

**Manchester City Council
Report for Resolution**

Report to: Neighbourhoods and Environment Scrutiny Committee – 6
March 2019
Executive – 13 March 2019

Subject: Greater Manchester Clean Air Plan – Tackling Nitrogen Oxide
Exceedances at the Roadside – Outline Business Case

Report of: Deputy Chief Executive and City Solicitor

Summary

To summarise the key features of Greater Manchester's feasibility study and its Outline Business Case (OBC) to reduce nitrogen dioxide exceedances in Manchester and across Greater Manchester in the shortest possible time. This OBC has been developed by Manchester City Council collectively with all Greater Manchester local authorities and the GMCA, and co-ordinated by TfGM in line with Government direction and guidance.

Recommendations

Scrutiny Committee is recommended to note and comment on the report

The Executive is recommended to:

1. Note that the Council is legally obliged to produce a feasibility study to identify the option which will deliver compliance with the requirement to meet legal limits of nitrogen dioxide following the Secretary of State issuing a direction under the Environment Act 1995;
2. Adopt the feasibility study undertaken to date;
3. Approve the OBC (for submission to the government's Joint Air Quality Unit);
4. Note that further stakeholder engagement and public consultation is an essential part of the process to help inform and refine ongoing work to produce a Full Business Case by the end of the calendar year;
5. Approve the commencement of the public conversation and engagement activity from 15 May 2019;
6. Note that further reports will be submitted to Executive on:
 - a) the proposals for statutory consultation, informed by the outcome of the public conversation and engagement.
 - b) formal approval of the Full Business Case.
7. Agree that Transport for Greater Manchester continue with the activity to produce the Full Business Case on behalf of the ten Greater Manchester authorities, under the direction of the Greater Manchester Clean Air Steering Group; and
8. Delegate to the Chief Executive, in consultation with the Executive Member for Transport, Planning and the Environment the approval of submission of supplementary information.

Wards Affected: All

Manchester Strategy outcomes	Summary of the contribution to the Strategy
A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities	The Clean Air Plan aims to improve air quality across Greater Manchester. By doing so the city will become a more attractive place to live, work and visit and this in turn is likely to lead to a stronger economy.
A highly skilled city: world class and home grown talent sustaining the city's economic success	A city with improved air quality is likely to be more successful at retaining and attracting talent.
A progressive and equitable city: making a positive contribution by unlocking the potential of our communities	Ensuring that residents can access job opportunities and other facilities in a safe and clean environment, will enable everyone to contribute to the success of the City.
A liveable and low carbon city: a destination of choice to live, visit, work	Reducing congestion and air pollution will improve perceptions of the City, and help to tackle greenhouse gas emissions.
A connected city: world class infrastructure and connectivity to drive growth	Investing in and maintaining the City's transport infrastructure will help to drive growth.

Financial Consequences – Revenue and Capital budgets

There are no financial implications directly arising from this report. As the Clean Air Plan is finalised further reports will be prepared at the appropriate stages to address the financial consequences.

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Background documents (available for public inspection):

The following documents disclose important facts on which the report is based and have been relied upon in preparing the report. Copies of the background documents are available up to 4 years after the date of the meeting. If you would like a copy please contact one of the contact officers above.

- UK plan for tackling roadside nitrogen dioxide concentrations (July 2017)
- Improving air quality: national plan for tackling nitrogen dioxide in our towns and cities (May 2017)
- Improving air quality in the UK: Tackling nitrogen dioxide in our towns and cities (December 2015)
- Air Quality (Standards) Regulations 2010
- Air Quality Task and Finish Group Final Report (November 2017)
- Greater Manchester Low Emissions Strategy and Air Quality Action Plan
- 11 January 2019, report to GMCA/AGMA: Clean Air Update
- 14 December 2018, report to GMCA: Clean Air Update
- 30 November 2018, report to GMCA: Clean Air Plan Update
- 26 October 2018, report to GMCA: GM Clean Air Plan Update on Local Air Quality Monitoring
- 15 November 2018, report to HPEOS Committee: Clean Air Update
- 16 August 2018, report to HPEOS Committee: GM Clean Air Plan Update
- Greater Manchester's Outline Business Case to tackle Nitrogen Dioxide Exceedances at the Roadside, comprising:
 - Executive Summary
 - Strategic Case
 - Economic Case
 - Financial Case
 - Commercial Case
 - Management Case
 - Options Appraisal Report
 - Individual Authority Compliance Summary for Manchester City Council
 - Economic Appraisal Methodology Report
 - Equality Impact Assessment
 - Modelling Report
 - Analysis of Distributional Impacts
 - Analysis of Distributional Impacts Appendix A
 - Analysis of Distributional Impacts Appendix B
 - Project and Work Package Summary Sheets
 - Organisation and Programme Governance Model
 - Programme and Project Procedures and Overview of TfGMs Programme and Project Lifecycle Stages
 - Programme and Delivery Schedule and Plan on a Page
 - Stakeholder Management Plan
 - Risk Management Plan
 - Monitoring and Evaluation Plan
 - Programme Risk Register
 - Project Risk Register
 - Steering Group Terms of Reference
 - Glossary

1. Context and Background

- 1.1 Taking action on air quality is not optional. The severe and long lasting health implications of poor air quality as well as the legal obligations placed on Greater Manchester local authorities means that authorities need to act decisively and swiftly to reduce harmful air pollutants, and nitrogen oxides in particular.
- 1.2 Greater Manchester authorities in deciding to work together to respond to this vital issue are demonstrating collective leadership, which is essential to help clean the air for our combined population of nearly three million residents. Analysis reveals that locations of damaging roadside nitrogen dioxide concentrations can be found in every district.
- 1.3 Given that air pollution does not respect boundaries, this coordinated approach is also the most effective way to deal with a problem that affects all parts of Greater Manchester, and cannot be remedied on a site by site or district by district basis.
- 1.4 The ten authorities, supported by Transport for Greater Manchester, have now developed a draft package of co-ordinated and robust measures in a very short period of time that complies with the highly prescriptive Government guidance for tackling NOx emissions.
- 1.5 However, much more work is required to flesh out some of the measures to ensure that they achieve their intended purpose, and to ensure that the measures proposed to support affected businesses and individuals are fair and effective, and that the socio-economic impacts of measures are understood and can be mitigated.
- 1.6 This is why further engagement with stakeholders and affected parties to refine the measures, in addition to full public consultation, are vital next steps in the process toward developing the Full Business Case by the end of the year.
- 1.7 The Greater Manchester approach, set out below, will require significant government funding. Without full financial support, the package of measures which was devised in the context of guidance that identified Implementation Funding and Clean Air Plan funding is unlikely to deliver the intended results. In a scenario of inadequate government support, the most obvious outcomes are a failure to reduce exceedances as quickly as required, and economic damage, for example to local businesses who are left unsupported but required to upgrade their vehicle fleet.
- 1.8 By taking a combined approach, Greater Manchester's bid for the substantial funding required to deal with this key public health priority can only be strengthened.

2. Introduction

- 2.1 Previous reports as well as briefings to members have set out the health challenge presented by poor air quality, the legal context and the tightly specified approach that Government has directed local authorities to follow within very tight timescales in order to address predicted nitrogen dioxide (NO₂) exceedances in the shortest possible time.
- 2.2 These are summarised below, followed by a description of the feasibility study and the resulting OBC that has been developed by the GM Steering Group, following government guidance.
- 2.3 The OBC document itself is being finalised at the time this report is being produced but will be published as an appendix to this report prior to the meeting.

3. Air Quality and Health

- 3.1 Poor air quality is the largest environmental risk to the public's health. Taking action to improve air quality is crucial to improve population health.
- 3.2 Whilst air quality has been generally improving over time, particular pollutants remain a serious concern in many urban areas. These are oxides of nitrogen (NO_x) and its harmful form nitrogen dioxide (NO₂), and particulate matter (PM).
- 3.3 In Greater Manchester road transport is responsible for approximately 80% of NO₂ concentrations at roadside, of which diesel vehicles are the largest source.
- 3.4 Long-term exposure to elevated levels of particulate matter (PM_{2.5}, PM₁₀) and NO₂ may contribute to the development of cardiovascular or respiratory disease, and may reduce life expectancy¹. The youngest, the oldest, those living in areas of deprivation, and those with existing respiratory or cardiovascular disease are most likely to develop symptoms due to exposure to air pollution^{2,3}.
- 3.5 Public Health England estimate the health and social care costs across England due to exposure to air pollution will be £5.3 billion by 2035 for diseases where there is a strong association with air pollution, or £18.6 billion for all diseases with evidence of an association with air pollution⁴.

4. Legal Background

¹ Air Quality – A Briefing for Directors of Public Health (2017), <https://www.local.gov.uk/air-quality-briefing-directors-public-health>

² Air Quality – A Briefing for Directors of Public Health (2017), <https://www.local.gov.uk/air-quality-briefing-directors-public-health>

³ RCP and RCPCH London, Every breath we take lifelong impact of air pollution (2016), <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>

⁴ <https://www.gov.uk/government/news/new-tool-calculates-nhs-and-social-care-costs-of-air-pollution>

- 4.1 Because of their harm to human health, legal Limit Values⁵ for concentrations of certain pollutants in ambient air have been established. The European Ambient Air Quality Directive (2008/50/EC) incorporates many of the World Health Organisation (WHO)' air quality standards into European Law, which was transposed into English law by the 2010 Air Quality Standards Regulations (SI. 2010 No. 1001).
- 4.2 The 2010 regulations set legally binding limits for concentrations of major air pollutants that affect human health, including NO₂ and particulates. Regulation 26 of the 2010 Regulations requires the Secretary of State to draw up and implement a national air quality plan so as to achieve the relevant limit or target value within the “shortest possible time”.
- 4.3 Since 2010, the UK has been in breach of legal Limit Values for NO₂ concentrations in major urban areas.
- 4.4 The Greater Manchester Urban Area Zone is one of 37 reporting zones across the UK where the Department for the Environment, Food and Rural Affairs (Defra) modelling of annual mean NO₂ concentrations predicts levels that exceed statutory Limit Values.
- 4.5 Whilst Greater Manchester currently meets Limit Values for other pollutants, the 2016 Greater Manchester Low Emission Strategy and Air Quality Action Plan set out a co-ordinated approach for reducing all air pollutants, including particulates, as well as carbon dioxide.

5. Government's UK Air Quality Plans

- 5.1 Since 2010, Government has produced three successive Air Quality Plans to reduce NO₂ emissions in line with Limit Values. Environmental campaigning law organisation ClientEarth successfully challenged these Air Quality Plans in the High and Supreme Courts for failing to include actions necessary to achieve NO₂ Limit Values “in the shortest possible time”.⁶
- 5.2 Each successful legal challenge increased the number of local authorities directed by Government to take action. Over 60 local authorities are now under Direction:
- 2015: Birmingham Derby, Leeds, Nottingham and Southampton.
 - 2017: 23 local authorities – including Bolton, Bury, Manchester, Salford, Stockport, Tameside and Trafford.
 - 2018: 33 further local authorities, including Oldham.

⁵ European Union Limit Value regarding levels of NO₂ in major urban areas (40 micrograms per cubic metre (µg/m³)) set by the European Ambient Air Quality Directive (2008/50/EC) as implemented into UK law by the 2010 Air Quality Standards Regulations (SI. 2010 No. 1001)

⁶ *R (on the application of ClientEarth) (Appellant) v. Secretary of State for Environment, Food and Rural Affairs* [2015] UKSC 28.

- 5.3 In July 2017 Government served a Direction⁷ on seven Greater Manchester local authorities requiring them to produce a feasibility study, in accordance with the HM Treasury's Green Book, in which they must 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".
- 5.4 This Direction was supplemented by guidance issued by the Department for Transport (DfT), including the 'Clean Air Zone Framework'⁸ and the 'UK plan for tackling roadside nitrogen dioxide concentrations'⁹.
- 5.5 Government also established the Joint Air Quality Unit (JAQU) to help deliver the National Plan by closely guiding local authorities.
- 5.6 Government has allocated £255 million for Implementation Funding and £220 million for a Clean Air Fund. Local authorities will be allocated Implementation Funding based on their Final Business Case. Local authorities will bid to the Clean Air Fund for support to help local people, businesses and other groups to switch to cleaner vehicles or make alternative travel choices.
- 5.7 The proposals put forward will therefore be conditional upon sufficient funding being provided by Government.
- 5.8 Oldham Council are under a separate Direction¹⁰ which they complied with by the production of their feasibility study submitted to JAQU in July 2018. No further Direction was issued to Oldham as Government acknowledged in its supplemental plan that the exceedance identified in Oldham was being considered as part of the Greater Manchester plan.
- 5.9 Whilst Rochdale and Wigan Councils were not compelled to act through a ministerial Direction, they are participating in the Greater Manchester-wide approach as they are required to address the exceedances that have been identified within their boundaries during the Target Determination exercise (see further detail in Section 7). This revealed 250 points of exceedance across 152 road links and all ten districts in 2021.
- 5.10 On this basis, Greater Manchester's collective approach to develop a city-region wide Clean Air Plan has been accepted by government, and consequently no further ministerial Directions have been issued. A letter from the Minister in January 2019 requires GM's OBC to be submitted by end of March 2019.
- 5.11 Government officials have subsequently confirmed the following

⁷ Environment Act 1995 (Feasibility Study for Nitrogen Dioxide Compliance) Air Quality Direction 2017

⁸ <https://www.gov.uk/government/publications/air-quality-clean-air-zone-framework-for-england>.

⁹ <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>.

¹⁰ Environment Act 1995 (Feasibility Study for Nitrogen Dioxide Compliance) Air Quality Direction 2018)

“we are content with the baseline modelling. In line with our guidance, as your local model has identified NO₂ exceedances on roads within the PCM network beyond those modelled nationally, these should be addressed in your air quality plan. This means your plan should address the exceedances identified in all 10 authorities, in line with the approach you are already taking.

Following submission of your Outline Business Case by 31 March we anticipate, subject to a review of the plan you submit, that Ministers will direct local authorities to proceed to continue to develop an FBC and to start implementing plans, together with appropriate funding. It is likely this stage this would entail directing all 10 Greater Manchester authorities.”

- 5.12 If a local authority chose to not approve the OBC for submission to the government’s Joint Air Quality Unit, this could, without an alternative plan to reduce NO₂ emissions in the shortest possible time, lead to a potential legal challenge against the said local authority.
- 5.13 The government Directives referred to above relate only to the roads that local authorities are responsible for, and does not direct local authorities to assess or act to reduce NO₂ concentrations on the Strategic Road Network (SRN, typically motorways) managed by Highways England (a government owned company).
- 5.14 This is a significant issue in the context of the 120 km of SRN that stretches across the conurbation, often through urban areas. Motorway traffic, where the carriageway runs close to a local road can contribute up to 50% more pollution than local roads. Between 30 - 40% of east-west HGV traffic does not exit the SRN in Greater Manchester, but travels through it.
- 5.15 In addition there are locations where high levels of pollution measured close to residential properties are the result of the flows of tens of thousands of vehicles per day, including approximately 13,000 HGV’s, on the SRN and not as a result of traffic on the local highway network.
- 5.16 Greater Manchester is working with Highways England to ensure that they play a much more active role in developing measures which will effectively complement those set out below, and these will need to be clearly identified in the Full Business Case.

6. Greater Manchester Feasibility Study

- 6.1 A Greater Manchester Senior Leadership Steering Group (Steering Group) is responsible for guiding the feasibility study. Members include Directors or Assistant Directors from each local authority and senior representatives from Highways England, Public Health England, AGMA, Local Partnerships and Transport for Greater Manchester (TfGM) and JAQU.
- 6.2 The purpose of taking a Greater Manchester-wide approach is to avoid introducing measures in one part of the conurbation that simply displace pollution to other locations, and to ensure that (as far as possible) the

eventual agreed package of measures complements other Greater Manchester strategies.

- 6.3 TfGM has been coordinating the GM feasibility study on behalf of the ten Greater Manchester local authorities, who remain legally responsible for reducing NO₂ to legal Limit Values.
- 6.4 The feasibility study process comprises a series of steps and processes, namely: Strategic Outline Case, Initial Evidence and Target Determination, Outline Business Case and Full Business Case. These are outlined below.

7. Initial Evidence and Target Determination

- 7.1 In their National Plan, Government identified eleven areas of road, within seven Greater Manchester local authorities, where the national Pollution Climate Mapping (PCM) model predicted NO₂ concentrations are likely to exceed the statutory NO₂ annual mean EU Limit Value beyond 2020. Oldham was added in a later supplement to the National Plan (March 2018).
- 7.2 The predictions in the national model were based on national scale assumptions and datasets, and were required to be verified against local evidence.
- 7.3 More informed local analysis revealed a bigger problem than that identified by Government. It predicts a greater spatial distribution of NO₂ exceedances across roads in all Greater Manchester districts and typically higher concentrations of NO₂ in specific locations.
- 7.4 Local modelling identified 152 stretches of road (road links) where concentrations of NO₂ are forecast to exceed the legal Limit Value (40 µg/m³) beyond 2020. 112 of these road links are on the national PCM model, which have the highest car use and heavy freight flows. 40 of these are shorter stretches of local roads, often around town centres across Greater Manchester where there is greater bus, taxi and van usage.
- 7.5 Local modelling also predicts higher concentrations of NO₂ in locations across Greater Manchester. This means the concentration of NO₂ in the air at roadside is worse than originally predicted by Government.¹¹
- 7.6 Some of the reasons for this are that vehicles using Greater Manchester's roads are typically older than the national average (especially buses and taxis); that local traffic data showed that in some areas vehicles are moving

¹¹ Modelling of air quality can be presented in two different ways: a point along a road which has a certain concentration of NO₂ or the stretch of road which has a certain concentration of NO₂. Presenting point data provides more specific and detailed information on the air quality problem, as it allows an understanding of how concentrations of NO₂ vary at different locations on the road. The OBC modelling presents emissions information on the basis of point data.

more slowly than the national modelling anticipated; and because local modelling also showed higher background concentrations of NO₂ than the national modelling.

- 7.7 The outcome of the local modelling is an agreement, referred to as Target Determination, of the NO₂ exceedances that Greater Manchester must resolve when developing possible solutions. The Greater Manchester modelling has now been agreed by Government, meaning that all the illegal exceedances in all ten GM local authority areas need to be addressed.

8. Strategic Outline Case

- 8.1 The Strategic Outline Case (SOC) was submitted to Government in March 2018. This document identified a long-list of 96 measures, which was then sifted to a shortlist of 14, based on Government's Primary Success Criteria (defined as reduction of NO₂ concentrations in the "shortest possible time").

- 8.2 The SOC recognised that as locations of exceedances identified by Government covered areas across Greater Manchester, no single measure was likely to deliver legal compliance on its own.

8.3 Table 1. Shortlisted Measures in the Strategic Outline Case

Shortlisted measure	Details
Retrofit/upgrade public transport fleet	Retrofit or upgrade vehicles to a higher Euro standard.
Retrofit/upgrade local authority fleets	Retrofit or upgrade to a higher Euro standard (procurement).
Increase public transport capacity	Identify specific routes where most impact will be made, with a particular focus on the role that an attractive bus system would need to play in achieving significant additional modal shift in the near term.
Switch Bus/HGV/LGV/GM fleet to GtL	Using cleaner alternative fuels, e.g. Gas-to-Liquid (GtL).
Electric vehicle (EV) incentivisation	Increase EV uptake through expanding the charging network or financial incentives.
Differential parking charges	E.g. different charges for times of day, vehicle type, car-sharers and could include a workplace parking levy.
Congestion Deal – increase capacity	Review existing junction improvement plans – assess impact and identify opportunities to accelerate.
Congestion Deal – encouraging alternatives	Encouraging alternative travel choices through road space reallocation.

Shortlisted measure	Details
Congestion Deal – network management	Changing traffic signal timing to optimise flows, reducing congestion.
Private hire and taxi alternative fuels	Incentivise change to EV/Ultra-Low-Emission vehicles, increase EV infrastructure for taxis, retrofitting and increasing LPG refuelling infrastructure for taxis.
Communications campaigns	Increase awareness of health and cost benefits for public and of different modes of transport or around particular communities/schools.
Sustainable travel engagement	Work with employers and individuals to encourage sustainable travel choices.
Active travel programme – infrastructure	Expand and improve cycling and walking infrastructure.
Clean Air Zones – Class B, C or D	Different classifications/time restriction and geographical areas to be modelled for their impact on NO ₂ and timescale of any impact.

- 8.4 Government guidance sets out charging Clean Air Zones (CAZ) as the measure most likely to achieve legal Limit Values for NO₂ in the shortest possible time. A charging CAZ places a penalty on the most polluting vehicles moving within a designated area. Government guidance specifies that local authorities must consider charging CAZ as their benchmark measure.
- 8.5 Government specifies four classes of charging CAZ that apply penalties to different types of vehicle that are classified as non-compliant because they fall below particular European Commission emission standards. Cleaner, compliant vehicles are not charged.
- Class A: Buses, coaches, taxis and private hire vehicles.
 - Class B: Buses, coaches, heavy goods vehicles (HGVs) taxis and private hire vehicles.
 - Class C: Buses, coaches, HGVs, large vans, minibuses, small vans/ light commercials, taxis and private hire vehicles.
 - Class D: Buses, coaches, HGVs, large vans, minibuses, small vans/ light commercials, taxis and private hire, cars, motorcycles/mopeds.
- 8.6 The associated emissions standards are as follows:
- Euro 3 for motorcycles, mopeds, motorised tricycles and quadricycles.
 - Euro 4 for petrol cars, vans, minibuses and other specialist vehicles.
 - Euro 6 for diesel cars, vans and minibuses and other specialist vehicles.
 - Euro VI for lorries, buses and coaches and other specialist heavy vehicles.

8.7 It is important to recognise the clear differences between Clean Air Zones and Congestion Charging systems, not least in terms of their very different objectives and time-spans. The objective of any penalty in a CAZ is for all vehicles which drive within the area in a Clean Air Zone to have engines which comply with emissions standards. Unlike Congestion Charging, a CAZ does not seek to reduce the number of vehicles on roads. This means that over time and as vehicles are upgraded, the number of penalties levied reduces. CAZs are therefore relatively short-term, only apply to non-compliant vehicles and will operate at a loss once vehicles become cleaner. Under a Congestion Charge however, the requirement to pay applies to all vehicles, is enduring, and creates a long-term revenue stream. In contrast a CAZ in its later years should not generate surpluses as vehicles become cleaner.

8.8 GMCA has ruled out congestion charging.

9. Assessing the Options for Greater Manchester

9.1 Following the issue of the SOC in March 2018, a process of refining the shortlisted measures and developing a range of options that combine the measures in different ways has been undertaken. This was overseen by the GM Steering Group, to understand the type and scale of intervention needed to reduce NO₂ to within legal Limit Values in the “shortest possible time” across Greater Manchester.

9.2 A best performing option is recommended within the OBC for further consideration and discussion with stakeholders and the public to aid the development of the Full Business Case.

9.3 The core goal of the GM Clean Air Plan is to address the legal requirement to remove ALL exceedances of concentrations of NO₂ that have been forecasted to exceed the legal Limit Value (40 µg/m³) identified through the target determination process in the “shortest possible time” in line with with Government guidance and legal rulings.

Options have been assessed against the UK Government’s Primary Critical Success Factors:

- **Reduction in NO₂ emissions:** likelihood that the measure/option will contribute significantly to a reduction in NO₂ concentrations to achieve compliance with the EU Limit Values
- **Feasibility:** likelihood of measure being implemented in time to deliver desired NO₂ reduction and achieve compliance.

9.4 Where modelled options deliver compliance in the same year they have been further assessed against Government’s Secondary Critical Success Factors, as set out in the SOC:

Strategic fit with local strategies and plans: ensuring the alignment of the option with longer term economic, social and environmental goals and that the risk of unintended consequences is minimised.

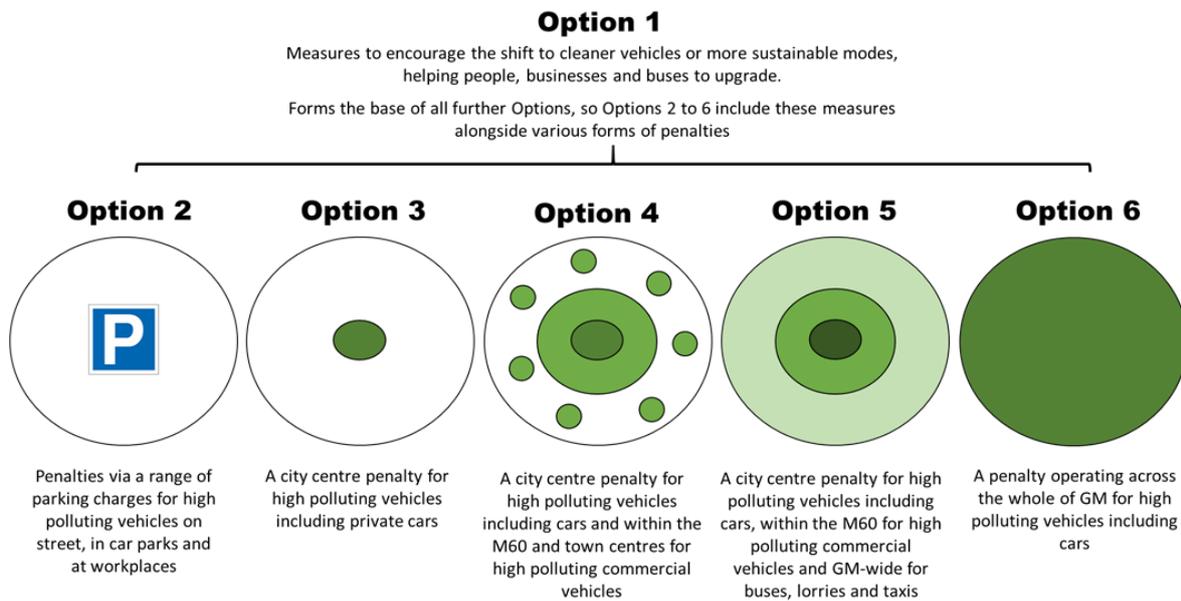
Value for money: a high-level indication of the costs and benefits of each option.

Distributional impact: in order to understand the potential impacts, both positive and negative on different groups within society, with a particular focus on the most vulnerable. It is of vital importance that the plan does not result in disproportionately negative economic or social impacts for the region or those living, working or doing business within it.

Deliverability of the options, in terms of the affordability of the cost of implementation, the supply-side capacity and capability to deliver the measures outlined in the options, and the achievability of delivering the option.

- 9.5 The SOC identified that the fundamental causes of the exceedances were variable in terms of the source of emissions and that these sites were interconnected in complex ways. Therefore, any effective proposals would need to comprise of a package of measures, able to tackle the overall problem holistically.
- 9.6 A series of six options comprising of different packages of measures was developed initially in response to the problem as revealed by local modelling. These measures have been assessed and refined further from the shortlist in Table 1.
- 9.7 The assessment process involved further modelling and analysis of the effectiveness of measures, both individually and as a package; this included engagement with stakeholders and professional experts, and the use of a Multi-Criteria Analysis (MCA) tool to assess the performance of each option against the success factors and relative to each other. In this way, the measures and packages of options have been assessed and refined into a preferred option that best secures the required objectives.

9.8 Figure 1. Summary of six options for initial appraisal



9.9 Following the initial appraisal of the six options, three were discounted (see section 9) and three developed as the ‘best performing’ options to be subject to a more detailed appraisal process.

9.10 These three options were derived from options 4 and 5 above and have been adapted to reflect a deeper level of understanding of the issues that emerged throughout the options appraisal process. As such, they are considered more likely to deliver effective reductions in NO_x emissions and greater compliance than the options initially specified.

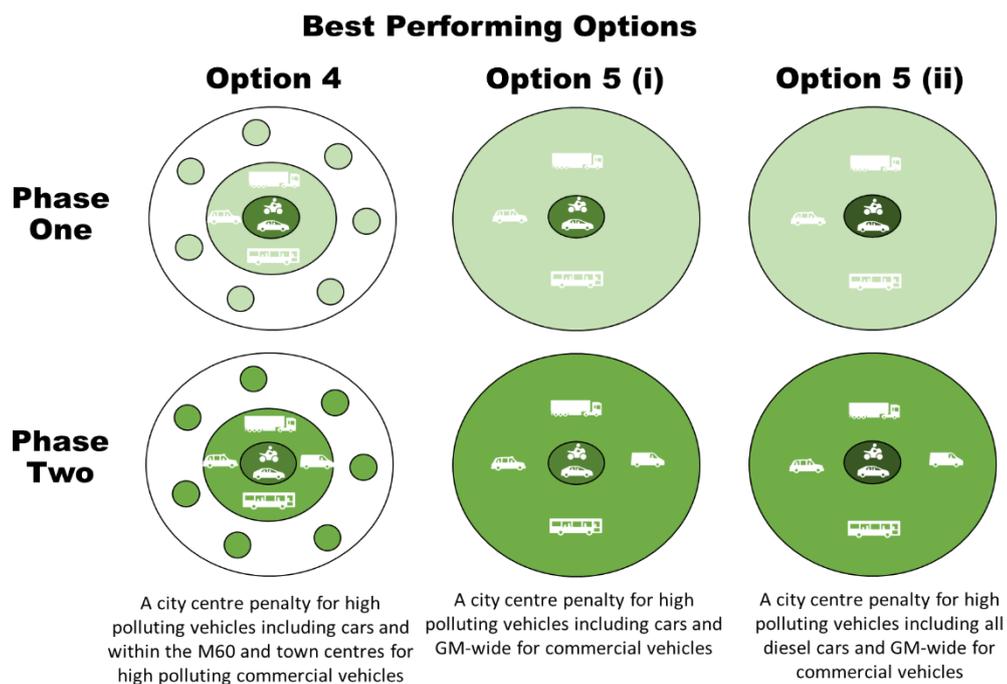
9.11 In particular, the following changes have been made:

- Various incentives measures were judged to be ineffective for the specific requirements set by Government for a NO_x plan (e.g.: public transport improvements beyond the existing programme and GTL conversion for HGVs) or undeliverable in the timescale/ with existing powers and have been excluded.
- Vehicle Renewal Schemes to help businesses and residents upgrade their vehicle have been included.
- The initial assessment suggested that the second-hand van market would not be sufficiently mature by 2021 to support a large-scale CAZ for vans – a lack of available, affordable and compliant vehicles could result in a higher than predicted proportion of vehicles ‘staying and paying’ rather than upgrading and create substantial risk of economic damage. Therefore, implementation of the city region scheme has been divided into two phases: Phase 1 would involve a CAZ B encompassing buses,

hackney cabs and PHVs, HGVs and coaches; and Phase 2 would extend to a CAZ C including vans and minibuses at a later date.

- Finally, and related to the point above, the M60 boundary in Option 5 has been dropped, with the schemes only reviewed for possible application within the Inner Relief Route or at GM-wide instead. Applying an additional boundary adds cost and complexity to the scheme, and risks customer confusion. Further analysis showed that the M60 boundary does not reflect where the outstanding locations of non-compliance remain post-2021, many of which are outside this zone. Therefore, it does not make sense in terms of delivering compliance in the shortest possible time to implement a second phase solely in this zone.
- Two variants of option 5 were explored, one including a CAZ D within the IRR (Option 5(i)) and one where the CAZ D was enhanced so that all diesel cars and PHVs were considered non-compliant (Option 5(ii)).

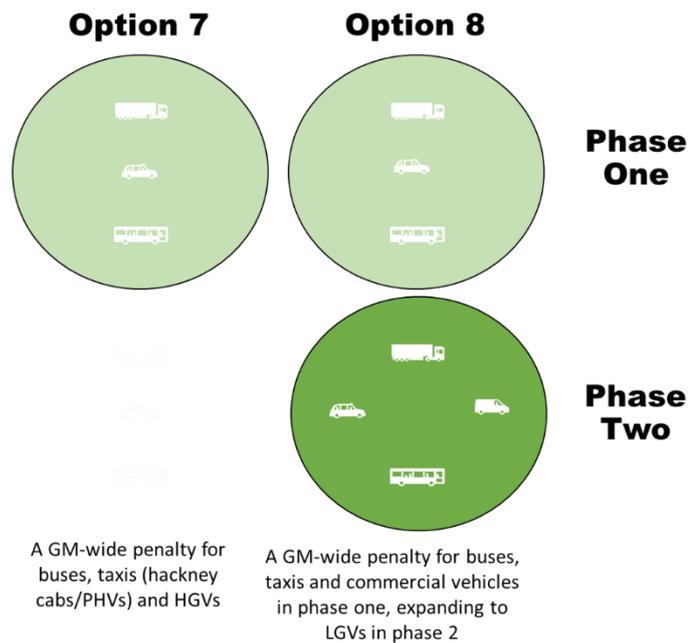
9.12 **Figure 2 – Summary of three best performing options for detailed appraisal**



9.13 Discussions with the local authorities raised two significant concerns: that the risk of unintended socio-economic consequences is not sufficiently understood; and that other options had not been explored in sufficient depth to be ruled out.

9.14 As a result, further work was undertaken to address these concerns. This involved additional analysis of the socio-economic impacts, and assessment of two new options, following the same process as utilised to date.

9.15 **Figure 3 – Further options assessed**



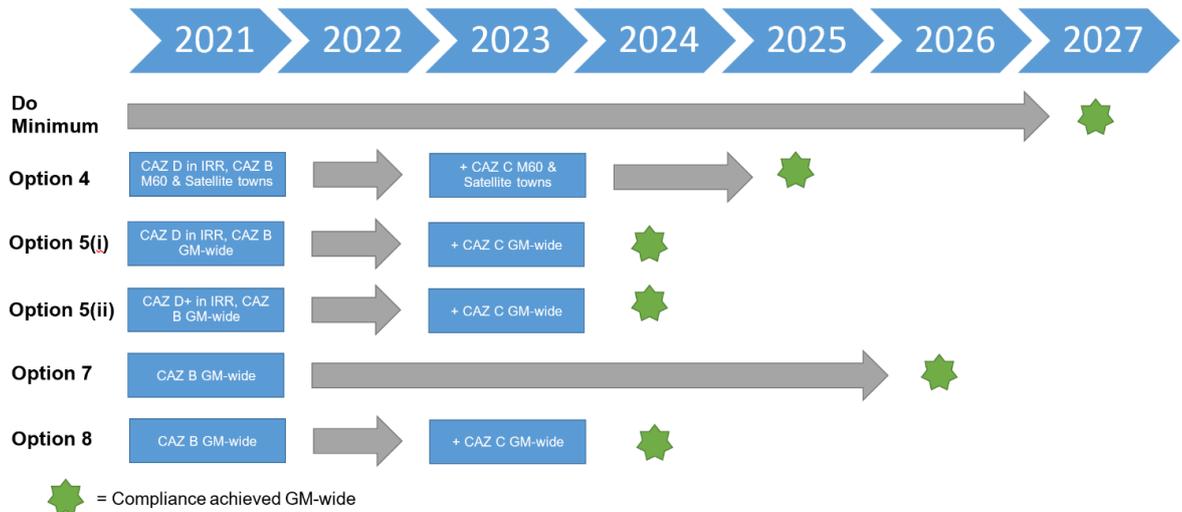
9.16 Modelling has indicated that:

- Option 4 is predicted to deliver compliance (so that all sites have concentrations below the Limit Value) by 2025,
- Options; 5(i), 5(ii) and 8 are all predicted to deliver compliance one year earlier, in 2024.
- Option 7 was not likely to be sufficient, delivering lower emissions benefits in each year, than Option 8 and reaching compliance two years later, in 2026

9.17 Options 4 and 7 were therefore ruled out of further consideration, because options 5(i), 5(ii) and 8 deliver compliance earliest.

9.18 Further information on how each option performs in terms of the compliance date is set out in Annex 1.

9.19 **Figure 4 – Assessment of compliance of options**



9.20 Options 5(i), 5(ii) and 8, as the most promising options, have been considered in terms of their performance against the Primary and Secondary Success Factors. A table summarising this assessment are included in Annex 2.

10. WHY OPTIONS 2, 3 AND 6 WERE DISCOUNTED

10.1 Options 2, 3 and 6 were ruled out as they did not deliver compliance in the shortest possible time:

10.2 Option 2 – Parking measures have a limited effect on the heaviest and dirtiest vehicles, such as HGVs and buses. They only affect those cars or vans that need to park in an area and not those passing through, or those with uncontrolled or off-street parking available. A Workplace Parking Levy has been shown to be effective in deterring car travel and supporting investment in more sustainable modes in the only UK example (in Nottingham), but the implementation timeframe is slow and the measure is poorly targeted in terms of its effect on the dirtiest vehicles. There are very few controlled parking zones or residents’ parking permit schemes in place across the city-region and thus it would be difficult and expensive to deliver differential parking on-street. Off street public parking is managed through contracts owned by the ten districts, running to different timescales and with limited flexibility in the short term. In summary, using parking as the constraint measure was deemed challenging to implement, poorly targeted and not likely to deliver compliance in the shortest possible time.

10.3 Option 3 – A city centre penalty for high polluting vehicles would have effect in the city centre and on the key radial routes into to the city centre. However, air quality modelling has shown that a city centre CAZ D, with no further CAZ measures across the remainder of GM, would leave around 200 sites non-compliant within the wider region in 2021, including some sites of non-compliance within the city centre itself. It has therefore been

demonstrated that the option does not deliver compliance in the shortest possible time and has been rejected.

10.4 Option 6 – A GM-wide CAZ D was developed to understand whether compliance could be achieved under any scenario by 2021. The ‘all or nothing’ nature of this proposal presented a risk that no real improvements to air quality would be achieved for quite some time, and the time to compliance would be highly uncertain.

10.5 Specifically, with regard to option 6;

- The assessment assumed that all of the options can be delivered by 2021. It is very unlikely that all aspects of the scheme, from the technical work required to design the scheme, to the scale of the infrastructure provision and customer service offer required to deliver it, could be delivered in that timescale.
- The scale of the intervention across the whole of GM is considered to be potentially undeliverable in physical terms.
- The modelling also forecasts substantial mode shift from car to public transport, but for many of the diverse trips across the wider city-region there is simply not a viable public transport alternative available (at this time) and this mode shift is not likely to materialise and it would not be possible in the required timescales to deliver transformative public transport improvements to facilitate this mode shift. This would therefore significantly delay compliance.
- A scheme on this scale would raise very significant issues in terms of the economic and social impact on the region, and widespread mitigation measures would be required that are not likely to be feasible.

10.6 In summary, Option 6 would not deliver compliance in the shortest possible time, and would not perform effectively in terms of reducing human exposure due to long periods where non-compliant vehicles continue to be used.

11. Determining the Preferred Option

11.1 Options 5(i), 5(ii) and 8, include a package of Measures, designed to ensure local people and businesses are fully informed about clean air and know how they can reduce their contribution to poor air quality; to encourage the uptake of the cleanest vehicles; and most significantly, to support local businesses to upgrade their fleets as quickly as possible.

11.2 In addition, all three options propose a region-wide CAZ, starting at Category B from 2021 and expanding to a Category C in a later phase, assumed to be 2023. This large scale scheme is challenging to implement, in terms of: the need for substantial funding and support from Government; as well as the need for considerable collaboration between the ten districts; and the demand generated for compliant vehicles from a range of suppliers. Nevertheless, it is clear from the analysis carried out to date that a smaller scale scheme would not be sufficient to deliver compliance in the shortest possible time.

- 11.3 The full implementation of a CAZ C is proposed for 2023 rather than 2021 due to the assessment which suggested that the second-hand compliant van market would not be sufficiently mature by 2021 to provide compliant upgrade options and support the implementation of large-scale CAZ for vans. Crucially, this does not delay the year of achieving compliance and reduces the risk of socio-economic damage. Modelling indicates that a GM-wide CAZ C cannot deliver compliance in 2021 or earlier than 2024 regardless of when it is implemented.
- 11.4 It is however vital to support local businesses, residents and operators to upgrade their vehicles, not least as Greater Manchester has an older than average fleet and an economy dominated by small businesses. There is a risk that without these supporting Measures, the CAZ will be ineffective because businesses cannot afford to upgrade or the effect of the scheme will cause unacceptable economic damage.
- 11.5 Furthermore, there is a risk that a CAZ implemented without financial support could damage the public and accessible transport offer in the region. At present, most buses and nearly all hackney cabs and many private hire vehicles in the region are non-compliant, with the oldest vehicles typically owned by small local businesses or sole traders. There is a risk that without support, bus operators may choose to reduce bus services rather than upgrade their fleets, that hackney cab drivers switch to driving compliant but less accessible private hire vehicles, and that the private hire trade is potentially impacted by the financial cost of upgrading a non-compliant vehicle.
- 11.6 Therefore, the Clean Vehicle Funds to be demanded of Government, are an essential and common component to achieve compliance. They add to the cost and complexity of delivery, and there is concern over the ability to supply sufficient compliant vehicles to meet demand.
- 11.7 Options 5(i) and 5(ii) would require further and additional financial support to help private car drivers upgrade their vehicle. Such an approach could be considered high risk, as a viable and value-for-money private car scrappage-type model has not been identified that would satisfy HM Treasury, and none have been developed and tested in the UK to date. Further, the analysis indicates that a city centre penalty for private cars, a feature shared by options 5(i) and 5(ii), does not bring forward compliance any earlier when compared to option 8, primarily as the city centre zone is relatively compact and therefore its effects are modest in terms of stimulating compliance.
- 11.8 Option 8 carries less risk in this regard, can be delivered at a lower cost (to Government), and is thus more affordable.
- 11.9 As the option that delivers compliance in the shortest possible time, and at the lowest cost, option 8 is also considered the 'benchmark CAZ' for the purposes of comparison.

- 11.10 Whilst option 8 presents many delivery challenges, it is more feasible and achievable than options 5(i) and 5(ii) and thus offers greater confidence that compliance can be achieved in the shortest possible time.
- 11.11 Further, it is considered that options 5(i) and 5(ii) may cause unacceptable and significant unintended consequences to distributional impacts, particularly in terms of the impact on the affordability for residents, the impact on the local economy, and the impact on health and the quality of life of local residents. There are particular concerns in terms of the potential impacts on low income car-dependent workers, small businesses, and city centre retail. Option 8 delivers compliance in the same year without the same potential risk of damaging economic impacts.
- 11.12 On balance, therefore, it is considered that option 8, whilst remaining a substantial and complex undertaking, is the surest way of delivering compliance in the shortest possible time; providing considerable health benefits at the lowest cost to society and the economy of the three options.
- 11.13 Option 8 delivers considerable health benefits between 2021 and 2023, as the chart below indicates.

Significant reductions in NO₂ concentrations in early years bring real health benefits
 Compliance achieved 3 years earlier than Do Minimum



- 11.14 Option 8 is recommended as the option that delivers compliance in the shortest possible time, at the lowest cost, least risk and with the least negative impacts.
- 11.15 Modelling shows that with the collective action outlined above GM's authorities gradually achieve compliance between 2021 and 2024.
- Wigan and Trafford in 2021

- Bolton, Bury, Oldham, Rochdale, Salford, Stockport and Tameside by 2023
- Manchester in 2024

Modelled sites of non-compliance by authority, 2021, 2023, 2025

	2021		2023		2025	
	<i>Do min</i>	<i>Option 8</i>	<i>Do min</i>	<i>Option 8</i>	<i>Do min</i>	<i>Option 8</i>
<i>Bolton</i>	19	6	3	0	0	0
<i>Bury</i>	23	9	12	0	4	0
<i>Manchester</i>	88	28	29	3	2	0
<i>Oldham</i>	15	4	3	0	1	0
<i>Rochdale</i>	10	2	2	0	0	0
<i>Salford</i>	36	11	10	0	1	0
<i>Stockport</i>	30	5	5	0	0	0
<i>Tameside</i>	16	6	4	0	0	0
<i>Trafford</i>	10	0	0	0	0	0
<i>Wigan</i>	3	0	0	0	0	0
<i>GM Total</i>	250	71	68	3	8	0

- 11.16 However, concerns remain about the socio-economic impacts, therefore more work is required for the Full Business Case to ensure that proposed mitigations are effective.
- 11.17 An indicative Equality Impact Assessment (EQIA) has also been completed and will form part of the OBC. However, it is noted that further and fuller assessment of economic and equalities impacts will be required at FBC stage.
- 11.18 There remains much we do not know about the possible impacts of the proposals, for example on low income workers, key business sectors such as retail and leisure, transport and distribution and on small local businesses. A programme of research, analysis, public and stakeholder engagement and a thorough integrated impact assessment has commenced and will be continued throughout 2019.

12. Modelling Assumptions and Uncertainties

- 12.1 The analysis underpinning the GM Clean Air Plan has been produced in line with JAQU guidance using the best data and tools available, and localised to Greater Manchester where possible.
- 12.2 However, the nature of the air quality challenge means that there are many sources of uncertainty in the modelling, and further sensitivity testing is underway.
- 12.3 In addition, it is important to acknowledge that there are some key assumptions that will need testing at the Full Business Case stage. This will include bus/taxi/PHV compliance, the behavioural responses of drivers, and the impact of measures such as vehicle renewal funds.

- 12.4 Assumptions made in the context of advice from JAQU includes that by 2021 that the majority of vehicles in scope will be compliant or upgrade to a compliant vehicle (for example buses and taxis) and the remaining non-compliant:

HGV's are assumed to stay and pay, upgrade or cancel their trip;
PHV's are assumed to stay and pay or upgrade;
LGVs are assumed to stay and pay, change mode or cancel their trip.

- 12.5 The regional scale of the options also means that assumptions should continue to be tested.
- 12.6 Engagement to date, for example with bus operators, the local taxi and private hire trade and the freight industry has been invaluable in helping develop the measures, and further engagement at local level will be undertaken as part of the process to develop a Full Business Case.

13. Commercial, Financial and Management Assumptions

Commercial assumptions

- 13.1 The procurement of all goods and services will use TfGM's established procurement processes.

Financial assumptions

- 13.2 In developing the OBC, it has been assumed that JAQU Implementation and Clean Air Funds will provide funding for all costs relating to scheme's implementation, and that DEFRA/JAQU will underwrite any net operational deficit, as may be necessary, over the life of the scheme until compliance is achieved.
- 13.3 If scheme operations generate any net surplus, this would be re-invested back into achieving Local Transport Plan (2040 Greater Manchester Transport Strategy) objectives, as required by the Transport Act 2000.
- 13.4 There is a considerable amount of uncertainty in the assumptions around revenue generation, since there is no CAZ currently in operation in the UK. Therefore, the forecasts included in the financial model are indicative at this stage.
- 13.5 Greater Manchester will be submitting the OBC as an application to the Implementation Fund on the assumption that all the measures outlined in the case are required to bring forward compliance in the shortest possible time frame.
- 13.6 In the financial business case, it is assumed that:
- the CAZ penalties are a daily charge and set at different levels for different vehicle types, to reflect their emissions. The aim is that non-

compliant vehicles with the highest emissions are incentivised to respond to comply with the standard.

- the CAZ daily charges remain constant in nominal prices, and therefore they reduce in real terms.
- any GM CAZ will operate on a daily basis and, therefore, non-compliant vehicles that enter or move within the area of the CAZ will only pay once each day.

13.7 Table 2 – CAZ Penalties as assumed for modelling purposes

Vehicle Type	CAZ Penalty
Taxi / PHV	£7.50
LGV	£7.50
HGV	£100
Bus/Coach	£100

Management Assumptions

- 13.8 TfGM will continue to co-ordinate delivery from OBC to FBC. Decisions with regard to which organisation will operate any CAZ will be developed between OBC and FBC.

14. CLEAN VEHICLE FUNDS

- 14.1 An essential component of the OBC is a package of support for businesses affected by the best performing option. This comprises a number of schemes that will be further refined through ongoing engagement with businesses and stakeholders and inform the FBC. Current proposals include the following:

Clean Freight Fund - covering LGVs, Minibuses, HGVs, Coaches (£59 million)

- 14.2 Support for local small businesses, sole traders and the voluntary sector, registered in GM in the form of a discount on the purchase of a compliant commercial vehicle when scrapping a non-compliant vehicle or retrofitting to make compliant.
- 14.3 Priority for funding will be based primarily on air quality impact such that the most polluting vehicles can be targeted.

Clean Taxi Fund – covering Taxis and Private Hire Vehicles (£28 million)

- 14.4 Support to upgrade non-compliant taxi and private hire vehicles by offering a contribution towards the purchase of a compliant vehicle from an approved supplier when trading in a non-compliant vehicle.
- 14.5 It will also provide part funding for the retrofitting of taxis.
- 14.6 This funding opportunity also recognises the work currently being undertaken to develop some common minimum licensing standards for Taxis and Private

Hire across Greater Manchester. This work will ensure that there is clarity for the trade and drivers about vehicle standards that meet both proposed CAZ requirements and any Greater Manchester minimum standards, that will be consulted on later in the year.

Clean Bus Fund (£29 million)

- 14.7 Provide support to retrofit the majority of existing Euro IV and V buses with flexibility for the move to an EV bus network, via financial assistance towards charging infrastructure, prioritised on Air Quality benefits and commercial contribution.
- 14.8 Across all the Clean Vehicle Funds, further work is required between OBC and FBC to develop the assumption on the value per vehicle, criteria for access to the funding by vehicle owners, and the impact on specific groups of businesses affected by the introduction of the CAZ.
- 14.9 Through the 2040 Transport Strategy and the 2014 Devolution Agreement, the Combined Authority is progressing its reform programme utilising the provisions within the Bus Services Act, and as with other modes care is being taken to ensure complementarity in policy development.

Loan Finance (£TBC)

- 14.10 Work is also underway to explore the possibility of defining and providing a supporting measure to provide loans at preferential rates for those who are taking advantage of the Clean Vehicle Funding. The exact design and criteria would have to be determined at FBC stage following further engagement and consultation.
- 14.11 So far there have been three key groups for engagement – taxis & PHVs, bus operators and freight/ local business – to understand their concerns, obtain information about their fleets and seek their early feedback on proposals.
- 14.12 The taxi and PHV trade highlighted that subsidies and low interest rate loans would be beneficial as would other incentives through licensing and traffic flow. EV charging infrastructure was key to take up of electric vehicles, but they noted a limited choice for electric taxis, and that timescales for implementation were tight.
- 14.13 Business groups and freight representative bodies provided information about their fleets, to inform the development of the Clean Vehicle Fund measure. They have also advised that certainty around compliant vehicles and timescales for implementing the plan are essential to business planning.
- 14.14 Bus operators raised concerns around the capacity to retrofit vehicles and timescales for implementation.

14.15 Stakeholder dialogue will continue throughout development of the GM CAP to support the detailed design of the packages of measures.

15. Consistency with Other City Council Gm Policies, Plans and Strategies

15.1 Greater Manchester has a longstanding track record in taking a balanced approach to policy development to promote sustainability, inclusion and growth.

15.2 The GM approach is unique insofar as it utilises existing governance and administrative arrangements to bring together ten local authorities and their highway networks, permitting the development and the implementation of a co-ordinated plan to reduce roadside NO₂ concentrations that will benefit nearly three million people. Such a joined-up approach provides the potential for the most effective and swift reduction in emissions in areas across the whole of the city region.

15.3 Improving air quality is a key policy priority for Greater Manchester. The Greater Manchester Strategy¹² states that Greater Manchester should be ‘a place at the forefront of action on climate change with clean air and a flourishing natural environment’ including by ‘reducing congestion and improving air quality’.

15.4 Air Quality is also a key focus of the Greater Manchester Transport Strategy 2040 (“2040 Strategy”), which is Greater Manchester’s current statutory Local Transport Plan, prepared by TfGM on behalf of the GMCA and the Greater Manchester Local Enterprise Partnership (GMLEP).

15.5 The 2040 Strategy is accompanied by 5-year delivery plans, which set out the city-region’s short term delivery priorities. A draft updated 5-year Delivery Plan for 2020 to 2025¹³ was published in January 2019, and includes a range of recommendations for delivering Greater Manchester’s clean air and carbon reduction ambitions, building on from the Air Quality Action Plan 2016-2021 and Low Emission Strategy (GMCA, 2016). These include investment in the Greater Manchester Electric Vehicle (EV) charging network; ambitions to deliver a zero-emission bus fleet by 2040; transformation of cycling and walking infrastructure (including £160m investment in the next few years); and measures to reduce freight emissions.

15.6 In common with longstanding policy, further work continues on improving the public transport network and in particular its closer integration across modes. Greater Manchester has consistently used its available transport funding to improve public transport and enhance active travel options, thereby encouraging people to leave their car at home or at park and rides and travel more sustainably. Greater Manchester works to maximise all opportunities to access funding for the region to make it easier to travel by public transport, bike or on foot.

¹² <https://www.greatermanchester-ca.gov.uk/ourpeopleourplace> 2017

¹³ [Greater Manchester Transport Strategy 2040 Draft Delivery Plan](#) (2020-2025) (2019), TfGM

- 15.7 This Plan will ensure that Greater Manchester can address the nearer term issue of NO₂ exceedances in existing urban areas. Members will recognise that this is a crucial component in safeguarding our urban areas as the strategic focus for future development, as set out in the revised draft Greater Manchester Spatial Framework. Without this continued focus, Greater Manchester would risk excessive dispersed development that would undermine both the existing air pollution challenge and longer-term carbon reduction objectives.
- 15.8 The approach outlined is also consistent with the objectives of the Our Manchester Strategy. During the consultation on the Strategy Manchester residents and businesses stressed the importance of improving the quality of the local environment as one of their priorities. The Clean Air Plan seeks to further this aim.

16. Next Steps

- 16.1 Subject to the governance approval of each of the ten GM local authorities, the OBC will be submitted to Government within the required deadline of 31 March 2019. Government's response is expected 6 – 8 weeks after submission.
- 16.2 A public 'conversation' is proposed to run between early May and mid-June (for six weeks) to help further inform the work, and this will supplement the more targeted stakeholder engagement that is ongoing with affected businesses. In addition, further deliberative research is proposed to take place during March and April. These forms of engagement and dialogue will all inform the further development and detailed design of the measures identified in the OBC, to refine the proposals that will comprise the Full Business Case.
- 16.3 As required by Transport Act 2000, a statutory consultation relating to the proposed introduction of a charging Clean Air Zone is proposed to run between August and October 2019.
- 16.4 Further work to refine the assumptions and look in detail at 2023 exceedances, including further socio-economic work will be undertaken.
- 16.5 This will enable the development of a Full Business Case for further consideration by GMCA and constituent local authorities prior to submission to Government by the end of 2019.

17. Recommendations

- 17.1 Recommendations are set out at the front of this report.