Zone income or Implementation Fund. As set out below, this will be sufficient to cover the planned monitoring and evaluation activities for the Clean Air Zone Implementation.

The Tyneside Authorities have limited revenue budgets and correspondingly efforts have been made to minimise resource requirements. Table 2 sets out expected elements and costs.

Table 2 Resource Requirements for the Tyneside Clean Air Zone Monitoring and Evaluation

Element	Cost (£)	Frequency/Count	Cost Type	Total
Nitrogen Dioxide Monitoring	Under discussion	To be concluded at FBC	Capital	0
Particulate Monitoring	Under discussion	To be concluded at FBC	Capital	0
Pedestrian and Cycle Counts	5,000	8	Revenue	40,000
Business Surveys	10,000	3	Revenue	30,000
Traffic counts	10,000	3	Revenue	30,000
Staff time for monitoring	5,000	8	Revenue	40,000
Re-running of models	10,000	2	Revenue	20,000
Report Writing	40,000	2 (1 & 5 year post)	Revenue	80,000
Total				**£240,000**

These costs have been accounted for in the Financial Case.

Reporting

Monitoring and Evaluation will be reported as follows:

- JAQU required reporting quarterly on air quality and other monitoring data;
- Post Opening Scheme evaluation one year after scheme delivery; and
- Post Opening Scheme evaluation five years after scheme delivery

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