

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

Evidence Submission for a new GM Clean Air Plan

Supplementary Appraisal Report



Salford City Council



Oldham Council

TRAFFORD COUNCIL



Warning: Printed copies of this document are uncontrolled

Version Status:	APPROVED	Prepared by:	Transport for Greater Manchester on behalf of the 10 Local Authorities of Greater Manchester
Date:	October 2024		

Contents

1	Preface	3
2	Purpose of this Document	5
3	Queens Road Depot Electrification Delay.....	6
4	M602 Speed Limit Removal.....	10
5	Assessment on Investment-led Plan Compliance Year.....	11
6	Updated Comparative Appraisal	22
7	Cost Impact	30
8	Value for Money.....	31
9	Equality Impacts	36
10	Analytical Assurance.....	41
11	Risks and Mitigation – Queens Road Depot Electrification.....	42
12	Summary	43

APPROVED

1 Preface

- 1.1.1 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.
- 1.1.2 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.
- 1.1.3 Drafts of the *Appraisal Report* and supporting documentation have been 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.
- 1.1.4 However, following the substantial drafting of the *Appraisal Report* and supporting documentation for these developments, two additional issues have arisen.
- 1.1.5 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. 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.
- 1.1.6 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.
- 1.1.7 The implications of these two issues (delay to Queens Road depot and change to M602 speed limit) are addressed in this Supplementary Appraisal Report, included as part of this evidence submission documentation. Therefore, this Supplementary Appraisal Report should be read in conjunction with the *Appraisal Report* and associated documentation.
- 1.1.8 It should be noted that the *Appraisal Report* considers the developments set out in paragraph 1.1.2 (delay to Stockport all-electric bus depot, changes to bus fleets and correction to Euro V retrofit bus modelling emission values) without addressing the implications of the delay to the electrification of the Queens Road depot or the M602 issue, which are addressed in this Supplementary Appraisal Report.

1.1.9 In addition, since the drafting of the *Appraisal Report* and supporting material, government published the 'Bus Retrofit Performance Report'¹ 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.

APPROVED

¹ <https://assets.publishing.service.gov.uk/media/66e1ab11951c1776394a003c/bus-retrofit-performance-24.pdf>

2 Purpose of this Document

- 2.1.1 This Supplementary Appraisal Report considers the implications on the date of compliance associated with the delay to Queens Road depot and the change to the M602 speed limit, and provides a comparative appraisal of the Investment-led Plan and the CAZ Benchmark taking these matters into account.
- 2.1.2 This report provides further details as to the implications of the delay to the electrification of Queens Road depot and the removal of the M602 temporary speed limit including:
- Why this means compliance in 2025 is no longer likely;
 - Why 2026 is the earliest likely year of compliance;
 - Details of revised modelling demonstrating that the Investment-led Plan, even with the delay to the electrification of Queens Road depot and the removal of the M602 temporary speed limit, achieves compliance in 2026; and
 - A revised comparative appraisal of the Investment-led Plan (taking into account the matters outlined above) and the CAZ Benchmark, against a revised forecast year of compliance of 2026, demonstrating that only the Investment-led Plan meets the Determining Success Factor of achieving compliance in the shortest possible time.
- 2.1.3 This Supplementary Appraisal Report also indicates where the assessment of other matters including equalities impact and value for money are materially altered for the Investment-led Plan, as compared to the assessment in the *Appraisal Report* on the basis of a compliance year of 2025.

3 Queens Road Depot Electrification Delay

- 3.1.1 As set out in Section 7.2 of the *Appraisal Report*, investment in cleaner buses represents the most important mechanism for reducing exceedances under the Investment-led Plan and is grounded in the ability now provided by GM operating a bus franchising scheme.
- 3.1.2 The GMCA is delivering a bus franchising scheme for local services across all 10 districts in GM. TfGM is responsible for operating the franchising scheme on behalf of the GMCA and has the authority to manage franchise agreements in respect of local services, including the specification of fleet requirements and deployment.
- 3.1.3 The implementation of bus franchising across the region is being delivered in three tranches:
- Tranche 1 (24th September 2023) – covering Bolton, Wigan and parts of Salford and Bury;
 - Tranche 2 (24th March 2024) – covering Oldham, Rochdale and parts of Bury, Salford and north Manchester; and
 - Tranche 3 (5th January 2025) – covering Stockport, Tameside, Trafford and the remaining parts of Manchester and Salford.
- 3.1.4 Control of the bus network along with the electrification of the bus fleet means TfGM can target electric buses and compliant OEM Euro VI Vehicles to the areas where modelling indicates that NO₂ limits are exceeded.
- 3.1.5 To achieve this, TfGM have delivered a major programme of works to an unprecedented schedule over 12 months, delivering Tranches 1 and 2 as well as having electrified Bolton and Oldham depots. Currently they are in the process of mobilisation of Tranche 3 and are progressing with the electrification of another 4 depots at Middleton, Hyde Road, Ashton and Queens Road, and adding more charging units to Bolton depot.
- 3.1.6 However, the TfGM Bus Team have advised that following a delivery review they are no longer able to electrify Queens Road depot in the time frame required for the Investment-led Plan to deliver compliance by 2025.
- 3.1.7 This delivery risk was identified following an internal review of Queens Road depot as part of the wider depot electrification programme. Queens Road depot is a Grade 2 listed building serving as an operational bus facility. Major works are required to maintain historical features, make necessary repairs to the structure as well as install the charging infrastructure.
- 3.1.8 Whilst depot electrification has always been an identified risk to the deliverability of the GM CAP (and was identified in the 'Summary of Key Risks' in the *Appraisal Report*), it has now become apparent that this risk has materialised.

- 3.1.9 Delivery of Queens Road depot is fundamental to the Investment-led Plan as set out in the *Appraisal Report* as 73 Zero Emission Buses (ZEBs) are to be operated from this depot across 12 services. These services run through 17 forecast exceedance sites in the 2025 Do-Minimum. The location of these exceedances are concentrated in the Regional Centre, as well as the A57 Regent Road and the A58 Bolton Street Bury (2 exceedance points at this location).
- 3.1.10 Since it became apparent that this risk was likely to materialise, TfGM have been exploring alternative solutions to Queens Road depot electrification to enable the GM Authorities to deliver compliance in 2025. GM has completed a high-level review of alternative options to deliver the required air quality improvements at the exceedance sites where the 73 ZEBs were planned to operate in the absence of Queens Road depot which is summarised in **Table 1**.

APPROVED

Table 1 Queens Road Depot - Alternate Options Considered

Option	Key Considerations		Commentary
	Deliverable by beginning of 2025?	Sufficient Air Quality Benefits by 2025?	
Utilisation of other Investment-led Plan measures, namely local measures, to be deployed at the exceedance sites in 2025.	No	No	Further targeted local traffic measures have, to date, not been developed. To do so would require planning and assessment with respective Local Highway Authorities, could require numerous individual interventions and would take many months to develop, agree and then deliver, this process, even if appropriate local measures could be identified (which is unclear) is unlikely to result in deliverable schemes quickly enough to achieve the required air quality improvement to deliver compliance in 2025.
Redeployment of planned ZEB services from Queens Road to other depots in 2025 utilising existing infrastructure.	No	Yes	There is insufficient available charging capacity based on the number of ZEBs which would be required to serve existing routes from more remote depots. Therefore, this option is not deliverable within the required timescales. In addition, redeployment of planned services from Queens Road depot would involve significant additional operational costs associated with extra mileage from depots and renegotiation of contracts with bus franchisees.
Redeployment of planned ZEB services from Queens Road to other depots in 2025 with supporting additional infrastructure works to increase charging capacity.	No	Yes	This option is not deliverable within the required timescales as this does not allow sufficient time to increase charging capacity enough to support ZEB services operating from 2025. In addition, redeployment of planned services from Queens Road depot would involve significant additional operational costs associated with extra (dead) mileage from depots and renegotiation of contracts with bus franchisees.
Identification of new charging infrastructure locations based on bus routing as opposed to depot charging to support ZEBs on relevant routes required to achieve compliance in 2025.	No	Yes	There is insufficient time to deliver additional charging infrastructure at locations such as bus interchanges due to delivery issues including footprint and utility constraints, in addition to lead-in times associated with securing the necessary planning consents.
Replacement of planned ZEB services from Queens Road with OEM Euro VI vehicles.	Yes	No	As part of the development of the Investment-led Plan, GM assessed the air quality improvement required from bus at each individual forecast exceedance site. As part of this work, it has been calculated that compliance cannot be achieved at all remaining forecast exceedance sites in 2025 without ZEBs operating from Queens Road depot.

- 3.1.11 As summarised above, this high-level review concluded that none of the identified options are likely to deliver compliance in 2025. Additionally, on the basis that the electrification of Queens Road depot is deliverable by the end of 2025, none of these options are considered to achieve compliance in a shorter time and some may not achieve compliance by 2026 due to deliverability or timescale issues, or insufficient air quality benefits. There is confidence that the electrification of Queens Road depot is deliverable in this timeframe and will enable compliance to be achieved at the remaining exceedance sites, as part of the Investment-led Plan, due to this component forming part of the original scheme which was designed, modelled and submitted to JAQU.
- 3.1.12 Having considered the impacts, risk and delivery issues associated with the above options, it is considered that the approach that is most likely to achieve compliance as soon as possible and by 2026 at the latest is to continue with the electrification of the Queens Road depot as quickly as possible. Comparatively, the Investment-led Plan including the impact, risk and issues associated with the electrification of the Queens Road depot, still performs better than the CAZ Benchmark when compared to JAQU's Critical Success Factors and specifically, delivering a scheme in accordance with the Legal Direction.

APPROVED

4 M602 Speed Limit Removal

- 4.1.1 National Highways have been trialling 60mph speed limits on short sections of the strategic road / motorway network where action needs to be taken to reduce emissions and improve air quality.
- 4.1.2 Based on the findings of their research programme², there was an expectation there will be a reduction in NO₂ when traffic is reduced from 70 to 60mph in these locations.
- 4.1.3 National Highways have been trialling this approach on certain roads, to assess whether reducing the speed limit reduces NO₂ levels. This included M602 junctions 1 to 3 near Eccles. They have been monitoring this area and they have notified GM that the speed limit trial is now complete, and the 70mph speed limit is to be reinstated.
- 4.1.4 The M602 speed limit is an assumption in GM's modelling of both the Do-Minimum and Do-Something scenarios and leads directly onto Regent Road, one of the sites where local measures are proposed. Removal of the M602 temporary speed limit could influence traffic volumes on the M602 and the A57 Regent Road which has the potential to impact on NO₂ compliance at this site.
- 4.1.5 In agreement with JAQU, a scenario has been tested through the current modelling to understand the implications of the removal of the M602 temporary speed limit on the Investment-led Plan.

² [TSC Word Report Template \(highwaysengland.co.uk\)](https://www.highwaysengland.co.uk)

5 Assessment on Investment-led Plan Compliance Year

5.1 Queens Road

5.1.1 As noted above, following the materialisation of the Queens Road risk, modelling indicates that compliance in 2025 with the Investment-led Plan is no longer likely as considered in the *Appraisal Report* and none of the alternative options available are considered likely to deliver compliance in 2025. As such, 2026 is considered to be the earliest likely year of compliance, meaning an assessment of the Investment-led Plan capacity to deliver compliance in that year is required.

5.1.2 The evidence base that underpinned the Investment-led Plan, submitted to JAQU in December 2023, did not include a 2026 model year for the Investment-led Plan as the Plan was modelled to achieve compliance in 2025. However, a 2026 Do-Minimum position had been developed to support the testing of the CAZ Benchmark.

5.1.3 Following the materialisation of the Queens Road risk, a 2026 Do Something forecast year was developed for the Investment-led Plan, applying the measures which were developed to achieve compliance in 2025 as reported in Section 7. The Investment-led Plan has been modelled, based on a 2026 forecast year, to achieve compliance in 2026 with no exceedances present.

5.1.4 Assuming Queens Road depot is not electrified by January 2025 and therefore full compliance is not achieved in 2025, compliance is modelled to be achieved at most exceedance sites through the Investment-led Plan in 2025 with the remaining sites, associated with ZEBs operating out the Queens Road depot, forecast to be compliant in 2026. Based on a 2026 compliance year, the Investment-led Plan measures have greater headroom with added resilience at the 2025 forecast exceedances that the bus, taxi and local measures are seeking to address, in part due to air quality improvements associated with natural fleet upgrades.

5.1.5 It is considered that ZEBs will not be required to be operated from an electrified Queens Road depot for the full year of 2026, adding further resilience to the ability of the Investment-led Plan to achieve compliance in 2026.

5.2 Summary Results for the Investment-led Plan with Queens Road delay

5.2.1 **Table 2** shows the number of sites remaining in exceedance of legal limits in 2026 under the Do Minimum and the Investment-led Plan, by local authority. The updated Investment-led Plan scenario assumes the delivery of Queens Road depot electrification by the end of 2025. The location of the modelled exceedances is presented in **Figure 1**. The results show:

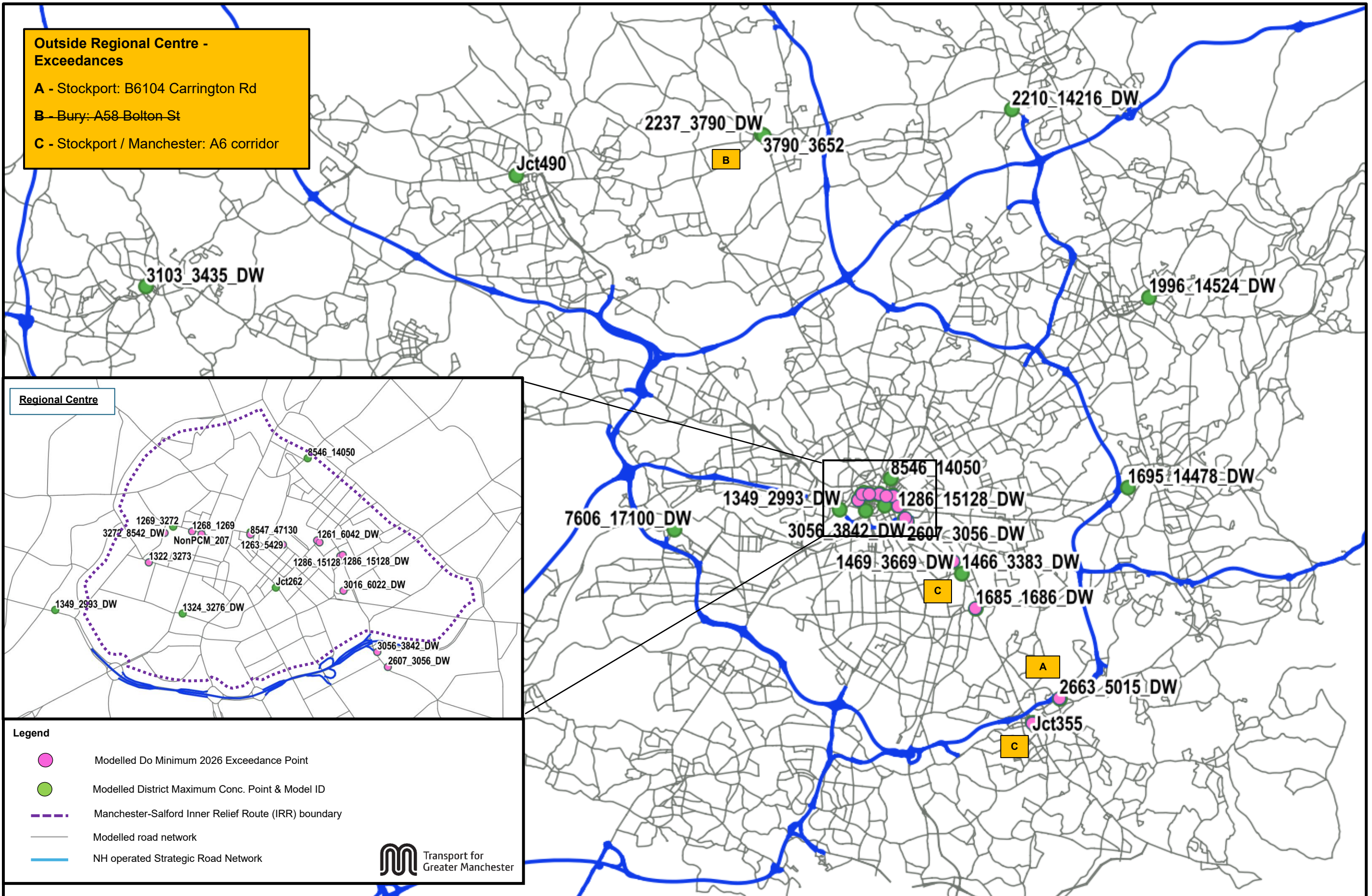
- without action, there are predicted to be 17 non-compliant sites across GM in 2026; and
- following the full operation of the Investment-led Plan in 2026 GM achieves compliance.

Table 2 Number of sites remaining in exceedance of legal limits for NO₂ concentrations in 2026, Greater Manchester, by local authority for each Investment-led Plan measure

District	2026	
	Do Min.	Investment-led Plan
Bolton	0	0
Bury	0	0
Manchester	15	0
Oldham	0	0
Rochdale	0	0
Salford	0	0
Stockport	2	0
Tameside	0	0
Trafford	0	0
Wigan	0	0
GM Total	17	0

APPROVED

Figure 1 Do Minimum 2026 Exceedance Points and Maximum Concentrations in GM



- 5.2.2 The Investment-led Plan aims to deliver compliance in the shortest possible time and to reduce human exposure to levels of NO₂ above the legal limit as quickly as possible. **Table 3** demonstrates the benefits being delivered in terms of reduced concentrations including at sites remaining in exceedance in 2026. This also shows that the number of sites close to exceedance reduces as a result of the Investment-led Plan. Health benefits continue to be delivered by reductions in NO₂ concentrations even below the legal limit.
- 5.2.3 With action, there are no sites that are non-compliant, and an increase in the number of sites predicted to have concentrations less than 35 µg/m³.

Table 3 Number of modelled sites by scale of NO₂ exceedance by year, Greater Manchester

Scenario	Compliant sites		Non-compliant sites				Change in no. of sites in exceedance
	Very compliant (below 35 µg/m ³)	Compliant but close (35 to 40 µg/m ³)	Non-compliant (40 to 45 µg/m ³)	Very non-compliant (45 to 50 µg/m ³)	Extremely non-compliant (> 50 µg/m ³)	Total non-compliant (> 40 µg/m ³)	
2026							
Do minimum	2467	56	12	5	0	17	na
Investment-led Plan	2506	34	0	0	0	0	-26

5.3 Transport and Air Quality Impacts for the Investment-led Plan

- 5.3.1 In this section the impacts of the Investment-led Plan are discussed further with reference to the key exceedance points identified earlier, examining details relating to the changes to traffic and emissions by vehicle type.
- 5.3.2 **Table 4** shows the concentration with the Investment-led Plan, at the exceedances or the highest concentration site for each district in the Do Minimum 2026 scenario.
- 5.3.3 The air quality and source apportionment data for 2026 is provided in **Table 5**, whilst the impacts on the traffic flows are provided in **Table 6**.
- 5.3.4 With the Investment-led Plan in operation, there are predicted to be no exceedances remaining in 2026. The A58 Bolton St, Bury receives an improvement of -2.3 µg/m³ as a result of the Investment-led Plan, this location would be compliant naturally in 2026, but the Investment-led Plan bus measures for this location could be implemented in 2025 and would deliver compliance in 2025.

- 5.3.5 On the A6 corridor between the Stockport depot and Piccadilly bus station in the Inner Relief Route (IRR), there are reductions of $-15 \mu\text{g}/\text{m}^3$ at A6 Piccadilly and Portland St, ranging down to $-4.7 \mu\text{g}/\text{m}^3$ at other exceedance points inside the IRR. Outside the IRR the reductions range from $-10.3 \mu\text{g}/\text{m}^3$ at A6 Stockport Road to $-5.7 \mu\text{g}/\text{m}^3$ at A6 London Rd. All exceedances on routes served by the Stockport depot are removed as a result of the bus measure.
- 5.3.6 At exceedances sites elsewhere in the IRR, the bus measure leads to reductions of between $-8.8 \mu\text{g}/\text{m}^3$ on Gartside St and $-5.9 \mu\text{g}/\text{m}^3$ on New York St.
- 5.3.7 The local traffic management (LTM) measures at the St John's Area around A34 Quay St delivered large improvements in the 2025 scenario of $-3.0 \mu\text{g}/\text{m}^3$, which would be required to deliver compliance in 2026. Great Bridgewater St is naturally compliant by 2026, as is the A57 Regent Road.

Table 4 NO₂ concentration with Investment-led Plan at key compliance sites – 2026 ($\mu\text{g}/\text{m}^3$)

Point ID	Road name	Local Authority	Do Min.	With Investment-led Plan	Total ILP Change in NO ₂ conc.
2237_3790_DW	A58 Bolton St	Bury	40.0	37.7	-2.3
3790_3652	A58 Bolton St	Bury	38.5	36.4	-2.1
3016_6022_DW	A6 Whitworth St	Manchester	47.4	36.1	-11.3
1322_3273	A34 Quay St	Manchester	46.2	36.0	-10.2
1261_6042	Portland St	Manchester	47.6	32.3	-15.3
1261_6042_DW	Portland St	Manchester	47.2	32.2	-15.0
1286_15128	A6 Piccadilly	Manchester	46.9	31.6	-15.3
3272_8542_DW	Gartside St	Manchester	44.4	35.6	-8.8
8547_47130	King St	Manchester	43.7	38.0	-5.7
1263_5429	New York St	Manchester	43.4	37.5	-5.9
1286_15128_DW	A6 Piccadilly	Manchester	44.1	30.6	-13.5
1469_3669_DW	A6 Stockport Rd	Manchester	42.6	32.3	-10.3
1268_1269	A34 Bridge St	Manchester	42.3	37.2	-5.1
2607_3056_DW	A6 Ardwick Green	Manchester	41.3	35.2	-6.1
3056_3842_DW	A6 London Rd	Manchester	41.1	35.4	-5.7
1685_1686_DW	A6 Stockport Rd	Manchester	41.3	32.1	-9.2

NonPCM_207	A34 Bridge St	Manchester	40.8	36.1	-4.7
1324_3276_DW	Great Bridgewater St	Manchester	39.4	35.6	-3.8
8547_47130_DW	King St	Manchester	40.0	35.2	-4.8
8546_14050	A664 Shudehill	Manchester	40.3	40.3	0.0
1466_3383_DW	A6 Stockport Rd	Manchester	39.8	30.5	-9.3
Jct262	Portland St	Manchester	40.0	38.6	-1.4
1269_3272	A34 Bridge St	Manchester	39.4	34.3	-5.1
1349_2993_DW	A57 Regent Rd	Salford	38.6	37.8	-0.8
Jct355	A6 Wellington Rd South	Stockport	43.5	37.3	-6.2
2663_5015_DW	B6104 Carrington Rd	Stockport	42.1	35.3	-6.8
Jct490	Vernon St	Bolton	38.0	37.9	-0.1
1996_14524_DW	A62 Bottom o' th' Moor	Oldham	38.3	38.2	-0.1
2210_14216_DW	A664 Edinburgh Way	Rochdale	37.2	37.0	-0.2
1695_14478_DW	A635 Manchester Rd	Tameside	35.4	35.3	-0.1
7606_17100_DW	B5214 Trafford Blvd	Trafford	37.0	36.5	-0.5
3103_3435_DW	King St West	Wigan	39.3	39.1	-0.2

Table 5 Predicted annual mean NO₂ concentrations and source apportionment at key compliance sites on the Greater Manchester road network – With Investment-led Plan including Bus, Taxi & LTM Measures 2026

Point ID	Census ID	Road name	Local Authority	Annual mean NO ₂ conc (µg/m ³)	BG ³ NOx conc (µg/m ³)	BG NO ₂ conc (µg/m ³)	Road NOx contrib (µg/m ³)	Road NO ₂ contrib (µg/m ³)	Traffic Flow (veh per day)	NOx contribution by vehicle type (%)					Change in Annual mean NO ₂ conc (µg/m ³)
										Bus	Taxi	HGV	LGV	Car	
2237_3790_DW	38354	A58 Bolton St	Bury	37.7	19.6	14.1	51.4	23.6	80,734	1%	6%	21%	28%	44%	-2.3
3790_3652	38354	A58 Bolton St	Bury	36.4	19.6	14.1	48.8	22.2	80,734	1%	6%	21%	28%	44%	-2.1
3016_6022_DW	46165	A6 Whitworth St	Manchester	36.1	29.4	19.9	40.5	16.2	6,870	68%	2%	4%	9%	17%	-11.3
1322_3273	27975	A34 Quay St	Manchester	36.0	32.5	21.7	32.1	14.3	13,178	0%	7%	11%	33%	49%	-10.2
1261_6042	77003	Portland St	Manchester	32.3	32.5	21.7	24.6	10.6	1,033	100%	0%	0%	0%	0%	-15.3
1261_6042_DW	77003	Portland St	Manchester	32.2	32.5	21.7	24.3	10.5	1,033	100%	0%	0%	0%	0%	-15.0
1286_15128	70158	A6 Piccadilly	Manchester	31.6	32.5	21.7	24.0	9.9	3,563	73%	2%	8%	7%	10%	-15.3
3272_8542_DW	N/A	Gartside St	Manchester	35.6	32.5	21.7	31.3	13.9	5,354	0%	8%	12%	27%	53%	-8.8
8547_47130	N/A	King St	Manchester	38.0	32.5	21.7	37.4	16.4	21,673	0%	7%	12%	28%	53%	-5.7
1263_5429	N/A	New York St	Manchester	37.5	32.5	21.7	35.4	15.8	9,753	0%	8%	7%	31%	55%	-5.9
1286_15128_DW	70158	A6 Piccadilly	Manchester	30.6	32.5	21.7	21.4	8.9	3,563	73%	2%	8%	7%	10%	-13.5
1469_3669_DW	28695	A6 Stockport Rd	Manchester	32.3	22.3	15.8	34.6	16.5	28,216	32%	5%	6%	18%	39%	-10.3
1268_1269	27974	A34 Bridge St	Manchester	37.2	32.5	21.7	36.4	15.5	12,524	36%	5%	6%	17%	36%	-5.1
2607_3056_DW	26157	A6 Ardwick Green	Manchester	35.2	29.4	19.9	31.6	15.3	33,093	17%	5%	5%	29%	43%	-6.1
3056_3842_DW	26157	A6 London Rd	Manchester	35.4	29.4	19.9	32.2	15.5	34,411	17%	6%	6%	28%	44%	-5.7
1685_1686_DW	73778	A6 Stockport Rd	Manchester	32.1	21.2	15.1	35.8	17.0	27,855	35%	4%	12%	18%	30%	-9.2
NonPCM_207	N/A	A34 Bridge St	Manchester	36.1	32.5	21.7	33.5	14.4	12,524	36%	5%	6%	17%	36%	-4.7
1324_3276_DW	N/A	Great Bridgewater St	Manchester	35.6	27.0	18.6	39.3	17.0	10,148	0%	6%	22%	28%	45%	-3.8
8547_47130_DW	N/A	King St	Manchester	35.2	32.5	21.7	30.5	13.6	21,673	0%	7%	12%	28%	53%	-4.8
8546_14050	57427	A664 Shudehill	Manchester	40.3	32.5	21.7	33.8	14.2	10,834	39%	5%	10%	15%	32%	0.0
1466_3383_DW	7946	A6 Stockport Rd	Manchester	30.5	22.3	15.8	29.6	14.7	25,127	28%	5%	7%	19%	40%	-9.3
Jct262	N/A	Portland St	Manchester	38.6	29.4	19.9	39.9	18.7	4,882	87%	1%	1%	6%	5%	-1.4
1269_3272	27974	A34 Bridge St	Manchester	34.3	32.5	21.7	30.8	12.7	12,064	45%	4%	10%	15%	26%	-5.1
1349_2993_DW	73792	A57 Regent Rd	Salford	37.8	22.7	16.0	47.0	21.8	55,130	0%	6%	18%	31%	45%	-0.8

³ BG = Background

Jct355	N/A	A6 Wellington Rd South	Stockport	37.3	21.9	15.5	45.5	21.8	24,888	18%	5%	11%	26%	39%	-6.2
2663_5015_DW	N/A	B6104 Carrington Rd	Stockport	35.3	17.5	12.7	49.1	22.6	18,037	20%	3%	31%	25%	21%	-6.8
Jct490	N/A	Vernon St	Bolton	37.9	23.7	16.6	44.4	21.2	10,302	14%	5%	6%	34%	40%	-0.1
1996_14524_DW	36632	A62 Bottom o' th' Moor	Oldham	38.2	23.9	16.7	43.7	21.5	33,692	31%	4%	8%	22%	34%	-0.1
2210_14216_DW	17322	A664 Edinburgh Way	Rochdale	37.0	16.7	12.2	58.0	24.8	34,720	0%	4%	42%	26%	28%	-0.2
1695_14478_DW	99618	A635 Manchester Rd	Tameside	35.3	24.1	16.8	38.9	18.5	46,720	0%	6%	17%	34%	43%	-0.1
7606_17100_DW	N/A	B5214 Trafford Blvd	Trafford	36.5	17.9	13.0	49.1	23.5	28,942	37%	4%	19%	11%	30%	-0.5
3103_3435_DW	N/A	King St West	Wigan	39.1	27.2	18.6	45.6	20.6	7,194	79%	1%	8%	5%	7%	-0.2

APPROVED

Table 6 Predicted impact on traffic flows at key compliance sites on the Greater Manchester road network – With Investment-led Plan including Bus, Taxi & LTM Measures 2026

Point ID	Local Authority	Do Min : Total AADT Flows (no. veh per day)									ILP : Change in AADT Flows (no. veh per day) from Do Min.								
		All Vehicles	Taxi (comp)	Taxi (non-comp)	HGV (comp)	HGV (non-comp)	LGV (comp)	LGV (non-comp)	Car (comp)	Car (non-comp)	All Vehicles	Taxi (comp)	Taxi (non-comp)	HGV (comp)	HGV (non-comp)	LGV (comp)	LGV (non-comp)	Car (comp)	Car (non-comp)
2237_3790_DW	Bury	80,745	4,187	373	1,675	107	9,883	1,961	57,133	4,417	-11	374	-373	0	0	-19	-6	12	0
3790_3652	Bury	80,745	4,187	373	1,675	107	9,883	1,961	57,133	4,417	-11	374	-373	0	0	-19	-6	12	0
3016_6022_DW	Manchester	6,899	350	31	53	03	670	130	4,761	368	-29	25	-31	-3	0	-12	-2	-6	-2
1322_3273	Manchester	14,131	765	68	295	19	1,925	376	9,761	755	-953	-11	-68	-61	-4	-33	-3	-710	-59
1261_6042	Manchester	1,033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261_6042_DW	Manchester	1,033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1286_15128	Manchester	3,610	194	21	56	04	364	71	1,946	172	-48	34	-21	0	0	1	0	-70	3
3272_8542_DW	Manchester	6,403	371	33	130	08	690	135	4,558	353	-1,049	-14	-33	-20	-1	-63	-12	-847	-52
8547_47130	Manchester	21,707	1,170	103	392	25	2,466	481	15,477	1,187	-34	100	-103	1	0	-22	-5	-4	1
1263_5429	Manchester	9,804	545	48	193	12	1,226	238	6,769	521	-51	42	-48	0	0	-17	-3	-21	-3
1286_15128_DW	Manchester	3,610	194	21	56	04	364	71	1,946	172	-48	34	-21	0	0	1	0	-70	3
1469_3669_DW	Manchester	28,281	1,476	131	465	30	3,150	615	20,044	1,551	-64	123	-131	11	1	-9	-2	-51	-6
1268_1269	Manchester	11,917	594	53	170	11	1,234	241	7,901	609	608	86	-53	15	1	58	11	452	33
2607_3056_DW	Manchester	33,383	1,585	139	568	36	4,792	935	22,431	1,730	-290	141	-139	1	0	8	1	-249	-53
3056_3842_DW	Manchester	34,685	1,652	145	575	37	4,774	932	23,584	1,810	-274	150	-145	1	0	30	6	-265	-50
1685_1686_DW	Manchester	27,873	1,458	131	515	33	3,303	646	19,351	1,505	-19	128	-131	-1	0	3	0	-20	2
NonPCM_207	Manchester	11,917	594	53	170	11	1,234	241	7,901	609	608	86	-53	15	1	58	11	452	33
1324_3276_DW	Manchester	10,726	598	55	328	21	1,605	313	7,118	571	-578	-16	-55	23	1	-187	-36	-275	-30
8547_47130_DW	Manchester	21,707	1,170	103	392	25	2,466	481	15,477	1,187	-34	100	-103	1	0	-22	-5	-4	1
8546_14050	Manchester	10,825	606	53	191	12	1,033	201	7,118	546	9	52	-53	0	0	-1	0	13	-1
1466_3383_DW	Manchester	25,107	1,332	118	516	33	2,823	551	17,509	1,369	20	121	-118	3	0	28	6	-20	0
Jct262	Manchester	4,638	181	18	90	6	705	138	1,661	163	244	21	-18	2	0	-28	-4	269	2
1269_3272	Manchester	12,669	669	60	200	13	1,307	255	8,413	650	-605	33	-60	-16	-1	-22	-4	-501	-30
1349_2993_DW	Salford	56,881	2,699	238	2,446	156	8,655	1,681	37,739	2,900	-1,752	162	-238	31	2	-280	-61	-1,251	-106
Jct355	Stockport	24,866	1,200	107	1,097	70	3,486	673	16,200	1,255	22	111	-107	-6	-1	23	5	-3	1

2663_5015_DW	Stockport	18,048	725	65	1,709	109	3,782	743	9,659	754	-11	66	-65	13	1	-19	-3	-3	0
Jct490	Bolton	10,314	497	44	160	10	1,815	354	6,747	521	-12	43	-44	1	0	-2	-1	-8	-1
1996_14524_DW	Oldham	33,692	1,653	148	934	60	4,907	959	22,747	1,736	0	144	-148	-1	0	34	6	-31	-3
2210_14216_DW	Rochdale	34,721	1,647	146	2,174	139	5,238	1,020	22,443	1,732	-1	144	-146	-2	0	-4	-1	8	-1
1695_14478_DW	Tameside	46,718	2,220	198	2,393	153	7,404	1,447	30,148	2,349	2	197	-198	-3	0	19	6	-11	-7
7606_17100_DW	Trafford	28,958	1,485	130	1,760	112	2,362	461	20,235	1,590	-16	133	-130	-13	-1	5	1	-11	0
3103_3435_DW	Wigan	7,198	316	29	330	21	855	167	3,985	319	-4	28	-29	0	0	-26	-5	28	1

APPROVED

5.3.8 The potential for rerouting from the LTM measures is described in the AQ3 report for 2025 and would be very similar in terms of impacts in 2026 with no material impact on compliance at other sites.

5.4 M602

5.4.1 The Do Minimum and Do Something forecast scenarios modelled for the Investment-led Plan assume that National Highways' reduced speed limit on the M602 (60mph) will remain in place through the forecast modelled years (2025 and 2026). As National Highways have now informed TfGM that they are planning to remove the reduced speed limit, it has been agreed with JAQU that a scenario is tested, based on modelling conducted to date, to understand the implications of this change to the Investment-led Plan.

5.4.2 The model test has been conducted to test the compliance impact on the Investment-led Plan. This test reverts to the original model coding of M602 operating with a 70mph speed limit, which involves an increase in the modelled free flow speed along M602 Junctions 1 to 3. The focus of this test is on the compliance impact at the A57 Regent Road exceedance site which is located to the east of the M602 and one of the main feeder roads downstream from the motorway.

5.4.3 The traffic results show flow changes on the M602 are typically less than 50 passenger car units (PCU) with small reassignment impacts from parallel routes. Flow changes at the A57 Regent Road exceedance site are less than 15 PCUs.

5.4.4 In air quality terms, there is some switching of traffic from the A580/A6 corridor onto the M602/A57 Regent Road corridor however this does not impact the number of exceedances in the Do Minimum.

5.4.5 In the Investment-led Plan scenario for 2025, whilst there are relatively low impacts across the network in part because the A57 Regent Road local measures add delays at the east end of the corridor, there is an increase of 0.1 ug/m^3 at the A57 Regent Road, Salford. In 2025 the change to the M602 speed limit could therefore impact on compliance. However, by 2026 the A57 concentration has reduced by approximately 2 ug/m^3 , so this level of NO_2 impact due to alteration to the M602 would not be expected to delay compliance in 2026.

5.4.6 The change to the M602 speed limit would not have a material impact on the capacity of the Investment-led Plan to achieve compliance with in 2026.

5.5 Summary

5.5.1 The output of these scenarios mean that the earliest possible year of compliance is now 2026, and the remainder of this document assesses the Investment-led Plan and the CAZ Benchmark on this basis.

6 Updated Comparative Appraisal

6.1.1 This section provides a comparative appraisal between the Investment-led Plan and the CAZ Benchmark, as shown in **Table 7**, reflecting the impacts associated with a delay to the electrification of Queens Road depot. This means that the Investment-led Plan with Queens Road delay, and the CAZ Benchmark are each scored on the basis of 2026 being the earliest possible year of compliance. For ease of comparison the table below also includes the original scoring of the Investment-led Plan without any Queens Road delay, which was scored on the basis of compliance being delivered in 2025, including the level of certainty and risk associated with delivery in that compliance year.

6.1.2 National Highways' removal of the reduced speed limit on the M602, between Junctions 1 and 3, is not considered to have a material impact on the Investment-led Plan which incorporates the delivery issue at Queens Road and therefore this issue has not been directly addressed in commentary below. The term 'Investment-led Plan (QR delay)' refers to the Investment-led Plan which considers the delivery issue at Queens Road.

6.1.3 For consistency, the appraisal has been carried out in the same manner as the appraisal in the *Appraisal Report*, adopting the approach set out in Section 6 of that Report and adopting the same Critical Success Factors (CSFs), against the scale criteria as set out by JAQU Option Appraisal Guidance. This approach consists of an appraisal of the following CSFs:

- Determining Success Factor: Scored based on a Pass/Fail criteria.
- Primary & Secondary Success Factor: Scored based on a four-point scale as follows:

✓✓	Excellent
✓	Good
-	Satisfactory or no score
×	Poor

6.1.4 It should be noted that this appraisal has been scored in relative terms between each scenario based on the above four-point scale. Because of the nature of this scale if two options achieve the same score (e.g. "Good") this does not necessarily mean there is no absolute difference between each scenario but that, applying appropriate professional judgement, each option can be considered "Good" in relation to the relevant CSF. Where options achieve the same score but deliver materially different benefits or disbenefits or raise different issues this is noted in the final column of the table below.

- 6.1.5 It should also be noted that the Investment-led Plan without a delay to the Queens Road depot electrification delivered compliance in 2025 so inherently delivers benefits quicker than the Investment-led Plan with the delay to the Queens Road depot. This is not always reflected in the scoring since the Investment-led Plan was assessed against a compliance year of 2025 whereas the Investment-led Plan with Queens Road depot electrification is assessed against a compliance year of 2026.
- 6.1.6 The updated comparative appraisal summary demonstrates that the Investment-led Plan remains the only option tested which passes the Determining Success Factor and meets the obligation of the 10 GM Authorities to deliver compliance in the shortest possible time and by 2026 at the latest. Modelled compliance is not achieved in either 2025 or 2026 under the CAZ Benchmark which thus fails against the Determining Success Factor.
- 6.1.7 The appraisal also demonstrates that the Investment-led Plan performs better against other CSFs relative to the CAZ Benchmark. The Investment-led Plan, with a delay to the electrification of Queens Road depot to the end of 2025, performs better than the CAZ Benchmark against the Primary CSFs in that it delivers greater reductions in NO₂ exceedances in each year, and does so earlier than the CAZ Benchmark.
- 6.1.8 The Investment-led Plan also performs better than the CAZ Benchmark against the Secondary CSFs. It is a better strategic fit in terms of air quality and climate change (delivering greater air quality benefits), transport (providing additional cleaner buses that will continue to give benefits after compliance is achieved), growth and economy (by not imposing charges on users it removes the risk of restricting growth or damaging businesses). It remains better VfM than the CAZ Benchmark, delivering better air quality benefits at a lower cost, and its distributional health benefits, affordability for users and quality of life impacts are preferable to the CAZ Benchmark.
- 6.1.9 Fundamentally, the Investment-led Plan is considered more affordable and therefore more deliverable than the CAZ Benchmark.

Table 7 CSF Appraisal Summary - Updated

Success Factor	Code	ILP	ILP QR delay	CAZ	Summary
Determining Success Factor					
Compliance in the shortest possible time Which scenario reduces to zero the number of locations predicted to be in exceedance of the legal limits of NO ₂ concentrations in the shortest time?	C1	Pass	Pass	Fail	The Investment-led Plan (QR delay) ⁴ is now forecast to achieve compliance in 2026 which is now considered to be the shortest possible time for achieving compliance in GM. The CAZ Benchmark is modelled to not achieve compliance in 2026 with 16 sites modelled to remain in exceedance. Therefore, the Investment-led Plan continues to 'pass' the determining success factor whereas the CAZ Benchmark 'fails' based on compliance in the shortest possible time.
Primary Success Factors					
Reduction in NO₂ emissions Which scenario delivers... The greatest reduction in the number of locations in exceedance (presumed to represent human exposure) in each year?	N1	✓✓	✓✓	✓	The Investment-led Plan (QR delay) is modelled to deliver significant reductions in the number of locations in exceedance with no sites forecast to remain in exceedance in 2026. The Investment-led Plan (QR delay) continues to deliver incremental air quality benefits in 2025 with the remaining air benefit provided by ZEBs operating out of Queens Road depot in 2026. The CAZ Benchmark is modelled to reduce the number of exceedance sites in 2026 from 17 to 16 with compliance not achieved across all sites and the estimated realistic 'go-live' date is not until July 2026, limiting potential reductions in human exposure.
The greatest reduction In NO ₂ concentrations at the roadside in each year prior to compliance being achieved?	N2	✓	-	✗	AQ benefits from the deployment of cleaner (OEM Euro VI and zero emission) buses are planned to be delivered incrementally prior to 2026 which captures benefits ahead of the modelled full year compliance in 2026 for the Investment-led Plan (QR delay). The different components of the local measures will deliver benefits ahead of 2026 alongside funding for taxis. However, on the basis that Queens Road is not operational by January 2025, the Investment-led Plan (QR delay) will not deliver compliance to all sites in 2025 and 2026 would be the first full year of compliance and therefore the Investment-led Plan (QR delay) scores lower than it did without that delay. The CAZ Benchmark's realistic programme assumption to open the funds in January 2026 and 'go-live' with the zone in July 2026 will delay air quality benefits from this scenario beyond those accrued under the Investment-led Plan (QR delay).

⁴ The Investment-led Plan (QR delay) refers to the Investment-led Plan which incorporates the delivery issue at Queens Road which means that the earliest possible year of compliance is now 2026.

Success Factor	Code	ILP	ILP QR delay	CAZ	Summary
Compliance without putting other sites closer to exceedance (defined as concentrations of 38-40 µg/m ³) than without action?	N3	✓	✓	✓	<p>The Investment-led Plan (QR delay) is modelled to deliver compliance without putting other sites into exceedance. The implementation of cleaner buses on routes past remaining exceedance sites are new to purchase and are not being redeployed from existing services elsewhere in GM. There is some local re-routing associated with the implementation of the local highway measures which inherently are modelled to cause some rerouting to reduce flow and speeds past the areas of remaining exceedance.</p> <p>The CAZ Benchmark is modelled to result in some minor rerouting for trips through the Regional Centre albeit the volumes are modelled to be minor.</p>
Feasibility Are the Measures proposed within the legal powers of the GM Authorities?	F1	✓✓	✓✓	✓✓	The GM Authorities have the relevant legal powers to implement the Investment-led Plan or CAZ Benchmark.
Can a governance route be developed to enable timely local government joint working as required for delivery?	F2	✓	✓	✓	The GM Authorities have proposed a governance route that facilitates the local government co-operation required for delivery the Investment-led Plan and CAZ Benchmark. Bus franchising is being rolled out across GM from September 2023 and the necessary governance arrangements are in place and live for the deployment of Euro VI and ZEBs based on GM's requirements.
What is the likelihood of the Measures being effective?	F3	✓✓	✓✓	✗	<p>Only the Investment-led Plan measures are modelled to be effective and achieve compliance in the shortest possible time and by 2026 at the latest. Whilst the Queens Road delay means the Investment-led Plan's (QR delay) forecast year of compliance is now 2026, this is still ahead of the CAZ Benchmark and is now considered to represent the shortest possible time to deliver compliance.</p> <p>Certainty of modelled compliance being delivered can be provided through GM's ability to specify particular buses on remaining exceedance locations through bus franchising. The GM Authorities are also to implement targeted local highway measures and implementation of a consistent emission standard for GM-licensed taxis.</p> <p>Conversely, the modelled results for the CAZ Benchmark show that this scenario is not effective in achieving the requirements of the Direction.</p>
Is delivery of the scenario subject to significant risks that make achieving	F4	✓	✓	✗	The Investment-led Plan is aligned with GM strategic politically endorsed plans. There are risks associated with the delivery of electrification of depots, availability of cleaner buses, local measure delivery at A57 Regent Road and A34 Quay Street and modelling uncertainties. There is recognition that one of the identified risks at the Queens Road depot has materialised, with depot electrification

Success Factor	Code	ILP	ILP QR delay	CAZ	Summary
compliance in the shortest possible time less likely?					<p>fundamental to achieving compliance in 2025 through the Investment-led Plan. However, the quantum and profile of risk associated with the Investment-led Plan with the Quens Road delay remains consistent.</p> <p>The CAZ Benchmark test has failed to produce modelled compliance by 2026. It is considered that the CAZ Benchmark cannot realistically be operational until July 2026 and does not achieve compliance with the requirements of the direction.</p>
Secondary Success Factors					
Strategic fit with local strategies and plans Air quality and climate change	S1	✓✓	✓✓	✓	Both the Investment-led Plan and the CAZ Benchmark are modelled to deliver improvements in NO ₂ concentrations, and also reduce PM and greenhouse gas emissions. However, the CAZ Benchmark fails to meet the requirements of the Direction.
Transport	S2	✓✓	✓✓	-	<p>The Investment-led Plan acts to promote sustainable travel and will deliver a cleaner, newer bus and taxi fleet for GM passengers.</p> <p>The CAZ Benchmark acts to promote more environmentally friendly travel and will deliver incentives to upgrade HGVs, LGVs, taxis, coaches and minibuses that would otherwise be subject to a Daily Charge albeit the impact of the Daily Charge on impacted vehicles is not fully mitigated by the supporting funding.</p>
Growth	S3	✓	✓	-	The Investment-led Plan does not seek to impose charges on users which could restrict growth being brought forward by nine of the 10 GM local authorities via the Places for Everyone Joint Development Plan and Stockport's Local Plan. There is a risk that investment is deterred in the Regional Centre under the CAZ Benchmark associated with the impact of a charge for non-compliant vehicles.
Economy	S4	✓	✓	-	<p>The Investment-led Plan is not considered to have a negative impact on the economy. The implementation of a consistent emission standard across the 10 GM local authorities would require taxi owners and operators to respond to continue operating in GM, licensed to a GM local authority. However, the CTF measure does provide financial support for those upgrading to compliant vehicles.</p> <p>There is a risk that the CAZ Benchmark could affect economic performance by adding an additional financial burden for some businesses.</p>
Value for money Estimated value for money of the scenario	V1	-	-	x	It would be more cost effective to not provide financial support to buses and taxis and defer to natural upgrade cycles however this would result in GM not meeting the requirements of the Direction. The Investment-led Plan (QR delay) is now forecast to achieve compliance in 2026 unlike the CAZ Benchmark scenario which fails to achieve compliance in 2026.

Success Factor	Code	ILP	ILP QR delay	CAZ	Summary
compared to the risk of inaction					<p>The CAZ Benchmark would generate revenues through daily charges on non-compliant vehicles travelling through the Regional Centre however this is expected to be outweighed by the costs to implement and operate this scenario.</p> <p>Costs to implement and manage both scenarios are higher than the expected quantifiable benefits however this is not the determining factor compared to the risk of inaction.</p>
Distributional impact Health benefits	Q1	✓✓	✓✓	✓	<p>All groups will experience health benefits from the scenarios. Those living in areas with the worst air quality and those most vulnerable to the effects of poor air quality will benefit the most. The health benefits of the Investment-led Plan are likely to be more spatially distributed across the 10 Authority areas compared to the CAZ which is believed to concentrate the air quality benefits within the Regional Centre, aligned to the scenario's boundary.</p> <p>Under the Investment-led Plan, there is also expected to be a disproportionately higher benefit from those living in the Regional Centre through the operating patterns of buses and taxis. Whilst the Investment-led Plan (QR delay) delivers health benefits slightly later compared with the original Investment-led Plan (excluding QR delay) it is still considered to be 'Excellent' overall and comparatively better than a CAZ Benchmark.</p>
Accessibility (in terms of journey time and connectivity to opportunities and services)	Q2	-	-	-	<p>The Investment-led Plan does not have a material impact in relation to accessibility. At a local level, accessibility for residents in and around the Regent Road and Quay St areas could be impacted, depending upon design solution taken forward.</p> <p>The CAZ Benchmark is modelled to have limited rerouting for trips passing through the Regional Centre. However, this has been minimised based on the CAZ boundary to border the insider of the Manchester and Salford Inner Ring Road.</p>
Affordability (for users)	Q3	✓	✓	×	<p>The Investment-led Plan does not impose charges on users and is therefore considered to not have an adverse affordability impact. There is a small adverse impact on non-compliant taxi owners and operators as a result of the proposed consistent emission standards, however, this is expected to be balanced by the provision of funding to support upgrades to all affected vehicles and additional funding to support compliant ICE Hackney Carriages to upgrade to cleaner, ZEC vehicles.</p>

Success Factor	Code	ILP	ILP QR delay	CAZ	Summary
					The CAZ Benchmark would include a Daily Charge on non-compliant vehicles in the Regional Centre and therefore has an adverse impact on user affordability as supporting mitigation funding does not fully cover the impact of upgrading to a compliant vehicle.
Impact on the local economy – considering low income workers, small businesses, town centres and key sectors	Q4	✓	✓	✗	<p>The Investment-led Plan does not impose charges on users and is therefore considered to not have an adverse impact on the local economy, workers and users.</p> <p>The CAZ Benchmark includes a Daily Charge which is likely to disproportionately impact low income workers and small businesses, particularly those who require vehicle access to the Regional Centre on a frequent basis.</p>
Impact on the quality of life of local residents and on equalities	Q5	✓	✓	-	<p>The Investment-led Plan and the CAZ Benchmark are modelled to provide air quality benefits and reduce human exposure to NO₂, leading to improvements in physical health. The CAZ Benchmark disproportionately benefits the Regional Centre whilst having a negligible impact to outer sites. Conversely, the Investment-led Plan is anticipated to have a more dispersed impact across GM albeit retaining a higher Regional Centre benefit associated with the operating patterns of taxis and buses.</p> <p>Both versions of the Investment-led Plan are forecast to deliver compliance sooner than a CAZ Benchmark and achieve the requirements of the Direction and thus has a higher beneficial impact on the quality of life of local residents and equalities compared to the CAZ Benchmark which fails to achieve compliance in the final forecast modelled year. Whilst the Investment-led Plan (QR delay) benefits slightly later compared with the original Investment-led Plan (excluding QR delay), it is still considered to be 'Good' overall and comparatively better than a CAZ Benchmark.</p>
Deliverability The Affordability of the cost of implementation (for the public sector)	D1	-	-	✗	<p>Whilst the Investment-led Plan is modelled to achieve the core objectives, it is estimated that £15.2m of additional funding will be required from government based on the previously awarded funding amount.</p> <p>The CAZ Benchmark would include revenues from the CAZ which would contribute towards the operating costs of the CAZ. The CAZ boundary is based on a different geography (Regional Centre as opposed to GM-wide) to the Previous GM CAP and thus, there are additional signage and camera requirements which cannot be utilised from the Previous GM CAP. It is estimated that £61.9m of additional funding will be required from government based on the previously awarded funding.</p> <p>Whilst the costs of each scenario are above the total of the previous funding award by JAQU, minus the committed funding, the Investment-led Plan is cheaper than the CAZ Benchmark.</p>

Success Factor	Code	ILP	ILP QR delay	CAZ	Summary
The Supply-side capacity and capability to deliver the Measures outlined in the scenario	D2	-	-	-	There are some concerns about supply-side capacity within the taxi sector, particularly on the availability of second-hand Hackney Carriages as the GM non-compliant vehicle population exceeds the number of available, compliant second-hand vehicles which impacts both the Investment-led Plan and CAZ Benchmark. The GM Authorities have certainty on the ability to procure cleaner buses to operate at remaining exceedance locations however there is an availability risk around the quantify of vehicles that the GM Authorities are seeking to procure.
The Achievability of delivering the scenario, considering issues such as difficulty with scale or obtaining resources to implement and operate a Measure/ scenario	D3	✓	✓	-	<p>The Investment-led Plan comprises of three core measures. They are: bus measures, taxi measures and local highway measures.</p> <ul style="list-style-type: none"> The bus measures form part of the implementation of bus franchising across GM and it is considered that the number and distribution of ZEBs and OEM Euro VIs required can be delivered within the required timescales. However, delivery of cleaner buses is contingent on the availability of a sufficient number of vehicles and ZEB specifically, and the electrification of depots to provide the necessary EV charging infrastructure. The taxi measures comprise of provision of financial support to non-compliant, GM-licensed vehicle owners and the implementation of a consistent emissions standard across the 10 GM local authorities for all vehicles by the 31st December 2025. There is a risk that non-compliant taxis, licensed to a GM local authority, could re-license to a non-GM local authority to continue to operate their non-compliant vehicle. This risk is only associated to PHVs which have the ability to operate outside of their licensed authority. However, the provision of financial support to help non-compliant taxi owners upgrade provides mitigation and the incentive is likely to be attractive for vehicle owners to potentially bring forward their vehicle upgrade outside of their natural upgrade cycle. The local highway measures comprise of changes to speed limits, junction signals and measures to reduce through traffic. These measures are being delivered by Manchester and Salford Local Authorities and TfGM. A delivery programme is being confirmed with the lead parties and there is an associated delivery risk with this. <p>The CAZ Benchmark is considered to be deliverable on the basis of the GM Authorities' prior knowledge of the scheme and ability to procure the necessary services/agree contracts. However, fundamentally, the CAZ Benchmark does not achieve compliance with the Direction. Furthermore, based on schedule estimates, the CAZ Benchmark cannot realistically be implemented until July 2026.</p>

7 Cost Impact

- 7.1.1 The delay to the electrification of Queens Road depot has a minimal impact on the implementation costs set out in the *Appraisal Report*, submitted as part of the Summer 2024 evidence submission. Furthermore, there are no cost implications related to M602 reduced speed limit removal.
- 7.1.2 As the Investment-led Plan is modelled to achieve compliance in the shortest possible time and by 2026 at the latest considering the Queens Road depot electrification delay and M602 reduced speed limit removal, GM has concluded that there will be no significant operational, or whole life costs implications to the Investment-led Plan.
- 7.1.3 Therefore, GM's position is to not change any of the costs set out in Section 7.6 of the *Appraisal Report*.

APPROVED

8 Value for Money

- 8.1.1 This section provides a high-level summary of the approach taken to assess the Value for Money (VfM) of the Investment-led Plan (including the Queens Road delay) and the CAZ Benchmark scenarios and the materiality on VfM impacts arising from the Queens Road delay and M602 issues.
- 8.1.2 **Table 8** sets out the updated assessment of VfM impact for the Investment-led Plan, Investment-led Plan (QR delay) and CAZ Benchmark based on identified metrics and proposed assessment type as reported in the *Appraisal Report*. This Supplementary Appraisal Report does not include a full Cost Benefit Analysis which is included for the original Investment-led Plan as part of the *Value for Money Note*. Based on the pragmatic and proportionate approach adopted, reproducing an updated version of this analysis for an Investment-led Plan (QR delay) scenario is not considered necessary, since the quantified relative difference of the Investment-led Plan (QR delay) in VfM terms is considered to remain consistent with the analysis previously undertaken.
- 8.1.3 Consistent with the approach to assess the impact of the Investment-led Plan (QR delay) in other sections of this report, National Highways' removal of the reduced speed limit on the M602 does not have a material impact on the outcomes of the Investment-led Plan (QR delay) and therefore this issue has not been directly considered in the scoring of this scenario.

Table 8 Assessment of VfM impacts - updated

Impact	Assessment
Economy	
Business travel times and reliability	<ul style="list-style-type: none"> Both GM CAP scenarios would result in businesses upgrading to newer vehicles, meaning that they are less likely to be affected by reliability issues. These vehicles are also more likely to be fuel efficient, improving travel times and costs. The relative scale of benefits from vehicle upgrades is higher in the CAZ Benchmark scenario compared to Investment-led Plan as the latter is constrained to provision of funds for taxis only. The Investment-led Plan proposes to provide additional funding to support the upgrade of retrofitted buses to OEM Euro VI or ZEB, whereas there is no such assumed investment as part of the CAZ Benchmark scenario due to the funding already invested through the CBF on retrofitted and replaced buses. The newer bus fleet may incentivise a higher public transport use under the Investment-led Plan scenario; however, the likely trip transfer is assumed to be low. The introduction of a charging zone under the CAZ Benchmark could have travel time disbenefits for businesses. Businesses operating with non-compliant vehicles will be faced with a choice: pay the daily charge and use the most efficient route in the Regional Centre or avoid the daily charge and re-route around the Regional Centre. Although the assumed number of trips are low, those who select the latter option may experience an increase in journey times. Overall, it is concluded that the CAZ Benchmark is likely to have a relative higher adverse impact compared to the Investment-led Plan on the basis that the potential trip rerouting impact is more widespread albeit in both scenarios' impacts are considered to be low. Investment-led Plan (QR delay) Impact: There are no further business travel times and reliability impacts to the Investment-led Plan scenario as a result of the Queens Road issue.
Business costs and revenues	<ul style="list-style-type: none"> The CAZ Benchmark scenario has the potential to result in higher business costs compared to the Investment-led scenario. Under a Regional Centre Class C CAZ, businesses that operate within the Regional Centre are likely to be disproportionately adversely impacted by the CAZ. This may be directly or indirectly in the case that customers or the supplier chain are impacted by operating non-compliant buses. Whilst the provision of financial support for affected vehicles is expected to reduce the adverse impact, it does not eliminate the adverse impact on non-compliant vehicles that are travelling to/and from the Regional Centre. There is anticipated to be a limited adverse impact from the Investment-led Plan on taxis, associated with the alignment of a consistent emission standard across the 10 GM local authorities by 31st December 2025, which may require taxi owners / operators to upgrade their vehicle earlier than they otherwise would have done so. However, this is likely to be outweighed in most cases by the provision of financial support to non-compliant, GM-licensed taxis. There is also financial support proposed for ICE compliant, GM-licensed Hackney Carriages to upgrade to a ZEC Hackney Carriage. It should be stated that the impact of implementation of a consistent emission standard is not equal across the 10 GM local authorities based on their current status of emission standards; however, for five of the 10 GM local authorities, it will result in bringing forward the emission standard date by approximately three months. Overall, it is concluded that the Investment-led Plan would provide a low positive impact on business costs on revenues on the basis of provision of funds to support bus upgrades and upgrade of compliant taxis to ZEC vehicles, which therefore goes beyond the population that would be affected by the

Impact	Assessment
	<p>implementation of a consistent emission standard. By comparison, the charge associated with the CAZ Benchmark would potentially adversely impact all non-compliant vehicle types under a Class C and whilst the supporting mitigation funding would lessen the cost of upgrade.</p> <ul style="list-style-type: none"> • Investment-led Plan (QR delay) Impact: There are no further business cost and revenue impacts to the Investment-led Plan scenario as a result of the Queens Road issue.
Social	
Commuter / other travel times and reliability	<ul style="list-style-type: none"> • Modelling identifies limited changes to travel time in both scenarios due to local re-routing associated with the Regional Centre CAZ and the local highway measures associated with the Investment-led Plan. • There are a number of cancelled trips as a result of the CAZ Benchmark scenario. However, the number is low and so this is not expected to have a material impact on travel times / reliability. • Consistent with the 'economy' assessment, the CAZ Benchmark is likely to have a relative higher adverse impact compared to the Investment-led Plan on the basis that the potential trip rerouting impact is more widespread albeit both scenario impacts are considered to be low. • Investment-led Plan (QR delay) Impact: There are some minor commuter / travel time benefits associated with National Highways' decision to remove the temporary reduced speed limit on the M602 however this is not considered to have a significant impact to travel times due to the lack of alternative routes over 60 mph. In any event, it is considered that the M602 speed limit change would impact the Investment-led Plan and the CAZ Benchmark in equal measure.
Amenity benefits	<ul style="list-style-type: none"> • Both scenarios incentivise upgrades to newer vehicle fleets. The CAZ Benchmark scenario is estimated to fund a higher number of vehicles compared to the Investment-led Plan, although albeit these will be largely private commercial vehicles. • The Investment-led Plan focuses fleet upgrades on new buses and on new and second-hand taxis. • In both scenarios, the amenity benefits are likely to be low, albeit upgrades to newer buses and taxis provider wider benefits to passengers. • The CAZ Benchmark is expected to provide a wider amenity benefit to different vehicle owners from the upgrades of eligible vehicles that are captured as part of CAZ Class C, albeit the level of benefit is low. However, the Investment-led Plan is likely to achieve a higher amenity benefit from buses and taxis, compared to these vehicles under a CAZ Benchmark. • Investment-led Plan (QR delay) Impact: There are no further material impacts on amenity benefit considered as part of this scenario. Although, there are fewer ZEBs compared to the original plan, there is an increase in the total number of new cleaner buses supported by 77 OEM Euro VI buses in addition to 40 new ZEBs. There are no changes to the number of taxis expecting to be upgraded.
Environment	
Carbon emissions	<ul style="list-style-type: none"> • Both scenarios deliver a reduction in carbon emissions and associated benefits from investment in newer fleets and local highway measures associated with the Investment-led Plan. It is modelled that both scenarios deliver a higher emissions reduction in the Regional Centre than elsewhere in GM due to the extent of the CAZ boundary and the emissions benefit derived from buses and taxis, which have higher volumes operating in the Regional Centre. • The carbon emissions reduction from the Investment-led Plan is modelled to be higher than the CAZ Benchmark, although the spatial distribution of benefits

Impact	Assessment
	<p>is broadly similar between the two scenarios with a higher concentration of benefits located in the Regional Centre.</p> <ul style="list-style-type: none"> • Investment-led Plan (QR delay) Impact: In this scenario the Investment-led Plan would still deliver greater and quicker carbon reduction benefits compared to a CAZ Benchmark albeit the emissions benefit associated with buses operating from Queens Road will likely be delayed/redistributed from 2025 to 2026.
Local air quality emissions	<ul style="list-style-type: none"> • Similar to the carbon emissions benefits, both scenarios deliver a reduction in local air quality emission and associated benefits from investment in newer fleets and local highway measures associated with the Investment-led Plan. It is modelled that both scenarios deliver a higher emissions reduction in the Regional Centre than elsewhere in GM due to the extent of the CAZ boundary and the emissions benefit derived from buses and taxis which have higher volumes operating in the Regional Centre. • The local air quality emissions reduction from the Investment-led Plan is modelled to be higher than the CAZ Benchmark, although the spatial distribution of benefits is broadly similar between the two scenarios with a higher concentration of benefits located in the Regional Centre. • Investment-led Plan (QR delay) Impact: Similar to the anticipated impact on carbon emissions, the Investment-led Plan in this scenario would still deliver greater and quicker local air quality benefits compared to a CAZ Benchmark albeit the emissions benefit associated with buses operating from Queens Road will likely be delayed/redistributed from 2025 to 2026.
Noise	<ul style="list-style-type: none"> • In both scenarios, there is expected to be a low positive noise impact from the GM CAP measures. The upgrade to newer and quieter vehicles, particularly zero emission buses, taxis and hybrid taxis, is expected to result in some low positive localised impacts. The spatial distribution of these impacts is expected to be experienced in the Regional Centre and the most in both scenarios, aligning with the distribution of bus and taxi operations in addition to affected vehicles associated with the Regional Centre CAZ. • Similar to the 'amenity' benefit scoring, the anticipated benefit from both scenarios is expected to be small. • Investment-led Plan (QR delay) Impact: There is anticipated to be no material impact to noise as a result of this scenario on the Investment-led Plan.
Public Accounts	
Capital costs	<ul style="list-style-type: none"> • The capital cost for both scenarios cover the development and implementation costs associated with the proposals in addition to the cost to deliver the measures. The CAZ Benchmark consists mostly of supporting vehicle mitigation funding whereas the Investment-led also provides funding for local highway measures and new cleaner buses and supporting infrastructure. • As the costs have been used to inform the scenario cost effectiveness, and not compared against monetised benefits in this submission, the costs have not been discounted to 2010 prices. The costs presented in this submission reflect current (2024) prices. • The capital cost for the Investment-led Plan (£84.5 million) is less than the CAZ Benchmark costs (£120.3 million) These figures are also inclusive of a 5% contingency allowance across the total cost of each scenario. • Investment-led Plan (QR delay) Impact: As set out in Section 7, there is no cost impact to the delay associated with Queens Road depot as the Investment-led Plan remains unchanged albeit the Queens Road depot is scheduled to be deliver later than planned.

Impact	Assessment
Operating costs	<ul style="list-style-type: none"> • The operating costs for each scenario comprise of costs to operate the vehicle fund, decommissioning costs, CAZ revenues (where relevant) and CAZ service termination fees (where relevant). Whilst the CAZ Benchmark is forecast to deliver an income through daily charge and penalty revenues, the income is outweighed by the operating cost expenditure to manage the operating body for the zone, CAZ office service costs, penalty enforcement costs, signage costs etc. • As the costs have been used to inform the scenario cost effectiveness, and not compared against monetised benefits in this submission, the costs have not been discounted to 2010 prices. The costs presented in this submission reflect current (2024) prices. • The operating cost for the Investment-led Plan, consistent with the capital costs, are expected to be less (£39.2 million) compared to the CAZ Benchmark scenario (£50.1 million) • Investment-led Plan (QR delay) Impact: As set out in Section 7, there is no cost impact to the delay associated with Queens Road depot as the Investment-led Plan remains unchanged albeit the Queens Road depot is scheduled to be deliver later than planned.

APPROVED

9 Equality Impacts

9.1.1 The GM Authorities undertook a high-level assessment to understand the likely equality impacts from the Investment-led Plan and CAZ Benchmark as reported in the *Appraisal Report*. The assessment drew on findings of previous iterations of Equality Impact Assessment (EqIA) and used data, insights and findings from the Previous GM CAP consultation and engagement activity. This report builds on that assessment to consider the likely equality impacts of the Investment-led Plan taking into account the Queens Road delay.

9.1.2 As reported earlier, National Highways' removal of the reduced speed limit on the M602 does not have a material impact on the compliance date of the Investment-led Plan (QR delay) and therefore this issue has not been directly addressed in the commentary below.

9.1.3 The EqIA finds that individuals with the following protected characteristics are likely to be differentially or disproportionately impacted by either scheme scenario:

- Age – very young children, young people and older people are likely to be disproportionately impacted by both scheme scenarios.
- Disability – those with mobility, communication or learning impairments, individuals with long-term health conditions, particularly those related to respiratory problems or stamina/breathing/fatigue are likely to be disproportionately impacted by both scheme scenarios.
- Sex – males likely to be disproportionately affected by both scheme scenarios.
- Race – individuals from a minority ethnic background are likely to be directly, indirectly and disproportionately impacted by both scheme scenarios.
- Religion/belief – individuals of Hindu, Muslim and Sikh faith are likely to be indirectly but disproportionately impacted by both scheme scenarios. This is as a result of intersecting identity with race/ethnicity.
- Pregnancy/maternity – expectant mothers likely to be differentially impacted by both scheme scenarios.
- Further characteristics – it has been identified that people in low-income households and carers are highly likely to be disproportionately impacted by both GM CAP scenarios.

9.1.4 **Table 9** consider the impacts of each scenario on the protected characteristic groups in addition to those which have been identified as likely to be disproportionately impacted by the GM CAP (low-income households and carers).

Table 9 Equality Impacts - updated

Protected Characteristic	CAZ Benchmark		Investment-led Plan (QR delay)		Investment-led Plan		Comments
	Positive Impact	Adverse Impact	Positive Impact	Adverse Impact	Positive Impact	Adverse Impact	
Age	Yes	Yes	Yes	Yes	Yes	Yes	<p>Older people and young children disproportionately benefit from improvements to air quality.</p> <p>Prevalence of taxi trade in 55+ years age category leads to a disproportionate financial impact of charging under the CAZ Benchmark and the cost of upgrade under the Investment-led Plan through the alignment of emission standards.</p> <p>The Investment -led Plan (QR delay) will result in the benefits and disbenefits occurring later (in 2026 instead of 2025) but no other changes will be experienced.</p>
Sex	Yes	Yes	Yes	Yes	Yes	Yes	<p>Majority of individuals in scope for funds likely to be male, related to prevalence of males in driving roles. Benefit from funds but face impacts to affordability by cost gap in relation to the taxi trade.</p> <p>Delays to the implementation of Queens Road would not have any additional equality impacts on this group.</p>
Disability	Yes	Yes	Yes	None	Yes	None	<p>People with certain disabilities or long-term health conditions (particularly if these relate to respiratory problems) are likely to be more sensitive to changes in air quality and will benefit more quickly from improvements in air quality.</p> <p>The Investment-led Plan can be delivered sooner than the CAZ Benchmark, reducing exposure to harmful pollutants albeit the Investment-led Plan (QR delay) delivers benefits later compared to the original Investment-led Plan.</p> <p>People with disabilities are more likely to be reliant on taxis and community transport which are at risk of costs incurred by a CAZ Benchmark.</p>

Protected Characteristic	CAZ Benchmark		Investment-led Plan (QR delay)		Investment-led Plan		Comments
	Positive Impact	Adverse Impact	Positive Impact	Adverse Impact	Positive Impact	Adverse Impact	
Ethnicity	Yes	Yes	Yes	Yes	Yes	Yes	<p>Areas of poor air quality in GM often correlate with low-income communities. These communities often have greater populations of people from minority ethnic backgrounds with poorer reported health outcomes.</p> <p>Prevalence of ethnic minority background among taxi trade. This group would benefit from Investment-led Plan Clean Taxi Fund but face impacts on affordability due to cost gap. These impacts would be unchanged in an Investment-led Plan (QR delay) scenario.</p> <p>Ethnic minorities are more likely to rely on public transport – any additional cost to customer passed down from CAZ Benchmark would therefore disproportionately impact this group.</p> <p>The Investment-led Plan can be delivered sooner than the CAZ Benchmark, reducing exposure to harmful pollutants albeit the Investment-led Plan (QR delay) delivers benefits later compared to the original Investment-led Plan.</p>
Religion / faith	Yes	Yes	Yes	Yes	Yes	Yes	<p>Intersectionality with ethnicity. Individuals of Sikh, Muslim and Hindu faiths face similar impacts as outlined above.</p> <p>The Investment-led Plan can be delivered sooner than the CAZ Benchmark, reducing exposure to harmful pollutants albeit the Investment-led Plan (QR delay) delivers benefits later compared to the original Investment-led Plan.</p>
Pregnancy / maternity	Yes	None	Yes	None	Yes	None	<p>Expectant parents and babies in utero benefit disproportionately from improvements in air quality.</p> <p>The Investment-led Plan can be delivered sooner than the CAZ Benchmark, reducing exposure to harmful pollutants albeit the Investment-led Plan (QR delay) delivers benefits later compared to the original Investment-led Plan.</p>
Low-income	Yes	Yes	Yes	Yes	Yes	Yes	<p>Low-income households likely to live in areas of poor air quality and disproportionately benefit from improvements.</p> <p>Low-income owners of non-compliant vehicles face additional financial impact from charging and cost gap. Low-income households are less likely to own a vehicle and therefore are more likely to rely on public</p>

Protected Characteristic	CAZ Benchmark		Investment-led Plan (QR delay)		Investment-led Plan		Comments
	Positive Impact	Adverse Impact	Positive Impact	Adverse Impact	Positive Impact	Adverse Impact	
							transport – additional cost to customer passed down from CAZ Benchmark would also disproportionately impact this group. The Investment-led Plan can be delivered sooner than the CAZ Benchmark, reducing exposure to harmful pollutants albeit the Investment-led Plan (QR delay) delivers benefits later compared to the original Investment-led Plan.
Carers	Yes	Yes	Yes	None	Yes	None	Carers likely to be older – disproportionate benefit from improvements in air quality. Individuals likely to be low-income and reliant on public transport and taxi. At risk of costs incurred as a result of the CAZ Benchmark with potential for additional costs associated with vehicle modifications to support transit of patients. The Investment-led Plan can be delivered sooner than the CAZ Benchmark, reducing exposure to harmful pollutants albeit the Investment-led Plan (QR delay) delivers benefits later compared to the original Investment-led Plan.

APPENDIX

9.1.5 As shown in **Table 9**, the Investment-led Plan (QR delay) does not materially alter the impacts on protected characteristic groups as compared to the original Investment-led Plan. Whilst it is recognised that air quality benefits associated with the Investment-led Plan (QR delay) will be delivered later than originally planned, this will still be in advance of a CAZ Benchmark, which is not considered likely to 'go-live' until July 2026.

APPROVED

10 Analytical Assurance

- 10.1.1 The Queens Road depot electrification delay and M602 speed limit removal does not impact the conclusions of the Analytical Assurance Statement (AAS) with reference to a 2026 compliance year, in terms of:
- reasonableness of the analysis / scope for challenge; or
 - risk of error / robustness of the analysis.
- 10.1.2 This is due to the 2026 scenarios remaining unchanged, with the exception of the M602 speed limit removal which has been shown through modelling to have minimal impact, and the methods used to derive the modelled assessments remaining consistent with those presented in the Appraisal Report and supporting documentation.
- 10.1.3 The AAS also comments on the level of inherent uncertainty (i.e. at the beginning of the analysis) and whether the analysis has reduced the level of uncertainty (i.e. what is the level of residual uncertainty remaining at the end of the analysis).
- 10.1.4 Even with the delay to the electrification of Queens Road depot and the M602 speed limit removal, the Investment-led Plan is the only option tested which passes the legal direction that the 10 GM Authorities must comply with to deliver compliance in the shortest possible time and by 2026 at the latest.
- 10.1.5 Assured against a 2026 compliance year, the Investment-led Plan has less uncertainty of achieving compliance because the core elements are planned to be delivered ahead of 2026, reducing uncertainty associated with programme delivery risk.
- 10.1.6 Also, the Investment-led Plan, assessed against a 2026 compliance year, provides additional resilience because:
- There is increased headroom (between modelled concentrations and the legal limit) in 2026 at those locations which were the last points of exceedance to be resolved by the Investment-led Plan in 2025, due to air quality improvements associated with natural fleet upgrades;
 - ZEBs will not be required to be operated from an electrified Queens Road depot for the full year of 2026 to achieve compliance, adding delivery resilience to the ability of the Investment-led Plan to achieve compliance in 2026; and
 - Sensitivity testing has shown that there is a higher likelihood that modelled concentrations are overpredicted than underpredicted in the core scenario, which also applies to 2026 forecasts.

11 Risks and Mitigation – Queens Road Depot Electrification

- 11.1.1 An overview of risk management across the Investment-led Plan is reported in Section 7.8 of the *Appraisal Report*.
- 11.1.2 This section provides an overview of the high level risks identified to the electrification of Queens Road depot. The proposed approaches to risk mitigation are set out in **Table 10** below.
- 11.1.3 TfGM will be responsible for delivering the electrification of Queen Road depot. The comprehensive strategy to mitigate and manage these risks will be detailed as part of the Queens Road Depot project risk register.

Table 10 Queens Road Depot – Identified Risks and Mitigation

Risk	Description	Mitigation
Limited footprint within a listed building	Limited space restricts the available work area while keeping bus operations running.	Create a phasing plan to determine necessary working space and any additional area required, then look for appropriate sites. Establish provisional area designated for parking and / or storage throughout the construction phase.
	Electrification necessitates moving operational equipment like fuelling and washes, posing a challenge to sequence this while keeping operations running.	Develop phasing plan to agree working space needed and if temporary alternative facilities needed.
Condition of listed building / site	Hidden Structural Defects and unexpected conditions.	Additional surveys in Oct - Dec 24 to confirm.
	Current electrical systems are inadequate, and extra work will be necessary to meet the new supply requirements.	Further survey of existing electrical circuits to establish essential works to make satisfactory. Survey in Oct - Dec 24 to confirm.
Fire Risks	Extra measures required to detect, control, and minimize fire hazards.	Undertake Fire Risk Assessment and Mitigation. Additional survey in Oct - Dec 24
Listed building consents and approvals	Grade 2 Listed status might require a Planning Application, Listed Building Consent, and Building Control approval.	Early and ongoing liaison with local authority to determine if the work requires approval and ensure approval process commences promptly.

12 Summary

- 12.1.1 The *Appraisal Report* and supporting material for these developments considered GM proposals for an Investment-led Plan that could achieve compliance in 2025.
- 12.1.2 However, in the process of preparing the *Appraisal Report* and supporting material for these developments, an identified risk “Delays to bus depot electrification” materialised and there is now a delivery delay in the electrification of Queens Road depot. National Highways also advised that the temporary speed limit on the M602, also in the Investment-led Plan modelling assumptions, is to be removed.
- 12.1.3 This Supplementary Appraisal Report considers the implications on the date of compliance associated with these matters and provides a comparative appraisal of the Investment-led Plan and the CAZ Benchmark.
- 12.1.4 Taking into account the speed limit removal and the delay to the delivery of Queens Road depot electrification, the GM Authorities remain able to demonstrate, based on modelling conducted to date, that the Investment-led Plan will deliver compliance the shortest possible time and by 2026 at the latest. If the Queens Road depot is electrified earlier than currently assumed, then NO₂ benefits would be delivered ahead of 2026.
- 12.1.5 Any changes associated with the Queens Road depot delay and the M602 speed limit removal will not have a material impact on the modelling for the compliance of a CAZ Benchmark and modelling showing that the CAZ Benchmark does not achieve compliance in 2025 or 2026 remains valid.
- 12.1.6 The changes associated with the Queens Road depot delay and the M602 speed limit removal do not alter the VfM conclusion that, taking account of the primary CSFs in the context of the expected scenario benefits in addition to anticipated economy, social and environmental benefits from an Investment-led Plan and the CAZ Benchmark weighed against the forecast costs of both scenarios, the Investment-led Plan would deliver a higher VfM relative to the CAZ Benchmark scenario. Given that the Investment-led Plan delivers the primary aim of achieving air quality compliance in the shortest possible time and has been previously identified as the lowest cost scenario to do so, it is therefore considered to represent VfM.
- 12.1.7 From an equality perspective, the Investment-led Plan would continue to deliver an air quality improvement that benefits individuals with protected characteristics albeit the full benefit would be spread across 2025 and 2026. Comparatively, the air quality improvement would remain faster for the Investment-led Plan than the CAZ Benchmark due to the former achieving compliance earlier and being able to implement the Investment-led Plan earlier. The changes associated with the Queens Road depot delay and the M602 speed limit removal do not change the following equality conclusions:

- Under the Investment-led Plan, the adverse financial impact on protected characteristic groups is to a lesser extent than the CAZ Benchmark.
- The Investment-led Plan reduces the risk to health, jobs, livelihoods and businesses compared to a CAZ Benchmark

12.1.8 There is no anticipated cost impact as a result of the Queens Road depot electrification delay and the M602 issue on the Investment-led Plan and GM is confident it can deliver its Plan as set out in the *Appraisal Report*, subject to a decision from government.

12.1.9 GM therefore considers that the Investment-led Plan delivers compliance in the shortest possible time and ahead of a CAZ Benchmark and this is sufficiently evidenced in this submission documentation to proceed with the implementation of this proposal.

12.1.10 The supplementary comparative appraisal demonstrates that the Investment-led Plan performs better against the CSFs than the CAZ Benchmark. Fundamentally, the Investment-led Plan meets the requirements of the Determining CSF, delivering compliance in the shortest possible time and by 2026 at the latest. By contrast, modelled compliance is not achieved in either 2025 or 2026 under the CAZ Benchmark which thus fails against the Determining CSF.

12.1.11 The Investment-led Plan performs better than the CAZ Benchmark against the Primary CSFs in that it delivers greater reductions in NO₂ exceedances in each year, and does so earlier than the CAZ Benchmark. However, both the Investment-led Plan and the CAZ Benchmark are considered to be feasible on the basis that the GM Authorities have the relevant legal powers and a clear governance route to implement either scenario (drawing on prior knowledge, in respect of the CAZ and the vehicle funds, assembled from the development activity undertaken on the Previous GM CAP).

12.1.12 The Investment-led Plan also performs better than the CAZ Benchmark against the Secondary CSFs. It is a better strategic fit in terms of air quality and climate change (delivering greater air quality benefits), transport (providing additional cleaner buses that will continue to give benefits after compliance is achieved), growth and economy (by not imposing charges on users it removes the risk of restricting growth or damaging businesses). It is better VfM than the CAZ Benchmark, delivering better air quality benefits at a lower cost, and its distributional health benefits, affordability for users and quality of life impacts are preferable to the CAZ Benchmark. Finally, the Investment-led Plan is considered more affordable and therefore more deliverable than the CAZ Benchmark.

12.1.13 The Investment-led Plan is the only option tested which passes the legal requirement placed on the 10 GM Authorities to deliver compliance in the shortest possible time and by 2026 at the latest.