

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

Note 31: Results of tests to assess the optimal charge levels for a Greater Manchester Clean Air Zone



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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.

1 Introduction

1.1 Greater Manchester (GM) district authorities have been mandated by the Government to produce a Clean Air Plan (CAP) to set out how they will target and mitigate areas of poor air quality within their boundaries. Arup and AECOM have been commissioned by Transport for Greater Manchester (TfGM) to assess the impact of various Clean Air Zone (CAZ) charges on non-compliant vehicle owner responses. This technical note aims to outline the methodology and key assumptions incorporated into this assessment as well as its results.

2 Methodology

2.1 The aim of the CAZ charges is:

- To reduce NOx emissions (and not to target other pollutants, although benefits are likely) by encouraging drivers to upgrade to a cleaner vehicle;
- for as few people as possible to choose to 'stay and pay', accepting that this may remain the best choice for infrequent visitors; and
- to be as low as possible whilst achieving these objectives.

2.2 The cost response models developed for light goods vehicles (LGVs), heavy goods vehicles (HGVs), taxis and private hire vehicles (PHVs) were used to test various charge levels for each vehicle type holding all other variables constant. The output from each test was a percentage of the non-compliant vehicle market that is estimated to 'Stay & Pay' the CAZ charge (i.e. remain non-compliant). The appropriate charge level can be estimated based on the minimum charge which produces an acceptable response.

2.3 Modelling has been carried out for the first year in which charges are proposed for the vehicle type in question, so 2021 for HGVs and Private Hire Vehicles (PHVs), and 2023 for LGVs and Hackney Cabs. Note that all Hackney Cabs have been treated as Wheelchair Access Vehicles (WAVs) and all PHVs as non-WAVs for the purposes of the modelling. At present, around 300 Hackney Cabs are non-WAV and around 100 PHVs are WAV. This represents around 15% of the Hackney Cab market and less than 1% of the PHV market. The introduction of Minimum Licensing Standards, if implemented as currently proposed, could mean that all Hackney Cabs must be WAVs in future.

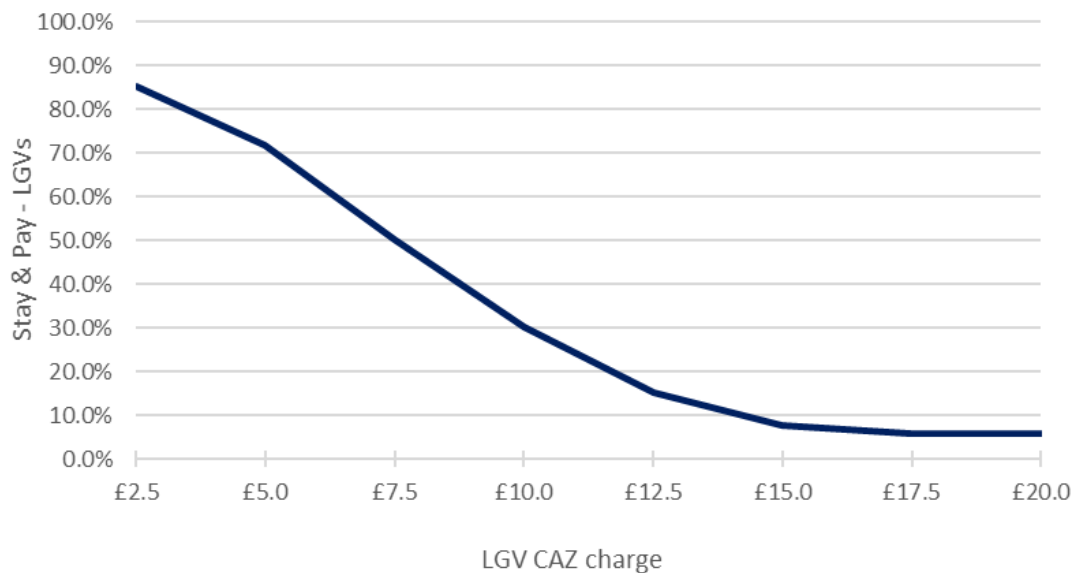
2.4 Note that GM does not have modelling tools available to test the behavioural responses of the other vehicles in scope for the charge, which are bus, coach and minibus.

2.5 The set of base case assumptions held constant throughout this assessment is attached as an appendix.

3 Light goods vehicles (LGVs)

3.1 The estimated 'Stay & Pay' response for LGVs in 2023 is shown in Figure 1. The lowest charge tested was £2.50 per day. Increased charge levels were tested in increments of £2.50 up to a maximum of £20.00 per day.

Figure 1 Proportion of LGVs forecast to Stay and Pay at varying charge levels, 2023

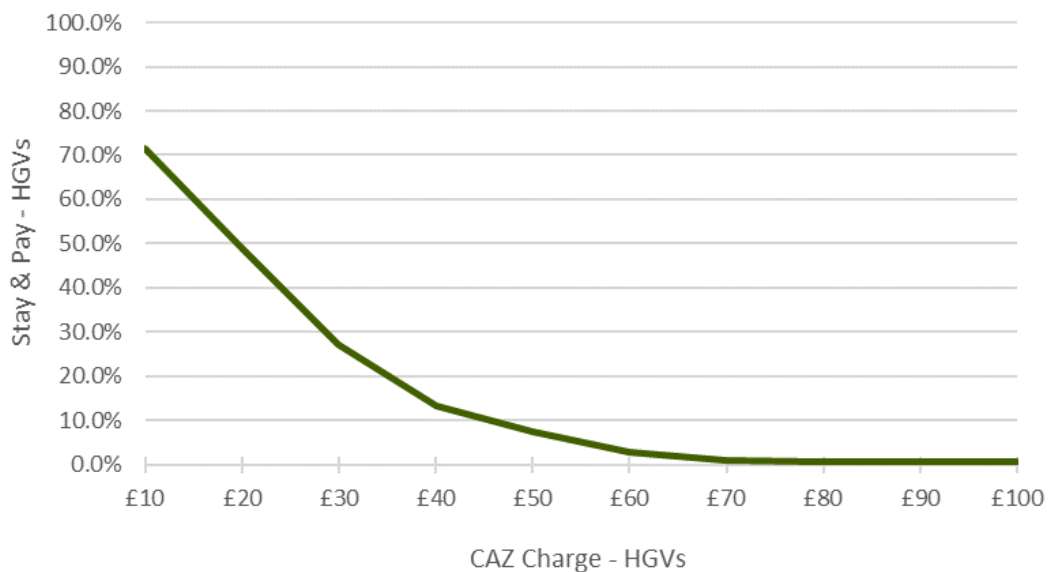


3.2 The lowest charge of £2.50 per day produced a 'Stay & Pay' response of approximately 85 percent. The greatest decrease takes place to £10, with a smaller reduction seen with an increase to £12.50 and then very little change at charges above £12.50. The 'Stay & Pay' response is estimated to gradually decrease towards zero at a charge level of over £15.00. Some vehicle owners will choose to downgrade to an estate car (not affected by the CAZ) rather than upgrading to a compliant van; this is classified as a 'stay and pay' response.

4 Heavy goods vehicles (HGVs)

4.1 The estimated 'Stay & Pay' response for HGVs is shown in Figure 2. The lowest charge tested was £10.00 per day. Increased charge levels were tested in increments of £10.00 up to a maximum of £100 per day.

Figure 2 Proportion of HGVs forecast to Stay and Pay at varying charge levels, 2021



4.2 The 'Stay & Pay' response at the lowest charge tested of £10.00 is estimated to be 70 percent. This response rapidly decreases as the charge increases up to £40.00 per day where the 'Stay & Pay' response is estimated to be approximately 10 percent. A further reduction of approximately eight percent in 'Stay & Pay' is achieved by increasing the charge to £60.00 per day. At this charge level, it is estimated that almost the entire HGV market will choose to become compliant and thus any further increases in charge are not estimated to achieve material shifts towards compliance.

5 Taxis and Private Hire Vehicles (PHVs)

5.1 Note that there was less data available about the operational costs of Hackney Cab and PHV drivers and operators to inform the development of the model, and some evidence that real-world choices are driven by factors beyond the scope of this modelling, and therefore the results should be treated with appropriate caution. Changes to licensing standards could also affect the options available, and the choices made by drivers and operators.

5.2 The estimated 'Stay & Pay' responses for Hackney Cabs and PHVs are shown in **Figure 3 Proportion of Hackney Cabs forecast to Stay and Pay at varying charge levels, 2023** and Figure 4 Proportion of PHVs forecast to Stay and Pay at varying charge levels, 2021, respectively. The lowest charge tested was £2.50 per day. Increased charge levels were tested in increments of £2.50 up to a maximum of £15.00 per day.

Figure 3 Proportion of Hackney Cabs forecast to Stay and Pay at varying charge levels, 2023

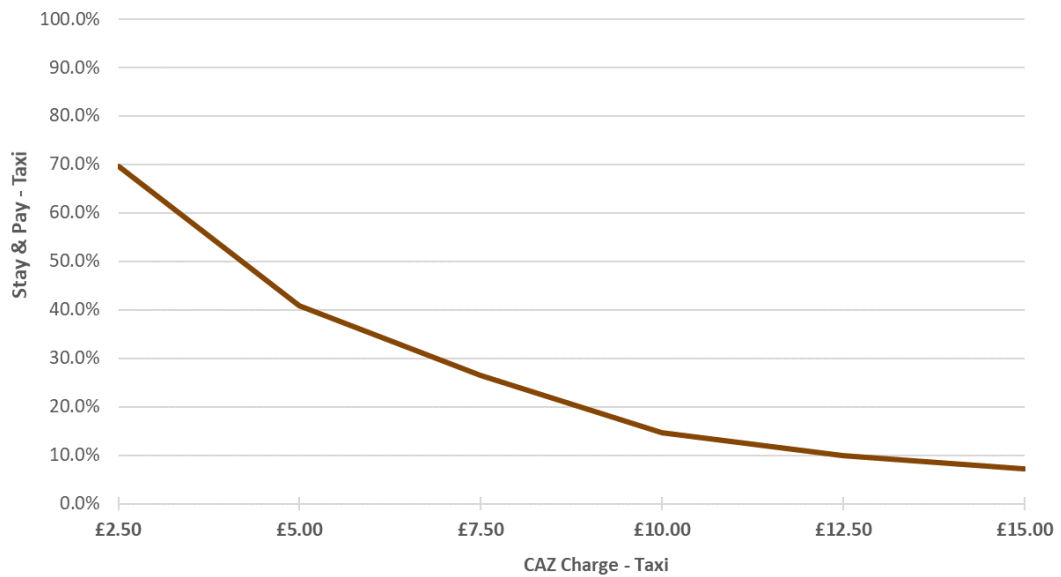
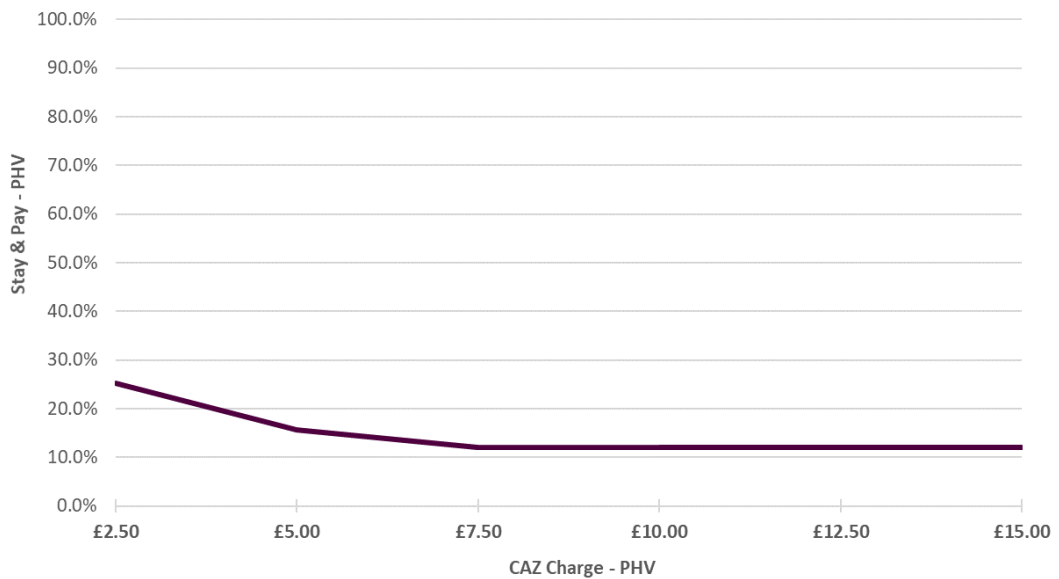


Figure 4 Proportion of PHVs forecast to Stay and Pay at varying charge levels, 2021



- 5.3 At the minimum charge level tested, the 'Stay & Pay' response is estimated to be approximately 70 percent for taxis and 25 percent for PHVs. This difference can be explained by the higher capital cost (cost to upgrade) of a Hackney Cab relative to a PHV.
- 5.4 Significant reductions in the 'Stay & Pay' response for Hackney Cabs are estimated for each increment up to £10.00 per day at which point just over 10 percent are estimated to remain non-compliant.

5.5 The proportion of non-compliant PHV owners that remain non-compliant is estimated to reduce from approximately 25 percent to 15 percent at a charge of £5.00 per day and then to just over 10 percent at a charge of £7.50. Any further charge increases are not estimated to have a material impact on the response.

6 Conclusion

6.1 The analysis outlined in this note aims to estimate the impact of varying charge levels on the proportion of non-compliant vehicle owners which will choose to 'stay and pay', remaining non-compliant after CAZ is implemented. The results have been used to inform the decision-making process regarding what charge will be implemented as part of CAZ for each vehicle type, alongside wider considerations such as the charge levels being applied elsewhere.

6.2 In summary, the conclusions for each vehicle type are:

- For LGVs, the proportion of vehicles choosing to stay and pay reduces considerably with increased charges up to £10, with a smaller reduction seen with an increase to £12.50 and then very little change at charges above £12.50.
- For HGVs, the proportion of vehicles choosing to stay and pay reduces steeply with charge increases to £60. Charges above £60 are not estimated to achieve material changes in behaviour.
- For Hackney Cabs, the proportion of vehicles choosing to stay and pay reduces significantly with each increment up to £10 per day, with no significant reductions seen with further charge increases.
- For PHVs, the proportion of vehicles choosing to stay and pay reduces with each increment up to £7.50 per day, with no significant reductions seen with further charge increases.