

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

## Note 29: Option for Consultation Modelling Summary Note



Salford City Council



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## **COVID-19 Pandemic Statement**

This work has not considered the impact of the COVID-19 pandemic. Whilst we are continuing, where possible, to develop the Greater Manchester Clean Air Plan, the pandemic has already had an impact on our ability to keep to the timescales previously indicated and there may be further impacts on timescales as the impact of the pandemic becomes clearer.

We are also mindful of the significant changes that could result from these exceptional times. We know that the transport sector has already been impacted by the pandemic, and government policies to stem its spread. The sector's ability to recover from revenue loss, whilst also being expected to respond to pre-pandemic clean air policy priorities by upgrading to a cleaner fleet, will clearly require further thought and consideration.

The groups most affected by our Clean Air Plan may require different levels of financial assistance than we had anticipated at the time of writing our previous submission to Government.

More broadly, we anticipate that there may be wider traffic and economic impacts that could significantly change the assumptions that sit behind our plans. We have begun to consider the impacts, and have committed to updating the government as the picture becomes clearer over time.

We remain committed to cleaning up Greater Manchester's air. However, given the extraordinary circumstances that will remain for some time, this piece of work remains unfinished until the impact of the COVID-19 pandemic has been fully considered by the Greater Manchester Authorities.

NB: Since the modelling contained in this report was completed, the Government have supplied GM with £41m of funding towards the retrofit and purchase of compliant buses, coaches, HGVs, minibuses and PHVs (includes Government-estimated delivery costs at 5%). The Government have also confirmed that they do not support the proposed Sustainable Journeys measure and a new Ministerial Direction was issued in March 2020. As the impact of the Government's decisions on the results and conclusions contained in this report was considered likely to be minor, the modelling has not yet been updated. Updated modelling will be carried out post-consultation to reflect any changes to the policy and proposals arising from the consultation and to reflect feedback from the Government and the Technical Independent Review Panel (TIRP) received since the modelling described in this report was completed.

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## 1 Introduction

This note summarises the results of updated modelling since the OBC, to inform the consultation process. The key analysis tables from the OBC have been updated to enable cross referencing more easily.

## 2 Updates to the Modelling Process post-OBC

There have been no updates to the 2016 Base model applied.

### Do Minimum 2021, 2023 & 2025

Since the OBC modelling, there have been a number of updates to the future year Do Minimum modelling process. During discussions with JAQU it was confirmed that these alterations did not constitute a change to the Target Determination process, but were appropriate technical refinements based on more up to date datasets.

These updates are:

- Update of Bus Routes and services and fleets. This has had two effects. Firstly, the OBC used a 2015/16 operational dataset which was correct for the Base Year model verification, and the fleet was then projected to the future years of 2021/2023/2025. The current modelling update has used the most recently available 2019 bus dataset and projected forward based on the OBC fleet-rollover method. This has resulted in an older future year bus fleet than was projected in the OBC, because bus operators have not invested in newer bus fleet as frequently since 2016 as in preceding years, which has the effect of increasing future emissions on a per vehicle basis. Secondly, overall bus mileage across GM has reduced by approx. 11% compared with the OBC assumptions, as operators have stopped running some less profitable routes.

These factors in combination will have the overall effect of increasing the Do Minimum bus emissions compared with the OBC, because the impact of the older fleet is more significant than the reduced mileage. However, in Do Something scenarios, a 100% Euro VI fleet was assumed in the OBC and this modelling version. Therefore, the reduced mileage will be the only variant, and bus emissions will be reduced compared with the OBC.

- Updates to the Emission Factor Toolkit. This has primarily affected the split of petrol and diesel cars, increasing the petrol and EV/hybrid fleet in line with more recent sales trends. Overall this has reduced NO<sub>x</sub> emissions compared with OBC by approx. 2%, however this varies depending on the vehicle mix on a given road. Furthermore, because petrol cars have lower f-NO<sub>2</sub> than diesel cars, there is a secondary effect which further reduces the final NO<sub>2</sub> concentrations.

- Growth of LGVs. The demand matrices had not been correctly projected forwards in the OBC modelling. This correction has increased LGV emissions by approx. 1%.
- Reduced number of modelled output points. In order to speed up model processing, only those sites that were predicted to be  $>38 \text{ ug/m}^3$  in the OBC Do Minimum 2021 have been calculated herein. This reduces the number of output points reported from ~17,000 to ~2,500.

### **Do Something Modelling post-OBC**

Updates to the Do Something modelling for with Consultation Option are reported in Section 4. A table summarising the methodology and assumptions has been supplied separately as “Summary of method and assumptions at Consultation package Oct 2019.docx”.

Note that the results presented herein, have under-represented the effect on the Clean Taxi Funds, which allow for upgrade to both a compliant diesel Hackney Carriage and an EV. However, analysis of the impact on NOx emissions has been undertaken and is very marginal so unlikely to materially alter the conclusions as reported. This will be updated and finalised.

### 3 Impacts on the Do Minimum model results

Tables 1 to 3 summarise the OBC and updated modelling results for the Do Minimum years of 2021, 2023 and 2025. The exceedances in each year are shown in Figures 1 to 3.

There is a reduction in the Target Determination number of points of exceedance in 2021 from the OBC (no. 250 to 203) as many of more marginal exceedance along 'Other Locations' have reduced. However, over time into 2025, the bus routes are more persistent due to older modelled fleet, so there is an increase in overall exceedances in 2025 (no. 8 to 12).

There are predicted to be exceedances in all 10 districts in the Do Minimum scenarios for both 2021 and 2023. By 2025, exceedances are only predicted in Salford, Manchester and Bury, which is consistent with the OBC scenarios (following the model refinement to A62 Oldham incorporated into the Local Exceedance work).

The updated modelling shows results consistent with methodological modelling alterations described previously. The locations where car and van flows are greatest have a reduced number of exceedances, typically sites classed as 'Other Locations'. Those sites in the IRR where bus contributions are most significant have an increased number of exceedances. The number of exceedances at sites classed as 'Urban Centres' are relatively unaltered most likely because increases in bus emissions and reductions in car and van emissions offset one another.

Beyond the IRR, the key last points of exceedance in the OBC in 2025, which were on roads classed as 'Other Locations', still remain at:

- A57 Regent Rd, Salford
- A6 Ardwick Green, Manchester
- A58 Bury Bridge, Bury

Additionally, there is an extra exceedance at:

- A6 Chapel St, Salford.

The exceedance on the A56 Bury New Road, adjacent to M60 J18, is no longer predicted to exceed in 2025.

OBC Table 1-4: Predicted annual mean NO<sub>2</sub> concentrations at points on the Greater Manchester road network - 2021, 2023 and 2025 without further action ('Do Minimum')

**OBC Data**

Road classification <sup>1</sup>	Compliant sites		Non-compliant sites			
	Very compliant (below 35 µg/m <sup>3</sup> )	Compliant but marginal (35 to 40 µg/m <sup>3</sup> )	Non-compliant (>40 to 45 µg/m <sup>3</sup> )	Very non-compliant (>45 to 50 µg/m <sup>3</sup> )	Extremely non-compliant (>50 µg/m <sup>3</sup> )	Total non-compliant (>40 µg/m <sup>3</sup> )
<b>2021</b>						
Inside Manchester-Salford Inner Relief Route (IRR)	475	73	34	19	5	<b>58</b>
Other Urban centres	465	66	17	4	0	<b>21</b>
Other Other locations	15,341	464	124	39	8	<b>171</b>
<b>Total</b>	<b>16,281</b>	<b>603</b>	<b>175</b>	<b>62</b>	<b>13</b>	<b>250</b>
<b>2023</b>						
Inside IRR	552	35	16	3	0	<b>19</b>
Other Urban centres	523	25	4	0	0	<b>4</b>
Other locations	15781	150	38	7	0	<b>45</b>
<b>Total</b>	<b>16,856</b>	<b>210</b>	<b>58</b>	<b>10</b>	<b>0</b>	<b>68</b>
<b>2025</b>						
Inside IRR	601	4	1	0	0	<b>1</b>
Other Urban centres	547	5	0	0	0	<b>0</b>
Other locations	15,920	49	7	0	0	<b>7</b>
<b>Total</b>	<b>17,068</b>	<b>58</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>8</b>

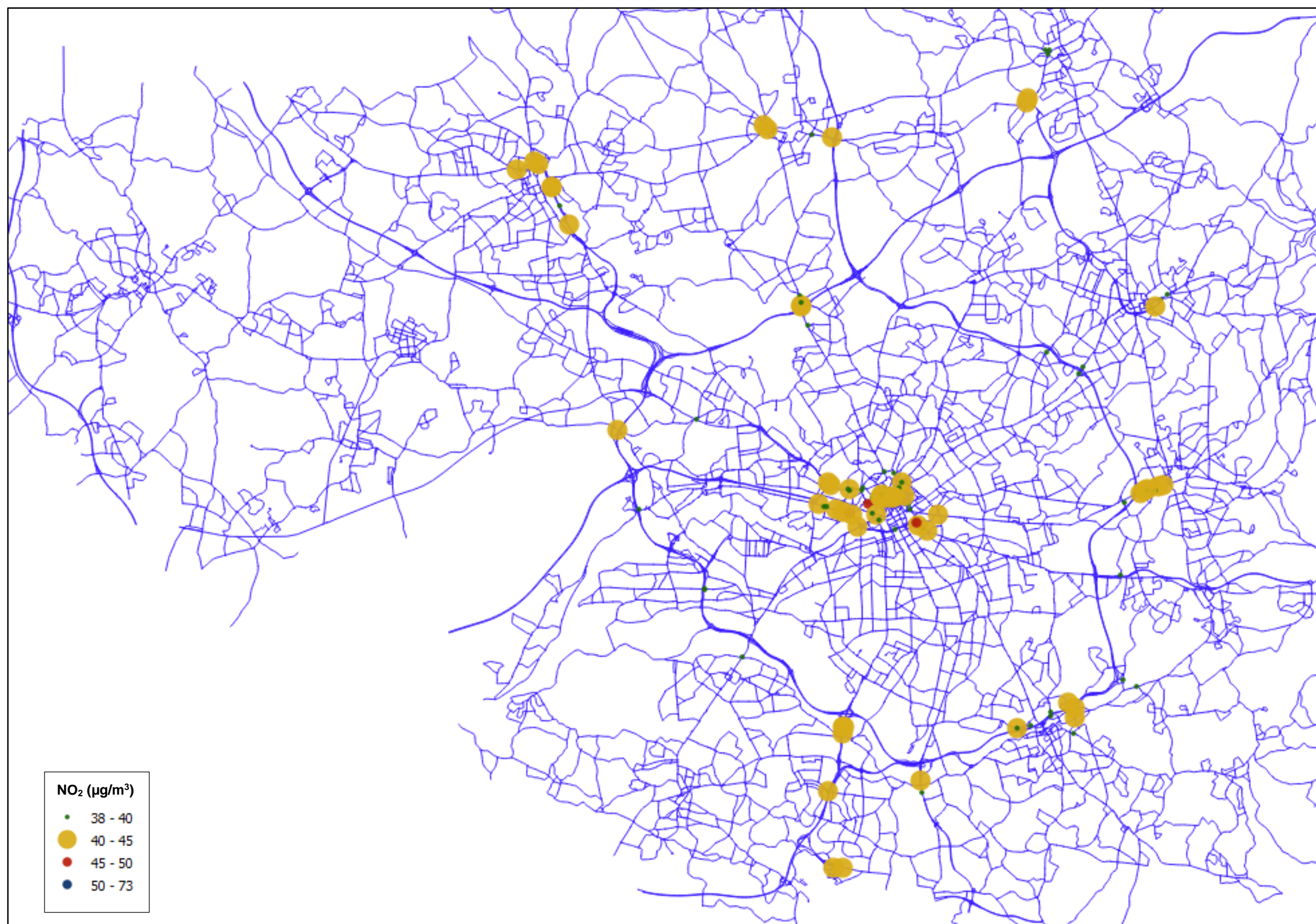
**Consultation Option Data**

Road classification <sup>1</sup>	Compliant sites		Non-compliant sites			
	Very compliant (below 35 µg/m <sup>3</sup> )	Compliant but marginal (35 to 40 µg/m <sup>3</sup> )	Non-compliant (>40 to 45 µg/m <sup>3</sup> )	Very non-compliant (>45 to 50 µg/m <sup>3</sup> )	Extremely non-compliant (>50 µg/m <sup>3</sup> )	Total non-compliant (>40 µg/m <sup>3</sup> )
<b>2021</b>						
Inside Manchester-Salford Inner Relief Route (IRR)	150	72	29	19	5	<b>53</b>
Other Urban centres	170	48	14	5	0	<b>19</b>
Other locations	1531	365	100	25	6	<b>131</b>
<b>Total</b>	<b>1851</b>	<b>485</b>	<b>143</b>	<b>49</b>	<b>11</b>	<b>203</b>
<b>2023</b>						
Inside IRR	205	39	21	9	1	<b>31</b>
Other Urban centres	213	20	4	0	0	<b>4</b>
Other locations	1869	150	30	4	0	<b>34</b>
<b>Total</b>	<b>2287</b>	<b>209</b>	<b>55</b>	<b>13</b>	<b>1</b>	<b>69</b>
<b>2025</b>						
Inside IRR	240	27	8	0	0	<b>8</b>
Other Urban centres	233	4	0	0	0	<b>0</b>
Other locations	1990	78	4	0	0	<b>4</b>
<b>Total</b>	<b>2463</b>	<b>109</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>12</b>

Note: The total number of predicted points and distribution of those points changes between 2021 and 2023/2025 due to planned changes to the road network.

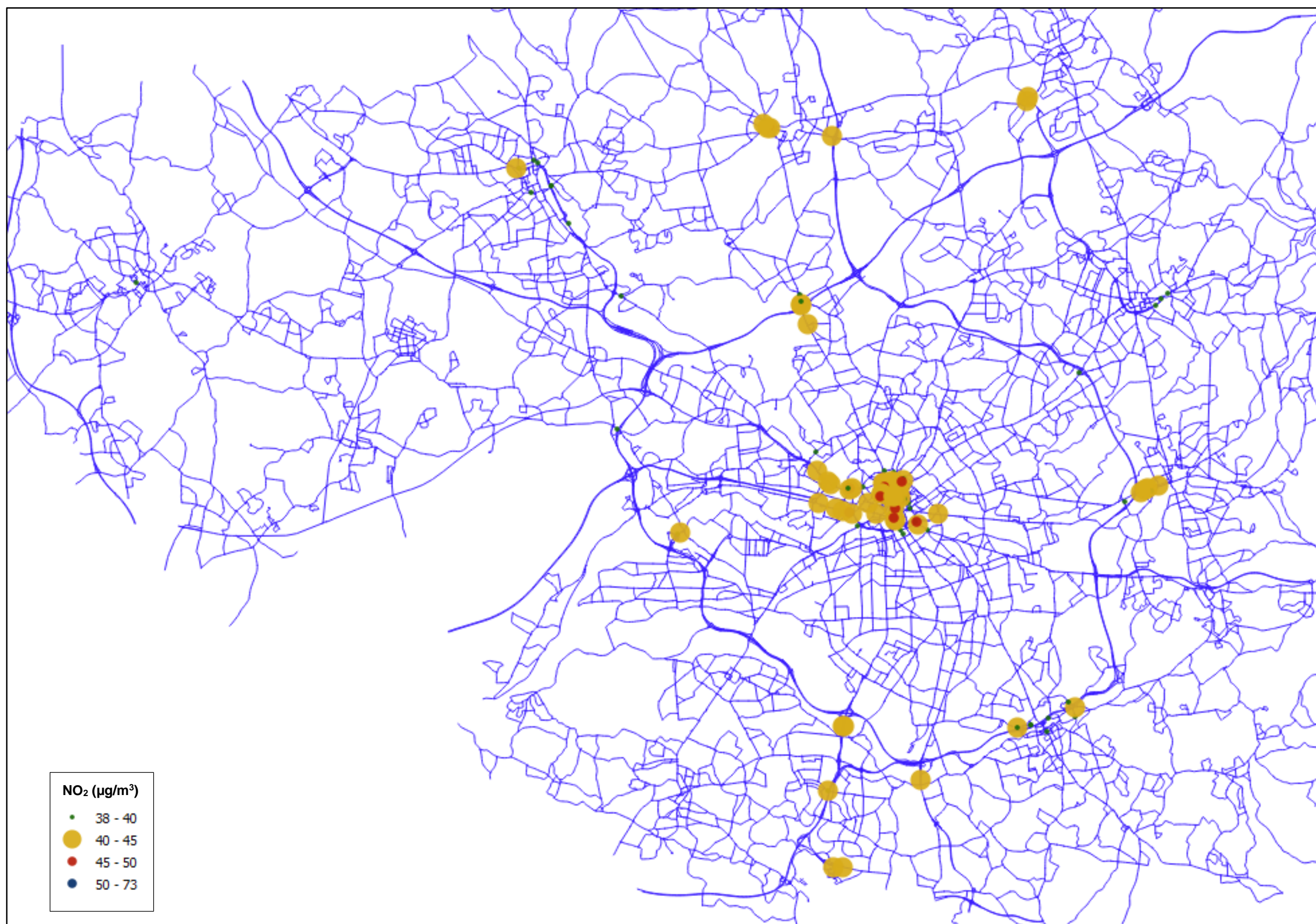
<sup>1</sup> "Inside Inner Relief Route" is the area encircled by the Inner Relief Route. "Other Urban centres" are areas that were defined for the purposes of air quality modelling for Option 4 testing. "Other locations" are roads outside of Urban centres and the Inner Relief Route, often arterial roads links the urban centres.

**Figure 1: Option for Consultation Do Min 2021 Exceedances**





**Figure 2: Option for Consultation Do Min 2023 Exceedances**





**Figure 3: Option for Consultation Do Min 2025 Exceedances**



#### **4 Impacts on the Do Something model results**

The tables in this section summarise the OBC results and the Consultation Option years of 2021, 2023 and 2025. The exceedances in each year are shown in Figures 4 to 6.

In summary, the key conclusions from the model results are:

- All sites are compliant in 2024
- The last areas to become compliant are as per the OBC and Local Exceedances work. In the Consultation Option, just three sites remain non-compliant in 2023:
  - 2 sites on the A34 near Deansgate at about 41.5 ug/m<sup>3</sup>
  - A58 Bury Bridge at 40.9 ug/m<sup>3</sup>
- Furthermore, this modelling does not take into account the City Centre Transport Strategy proposals nor the EV Incentives Measures, which would bring additional benefits. The CCTS proposals could be effective at the Deansgate sites identified above – analysis of the separate CCTS proposal modelling is underway to allow us to draw some early conclusions on the possible co-benefits. It should be noted that the CCTS proposals do not have any formal status at this time.

OBC Table 1- 8: Number of sites remaining in exceedance of legal limits for NO2 concentrations by year, Greater Manchester, by local authority with action in the shortest possible time

OBC Data

LA	2021		2023		2024 (Interpolated)		2025	
	Do Min	Option 8	Do Min	Option 8	Do Min	Option 8	Do Min	Option 8
Bolton	19	6	3	0	-	0	0	8
Bury	23	9	12	0	-	0	4	0
Manchester	88	28	29	3	-	0	2	0
Oldham	15	4	3	0	-	0	1	0
Rochdale	10	2	2	0	-	0	0	0
Salford	36	11	10	0	-	0	1	0
Stockport	30	5	4	0	-	0	0	0
Tameside	16	6	5	0	-	0	0	0
Trafford	10	0	0	0	-	0	0	0
Wigan	3	0	0	0	-	0	0	0
GM Total	250	71	68	3	-	1	8	0

Consultation Option Data

LA	2021		2023		2024 (Interpolated)		2025	
	Do Min	Cons. Op	Do Min	Cons. Op	Do Min	Cons. Op	Do Min	Cons. Op
Bolton	13	6	1	0	-	0	0	0
Bury	16	7	8	1	-	0	1	0
Manchester	76	22	39	2	-	0	9	0
Oldham	9	1	0	0	-	0	0	0
Rochdale	5	2	2	0	-	0	0	0
Salford	36	10	11	0	-	0	2	0
Stockport	21	5	3	0	-	0	0	0
Tameside	13	5	4	0	-	0	0	0
Trafford	7	0	1	0	-	0	0	0
Wigan	7	0	0	0	-	0	0	0
GM Total	203	58	69	3	-	0	12	0

OBC Table 1-9: Number of sites by scale of exceedance by year, Greater Manchester road network - 2021, 2023 and 2025

OBC Data

Scheme Option	Compliant sites		Non-compliant sites			
	Very compliant (below 35 µg/m³)	Compliant but marginal (35 to 40 µg/m³)	Non-compliant (>40 to 45 µg/m³)	Very non-compliant (>45 to 50 µg/m³)	Extremely non-compliant (>50 µg/m³)	Total non-compliant (>40 µg/m³)
2021						
Do Minimum	16,281	603	175	62	13	250
Option 8	16,836	227	62	9	0	71
2023						
Do Minimum	16,856	210	58	10	0	68
Option 8	17,072	59	3	0	0	3
2025						
Do Minimum	17,068	58	8	0	0	8
Option 8	Options 5(i), 5(ii) and 8 are fully compliant by 2024, Option 4 by 2025 and Option 7 by 2026.					

Consultation Option Data

Scheme Option	Compliant sites		Non-compliant sites			
	Very compliant (below 35 µg/m³)	Compliant but marginal (35 to 40 µg/m³)	Non-compliant (>40 to 45 µg/m³)	Very non-compliant (>45 to 50 µg/m³)	Extremely non-compliant (>50 µg/m³)	Total non-compliant (>40 µg/m³)
2021						
Do Minimum	1851	485	143	49	11	203
Consultation Option	2266	216	52	5	0	57
2023						
Do Minimum	2287	209	55	13	1	69
Consultation Option	2485	51	3	0	0	3
2025						
Do Minimum	2463	109	12	0	0	12
Consultation Option	2525	14	0	0	0	0



**Figure 4: Option for Consultation Do Something 2021 Exceedances**





Figure 5: Option for Consultation Do Something 2023 Exceedances

