

Greater Manchester's Outline Business Case to tackle Nitrogen Dioxide Exceedances at the Roadside

Financial Case



Oldham Council

TRAFFORD COUNCIL



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Approved

4 Financial Case

- 4.1.1 Since 2010 major urban areas in the UK, including the ten local authorities of Greater Manchester, have been in breach of the European Union Limit Values regarding levels of NO₂ as implemented through the Air Quality Standards Regulations (2010). These Regulations require the Secretary of State to develop and implement a national Air Quality Plan to achieve the relevant EU Limit Value within the “shortest possible time”¹.
- 4.1.2 As a result of the ClientEarth case in 2015, the UK Government was found to have produced inadequate plans and was directed by the UK Supreme Court to take action². Subsequent defeats for the UK Government in the UK High Court on the basis of inadequate planning and action, in 2016³ and 2018⁴, have further emphasised the need for an improved approach.
- 4.1.3 Government Air Quality Plans⁵ have subsequently required local authorities with persistent exceedances to undertake local action to consider the best option to achieve statutory NO₂ limit values in the “shortest possible time”, and this Outline Business Case investigates the feasibility of possible interventions that form the Greater Manchester Clean Air Plan (GM CAP).
- 4.1.4 It is vital to improve air quality because of the effect air pollution has on the health of people living, working and travelling in Greater Manchester. The Greater Manchester Strategy 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 ‘*improving air quality*’⁶. Greater Manchester’s ten local authorities have chosen to take a regional wide approach to producing a GM CAP to complement other GM-wide strategies such as the existing GM Air Quality Action Plan⁷ and GM Low-Emission Strategy⁸.

¹ Department for Environment Food and Rural Affairs, Department for Transport, ‘UK plan for tackling roadside nitrogen dioxide concentrations: Detailed plan: July 2017’ (2017), available at: <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>.

² * *R (On the Application of Client Earth) v Secretary of State for the Environment, Food and Rural Affairs* [2015] UKSC 28.

³ *R (On the Application of Client Earth (No 2)) v Secretary of State for the Environment, Food and Rural Affairs* [2016] EWHC 2740.

⁴ *R (On the Application of Client Earth (No 3) v (1) Secretary of State for the Environment, Food and Rural Affairs (2) The Secretary of State for Transport and (3) Welsh Ministers* [2018] EWHC 315.

⁵ Department for Environment Food and Rural Affairs, Department for Transport, ‘UK plan for tackling roadside nitrogen dioxide concentrations: Detailed plan: July 2017’ (2017), available at: <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>

⁶ Greater Manchester Strategy: our people our place, available at: <https://www.greatermanchester-ca.gov.uk/ourpeopleourplace>

⁷ Greater Manchester Air Quality Action Plan 2016-2021, available at <https://www.greatermanchester-ca.gov.uk/media/1272/air-quality-action-plan-2016-21.pdf>

⁸ Greater Manchester Low-Emission Strategy, available at <https://www.greatermanchester-ca.gov.uk/media/1276/low-emission-strategy-dec-2016.pdf>

4.1.5 The proposed GM CAP is a package of measures to address the NO₂ levels in Greater Manchester aimed at and achieving compliance in the “shortest possible time”. Each of these elements is integral to the successful delivery of the GM CAP and protecting the health of the Greater Manchester population, and therefore these measures must to be considered as a whole package if compliance is to be achieved. The package comprises the following:

- **Clean Air Zone across Greater Manchester**
 - Phase 1: (assumed from 2021) buses, taxis, Private Hire Vehicles and Heavy Goods Vehicles (Clean Air Zone Category B)
 - Phase 2: (assumed from 2023) expanding to Light Goods Vehicles and minibuses (Clean Air Zone Category C)
- **Vehicle Renewal Schemes** – to provide an affordable incentive to dispose/retrofit vehicles
 - Clean Freight Fund, Clean Taxi Fund, Clean Bus Fund, Loan Finance
- **Electric Vehicle Infrastructure and Promotion**
- **Sustainable Journeys** – an extensive behaviour change programme of travel planning with schools, workplaces and individuals
- Supported by Local Authority and Greater Manchester Fleet Upgrades, a review of Parking Standards and Bus Capacity Network Planning.

4.1.6 Improving air quality and reducing emissions harmful to health is a key policy priority for Greater Manchester, and the measures proposed in the GM CAP will also be complemented by ongoing activity arising from existing investment decisions by TfGM to improve Greater Manchester’s active travel and transport network.

Table 4- 1: A Summary of the Measures in the GM CAP

CAP Measure	
Clean Air Zone	Phase 1 of the Clean Air Zone (CAZ) is a Category B across the boundary of Greater Manchester in 2021, leading to a phase 2 CAZ Category C in 2023.
Local Authority and Greater Manchester Fleet Upgrade	Upgrade to the Local Authority and Greater Manchester family fleets to the lowest emission possible. This will include Local Authority-operated vehicles not planned to be compliant by 2021, including cars/vans, refuse collection vehicles, HGVs, contracted services and the Transport for Greater Manchester (TfGM) provided bus fleet.
Clean Freight Fund	Vehicle renewal schemes offering owners of older non-compliant vehicles in Greater Manchester an affordable incentive to swap/retrofit their vehicles, including vans and minibuses, Heavy Goods Vehicles and coaches.
Clean Taxi Fund	Vehicle renewal schemes offering owners of older non-compliant Private Hire Vehicles (PHVs) and Taxis in Greater Manchester an affordable incentive to swap/retrofit their vehicles.
Loan Finance	Offering vehicle owners/businesses the opportunity to upgrade their non-compliant vehicles to compliant vehicles either through a loan or subsidised lease.
Clean Bus Fund	Offering subsidies to retrofit existing Euro IV and V buses and a contribution towards the purchase of the cleanest buses, electric buses and electric bus charging infrastructure, prioritised on Air Quality (AQ) impact and commercial contribution (including the TfGM operated bus fleet).
EV Infrastructure and Promotion	300 additional rapid charging points (Dual Headed) across all ten districts of GM, including some for taxis/PHVs only and supporting communications delivering events, such as experience days, to showcase the benefits of Electric Vehicles and highlight the support available.
Sustainable Journeys	Workplace, school and personal travel planning to help people and businesses understand how they will be affected by the CAP and how best they can adapt.

Table 4- 2: Measures identified but no financial ask from Joint Air Quality Unit (JAQU)

Measure	
Parking Standards and Local Authority Parking	Review of parking standards, conversion of long stay to short stay car parks and Local Authority and Greater Manchester Combined Authority (GMCA) staff parking.
Bus Capacity	Liaison with Bus Operators to understand which routes may have expected increase in demand to allow Bus Operators to plan increases in commercial services. Commitment to inform all Bus Operators through communication and marketing strategies.
Ongoing Improvements	A programme of investment in public transport and the highway network is planned and is, to the extent that funding is available, underway. Co-ordination with ongoing projects, work packages and business as usual to ensure air quality benefits are maximised.

4.2 Financial Case Introduction

4.2.1 This section sets out the overall Financial Case for the Greater Manchester Clean Air Plan (GM CAP). It outlines the initial indicative cost estimates and funding requirements to implement the GM CAP as well as outlining the ongoing financial support required over the life of the GM CAP.

4.2.2 The purpose of this Financial Case is to support the application to the Department for Environment, Food and Rural Affairs (DEFRA)/Joint Air Quality Unit (JAQU) Implementation Fund for Clean Air Zones to fund the GM CAP.

4.2.3 The costs for the GM CAP include implementation costs for all the Measures and the costs of their ongoing operation and maintenance. The financial case for GM CAP is modelled through to 2029.

4.3 Financial Assumptions

General

4.3.1 GMCA is assuming Central Government, via the JAQU Implementation and Clean Air Funds, will fund all costs relating to scheme implementation and DEFRA/JAQU will underwrite any net operational deficit, in so much as there is one, over the life of the scheme until compliance is achieved.

4.3.2 All of the Measures and funding proposed are required to achieve compliance with the EU Directive in the shortest possible time. The Measures are designed to complement each other and all are required to achieve the Air Quality benefits outlined in the economic case. Any reduction in individual elements within the programme will impact on the benefits outlined in the business case.

- 4.3.3 For the purposes of this Financial Case it is assumed that the Local Authorities will delegate to the GMCA the necessary powers to act as the lead Contracting Authority subject to appropriate governance arrangements as specified by the Local Authorities. This permits the GMCA to appoint a Delivery Body to propose a procurement strategy for the development and implementation of the proposed GM CAP.
- 4.3.4 The operations for the GM CAP will be delivered by an operating body through delegated arrangements similar to those proposed in creating the Delivery Body referred to in paragraph 4.3.3.
- 4.3.5 GMCA and the Greater Manchester districts do not have any financial resources to fund the implementation costs or the ongoing operational, maintenance, renewal or decommissioning costs of the Greater Manchester Clean Air Plan and are not currently bidding for other funding sources to provide support for implementation or ongoing operation and maintenance costs.
- 4.3.6 The financial model assumes all VAT associated with the GM CAP is recoverable and that the CAZ daily charges and penalty notices will not be subject to VAT.

Costs

- 4.3.7 At this stage in the OBC, the current forecast costs reflect a high degree of estimation and a degree of uncertainty. Scheme costs are estimated based on assumptions derived for other similar schemes and from market intelligence and/or market data as far as it is available.
- 4.3.8 The costs will be refined through the procurement process and the GM CAP design and development activities as the scheme progresses through to Full Business Case (FBC).
- 4.3.9 Costs are indexed in line with their relevant WebTAG (Transport Analysis Guidance) defined indexations. Staff wage costs are indexed at Average Wage Earnings and all other cost items with the Retail Price Index.
- 4.3.10 It is assumed that the CAZ infrastructure will be decommissioned two years after full compliance is forecast to be achieved in the Do Minimum scenario, as described in the strategic case. This allows for an additional year of operations after the Do Minimum compliance date in 2027 and for decommissioning in 2029.
- 4.3.11 None of the schemes have a Quantified Risk Assessment (QRA) included in the costs, as agreed with JAQU for the submission of this OBC; instead, schemes have an overall level of Optimism Bias/contingency applied on top of the base cost.

- 4.3.12 Optimism Bias (OB) has been assessed for each GM CAP Measure (implementation and operational costs) in order to apply an appropriate OB level reflecting the current uncertainty in underlying cost assumptions and estimates. Therefore, each Measure may have different levels of OB applied to certain cost elements within the Measure. As the Measures progress towards FBC it is anticipated that these figures will change, risk-specific allocations (QRA) will be identified and revised levels of contingency allowances will be quantified as more cost certainty is achieved.

Revenue

- 4.3.13 There are several assumptions that underpin the revenue generation. However, there is a considerable amount of uncertainty in the assumptions since there is no CAZ currently in operation in the UK and therefore, the forecasts included in the financial model are indicative.
- 4.3.14 Scheme revenues are calculated from traffic model outputs. The traffic model assumptions are taken from similar schemes and modified to the local context. Local user responses to the implementation of a CAZ may differ from the forecast values. A sensitivity analysis will be carried out to test the impact of altering underlying assumptions.
- 4.3.15 There is no connectivity assumed with other cities' CAZ schemes, therefore, if a vehicle enters another city's CAZ on the same day, it is still assumed to incur a charge when entering the GM CAP zone.
- 4.3.16 Indicative daily charges, including penalty notices, have been assumed for modelling the scheme. It is assumed that the charge levels remain constant in nominal prices (i.e. £7.50 in 2021 and £7.50 in 2028); and therefore they reduce in real terms. The assumption not to inflate the CAZ charge over the life of the scheme is not anticipated to have a significant impact on compliance dates.
- 4.3.17 This assumption does not rule out increasing (or decreasing if it is deemed not to affect the air quality compliance date) the charges over the life of the scheme, as this will be included in the Charging Order. The initial charge will be defined following the consultation and additional behavioural modelling.
- 4.3.18 The charge is planned as a daily capped charge, therefore, non-compliant vehicles that have entered the CAZ more than once on the same date will only pay once.
- 4.3.19 No revenue is currently included in relation to Electric Vehicle membership schemes, however, this does not discount a charging scheme being introduced in the future.

Financial Summary

- 4.3.20 The table below summarises the current forecast implementation and operational costs over the life of the scheme:

Table 4- 3: GM CAP cashflow summary, £m nominal prices

	Total	Funding
Implementation Costs	(256)	JAQU Clean Air Implementation Fund
Operational Costs	(174)	Scheme revenue or JAQU Clean Air Implementation Fund
Total	(430)	

4.3.21 Revenues generated by the scheme are expected to cover the operational costs, but there are significant risks to both the operational costs and revenue figures; these uncertainties will be better understood through the process of developing the FBC in order to provide more refined estimates.

4.3.22 In accordance with the Transport Act 2000, if surplus revenues are generated over the life of the scheme they will be invested back into transport-related schemes within GM. GM is currently developing sustainable travel schemes within the GM 2040 strategy, where the surplus revenues could be used to fund relevant schemes if this scenario became a possibility.

4.3.23 In accordance with JAQU guidance any surplus funds can also be allocated to schemes to compensate those that have been disproportionately impacted by the CAZ scheme implementation.

Implementation Costs

4.3.24 The funding requirement from DEFRA/JAQU to implement the GM CAP is currently forecast to be £256 million. Table 4- 4 summarises the costs (including the OB by scheme) by Measure and key cost drivers for the Measures:

Table 4- 4: Implementation cost summary including OB/contingency, £m nominal prices, total 2021-28

CAP Measure	Implementation Cost £m	Cost Drivers
Clean Air Zone	78	<ul style="list-style-type: none"> • Signs, Automatic Number-Plate Recognition (ANPR) cameras and associated installation costs • IT systems to manage the scheme and Penalty Charge Notices (PCN) process • Detail design work and marketing campaigns prior to scheme launch • Mobilisation and recruitment costs for staffing the scheme

CAP Measure	Implementation Cost £m	Cost Drivers
Local Authority and Greater Manchester Fleet Upgrade	27	<ul style="list-style-type: none"> Upgrade of non-compliant vehicles owned by the Districts to lowest emission possible, including all Local Authority operated cars/vans, refuse collection vehicles, HGVs
Clean Freight Fund	59	<ul style="list-style-type: none"> Population of non-compliant vehicles Amount allocated per vehicle
Clean Taxi Fund	28	<ul style="list-style-type: none"> Population of non-compliant taxis and PHVs Amount allocated per vehicle
Clean Bus Fund	30	<ul style="list-style-type: none"> Population of non-compliant buses in Greater Manchester Cost to retrofit buses, where possible
EV Infrastructure and Promotion	25	<ul style="list-style-type: none"> Cost to buy and install 300 dual head rapid chargers
Sustainable Journeys	9	<ul style="list-style-type: none"> Resource to deliver interventions Costs are profiled from 2019 to 2028
Loan Finance	TBC	<ul style="list-style-type: none"> This Measure is yet to be further defined, however, a general assumption for cost to administer a loan scheme is c1% of the loan book value
Total	256	Excludes Loan Finance Cost

4.3.25 At the OBC stage there are a number of uncertainties around the cost estimates as outline design works and supplier engagement have not yet commenced. Additionally, no singular scheme currently exists to provide a basis for costing estimates.

4.3.26 Due to the current scheme design stage the cost forecasts use OB levels recommended by the Department for Transport's (DfT) WebTAG guidance to quantify risk and contingency allowances. As design and market engagement progresses, the levels of OB will be reduced and specific quantified risk allowances will be included as the confidence around cost assumptions increases.

4.3.27 DfT's WebTAG guidance recommends OB levels for roads projects of 44% at the Strategic Outline Business Case stage and 15% at the Outline Business Case stage. For IT projects, 200% is recommended at SOBC stage with no specific recommendation for the OBC.

4.3.28 The above schemes include a level of OB/contingency depending on the certainty of the cost estimates. Table 4-5 summarises the level of OB/contingency applied by scheme, and the justification.

Table 4- 5: Implementation costs effective OB, £m nominal prices, total 2021-28

CAP Measure	OB Cost £m	Effective Rate	Justification
Clean Air Zone	23	41%	A blended rate to cover costs with more certainty such as recruitment, design feasibility at 15% and systems implementation uncertainty at 200% (this is in line with WebTAG for IT schemes at SOBC stage).
Local Authority and Greater Manchester Fleet Upgrade	1	15%	A blended rate to cover supplier costs and resource to implement the measure.
Clean Freight Fund	0	0%	OB contained within assumptions around cost per vehicle as opposed to overlaying a specific percentage across all costs.
Clean Taxi Fund	0	0%	OB contained within assumptions around cost per vehicle as opposed to overlaying a specific percentage across all costs.
Clean Bus Fund	4	15%	In line with DfT WebTAG for road schemes at OBC stage. Costs for retrofitting a bus are tendered prices from previous TfGM schemes.
EV Infrastructure and Promotion	3	15%	In line with DfT WebTAG for road schemes at OBC stage. Costs for installing infrastructure are prices from previous TfGM schemes.
Sustainable Journeys	1	15%	In line with DfT WebTAG for road schemes at OBC stage. Costs are mainly staff-related based on TfGM staff banding.
Total	32		

4.4 Operational Costs

4.4.1 There are two Measures in the GM CAP that will incur operational and maintenance (O&M) costs post-implementation (this does not currently include the ongoing operational costs to administer a Loan Finance scheme):

- The CAZ; and
- EV Infrastructure and Promotion.

4.4.2 Based on initial indicative financial costings the table below summarises the operational costs to 2028 and the key cost drivers.

Table 4- 6: O&M cost summary including OB/contingency, £m nominal prices, total 2021-28

CAP Measure	Operational Cost £m	Cost Drivers
Clean Air Zone	163	<ul style="list-style-type: none"> • Staff to recover PCN charges • Office costs and IT systems • ANPR camera and sign maintenance • Mobile enforcement units • Decommissioning costs
EV Infrastructure and Promotion	11	<ul style="list-style-type: none"> • Ongoing maintenance of the charge points • Electricity costs are assumed to be recovered from user.
Total	174	

4.4.3 The table below summarises the level of OB/contingency applied to the operational costs by scheme and the justification.

Table 4- 7: Operations and maintenance effective OB

CAP Measure	OB Cost £m	Effective Rate	Justification
Clean Air Zone	39	32%	A blended rate to cover costs with more certainty such as recruitment, design feasibility at 15% and systems implementation uncertainty at 200% (this is in line with WebTAG SOBC).
EV Infrastructure and Promotion	1	15%	In line with DfT WebTAG for road schemes.
Total	40		

Revenue

- 4.4.4 The Clean Air Zone Measure of the GM CAP is the only Measure assumed to generate revenue.
- 4.4.5 The value of the daily charges and PCNs will be finalised through the consultation, and therefore, the current forecast revenues presented here are subject to subsequent change as the business case develops.
- 4.4.6 Revenue will be generated as vehicles not complying with the minimum Euro Standard requirements defined in the respective Clean Air Zones, will have the daily charge levied on them.
- 4.4.7 Table 4-8 provides a summary of the current indicative estimates of CAZ Measure revenues by vehicle type using the current assumed charges (daily and PCN) per vehicle.
- 4.4.8 Indicative charges (daily and PCNs) have been assumed for modelling the scheme. The charging and penalty levels are assumed to stay constant in real terms and are not inflated with any indexation in the financial modelling (i.e. £7.50 in 2021 and £7.50 in 2028). The assumption not to inflate the CAZ charge over the life of the scheme is not anticipated to have a significant impact on compliance dates.

Table 4- 8: GM CAP revenue summary, £m nominal prices, total 2021-28

Vehicle Type	Standard CAZ Charge £m	Penalty Charge Notice £m	Total £m
LGV	48	19	67
HGV	141	11	152
Hackney Carriages and PHVs	30	12	42
Total	219	42	261

- 4.4.9 The implementation costs, as presented in Table 4- 3, are assumed to be fully funded by the Clean Air Zone Implementation Fund. The GM CAP operations are expected to generate a net surplus over the first six years, with the final two years operating at a net loss
- 4.4.10 A CAZ reserve fund will be established from the forecast surpluses in net revenues in the earlier years of the scheme to be ring-fenced to fund the later years' operating losses.
- 4.4.11 If over the life of the scheme it generates an operational loss (i.e. cumulative net revenues are lower than cumulative operating costs), then it is assumed that DEFRA/JAQU via the Clean Air Zone Implementation Fund (or other relevant Central Government funding streams) will underwrite the net loss.

- 4.4.12 If the scheme generates an operational surplus (i.e. cumulative net revenues are higher than cumulative operating costs), then in accordance with the Transport Act 2000, these will be invested back into transport-related schemes within GM. GM is currently developing sustainable travel schemes within the GM 2040 strategy, where the surplus revenues could be used to fund relevant schemes if this scenario became a possibility.
- 4.4.13 In accordance with JAQU guidance any surplus funds can also be allocated to schemes to compensate those that have been disproportionately impacted by GM CAP implementation.

Overview of Scheme Measures

4.5 Clean Air Zone

Cost Assumptions

- 4.5.1 At this stage in the OBC, the current forecast costs reflect a high degree of estimation and are open to a degree of uncertainty; the costs will be further refined throughout the FBC process.
- 4.5.2 Where available, costs have been estimated using local information and local data. Some of the costs were derived from per item cost estimates and a forecast of the number of assets (including ANPR cameras, signage and mobile enforcement units) required, based on the estimated CAZ area.
- 4.5.3 Assumptions on how the major cost headings have been estimated are summarised in Table 4- 9

Table 4- 9: CAZ cost assumptions

Cost category	Description
Project management	<ul style="list-style-type: none"> Staff to oversee the implementation of the scheme An estimate of 10% of implementation costs was used for the project management costs. This is in line with other TfGM projects for schemes at this level of design and will be updated with a bottom up assessment as the scheme progresses towards FBC.
Mobilisation	<ul style="list-style-type: none"> As part of the scheme mobilisation, staff will be recruited and trained to be ready for go-live date. Some resources are assumed to be in place before the start of operations such as managers, supervisors, and junior officers. A recruitment cost, accounting for the costs of the recruitment process and IT supply, is included.
Signs	<ul style="list-style-type: none"> An analysis of the road network was undertaken to assess sign placement. The scheme assumes a number of signs are required on the key route network, A roads and B roads. The exact amount will be refined for the FBC.

Cost category	Description
	<ul style="list-style-type: none"> Costs associated with sign implementation and maintenance from other schemes were used.
ANPR cameras	<ul style="list-style-type: none"> An analysis of the road network was undertaken to assess camera placement required to capture all non-compliant vehicles. Further detailed design work to understand the exact mix of fixed and mobile cameras will be completed for the FBC. Cost associated with camera implementation and maintenance from other schemes was used. This high-level cost includes power supply and communications.
AQ monitoring implementation	<ul style="list-style-type: none"> Based on JAQU guidance, the costs of the initial installation of additional AQ monitoring sites across Greater Manchester and their continual monitoring is costed. A number of diffusion tubes will be placed on existing infrastructure. These low cost tubes will be replaced on a monthly basis. Cost includes installation of tubes, collection and analysis.
Charge and PCN issuance	<ul style="list-style-type: none"> JAQU has advised that a national backend system reviewing ANPR data for non-compliant vehicles will be provided. JAQU have requested that 5% of CAZ charge revenue is included as a proxy to estimate the cost for this service. This is yet to be agreed. The CAZ operator will be responsible for the PCN process. This process will incur non-staff operational costs associated with matching vehicle registration to owner data and issuing penalty notices. Costs from other schemes have been used. An IT backend system will also be required to administer this process. Implementation and operational cost have been forecast from estimates for other schemes. There remains significant uncertainty surrounding the timing and cost interface of the CAZ system with JAQU's national backend system. Due to this level of uncertainty we have applied a figure of 200% OB against the development costs.
Staff costs	<ul style="list-style-type: none"> The primary staff requirement is related to the PCN process. Rates of handling PCN reviews, representations and appeals are assumed in defining the number of staff required. The staff estimates include managers and supervisors.
Mobile enforcement	<ul style="list-style-type: none"> Mobile enforcement units will be used to assist in enforcing the CAZ across Greater Manchester; as placing ANPR cameras on all roads throughout the zone is not currently considered to represent good value for money. The mobile enforcement units will be staffed to run in shift patterns with gradually decreasing hours as the number of non-compliant vehicles in the Greater Manchester vehicle fleet decreases.

Cost category	Description
	<ul style="list-style-type: none"> Capital and operational costs are currently forecast at a high level and will be refined with continued analysis.
Marketing and communications	<ul style="list-style-type: none"> The TfGM marketing and communication teams have performed an assessment of the costs required for consultation, a pre-implementation campaign and continued operational marketing campaigns during the CAZ's operation.
Overhead	<ul style="list-style-type: none"> Costs associated with back office functions such as HR, finance, legal and insurance are forecast using per employee figures sourced from other operations. Office costs are assumed on a per employee level for serviced office space to allow for the flexibility of staff levels associated with the declining fleet proportion of non-compliant vehicles and the associated CAZ operations that they incur.
Decommissioning	<ul style="list-style-type: none"> Cost forecasts from a per item cost build up, which includes sign and ANPR removal and IT system decommissioning.

Revenue Assumptions

- 4.5.4 Charging CAZ schemes are based on charging a fee to enter or move around within the zone for vehicles that do not meet the required emission standards.
- 4.5.5 It is currently assumed that the CAZ is the only Clean Air Plan Measure that may generate revenues. The GMCA recognises the DEFRA guidance noted below and has adhered to this principle when modelling the charge levels, both daily and PCNs.
- “Local authorities should not set the level of charge as a revenue raising measure. The Transport Act 2000 requires any excess revenue that may arise from charges above the costs of operation to be re-invested to facilitate the achievement of local transport policies and these should aim to improve air quality and support the delivery of the ambitions of the zone, while ensuring this does not displace existing funding. Such charges may not be used as a form of taxation to raise revenue generally.”***
- 4.5.6 The level of the charges modelled reflects the assumption of value required to change behaviours and **not** to generate revenue. The behavioural response of users' actions following the introduction of a charging CAZ was estimated based on a stated preference survey data modified to be applicable to the Manchester context.
- 4.5.7 The principal drivers of revenue will be:
- using a non-compliant vehicle within the GM boundary
 - the daily charge for the non-compliant vehicle; and
 - income received from PCNs due to non-payment of the daily charge.

- 4.5.8 To allow owners of non-compliant vehicles an opportunity to prepare for the introduction, a Clean Air Zone deferred ('sunset') period for LGVs will be applied to 2023, when a CAZ C will become operational across the GM boundary.
- 4.5.9 There will be some form of whitelisting criteria which will allow certain non-compliant vehicles to be exempt from the daily charge. This set of criteria is yet to be defined and therefore is not reflected in a reduction of the current forecast revenues.
- 4.5.10 Table 4- 10 details the proposed daily charges by vehicle type and the PCN by vehicle type. These are indicative charge levels which will be finalised after the consultation and in preparation for the FBC submission.

Table 4- 10: Non-compliant vehicle CAZ charges

	CAZ charge	Full PCN
Taxi	7.50	120.00
LGV	7.50	120.00
HGV	100.00	120.00
Bus/coach	100.00	120.00

- 4.5.11 A Penalty Charge Notice is a notice that offers an alleged offender the opportunity to pay a fine, in which case the matter is not prosecuted, saving time and expense. The alleged offender has the option to refuse and be charged with the offence. Penalty Charge Notices will be issued to users who do not pay the daily CAZ charge within a pre-determined timeframe. These users will be subject to a PCN, which if paid within 14 days will be subject to a 50% discount.
- 4.5.12 In the financial business case it is assumed that all PCNs issued, whether paid within the discount period or after, will comprise payment of the original CAZ daily charge in addition to the PCN. For example, an HGV paying the PCN within 14 days will pay the discounted PCN of £60 **and** the original CAZ charge of £100.
- 4.5.13 The CAZ daily charges are set at different levels for different vehicle types to reflect the contribution each type of vehicle model contributes to air pollution. The aim is that vehicles with the highest emissions are incentivised to comply with the standard. For example, while LGVs make up the majority of the traffic, they make a smaller contribution to air pollution on a per vehicle basis, hence they have been allocated a lower charge level.
- 4.5.14 It is assumed that the CAZ daily charge levels remain constant in nominal prices (i.e. £7.50 in 2021 and £7.50 in 2028); and therefore they reduce in real terms.

4.5.15 The charge is planned as a daily capped charge, therefore, non-compliant vehicles that have entered the CAZ more than once on the same date will only pay once.

4.5.16 Based on data from other schemes, the OBC includes the following assumptions about penalty charges:

- rate of unpaid daily charges that receive a PCN is 5%;
- rate of PCN paid is 70%;
- rate of PCNs paid within discount time period is 80%; and
- 30% of PCNs go unpaid. Non-payment includes vehicles that do not have correct ownership details, as well as charges that successfully represent or appeal their case and have the penalty charge notice reversed. No revenue is assumed to be collected from either.

4.5.17 The table below summarises the overall operational cost (Opex) and revenue over the life of the CAZ.

Table 4- 11: Summary of Ongoing Financial Operations Over Life of CAP

	Opex £m	Revenue £m	Net Total £m
GM CAP	(174)	261	87

Local Authority and Greater Manchester Fleet Upgrade

4.5.18 The Local Authority Fleet Upgrade will upgrade the Local Authority and Greater Manchester family fleets to the lowest emission possible. This will include all Local Authority operated cars/vans, refuse collection vehicles, HGVs, contracted services and the TfGM provided bus fleet.

Table 4- 12: Local Authority and GM Fleet Upgrade cost

CAP Measure	Implementation Capital Funding £m	Implementation Revenue Funding £m	Total Implementation Funding £m
Local Authority and Greater Manchester Fleet Upgrade	27	-	27

VEHICLE RENEWAL SCHEMES

Clean Freight Fund

4.5.19 The establishment of a Clean Freight Fund will offer local small and micro businesses, sole traders and the voluntary sector, registered in Greater Manchester, a contribution towards the cost of acquiring a compliant commercial vehicle when scrapping a non-compliant vehicle or towards the cost of retrofitting to make the vehicle compliant.

- 4.5.20 Priority for funding will be based primarily on air quality impact such that the most polluting vehicles can be targeted.
- 4.5.21 The vehicles to be covered by this fund are as follows:
- Light Goods Vehicles and minibuses
 - Heavy Goods Vehicles and coaches
- 4.5.22 The fund is expected to target the most polluting vehicles from the roads and replace them with cleaner vehicles.
- 4.5.23 Depending on the vehicle, the fund will offer either a value for their current non-compliant vehicle to act as a contribution to upgrade to a compliant vehicle, or a contribution to installing a retrofitted solution to their current vehicle.
- 4.5.24 Further work is required between OBC and FBC to test the assumptions on the value per vehicle, the upgrade premium and the likely uptake of the Clean Freight Fund.
- 4.5.25 Within each fund there is an assumption that 5% of the fund value is required to administer the process. The administration will cover staff, disposing of the non-compliant vehicles, IT systems to record and process payments, operational overheads and the cost of premises.
- 4.5.26 The OBC financial case assumes that the most polluting vehicles are targeted first whilst providing support to the most vulnerable groups.

Clean Taxi Fund

- 4.5.27 The Clean Taxi Fund will offer Greater Manchester Registered taxis and private hire drivers support to upgrade their non-compliant vehicles.
- 4.5.28 The establishment of a Clean Taxi Fund will offer taxi and private hire drivers a contribution to the purchase of a compliant vehicle from an approved supplier when trading in a non-compliant vehicle. It will also provide a contribution for the retrofitting of taxis.
- 4.5.29 The scheme will only be open to vehicles and drivers licensed within GM. Over the past three years, the number of licences has been falling; it is believed that this reflects the increasing tendency for drivers to license out of region but operate within the region. It is likely that the introduction of the Clean Air Zone – which will offer better terms including access to this vehicle renewal scheme – will reverse this trend.
- 4.5.30 Across all the Clean Taxi Fund, further work is required between OBC and FBC to test the assumption on the value per vehicle, the upgrade premium and the likely uptake of the Clean Taxi Fund.

Table 4- 13: Vehicle Renewal Schemes Cost Summary

CAP Measure	Implementation Capital Funding £m	Implementation Revenue Funding £m	Total Implementation Funding £m
Clean Freight Fund	-	59	59
Clean Taxi Fund	-	28	28
Vehicle Renewal Total	-	87	87

Loan Finance

4.5.31 In order to further assist groups who may be adversely affected by the implementation of charging in the Clean Air Zone, a Loan Finance scheme is being developed. In the preferred option the groups who will be adversely affected will include:

- LGV operators wanting to upgrade to new compliant vehicles from recognised/approved dealers;
- HGV operators wanting to upgrade to new compliant vehicles from recognised/approved dealers;
- Private Hire Vehicle owners wanting to upgrade to an EV or compliant vehicle; and
- Hackney carriage owners wanting to upgrade to an EV or compliant vehicle.

4.5.32 In addition to centrally funded Clean Freight/Taxi funding, the GMCA in accordance with the GM Combined Authority Order 2011, is assessing the possibility of defining and providing a supporting Measure which will be to provide loans at preferential rates for those who are taking advantage of the Clean Freight/Taxi funding schemes. This could be through a loan for a vehicle, or subsidy of a lease plan. The exact design and criteria will have to be determined at FBC stage following consultation with those affected.

4.5.33 For the purpose of this draft Measure it is assumed that Bus Operators will be out of scope for any preferential loans as they will be eligible to apply for funding from the Clean Bus Fund scheme.

4.5.34 The key principles for this Measure are as follows:

- GMCA can borrow money at lower rates through organisations such as the Public Works Loan Board, and the Treasury, than banks accessing capital markets;

- if GMCA chooses to lend/subsidise the capital to people/businesses of GM it may become a financially attractive proposition to an individual or business;
- GMCA would underwrite the loans and therefore be exposed to risk of default;
- a Financial Conduct Authority regulated third party would be required to administer the scheme and make the loan to customer;
- the loan would be secured against the vehicle purchased or leased;
- the loan finance or an alternative arrangement would need to be compliant with Islamic Finance rules to ensure equality;
- the expectation is that DEFRA/JAQU would fund the administration and arrangement fees; typical costs for this might be 1% of loan book value. This cost is **not** currently included in the funding request to JAQU.

4.5.35 The cost, delivery and operation of the Loan Finance scheme will be further developed throughout the process of the FBC.

Clean Bus Fund

4.5.36 There are currently around 2,000 buses in the Greater Manchester fleet. The Clean Bus Fund will offer subsidies 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. Buses that are not eligible for retrofit will require the market to identify a solution.

4.5.37 The cost to retrofit an individual bus is around £20,000 and it is estimated therefore that a fund of approximately £30 million is required to retrofit the bus fleet, including costs to administer the scheme.

4.5.38 Whilst the retrofit option is a relatively inexpensive way to achieve compliance, it does not fit with the Greater Manchester longer-term strategy or the 2040 ambition to have a zero emission bus fleet.

4.5.39 The table below summarises a range of options GM would like to discuss further in order to meet the 2040 ambition:

Table 4- 14: Potential Future Funding Requirements

Option Description	Value £m
Replace all non-compliant buses (Pre-Euro VI) with Electric Vehicles and upgrade essential infrastructure to maintain an electric fleet	725
To retrofit all non-compliant Euro V buses up to 10 years old (c.610 buses) and to purchase new Diesel Euro VI for the remainder (c.1,190 buses)	240

Replacing 700 buses (Euro III-IV) with Euro VI compliant diesel vehicles and retrofit the remaining (Euro V) c.900 buses	130
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4.5.40 The Mayor of Greater Manchester has pledged that Greater Manchester will have a zero emission bus fleet as part of GM's ambition to meet greenhouse gas targets. Greater Manchester has also signed a declaration of intent to move to a zero emission bus fleet as soon as and wherever possible.

Table 4- 15: Clean Bus Fund Measure cost

CAP Measure	Implementation Capital Funding £m	Implementation Revenue Funding £m	Total Implementation Funding £m
Clean Bus Fund	-	30	30

Electric Vehicle Infrastructure and Promotion

4.5.41 Funds that incentivise people and business to upgrade their vehicles will encourage consideration of less polluting vehicles. When deciding whether to purchase an Electric Vehicle, one of the considerations will be the practicality of being able to charge and park the vehicle. The Electric Vehicle Infrastructure and Promotion initiative will deliver 300 additional rapid charging points (Dual Headed) across Greater Manchester, including some for taxis/PHVs only.

4.5.42 Chargers will be deployed across all 10 districts of Greater Manchester to create a comprehensive network. This will provide 27 dual chargers in each district with an additional 30 dual chargers in the regional centre to account for use by taxis and increased travel demand.

4.5.43 The key implementation costs for this workstream are based on benchmarks from the Centre for Excellence for Low Carbon and Fuel Cell Technologies and from similar programmes that TfGM has delivered.

4.5.44 The implementation costs include the following:

- Purchase, installation and connectivity to the grid of the Electric Vehicle rapid chargers
- Traffic Regulation Orders and project costs to manage the implementation
- Communication and marketing campaigns will be used to highlight the benefits of Electric Vehicles and the support available to businesses and local residents. The costs for these are based on similar campaigns TfGM has delivered

4.5.45 Once the infrastructure is operational there will be annual costs of around £1 million per annum to cover the following:

- Maintenance and repairs of the infrastructure

- Staff costs to operate the infrastructure and engage with the customers

4.5.46 No revenue is currently included in relation to Electric Vehicle membership schemes, however, this does not discount a charging scheme being introduced in the future.

Table 4- 16: EV infrastructure and promotion fund cost

CAP Measure	Implementation Capital Funding £m	Implementation Revenue Funding £m	Total Implementation Funding £m
EV Infrastructure and Promotion	24	1	25

Sustainable Journeys

4.5.47 The changes that will be made in Greater Manchester are likely to be disruptive for some people. Helping people and businesses to understand how they will be affected and how best they can adapt will be an important part of implementing a Clean Air Plan.

4.5.48 Key activities within this workstream are the provision of:

- Extensive support for sustainable travel plans that individuals and organisations will be given, through one-to-one contact. The cost for this is based on costs TfGM have incurred for smaller scale interventions.
- Specific grants to help businesses improve their sustainable modes of transport for employees, such as installing cycling infrastructure at the place of work. The actual amount of grants awarded will be different, business by business, depending on the scale of infrastructure required.
- Staff/other resources required to go directly to businesses to discuss and advise on sustainable freight practices; and staff/other resources required to go directly into schools and advise on sustainable interventions for students, parents and staff about their journeys to and from school.

Table 4- 17: Sustainable journey measure cost

CAP Measure	Implementation Capital Funding £m	Implementation Revenue Funding £m	Total Implementation Funding £m
Sustainable Journeys	-	9	9

Funding

4.5.49 There are three main funding sources for the implementation of Clean Air Zones. These are:

- A £255 million Implementation Fund - this is designed to support local authorities in the planning and delivery of targeted action to improve air quality.
- A £220 million Clean Air Fund - an opportunity for local authorities to implement additional Measures tailored to their area which minimise the potential impact of local air quality plans - either by enabling the local authority to implement local plans that collectively impact on fewer people, or by providing direct support to those impacted.
- Revenue from CAZ charges - funding will become available from the charges that are applied to each CAZ. It is intended this will fund ongoing operations and the decommissioning cost at the end of the programme.

4.5.50 The Greater Manchester Clean Air Plan is submitting the OBC as an application to the Implementation Fund on the assumption that all of the Measures outlined in the case are required to bring forward compliance in the quickest possible time frame.

4.5.51 Any reduction in individual elements within the programme will impact on the benefits outlined in the business case.

Other Funding Sources Contributing to the Clean Air Plan

4.5.52 In addition to the funding request to JAQU within this business case, TfGM is in the process of bidding, or has secured other funding that will contribute to the GM CAP as follows:

- Early Measures Fund - this is expected to support small, ambitious and good value early Measures to improve air quality and start to reduce concentrations in Clean Air Zone. TfGM were successful in being awarded £3 million to support the early roll-out of 25 Electric Vehicle rapid chargers.
- Ultra-Low Emission Bus Fund - TfGM were successful in securing £5 million for 23 electric buses and associated infrastructure.
- Transforming Cities Fund - £160 million has been secured to provide cycling and walking infrastructure to the standards outlined within the Cycling and Walking Commissioner's 'Made to Move' report.
- ULEV Taxi Infrastructure - TfGM has been successful in securing around £2 million to install 80 rapid chargers to encourage taxis to switch to Ultra-Low Emission Vehicles.
- ULEV Bus Fund - TfGM has been successful in securing around £4 million to support the electrification of buses, including infrastructure.
- Clean Bus Technology Fund - £3 million has been secured to retrofit approximately 170 buses.

- Highways England Air Quality Designated Fund - TfGM will work with Highways England to make progress on reducing the Strategic Road Network's impact on air quality to support wider government initiatives through accessing this fund.

Key Sensitivities

4.5.53 A series of sensitivity tests has been run to test the scheme's financial stability. The assumptions that were tested were selected due to their relative uncertainty, their sensitivity to change and their ability to impact cash flows

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Table 4- 18: Sensitivity test results

Sensitivity test	Description	Impact
HGV daily charge reduced	HGV charges are initially proposed at £100 per day. It is noted that while other CAZs have initially proposed this figure they have subsequently lowered the HGV daily charge to £50. This lower charge level was tested.	As would be expected, lowering the HGV charge to £50 has a significant impact on scheme revenue, reducing the top line by £73m (28%). The lower revenue results in a greater operating loss in the final years of the scheme and would require an increased build up of the sinking fund during initial scheme years. CAZ daily charges are currently set to influence behavioural change and not generate revenue; these will be reviewed in line with the development of the FBC.
Capex and Opex increase	Cost estimates are currently in varied levels of certainty. Costs were increased by 20% to assess impacts on implementation and operating costs.	Capex increased by £34m, less than 15% overall as Clean Incentive Fund values were considered fixed. Opex also increased by £29m, resulting in operating margin reducing by 33% to £59m. The increase in opex will require a greater build-up of the sinking fund as operating losses in the final two years of operation exceed the forecast fund value by £4m.
Daily Charge Avoidance	A sensitivity on charge avoidance was undertaken to assess the impact on operating profit. It was assumed that 10% of non-compliant vehicles avoided the charge.	The impact of flexing Clean Air Zone charging compliance, reduced the operating margin by £19m to £67m. Although a substantial figure, this did not have a significant impact on the cash flow position to the extent that it would adversely impact the scheme as a going concern.
Combined low	The above scenarios were tested in multiple combinations to assess combined low scenarios.	The combined impact of lower HGV charges and higher operating cost, results in the scheme incurring a net operating loss over the forecast operational period. This scenario would require ongoing subsidy from JAQU for the scheme to remain operational post 2026.
Capex and Opex OB reduced	The OB levels were lowered to 15% for all cost items where they were in excess of this level. OB for the IT backend system was lowered from 200% to 100%.	The lowering of OB levels reduced implementation costs by £13m (5%) and operating costs by £20m (11%).

- 4.5.54 The sensitivity tests indicate that the GM CAP would incur an operational loss if the implementation of a lower HGV CAZ charge is accompanied by moderate increases in operational cost. As the scheme progresses toward Full Business Case, vehicle CAZ charge and operational cost assumptions will mature. It is anticipated that these figures will be further tested throughout the development of the FBC.
- 4.5.55 The level of the charges modelled reflects the assumption of value required to change behaviours and **not** generate revenue. The behavioural response of users' actions following the introduction of a charging CAZ was estimated based on stated preference survey data modified to be applicable to the Manchester context.

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