Greater Manchester's Clean Air Plan to tackle Nitrogen Dioxide Exceedances at the Roadside

Evidence Submission for a new GM Clean Air Plan

T4 Appendix B: Technical Note 37 - Vehicle Population Estimates

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Contents

1 Purpose of this Document

1.1.1 This document discusses the key vehicle volumetric information used for the Greater Manchester Clean Air Plan.

1.1.2 The purpose of this note is to:

- Discuss the methodology used for projecting vehicle fleet information to forecast future year volumes and determining levels of compliance for each vehicle type modelled; and
- Report on the vehicle volumes modelled in terms of baseline and future scenarios in relation to vehicle type and compliance.

1.1.3 Per vehicle funding amounts can be found in the *Appraisal Report* document.

1.1.4 This document describes the methodology of determining vehicle volumes by mode. Compliance with the GM CAP has been assessed for modelled forecast years of 2023 and 2025.

1.1.5 The modes discussed within this document are:

- Heavy Goods Vehicles (HGVs);
- Light Goods Vehicles (LGVs);
- Hackney carriages;
- Private Hire Vehicles (PHVs);
- Local bus;
- Coaches; and
- Minibuses.

1.1.6 Each chapter of this report follows a consistent structure where the key data used to understand the vehicle fleet is discussed, along with baseline volumetric information. The chapter then goes on to discuss the impacts of projecting vehicle volumes into the future.

1.1.7 The vehicle volumes quoted within this Technical Paper are based on the recently prepared updates to the modelling of the GM CAP, which are discussed in the *T4* and *AQ3* reports and associated appendices.

1.1.8 This document is part of a suite of documents that have been produced to describe the transport and air quality modelling deliverables for the study. The documents in the series include:

- Local Plan Transport Modelling Tracking Table (T1), which demonstrates that the transport modelling requirements for the study are being met;

- Local Plan Transport Model Validation Report (T2), which explains in detail how the road traffic model was validated against real-world data;
- Local Plan Transport Modelling Methodology Report (T3), this document details the development of the future year without scheme model (Do Minimum);
- Local Plan Transport Model Forecasting Report (T4), which presents baseline and scenario forecasts for GM CAP;
- Local Plan Air Quality Modelling Tracking Table (AQ1), which demonstrates that the air quality modelling requirements for the study are being met;
- Local Plan Air Quality Modelling Methodology Report (AQ2), which provides an overview of the air quality modelling process;
- Local Plan Air Quality Modelling Report (AQ3), which provides details of modelled NOx and NO2 concentrations for the base and forecast years, including comparisons with measured concentrations for the base year;
- Sensitivity Testing Report, which provides a summary of the sensitivity tests carried out on the core scenarios to test areas of uncertainty, understand whether the tests result in a positive or negative benefit and the scale of benefit; and
- Analytical Assurance Statement, consider the limitations, uncertainties and risks in the evidence base, and the implications of these for decision makers.

2 Greater Manchester Clean Air Plan Overview

2.1 Background to the Clean Air Plan

2.1.1 In 2017 the Secretary of State (SoS) for Environment, Food and Rural Affairs issued directions under the Environment Act 1995 requiring many local authorities, to produce feasibility studies to identify the option which will deliver compliance with the requirement to meet legal limits for nitrogen dioxide (NO_2) in the shortest possible time. The legal limit being defined as the long-term annual mean legal limit of 40 µg/m^3.

2.1.2 In Greater Manchester (GM), the ten local authorities, the Greater Manchester Combined Authority (GMCA) and Transport for Greater Manchester (TfGM) are working together to develop a Clean Air Plan to tackle NO_2 exceedances at the roadside, herein known as Greater Manchester Clean Air Plan (GM CAP).

2.1.3 The development of the GM CAP is funded by government and is overseen by the Joint Air Quality Unit (JAQU), the joint Department for Environment, Food and Rural Affairs (DEFRA) and Department for Transport (DfT) unit established to deliver national plans to improve air quality and meet legal limits. The costs related to the business case, implementation and operation of the GM CAP are either directly funded or underwritten by government acting through JAQU and any net deficit over the life of the GM CAP will be covered by the New Burdens Doctrine, subject to a reasonableness test[1].

2.1.4 In March 2019, the ten GM Local Authorities collectively submitted an Outline Business Case (OBC)[2] for the GM CAP to JAQU outlining a package of measures to deliver regional compliance with legal limits for NO_2 emissions in the shortest possible time.

2.1.5 In July 2019, the Environment Act 1995 (Greater Manchester) Air Quality Direction 2019 was made, which required all ten of the GM local authorities to implement a charging Clean Air Zone Class C[3] with additional measures. There was also an obligation to provide further scenarios appraisal information to demonstrate the applicable Class of Charging CAZ and other matters to provide assurance that the local plan would deliver compliance in the shortest possible time and by 2024 at the latest.

[1] The new burdens doctrine is part of a suite of measures to ensure Council Tax payers do not face excessive increases. New burdens doctrine: guidance for government departments - GOV.UK (www.gov.uk)
[2] https://cleanairgm.com/technical-documents/#outline-business-case
[3] https://www.gov.uk/government/publications/air-quality-clean-air-zone-framework-for-england/annex-a-clean-air-zone-minimum-classes-and-standards

2.1.6 In March 2020, the Environment Act 1995 (Greater Manchester) Air Quality Direction 2020 was made, which required the submission of an Interim FBC (along with confirmation that all public consultation activity has completed) as soon as possible and by no later than 30 October 2020. The 2020 direction confirmed that legal duty remains to ensure the GM CAP (Charging Clean Air Zone Class C with additional measures) is implemented so that NO_2 compliance is achieved in the shortest possible time and by 2024 at the latest and that human exposure is reduced as quickly as possible. The Ministerial letter accompanying the March 2020 direction confirmed that the minister was satisfied that the main evidence queries from the July 2019 direction had been addressed.

2.1.7 A statutory consultation on the proposals took place in Autumn 2020.

2.1.8 The GMCA - Clean Air Final Plan report[4] on 25th June 2021[5] endorsed GM's Final CAP and policy in compliance with this direction, following a review of all of the information gathered through the GM CAP consultation and wider data, evidence and modelling work. Throughout the development of the previous Plan, the JAQU reviewed and approved all technical and delivery submissions. Within this document, this is referred to as the Previous GM CAP.

2.2 The Previous GM CAP and the impacts of Covid-19

2.2.1 Under the Previous GM CAP, GM was awarded £123 million by government for funds aimed at encouraging vehicle upgrades to secure compliance and mitigating the impacts of the GM-wide CAZ. The funds included £15.4 million for bus retrofit, £3.2 million for bus replacement, £10.2 million for Private Hire Vehicles (PHVs), £10.1 million for Hackney Carriages, £7.6 million for Heavy Goods Vehicles (HGVs), £4.4 million for coaches, £2.0 million for minibuses and £70.0 million for Light Goods Vehicles (LGVs).

2.2.2 The June 2021 Clean Air Final Plan report set out that the Air Quality Administration Committee (AQAC) had the authority to establish and distribute the funds set out in the agreed GM Clean Air Plan policy. On 21 September 2021 the AQAC approved the establishment and distribution of the agreed bus replacement funds.

2.2.3 On 13 October 2021 the AQAC agreed the distribution of Clean Air funds set out in the agreed GM Clean Air Plan policy as follows:

- From 30 November 2021 applications for funding would open for HGVs.
- From the end of January 2022 applications for funding would open for PHVs, Hackney Carriages, coaches, minibuses and LGVs.

[4] https://democracy.greatermanchester-ca.gov.uk/documents/s15281/GMCA%20210621%20Report%20Clean%20Air%20Plan%20-%20FINAL%20FINAL.pdf

[5] Also considered by the GM authorities through their own constitutional decision-making arrangements.

2.2.4 On 20th January 2022, the AQAC considered the findings of an initial review of conditions within the supply chain of LGVs in particular following Covid-19 related impacts, which were impacting the availability of compliant vehicles and supply-side constraints resulting in price increases, particularly in the second-hand market[6]. The AQAC agreed that a request should be made to the SoS to pause the opening of the next phase of Clean Air Funds. This was to allow an urgent and fundamental joint policy review with government, to identify how a revised policy could be agreed to deal with the supply issues and local businesses' ability to comply with the GM CAP.

2.2.5 On 8th February 2022, the AQAC noted the submission of a report "Issues Leading to Delayed Compliance Based on the Approved GM CAP Assumptions". The report concluded that on balance, the latest emerging evidence suggested that with the approved plan in place, it was no longer likely that compliance would be achieved in 2024. Members also requested that arrangements were put in place for those vehicles owners who had already placed orders pending funding opening at the end of January to ensure they are not detrimentally impacted by the decision to pause the opening of the funds. Government subsequently issued The Environment Act 1995 (Greater Manchester) Air Quality Direction 2022[7] which confirmed that the March 2020 Direction had been revoked and required that by 1st July 2022 the GM authorities should:

- Review the measures specified in the local plan for NO_2 compliance and associated mitigation measures; and
- Determine whether to propose any changes to the detailed design of those measures, or any additional measures.

2.2.6 This Direction ('the Direction') also stated that the local plan for NO_2 compliance, with any proposed changes, must ensure the achievement of NO_2 compliance in the shortest possible time and by 2026 at the latest. It should also ensure that human exposure to concentrations of NO_2 above the legal limit is reduced as quickly as possible.

2.3 The Case for a new GM CAP

2.3.1 On 1st July 2022, the AQAC noted that the 'Case for a new Greater Manchester Clean Air Plan[8] document and associated appendices would be submitted to the SoS as a draft document subject to any comments of GM Authorities.

2.3.2 On 17th August 2022, the AQAC agreed to submit the 'Case for a new Greater Manchester Clean Air Plan' to the SoS as a final version and approved the Case for a New Plan - Air Quality Modelling Report for submission to JAQU.

[6] https://democracy.greatermanchester-ca.gov.uk/documents/s18685/ARUP%20Technical%20Note.pdf
[7] The Environment Act 1995 (Greater Manchester) Air Quality Direction 2022 (publishing.service.gov.uk)
[8] https://assets.ctfassets.net/tlpgbvy1k6h2/7jtkDc5AODypDQIw0cYwsl/67091a85f26e7c503a19ec7aeb2e8137/Appendix_1_-_Case_for_a_new_Greater_Manchester_Clean_Air_Plan.pdf

2.3.3 The 'Case for a new Greater Manchester Clean Air Plan' set out that challenging economic conditions, rising vehicle prices and ongoing pandemic impacts meant that the original plan of a GM-wide charging CAZ was no longer the right solution to achieve compliance, instead proposing an investment-led, non-charging GM CAP.

2.3.4 The primary focus of the 'Case for a new Greater Manchester Clean Air Plan' was to identify a plan to achieve compliance with the legal limit value for NO_2 in a way that considered the cost-of-living crisis and associated economic challenges faced by businesses and residents. This would be achieved through an investment-led approach combined with wider measures that the GM Authorities are implementing and aimed to reduce NO_2 emissions to within legal limits, in the shortest possible time and at the latest by 2026.

2.3.5 The 'Case for a new Greater Manchester Clean Air Plan' proposed using the remaining funding that the government has awarded to GM for the Previous GM CAP to deliver an investment-led approach to invest in vehicle upgrades, rather than imposing daily charges, and deliver new Zero Emission Buses (ZEBs) as part of the Bee Network[9] (a London-style integrated transport network for GM). The new plan would ensure that the reduction of harmful emissions would be at the centre of GM's wider objectives. Within this document, this plan is referred to as the 'Investment-led Plan'.

2.3.6 The GM Authorities committed to a participatory approach to the development of the new plan to ensure that the GM Authorities' proposals would be well-grounded in evidence in terms of the circumstances of affected groups and possible impacts of the new plan on them, and therefore the deliverability and effectiveness of that plan.

2.3.7 Between August and November 2022, the GM Authorities carried out engagement and research with key stakeholders - vehicle-owning groups and representatives of other impacted individuals, such as community, business, environment and equality-based groups. This activity included targeted engagement sessions with all groups, and an online survey and supporting qualitative research activity with vehicle-owning groups.

2.3.8 Input from those engaged informed the ongoing policy development process as the GM Authorities developed the package of measures forming the Investment-led Plan.

[9] The Bee Network is Greater Manchester integrated transport system joining together bus, Metrolink, rail and active travel https://tfgm.com/corporate/business-plan/case-studies/bee-network

2.4 The Investment-led Plan and the impact of bus retrofit issues

2.4.1 Having submitted the 'Case for a new Greater Manchester Clean Air Plan'[10] in July 2022, the GM Authorities were asked by government in January[11] 2023 to:

- *Provide modelling results for a benchmark CAZ to address the persistent exceedances identified in central Manchester and Salford, in order for these to be compared against your proposals.*
- *Identify a suitable approach to address persistent exceedances identified in your data on the A58 Bolton Road in Bury in 2025, and to propose a suitable benchmark.*
- *Set out how the measures you have proposed will be modelled and evidenced overall, and to ensure that they are modelled without any unnecessary delay.*

2.4.2 The GM Authorities undertook the work required to supply this further evidence and on 8th March 2023 submitted the report 'Approach to Address Persistent Exceedances Identified on the A58 Bolton Road, Bury'[12]. GM Authorities also worked to address the remaining two requests from government by June 2023 on the basis of providing further information to support its Investment-led Plan and testing the proposal against a suitable benchmark CAZ, herein referred to as the 'CAZ Benchmark'.

2.4.3 In April 2023, government advised TfGM that it was to pause any new spending on bus retrofit as it had evidence that retrofitted buses have poor and highly variable performance in real-world conditions[13]. This new evidence followed a JAQU-funded study to quantify nitrogen oxide (NO_X) and NO_2 emissions from buses under real-world driving conditions in three cities across the UK, including Manchester (monitoring took place in Manchester City Centre between 21st November and 12th December 2022). The monitoring indicated that retrofitted buses were not reducing emissions as expected, with significant variation in performance between bus models with retrofit technologies. Furthermore, emissions of primary-NO_2 (as opposed to NO_X) were highly variable, potentially worsening roadside NO_2 concentrations despite an overall reduction in NO_X emissions.

2.4.4 Government therefore commenced a six-month focused research programme to quickly investigate the causes of this poor performance and scope how it could be improved, which was anticipated to be reported in Autumn 2023.

[10] https://assets.ctfassets.net/tlpgbvy1k6h2/7jtkDc5AODypDQIw0cYwsl/67091a85f26e7c503a19ec7aeb2e8137/Appendix_1_-_Case_for_a_new_Greater_Manchester_Clean_Air_Plan.pdf

[11] https://democracy.greatermanchester-ca.gov.uk/documents/s24937/Appendix%201.%20Ministerial%20Letter%20to%20GM%20with%20attachment.pdf

[12] https://democracy.greatermanchester-ca.gov.uk/documents/s24939/Appendix%203.%20GM%20CAP%20A58%20Bury%20Measure%20Report%20DRAFT%20for%20AQAC%20Approval%20Feb%2023.pdf

[13] https://democracy.greatermanchester-ca.gov.uk/documents/s27699/Appendix%201.%20Letter%20from%20DfT%20to%20Greater%20Manchester%20regarding%20Bus%20Retrofit%20Update.pdf

2.4.5 In the light of government's new evidence, JAQU issued revised general guidance[14] to authorities producing CAPs nationwide. In summary, this required that air quality modelling should no longer assume any air quality benefits from a retrofitted bus.

2.4.6 GM incorporated the revised guidance, as agreed with JAQU, into the modelling which underpins the development of its CAP to produce a report that appraises the ability of the Investment-led Plan and the CAZ Benchmark to deliver compliance with the legal limit value in the shortest possible time and by no later than 2026. The key findings from government's six-month focused research programme were not available at the time this work was undertaken.

2.4.7 The first version of the *Appraisal Report* and supporting documentation was submitted to government in December 2023. The *Appraisal Report* concluded that GM's Investment-led Plan can deliver compliance in 2025 and performs better than a CAZ Benchmark.

2.5 Key developments since December 2023 submission

2.5.1 Since the submission of evidence to JAQU in December 2023 there have been a number of key developments, resulting in a need to update the modelling, the *Appraisal Report* and supporting documentation.

2.5.2 Further modelling was undertaken in Summer 2024 to consider and address the following key developments:

- Delay to Stockport all-electric bus depot;
- Changes to bus fleets (operational and planned); and
- Correction to Euro V retrofit bus modelling emission values.

2.5.3 Drafts of the *Appraisal Report* and supporting documentation were updated to take account of the key developments and the Summer 2024 modelling, in preparation for submission to government. These updates did not change GM's conclusion that the Investment-led, non-charging plan can deliver compliance in 2025 and performs better than a CAZ Benchmark.

2.6 Developments following Summer 2024 modelling

2.6.1 Following the substantial drafting to update the *Appraisal Report* and supporting material (to address the key developments since the December 2023 submission), two additional issues have arisen.

[14] Bus Retrofit Update - Technical Guidance for Local Authorities, JAQU Guidance, May 2023

2.6.2 Firstly, a risk identified in the December 2023 submission “Delays to bus depot electrification” has materialised and there is now a delivery delay to the electrification of Queens Road depot. This was due to take place by January 2025, which was the assumed delivery date in the modelling of the Investment-led Plan.

2.6.3 This poses a significant challenge to achieving compliance in 2025, as 73 ZEBs are to be operated out of Queens Road depot. The issue affects 12 bus services, which run through 17 forecast ‘Do Minimum’ exceedance sites in 2025.

2.6.4 Secondly, in July 2024 National Highways also advised TfGM that the temporary speed limit on the M602 is to be removed, and the 70mph speed limit reinstated. The M602 temporary speed limit is assumed to be in place in the Investment-led Plan modelling assumptions.

2.6.5 The implications of these two issues are addressed in the *Supplementary Appraisal Report*, included as part of this evidence submission documentation. Therefore, the *Appraisal Report* and associated documentation, including this report, should be read in conjunction with the *Supplementary Appraisal Report*.

2.6.6 In addition, since the drafting of the *Appraisal Report* and supporting material, government published the ‘Bus Retrofit Performance Report’[15] on the 12th September 2024. The key findings of this report include that the retrofit technology fitted onto retrofitted buses is not reducing NO_X emissions to the levels expected and retrofit performance is highly variable. These findings are consistent with the guidance issued in May 2023. Therefore, the publication of the study findings has no impact on the Investment-led Plan, the *Appraisal Report* and supporting material.

[15] https://assets.publishing.service.gov.uk/media/66e1ab11951c1776394a003c/bus-retrofit-performance-24.pdf

3 HGVs

3.1 Vehicle Type Overview

3.1.1 This section discusses the vehicle volumetric information associated with HGVs which has been utilised by the GM CAP project.

3.1.2 HGVs are defined as any goods vehicle with a Maximum Gross Weight (MGW) of over 3.5 tonnes. Rigid HGVs can be divided into vehicles with 32 tonne, 26 tonne, 18 tonne and 7.5 tonne MGW. Due to the operation of HGVs as a primarily long-distance vehicle, this vehicle type has the potential to be impacted by multiple CAZs in an operational day.

3.2 Base Year Vehicle Populations

3.2.1 HGV base-year vehicle numbers have been developed using two main datasets: firstly, the Automatic Number Plate Recognition (ANPR) survey, undertaken across a week in January 2019, covering a total of 42 locations and all GM districts and secondly Vehicle Licensing Statistics data, available from the Department for Transport (DfT). The ANPR survey was designed to provide a representative age profile of the vehicle fleet operating in GM in terms of:

- Vehicle type (including fuel use); and
- Age profile.

3.2.2 Registration plates from the ANPR survey were submitted to the Driver and Vehicle Licensing Agency (DVLA) who processed the data set to append anonymised information concerning each vehicle. The DVLA dataset parameters provide further detail on vehicle type and size. Data gathered was extracted, anonymised, and assessed. Analysis was conducted to summarise the data by vehicle type, registered location, fuel type and compliance. This was aligned to the overall scale of freight operations operating within GM, which is discussed within Technical Note 3: Analysis of Freight Market[16].

3.2.3 The data generated the number of GM and non-GM registered vehicles, separated by high and low frequency in the vicinity of the Regional Centre. The splits between GM and Non-GM are required to understand the proportion of the overall fleet serving GM that is eligible for funding (i.e. only those based in GM). Trip frequency is important in the context of responding to the CAP, in particular in the context of a CAZ Benchmark.

3.2.4 **Table 3-1** presents the number of HGVs serving GM in January 2019 split by compliant and non-compliant vehicles.

[16] https://assets.ctfassets.net/tlpgbvy1k6h2/sxMVbAwfJrcq3tFd9Thb7/fd8843b6d128ef318da320ee22ca6ac5/3_-_GM_CAP_Analysis_of_the_freight_market.pdf

Table 3-1: January 2019 HGV Volumes

Modelled Response	GM Based	Non-GM Based	Total
Compliant	12,212	29,852	**42,064**
Non-Compliant	13,525	15,203	**28,728**
Total	**25,737**	**45,055**	**70,792**

3.3 Future Year Vehicle Populations without GM CAP

3.3.1 Projection of the estimated HGV numbers, as set out in **Table 3-1**, was undertaken to forecast the natural change in compliant vehicles into the future, without any interventions applied (Do Minimum – No GM CAP). This was undertaken to understand the market's proportion of natural upgrades. It should be noted that the modelling assumes no growth in overall vehicle volumes over time, given the relatively short timescales associated with the opening of GM CAP. Natural upgrades have been incorporated into the key forecast years (2025 and 2026) through retention of a constant age profile with the number of non-compliant vehicles reducing over time. These are summarised in **Table 3-2**.

3.3.2 Given the survey of the base data was taken in January 2019, the modelled projections also refer to the month of January.

3.3.3 No alteration has been made to the normal upgrade cycle for this vehicle type.

Table 3-2: HGV Projection without GM CAP (Natural turnover)

Year	Modelled Response	GM Based	Non-GM Based	Total
2025	Compliant	21,075	42,016	**63,091**
	Non-Compliant	4,662	3,039	**7,701**
	Total	**25,737**	**45,055**	**70,792**
2026	Compliant	22,053	42,830	**64,883**
	Non-Compliant	3,684	2,225	**5,909**
	Total	**25,737**	**45,055**	**70,792**

3.4 GM CAP – Investment-led Plan

<u>Vehicles Populations Impacted by GM CAP</u>

3.4.1 The mode is not impacted by the Investment-led Plan.

Funding Allocation

3.4.2 The mode is not impacted by the Investment-led Plan, so there is no specific funding allocation.

3.5 GM CAP - CAZ Benchmark

Behavioural Responses for CAZ Benchmark (2025 & 2026)

3.5.1 The introduction of a CAZ Benchmark would have an impact on the volume of compliant HGVs operating within GM, in particular within the Regional Centre, as they respond to the potential CAZ charge. HGVs operating within the zone that do not meet Euro VI emissions standards are considered non-compliant, and therefore would be subject to a daily charge of £60. To assess the likely behavioural responses associated with the introduction of the CAZ and associated funds, a Cost Response Model for commercial vehicles has been developed.

3.5.2 The input data from the DVLA and ANPR survey, as well as population data, were segmented to understand different impacts of the CAZ Benchmark on groups based upon vehicle registration location, frequency of travel in the CAZ, vehicle type, business sector and vehicle age. The behavioural responses generated for the CAZ Benchmark for HGVs are as follows:

- Pay Charge;
- Change mode (downsize to LGV);
- Cancel Trip; and
- Upgrade Vehicle.

3.5.3 As shown in **Table 3-3**, the number of compliant HGVs serving GM is forecast to increase as a result of the implementation of the CAZ and associated mitigation funding for HGVs.

Table 3-3: CAZ+Funds Behavioural Responses

Modelled Response	2025	2026
Pay Charge	2.2%	1.2%
Change Mode (To LGV)	0%	0%
Cancel Trip	0%	0%
Upgrade Vehicle	97.8%	98.8%

Source: See TN49 CAZ Assumptions for background to behavioural responses.

Vehicle populations Impacted by GM CAP

3.5.4 The application of the CAZ Benchmark (including funds) results in a small overall increase in the number of compliant HGVs based in GM, as shown in **Table 3-4**. Despite the high overall behavioural response, the upgrade response is small due to the high compliance levels within the existing fleet.

Table 3-4: HGV CAZ+Funds Vehicle Volumes

Year	Modelled Response	GM Based	Non-GM Based	Total
2025	Compliant	21,257	42,135	**63,392**
	Non-Compliant	4,480	2,920	**7,400**
	Total	**25,737**	**45,055**	**70,792**
2026	Compliant	22,199	42,918	**65,117**
	Non-Compliant	3,538	2,137	**5,675**
	Total	**25,737**	**45,055**	**70,792**

CAZ Annual Chargeable Trips

3.5.5 For the remaining non-compliant HGVs who choose to stay and pay the charge, an overall annual number of chargeable trips has been derived as shown in **Table 3-5**, which varies based on an assumed 2025, or 2026 opening of the CAZ Benchmark. The lower values in 2026 reflect the ongoing natural turnover of the fleet which will also improve the background compliance of the HGV fleet operating within GM.

Table 3-5: HGV Annual Chargeable Trips

Year	Annual chargeable trips (2025 opening)	Annual chargeable trips (2026 opening)
2025	1,559	
2026	1,502	652
2027	1,502	652
2028	1,441	626
2029	1,400	608
2030	1,347	585

Funding Allocation

3.5.6 The grant levels, assumed for the CAZ Benchmark, are presented in **Table 3-6**. The grants are provided for vehicle replacement only, because retrofit is not an option. Details relating to the derivation of the current proposed grants for each vehicle type are discussed within the *Appraisal Report*.

Table 3-6: Proposed per vehicle grant offer for HGVs

Vehicle Type		Grant Available
Articulated	44t	£8,160
Rigid	32t	£15,070
	26t	£11,300
	18t	£8,790
	Up to 7.5t	£6,280
ZEC	New	£15,070
	Second-hand	£15,070

3.5.7 **Table 3-7** provides details of the number of HGVs that might be eligible to apply for funding.

Table 3-7: Number of Non-Compliant GM Based HGVs eligible for funding

Vehicle Volumes	Eligible Vehicles 2025	Eligible Vehicles 2026
Non-Compliant GM Based	4,662	3,684
Vehicles Eligible for Financial Assistance / Expected to respond to CAP	2,564	2,026

3.5.8 Funding was allocated based on the grants available for upgrade options.

3.5.9 **Table 3-8** provides a summary of the number of HGVs that can be served by the funding for vehicle upgrade, which varies based on scheme opening.

Table 3-8: Allocation of HGVs Accessing the Funds

Type	Vehicle Served	Funding Amount
2025 Opening	100	£1,088,968
2026 Opening	80	£869,322

3.5.10 As HGV funding will be available to all GM based HGVs which meet the funding criteria, it is also expected that those vehicle owners with GM based HGVs due for replacement, would also access the fund. These are shown in **Table 3-9**.

Table 3-9: Allocation of HGVs naturally turning over Accessing the Funds

Type	Vehicle Served	Funding Amount
2025 Opening	556	£6,039,624
2026 Opening	1,094	£11,879,222

3.5.11 The combined funding totals for HGV are summed in **Table 3-10**.

Table 3-10: Combined HGV Fund

Type	Vehicle Served	Funding Amount
2025 Opening	656	£7,128,592
2026 Opening	1174	£12,748,544

4 LGVs

4.1 Vehicle Type Overview

4.1.1 This section discusses the vehicle volumetric information associated with LGVs which has been utilised by the GM CAP project.

4.1.2 LGVs are goods vehicles with an MGW of 3.5 tonnes or less and are commonly known as vans. LGVs serve a wide variety of business sectors, including construction, removals, food, communications pick-up, parcel home delivery and supermarket home delivery. Detailed research on LGVs has been carried out as part of the Cost Response Model report.

4.2 Base Year Vehicle Populations

4.2.1 LGV vehicle numbers have been developed using two main datasets: firstly, the Automatic Number Plate Recognition (ANPR) survey, undertaken across a week in January 2019, covering a total of 42 locations and all GM Authorities and secondly Vehicle Licensing Statistics data, available from the Department for Transport (DfT). The ANPR survey was designed to provide a representative profile of the vehicle fleet operating in GM in terms of:

- Vehicle type (including fuel use); and
- Age profile.

4.2.2 Registration plates collected were submitted to the Driver and Vehicle Licensing Agency (DVLA) who processed the data set to append anonymized information concerning each vehicle. The DVLA dataset parameters provide further detail on refinement in identifying vehicle type and size. Data gathered was extracted, anonymised and assessed. Analysis was conducted to summarise the data by vehicle type, registered location, fuel type and compliance. This was aligned to the overall scale of freight operations operating within GM, which is discussed within Technical Note 3: Analysis of Freight Market[17].

4.2.3 The data generated the number of GM and non-GM registered vehicles, separated by high and low frequency. The splits between GM and Non-GM are required to understand the proportion of the overall fleet serving GM that is eligible for funding (i.e. only those based in GM). Trip frequency, in particular for access to the Regional Centre, is important in the context of responding to the CAP, in particular in the context of a CAZ Benchmark.

4.2.4 **Table 4-1** presents the number of LGVs serving GM in January 2019 split by compliant and non-compliant vehicles.

[17] https://assets.ctfassets.net/tlpgbvy1k6h2/sxMVbAwfJrcq3tFd9Thb7/fd8843b6d128ef318da320ee22ca6ac5/3_-_GM_CAP_Analysis_of_the_freight_market.pdf

Table 4-1: January 2019 LGV Volumes

Modelled Response	GM Based	Non-GM Based	Total
Compliant	27,290	74,147	**101,437**
Non-Compliant	108,456	67,535	**175,991**
Total	**135,746**	**141,682**	**277,428**

4.3 Future Year Vehicle Populations without GM

4.3.1 Projection of the existing LGV numbers was undertaken to forecast the natural change in compliant vehicles into the future, without any interventions applied (Do Minimum – No GM CAP). This was undertaken to understand the market's proportion of natural upgrades. It should be noted that the modelling assumes no growth in overall vehicle volumes over time, given the relatively short timescales associated with the opening of GM CAP. Natural upgrades have been incorporated into the modelling years (2025 and 2026) through retention of a constant age profile with the number of non-compliant vehicles reducing over time. These are summarised in **Table 4-2**.

4.3.2 Given the survey of the base data was taken in January 2019, the modelled projections also refer to the month of January.

4.3.3 Certain vehicle types, including LGVs, have been impacted by economic conditions following Covid-19 with a noticeable delay in the normal cycle of purchasing new and second-hand vehicles. A one-month delayed fleet upgrade has been applied to the natural turnover of LGVs.

Table 4-2: LGV Projection without GM CAP (Natural turnover)

Year	Modelled Response	GM Based	Non-GM Based	Total
2025	Compliant	85,995	123,376	**209,370**
	Non-Compliant	49,751	18,306	**68,058**
	Total	**135,746**	**141,682**	**277,428**
2026	Compliant	91,927	126,126	**218,053**
	Non-Compliant	43,819	15,556	**59,375**
	Total	**135,746**	**141,682**	**277,428**

4.4 GM CAP – Investment-led Plan

<u>Vehicles Populations Impacted by GM CAP</u>

4.4.1 The mode is not impacted by the Investment-led Plan.

Funding Allocation

4.4.2 The mode is not impacted by the Investment-led Plan, so there is no specific funding allocation.

4.5 GM CAP - CAZ Benchmark

Behavioural Responses for CAZ Benchmark (2025 & 2026)

4.5.1 The introduction of the CAZ Benchmark will have a notable impact on the volume of compliant LGVs operating within GM as they respond to the potential CAZ charge. LGVs operating within the zone that do not meet emissions standards are considered non-compliant, therefore, to be charged £10 per day. To assess the likely behavioural responses associated with the introduction of the CAZ and associated funds, a Cost Response Model for commercial vehicles has been developed.

4.5.2 The input data from the DVLA and ANPR survey, as well as population data, were segmented to understand different impacts of the GM CAZ on groups based upon vehicle registration location, frequency of travel in the CAZ, vehicle type, business sector and vehicle age.

4.5.3 The behavioural responses generated for the CAZ Benchmark for LGVs are as follows:

- Pay Charge;
- Change mode;
- Cancel Trip; and
- Upgrade Vehicle.

4.5.4 **Table 4-3** presents the forecast behavioural responses for non-compliant LGVs accessing the CAZ, based on values derived from the Cost response model.

Table 4-3: CAZ+Funds Behavioural Responses

Modelled Response	2025	2026
Pay Charge	20.9%	21%
Change Mode	3.2%	2.5%
Cancel Trip	0%	0%
Upgrade Vehicle	75.9%	76.5%

Source: See TN49 CAZ Assumptions for background to behavioural responses

Vehicles Populations Impacted by CAZ Benchmark

4.5.5 The application of the CAZ with Funds scenario results in an increase in the number of GM Based compliant LGVs, as shown in **Table 4-4**.

Table 4-4: LGV CAZ+Funds Vehicle Volumes

Year	Modelled Response	GM Based	Non-GM Based	Total
2025	Compliant	89,016	124,488	**213,503**
	Non-Compliant	46,603	17,148	**63,750**
	Total	**135,619**	**141,635**	**277,254**
2026	Compliant	94,609	127,078	**221,687**
	Non-Compliant	41,050	14,573	**55,623**
	Total	**135,658**	**141,651**	**277,309**

CAZ Annual Chargeable Trips

4.5.6 For the remaining non-compliant LGVs who choose to stay and pay the charge, an overall annual number of chargeable trips has been derived as shown in **Table 4-5**, which varies based on an assumed 2025 or 2026 opening of the CAZ Benchmark. The lower values in 2026 reflect the ongoing natural turnover of the fleet which will also improve the background compliance of the LGV fleet operating within GM.

Table 4-5: LGV Annual Chargeable Trips

Year	Annual chargeable trips (2025 opening)	Annual chargeable trips (2026 opening)
2025	261,724	
2026	250,717	229,425
2027	235,326	215,341
2028	221,267	202,476
2029	209,131	191,370
2030	200,555	183,523

Funding Allocation

4.5.7 The grant levels, for LGV, are presented in **Table 4-6**. The grants are provided for vehicle replacement only, while retrofit is not an option. Details relating to the derivation of the current proposed grants for each vehicle type are discussed within the *Appraisal Report*.

Table 4-6: Proposed per vehicle grant offer for LGVs

Vehicle Type	Grant Available
Under 1.6t	£4,400
Over 1.6t and up to 3.5t	£5,650
New ZEC	£5,650
Second-hand ZEC	£5,650

4.5.8 **Table 4-7** provides details of the number of LGVs eligible to apply for funding.

Table 4-7: Number of Non-Compliant GM Based LGVs eligible for funding

Vehicle Volumes	2025	2026
Non-Compliant GM Licensed	49,751	43,819
Vehicles Eligible for Financial Assistance / Expected to respond to CAP	36,318	31,988

4.5.9 Funding was allocated based on the grants available for upgrade options.

4.5.10 **Table 4-8** provides a summary of the number of LGVs that can be served by the funding for vehicle upgrade, which varies based on scheme opening.

Table 4-8: Allocation of LGVs Accessing the Funds

Type	Vehicle Served	Funding Amount
2025 Opening	2,205	£11,840,917
2026 Opening	1,958	£10,511,523

4.5.11 As LGV funding will be available to all GM-based LGVs which meet the funding criteria, it is also expected that those vehicle owners with GM-based LGVs due for replacement, would also access the fund. These are shown in **Table 4-9**.

Table 4-9: Allocation of GM-Based LGVs naturally upgrading and accessing the Funds

Type	Vehicle Served	Funding Amount
2025 Opening	6,407	£34,401,163
2026 Opening	10,737	£57,652,767

4.5.12 The combined funding totals for LGV are summed in **Table 4-10**.

Table 4-10: Combined LGV Fund

Type	Vehicle Served	Funding Amount
2025 Opening	8,612	46,242,080
2026 Opening	12,695	68,164,290

5 Hackney Carriages

5.1 Vehicle Type Overview

5.1.1 This section discusses the vehicle volumetric information associated with hackney carriages which has been utilised by the GM CAP project.

5.1.2 Hackney carriages, alongside PHVs, offer a flexible form of door-to-door public transportation. Hackney carriages can be distinguished from PHVs in their licensing and operating regime. Hackney carriages can be hailed by passengers in the street, pick up fares from taxi ranks and pre-bookings from within their licensing authority or an origin outside their area. Local authorities can regulate hackney carriage fare tariffs and supply through issue of licenses. Detailed research on hackney carriages has been carried out as part of the Cost Response Model report.

5.2 Base Year Vehicle Populations

5.2.1 For hackney carriages, the data sources which have been used to understand vehicle operations within GM are:

- the 2023 GM taxi license database; and
- DVLA/DfT/JAQU data on licensed vehicles at the end of the quarter by body type, fuel type, year of first registration, estimated Euro Standard, taxi license type, taxi license area, GM, 2023 Q2

5.2.2 **Table 5-1** presents the number of hackney carriages serving GM in 2023, split by compliant and non-compliant vehicles, for those licensed to GM and those not licensed to a GM Authority, though operating within GM (due to licensing requirements for hackney carriages, these are assumed to be visiting hackney carriages from neighbouring authorities, dropping of, rather than picking up passengers).

Table 5-1: 2023 Hackney Carriage Volumes

Modelled Response	GM Licensed	Non-GM Licensed	Total
Compliant	709	131	**827**
Non-Compliant	1,181	88	**1,282**
Total	**1,890**	**219**	**2,109**

5.3 Future Year Vehicle Populations without GM

5.3.1 A projection of existing hackney carriage numbers was undertaken to forecast the natural change in compliant vehicles into the future based on a scenario without any interventions applied (Do Minimum – No GM CAP) to understand the market's proportion of natural upgrades. It should be noted that the modelling assumes no growth in overall vehicle volumes over time, given the relatively short timescales associated with the opening of GM CAP. Natural upgrades have been incorporated into the modelling years (2025 and 2026) through retention of a constant age profile with the number of non-compliant vehicles reducing over time. These are summarised in **Table 5-2**.

Table 5-2: Hackney Carriage Projection without GM CAP (Natural turnover)

Year	Modelled Response	GM Licensed	Non-GM Licensed	Total
2025	Compliant	993	169	1,162
	Non-Compliant	897	50	947
	Total	**1,890**	**219**	**2,109**
2026	Compliant	1,173	187	1,360
	Non-Compliant	717	32	749
	Total	**1,890**	**219**	**2,109**

5.3.2 It should be noted that the non-GM licensed hackney carriages are not explicitly included within the GM CAP modelling. It is also important to note that these hackney carriages, considered as visitors to GM, are also not eligible for funds and can't operate a hackney carriage within GM.

5.4 GM CAP – Investment-led Plan

Vehicles Populations Impacted by GM CAP

5.4.1 The introduction of the GM CAP will have a notable impact on the volume of compliant hackney carriages operating within GM.

5.4.2 The application of the Investment-led Plan scenario will lead to a significant increase in the number of compliant hackney carriages. Given that in this scenario taxis will not be able to operate if unlicensed, it has been assumed that by the end of 2025, all hackney carriages will be compliant. The investment led vehicle volumes are shown in **Table 5-3**. It is noted that the values below are derived from the 2023 GM licensed vehicle fleets, excluding the impacts of natural turnover of the fleet.

Table 5-3: Hackney Carriage Investment-led Plan Vehicle Volumes

Year	Modelled Response	GM Licensed	Non-GM Licensed	Total
2025	Compliant	709	169	878
	Non-Compliant	1,181	50	1,231
	Total	**1,890**	**219**	**2,109**
2026	Compliant	1,890	187	2,077
	Non-Compliant	0	32	32
	Total	**1,890**	**219**	**2,109**

Funding Allocation

5.4.3 The grant levels for GM CAP are presented in **Table 5-4**. The grants are provided for vehicle replacement only, while retrofit is not an option.

Table 5-4: Proposed per vehicle grant offer for hackney carriages

Funding	Vehicle type
£6,280	Compliant WAV
Up to £12,560	New ZEC WAV (running costs)
£12,560	Second-hand ZEC WAV
£3,770	Compliant non-WAV
£6,280	Compliant EURO 6+
£7,530	New ZEC non-WAV (running costs)
£7,530	Second-hand ZEC non-WAV

5.4.4 **Table 5-5** provides details of the number of hackney carriages that are forecast to be eligible to apply for funding.

Table 5-5: Number of Non-Compliant GM Licensed hackney carriages eligible for funding

Vehicle Volumes	Eligible Vehicles	
	Core Fund	Electric Hackney Upgrade Fund
Non-Compliant GM Licensed	1,201	588

5.4.5 **Table 5-6** provides a summary of the number of vehicles that can be served by the funding for vehicle upgrade. Details relating to the derivation of the current proposed grants for each vehicle type are discussed within the *Appraisal Report*.

Table 5-6: Allocation of Hackney Carriages Accessing the Funds

Fund	Type	Vehicle Served	Funding Amount
Update from Non-compliant	WAV	ICE	£3,994,080
		Electric	£6,280,000
	Non-WAV	ICE	£105,560
		Electric	£128,010
	Total		**£10,507,650**
Electric hackney upgrade from compliant ICE	WAV	ICE	N/A
		Electric	£6,468,400
	Non-WAV	ICE	N/A
		Electric	£1,460,820
	Total		**£7,929,220**

5.5 GM CAP - CAZ Benchmark

Behavioural Responses for CAZ Benchmark (2025 & 2026)

5.5.1 The introduction of the CAZ Benchmark will have a notable impact on the volume of compliant hackney carriages operating within GM as they respond to the potential £7.50 CAZ charge per day. To assess the likely behavioural responses associated with the introduction of the CAZ and associated funds, a Cost Response Model for commercial vehicles has been developed.

5.5.2 The input data from the DVLA and ANPR survey, as well as population data (including taxi licensing data), were segmented to understand different impacts of the GM CAZ on groups based upon vehicle registration location, frequency of travel in the CAZ, vehicle type, business sector and vehicle age.

5.5.3 The behavioural responses generated for the GM CAP for hackney carriages are as follows:

- Pay Charge;
- Change mode;
- Cancel Trip; and
- Upgrade Vehicle.

5.5.4 As shown in **Table 5-7**, the proportion of compliant hackney carriages operating within GM is expected to increase significantly, as a result of the implementation of the CAZ and associated mitigation funding for hackney carriages.

Table 5-7: CAZ+Funds Behavioural Responses

Modelled Response	2025	2026
Pay Charge	16.3%	17.4%
Change Mode	0%	0%
Cancel Trip	0%	0%
Upgrade Vehicle	83.7%	82.6%

Source: See TN49 CAZ Assumptions for background to behavioural responses

Vehicles Populations Impacted by GM CAP

5.5.5 The application of the CAZ with Funds scenario results will significantly increase the of compliant hackney carriages operating within GM as shown in **Table 5-8**.

Table 5-8: Hackney CAZ+Funds Vehicle Volumes

Year	Modelled Response	GM Licensed	Non-GM Licensed	Total
2025	Compliant	1,455	195	1,649
	Non-Compliant	435	24	460
	Total	**1,890**	**219**	**2,109**
2026	Compliant	1,537	203	1,740
	Non-Compliant	353	16	369
	Total	**1,890**	**219**	**2,109**

CAZ Annual Chargeable Trips

5.5.6 For the remaining non-compliant hackney carriages who choose to stay and pay the charge, an overall annual number of chargeable trips has been derived as shown in **Table 5-9**, which varies based on an assumed 2025, or 2026 opening of the CAZ Benchmark.

Table 5-9: Hackney Carriage Annual Chargeable Trips

Year	Annual chargeable trips (2025 opening)	Annual chargeable trips (2026 opening)
2025	29,259	
2026	26,472	31,233
2027	23,713	27,978
2028	21,517	25,387
2029	19,707	23,251
2030	18,862	22,255

5.5.7 The grant levels, for GM CAP, are presented in **Table 5-10**. The grants are provided for vehicle replacement only, while retrofit is not an option.

Table 5-10: Proposed per vehicle grant offer for hackney carriages

Funding	Vehicle type
£6,280	Compliant WAV
Up to £12,560	New ZEC WAV (running costs)
£12,560	Second-hand ZEC WAV
£3,770	Compliant non-WAV
£6,280	Compliant EURO 6+
£7,530	New ZEC non-WAV (running costs)
£7,530	Second-hand ZEC non-WAV

5.5.8 **Table 5-11** provides details of the number of hackney carriages that are forecast to be eligible to apply for funding.

Table 5-11: Number of Non-Compliant GM Licensed Hackney Carriages eligible for funding

Vehicle Volumes	2025	2026
Non-Compliant GM Licensed	1,181	1,181
Vehicles Eligible for Financial Assistance / Expected to respond to CAP	1,181	1,181

5.5.9 **Table 5-12** provides a summary of the number of vehicles that can be served by the funding for vehicle upgrade.

Table 5-12: Allocation of Hackney Carriages Accessing the Funds

Type	Vehicle Served	Funding Amount
2025 Opening	619	£5,500,197
2026 Opening	617	£5,485,646

6 Private Hire Vehicles (PHVs)

6.1 Vehicle Type Overview

6.1.1 This section discusses the vehicle volumetric information associated with PHVs which has been utilised by the GM CAP project.

6.1.2 PHVs offer a flexible form of door-to-door public transport and can be distinguished from hackney carriages in their licensing and operating regime. PHVs traditionally must be booked through a licensed operator. Technological advancements in the PHV sector have seen the introduction of digital booking platforms that connects the driver and passenger with large companies, such as Uber, championing this platform and now operating worldwide. This change has seen strong growth in the PHV market over recent years.

6.2 Base Year Vehicle Populations

6.2.1 For PHVs, the sources of data which have been used to understand vehicle operations within GM are:

- the 2023 GM taxi licence database; and
    - DVLA/DfT/JAQU data on licensed vehicles at the end of the quarter by body type, fuel type, year of first registration, estimated Euro Standard, taxi license type, taxi license area, GM, 2023 Q2

6.2.2 **Table 6-1** presents the number of PHVs serving GM in 2023 split by compliant and non-compliant vehicles.

Table 6-1: 2023 PHV Volumes

Modelled Response	GM Licensed	Non-GM Licensed	Total
Compliant	9,512	4,929	**14,441**
Non-Compliant	2,343	2,052	**4,395**
Total	**11,855**	**6,981**	**18,836**

6.3 Future Year Vehicle Populations without GM

6.3.1 A projection of the existing PHV numbers was undertaken to forecast the natural change in compliant vehicles into the future based on a scenario without any interventions applied (Do Minimum – No GM CAP) as shown in **Table 6-2** to understand the market's proportion of natural upgrades. It should be noted that the modelling assumes no growth in overall vehicle volumes over time, given the relatively short timescales associated with the opening of GM CAP. It is noted that for the non-GM licensed PHV fleet, there has been an increase from 20% of the GM fleet in 2021 to 41% 2023, despite this increase in the overall fleet size, these vehicles are not explicitly captured within the modelling, and are also not eligible for GM CAP taxi funds.

6.3.2 Natural upgrades have been incorporated into the modelling years (2025 and 2026) through retention of a constant age profile with the number of non-compliant vehicles reducing over time. These are summarised in **Table 6-2**.

Table 6-2: PHV Projection without GM CAP (Natural turnover)

Year	Modelled Response	GM Licensed	Non-GM Licensed	Total
2025	Compliant	10,705	6,241	**16,946**
	Non-Compliant	1,150	740	**1,890**
	Total	**11,855**	**6,981**	**18,836**
2026	Compliant	11,065	6,914	**17,979**
	Non-Compliant	790	67	**857**
	Total	**11,855**	**6,981**	**18,836**

6.4 GM CAP – Investment-led Plan

<u>Vehicles Populations Impacted by GM CAP</u>

6.4.1 The introduction of the CAZ Benchmark will have a notable impact on the volume of compliant PHVs operating within Greater Manchester.

6.4.2 The application of the CAZ Benchmark scenario will lead to an increase in the number of compliant PHVs. Given that in this scenario taxis will not be able to operate if unlicensed, it has been assumed that in the final modelling year (2026), all GM licensed PHVs will be compliant. The CAZ Benchmark vehicle volumes are shown in **Table 6-3**. It is noted that the values below are derived from the 2023 GM licensed vehicle fleets, excluding the impacts of natural turnover of the fleet.

Table 6-3: PHV Investment-led Plan Vehicle Volumes

Year	Modelled Response	GM Licensed	Non-GM Licensed	Total
2025	Compliant	9,512	6,241	**15,753**
	Non-Compliant	2,343	740	**3,083**
	Total	**11,855**	**6,981**	**18,836**
2026	Compliant	11,855	6,914	**18,769**
	Non-Compliant	0	67	**67**
	Total	**11,855**	**6,981**	**18,836**

Funding Allocation

6.4.3 The grant levels, following consultation, are presented in **Table 6-4**. The grants are provided for vehicle replacement only, while retrofit is not an option. Details relating to the derivation of the current proposed grants for each vehicle type are discussed within the *Appraisal Report*.

Table 6-4: Proposed per vehicle grant offer for PHVs

Funding	Vehicle type
£6,280	Compliant WAV
Up to £12,560	New ZEC WAV (running costs)
£12,560	Second-hand ZEC WAV
£3,770	Compliant non-WAV
£6,280	Compliant EURO 6+
£7,530	New ZEC non-WAV (running costs)
£7,530	Second-hand ZEC non-WAV

6.4.4 **Table 6-5** provides details of the number of PHVs that are forecast to be eligible to apply for funding.

Table 6-5: Number of Non-Compliant GM Licensed PHVs eligible for funding

Vehicle Volumes	Eligible Vehicles
	Core Fund
Non-Compliant GM Licensed	2,381

6.4.5 **Table 6-6** provides a summary of the number of vehicles that can be served by the funding for vehicle upgrade.

Table 6-6: Allocation of PHV Accessing the Funds

Fund	Type	Vehicle Served	Funding Amount
Core	WAV	ICE	£552,640
		Electric	£514,960
	Non-WAV	ICE	£168,157,080
		Electric	£90,631,080
	Total		**£10,507,650**

6.5 GM CAP - CAZ Benchmark

Behavioural Responses for CAZ Benchmark (2025 & 2026)

6.5.1 The introduction of the CAZ Benchmark will have a notable impact on the volume of compliant PHVs operating within GM as they respond to the planned £7.50 CAZ charge per day. To assess the likely behavioural responses associated with the introduction of the CAZ and associated funds, a Cost Response Model for taxis has been developed.

6.5.2 The input data from the DVLA and ANPR survey, as well as population data (including taxi licensing data), were segmented to understand different impacts of the CAZ on groups based upon vehicle registration location, frequency of travel in the CAZ, vehicle type, business sector and vehicle age.

6.5.3 The behavioural responses generated for the CAZ Benchmark for PHVs are as follows:

- Pay Charge;
- Change mode;
- Cancel Trip; and
- Upgrade Vehicle.

6.5.4 As shown in **Table 6-7**, the number of compliant PHVs serving GM is expected to increase significantly as a result of the behavioural responses forecasted due to the implementation of the CAZ and associated mitigation funding for PHVs.

Table 6-7: CAZ+Funds Behavioural Responses

Modelled Response	2025	2026
Pay Charge	21.5%	21.2%
Change Mode	0%	0%
Cancel Trip	0%	0%
Upgrade Vehicle	78.5%	78.8%

Source: See TN49 CAZ Assumptions for background to behavioural responses

Vehicles Populations Impacted by GM CAP

6.5.5 The application of the CAZ with Funds scenario results in an increase in the compliance rates for compliant PHVs operating within the Regional Centre as shown in **Table 6-8**.

Table 6-8: PHV CAZ+Funds Vehicle Volumes in the Regional Centre

Year	Modelled Response	GM Licensed	Non-GM Licensed, but still in GM	Total
2025	Compliant	11,299	6,623	17,921
	Non-Compliant	556	358	915
	Total	**11,855**	**6,981**	**18,836**
2026	Compliant	11,474	6,949	18,423
	Non-Compliant	381	32	413
	Total	**11,855**	**6,981**	**18,836**

CAZ Annual Chargeable Trips

6.5.6 For the remaining non-compliant PHVs who choose to stay and pay the charge, an overall annual number of chargeable trips has been derived as shown in **Table 6-9**, which varies based on an assumed 2025, or 2026 opening of the CAZ Benchmark.

Table 6-9: PHV Annual Chargeable Trips

Year	Annual chargeable trips (2025 opening)	Annual chargeable trips (2026 opening)
2025	142,896	
2026	138,557	140,902
2027	136,301	138,608
2028	134,266	136,539
2029	132,771	135,019
2030	131,662	133,891

Funding Allocation

6.5.7 The grant levels for GM CAP are presented in **Table 6-10**. The grants are provided for vehicle replacement only, while retrofit is not an option. Details relating to the derivation of the current proposed grants for each vehicle type are discussed within the *Appraisal Report*.

Table 6-10: Proposed per vehicle grant offer for PHVs

Funding	Vehicle type
£6,280	Compliant WAV
Up to £12,560	New ZEC WAV (running costs)
£12,560	Second-hand ZEC WAV
£3,770	Compliant non-WAV
£6,280	Compliant EURO 6+
£7,530	New ZEC non-WAV (running costs)
£7,530	Second-hand ZEC non-WAV

6.5.8 **Table 6-11** provides details of the number of PHVs that are forecast to be eligible to apply for funding, noting that all GM licensed non-compliant taxis are assumed to be eligible to this fund.

Table 6-11: Number of Non-Compliant GM Licensed PHVs eligible for funding

Vehicle Volumes	2025	2026
Non-Compliant GM Licensed	2,343	2,343
Vehicles Eligible for Financial Assistance / Expected to respond to CAP	2,343	2,343

6.5.9 **Table 6-12** provides a summary of the number of vehicles that can be served by the funding for vehicle upgrade.

Table 6-12: Allocation of PHVs Accessing the Funds

Type	Vehicle Served	Funding Amount
2025 Opening	1,433	£7,411,698
2026 Opening	1,401	£7,248,376

7 Buses

7.1 Vehicle Type Overview

7.1.1 This section discusses the vehicle information associated with buses which has been utilised by the GM CAP project.

7.1.2 According to DfT Vehicle Classifications, a bus is considered to fall within vehicle category M, which includes 'Motor vehicles with at least four wheels designed and constructed for the carriage of passengers' with buses found under classification M3 as they comprise more than eight seats and exceed 5 tonnes. For the purposes of the CAP, it is considered a bus if it is a registered bus operating on a registered bus service in GM.

7.1.3 Analysis of the bus market is provided in Technical Paper 11, submitted to JAQU in July 2019, and provides details of the operation of buses within GM. Since the submission material, the modelled bus routing data was updated to include up-to-date information about local bus flows based on 2023 services. Bus services have been reviewed against assumptions underpinning the highway assignment modelling including bus service routings, frequencies, and vehicle deployment.

7.1.4 To support an increased focus on bus, the modelling has applied several updates to reflect the most recent position with regard to bus. These include:

- Update to bus services within the modelling to reflect 2023 bus network; and
- Further planned updates to the bus network by 2025 delivered as part of the GM bus franchising process.

7.2 Sources of Vehicle Volume Data

7.2.1 For Buses, there are three key sources of data which have been used to understand vehicle operations within GM. These include:

- Bus service timetable data for reflecting 2023 service routings and frequencies from TfGM's AS400 database;
- Mapped bus routing data from TfGM's bus route mapping system (GMBusRoutes); and
- Information about the bus fleet composition in Greater Manchester from TfGM's Punctuality and Reliability Monitoring Survey (PRMS).

Base year and future Year Vehicle Populations without GM CAP

7.2.2 The bus services data in the do-minimum models has been updated to include up-to-date information for routings, frequencies and vehicle deployment based on 2023 services. This reflects changes to service patterns between 2019 and 2023 following the impact of the Covid-19 pandemic and investment into cleaner bus fleets in GM. This also takes into account operator-related changes implemented as part of the rollout of bus franchising.

7.2.3 Additional updates to support the analysis of bus flows within the modelling include:

- Updates to the representation of exhaust emissions from retrofitted vehicles in accordance with revised JAQU guidance published in April 2023; and
- Planned updates to the bus network by 2025 delivered as part of the GM bus franchising process, which represent a significant change in bus operations within the County with TfGM taking over responsibility for running and operating the franchised services and planning and coordinating the bus network.

7.2.4 These are discussed in detail below.

Updated Retrofit Position following April 2023 JAQU Guidance update

7.2.5 In 2022 JAQU funded a study to quantify NOx and NO_2 emissions from buses under real-world driving conditions in three cities across the UK, including Manchester, (monitoring took place in Manchester City Centre between 21st November and 12th December 2022).

7.2.6 The monitoring indicated the retrofitted vehicles were not reducing emissions as expected, with significant variation in performance between bus models with different retrofit technologies. Furthermore, emissions of primary-NO_2 (as opposed to NOx) were highly variable, potentially worsening roadside NO_2 concentrations despite an overall reduction in NOx emissions.

7.2.7 On 19th April 2023 government advised TfGM that it should pause any new spending on bus retrofit as they now have evidence that bus retrofit solutions that have been fitted and are in real world use have variability in performance.

7.2.8 In the light of this new evidence the JAQU science team issued revised guidance in May 2023, which sets out that Air Quality modelling should not assume any benefits from a retrofitted bus. JAQU also issued additional associated guidance specifically for GM giving the option to develop a bespoke emissions modelling methodology for retrofitted buses.

7.2.9 JAQU have provided the monitoring data from the first remote sensing survey, and some additional clarification on methodology between June and July 2023. GM have reviewed these datasets and recognise there is considerable variance within the data both in repeat samples of unique vehicles, and also between bus models, euro standard and retrofit technology (if fitted). Whilst there is evidence of some possible improvement to NOx emissions, which indicates that the updated JAQU modelling guidance for retrofitted buses could be pessimistic and over representing real-world emissions, it is not considered possible at this stage to produce a robust and defensible bespoke GM fleet methodology.

7.2.10 It is therefore considered that the most robust and efficacious approach to delivering the GM CAP, is to use the updated JAQU guidance for retrofit buses, rather than delay the appraisal to allow for on-going analysis of the remote sensing data currently being undertaken by JAQU. This is considered to be a conservative approach, meaning that the scale of targeted measures put in place should deliver sufficient improvements at locations of predicted exceedance, with greater confidence.

7.2.11 However, it is recognised that the remote sensing data indicates wide vehicle specific variation in emissions performance between vehicles. JAQU is also due to publish the outcomes of their research project in improving the performance of retrofit buses once analysis is complete, which could alter the assumptions used in our appraisal. GM will therefore keep the remote sensing data under review and consider the potential impact of this variability as part of our adaptive planning process for the operational phase of the proposed CAP and within the Analytical Assurance process.

7.2.12 GM has continued appraisal of the CAP, using the updated JAQU guidance for retrofit bus, which is reflected within the 2025 and 2026 Do Minimum Modelling.

<u>Further Planned updates to the bus network by 2025</u>

7.2.13 The Do Minimum modelling has been updated to reflect the inclusion of a fleet of ZEBs which have been deployed on routes into the Regional Centre. This includes further ZEBs that are already funded and are planned to be in operation from 2024.The Do Minimum modelled bus services data have been updated to include up-to-date information for routings, frequencies and vehicle deployment based on 2023 services. This reflects changes to service patterns between 2019 and 2023 following the impact of the Covid-19 pandemic and investment into cleaner bus fleets in GM. This also takes into account operator-related changes implemented as part of the rollout of bus franchising.

7.2.14 £35.8 million has been awarded to the GM after a joint bid to DfT's ZEBRA Scheme. Submitted by GMCA, TfGM, Stockport Council and Stagecoach Group PLC this scheme will see the construction of a new purpose-built electric bus depot in Stockport and replace 170 diesel buses that operate from Stockport Bus Depot with Zero Emission technology.

7.2.15 The ZEBRA scheme would convert approximately 10% of the GM bus fleet to Zero Emission technology and result in a reduction of carbon dioxide equivalent (CO2e) emission from the bus fleet of approximately 100,000 tCO2e by 2038.

7.2.16 The Stockport ZEBRA scheme was previously assumed to be delivered within the 2025 Do Minimum. However, construction of the new Stockport all-electric bus depot has been delayed. This is due to challenges with site availability associated with United Utilities works on the sewer assets within the site boundary and the need to adapt the site design to fit within the available footprint.

7.2.17 As a result, the ZEB services operating from Stockport depot have been removed from the Do Minimum modelling.

7.2.18 The 170 ZEBs that were due to operate out of the Stockport depot in 2025 are planned to be redeployed to other GM bus depots including Hyde Road, Middleton and Tameside to operate on other services where there is planned electric charging capacity.

7.2.19 The redeployment of these buses allows GM to benefit from the ZEBRA fleet as soon as possible. The Do Minimum has subsequently been updated to reflect the redeployment of ZEB buses onto other services operating out of the depots specified above with Euro V retrofits modelled to operate from this depot as an interim fleet.

7.3 Impact of GM CAP on buses

7.3.1 Please see the *Appraisal Report* for details relating to the volume, grants, and funding for local bus services. Local bus vehicle compliance levels are assumed to be only impacted under the Investment-led Plan.

7.3.2 **Table 7-1** illustrates the changes to fleet type (ZEB / OEM Euro VI) that is required to deliver compliance in 2025. This assumes delivery of committed franchising service upgrades to ZEB and OEM Euro VI. Whilst the bus measures are modelled to be very effective across all exceedance locations, there are three exceedance sites which remain after the deployment of the bus measures; A57 Regent Road, A34 Quay Street and Great Bridgewater Street. The ability of the bus fleet investment to be deployed and be effective at the forecast 2025 exceedance sites are dependent on having sufficient ability of depot charging infrastructure

Table 7-1: Summary of fleet and depot change requirements to achieve compliance

Route	Tranche	Depot	Bus Type	Vehicles *	Indicative Changes to Fleet Type	Exceedance
36	1	Bolton	ZEB	20	40 additional ZEBs required with depot electrification additional capacity (90 ZEBs required in total, with 50 currently operating).	A34 Bridge St, Manchester King St, Manchester New York St, Manchester Portland St, Manchester
37	1	Bolton	ZEB	20		
163	1	Bolton	ZEB	20		A664 Shudehill, Manchester
471	1	Bolton	ZEB	20		A58 Bolton St, Bury
472/ 474	1	Bolton	ZEB	10		
X39	1	Bolton	ZEB	0**		A34 Bridge St, Manchester King St, Manchester New York St, Manchester
1	2	Queens Road	ZEB	6	73 ZEBs required (no funding required for ZEBs) with depot electrification.	A6 Piccadilly, Manchester A34 Bridge St, Manchester A34 Quay St, Manchester Gartside St, Manchester King St, Manchester New York St, Manchester Portland St, Manchester
2	2	Queens Road	ZEB	3		A6 Piccadilly, Manchester King St, Manchester Portland St, Manchester
33/ 33B	2	Queens Road	ZEB	5		A57 Regent Rd, Salford Great Bridgewater St, Manchester Portland St, Manchester
67/ 67A	2	Queens Road	ZEB	12		A34 Bridge St, Manchester
97/ 98	2	Queens Road	ZEB	17		A58 Bolton St, Bury
100	2	Queens Road	ZEB	13		A34 Bridge St, Manchester
135	2	Queens Road	ZEB	14		Site of risk at Lever Street, Manchester (High NO2 monitored results recorded at this site)
477	2	Queens Road	ZEB	1		A58 Bolton St, Bury
480	2	Queens Road	ZEB	2		
192/ X92	3	Stockport	Euro VI	47	Upgrade of 77 buses to OEM Euro VI.	A6 Ardwick Green, Manchester A6 London Rd, Manchester A6 Piccadilly, Manchester A6 Stockport Rd, Manchester A6 Wellington Rd South, Stockport A6 Whitworth St, Manchester Portland St, Manchester
325	3	Stockport	Euro VI	5		B6104 Carrington Rd, Stockport
330	3	Stockport	Euro VI	16		
383/ 384	3	Stockport	Euro VI	9		A6 Wellington Rd South, Stockport

* This assumes delivery of committed franchising service upgrades to ZEB and OEM Euro VI.

** The X39 is operated with the fleet used for the 36, 37 & 471 services, therefore no additional ZEBs are required for this service.

7.3.3 40 buses operating from Bolton depot require upgrade to ZEBs to achieve compliance at A34 Bridge Street (Manchester), King Street (Manchester), New York Street (Manchester), Portland Street (Manchester), A664 Shudehill (Manchester) and A58 Bolton Street (Bury). The total fleet required to operate the services past these exceedance locations is 90 ZEBs and therefore with the 50 ZEBs that currently operate on these routes (as part of the bus franchising programme), the additional number of vehicles that require upgrade to ZEBs is 40.

7.3.4 73 buses operating from Queens Road depot require upgrade to ZEBs to achieve compliance at A6 Piccadilly (Manchester), A34 Bridge Street (Manchester), A34 Quay Street (Manchester), A57 Regent Road (Salford), A58 Bolton Street (Bury), Gartside Street (Manchester), Great Bridgewater Street (Manchester), King Street (Manchester), New York Street (Manchester) and Portland Street (Manchester). The total fleet required to operate the services past these exceedance locations is 73 ZEBs however funding is not required for the ZEBs at Queens Road as they will be provided by the committed franchising funding from CRSTS (but funding is required for the depot electric charging infrastructure).

7.3.5 It has been determined that there are a number of exceedance sites located in the Regional Centre and along the A6 corridor to Stockport, as well as B6104 Carrington Road (Stockport) which can achieve compliance through 77 buses upgraded to OEM Euro VI.

8 Coaches

8.1 Vehicle Type Overview

8.1.1 This section discusses the vehicle volumetric information associated with coaches which has been utilised by the GM CAP project.

8.1.2 According to DfT Vehicle Classifications, a coach is considered to fall within vehicle category M, which includes 'Motor vehicles with at least four wheels designed and constructed for the carriage of passengers.' with coaches found under classification M3 as they comprise more than eight seats and exceed five tonnes. A coach can be further defined by the function of the vehicle and the type of service offered. For example, the vehicle is not permitted to carry standing passengers and includes physical characteristics such as rear or underfloor engines to limit noise levels as well as a separate compartment for luggage from passengers. Also, for funding purposes, a coach that operates on a registered bus service is classified as a bus and eligible for that funding.

8.1.3 Analysis of the coach market is provided in *Technical Paper 4*, submitted to JAQU in July 2019, which provides details of the operation of coaches within GM.

8.2 Sources of Vehicle Volume Data

8.2.1 For coaches, there are two key sources of data which have been used to understand vehicle operations within GM. These are:

- A coach database (Transport Resources International database[18]), providing a record of coaches in operation across the UK in 2019 (February 2020 database version); and
- The 2019 GM automatic number plate recognition (ANPR) survey which included coaches within the data assessed.

8.2.2 The coach database provides a detailed set of data around the number of coaches in operation across the UK and includes details of the coaches owned by each operator which is based on geographical location. This enables an understanding of the coaches operating within GM. This database was used to support the majority of analysis contained within *Technical Paper 4* and was used to establish the overall quantum of coaches based in GM (2019) which is in the region of 697 vehicles, of which just 33% (233) are classified as compliant Euro VI vehicles.

[18] Transport Resources Limited. Database purchased from http://www.dougjack.co.uk/

8.2.3 The coach database does not provide information on the number of coaches based outside of GM, though operating within GM, or the frequency of operation of the coaches serving GM. To support a greater understanding of coaches operating within GM, the ANPR survey data, collected in 2019 was utilised to establish:

- The number of coaches based outside GM, though were observed operating within GM; and
- Typical frequency of operation of coaches serving GM.

8.2.4 ANPR data was used to understand quantum of GM based vehicles by comparing the number of unique coaches observed in the ANPR to the number of GM based vehicles from the coach database. This provided an estimate of the total number of coaches serving GM in 2019 and is summarised in **Table 8-1**.

Table 8-1: Number of Coaches Serving GM (2019)

Modelled Response	GM Based	Non-GM Based	Total
Compliant	233	529	**762**
Non-Compliant	464	448	**912**
Total	**697**	**977**	**1,674**

Source: Coaches and Minibuses Analysis

8.3 Future Year Vehicle Populations without GM CAP

8.3.1 Without intervention there will be a natural turnover of the coach fleet serving GM. Based on a typical lifespan of a coach of up to 20 years (based on HGV data), and assuming the same fleet age composition, the coach fleet was projected into the future. This was applied for each year by removing the oldest vehicles and replacing with a new one (keeping the overall age profile consistent). This naturally leads to an increase in Euro VI (compliant) coaches over time. The coach fleet serving GM was therefore projected from 2019 to 2025.These projections are presented in **Table 8-2**.

8.3.2 Certain vehicle types were severely impacted by wider economic conditions; therefore, a delayed fleet upgrade has been applied to the natural turnover of those vehicles. For coach there is no detailed information on the fleet upgrades of these vehicle types following the COVID-19 pandemic, although the coach sector has been significantly impacted. Therefore, a cautious approach has been taken and the funding calculations from the pre-pandemic 2019 fleet data (**Table 8-1**) has been estimated.

Table 8-2: Forecast Do Minimum (without CAP) Compliant Coaches 2025

Year	Modelled Response	GM Based	Non-GM Based	Total
2025	Compliant	480	648	1,128
	Non-Compliant	217	329	546
	Total	**697**	**977**	**1,674**

8.4 GM CAP – Investment-led Plan

Vehicles Populations Impacted by GM CAP

8.4.1 The mode is not impacted by the Investment-led Plan.

Funding Allocation

8.4.2 The mode is not impacted by the Investment-led Plan, so there is no specific funding allocation.

8.5 GM CAP - CAZ Benchmark

Vehicles Eligible for the Funds

8.5.1 The revised grant levels for coaches under GM CAP are presented in **Table 8-3** for coaches. Details relating to the derivation of the current proposed grants for each vehicle type are discussed within the *Appraisal Report*.

Table 8-3. Proposed per vehicle grant offer for coaches

Vehicle Type	Grant Available
Coach upgrade	£40,180

Table 8-4 provides details of the number of coaches are estimated to be eligible to apply for funding.

Table 8-4: Number of Non-Compliant GM-Based Coaches eligible for funding

	Number of Coaches
Non-Compliant GM Based	464
Vehicles Eligible for Financial Assistance / Expected to respond to CAP	259

Note: Due to limited data on Coaches - Calculations have been based on the 2019 fleet data

8.5.2 Based on the funding and grant levels, an allocation of the number of vehicles accessing funding has been calculated. This analysis considered the number of vehicles eligible for funding, although applies additional controls to restrict the number of vehicles to the total that can be accommodated by the vehicle funding offer.

8.5.3 There is no data on delayed natural fleet upgrade for coach, therefore, calculations for these vehicle types have been based on the 2019 fleet.

8.5.4 2019 fleet captured coaches operating on a GM-wide basis. The CAZ Benchmark boundary is focussed on the Regional Centre and thus not all of the GM-registered, non-compliant coaches operating within the Regional Centre will be subject to a CAZ charge in this option. However, coaches that operate rail and tram replacement services and those city-to-city services serving Manchester City Centre will route into the Regional Centre and therefore be subject to a charge.

8.5.5 **Table 8-5** provides a summary of the number of vehicles that can be served by the funding, and are assumed to be relevant to the Regional Centre. The grants are provided for vehicle replacement only, while retrofit is not an option.

Table 8-5: Allocation of Coaches Accessing the Funds

Type	Grant Level	Vehicle Served	Funding Amount
2025 / 2026	£40,180	35	**£1,398,682**

9 Minibuses

9.1 Vehicle Type Overview

9.1.1 This section discusses the vehicle volumetric information associated with minibuses which has been utilised by the GM CAP project.

9.1.2 According to DfT Vehicle Classifications, a minibus is considered to fall within vehicle category M, which includes 'Motor vehicles with at least four wheels designed and constructed for the carriage of passengers.' with minibuses found under classification M2 as they do not comprise more than eight seats (excluding the driver) and have a maximum weight not exceeding five tonnes. A minibus is legally defined as "a vehicle with between 9 and 16 passenger seats"[19]. A minibus can be further defined by the function of the vehicle and the type of service offered. For example, the vehicle is not permitted to carry standing passengers.

9.1.3 For the purposes of the GM CAP, those minibuses that operate as a licensed PHV or hackney carriage are classified as such and not included in the numbers presented in this chapter.

9.1.4 Analysis of the minibus market is provided in *Technical Paper 18*, submitted to JAQU in August 2019, and provides details of the operation of minibuses within GM.

9.2 Sources of Vehicle Volume Data

9.2.1 For minibuses, there are two key sources of data which have been used to understand vehicle operations within GM. These include:

- Analysis of DVLA registered vehicle database records based on Q2 2016 obtained in 201820; and
- Information obtained from the Minibus Market Analysis report, published in 2014, and based on DVLA data from 2012.

9.2.2 The availability of data on the minibus market has been challenging with comparisons between different datasets and the potential for double counting between owner and operator types. The Technical Paper 18 informed the total quantum of minibuses operating in GM, the vehicle models and fuel and engine type information which has been used to derive vehicle compliance.

[19] *https://www.gov.uk/driving-a-minibus*
[20] DfT (2018) *Analysis of DVLA registered vehicle database records* (version Q2 2016) by DfT

9.2.3 The DVLA dataset used to undertake this analysis provides minibus data based on vehicles registered per GM Authority. Recently collected ANPR data (2019) was also used to understand further detail in minibus travel within GM and included review of vehicle age profiles to understand the level of compliant vehicles operating in GM. The ANPR data was expanded by 1.47 for GM and 1.56 for Non-GM (based on LGV expansion factors) to determine the total number of minibuses serving GM. 10% of minibuses captured by the ANPR are identified as taxis and so were excluded from the minibus fleet data, as these vehicles are captured within the taxi mode. **Table 9-1** provides a breakdown of the 2019 minibus volumes.

Table 9-1: Number of Minibuses Serving GM (2019)

Modelled Response	GM Based	Non-GM Based	Total
Compliant	130	306	436
Non-Compliant	1,903	805	2,707
Total	**2,032**	**1,111**	**3,143**

Note: Values above exclude those minibuses that operate as PHVs

9.3 Future Year Vehicle Populations without GM CAP

9.3.1 Without intervention there will be a natural turnover of the minibus fleet serving GM. Based on a typical lifespan of a minibus of up to 20 years (in line with vans assumption), and assuming the same fleet age composition, the minibus fleet was projected into the future. This was applied for each year by removing the oldest vehicles and replacing with a new one (keeping the overall age profile consistent). This naturally leads to an increase in Euro VI (compliant) minibuses over time. The minibuses fleet serving GM was projected from 2019 to 2025.These projections are presented in **Table 9-2** and are based on pre-COVID-19 natural fleet turnover assumptions.

9.3.2 Certain vehicle types were severely impacted by recent economic conditions which have resulted in a noticeable delay in the normal cycle of purchasing new and second-hand vehicles. For minibus there is no detailed information on the fleet upgrades of these vehicle types during the pandemic, although the Minibus sector has been significantly impacted. Therefore, a cautious approach has been taken and calculations based on a 2019 fleet.

Table 9-2: Forecast without CAP Compliant Minibuses 2025

Year	Modelled Response	GM Based	Non-GM Based	Total
2025	Compliant	707	507	1,215
	Non-Compliant	1,324	604	1,928
	Total	**2,032**	**1,111**	**3,143**

Note: Values above exclude those minibuses that operate as PHVs.

9.4 GM CAP – Investment-led Plan

Vehicles Populations Impacted by GM CAP

9.4.1 The mode is not impacted by the Investment-led Plan.

Funding Allocation

9.4.2 The mode is not impacted by the Investment-led Plan, so there is no specific funding allocation.

9.5 GM CAP - CAZ Benchmark

Vehicles Eligible for the Funds

9.5.1 The grant levels for minibuses for GM CAP are presented in **Table 9-3** for minibuses. The grants are provided for vehicle replacement only, while retrofit is not an option. Details relating to the derivation of the current proposed grant for each vehicle type are discussed within the *Appraisal Report*.

Table 9-3: Proposed per vehicle grant offer for Minibuses

Vehicle Type	Grant Available
Upgrade	£6,280

9.5.2 **Table 9-4** provides details of the number of minibuses that might be eligible to apply for funding.

Table 9-4: Number of Non-Compliant GM Based Minibuses eligible for funding

Type of Minibus	Number of vehicles
Non-Compliant GM Based	1,903
Vehicles Eligible for Financial Assistance / Expected to respond to CAP	799

Note: Due to limited data on Minibus - Calculations have been based on the 2019 fleet data

9.5.3 Funding was allocated based on the grants available, as shown in **Table 9-5**.

Table 9-5: Allocation of Minibuses Accessing the Funds

Type	Grant Level	Vehicle Served	Funding Amount
Upgrade (2025/2026)	£6,280	243	£1,527,296

10 Summary

10.1.1 This Technical Paper has set out the vehicle volumetric data relevant to each vehicle type considered by the GM CAP. The analysis has focused on the number of vehicles, the proportion that are compliant and how this is forecast to change over time. The assessment has also presented the vehicle volumes and funding allocations for the Investment-led Plan scenario and CAZ Benchmark, showing how these influence the number of compliant vehicles operating within GM.