

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

Note 34 Vehicle Finance Subsidy Model



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| <p>Version Status:</p> | <p>APPROVED</p> | <p>Prepared by:</p> | <p>Transport for Greater Manchester on behalf of the 10 Local Authorities of Greater Manchester</p> |
| <p>Authorised by: Date:</p> | <p>Ian Palmer 10th August 2020</p> | | |

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 GM CAP Context

- 1.1 Since 2010 the UK has been in breach of national Limit Values for annual mean concentrations of nitrogen dioxide (NO₂), as set by the Air Quality Standards Regulations 2010, which implemented the Ambient Air Quality Directive (2008/50/EC) into English law. This is as a result of elevated NO₂ concentrations in major urban areas, including GM.
- 1.2 The UK Government's Air Quality Plan¹ requires local authorities with persistent exceedances to undertake local action to consider the best option to meet statutory NO₂ Limit Values in the shortest possible time.
- 1.3 In March 2019, the ten GM Local Authorities collaboratively submitted an Outline Business Case (OBC) for the GM CAP to the Joint Air Quality Unit (JAQU) outlining a package of measures to deliver regional compliance with national Limit Value for NO_x emissions.²
- 1.4 To support the development of the Vehicle Finance measure within the CAP, a vehicle finance subsidy model has been developed to calculate the level of subsidy required across vehicle types to offer the equivalent of an interest free or subsidised vehicle finance offering to prospective and eligible applicants.
- 1.5 This technical report aims to explain the methodologies and key assumptions incorporated in the development of the Vehicle Finance Subsidy Model (VFMS).

¹ Department for Environment, Food & Rural Affairs. 2017. UK Plan for tackling roadside nitrogen dioxide concentrations

² GM's Outline Business Case to tackle Nitrogen Dioxide Exceedances at the Roadside

2 Methodology

- 2.1 A typical vehicle finance product in the market generates income and cost for the vehicle finance provider. Using a simple example of a finance deal for a vehicle where the finance requirement is £10,000:

| Category | Amount |
|--|---------------|
| Purchase Price of Vehicle | £11,000 |
| Customer Deposit | £1,000 |
| Interest Rate (APR) | 7.9% |
| Repayment Term | 48 months |
| Monthly Repayment | £244 |
| Total Amount Repayable (incl. deposit) | £12,696 |
| Total Interest Payable | £1,696 |

- 2.2 This model can be used for hire purchase or lease agreements as ultimately an amount of money is provided to the end user at a cost, be it in the form of depreciation, capital costs, loss given default etc.
- 2.3 Under the above example, the total interest amount payable represents the income generated by the vehicle finance provider. Set against this income are the costs incurred by the vehicle finance provider. In simple “profit & loss” terms, the deal can be broken down as follows:

| Profit & Loss | Amount |
|---------------------|-------------------------------|
| Interest Income | £1,696 |
| Total Income | £1,696 |
| | |
| Cost of Capital | x |
| Loss Given Default | y |
| Mobilisation Costs | z |
| Total Costs | $x + y + z$ |

| | |
|--------------------------|----------|
| | |
| Profit before tax | ? |

2.4 By understanding how a vehicle finance provider will structure a vehicle finance deal, we can begin to calculate an assumption of what level of subsidy will be required to support the equivalent of an interest free vehicle finance product. We can achieve this by calculating the expected cost of each of the following cost categories:

- **Cost of capital:** representing the finance provider's own internal cost of lending the capital amount required to purchaser the vehicle. In the above example, how much has it cost the provider to utilise the £10,000 finance requirement to acquire the vehicle;
- **Loss given default rate:** representing the loss incurred by the finance provider when a borrower defaults on a loan, calculated as a percentage of total exposure at the time of default and takes into account the value of the vehicle recovered. This will be calculated on an average basis across their whole portfolio and applied as a percentage against each individual deal; and
- **Mobilisation cost:** representing the initial administrative cost of originating (mobilisation costs) and administering the finance agreement, calculated as a percentage of the capital requirement.

2.5 Using this structure, we now need to calculate what we believe these costs will be when set against the profile and types of vehicles which we know will require upgrading to compliancy in Greater Manchester. To do this, we must understand the profile and make-up of vehicle types in Greater Manchester. Using this data, we can then apply a set of financial assumptions to calculate what we expect the financial breakdown of a vehicle finance deal to be against these vehicle types.

2.6 The VFMS model is developed using inputs derived from the Operational Cost Models and associated analyses which identify the spectrum of non-compliant vehicle profiles which may be upgraded under the scheme.

2.7 The general process of developing the VFMS is demonstrated in Figure 1.

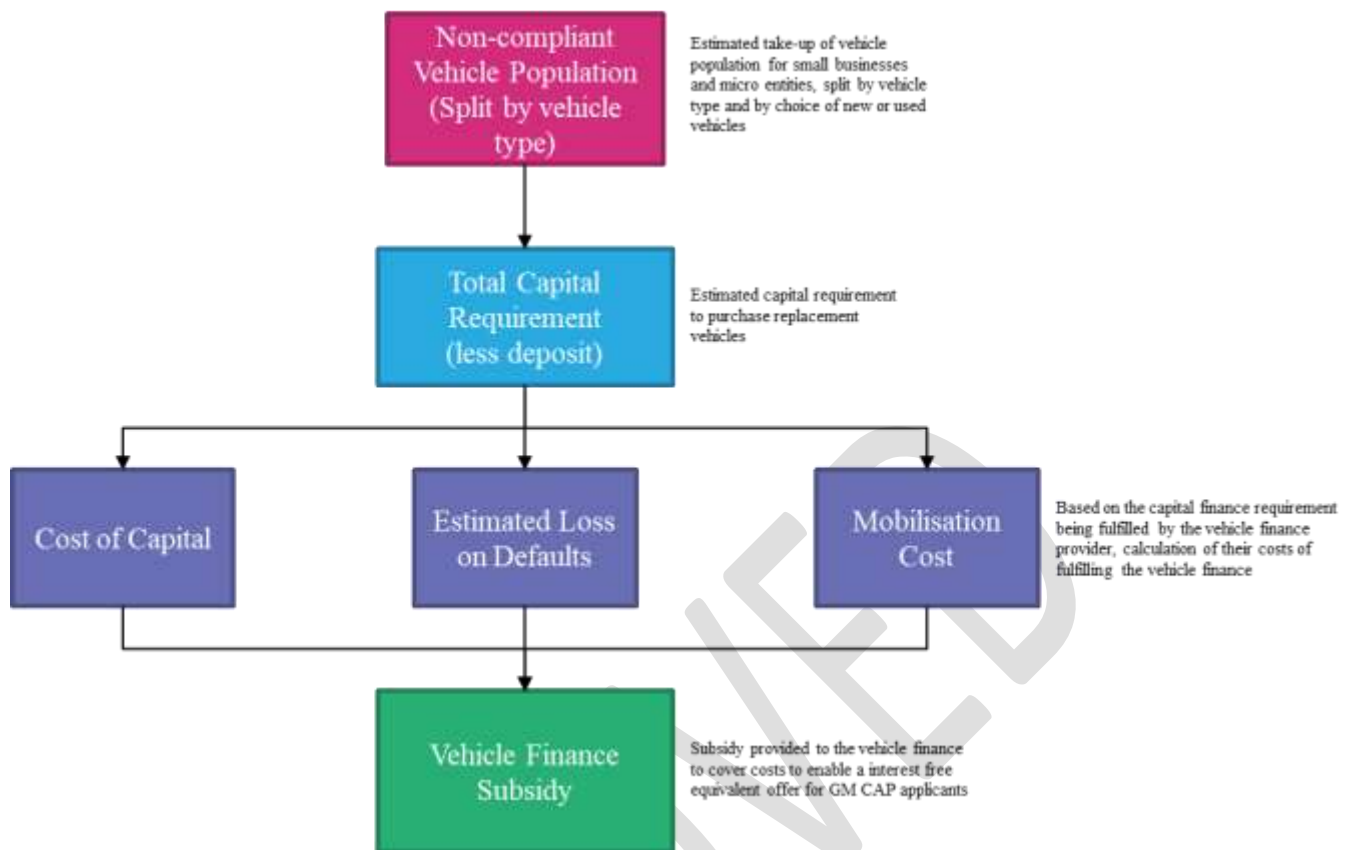


Figure 1: VFSM Process

- 2.8 By calculating the population and profile of vehicles being upgraded in Greater Manchester, we can make an assumption as to the total level of capital required to be spent by the finance providers in order to acquire the vehicles.
- 2.9 Using this capital figure, we can estimate the cost of capital of lending out this capital, the potential loss on default against this capital portfolio using assumptions provided by industry experts, and the initial mobilisation cost of writing the finance deals in the first instance.
- 2.10 This will give us a total cost to serve the provision of vehicle finance for each individual vehicle type. By then applying this against the number of vehicles being served, we can calculate the level of subsidy required per vehicle to enable an equivalent to an interest free finance deal.
- 2.11 We can then compare the resultant interest rate that a vehicle finance provider may require and compare this with market norms (by reference to industry experts).

3 Key Evidence and Assumptions Review

3.1 This section aims to review the key evidence and assumptions incorporated in the VFMS. It is worth noting that these assumptions are based on a mixture of existing data provided for by other workstreams within the CAP project and the operational experience of vehicle finance experts and suppliers who have been engaged with as part of the vehicle finance market engagement process.

3.2 The vehicle finance project has engaged specialist assistance from industry experts to test the validity of the assumptions used in the VFMS. There is an inherent challenge in the nature of vehicle finance, as the assumptions being used are commercially sensitive, and which will vary depending upon the lender and their credit / risk appetite. As a result, by the nature of the financial assumptions, these have been tested against expert advice as they cannot be referenced against a specific, quantifiable source for the commercially sensitive nature of them. For the purpose of this work, TfGM has engaged to advise them on these matters:

- **BSS Group:** A vehicle finance consultancy that operates its own vehicle brokerage and finance services;
- **Tarun Mistry & Associates (TMA):** A finance market consultancy covering consumer and business lending, regulated and unregulated, secured and unsecured markets; and
- **PWC:** Professional services firm, specifically their Debt & Capital advisory team to advise on the existing vehicle finance lender market.

3.3 As the vehicle finance project intends to run the procurement of a panel of vehicle finance providers, there will be the potential to test and strengthen the evidence base underpinning some of these assumptions and the scope for that is subject to review as part of the ongoing programme of work.

3.4 Vehicle Data and Categorisation

3.4.1 Vehicle data and categorisation is based on the outputs of the Operational Cost Model and associated analyses. For detailed information on the basis of this, please refer to Technical Note 35 Forecasting the required number of rapid chargers for Taxis.

3.4.2 This analysis provides the following outputs which are used in the VFMS to enable the calculation of an average vehicle finance subsidy amount by vehicle type:

- The individual vehicle types that will be upgraded within each category;
- The average New and Used price of each vehicle type; and
- The volume of non-compliant vehicle types within each vehicle category which could be upgraded.

3.4.3 Using these outputs, the VFMSM calculates the estimated subsidy requirement across the following vehicle types:

- Freight Vehicles - Panel Van (< 2.5t)
- Freight Vehicles - Panel Van (2.5t - 3.5t)
- Freight Vehicles - Box HGV (3.5t - 12t)
- Freight Vehicles - Box HGV (12t - 21t)
- Freight Vehicles - Box HGV (21t - 29t)
- Freight Vehicles - Box HGV (29t - 38t)
- Freight Vehicles - Box HGV (> 38t)
- Freight Vehicles - Pickup truck (< 2.5t)
- Freight Vehicles - Pickup truck (2.5t - 3.5t)
- Freight Vehicles - Refrigerated (< 2.5t)
- Freight Vehicles - Refrigerated (2.5t - 3.5t)
- Freight Vehicles - Refrigerated (3.5t - 12t)
- Freight Vehicles - Refrigerated (12t - 21t)
- Freight Vehicles - Refrigerated (21t - 29t)
- Freight Vehicles - Refrigerated (29t - 38t)
- Freight Vehicles - Refrigerated (> 38t)
- Freight Vehicles - Custom/Specialised (< 2.5t)
- Freight Vehicles - Custom/Specialised (2.5t - 3.5t)
- Freight Vehicles - Custom/Specialised (3.5t - 12t)
- Freight Vehicles - Custom/Specialised (12t - 21t)
- Freight Vehicles - Custom/Specialised (21t - 29t)
- Freight Vehicles - Custom/Specialised (29t - 38t)
- Freight Vehicles - Custom/Specialised (> 38t)
- Freight Vehicles - Waste Lorry (3.5t - 12t)
- Freight Vehicles - Waste Lorry (12t - 21t)
- Freight Vehicles - Waste Lorry (21t - 29t)
- Freight Vehicles - Waste Lorry (29t - 38t)
- Freight Vehicles - Waste Lorry (> 38t)
- Freight Vehicles - Artic (3.5t - 12t)
- Freight Vehicles - Artic (12t - 21t)
- Freight Vehicles - Artic (21t - 29t)
- Freight Vehicles - Artic (29t - 38t)
- Freight Vehicles - Artic (> 38t)

- Taxis and PHV - Euro 6 - Hackney (Taxi)
- Taxis and PHV - Euro 6 - Non-London Hackney (Taxi)
- Taxis and PHV - Euro 6 - Private Hire Vehicle
- Taxis and PHV - Electric - Hackney (Taxi)
- Taxis and PHV - Electric - Non-London Hackney (Taxi)
- Taxis and PHV - Electric - Private Hire Vehicle
- Coach [TBC]
- Minibus [TBC]

3.5 Financial Assumptions

3.5.1 As stated above the assumptions used in the vehicle finance model are difficult to evidence due to the diversity of finance business models and commercial sensitivity in discussion with suppliers.

3.5.2 The VFMSM calculates the cost of typical finance deal by individual vehicle type to arrive at a subsidy amount to cover the element of 'income' that would be typically be earned by the finance provider over the term of the deal. The following elements of a finance deal have been identified for calculation:

- **Cost of capital:** representing the finance provider's own internal cost of lending the capital amount required to purchaser the vehicle;
- **Loss given default rate:** representing the loss incurred by the finance provider when a borrower defaults on a loan, calculated as a percentage of total exposure at the time of default; and
- **Mobilisation cost:** representing the initial cost of setting up and then administering the vehicle finance on a given vehicle, calculated as a percentage of the capital requirement.

3.5.3 It is worth noting that it is proposed that the finance subsidy being offered does not separately cover an additional yield or margin which the finance company would typically make on a finance deal as part of this calculation. This has been avoided given we cannot determine what the internal return being sought by a finance company will be – instead we have deliberately made generous estimates of the cost of capital and mobilisation costs to cover this. In addition we have sought to benchmark the finance subsidies being provided against the interest earned by a finance provider on a typical finance deal in the existing market across a 4 year term to ensure the reasonableness of our subsidy.

- 3.5.4 The interest rate used in the cost of capital calculation has been selected to represent the spread of borrowing terms the vehicle finance providers are likely to have access to capital at. As the project intends to procure a panel of prospective lenders, they each have varying costs of capital dependent on their size, financial backing and profile of customers they would typically lend to. The internal rate at which lenders will borrow money at is commercially sensitive, but assumptions can be made based on the current Bank of England interest rates, the typical rates charged by the providers themselves in the market and their need to generate a commercial return.
- 3.5.5 For the VFSM, it has been assumed that an internal cost of capital rate of 4% is a representative rate across the vehicle finance providers. Whilst it is acknowledged that some larger financial institutions will be able borrow at a lower rate than this, smaller lenders (and those which may have more appetite to serve applicants from the higher credit risk spectrum of the market) are likely to pay closer to 5% for their cost of capital. As a result, having tested this assumption with TMA and BSS Group, it was agreed that 4% would be a reasonable and conservative measure.
- 3.5.6 The loss given default rate was prepared in conjunction with BSS Group based on their experience of lending in the vehicle finance market. Whilst larger lenders will publish their loss given default rates as part of the financial results, these are prepared based on their total lending and will include asset classes beyond vehicles. Given the limitations of utilizing this data, we have reviewed each of the vehicle types and formulated a loss given default rate for each vehicle category based on technical advice. These rates have then been tested with TMA to assess the reasonableness of these assumptions (See Appendix A).
- 3.5.7 A one-off mobilisation cost has been applied to cover costs of mobilising the vehicle finance loan at the point of it being drawn down. This has been based on a percentage of the capital loan amount being borrowed. This is an internal cost borne by the vehicle finance providers and will typically vary on each individual deal (as certain applications may be more labour intensive where further information is required, versus those which may be processed automatically). Given the varying nature of this, we have used a blanket assumption of 1% of the capital loan amount being borrowed, having consulted with BSS Group based on their own experience, and subsequently tested with TMA to assess the reasonableness of this assumption. (See Appendix A.)
- 3.5.8 The calculations we have made have been based on the assumption that the applicant has 10% of the purchase price of a vehicle to use as a deposit. The expectation is that this deposit amount will be provided by the part exchange value of their existing non-compliant vehicle or personal funds. Other work is ongoing to quantify the reasonableness of this assumption and the requirement for any further funding to support this, potentially as part of the Hardship offer.

3.5.9 Detailed breakdown of the assumptions will be provided in a separate assumptions book to be supplied with the final version of the VFSM at FBC.

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4 Model Outcome Assignment

- 4.1 The outputs of the model for each of the categorised vehicle groups are as shown in **Table 4-1** below.

Table 4-1. Model output

| Outputs per vehicle category |
|--|
| No. of vehicles |
| Capital amount required (less deposit) |
| Cost of capital (interest costs) |
| Mobilisation Costs |
| Bad debt costs (loss given default) |

- 4.2 The outputs are then taken to calculate the vehicle subsidy required per vehicle category using the following calculation:

(Cost of capital + mobilisation costs + loss given default cost) / No. of vehicles

= vehicle finance subsidy per vehicle

- 4.3 The final subsidy amounts will be provided upon completion of the development of the vehicle finance project as part of the Delivery Plan and with the final version of the vehicle finance subsidy model at FBC.
- 4.4 The vehicle finance model generates an average amount required across all vehicle types. In reality, when the vehicle finance provider assesses an individual for finance, taking into account vehicle being acquired, term of finance and credit history, the loss given default rate will vary and therefore might result in higher or lower than the average in the model.

5 Model Limitations

5.1 The VFMS has been developed to simulate the cost base of the vehicle finance providers as closely to reality as possible. However, due to the limited data availability and complex nature of the modelling scope, the VFMS does have certain limitations. The main three potential risks of VFMS are discussed in the following sections and will be considered in future versions of the Analytical Assurance Statement.

5.2 Finance Assumptions

5.2.1 Due to the commercial nature of the vehicle finance providers and the competitive position each hold, it is not possible to obtain detailed accuracy of the assumptions which have been used in the VFMS. To mitigate this challenge, the following steps have been taken:

- The assumptions have been tested with specialist vehicle finance advisory consultants who have a deep knowledge of the mechanisms by which vehicle finders operate; and
- The subsidy amount has been compared against typical borrowing rates in the market to test whether the subsidy amount being offered is in line with the total interest cost on a comparable vehicle finance package.

5.3 Variability of lenders

5.3.1 The finance assumptions will invariably change according to the profile and type of lender. Factors such as a lender's particular risk appetite, strength of their own balance sheet and access to capital can all affect the financial assumptions used within the VFMS and they can vary significantly from lender to lender. This will be considered as part of the competitive dialogue process of procurement with refinements made to the VFMS as necessary.

5.4 Profile of applicants

5.4.1 The profile of prospective applicants may be atypical and will likely vary across the population group. There is no 'average' that can be reasonably assumed due to the inherent variability of an individual or businesses' circumstance, their credit profile and borrowing history. This has been considered in developing the scheme and the potential subsidy amounts which will vary by applicant subject to a maximum cap defined during procurement.

Appendix A. Appendix

A1.1. Loss Given Default Rates

| Vehicle Category | Loss Given Default Rate |
|------------------|-------------------------|
| LGV | 5% |
| HGV | 5% |
| Taxi (Hackney) | 7.5% |
| PHV | 7.5% |
| Coach | 5% |
| Minibus | 5% |

A1.2. Key Model Assumption %

| Assumption | % |
|-------------------|-----|
| Deposit | 10% |
| Mobilisation Cost | 1% |
| Cost of Capital | 4% |