



## Ultra-Low Emission Bus Scheme Application Form

Guidance on the application process is available on the DfT website<sup>1</sup>.

### Applicant Information

Are you a (Tick which of the following applies):

Local Authority

Bus Operator

### **Local authority or bus operator name(s):**

Greater Manchester Combined Authority

*If it is a joint bid, please enter the names of all bidders and specify who the lead will be. Only one proforma is expected to be completed for a joint bid, however your proforma should make clear who the individual partners are.*

### **(For joint bids only) Who is the lead bidder?**

N/A

<sup>1</sup> <https://www.gov.uk/government/publications/low-emission-bus-scheme>

**Bid Manager name and position:**

Alison Chew, Interim Head of Bus Services, Transport for Greater Manchester

*Name and position of the official with day to day responsibility for delivering the proposed bid*

**Contact telephone number:** [REDACTED]

**Email address:** [REDACTED]

**Postal address:** Transport for Greater Manchester, 2 Piccadilly Place, Manchester, M1 3BG

**Website address for published bid (if applicable):** [www.tfgm.com](http://www.tfgm.com)

*When authorities submit a bid for funding to the Department, as part of the Government's commitment to greater openness in the public sector under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, they must also publish a version excluding any commercially sensitive information on their own website within two working days of submitting the final bid to the Department. The Department reserves the right to deem the bid as non-compliant if this is not adhered to. We welcome any bus operator that wishes to do so too.*

## **SECTION A - Bid description and funding profile**

### **A1. Headline description:**

*Please enter a brief description of the bid in no more than 300 words. You will be able to elaborate on this in the sections below.*

Our vision is for Greater Manchester (GM) to have 'World class connections that support long-term, sustainable economic growth and access to opportunity for all'.

The role of technology and innovation will be even more important in the period up to 2040, enabling us to improve transport performance and quality of life, reduce costs and resource consumption, and to provide tailored information directly to transport users, providing a much better experience.

The four key elements of that vision, namely sustainable economic growth, quality of life, environment and developing an innovative city-region, will provide a focus for transport investment up to 2040 and beyond.

The Mayor of GM, Andy Burnham, has set ambitious targets to improve air quality and has pledged that GM will have a zero emission bus fleet as part of its ambition to meet Greenhouse gas emission targets. The transition to Ultra Low Emission Vehicle (ULEV) technologies aligns with Transport for Greater Manchester's (TfGM) strategic objectives (Strategic Objective 2: A transport system that enables a clean, healthy and sustainable future).

Our bid targets the deployment of electric buses on three high profile services; the free to use Manchester City Centre 'Metroshuttle' service, School bus services and the high patronage Busway service.

They also have a strong brand identity within GM and are highly visible which we believe will send a positive message to operators, customers, visitors and residents, illustrating that we support the adoption of ULEVs and are confident in leading this technology revolution.

In summary the proposal seeks to deploy 13 fully electric single deck buses on the Manchester City Centre 'Metroshuttle' service in 2021, 41 fully electric single deck School buses in 2020 and 10 fully electric double deck buses on the Busway service in 2020. This will be supported by infrastructure investments at relevant depots.

**Word Count 300**

**A2. Geographical area:**

*Please provide details of the area covered by the bid*

The selected routes reside wholly within the GM region, specifically:

**Manchester City Centre 'Metroshuttle' service**

The central Manchester services were introduced in 2002, branded as 'Metroshuttle', and currently operate three separate routes within the inner ring road. The operating contract is in the process of being renewed with options being considered in respect of routing.

**Busway (Vantage)**

Two services, the V1 and V2 currently operate a 12-15 mile route linking Leigh and Atherton in the Wigan district, with Salford and central Manchester (terminating at Manchester Royal Infirmary & Oxford Road). The routes utilise the guided busway between Leigh and Ellenbrook and bus priority measures through the districts of Salford and Manchester.

**School bus services**

The selected services operate right across the GM area. The vehicles serve more than 20 schools located right across Greater Manchester's ten districts; Manchester, Stockport, Tameside, Oldham, Bolton Rochdale, Wigan, Salford, Trafford and Bury.

**A3. Total DfT funding sought (£m):**

2018/19 - £0

2019/20 - £10,108,646

2020/21 - £2,504,934

*Although there is no cap on bids, where they exceed £5m, bidders should demonstrate how their plans (and the amount sought) can be scaled down. In this case, bidders should provide the information for the second, scaled-down, bid in section D.*

**A4. Total DfT funding sought for second, scaled down, bid, if applicable (£m):**

2018/19 - £0

2019/20 - £4,487,426

2020/21 - £2,504,934

**A5. Total cost of your proposal (This should include DfT funding as specified in A3 + any 3rd party contributions) (£m):**

2018/19 - £0

2019/20 - £22,956,528

2020/21 - £5,289,912

**A6. Total cost of your proposal for second, scaled down, bid, if applicable (This should include DfT funding as specified in section A4 + any 3rd party contributions) (£m):**

2018/19 - £0

2019/20 - £10,571,568

2020/21 - £5,289,912

**A7. Joint bids:**

*If this is a joint bid, please give further details of how you will work together and your reason for submitting a joint bid.*

N/A

## **SECTION B – Evidence against the assessment criteria**

### **B1. Ambition**

*Use the space below to set out (using a maximum of 1,000 words) how you meet the “Ambition” criteria, as set out in paragraph 3.2 of the bidding guidance. It is highly recommended that you refer to this guidance when providing evidence against the assessment criteria, as this will be crucial to the success of your bid. Ambition has a weighting of 30%. Amongst other things, you may wish to consider:*

*1. The proportion of your bus fleet that will be ultra-low emission;*

In GM there are approximately 2,000 buses operated by around 25 operators. TfGM has a fleet of 150 buses, all of which are leased to operators and are used on a range of different services across GM.

The Mayor of GM, Andy Burnham, has set ambitious targets to improve air quality. He has pledged that GM will have a zero emission bus fleet and signed a declaration of intent with other European City Mayors. A Mayoral Letter of Support for this bid is attached at Appendix 1.

DfT funding has previously supported the purchase by TfGM of 101 environmentally-friendly, diesel electric hybrid vehicles which fall into three categories:

- General Network Buses – 27 vehicles used on contracts providing subsidised services
- Yellow School Buses – 52 vehicles providing dedicated home-to-school services
- Free city and town centre services ('Metroshuttle') – 22 vehicles currently operating on routes in Manchester, Stockport and Bolton

The above fleet is supplemented by three fully electric vehicles that also operate on the Manchester City Centre 'Metroshuttle' service.

TfGM's ULEB proposal expands on the work undertaken on previous DfT low emission projects.

#### **Busway (Vantage) service**

In April 2016 the guided busway 'Vantage' service was launched between Leigh, Atherton, Tyldesley, Salford and Manchester, operated by First Manchester. As part of the DfT's Green Bus Fund 4, GMCA was successfully awarded £1.12 million to contribute to the purchase, by the service operator First Manchester, of 20 low emission double deck vehicles to operate on the service. The route was extended to serve the University and Central Manchester Hospital site in April 2017; to support this, a further five vehicles were purchased.

Since its inception in 2016, the busway service has continued to gain in popularity. A passenger survey in 2018 reported that 24% of respondents to the survey previously made their journey as a car driver. This indicates a significant level of behavioural change due to the high level of attractiveness of the Busway services. There was a 22% increase in patronage between the first and second years of operation of the Busway (2.16m passengers carried from 3rd April 2016-17 and 2.64m in 2017-18) and this is expected to continue to grow.

The TfGM ULEB project will purchase five E400 MMC Provincial Electric Vehicles to replace five existing Euro VI buses and purchase an additional five to increase capacity on the route. The purchase of these 10 vehicles will allow five vehicles to be cascaded onto other services within GM.

**Table 1: Busway Emission savings**

Service no	Route	Vehicles	Estimated Daily Miles Service	Estimated Daily Miles vehicle	Estimated Daily Departure Total (GiS)	Annual miles Service (GiS)	Annual Miles Vehicle (GiS)	CO2e saving (Tonnes WTW)	NOx savings (kg)
V1	MRI - Manchester - Tyldesley - Leigh	13	2021	168	134	626,977	46,237	334	781
V2	MRI - Manchester - Tyldesley - Atherton	12	1579	144	122	518,204	41,690	301	705

### Manchester City Centre 'Metroshuttle' service

A network of free city centre routes (currently branded as 'Metroshuttle'), operate across Manchester city centre, connecting residents and visitors with key locations. TfGM has used Green Bus Fund monies to purchase a combination of 17 diesel-electric hybrid Optare Versas and Solo SRs, and a further three full electric Optare Versa buses for use on the service. The purchase of these latter vehicles was supplemented by the installation of additional rapid charging points installed on the route, for in-service charging.

TfGM's ULEB proposal involves 13 vehicles operating on the service from October 2018 being full electric buses. The three existing electric buses will be cascaded to services in other areas of GM that also have issues with air quality. This will also give an opportunity for other operators in GM to use Electric buses.

**Table 2: Manchester City Centre 'Metroshuttle' savings**

Service no	Vehicles	Estimated Daily Miles Service	Estimated Daily Miles vehicle	Estimated Departure Total (GiS)	Annual miles Service (GiS)	Annual Miles Vehicle (GiS)	CO2e saving (Tonnes WTW)	NOx savings (kg)
M2	8	328	55	365	105,896	17,649	215	471
M1	5	264	66	360	85,005	21,251	149	681

## School Services

Our 'Clean Air for Schools' programme funded by the DfT in the 2013 and 2015 Clean Bus Technology Fund's allowed TfGM to retrofit all 41 Iveco School buses. This project had an estimated net benefit of 554 NOx kg. These vehicles are now all reaching the TfGM stipulated 15-year age limit for operation on school services and require replacing.

Our ULEB project will replace the retrofitted 41 Diesel Ivecos with 41 [REDACTED] Electric Vehicles. Each vehicle runs a unique route and the services are spread across all ten districts of GM. They will be targeted on routes that have specific air quality issues. Table 3 shows the estimated level of savings compared to the current fleet and the conventional Euro VI diesel bus. This project is scalable; we have scaled our bid to fall within the £7 million limit.

**Table 3: Iveco Emission savings**

Service	Vehicles	Estimated annual service miles (avg all vehicles)	Total CO2e saving (Tonnes WTW)	Total NOx savings (kg)
School Services	41	4545	175	554

### 2. How innovative is your bid?

Our bid is highly innovative; it builds on phase one of TfGM's move to an emission free bus fleet with Green Bus Fund 4. This project will build on this knowledge and roll out Electric Vehicles on other services and in different areas.

### 3. Your vision for the longer term and how this may fit in with wider strategies

GM has produced a draft road map to achieve the Mayoral ambition of a fully electric bus fleet. The delivery of this road map requires TfGM to take action now to start the electrification process. The delivery of the new electric buses set out in this bid is seen as a key step towards achieving this highly ambitious road map.

GM has a Low Emissions Strategy and an Air Quality Action Plan, these include air quality objectives which interlink with GM's 2040 Transport Strategy.

**Word Count 992**



## **B2. Deliverability**

*Use the space below to set out (using a maximum of 1,000 words) how you meet the “Deliverability” criteria, as set out in paragraphs 3.3 to 3.6 of the bidding guidance. Deliverability has a weighting of 10%. Amongst other things, you may wish to consider:*

- 1. Do you have a delivery strategy?*
- 2. Is there any match funding? Bidders can provide more detail in section C below.*
- 3. Can you show a reducing reliance on government subsidy?*
- 4. Do you have a proven track record of acquiring ultra-low emission buses?*

- 1. Do you have a delivery strategy?*

This bid includes the electrification of three separate bus services, each of which will require a different delivery strategy. These are set out in turn below:

### **Manchester City Centre ‘Metroshuttle’**

The Manchester City Centre ‘Metroshuttle’ service is currently operated by First Manchester from the Queens Road depot in Central Manchester. The current operating contract is in the process of being renewed for a new three-year period ending in October 2021. TfGM will introduce the 13 new electric vehicles into the fleet in time to be used for the next contract commencing in October 2021. Whilst this means we cannot currently confirm who will operate the service and from where, TfGM considers there to be a number of operators who will have suitable depot facilities to operate a fully electrified service in 2021, with sufficient lead-in time to identify who and where this would be.

The infrastructure to support the operation of the service will be installed by TfGM at the successful bidder’s depot in advance of the contract commencing in October 2021.

### **Busway (Vantage)**

The Busway services are currently operated by First Manchester from its Bolton bus depot. The current contract is for 10 years ending in 2026. Busway is a high specification GM service which utilises a guided busway for a portion of the route and it is a contractual requirement to replace all buses on the route which have reached an age of five years.

This bid is the first step towards achieving a fully electric Busway fleet and will involve the replacement of five buses which operate on the route and the introduction of an additional five buses to increase capacity at peak times. The five new buses will take the size of the vantage fleet to 30 buses, all of which will be operated by First Manchester.

TfGM has had regular dialogue with First Manchester during the preparation of this bid and First Manchester have confirmed that they are supportive of TfGM

introducing five replacement electric buses (replacing five existing Euro VI buses) and a further five electric buses to increase capacity on the route. First Manchester have also confirmed it will be possible to accommodate and operate 10 electric buses at its depot in Bolton. A letter of support from First Manchester is attached to this bid at Appendix 2.

### **School Bus Services**

TfGM currently operates a fleet of 87 dedicated school buses providing services across GM which are based at a variety of bus depots. TfGM has full control over the deployment of these buses and would anticipate that the new electric vehicles will continue to be based at a variety of depots across GM in order to optimise the service delivery. This enables dead mileage to be minimised and will also give exposure to electric energy to as wide a range of GM operators as possible.

The buses will be deployed in areas where they will have the biggest air quality benefit and TfGM has an ambition to provide at least one bus for each GM district.

The new electric school buses will primarily service school routes but will also be flexible to be used on non-school services out with school hours.

#### *2. Is there any match funding?*

Match funding of £15,632,860 will be provided by GMCA. This funding will be provided through the GMCA's agreed borrowing facilities.

#### *3. Can you show a reducing reliance on government subsidy?*

TfGM is seeking to kick-start the electrification of the GM fleet with this investment. Any further investment in TfGM-owned fleet would be funded through a combination of subsidies and locally supported borrowings.

#### *4. Do you have a proven track record of acquiring ultra-low emission buses?*

TfGM currently owns three electric buses which are used on the existing Metroshuttle service. This bid builds on TfGM's experience of purchasing three Optare Versa EV's in 2014 using the Green Bus Fund 4.

Manchester was the first place to operate a pantograph charged vehicle in 2017 on the Manchester City Centre 'Metroshuttle' service where we collaborated with Volvo, ABB and First Manchester to demonstrate that opportunity charging infrastructure can be located in a busy city centre environment with minimum impact and that vehicles can operate with no disruption to schedules. This project will build on this knowledge and roll out Electric Vehicles on other services and in different areas.

## *Project Management*

The management of the development and delivery of the project will be the responsibility of TfGM.

All of TfGM's projects and programmes are managed following the methodology set out in TfGM's Project and Programme Management Procedures. The purpose of these procedures is to ensure that TfGM's projects are managed effectively and efficiently and are delivered to the required standard, on budget and on time using a single corporate management methodology. This project and programme management approach brings consistency, vigour and visibility.

The procedures themselves have been developed drawing on best practice, alongside the drivers of the OGC Framework and ISO9001 Management System approaches.

The proposed project team will consist of TfGM staff from Projects Group, Bus Operations and air quality leads from the Environment Team, and this will combine the key skills required for successful delivery. The team will include a Project Manager who will be responsible for delivering the project and for reporting progress to the Chief Operating Officer. The project team can also draw on the support of professionals with technical and specialist skills including fleet management, procurement, finance, legal, risk and project controls.

**Word Count 909**

### **B3. Air Quality**

*Use the space below to set out (using a maximum of 1,000 words) how you meet the “Air Quality” criteria, as set out in paragraph 3.7 of the bidding guidance. Air Quality has a weighting of 30%. Amongst other things, you may wish to consider:*

*1. What is the air quality problem as identified by this bid?*

GM has a Low Emissions Strategy and an Air Quality Action Plan, these include air quality objectives which interlink with GM’s 2040 Transport Strategy. Progress has been made in reducing emissions and improving air quality. NO<sub>2</sub> levels and greenhouse gas emissions in Greater Manchester are falling and are forecast to continue to fall but, without additional action, they will not meet the necessary limits and targets in the near future and will continue to pose serious health, environmental and economic challenges for the city region.

The project has a strong strategic fit with the objectives in our Air Quality Action Plan (Action 3.3) which aims to explore the potential of new bus technologies, to ensure that benefits are maximised, to influence operators and to ensure low emission operations. It also fits with the National Plan for tackling roadside nitrogen dioxide concentrations (DEFRA, July 2017) identified 29 local authorities, including seven in Greater Manchester (GM), with areas likely to exceed the statutory NO<sub>2</sub> annual mean EU Limit Value of 40 µg/m<sup>3</sup> (the EU Limit Value) beyond 2020. In March 2018, 33 more local authorities were defined as having “shorter-term NO<sub>2</sub> problems” - including Oldham in GM.

TfGM, on behalf of the GM Local Authorities, is undertaking feasibility work to develop a GM Clean Air Plan. The plan will set out a package of measures which would address exceedances on the identified links. Any package identified will need to address emissions from buses.

*2. To what extent does your proposal address the local air quality problem?*

Early modelling has indicated that GM’s non-compliant links have contributions from bus services.

TfGM have conducted an exercise combining bus route data with our existing Air Quality Management Area and Joint Air Quality Unit PCM data. Using this data TfGM have selected of routes and services that would have most benefit to air quality in the region.

The impact on air quality as expected is dependent on service departures, times of operation, time spent on a particular link alongside the Euro class and emissions performance of the operators fleet.

#### **Busway (Vantage) service**

The services currently operate on roads including the A34 and A6 in our Air Quality Management Area.

The Busway operates on the section of the A6 which is North West of the city centre out to where it meets the East Lancs road, a major high flow corridor connecting Manchester and the Merseyside region.

On the A34 the section runs from Central Salford across the Irwell onto Princess Road and runs through the heart of the city centre.

### **Manchester City Centre 'Metroshuttle'**

The services operate in our existing Air Quality Management Area, including on key routes such as the A6, the A56 and the A6042.

The A56 in the city centre is known as Deansgate, one of the busiest retail and business districts in central Manchester.

The A6042 covers the North end of Corporation Street near the Manchester Arena and Victoria rail station.

### School Bus services

The project will replace 41 Diesel Ivecos with fully electric equivalents. Each vehicle runs a unique route and the services are spread across all ten districts of GM, the air quality impact is therefore varied.

*3. Are you able to estimate the improvements in air quality as a result of the grants made available through this fund?*

As the services within this bid will all operate fully electric vehicles, NO<sub>x</sub> emissions will be reduced to zero at the tail pipe. As buses in general are a smaller proportion of vehicle movements, it is difficult to model outcomes, however, we have estimated the annual NO<sub>x</sub> saving across the entire route for each service. It is worth noting that some of these services also have dead mileage which are not accounted for here, these are therefore conservative estimates.

**Table 4: Summary of Estimated GHG and Air Quality Savings**

Services (District)	Est Annual saving (kg NO <sub>x</sub> )	Est Annual saving (Tonnes NO <sub>x</sub> )
V1	781.46	0.78
V2	704.60	0.70
M1	471.32	0.47
M2a	234.86	0.23
M2b	445.62	0.45
Salford	48.66	0.05
Rochdale	47.21	0.05
Oldham	31.25	0.03
Tameside	70.33	0.07
Trafford	13.93	0.01
Wigan	59.89	0.06
Stockport	105	0.11
Bury	16.57	0.02
Other SBs	161	0.16
<b>Total</b>	<b>4725</b>	<b>4.7</b>

The completed GHG and Air Quality Improvements Spreadsheet is attached at Appendix 3.

**Word count 709**

## **B4. Value for Money**

*Use the space below to set out (using a maximum of 1,000 words) how you meet the “Value for Money” criteria, as set out in paragraph 3.8 of the bidding guidance. Bidders should make clear where they are referring to buses and where they are referring to infrastructure. Value for money has a weighting of 30%. Amongst other things, you may wish to consider:*

### *1. How competitive is your bid?*

TfGM is presenting a highly ambitious programme to start the process of converting the GM fleet to fully electric. The GM Mayor signed a declaration of intent at the European Metropolitan Transport Authorities conference in June 2018 for the city-centre region to move to a zero-emission bus fleet.

TfGM considers it appropriate to make an investment in electric vehicles at this time in order to kick-start the process of fleet electrification.

TfGM has selected three types of bus service, Busway, the Manchester City Centre ‘Metroshuttle’ service and School Buses which in total will deliver 64 zero emission electric buses to GM by 2021. The 64 new electric buses will be delivered at an average grant cost of £197,087 per bus with the remainder of the cost being borne by GMCA.

As a public body, TfGM does not have access to private funding to support this bid. Therefore, TfGM is seeking the maximum allowable grant funding in order to reduce the additional cost required to be met by GMCA.

### *2. Have you provided evidence to support any infrastructure ask?*

██████████ buses use efficient and low cost three phase 80kWh AC chargers which are circa 20% the cost of DC chargers making the cost of installation of multiple chargers extremely cost effective. Their slim line design ensures that they do not take up more space than necessary allowing for more chargers to be sited in bus depots. This will help enable the gradual conversion of all GM bus depots to electric with minimal impact on the number of buses which can be based in a single depot.

The chargers can provide up to 80kW of charge per hour and when used with the ██████████ Charging Management System ensures that all buses are charged ready for run-out and that the peak energy draw is managed over a longer period thus reducing the price of the charging infrastructure.

██████████ have provided a quotation for the infrastructure charging equipment which is included in the infrastructure grant request. At this stage, GMCA has not had an opportunity to seek quotations from the DNO for grid reinforcement costs. In the event that the actual grid reinforcement costs are lower than the level of grant funding requested, GMCA would return the excess to the DfT. GMCA understands that any costs above the requested funding is at GMCA’s risk.

In addition, TfGM is separately exploring options to include opportunity charging facilities for buses at bus stations or other suitable locations around GM. This is building on the experience of installing opportunity charging points outside Piccadilly Station.

### 3. What are the estimated annual carbon savings of your proposal?

The following table includes an estimation of the CO<sub>2</sub>e savings.

**Table 5: Estimated Carbon Savings**

Service n°	Operator	Existing Bus model	Comparator model (Diesel E6)	WTW g/km CO <sub>2</sub>	New Bus Model	WTW g/km CO <sub>2</sub>	Differential	Annual WTW saving (tCO <sub>2</sub> e)	Annual TTW saving (tCO <sub>2</sub> e)
V1	First	Volvo B5LH - Diesel Hybrid E6	████ Euro VI Diesel	1281	████ EV	890	391	334	461
V2	First	Volvo B5LH - Diesel Euro VI Hybrid	████ Euro VI Diesel	1281	████ EV	890	391	301	416
M1	New Metroshuttle	Optare Versa - Diesel Hybrid E5	████ Euro VI Diesel	1328	████ EV	608	720	149	137
M2a	New Metroshuttle	Optare Versa - Diesel Hybrid E5	████ Euro VI Diesel	1328	████ EV	608	720	74	68
M2b	New Metroshuttle	Optare Versa - Diesel Hybrid E5	████ Euro VI Diesel	1328	████ EV	608	720	149	129
School buses	Various	Iveco Diesel E5 (SCR Retrofit)	████ Euro VI Diesel	1328	████ EV	608	720	175	185
<b>Total</b>								<b>1174</b>	<b>2271</b>

### 4. Have you explained the assumptions underlying any quantitative analysis provided?

The analysis uses vehicle emissions data provided by operators and route intelligence on vehicle miles to calculate WTW estimates of CO<sub>2</sub>e.

The TTW estimates have used similar route data along with average vehicle efficiencies of the GM bus fleet. These have taken account of the age and size of vehicles on selected routes. The fuel data has then been used in conjunction with BEIS conversion factors.

### 5. A description of the buses you are replacing

The following GM buses will be replaced:

- **Busway Services** - 5 x Euro VI Diesel Hybrid buses which will be cascaded onto other GM services. The additional 5 EV's will increase capacity on the route.
- **Manchester City Centre 'Metroshuttle'** – 10 x Euro V Diesel Hybrid buses which will likely be scrapped due to vehicle age. It is expected that 3 x Electric Vehicles which will be cascaded onto another GM town centre shuttle



service (for example Stockport or Bolton) which will enable further Air Quality and CO2 benefits

- **School Buses** – 41 x Euro V diesel buses all with a life of 10 years or over which will likely be scrapped due to vehicle age.

The replacement of the current fleet, and where possible the cascading of existing buses to other routes, will enable a significant improvement in a variety of poor Air Quality areas and an annual WTW savings of 758 tCO<sub>2</sub>e.

*6. How renewable will the source of fuel be?*

The proposed [REDACTED] are electric vehicles which will be powered in bus depots using Grid electricity. TfGM currently sources 100% green energy for its Metrolink tram service and electric vehicle charge point network (GMEV) and it is therefore anticipated that TfGM would work with partners in implementing green tariffs for its new depot based charging stations. Therefore, to the extent possible, TfGM can confirm that the vehicles will have zero tail pipe emissions and will be close to zero emissions well to wheel.

[REDACTED] is intending to test the [REDACTED] in January 2019 and the [REDACTED] in February 2019 at which point certificates will be provided to support this bid. For the purposes of this bid, the estimates provided by [REDACTED] have been included at [REDACTED].

**Word Count – 999**

## **B5. The bid – supplementary information**

*Please use the space below to provide any further information about the bid not covered elsewhere (max 300 words):*

### **Proposed new buses**

██████████ have collaborated to develop a range of fully electric single and double decker vehicles for the UK market. These vehicles are all fitted with an electric heater and therefore have zero tail pipe emissions and are capable of ranges between ██████████ and ██████████.

This highly ambitious bid will require three different types of vehicle which are set out in more detail below:

- **Busway Services** - ██████████ (x10)
- **Metroshuttle** - ██████████ (x13)
- **School buses** - ██████████ (x41)

The proposed buses use advanced battery technology whereby the vehicles have sufficient energy on board to undertake a full day's duty. The vehicles will also have a pre-heat available whereby the buses are heated prior to run-out using grid electricity. This removes the need for the vehicle batteries to be used to warm up the bus thus reducing its overall range.

Written quotations from ██████████ for the price of the buses have been included in ██████████. The quotation for the ██████████ does not include the cost for the additional Vantage specification – this is a TfGM estimate based on previous experience of procuring Vantage buses.

**Word count - 214**

## **SECTION C – Funding**

<b>C1. The Buses</b>	
In total, how many new ultra-low emission buses are you bidding for?	10 x [REDACTED] [REDACTED] (with additional Vantage Spec) 13 x [REDACTED] 41 x [REDACTED] <b>64 buses in total</b>
In total, how much grant are you seeking?	£12,613,580

For each separate bus type, please provide the following. The calculator will give you the “Base grant”, “Top-up grant” and “Total grant eligibility”: If needed, please copy and paste more tables below. All rows are mandatory.

Note – You **must** submit your completed ‘calculator’ alongside this bid.

The completed ULEBS WTW calculator is attached in this bid at Appendix 6.

<b>Manufacturer's name<sup>2</sup></b>	[REDACTED]
Make and model of bus	[REDACTED] double decker (with additional Vantage Spec)
Ultra-Low Emission Bus Technology (e.g. plug-in electric etc.)	Plug-in electric
Number of buses in bid	10
Anticipated date of order	03/2019
Anticipated date of entry into service	03/2020
Cost per ultra-low emission bus <sup>3</sup>	£505,000 [REDACTED]
Cost per bus of diesel equivalent	£260,000 [REDACTED]

<sup>2</sup> In exceptional cases where this may be unknown, for example where a local authority is yet to go out to tender, it is sufficient to state the type of technology sought (e.g. hybrid, plug-in electric, gas).

<sup>3</sup> In the case where local authorities are yet to go out to tender, an average cost can be given

Base grant per bus (as per the calculator)	£119,100
Top-up grant per bus (as per the calculator)	£50,000
Total grant eligibility <sup>4</sup> per bus (as per the calculator)	£169,100
Total grant being sought per bus	£169,100
Value for Money (VfM) Score (as per calculator)	2.6
<b>Manufacturer's name</b>	
Make and model of bus	single decker 10.8m
Ultra-Low Emission Bus Technology (e.g. plug-in electric etc.)	Plug-in electric
Number of buses in bid	13
Anticipated date of order	10/2020
Anticipated date of entry into service	10/2021
Cost per ultra-low emission bus	£339,000
Cost per bus of diesel equivalent	£150,000
Base grant per bus (as per the calculator)	£94,500
Top-up grant per bus (as per the calculator)	£47,250
Total grant eligibility per bus (as per the calculator)	£141,750
Total grant being sought per bus	£141,750
Value for Money (VfM) Score (as per calculator)	2.6
<b>Manufacturer's name</b>	
Make and model of bus	
Ultra-Low Emission Bus Technology (e.g. plug-in electric etc.)	Plug-in electric
Number of buses in bid	41
Anticipated date of order	03/2019
Anticipated date of entry into service	03/2020
Cost per ultra-low emission bus	£352,000
Cost per bus of diesel equivalent	£163,000
Base grant per bus (as per the calculator)	£94,500
Top-up grant per bus (as per the calculator)	£47,250
Total grant eligibility <sup>5</sup> per bus (as per the calculator)	£141,750
Total grant being sought per bus	£141,750
Value for Money (VfM) Score (as per calculator)	2.6

<sup>4</sup> This is the total maximum grant you are eligible for as set out in your calculator (base grant + top-up grant, subject to any imposed caps)

<sup>5</sup> This is the total maximum grant you are eligible for as set out in your calculator (base grant + top-up grant, subject to any imposed caps)

Space below for copying more tables if needed:

## C2. The Infrastructure

*Please give a description of any infrastructure funding being sought over the period of funding (i.e. 2018-2021):*

The table below summarises the infrastructure required to accommodate the new electric buses. This is based on the best estimates TfGM has available at the time of bid submission.

Following submission of this bid, [REDACTED] and their infrastructure partners will undertake a desk top and physical survey of each location which will confirm the cost of the required infrastructure.

At this stage, TfGM has not had an opportunity to seek quotations from the DNO for grid connection costs. In the event that the actual grid reinforcement costs are lower than the level of grant funding requested, GMCA would return the excess to DfT. GMCA understands that any costs above the requested funding is at GMCA's risk.

**Grant requested – 75% of £4,357,440 = £3,268,080**

In total, how much grant are you seeking for infrastructure?	<b>£3,268,080</b>
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For each type of infrastructure<sup>6</sup>, please provide the following. If needed, please copy and paste more tables below. All rows are mandatory.

<sup>6</sup> Please refer to paragraphs 1.7 and 1.8 in the guidance

<b>Manufacturer's name<sup>7</sup></b>	██████████
Type of infrastructure	64 x Charging Station, installation, depot civil infrastructure and 2x ██████ Charging Management System (for Metroshuttle and Busway only)
Anticipated date of order	03/2019
Anticipated date of installation <sup>8</sup>	03/2020
Total cost	£1,131,200
Total eligible amount <sup>9</sup>	£848,400
Total grant sought	£848,400
<b>Manufacturer's name</b>	<b>DNO</b>
Type of infrastructure	DNO - grid reinforcement
Anticipated date of order	10/2020
Anticipated date of installation	10/2021
Total cost	£2,500,000
Total eligible amount	£1,875,000
Total grant sought	£1,875,000
<b>Manufacturer's name</b>	<b>N/a</b>
Type of infrastructure	Contingency at 20%
Anticipated date of order	03/2019
Anticipated date of installation	03/2020
Total cost	£726,240
Total eligible amount	£544,680
Total grant sought	£544,680

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### C3. Funding Profile

*Please use the information in sections C1 and C2 to complete the following summary funding table:*

<sup>7</sup> Where a local authority is yet to go out to tender, the name may not be known. The remaining rows should be filled in however.

<sup>8</sup> This is the date after which buses will be refuelled using the infrastructure

<sup>9</sup> This will be 75% of the cost of your infrastructure

Please complete the following tables. **Figures should be entered in £000s** (i.e. £10,000 = 10).

£000s		2018-19	2019-20	2020– 21			Total
<b>Buses</b>							
Number of buses in bid			51	13			64
Total grant eligibility (as per your calculator)			7,503	1,843			9,346
Total grant being sought			7,503	1,843			9,346
<b>Infrastructure</b>							
Total cost			3,475	883			4,357
Total eligible amount (i.e. 75%)			2,606	662			3,268
Total grant sought			2,606	662			3,268
<b>TOTAL grant sought (Bus and infrastructure)</b>							
			<b>10,109</b>	<b>2,505</b>			<b>12,614</b>
Match funding (if any) <sup>10</sup>			12,848	2,785			15,633

Please provide more information below on any match funding, notably:

1. What it will buy;
2. When it will be bought; and
3. The source(s)

Match funding of £15,632,860 will be provided by GMCA. This funding will be provided through the GMCA's agreed borrowing facilities.

<sup>10</sup> This should include any 3<sup>rd</sup> party contributions that have been secured

## **SECTION D – Funding (bid 2 – scaled-down)**

*Although there is no cap on bids, where they exceed £5m, bidders should demonstrate how their plans (and the amount sought) can be scaled down. In doing so, please complete tables D1-D3 below.*

<b>D1. The Buses (bid 2)</b>	
In total, how many new ultra-low emission buses are you bidding for?	34 electric buses
In total, how much grant are you seeking?	£6,992,360
<p>For each separate bus type, please provide the following. The calculator will give you the “Base grant”, “Top-up grant” and “Total grant eligibility”: If needed, please copy and paste more tables below. All rows are mandatory.</p> <p>Note – You must submit your completed ‘calculator’ alongside this bid.</p> <p>The completed ULEBS WTW calculator is attached in this bid at Appendix 6.</p>	
<b>Manufacturer's name<sup>11</sup></b>	[REDACTED]
Make and model of bus	[REDACTED] (with additional Vantage Spec)
Ultra-Low Emission Bus Technology (e.g. plug-in electric etc.)	Plug-in electric
Number of buses in bid	10
Anticipated date of order	03/2019
Anticipated date of entry into service	03/2020
Cost per ultra-low emission bus <sup>12</sup>	£505,000 ([REDACTED] additional Vantage scope)
Cost per bus of diesel equivalent	£260,000 ([REDACTED] additional Vantage scope)
Base grant per bus (as per the calculator)	£119,100
Top-up grant per bus (as per the calculator)	£50,000

<sup>11</sup> In exceptional cases where this may be unknown, for example where a local authority is yet to go out to tender, it is sufficient to state the type of technology sought (e.g. hybrid, plug-in electric, gas).

<sup>12</sup> In the case where local authorities are yet to go out to tender, an average cost can be given



Total grant eligibility <sup>13</sup> per bus (as per the calculator)	£169,100
Total grant being sought per bus	£169,100
Value for Money (VfM) Score (as per calculator)	2.6
<b>Manufacturer's name</b>	
Make and model of bus	
Ultra-Low Emission Bus Technology (e.g. plug-in electric etc.)	Plug-in electric
Number of buses in bid	13
Anticipated date of order	10/2020
Anticipated date of entry into service	10/2021
Cost per ultra-low emission bus	£339,000
Cost per bus of diesel equivalent	£150,000
Base grant per bus (as per the calculator)	£94,500
Top-up grant per bus (as per the calculator)	£47,250
Total grant eligibility per bus (as per the calculator)	£141,750
Total grant being sought per bus	£141,750
Value for Money (VfM) Score (as per calculator)	2.6
<b>Manufacturer's name</b>	
Make and model of bus	
Ultra-Low Emission Bus Technology (e.g. plug-in electric etc.)	Plug-in electric
Number of buses in bid	11
Anticipated date of order	03/2019
Anticipated date of entry into service	03/2020
Cost per ultra-low emission bus	£352,000
Cost per bus of diesel equivalent	£163,000
Base grant per bus (as per the calculator)	£94,500
Top-up grant per bus (as per the calculator)	£47,250

<sup>13</sup> This is the total maximum grant you are eligible for as set out in your calculator (base grant + top-up grant, subject to any imposed caps)

Total grant eligibility <sup>14</sup> per bus (as per the calculator)	£141,750
Total grant being sought per bus	£141,750
Value for Money (VfM) Score (as per calculator)	2.6

Please give a description of how this scaled down bid still meets the objectives of the fund as set out in the guidance and helps deliver your longer term vision.

The scaled down bid reduces the number of School Bus services from 41 to 11. There is no change to the electrification of the Busway or Manchester City Centre 'Metroshuttle' services. TfGM is flexible on the scaled back number of school bus services which could be flexed up or down.

Our choice to scale back the school bus services reflects the fact that both Vantage and the Manchester City Centre 'Metroshuttle' service have greater NOx and CO<sub>2e</sub> savings by vehicle. These services also have a greater impact on more priority areas for air quality compliance.

## **D2. The infrastructure (bid 2)**

*Please give a description of any infrastructure funding being sought over the period of funding (i.e. 2018-2021):*

The table below summarises the infrastructure required to accommodate the new electric buses. This is based on the best estimates TfGM has available at the time of bid submission.

Following submission of this bid, [REDACTED] and their infrastructure partners will undertake a desk top and physical survey of each location which will confirm the cost of the required infrastructure.

At this stage, GMCA has not had an opportunity to seek quotations from the DNO for grid connection costs. In the event that the actual grid reinforcement costs are lower than the level of grant funding requested, GMCA would return the excess to DfT. GMCA understands that any costs above the requested funding is at GMCA's risk.

<sup>14</sup> This is the total maximum grant you are eligible for as set out in your calculator (base grant + top-up grant, subject to any imposed caps)

**Grant requested – 75% of £2,532,480 = £1,899,360**

In total, how much grant are you seeking?	£1,899,360
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For each type of infrastructure<sup>15</sup>, please provide the following. If needed, please copy and paste more tables below.

<b>Manufacturer's name</b>	██████████
Type of infrastructure	34 x Charging Station, installation, depot civil infrastructure and 2x ██████████ Charging Management System (for Metroshuttle and Busway only)
Anticipated date of order	03/2019
Anticipated date of installation	03/2020
Total cost	£610,400
Total eligible amount (i.e. 75%)	£457,800
Total grant sought	£457,800
<b>Manufacturer's name</b>	<b>DNO</b>
Type of infrastructure	DNO - grid reinforcement
Anticipated date of order	10/2020
Anticipated date of installation	10/2021
Total cost	£1,500,000
Total eligible amount (i.e. 75%)	£1,125,000
Total grant sought	£1,125,000
<b>Manufacturer's name</b>	<b>N/a</b>
Type of infrastructure	Contingency at 20%
Anticipated date of order	03/2019
Anticipated date of installation	03/2020
Total cost	£422,080
Total eligible amount (i.e. 75%)	£316,560
Total grant sought	£316,560

Please give a description of how this scaled down bid still meets the objectives of the fund as set out in the guidance and helps deliver your longer term vision.

<sup>15</sup> Examples of the infrastructure most likely to be bid for under this fund are: standard, fast and inductive charging equipment, gas (this includes portable or fixed) and hydrogen re-fuelling systems.

The scaled down bid reduces the number of School Bus services from 41 to 11. There is no change to the electrification of the Busway or the Manchester City Centre 'Metroshuttle' services.

Our choice to scale back the school bus services reflects the fact that both Vantage and the Manchester City Centre 'Metroshuttle' service have greater NOx and CO<sub>2</sub>e savings by vehicle. These services also have a greater impact on more priority areas for air quality compliance.

### D3. Funding profile (bid 2)

Please use the information in sections D1 and D2 to complete the following summary funding table:

Please complete the following tables. **Figures should be entered in £000s** (i.e. £10,000 = 10).

£000s		2018-19	2019-20	2020 –21			Total
<b>Buses</b>			21	13			34
Number of buses in bid			3,250	1,843			5,093
Total grant eligibility			3,250	1,843			5,093
Total grant being sought							
<b>Infrastructure</b>							
Total cost			1,650	883			2,532
Total eligible amount (i.e. 75%)			1,237	662			1,899
Total grant sought			1,237	662			1,899
<b>TOTAL grant sought (Bus and infrastructure)</b>			<b>4,487</b>	<b>2,505</b>			<b>6,992</b>
Match funding (if any) <sup>16</sup>			6,084	2,785			8,869

Please provide more information below on any match funding, notably:  
1. What it will buy;

<sup>16</sup> This should include any 3<sup>rd</sup> party contributions that have been secured

2. *When it will be bought; and*
3. *The source(s).*

Match funding of £8,869,120 will be provided by GMCA. This funding will be provided through the GMCA's agreed borrowing facilities.

## **SECTION E – Monitoring and evaluation**

### **E1. Monitoring and Evaluation (optional)**

*While this section is optional, we encourage bidders to comment on how air quality could be monitored and evaluated as part of this scheme (as per paragraph 3.7 of the guidance). This will not form part of the assessment criteria, however, and will only be used to inform DfT on how best to monitor and evaluate this scheme.*

*Consideration of this could include any existing monitoring arrangements in place on the route(s) set out in the bid. Unless the route is bus-only, there can be difficulties in monitoring specific emission levels. As such, we may monitor and evaluate air quality through other parameters, such as the degree of zero emission running on the route.*

*Please use the space below to do this:*

GM local authorities working with TfGM are expected to provide data and metrics in order to monitor ongoing levels of emissions, including the performance of measures designed to reduce emissions. The Air Quality Action Plan (AQAP) sets out a commitment to provide better quality real-time data to the general public with the purpose of influencing travel choices.

NO<sub>2</sub> is measured using both continuous and passive techniques. The 10 GM Authorities currently undertake ambient monitoring of NO<sub>2</sub> across their administrative areas using passive NO<sub>2</sub> diffusion tube sites and automatic analysers.

There are currently 18 stations operational across GM providing real time information. The various analysers monitor different combinations of emissions including NO<sub>2</sub> and Particulate Matter (PM<sub>10</sub> & PM<sub>2.5</sub>). DEFRA supports monitoring equipment of some stations (5 locations) as part of the Automatic and Urban Rural Network (AURN). This network is currently undergoing an upgrade within GM, this will move one station to a preferred location in Tameside, replace 13 out of date monitors within the Bury, Stockport, Tameside, Trafford and Wigan local authority areas and see three new stations installed in Bolton, Rochdale and Wigan.

Real time data captured by the automatic analysers is freely available through the Great Air Manchester website, and historic data is available on the Air Quality England website. Real time data is a valuable resource in managing the impacts of harmful emissions.

Annual mean NO<sub>2</sub> concentrations are also recorded by the GM authorities' passive diffusion tube network. At present there are 217 different diffusion tube locations, however, some locations have more than one tube installed. The diffusion tube network supplements the coverage of automatic monitoring to provide more spatial coverage but is limited as diffusion tubes can only provide a measurement over a longer period of time (usually several weeks) and cannot be used to provide hourly measurements needed to compare with a shorter term objective standard.

Where appropriate, authorities and TfGM will be able to assess particular road link locations in near real time. An example of a key bus route in non-compliance is Oxford Road that does, at present, have continuous monitoring. TfGM will work with the 10 local authorities to determine if diffusion tube placement can take into account some of the specified routes in this bid to provide a before and after comparison. This will help determine the projects impact, particularly in priority zones such as schools.

## **SECTION F - Declarations**

### **F1. Section 151 Officer Declaration (for local authorities)**

As Section 151 Officer for Greater Manchester Combined Authority I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that Greater Manchester Combined Authority:

- has allocated sufficient budget to deliver this scheme on the basis of its proposed funding contribution;
- accepts responsibility for meeting any costs over and above the DfT contribution requested, including potential cost overruns and the underwriting of any funding contributions expected from third parties;
- accepts responsibility for meeting any ongoing revenue and capital requirements in relation to the scheme;
- accepts that no further increase in DfT funding will be considered beyond the maximum contribution requested and that no DfT funding will be provided after 2020/21;
- confirms that the authority has the necessary governance / assurance arrangements in place and the authority can provide, if required, evidence of this.

Name:

*RICHARD RAVEN*

Signed:



*\*This is only required from the lead authority in joint bids*



## **Submission of Bids**

The deadline for bids is 5pm, **30 June 2018**

An electronic copy should be submitted to [ulebs@dft.gsi.gov.uk](mailto:ulebs@dft.gsi.gov.uk)

Please also include the supporting documentation specified either within the guidance document or in this proforma. This should include, but is not limited to: a PSV licence (operators only) and quotes from the manufacturer(s) for the ultra-low emission bus and its' diesel equivalent. We also require evidence of the calculation of your base grant, top-up grant and total eligible grant. This will be given by the calculator as specified in the guidance. Bidders are also required to submit a separate GHG and air quality improvements spreadsheet which will be published alongside the guidance. Further information on the data required is located within the spreadsheet. Where match-funding has been secured, evidence of this will strengthen a bid. Please also provide evidence that the ULEB has been certified as such.

If, for any reason, you need to send hard copies of papers to DfT, please provide 3 copies to:

Ultra-Low Emission Bus Scheme  
Buses & Taxis Division  
Department for Transport  
Great Minster House  
33 Horseferry Road  
London  
SW1P 4DR