



Clean Air Fund Report

An outline of Birmingham's proposed mitigation measures

Report for the Joint Air Quality Unit

3rd December 2018

Birmingham City Council
1 Lancaster Circus Queensway
Birmingham B4 7DJ

Contents

1	Introduction	6
2	Long list/short list process	6
2.1	Summary of distributional impact analysis report	6
2.2	BCC Clean Air Zone consultation	9
2.3	Exemptions.....	10
2.4	Mitigation measure longlist.....	12
2.5	Mitigation shortlist.....	15
2.6	Integrations of exemptions and mitigation measures.....	16
2.7	Impact on compliance date	16
2.8	Summary of shortlisted measures.....	17
3	Overall approach to Value for Money and State Aid	20
3.1	Approach to Value for Money assessment	20
3.2	Approach to State aid	23
4	M1: Mobility support for individuals who regularly enter the CAZ	25
4.1	Summary of distributional impact on group	25
4.2	Description of mitigation measure	27
4.3	M1a: Delivery plan for supporting individuals working within the CAZ.....	32
4.4	M1b: Delivery plan for supporting individuals living outside the CAZ	35
4.5	State aid considerations	36
4.6	Value for Money	37
4.7	Quantification of scheme.....	39
5	M2: Financial support for Birmingham's taxi trade	41
5.1	Summary of distributional impact report.....	42
5.2	M2a: Financial support for Hackney carriage drivers.....	46
5.3	M2b: Hackney carriage leasing scheme	51
5.4	M2c: Financial support for Private Hire Vehicle driver	53
5.5	Value for Money	55
6	M3: 'Free miles' for ULEV LGVs on BCC's public charging network	56
6.1	Summary of distributional impacts	56
6.2	Description of mitigation measure	57
6.3	Delivery plan.....	57

6.4 State aid considerations	57
6.5 Value for Money	57
6.6 Quantification of package	58
7 M4: HGV & Coach compliance fund.....	59
7.1 Summary of distributional impact on group.....	59
7.2 Description of mitigation measure	60
7.3 Delivery plan.....	62
7.4 State aid considerations	64
7.5 Value for Money	64
7.6 Quantification of scheme.....	65
8 M5: Marketing and engagement campaign.....	67
8.1 Summary of distributional impact	67
8.2 Description of mitigation measure	67
8.3 Delivery plan.....	68
8.4 State aid considerations	68
8.5 Value for Money	68
8.6 Quantification	76
9 M6: Resident parking schemes	77
9.1 Summary of distribution analysis.....	77
9.2 Description of mitigation measures	77
9.3 Delivery plan.....	79
9.4 State Aid consideration	79
9.5 Value for Money	79
9.6 Quantification of scheme.....	79
10 Administrative cost and spending profile.....	81
10.1 Administrative costs	81
10.2 CAZ team administrative costs.....	84
10.3 Spending profile for mitigations	89

Authors

The report was prepared by Element Energy.



For comments or queries please contact:

Luke Gavin, Consultant, luke.gavin@element-energy.co.uk, +44 (0) 3300 883 916

Reviewers

Celine Cluzel, Director, Element Energy

celine.cluzel@element-energy.co.uk

David Harris, Birmingham City Council

David.I.Harris@birmingham.gov.uk

Acknowledgements

The authors would like to thank the numerous stakeholders who made valuable contributions to this document: Transport for West Midlands, Birmingham Children's Hospital, Birmingham Community Healthcare NHS Foundation Trust, the National Franchised Dealership Association, VRS, the Federation for Small Businesses, Leeds City Council and Transport for London.

We also thank the many teams from Birmingham City Council that have themselves available to help and input: the taxi licencing team, the benefits team, the Business Enterprise team and the Transportation Behaviour Change team.

Lastly, we are grateful for the assistance provided by the Joint Air Quality Unit team who provided constructive feedback on several occasions, helping us refine this report.

Acronyms

ANPR	Automatic Number Plate Recognition
ATF	Authorised Treatment Facility
BAME	Black, Asian and Minority Ethnic
BCC	Birmingham City Council
BCH	Birmingham Children's Hospital
BEV	Battery Electric Vehicles
DIA	Distributional Impact Appraisal
HGV	Heavy Goods Vehicle
CAF	Clean Air Fund
CPZ	Controlled Parking Zone
CS	Consumer Surplus
CSF	Critical Success Factor
CVRAS	Clean Vehicle Retrofit Accreditation Scheme
DEFRA	Department for Environment, Food & Rural Affairs
DfT	Department for Transport
DIA	Distributional Impact Analysis
DVLA	Driver and Vehicle Licencing Authority
EV	Electric Vehicle
HEV	Hybrid Electric Vehicle
HGV	Heavy Good Vehicle
HDV	Heavy Duty Vehicle
LGBT	Lesbian, Gay, Bisexual and Transgender
LGV	Light Goods Vehicle
LPG	Liquefied Petroleum Gas
LSOA	Lower Layer Super Output Area
MEOP	Market Economic Operator Principle
MSOA	Middle Layer Super Output Area
NINO	National Insurance Number
ONS	Office for National Statistics
PAYE	Pay As You Earn
PHEV	Plug in Hybrid Electric Vehicle
PHV	Private Hire Vehicle
PiCG	Plug in Car Grant
PiVG	Plug in Van Grant
PPZ	Permit Parking Zone
SME	Small and Medium sized Enterprises
TEMPro	Trip End Model Presentation Program
TfWM	Transport for West Midlands
TSRGD	Traffic Signs Regulations and General Directions
UCL	University College London
ULEV	Ultra-Low Emission Vehicle
VfM	Value for Money
VOC	Vehicle operating Costs

1 Introduction

This report is designed to support the Full Business Case submitted to Government by Birmingham City Council. It aims to thoroughly explain the thought process in designing the mitigation measures and justify the funding amount asked from the Clean Air Fund (CAF).

Section 2 outlines the process by which the final list of mitigation measures was reached; starting from a broad long list and comparing each to Critical Success Factors to arrive at the short list of measures which has been brought forward to the Clean Air Fund application. It also briefly explains the proposed exemptions and how these integrate with the mitigation measures.

Section 3 described the approach to assessing the Value for Money (VfM) for each measure as well as the overall State aid assessment.

The subsequent sections (4 to 9) detail each mitigation measure included in the short list including; a summary of the distributional impact on the affected group, a description of the proposed measure, a robust delivery plan, state aid considerations, value for money and lastly the methodology used to quantify the amount asked from the CAF.

Finally, Section 10 lays out the mitigation administration cost, and the total cost spending profile.

2 Long list/short list process

When designing mitigation measures to be requested from the CAF, an established longlist/shortlist process was followed. This involved the following steps:

- Taking the key conclusions from the Distributional Impact Appraisal report (DIA) to identify the groups most negatively impacted and so most in need of support, whilst also considering the impact on those with protected characteristics.
- From the DIA conclusions creating a longlist of mitigation measures. A wide range of measures were considered which could mitigate the negative impacts identified in the DIA. This list was deliberately broad and considered all options that could be enacted to help targeted user groups.
- Assessing the longlist measures: each measure on the longlist was assessed against Critical Success Factors (CSF). These are divided into:
 - **Primary CSF:** this criterion is crucial to the overall project success, measures which do not meet this criterion were rejected. This is a pass/fail criterion on whether the measure delays reaching compliance in the shortest possible timeframe.
 - **Secondary CSFs:** used to determine the best option relative to the project objectives, these included: Value for money, Distributional impacts, Strategic fit with other policies, supply side capability, affordability and achievability.
- Revising the longlist to a shortlist of measures. All measures were compared assessed against the CSFs mentioned above and a qualitative decision was made whether to progress the measure to the short list of measures. During this process the details of the measure in question was finalised.
- The short list of measures was then analysed and quantified before a final decision was made on the items taken forward to the CAF ask.

2.1 Summary of distributional impact analysis report

The results from the DIA were the primary source in identifying the groups negatively impacted by the CAZ and in need of support in the form of mitigation measures. The conclusions from this report were used to design a longlist of mitigation measures. The main findings from this report are summarised below, as well as the decision process of whether to include a mitigation measure targeted at the affected group in the longlist of mitigation measures.

Table 1 Summary of DIA findings and decision to include in mitigation measures

Affected group	Impact	Summary of distributional impact	Decision to include in longlist of mitigation measures
Low income households	***	The DIA has shown that low income households across Birmingham would bear a disproportionate amount of the increased vehicles costs for personal journeys. Those located in close proximity to the CAZ or those who need to regularly enter the CAZ (e.g. for work) would be worst affected and least able to avoid the CAZ for everyday journeys.	Decision to include support measures in longlist of mitigation measures with particular focus on those that live and work within the CAZ
Taxi drivers	***	<p>BCC are introducing new taxi licencing conditions in 2020 that will result in 1,140 hackney carriages currently in operation no longer being eligible to be licenced. This represents a fleet turnover of 90% in a single year. Drivers are faced with limited options as a Euro 6 vehicle can only be operated for 6 years due to a proposed ULEV licencing condition in 2026 and electric taxis involve high capital costs. This creates significant affordability issues for drivers forced to change their vehicle.</p> <p>Additionally, 90% of drivers identify themselves as from BAME groups and the majority of drivers live in the most income deprived areas of Birmingham.</p> <p>The new licensing conditions will have a similar impact on private Hire Vehicle drivers. Out of a total stock of 4,321 vehicles, only 162 are eligible to be licenced past January 2020. This leaves 4,159 vehicles which must be upgraded. 50% of drivers are registered in LSOA's in the 1st quintile for BAME residents and 90% reside in the most income deprived quintile in Birmingham.</p>	Decision to include support measures in longlist of mitigation measures
HGV fleets	***	There are 1,459 small operators in Birmingham (<5 vehicles) who are most at risk from CAZ charges as they lack the flexibility to redistribute their fleet and are less likely to have the necessary capital to either absorb the CAZ charges or alternatively upgrade to a compliant vehicle. Analysis of the HGV market has shown that substantial capital expenditure is required to upgrade a fleet and the CAZ will put significant pressure on local businesses.	Decision to include support measures in longlist of mitigation measures
SMEs	SMEs within the CAZ: **	Businesses within the CAZ will have a limited ability to avoid entering or exiting the zone and mapping has shown that there is a high proportion of SMEs which are dependent on vehicle transport within the CAZ creating affordability issues for the city's small businesses. Consultation with Birmingham's fleet operators has suggested that many will not reach	Decision to include support measures in longlist of mitigation measures

		compliance naturally before 2020 and so will face high capital costs or CAZ charges. There was also significant concern raised around the retention of staff who may change working location to avoid the charges.	
Disabled and elderly Individuals	Disabled: *** Elderly: **	Disabled people will be impacted by the potential reduction in community transport and wheelchair adapted taxis and the possible increase in cost of community transport. As a group, they have a reduced range of transport options and may be unable to use public transport, walk or cycle due to mobility issues. They also, on average, have lower household incomes making them less able to afford CAZ charges or increases in fares.	No: it was decided that mitigations for disabled residents was best covered by an exemption rather than by a mitigation measure requiring CAF funding. For more detail see Sections 2.6, 2.8 and Table 2.12 of the Final Business Case. Accessibility will also be covered in mitigation measures targeted at the taxi community to ensure wheelchair accessible vehicles remain available to elderly and disabled residents.
Women	**	Women have been shown to be more reliant on the use of taxis and private hire vehicles and have a more negative perception of other travel options due to safety concerns. They therefore would be disproportionately impacted by the increased cost of travel.	No: to prevent these negative impacts, mitigations will be targeted at the taxi community to ensure availability remains.
People with religious beliefs	**	Congregants of large places of worship within the CAZ would be adversely impacted if the increased cost of travel dissuades them from attending their place of worship.	No: It was decided that a mitigation measure would not be included in the long list. This is due to the difficulties in implementing a scheme targeted at worshipers and a risk of perceived unfairness on other groups. Instead there is a focus on a wider group of residents on low income

An additional impact that was considered concerned residents living near the boundary of the CAZ, those who park their vehicle on-street will be adversely affected if non-residents park in these areas and complete their journey on foot to avoid the CAZ charges. This was outside the scope of the DIA but has been included on the advice of BCC's transport team.

For each of the shortlisted items discussed later, this report gives a detailed description of the DIA for the affected group as an explanation and justification for proposing each mitigation measure.

2.2 BCC Clean Air Zone consultation

2.2.1 Summary of consultation responses

Between 4th July 2018 to 17th August 2018, BCC ran a public consultation regarding the introduction of the CAZ. 10,368 individuals and 384 organisations responded to the consultation. Below are some key results which were used to influence the design of the mitigation measures:

- 38% of individuals said they would need some form of support if a CAZ was introduced
- 81% of organisations felt there should be support for SMEs operating in the CAZ area
- The main groups that individuals felt should be supported were:
 - Visitors to the Birmingham Children's Hospital
 - Disabled drivers and their carers
 - Residents of the CAZ
 - Those on low income
 - Small and local businesses
 - Commuters and those working in the CAZ
 - Taxi drivers
- 22% of individuals mentioned the possibility of having to leave their job as a result of the CAZ charges
- 37% of individuals felt that residents and commuters would face financial difficulties as a result of CAZ charges
- 72% of organisations stated that the CAZ would be bad for business in Birmingham
- 26% of organisations believe that the CAZ will lead to job losses

The conclusions from the responses showed that, as well as supporting Birmingham's fleets adapt to the CAZ, a particular focus should be given to those working in the CAZ who commute from outside the zone. This is important for number of reasons, most importantly:

- These individuals have a limited ability to avoid entering the CAZ, if the public transport network is insufficient for their journey then they could have to upgrade their vehicle to avoid paying the charges which causes affordability issues.
- Businesses in the CAZ will suffer if employees move jobs to avoid paying the daily CAZ charges.

2.2.2 Case study: Birmingham Children's Hospital

Birmingham Children's Hospital (BCH) employs 2,800 staff and provides 24 hour per day services to residents of Birmingham, the West Midlands and the wider area. The key site at the hospital is located on Steelhouse Lane which lies within the proposed CAZ D boundary. BCH relies on a regional workforce to provide a full range of specialist care skills and many staff commute from the wider West Midlands area. The start and end time of many shifts make public transport inappropriate, these include arriving by 07:00 on weekdays and leaving at 10:00 or 02:00 in the evenings as well as a range of weekend shifts. To assess the impact on their staff and patients, BCH conducted a survey of 463 staff as well as 458 families. The conclusions form the study showed:

- Public transport services are often not adequate for staff and visitors
- There is a lack of safe cycle routes to the site
- The short time scale will prevent low income staff from upgrading their vehicle in time to avoid the CAZ charges
- 36% of staff would have to pay the CAZ charge with their current vehicle
- 69% of staff who would be charged stated that they rely on travelling to work by car because of other responsibilities

- Overall 37% of staff said they were totally dependent on their car for journeys to BCH
- 65% of staff that owned non-compliant vehicles stated that they would consider changing jobs in the next 3 years as a result of the CAZ charges

When comparing the responses from staff of BCH with other groups identified in the DIA as well as other consultation responses an important theme emerges. The hospital employs a wide range of staff, as well as the critical staff employed as key workers there are hundreds of others whose work is vital to the operation of the hospital (e.g. porters, receptionists and cleaners). The hospital has also committed to employing only band 2 and above ($>\text{£}17,460$ per year), this would likely be over the government definition of a low-income household (60% below the national median). This stresses the importance of providing support to a wider group of individuals who work within the CAZ, both for the sake of the employee and to ensure that organisations can retain/continue to attract staff. This is particularly important for key health workers as they provide a vital community service. If they were prevented from commuting to work this could jeopardise the continuing of safe levels of health services within the CAZ.

2.3 Exemptions

The results from the DIA shown in 2.1 were used to identify groups who should be offered an exemption from the CAZ charges. The exemptions are part of a rational approach which balances the need to reduce the impact on individuals and businesses and deliver compliance in the shortest possible time. Exemptions are offered in order to give vulnerable groups an extended period of time to adapt to the CAZ and are designed to reduce the negative impact that results from its implementation. Table 2 shows a summary of the exemptions being proposed.

Table 2 Summary of proposed exemptions

Exemption	Description	DIA	Length of exemption
Commercial vehicles registered within the CAZ	Commercially owned LGVs, HGVs and coaches registered within the CAZ are exempted. Limited to 2 vehicles per company (companies two cleanest non-compliant vehicles).	SMEs with vehicles registered within the CAZ will have a limited ability to avoid the charges and will be disproportionately affected.	1 year
Commercial vehicles with pre-existing finance agreements	Commercially owned LGVs, HGVs and coaches with finance agreements that extend beyond 2020 will be given a 1-year exemption.	Finance agreements will limit an organisation's ability to upgrade vehicle. Jacobs 'Freight and Logistics' ¹ report showed that many fleet operators have lease arrangements into the early 2020's.	1 year
Private vehicles registered within the CAZ	Private vehicles registered within the CAZ are exempted	Individuals with vehicles registered within the CAZ will have a limited ability to avoid the charges and will be disproportionately impacted. Areas within the CAZ have been shown to have high levels	2 years

¹ Jacobs: Clean Air Zone - Freight & Logistics, 2017

		of income deprivation compared to Birmingham as a whole.	
Individuals travelling into the CAZ for work	Individuals with a non-compliant who work within the CAZ will be exempt from paying the CAZ charges (Cap of £30,000 annual salary applied, this includes key workers).	Low income individuals will be disproportionately impacted by the CAZ, especially those that must regularly enter the zone for work. Key works provide essential services and BCC wants to ensure that their employment is retained within the CAZ	1 year
Individuals who live outside the CAZ	Individuals who live outside the CAZ with a non-compliant car (scheme limited to finite number of places, which will be allocated on distance from the CAZ and income)	The DIA has shown that those who live in areas in proximity to the CAZ will be disproportionately impacted, especially those who must enter regularly for purposes other than work	1 year
Visitors to key hospitals	Patients/ visitors of the hospital will be given an exemption for the duration of their stay.	Individuals who visit the hospital will have limited ability to avoid the zone and it is vital that individuals are not discouraged from attending health care services as a result of financial pressure	Duration of their stay (scheme will run for a 1-year period)
Community, school and disabled vehicles	Vans and minibuses registered as providing essential community and school transport services (section 19) as well as vehicles registered as disabled will be exempt. A disabled vehicle will have to be registered with the DVLA as such, blue badge holders will not automatically be exempt. This is because the volume of blue badge holders within Birmingham makes this unfeasible.	Community and school transport services are often run by not-for-profit organisations who will have limited ability to upgrade their vehicles. They provide essential services for vulnerable residents. Disabled residents are more likely to be from low income households and have reduced options as public transport is often inappropriate for individuals with mobility issues.	All years for disability adapted vehicles 1 year for community transport services

As well as the above exemptions, BCC are planning to exclude two wheeled vehicles (motorbikes, mopeds and scooters) from the CAZ charges. Motorcycles and scooters make up a very small amount of overall traffic and do not overall contribute to air quality issues significantly. The Clean Air Zone Framework requires motorcycles to be a minimum of Euro 3. Analysis of registration date for Birmingham suggests that almost three quarters of the motorcycle, scooter and moped fleet in Birmingham meets this standard.

Feedback from the consultation showed that many residents felt they should be excluded from the charges and this is forecast to have only a minimal effect on non-compliant vehicles traveling into the CAZ. Including them in the charge would also require the capability to read rear number plates rather than the standard frontal number plate recognition.

The impact on air quality that results from these exemptions is covered fully in Section 2.8.4 of the Final Business Case.

The Council considers that these exemptions as an important measure to give individuals and businesses an extended time frame to adapt to the CAZ. However, the Council also recognise that exemptions do not help individuals or business upgrade to a compliant vehicle other than providing them with a longer period to adjust. In some cases, individuals or businesses could be faced with the same issues after the 1-year exemption as they would have done in 2020 without an exemption. To assist those looking to upgrade their vehicle, BCC has devised a list of mitigation measures to be implemented alongside the exemptions.

However, the Council will keep the exemptions under review to ensure they are not impacting or hindering on delivering compliance.

2.4 Mitigation measure longlist

After the target groups were identified from the DIA, Element Energy conducted a detailed analysis of Birmingham's fleet and private vehicles from which a long list of mitigation measures to aid target user groups in adapting to the CAZ was created. This included a number of measures identified as potential mitigation as part of the Additional Measures workstream. The longlist of measures was as follows:

- **Mobility package for private vehicle owners:** residents are offered a mobility package in the form of credit for use on Birmingham's public transport network. Options for those included in the scheme are: Residents of the CAZ (low income or all), individuals who work within the CAZ (low income or all), Low income Birmingham residents, key workers
- **Scrapage scheme for private vehicle owners:** residents are offered a choice of cash payment to contribute to compliant vehicle purchase or mobility credit (as described above) in return for scrapping a non-compliant vehicle. Options for those included in the scheme are: all Birmingham residents, low-income residents of Birmingham, low income residents of West midlands, individuals who work within the CAZ.
- **Ultra-Low Emission Vehicle (ULEV) taxi grant:** Hackney carriage drivers who purchase a ULEV vehicle receive a grant to reduce the upfront purchase price or as a contribution to lease costs.
- **Private Hire Vehicle upgrade support:** Private Hire Vehicle drivers receive a financial contribution towards the purchase or lease of CAZ compliant vehicle.
- **ULEV taxi council leasing scheme:** the council borrows a lump sum of money with which to purchase a bulk order of ULEV taxis which are then leased to drivers on favourable terms.
- **Taxi scrapage scheme:** Hackney carriage drivers receive a discount on the purchase of a new ULEV vehicle if they scrap an older non-compliant vehicle.
- **ULEV taxi operational support package:** Hackney carriage and Private Hire vehicle drivers who buy or lease a ULEV vehicle receive payments to help with operational costs such as insurance, maintenance, electricity costs, licensing fees and access fees to taxi ranks.
- **Taxi retrofit fund:** Hackney carriage drivers receive a grant with which to install an accredited retrofit technology making their vehicle compliant.
- **SME grant scheme for HGVs/LGVs:** SMEs with non-compliant vehicles are offered a grant to help with the upfront costs of a compliant vehicle. An additional option in the case of LGVs for this item is to limit the grant offering to ULEV vehicles.
- **Retrofit scheme for HGVs/LGVs:** companies are offered a grant to help with the costs of retrofitting their vehicle fleet to bring to compliance. An additional option on this item is limiting the grant to SMEs.
- **Freight consolidation centre:** BCC would finance the development of a freight consolidation centre where non-compliant vehicles could deliver goods to be picked up by alternative forms of transport

(e.g. compliant vehicles, cycle freight etc.). This is designed to lessen the burden on non-compliant delivery fleets.

- **Free public charging electricity credit for LGVs:** companies that purchase a plug-in LGV receive free electric miles on Birmingham's public charging network, this will be offered in partnership with Birmingham's electric vehicle development partner (yet to be announced, procurement on-going).
- **Additional bus service priority along 4 key corridors into Birmingham City Centre:** This would increase priority lanes for public transport into the CAZ from key areas that have been identified as having the most pressing need.
- **Improving Birmingham's cycling and walking infrastructure:** Installation of key infrastructure such as walkways, cycle lanes and cycle storage facilities along key transport routes

The above proposals all directly address issues faced by groups identified in the DIA. Through discussions with the project consortium, two additional measures were identified which BCC feel are crucial in mitigating the most severe negative impacts of the CAZ:

1. **Residents parking scheme:** There is concern that individuals regularly entering the CAZ will park on the margins of the zone, which are generally residential areas, and complete the rest of the journey by foot, thus avoiding the CAZ charge. This will cause parking pressure in these areas and may prevent residents being able to park their own vehicles at an acceptable distance to their house. To address these concerns, Controlled Parking Zones are proposed, where all non-residential vehicles must pay for parking with the aim of preventing a build-up of traffic in these areas.
2. **Marketing and engagement campaign:** Online and offline information campaign from Birmingham City Council to reach out to all key user groups with the aim of providing information on the CAZ measures, how they will impact each group, the options that each group has to reach compliance and the assistance that is available in the form of mitigation measures, government funding schemes and city council initiatives.

The decision process regarding the long list items is summarised in Table 3 below.

Table 3 Description of longlist measures including the assessment against primary and secondary CSFs leading to a decision on whether to take each measure forward to the shortlist

Mitigation measure	Primary CSF: Does measure delay reaching compliance in shortest possible time?	Secondary CSFs	Decision to bring forward to short list
Mobility package for private vehicle owners	No: encourages use of the public transport	Unless scheme is targeted cost will become excessive	Yes – but limit package to low income individuals working within the CAZ
Scrapage scheme for private vehicle owners	No: in some instances, this will result in a compliant trip rather than a cancelled/re-routed trip, however the modelling suggests this does not impact the compliance date (Section 2.8.4 of the FBC)	Logistical and feasibility issues relating to the proof of scrapage, must be targeted to limit cost	Yes – but limit package to low-income individuals and target at those who regularly enter the CAZ
ULEV taxi grant	No: encourages transition to ULEV vehicle	State aid and double funding issues	No
ULEV taxi leasing scheme	No: encourages the transition to ULEV vehicles	Would require significant funding or, alternatively, a large	Not in this form. Edited to include a limited number of taxis for the council to lease to

		loan amount	drivers
Taxi scrappage scheme	No: encourages the transition to ULEV vehicles	Feasibility and logistical issues, as well as state aid issues	No
ULEV taxi operational support package	No: encourages transition to ULEV vehicle	Satisfies all secondary CSFs and positive feedback received from trade	Yes – Combined award where drivers receive equal funding for either retrofit solution or ULEV operational support package
Taxi retrofit fund	No: encourages transition to a compliant vehicle technology	Satisfies all secondary CSFs and positive feedback received from trade	
Private Hire Vehicle upgrade support	No: encourages transition to a compliant vehicle technology	Satisfies all secondary CSFs and positive feedback received from trade	Yes
SME grant for HGVs/LGVs	No: encourages transition to a compliant vehicle technology	State aid and double funding issues	Not in this form. Edited to include a fund for HGVs only where fleets can apply for a funding award to aid with either retrofit technology or the upfront cost of a compliant vehicle.
Retrofit scheme for HGVs/LGVs	No: encourages transition to a compliant vehicle technology	Issues with technology readiness for HGVs, for LGVs the cost of retrofit compares poorly with cost of new vehicle ²	Coaches added to this scheme.
Freight consolidation centre	No: would reduce the amount of CAZ entries from freight vehicles	Would require significant investment, negative feedback from Birmingham businesses and fleet operators, not feasible in the timeframe available	No
Free public charging electricity credit for LGVs	No: encourages transition to ULEV vehicle	Satisfies all secondary CSFs	Yes
Further bus priority improvements	No: encourages use of the public transport	Costs are not considered	No (could be developed at a later

² Retrofit technologies for buses and taxis cost between £12,000 - £15,000 which is in most cases higher than the cost of a second-hand van

		reasonable in relation to CAF ³	date outside of the CAF framework)
Improving Birmingham's cycling and walking infrastructure	No: encourages residents to walk and cycle	Size of impact compared to the costs and timeframe are not considered feasible in relation to CAF ² .	No (could be developed at a later date outside of the CAF framework). The Council has prepared a separate Local Cycling & Walking Investment Plan.
Residents parking scheme	No	Satisfies all secondary CSFs	Yes
Marketing and engagement campaign	No: encourages transition to ULEV vehicles	Satisfies all secondary CSFs	Yes

2.5 Mitigation shortlist

From this assessment, 9 mitigation measures were brought forward to the shortlist; these are quantified in detail and assessed against the CAF objectives. This assessment also forms the CAF application detailing why BCC believes they are necessary to mitigate the negative impacts of the CAZ on key groups. The 8 shortlisted items are:

1. Choice of mobility package or scrappage scheme for individuals who work within the CAZ
2. Scrappage scheme for residents of the West Midlands
3. HGV & Coach compliance fund: this is a combination of the retrofit scheme and SME grant outlined in the longlist, this will take the form of an open competition where fleets bid for funding to either retrofit their vehicles or alternatively purchase/lease a new or second-hand compliant vehicle
4. Hackney carriage support package: combination of the retrofit fund and the operational support package
5. Hackney Carriage council leasing scheme: this is in the form of a limited number of vehicles being purchased by the council to lease to drivers, this scheme will be targeted at those close to retirement and those considering purchasing a ULEV vehicle though all current drivers will be eligible.
6. Financial support for Private Hire Vehicles to upgrade to compliant vehicles
7. Free miles' for ULEV LGVs on BCC's upcoming public charging network
8. Marketing and engagement campaign
9. Residents parking scheme

For each of these, the following sections provide a detailed description of the measure, including:

- A summary of the distributional analysis as a **rationale for why the intervention is required**
- **A full description of the measure detailing how the measure meets the funds objectives and has no negative impact on air quality**
- **A detailed delivery plan of the measure**
- A description of state aid considerations
- Demonstration of how the measure represents **value for money**
- A quantification of the scheme explaining the methodology used to calculate the number affected stakeholders and the funding required.

³ Birmingham Clean Air Zone Feasibility – Additional Measures Study, 2018

2.6 Integrations of exemptions and mitigation measures

The exemption and mitigation measures that have been proposed are both designed to minimise the negative impacts identified by the distributional impact analysis. As such, in some cases overlaps exist between the groups targeted by the exemptions and those eligible for exemptions. Descriptions of how exemptions are integrated into the implementation of the mitigation measure are covered in detail in the delivery plan of each measure. A summary is provided below and shown in Figure 1:

- Receiving support through one of the mitigation measures proposed in no way affects an individual's/organisation's eligibility for an exemption and vice versa.
- Social mitigation measures proceed a 1-year exemption and involve a 2-step application process
- For mitigations affecting commercial vehicles:
 - The implementation of the mitigation measures will be extended to early 2021, this allows individuals/organisations to continue to use their vehicle during the exemption period and is organised so that beginning of the mitigation measure coincides with the end of the exemption.
 - Those that are eligible for mitigation measures but are not eligible for exemptions can receive the mitigation packages/funding to coincide with the implementation date of the CAZ (Jan 2020).

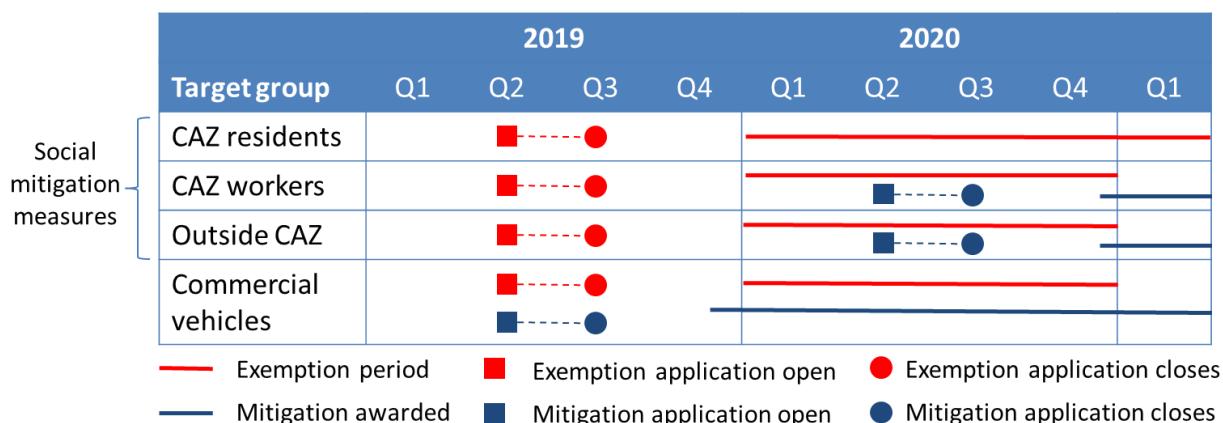


Figure 1 BCC's general approach to integrating the proposed exemptions and mitigation measures

2.7 Impact on compliance date

The set of measures will not delay compliance for a number of reasons:

- The measures are designed to help individuals and organisations switch to cleaner compliant vehicles earlier than they normally would, so it is not envisaged that any measure would delay compliance.
- For commercial fleets, especially in the case of taxis and HGVs, it is assumed that the vast majority would switch their vehicle as a result of the CAZ irrespective of any mitigation measures. Therefore, the measures should not impact the rate of compliance but instead make it financially easier for those who are forced to switch their vehicles
- For private individuals, the measures are designed to prevent non-compliant vehicles entering the CAZ and so are not considered to prevent compliance in any form.

The exception to the above is the scrappage scheme as this measure has the potential to cause an individual to travel into the CAZ with a compliant vehicle when they otherwise would have cancelled or re-routed their trip in order to avoid the CAZ charges. Air quality modelling has been conducted to analyse this impact. It shows that in monetary terms, if this mitigation is not included the net benefit of the CAZ on air quality will be £50,172,323. When this mitigation is included, this reduces to £49,901,646 meaning the measure has a negative impact on air the net air quality benefit of -£270,677. When compared to the total benefit, this amount is negligible and well below the resolution of the air quality model. In summary, this measure does not delay compliance and will not prevent Birmingham reaching compliance in the shortest possible timeframe.

Category	Summary of mitigation measure	Distributional analysis (how group is impacted)	Cost (volume x cost per user)
Restricted area	Individual can access the choice of a £1000 mobility credit offered in form of SWIFT travel card or a £2,000 package (Swift credit or contribution to compliant vehicle) in return for scrapping a non-compliant vehicle	Class D CAZ will force residents to either upgrade vehicle or pay charges if they wish to enter. For many individuals, public transport may be the only alternative, these measures decrease the cost of that switch or facilitate the purchase of a compliant vehicle.	£10.84 million (5,420 x £2,000)
First 1000 vehicles	With evidence of scrapping a non-compliant car individual receives either: <ul style="list-style-type: none"> • £2,000 cash payment toward the purchase of a compliant car • £2,000 mobility credit. Credit to be supplied on a SWIFT card with no expiration for use. 	Changes in licensing conditions will force over 90% of the 1280 vehicles currently operational to change (upgraded/retrofit). All options on the market require significant capital expenditure, this helps drivers to switch to a compliant vehicle.	£6.50 million (3,250 x £2,000)
BCC (Businesses and BCC members)	Drivers offered £5,000 as: <ul style="list-style-type: none"> • support payments to be paid towards operational expenses of ULEV vehicles (4 annual instalments of £1,250) • support for an LPG retrofit of their current or newly purchased vehicle 	Changes in licensing conditions will force over 90% of the 1280 vehicles currently operational to change (upgraded/retrofit). All options on the market require significant capital expenditure, this helps drivers to switch to a compliant vehicle.	£5 million (1000 x £5,000)
	BCC bulk purchase 50 ULEV taxis through public procurement tender and lease them to vulnerable drivers as well as on a try-before-you-buy basis	As above, changes in licensing	£2.75 million (50 x £55,000)
	Private Hire Vehicle owners who upgrade a non-compliant vehicle to a	As above, changes in licensing	£7 million

2.8 Summary of shortlisted measures

	compliant vehicle which fulfils BCC's 2020 licencing criteria and is under 3 years of age will receive financial aid of £2,000. This will aim to incentivise the switch to low emission vehicles (HEVs, PHEVs and BEVs)	conditions are expected to result in 95% of the 4,321 current vehicles needing to be upgraded to continue operation	(3,500 x £2,000)
gham	ULEV van drivers receive £750 credit to spend on BCC public charging network	SMEs operating coaches/HGVs/LGVs or relying on road transport will be disproportionately impacted. Vehicle capital costs are high, and many fleets must enter CAZ as part of business operation. This helps fleets change to a compliant vehicle.	£0.75 million (750 x £1,000)
st ounds	Fleets compete for £15,000 funding package to contribute towards: <ul style="list-style-type: none"> • Installing a retrofit solution • Upfront or lease costs of a compliant vehicle 		£10.05 million (670 x £15,000)
	Marketing and engagement campaign to provide information on the CAZ and reach out to groups eligible for support through mitigation measures	Ensures maximum uptake/knowledge of measure, to minimise negative impact	£0.38 million
d CAZ	Implementation of residents parking schemes to prevent overcrowding on margins of CAZ; will be deployed only if issues arise	Prevents vehicle overcrowding on residential streets CAZ margins	£5 million
		Total (excluding administrative costs)	£48.27 million

Table 4 below summarises each measure on the short list, arrived at through the process described above. It provides a brief description of the measure, the group impacted, geographical scope, a summary of the DIA and the funding ask. This is designed as a simple summary, please note that more extensive information on each of the measures can be found in later sections, including a detailed description of how the cost of each method was calculated.

The cost in the last column does not include the administration costs; these are detailed in the final Section.

Ref	Measure	Group impacted	Geographic scope	Summary of mitigation measure	Distributional analysis (how group is impacted)	Cost (volume x cost per user)
M1a	Mobility support for individuals working within the CAZ (20c)	Private car/van owners who work or live within the CAZ	Not restricted to geographic area	Individual can access the choice of a £1000 mobility credit offered in form of SWIFT travel card <u>or</u> a £2,000 package (Swift credit or contribution to compliant vehicle) in return for scrapping a non-compliant vehicle	Class D CAZ will force residents to either upgrade vehicle or pay charges if they wish to enter. For many individuals, public transport may be the only alternative, these measures decrease the cost of that switch or facilitate the purchase of a compliant vehicle.	£10.84 million (5,420 x £2,000)
M1b	Mobility support for residents outside CAZ (20c)	Private car/van owners	West Midlands	With evidence of scrapping a non-compliant car individual receives either: <ul style="list-style-type: none"> • £2,000 cash payment toward the purchase of a compliant car • £2,000 mobility credit. Credit to be supplied on a SWIFT card with no expiration for use. 	Changes in licensing conditions will force over 90% of the 3,250 vehicles currently operational to change (upgraded/retrofit). All options on the market require significant capital expenditure, this helps drivers to switch to a compliant vehicle.	£6.50 million (3,250 x £2,000)
M2a	Hackney carriage support package (20b)	Hackney carriages	Birmingham and surrounding areas (licenced BCC drivers)	Drivers offered £5,000 as: <ul style="list-style-type: none"> • support payments to be paid towards operational expenses of ULEV vehicles (4 annual instalments of £1,250) • support for an LPG retrofit of their current or newly purchased vehicle 	Changes in licensing conditions will force over 90% of the 1280 vehicles currently operational to change (upgraded/retrofit). All options on the market require significant capital expenditure, this helps drivers to switch to a compliant vehicle.	£5 million (1000 x £5,000)
M2b	Council Hackney carriage leasing scheme (20b)	Hackney carriages		BCC bulk purchase 50 ULEV taxis through public procurement tender and lease them to vulnerable drivers as well as on a try-before-you-buy basis		£2.75 million (50 x £55,000)
M2c	Private Hire Vehicle upgrade support (20b)	Private Hire Vehicles		Private Hire Vehicle owners who upgrade a non-compliant vehicle to a compliant vehicle which fulfils BCC's 2020 licencing criteria and is under 3 years of age will receive financial aid of £2,000. This will aim to incentivise the switch to low emission vehicles (HEVs, PHEVs and BEVs)	As above, changes in licensing conditions are expected to result in 95% of the 4,321 current vehicles needing to be upgraded to continue operation	£7 million (3,500 x £2,000)
M3	'Free miles' for ULEV LGVs (20b)	Van fleets	Birmingham	ULEV van drivers receive £750 credit to spend on BCC public charging network	SMEs operating coaches/HGVs/LGVs or relying on road transport will be disproportionately impacted. Vehicle capital costs are high, and many fleets must enter CAZ as part of business operation. This helps fleets change to a compliant vehicle.	£0.75 million (750 x £1,000)
M4	HGV & Coach compliance fund (20b)	HGV and Coach fleets	West Midlands	Fleets compete for £15,000 funding package to contribute towards: <ul style="list-style-type: none"> • Installing a retrofit solution • Upfront or lease costs of a compliant vehicle 		£10.05 million (670 x £15,000)
M5	Marketing and engagement campaign (20b)	Owners of non-compliant vehicles	-	Marketing and engagement campaign to provide information on the CAZ and reach out to groups eligible for support through mitigation measures	Ensures maximum uptake/knowledge of measure, to minimise negative impact	£0.38 million
M6	Resident parking scheme	Residents living close to the CAZ	Around CAZ	Implementation of residents parking schemes to prevent overcrowding on margins of CAZ; will be deployed only if issues arise	Prevents vehicle overcrowding on residential streets CAZ margins	£5 million
Total (excluding administrative costs)						£48.27 million

Table 4 Summary table of shortlisted mitigation measures

3 Overall approach to Value for Money and State Aid

3.1 Approach to Value for Money assessment

Individuals and business will be impacted by the CAZ in several ways; the impacts that they face can be thought of as changing their Consumer Surplus (CS). This change in Consumer Surplus can be broadly categorized into 5 benefit areas outline below:

- **Upgrade cost:** CS loss resulting from the costs associated with upgrading to a compliant vehicle
- **Welfare:** CS will be altered for individuals/businesses who must change their travel behaviour as a result of the CAZ (e.g. switching travel modes, cancelling or rerouting trip etc.).
- **User charge:** Loss in CS as a result of charges paid for entering the CAZ zone
- **Air quality:** changes in gross emissions (PM10 and NOx)
- **Travel time:** this represents the change in travel time and cost to vehicle users

The mitigation measures aim to offset the loss of Consumer Surplus, and the Value for Money for each of the measures is judged on how well this is achieved. This is measured in two ways;

- **The direct offset of Consumer Surplus loss:** Mitigation measures offset the negative impacts of the CAZ by offering monetary compensation (or equivalent) to the groups impacted. It is assumed that this compensation offsets the Consumer Surplus loss in a 1:1 ratio.
- **Allocated benefits from the Economic model.**

Table 5 shows the methodology by which the benefits were calculated for each mitigation measure and this is used for the basis of the Value for Money assessment. For mitigations M1a and M1b, a full value for money assessment has been carried out using the 5 Consumer Surplus categories outlined above. This is possible as the measures have a direct impact within the traffic model, allowing people to drive a vehicle where they may have chosen to re-route or cancel their trip without financial support. For all other measures the financial support is assumed to offset the upgrade cost of a new vehicle in a 1:1 ratio. The exemption to this is the engagement campaign, as, although important to maximise the benefits of the other measures, it creates no direct and quantifiable benefits.

As the Value for Money section for each measure shows, the measures represent low value for money *when quantified using this methodology*. For M1a and M1b this results from the increase in traffic and vehicle costs. For all other measures this results from using 1:1 ratio of pounds spent to benefit; when admin costs are included in this it results in net disbenefit for each pound spent. This VfM ratio of benefits received to money spent is summarised in Table 13 in 10.1. However, the council does not believe that this reflects the true value for money that will result from the measures for several reasons:

- This methodology does not account for additional, indirect benefits that will result from the mitigations. In some cases, these are significant. For each measure these are described in a separate section within the Value for Money assessment labelled as '*Additional non-quantified benefits*'.
- The baseline case (where mitigations are not introduced) is used as comparative tool to evaluate Value for Money. This baseline case will have significant disbenefits which are not quantified, the mitigation measures aim to offset these negative impacts, but this is not accounted for in the Value for Money calculation. A good example of this is where no support for workers was included in the mitigation measures, many may then decide to change work to locations outside the CAZ. This has severe impacts on the local economy and the livelihood of business which operate in the CAZ and in turn the individuals who are supported by these businesses. However, this negative economic impact is not considered in the baseline case, and though M1a offsets this impact it is not quantified in the VfM analysis.
- The Council is determined to aid individuals and business who will suffer negative impacts as a result of the CAZ and believes that this set of measures is the best method by which to do so. If the VfM analysis means these are not possible, the Council might have to resort to other measures (e.g. high-volume exemptions) which would have negative impacts on air quality. This set of measures is the best proposal and shows value for money compared to all viable alternatives that will not leave the residents and

business of Birmingham to suffer the negative consequences of the CAZ or have drastic air quality impacts.

Table 5 Description of methodology for allocating benefits to each mitigation measure

Ref	Measure	Description	Upgrade cost	Welfare	User Charge	Air Quality	Travel Time /VOC
M1a	Mobility support for individuals working within the CAZ (20c)	Mobility credit or scrappage payment to recipients directly offsets consumer surplus loss due to scheme implementation at a 1 to 1 ratio. The additional traffic resulting from this mitigation is run through the traffic model.					
M1b	Mobility support for individuals who regularly enter the CAZ (20c)						
M2a	Hackney carriage support package (20b)	The mitigation payments made to taxi and PHV drivers directly offsets consumer surplus loss due to scheme implementation at a 1 to 1 ratio. All taxis and PHVs are assumed compliant in the traffic model therefore impacts are not in the modelled outputs.			No economic model output as all taxis are assumed to upgrade in the base case		
M2b	Council Hackney carriage leasing scheme (20b)						
M2c	Private Hire Vehicle upgrade support (20b)						
M3	'Free miles' for ULEV LGVs (20b)	The mitigation payments made to LGV drivers directly offsets consumer surplus loss due to scheme implementation at a 1 to 1 ratio. The impact on ULEV uptake is not included in the modelled outputs.			No economic model output as all measure targets those who are already upgrading their vehicle therefore no increase in vehicle upgrades		
M4	HGV & Coach compliance fund (20b)	The mitigation payments made to HGV and Coach drivers directly offsets consumer surplus loss due to scheme implementation at a 1 to 1 ratio. No change in HGV traffic is assumed resulting from the mitigation to HGVs benefiting from the exemptions, additionally, and mitigations fleet redistributions are anticipated to result a largely compliant fleet entering Birmingham City Centre.			No change in HGV traffic assumed		
M5	Marketing and engagement campaign (20b)	No benefit assumed			No direct benefit assumed		
M6	Resident parking scheme	The mitigation cost is assumed to directly offsets consumer surplus loss due to scheme implementation at a 1 to 1 ratio.			No traffic impacts assumed		

Key

1:1 benefit on upgrade cost

Benefits allocated from the traffic and economic model

3.2 Approach to State aid

This section outlines the general approach to State aid; more detailed descriptions of the State aid considerations for each mitigation measure are given in each specific chapter. The Council recognises the importance of complying with State aid regulations and is also aware that several of the measures listed in this document may constitute State aid.

3.2.1 Definition of State aid

The measures were compared against 4 key criteria to judge whether State aid applies:

1. Is the assistance granted by the state or through state resources?

- This applies for all mitigation measures and exemptions.

2. Does the assistance give an advantage to one or more undertakings over others?

- Assistance can only be provided to a small subsection of the most impacted businesses; therefore, some businesses will naturally be supported over others.
- Support to entities not partaking in economic activity is not classified as State aid, as a result the mitigations and exemptions targeting individuals not carrying out economic activity (e.g. sole traders) are not classified as State aid.

3. Does the assistance distort or have the potential to distort competition?

- This can be broadly defined as strengthening the recipient relative to its competitors
- Business who benefit from mitigations or exemptions will by nature have a commercial advantage over those that are not awarded mitigations or exemptions.
- The exemption to this is the measures targeting hackney carriage and Private Hire Vehicle drivers. The support measures are designed to provide assistance to all those who wish to upgrade their vehicle and so does not provide a commercial advantage to one set of drivers over another set of drivers, instead offering equal support to all.

4. Does the assistance have the potential to affect trade between Member States?

The CAZ, and the mitigation support package is highly localised and is not expected to impact international trade. However, it has the potential to impact the HGV compliance fund as, although the impact of the Birmingham CAZ on continental freight operators will be negligible, theoretically it could provide an advantage to a local operator over operators from other Member States.

An additional consideration is the Market Operator Economy Principle (MOEP). This applies when, instead of State assistance, a commercial interaction takes place between the commercial entity and the State. In this instance the State is operating like any other commercial market player would do and so this activity does not constitute aid. The Hackney carriage leasing scheme involves the procurement of the taxis themselves as well as for an operator to run the scheme and public procurement regulations would apply to both. As this represents a commercial agreement between the State and the market the MOEP would apply and this would not constitute State aid.

Using these criteria, it seems that only M3 and M4 fulfil all the criteria to be constituted as State aid. However, after reviewing the measures in detail against European regulations on this matter, both fall under the De minimis amount and therefore is legally permitted. A flow chart of this process is shown in Figure 2 and the relevance to each mitigation measure and exemption is outlined in Table 6.

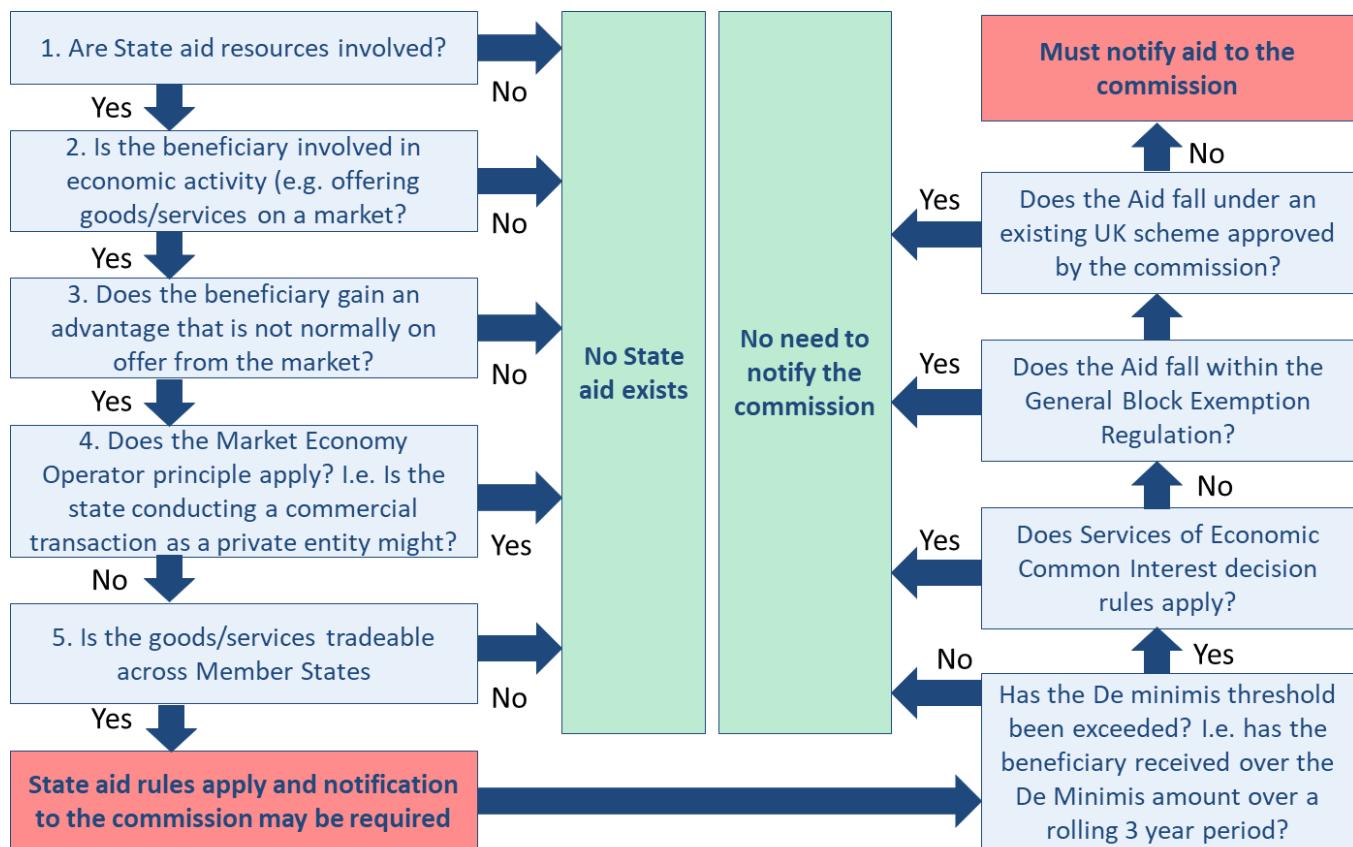


Figure 2 Flow chart of State aid considerations

Table 6 Relevance of State aid definitions to each mitigation and exemption

State aid criteria	Applies	Does not apply	Notes
1. Are State resources involved?	All mitigations and exemptions	None	All mitigations and exemptions are offered by the State
2. Is the beneficiary involved in economic activity?	<ul style="list-style-type: none"> • M2, M3, M4 • E1, E2, E9 	<ul style="list-style-type: none"> • M1, M6, M7 • E5, E6, E7, E8 	Mitigations/exemptions target individuals who are not engaged in economic activity, individuals are not themselves involved in economic activity
3. Does the beneficiary get an advantage that they could normally get from the market?	<ul style="list-style-type: none"> • M2, M3, M4 • E1, E2, E9 	None	All measures provide advantages that are not available from the open market

4. Does the Market Economy Operator Principle apply? (State conducting a commercial transaction)	<ul style="list-style-type: none"> • M3, M4, M2a, M2c • E1, E2, E9 	<ul style="list-style-type: none"> • M2b 	<ul style="list-style-type: none"> • The Council will contract with the vehicle manufacturer and leasing operator on a commercial basis and therefore the Market Economy Operator Principle applies.
5. Is the goods or service theoretically tradeable across Member States?	<ul style="list-style-type: none"> • M3, M4 • E1, E2, E9 	<ul style="list-style-type: none"> • M2a and M2c 	<ul style="list-style-type: none"> • Non-compliant long-distance freight transport is liable to CAZ charges, so although the impact will be negligible, this will likely constitute State aid. • Only taxis (Private Hire Vehicles and Hackney carriages) registered with the Birmingham licensing authority are impacted by the new licencing conditions. European based taxi drivers could not theoretically operate in Birmingham, so this is not classified as State aid.

3.2.2 De minimis threshold

The State can provide support to an individual without having to notify the Commission if the financial value of the award is under the De minimis threshold. This is measured over a 3-year rolling period. The maximum value that each user group can receive is shown below:

- Van fleets: The maximum support that a single business could receive occurs when a company receives two exemptions and mitigation support for a further two vehicles.
 - Exemption: 2 vehicles x £8 daily CAZ fine x 260 entries a year (5 times a week) = £4,160.
 - Mitigation: 2 support packages with a value of £1,000 = £2,000.
 - The total support received in this case would be £6,160, which is well below the De minimis threshold.
- HGV fleets: The maximum support that a single business could receive occurs when a company receives two exemptions and mitigation support for a further two vehicles:
 - Exemption: 2 vehicles x £50 daily CAZ fine x 260 entries a year (5 times a week) = £26,000.
 - Mitigation: 2 support packages with a value of £15,000 = £30,000.
 - The total support received in this case would be £56,000, which is well below the De minimis threshold.
- Taxi drivers: Maximum support is the £5,000 financial support to aid vehicle upgrade. The lease scheme will operate at market rates and so does not constitute State aid from a driver prospective.

4 M1: Mobility support for individuals who regularly enter the CAZ

4.1 Summary of distributional impact on group

The distributional impact analysis (DIA) has shown that residents on low incomes will be disproportionately impacted by the CAZ, this is particularly true for those residents who live in close proximity to the CAZ and those who must travel to the CAZ for work as they will be unable to avoid traveling into the CAZ. Quantitative analysis outlined in the DIA shows that residents of the most deprived LSOAs (quintile 1) will incur a disproportionately greater amount of the costs than more affluent areas. It also shows that that LSOAs within or adjacent to the CAZ would incur the highest proportion of costs relating to the CAZ and that these are also

the areas with the highest levels of income deprivation and generally high levels of non-compliant vehicle ownership.

For many within this group, the cost of upgrading to a compliant vehicle will be prohibitive, as will paying the CAZ charges on a regular basis. Figure 3 shows the estimated total cost of ownership for different powertrain types and compares this to keeping a non-compliant vehicle and paying the CAZ charges either 2 or 5 times a week. This is compared over a 4-year period to capture the long-term benefits of upgrading vehicle, however it is worth noting the upgrade cost will be faced in year 1 and could create affordability issues. This analysis assumes the purchase of a second-hand vehicle (2-year-old Euro 6 diesel, 9-year-old Euro 4 petrol, 1-year-old BEV and Petrol PHEV) or the retention of a Euro 5 diesel vehicle in the case of paying the CAZ charges. The resulting costs for each option demonstrate the affordability problem on low income households. For example, an individual will incur £3,072 of CAZ charges over a 4-year period if they enter the zone twice a week for 48 weeks a year. If they drive a medium sized car, the best option economically will be to upgrade to a second-hand petrol ICE, though this results in savings of only £715 over the 4 years when compared to paying the charges. The DIA categorised this variable as a negative impact on 'personal affordability', meaning that residents will be restricted in the usage of a private vehicles and will likely be reliant on public transport for regular trips into the CAZ.

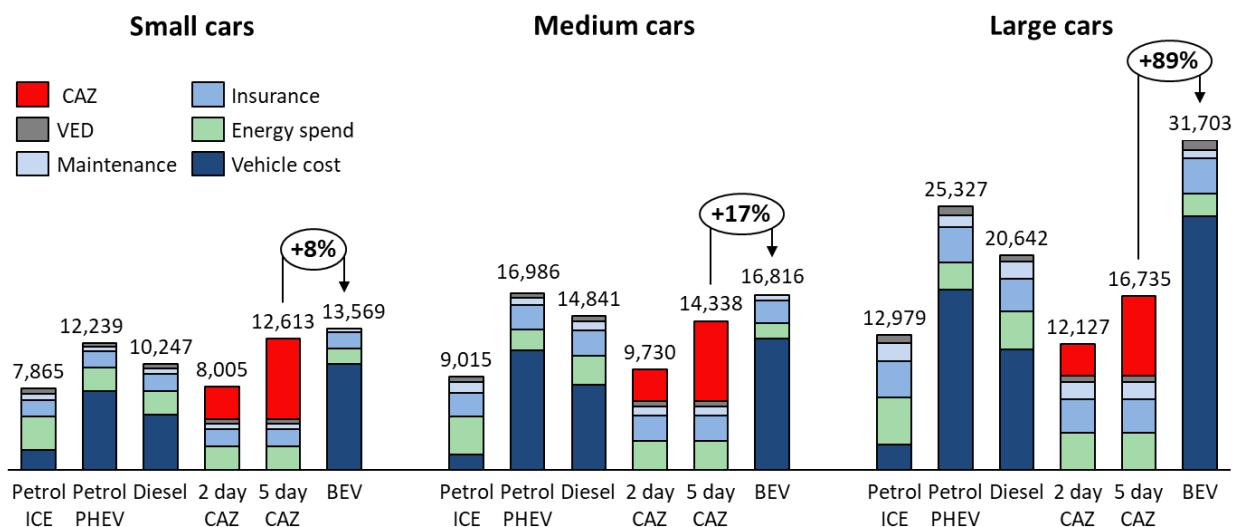


Figure 3 Comparison of 4-year total cost of ownership estimates for different options facing drivers in response to the CAZ. Assumes purchase of second-hand compliant vehicle or the continued use of a Euro 5 diesel vehicle. CAZ fee of £8/day. Source: Element Energy

Low income residents living within the CAZ who rely on their vehicles for leisure activities, to visit friends/family, for religious purposes (see below) or for day-to-day tasks such as shopping will be severely impacted by the CAZ. As discussed, without support, personal affordability issues will result in low income CAZ residents no longer being able to use a personal vehicle and current public transport is not sufficient outside of peak hours. TfWM are planning significant improvement to the West Midlands public transport infrastructure outlined in their Transport Plan⁴, however the majority of the measures will not come into force before 2022 so will not mitigate the immediate impacts of the CAZ. If an individual's access to these opportunities is limited, then this restricts the societal benefits which are derived from undertaking these activities. A report from UCL⁵ has concluded that a lack of mobility in this respect is inextricably linked to social disadvantage and exclusion and has a detrimental impact on quality of life.

The DIA has identified a specific negative impact on particular resident groups, most importantly:

- Religious groups whose regular place of worship is located inside the CAZ. Most places of worship are of a small size suggesting a localised catchment. However, there are a few exemptions, the most

⁴ Transport for West Midlands Transport Plan 2017/18

⁵ UCL: Transport and Poverty – A review of the evidence, 2014

prevalent being Birmingham Central Mosque which has a capacity of 20,000 and regularly attracts over 4,000 attendees to Friday prayers. Eight other places of worship have been identified as being of sufficient size to attract individuals from outside the CAZ. There may be a differential impact on religious groups if the introduction of the CAZ discourages or prevents congregants from attending their worship venue of choice. Establishing an exemption targeting worshippers would face implementation challenge (risk of abuse) and could include individuals with high income.

- Disabled residents who travel into the CAZ will be highly impacted, in general they are more likely to be from lower income households and may find public travel unsuitable. BCC propose that vehicles registered with the DVLA as disabled vehicles be given an exemption though this will not be expanded to blue badge holders as the volume within Birmingham makes this unfeasible.

It is proposed mitigations to support worshipers and blue badge holders entering the CAZ are included as part of the wider measure to support low income residents as these will be the most impacted. BCC sees this as preferential to specific measures targeted at religious groups and blue badge holders as such a scheme would have significant issues with enforceability and fraud potential as well as the perception, in the case of religious groups, that this was unfair on other minority groups (e.g. the LGBT community).

4.2 Description of mitigation measure

From the DIA and consultation feedback, there is a clear need to target mitigation measures at residents of the CAZ, those who work within the CAZ and those who regularly enter the CAZ, especially low-income individuals. The mitigation is designed to prioritise low income individuals who live and work within the CAZ for number of reasons:

- Individuals are forced to regularly travel into the CAZ and cannot alter their route to avoid the area, they are therefore most vulnerable to the CAZ charges. The distributional analysis has concluded that low-income residents will be disproportionately impacted.
- The financial circumstances of low-income individuals mean that they are less likely than others to be able to adapt to the CAZ, whether by upgrading their vehicle or by paying the CAZ charges.
- Low income households are more likely to own non-compliant vehicles. There is no definitive data on this, but it is a reasonable assumption considering households with less disposable income are more likely to own car of lower value which are in turn likely to be older vehicles and hence non-compliant. This is supported from evidence from the distributional impact analysis which showed that the LSOAs which will be most impacted by the CAZ charges are those which are in close proximity to the CAZ and have a high degree of low-income households, DfT licencing statistics show that these areas also contain a high proportion of non-compliant vehicles.
- To counter this, low income households are less likely to have access to a vehicle and government data shows that 44% of households in the lowest income quantile do not have access to a vehicle⁶. This is however not relevant to this measure as it targets those who do currently own vehicles. The delivery plan and quantification of the scheme is based on vehicle data rather than volume of individuals in the group.

BCC recognises that individuals will have varying levels of reliance on their vehicles depending on a number of factors (e.g. workplace location, school runs, proximity to public transport etc.). For some, shifting from a personal vehicle to using public transport will be an easy transition, for others the public transport network is not sufficient to meet their travel needs. To ensure that mitigation measures have a positive impact on all individuals eligible for the scheme, BCC are proposing to offer individuals a choice based on their needs and travel patterns:

- **Mobility credit.** A one-off provision of £1,000 mobility credit, this credit will be applied through a Swift card and can be used on any public transport in the West Midlands. The user can keep their non-compliant vehicle but will be liable to CAZ charges.

⁶ Department for Transport: Travel by vehicle availability, income, ethnic group, household type, mobility status and NS-SEC

- **Scrapage scheme.** Individuals who scrap a non-compliant vehicle receive either a £2,000 mobility credit awarded through a Swift card or alternatively a £2,000 payment to contribute towards the purchase of a compliant vehicle.

Which scheme an individual is eventually supported through will depend on their willingness to scrap their non-compliant vehicle. The funding required to support all non-compliant vehicle owners who work within the CAZ would be extremely high, therefore BCC propose to prioritise individuals who are defined as key workers and those on low incomes. The two options are explained in detail in the following paragraphs.

The support available to each group is summarised below and in Table 7:

- **CAZ residents:** 2-year exemption followed by scrapage scheme (to be funded by CAZ revenue outside of the CAF framework)
- **Workers:** can apply for a package of measures including a 1-year exemption followed by the choice of a £1,000 mobility package or a £2,000 scrapage scheme (as shown above). Limited to workers with an annual salary under £30,000. (the full justification of the salary cap value is given in 4.7.1.)
- **Residents outside the CAZ:** can apply for a 1-year exemption followed by a further scrapage scheme if necessary

Table 7 Summary of social mitigation measures offered to private vehicle owners

	2020	2021	2022
CAZ residents	Exemption	Exemption	The council may look to provide an additional scrapage scheme funded from the CAZ revenue. This will be conditional on an assessment of the needs of such a scheme conducted in 2021.
CAZ workers	Exemption	Mitigation (full choice)	-
Residents outside the CAZ	Exemption	Mitigation (scrapage only)	-

4.2.1 Mobility credit

To facilitate the transition to public transport, BCC is proposing to offer a mobility package to individuals from low income households who work and live within the CAZ. This would take the form of credit being applied to a user's travel account which can be used on the local train, bus and tram services as well as on the upcoming shared bike scheme. The suggested amount of £1,000 is sufficient to cover the majority of the cost of a years' worth of monthly passes for train, bus and tram services entering the city centre. The majority of individuals will not require this full service and in this case, they can purchase a less comprehensive package (e.g. bus services only) and use the rest of the credit on a pay-as-you-go basis, or alternatively towards an annual or monthly pass in subsequent years.

There has been concern raised that this will not mitigate the impact of the CAZ as it only provides a temporary benefit to the individual in comparison to the scrapage scheme which permanently replaces a non-compliant vehicle. However, the measure is designed to increase the use of public transport and a large part of this is to educate individuals on the benefits of public transport by incentivising them to make the initial transition away from personal car use. It is expected that once the transition is made, individuals will continue to benefit from public transport on its merits alone without the need for a subsidy. It is also important to note that the scheme presents a choice to the individual. If, in their opinion the mobility credit does not mitigate against the CAZ, then they are free to opt for the scrapage scheme instead. In the case of the mobility credit, they can **keep their current vehicle** to use outside of the CAZ (or pay the penalty charge if they choose to enter), the £1,000 is therefore a direct benefit rather than offsetting the cost of upgrade vehicle.

When designing this package, it is important to ensure that the public transport routes going into and out of the CAZ are sufficient to offer viable alternative to vehicle usage. The map below (Figure 4) was created by TfWM and shows the average travel time on public transport into the CAZ during the peak morning traffic period. It shows that the vast majority of locations within Birmingham can reach the city centre within 45 minutes. Element Energy compared these estimated times with forecast driving times using Google maps, the results showed that in most cases traveling by public transport was equitable if not quicker than by private vehicle. The results of this analysis give confidence that for commuting purposes, Birmingham's public transport network is able to provide a viable alternative to private vehicle use for residents of Birmingham.

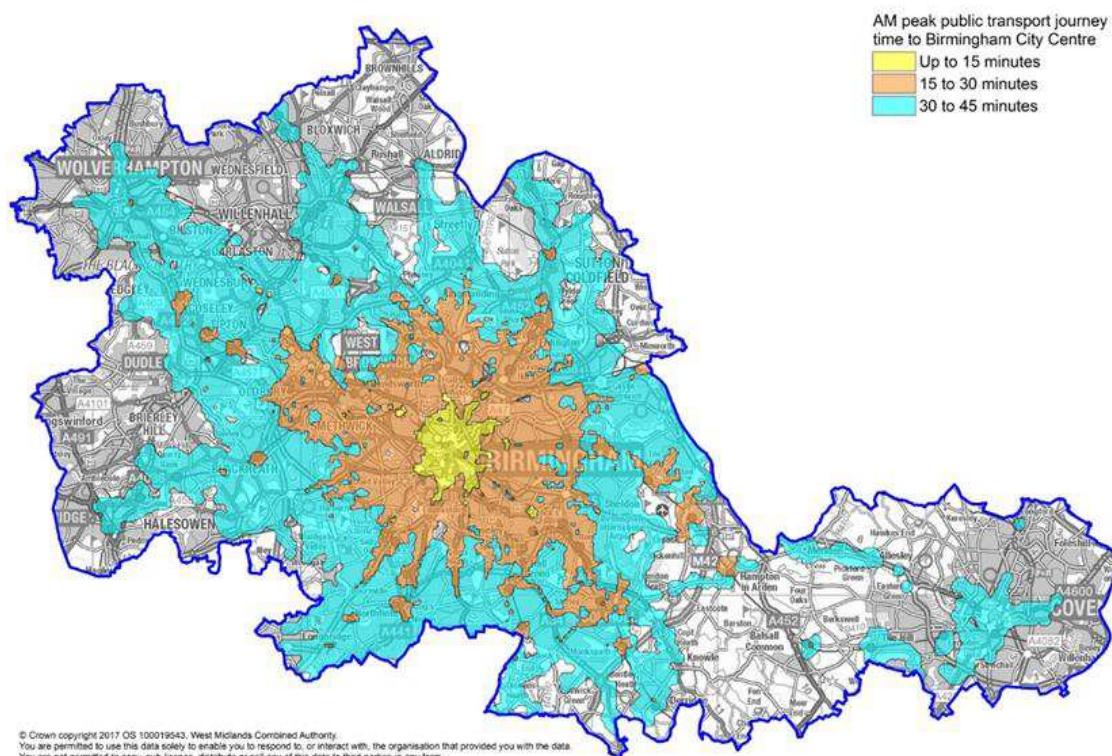


Figure 4 Illustration detailing modelled travel times on the West Midlands public travel network to the city centre during week day morning peak hours. Source: TfWM, 2018

It is however accepted that the public transport provision is less comprehensive outside of peak times and that public transport may not be sufficient for **those working irregular/night-time hours**. The map below (Figure 5) shows travel time into the city centre via public transport with a departure time between 00:00-02:00 on a Thursday morning. Although most of Birmingham can reach the city centre within an hour, there are significant areas where this is not possible. The travel time also compares unfavourably to estimates of travel time by private vehicle, which are reduced due to a reduction of traffic at this time. The Council does not have definitive data on the demographics of those travelling to work at off-peak hours. However, from consultation with industry, especially Birmingham Children's Hospital, it is clear the majority are either shift workers or else work in the hospitality industry, both with a high proportion of low-income employees. There is another caveat in the case of **individuals using their car to drop others within the CAZ before going on to their own workplace** (or other destinations) and this was mentioned as a concern by respondents in the recent consultation. BCC accepts that a public transport mobility credit does not adequately cover instances where a car used to fulfil separate trips for numerous individuals at the same time. The mitigation measure is designed to provide assistance to those who are forced to regularly enter the CAZ with a non-compliant vehicle and could realistically shift their travel mode on to the public transport system.

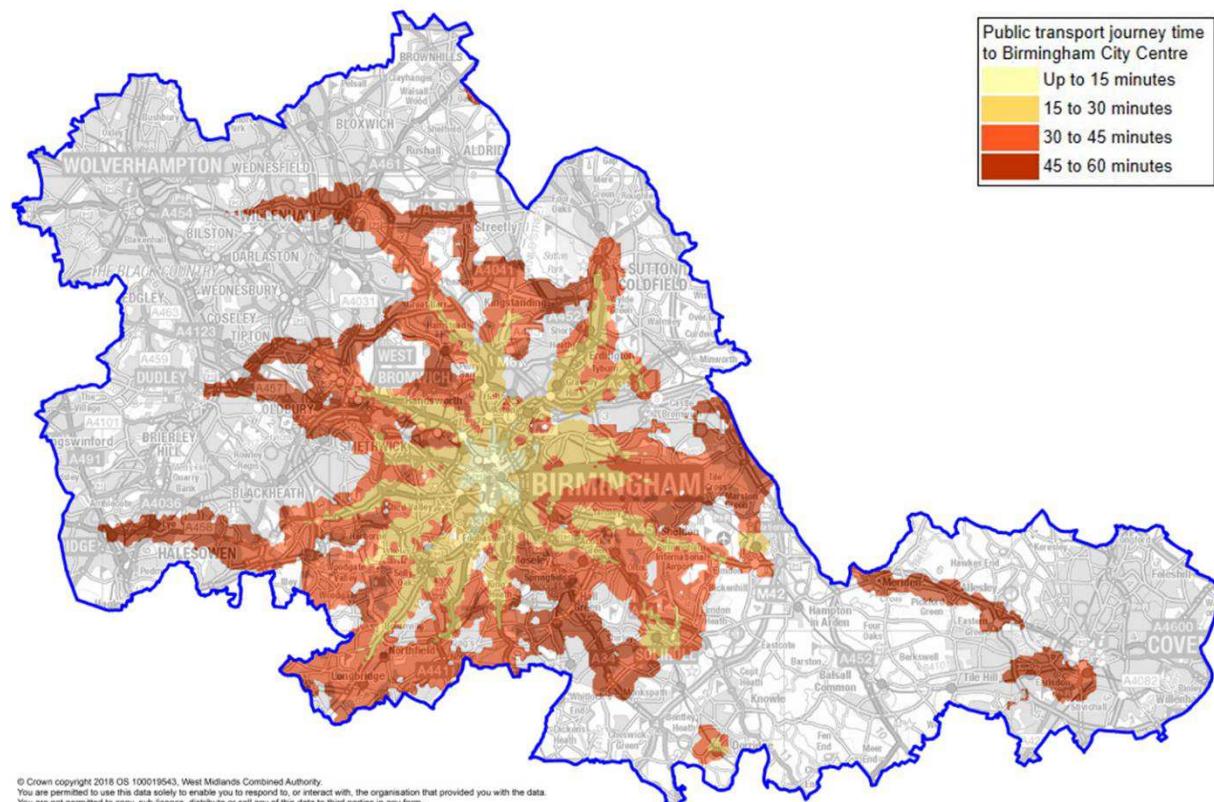


Figure 5 Illustration detailing modelled travel times on the West Midlands public travel network to the city centre on a weekday morning, 00:00 – 02:00. Source: TfWM, 2018

The proposed mobility package mitigates the negative impact of the CAZ by reducing the transport costs for local people (20.c of the CAF guidance). BCC plan for this package to be available to all individuals who work within the CAZ rather than limiting eligibility to just Birmingham residents. This is in recognition of the fact that many individuals who work within the CAZ will come from outside the Birmingham from the wider West Midlands area and will face the same negative impacts as a result of the CAZ.

There is a number of risks that BCC has considered associated with this scheme:

- **Could this measure cause additional trips and thus hinder compliance?** Although this will lead to a higher number of personal trips on public transport it will not impact the number of vehicle trips in the short term as public transport routes and services are not due to change as a result of this measure. Furthermore, all buses operating in the CAZ will be at least Euro VI by the end of 2020 (West Midlands Bus Alliance target). In the longer term an increased demand for public transport could lead to more routes being justified, but the effect of replacing personal vehicle trips will greatly outweigh the limited impact of a small increase in public transport vehicles traveling into the CAZ
- **Will this measure cause strain on the local public transport network?** Although this measure is designed to increase the use of public transport the increase in volume is not expected to cause strain on the transport network. This is because the number of individuals forecast to be eligible is small in comparison to the number of people currently using public transport. For more detail see section 4.7.
- **Will the measure negatively affect other initiatives such as car clubs?** This mitigation measure is designed for those who consistently enter the CAZ and so this is not expected impact car club usage which is only cost effective if used for non-regular trips.

4.2.2 Scrappage scheme

This option has been developed in tandem with the mobility credit described above and is designed to broaden the scope of the mitigation measure to include those whose travel patterns mean public transport is not a suitable option. This also recognises the fact that vehicles are often used for a second purpose during the commute to and from work (e.g. visit friends and family, leisure activities, religious commitments etc.). To account for this, BCC is proposing a scrappage scheme where, upon the scrappage of a non-compliant vehicle, individuals can receive the option of either £2,000 to contribute towards a compliant vehicle not eligible for the car or van plug-in-grant (most likely a second-hand Euro 4 petrol vehicle) or alternatively £2,000 of mobility credit as described above. The larger credit amount compared to the mobility package option is an acknowledgment that in this option the individual has given up the use of their car and so warrants a larger compensation. This proposal accounts for the fact that public transport may not be sufficient for all residents, especially outside of commuting hours as the maps supplied by TfWM (shown above) make clear. Figure 6 shows the decision process that individuals will face in deciding which package best suits their needs. This mitigation measure also has the benefit of reducing city wide emissions by taking older non-compliant vehicles off Birmingham's roads. This option ensures individuals do not lose the freedom to travel and suffer the associated social deprivations.

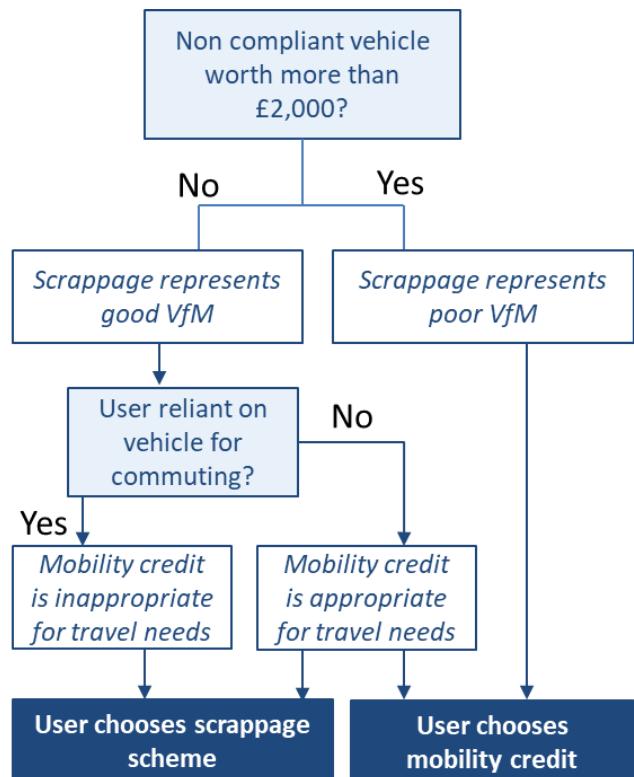


Figure 6 Decision tree diagram for individuals deciding which support package best suits their needs

When the additional cost of paying CAZ charges is considered, a funding award of £2,000 is considered a sufficient amount for individuals to be able have reasonable options available for replacing their vehicle with a compliant model. Element Energy's analysis of the used car market⁷ has shown that there are numerous Euro 4 petrol models in reasonable condition available for purchase for around £2,000 - £3,000. An additional consideration is the CAZ charges that the individual no longer pays as a result of upgrading to a compliant vehicle (at £8/day, 3 entries a week for 48 weeks/year comes to a total of £1,152). Figure 7 displays graphically a price comparison of popular second-hand Euro 4 petrol models against paying the CAZ charges 3 times a week. It should be noted that the CAZ charges shown are annual and so would have to be paid repeatedly in subsequent years, whereas the vehicle cost and scrappage fund amount are a one-off payment only seen in year one. The results show that in a lot of cases, the funding covers the majority of the vehicle cost and hence BCC deems this an adequate amount for individuals to use towards the purchase of a compliant vehicle.

BCC recognises that the funding, in some cases, does not cover the full cost of the vehicle and affordability issues may remain for individuals. This is of particular concern as affordability issues are likely to disproportionately affect low income individuals and the cost differential may prevent the individuals who need the scheme most from participating. However, there is a risk that if a higher amount was offered, this would make the cost of the scheme prohibitively high and encourage individuals to spend the money on more expensive vehicles unnecessarily. Potential affordability issues are also partly mitigated by the choice an individual has to instead receive the scrappage payment in the form of a mobility credit, in an instance where a suitable vehicle cannot be found within an individual's budget the mobility credit still provides alternative benefits to the individual. BCC feels that a funding award of £2,000 achieves a good balance between

⁷ Using this data source: <http://www.usedcarexpert.co.uk/cars/fuel-petrol/>

covering the majority of a vehicles upfront cost, and in some cases the entirety of the vehicles cost, whilst keeping the total scheme cost to a minimum so that more individuals can be supported.

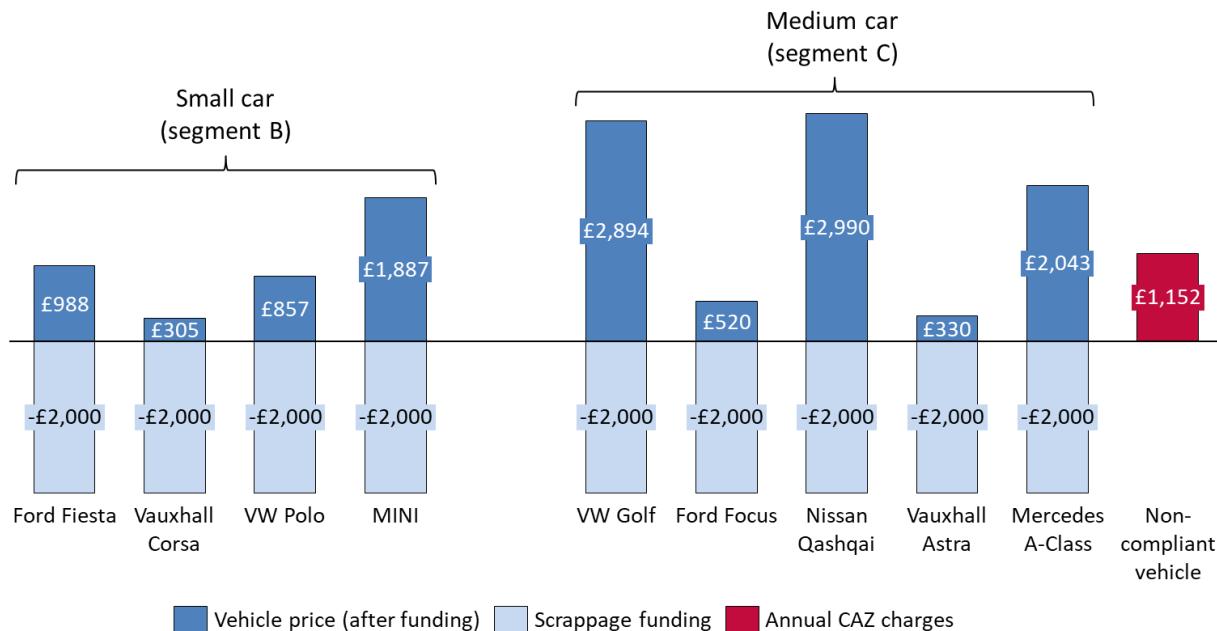


Figure 7 Comparison of average vehicle cost of popular Euro 4 models in the small and medium car segments against the annual cost of paying CAZ charges (entry 3 times/week over 48 weeks)

The scrappage element means the scheme is more targeted at those who enter the CAZ regularly with their vehicle. The logic behind this is that if an individual does not regularly drive into the CAZ for work, £2,000 would be less sufficient to warrant scrapping their existing vehicle. When CAZ charges are considered, the benefits of the scrappage scheme become much stronger. In this way the scheme targets those who are most negatively impacted (i.e. those who regularly drive into the CAZ for work).

Initially, there were concerns over the unintentional impacts that this scheme would have on Birmingham's second-hand car market. However, after quantifying the number of second-hand purchases that this scheme is likely to lead to it was concluded that this impact will be negligible. For reference, if 50% of individuals choose the scrappage option it will result in the sale of 4,335 second hand vehicles over a year. This compares to an estimate of over 800,000 second hand vehicle sales per year in the West Midlands region⁸. For more information on the quantification of the scheme see section 4.7.

An important point to note is that these options can be interchangeable. For example, if DEFRA considered that providing individuals with money to purchase compliant vehicles did not fit with the fund's objectives and the mobility credit option was preferred, then this choice can be removed, and the scheme would solely involve providing mobility credits on proof of scrappage. However, BCC sees providing the individual a choice as the optimum solution as it offers a direct substitute for those whose travel patterns are not suitable for public transport.

4.3 M1a: Delivery plan for supporting individuals working within the CAZ

The implementation of this measure can broadly be categorised into two phases;

1. The identification, application and validation of target individuals resulting in a list of individuals who will be supported.
2. The implementation of the mitigation measures themselves which will deliver the mobility credit and scrappage scheme awards to the individuals.

⁸ 8.11 million second hand car sales in 2017 (SMMT), 9.7% of total vehicle stock registered in West Midlands (Government licencing data – VEH02). Note, this estimate is for the West Midlands region, not the West Midlands metropolitan county

4.3.1 Identification, application and validation of target individuals

To engage with target individuals, the scheme will be integrated with BCC's communication campaign to ensure low-income individuals and employers are made aware of the schemes available to them. Initially they will be contacted, either directly or indirectly, through a targeted marketing campaign, and a request will be made for them to register their interest in the scheme.

As described above, the support offered to individuals working in the CAZ involves a year exemption followed by the awarding of mitigation measures. The application process for the exemption is very similar to that of the mitigation measures and the same resources will be used to implement both schemes. In this document we have just described the delivery plan for the mitigation measure, though it is worth noting that a 1-year exemption period will be in place for workers through 2020 (depending on their income).

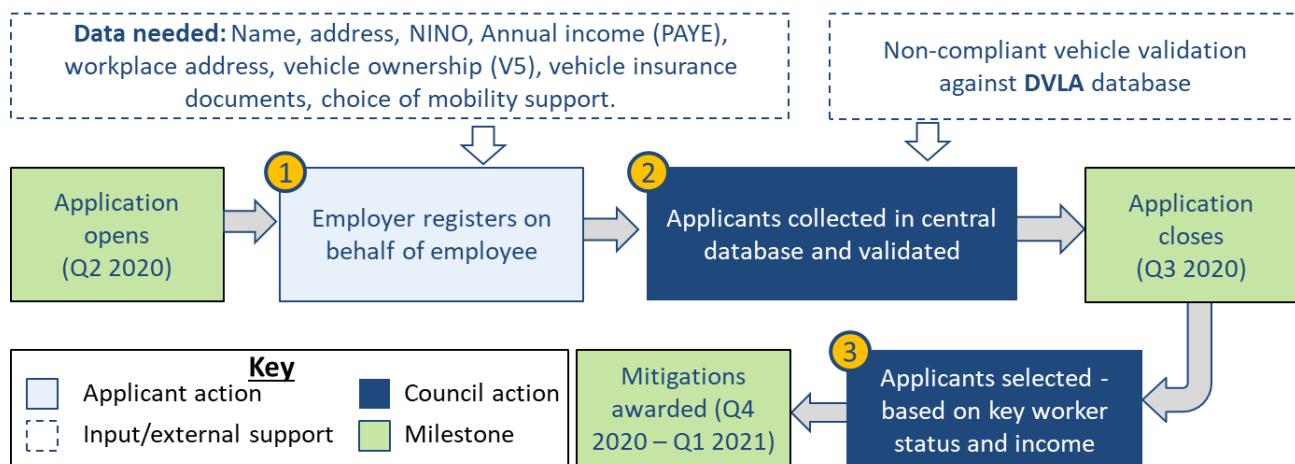


Figure 8 Summary of the identification and validation process for supporting individuals who work within the CAZ

The key to the success of this mitigation measure will be the establishment of a process for the identification of those most in need of support. For this purpose, BCC proposes to allocate the funding support based on income, with a salary cap of £30,000 used as an eligibility criterion. The proposed delivery plan consists of the following steps:

- Workplaces apply for the mitigation measure on behalf of their employees:** This is seen as the optimum solution as employers have the ability to easily validate an individual's annual income as well as their workplace location. There will be a two-stage application process;
 - First the company will register itself and have a company account on the permit software system described in Section 5.10 of the FBC. For this the company must provide their company registration number, proof of address in the form a rental agreement or land registry documents. During the consultation, BCC received a high volume of feedback concerned with loss of staff and wanting assurances that there will be provision in place to help individuals get to their workplace, this was supported by the detailed response from BCH. This, combined with the simple and quick sign up process, suggests that employers are engaged in this issue and will be willing to register so that their staff can access benefits.
 - The company will then register their employees who are interested in applying for the scheme. This will involve collecting and uploading to the portal the following information: Name, proof of address (utility bill or bank statement), national insurance number, proof of annual income (P60 or 3-months of pay slips), evidence of non-compliant vehicle ownership (V5), Valid vehicle insurance documents, confirmation that this vehicle is primary means of travel to work (yes/no), as well as additional survey questions. Employees will be given their own account log in details, so they can track their individual application on the system.
- Validation of applications:** This will involve the manual validation of all documents provided as part of the application resulting in a database of applicants who have been confirmed to be working in the

CAZ with a non-compliant vehicle alongside their validated annual income (To be eligible the vehicle must have been registered to the individual prior to 10th September 2018). This database will be used to track the successful applicants of the mitigation measures.

3. **Confirmation of applicants:** Once all the validated applicants have been collected in a central database, they will be contacted to notify them of the success of their application and to provide instructions for the requirements in the next stage of delivery.

The next step in the process is providing the individual with the support package, the first stage of this will be a one-year exemption. After the exemption, the application process will repeat with the inclusion of the choice of support; Mobility credit or scrappage scheme. The individual delivery plans for the mobility credit and scrappage scheme are described below.

4.3.2 Mobility credit

This will be supplied via Swift⁹; a scheme owned and operated by TfWM providing travel cards which can be used on a number of different travel modes and with any operator that provides public transport within the West Midlands. Element Energy has had discussions with a representative from Swift who assured BCC that a product can be put in place whereby the relevant individuals can register for an account on to which the council can apply the £1,000 of credit. The individual can then assess the options available and decide which is most suitable for their travel needs. Any remaining credit on their account could be used on a pay-as-you-go basis or could be used to contribute towards additional travel cards in subsequent years. For context, examples of travel cards available through Swift are shown below:

- Monthly pass covering bus, train and tram usage in zones 1-5 (entirety of West Midlands) is £99/month which totals to an annual cost of **£1,188**.
- Annual combined metro and bus pass: **£1020**
- Annual pass for all buses within the network West Midlands area is **£775**
- Annual metro pass: **£800**

Besides Swift, there are car club options – e.g. Co-Wheels **£60** minimum annual spend plus any **additional usage** over this.

From this evidence, it can be concluded that £1,000 will be sufficient to cover the majority of an individual's annual public transport expenses. The Swift card will also include the upcoming Next Bike bicycle sharing scheme being introduced in Birmingham and individuals will be able to use the mobility credit to purchase an annual membership to this scheme (estimated to be an annual cost of £30).

4.3.3 Scrappage scheme

An additional step in the validation process will be the proof of vehicle scrappage, this is an established process and BCC do not see logistical complications in the individual providing a certificate of destruction to the council. If the individual decides to select the mobility package option then they will receive £2,000 credit on a Swift account, again very similar to the process described previously for the mobility package mitigation measure. This credit will not have an expiry date and is a sufficient amount to provide users with almost 90% of the cost of 2 years of full travel coverage ($2 \times £1,188 = £2,366$), as before users could choose different options to suit their individual needs. The Council is also exploring opportunities to offer credit on car sharing schemes as part of this package and BCC have recently awarded a tender to expand car sharing services within the city. BCC will work closely with the successful applicant; Co-Wheels, to include their services as part of the mobility credit.

The process is slightly more complicated if the individual opts to use the scrappage credit to purchase a compliant vehicle. In this instance, after providing proof of scrappage on their old non-compliant vehicle the individual would purchase a compliant vehicle. After receiving proof of purchase, the council would then

⁹ <https://www.networkwestmidlands.com/swift>

reimburse £2,000 or the price of the vehicle (whichever is the lowest amount). There are two routes by which the council can allocate this money:

1. The individual first purchases the car and then provides proof of purchase (as well as scrappage of a non-compliant vehicle), this becomes a simple process of checking the vehicle on the DVLA database to ensure it is a compliant vehicle before releasing the fund to the individual.
2. However, BCC understands that individuals may not have the ability to provide the upfront capital for this purchase, especially as the measure is targeting low income individuals. In these instances, BCC will reach agreements with 2nd hand vehicle dealerships where the individual can take their non-compliant vehicle to a 2nd hand vehicle dealership which will scrap the vehicle and offer a £2,000 discount on vehicle from their dealership. The Council has had conversations with the NFDA (National Franchised Dealers Association) who approve of the process and have outlined a clear process that would be followed. The council wishes to use franchised dealerships as their associations with OEMs ensures accountability and commercial transparency. They also guarantee a certain level of vehicle quality to ensure the financial support contributes towards viable alternative vehicles. They have also agreed to allow the Council to communicate with their members through the weekly/monthly newsletter. The process is as follows:
 - The authorised dealership purchases the vehicle off the individual for a pre-agreed amount, in this case £2,000. This is given in the form of discount on a 2nd hand vehicle in their stock.
 - The dealership then scraps the vehicle and provides the council with the certificate of destruction.
 - The council reimburses the dealership £2,000.

The process for validating the scrapped vehicles is as follows:

- After being accepted onto the scheme, individuals will take their vehicles to an authorised treatment facility (ATF). The individual must then notify the DVLA that the vehicle has been scrapped.
- The ATF will provide the individual with a 'certificate of destruction' within 7 days of the vehicle being scrapped. The individual will also retain the yellow slip (V53/3).
- These documents will be used as evidence to release the funds to the individual.
- Alternatively, the user will bring their non-compliant vehicle to a council authorised 2nd hand dealership where they will trade their vehicle for a £2,000 discount on any compliant vehicle.

4.4 M1b: Delivery plan for supporting individuals living outside the CAZ

The delivery plan for residents outside the CAZ will be run in parallel to that of the scheme for workers, with a 1-year exemption being offered in 2020 and a further scrappage scheme offered in 2021. The delivery plan is very similar with some key differences summarised below:

- Individuals will register themselves rather than go through their employer, this is because the scheme targets a wider group of people, not all who will be currently employed (e.g. unemployed individuals, students etc.)
- The allocation of the exemptions and mitigations will be based on the distance from their address to the CAZ. Initially, BCC wanted to again use income as the key metric to judge who was most need of support. However, without assistance from employers (as in the workers scheme), validating an individual's income is extremely difficult. This is especially hard considering that many could be unemployed and that the scheme is open to all West Midlands residents meaning using the benefits system as a validation point would mean interacting with multiple local authority benefits teams, all potentially using a different database system. Additional questions will be added, for example confirmation that the individual is not earning over £20,000 and the reason that they need to travel into the CAZ with their vehicles.
- Only the scrappage scheme will be available, and they will not have the option of selecting the £1,000 mobility credit.

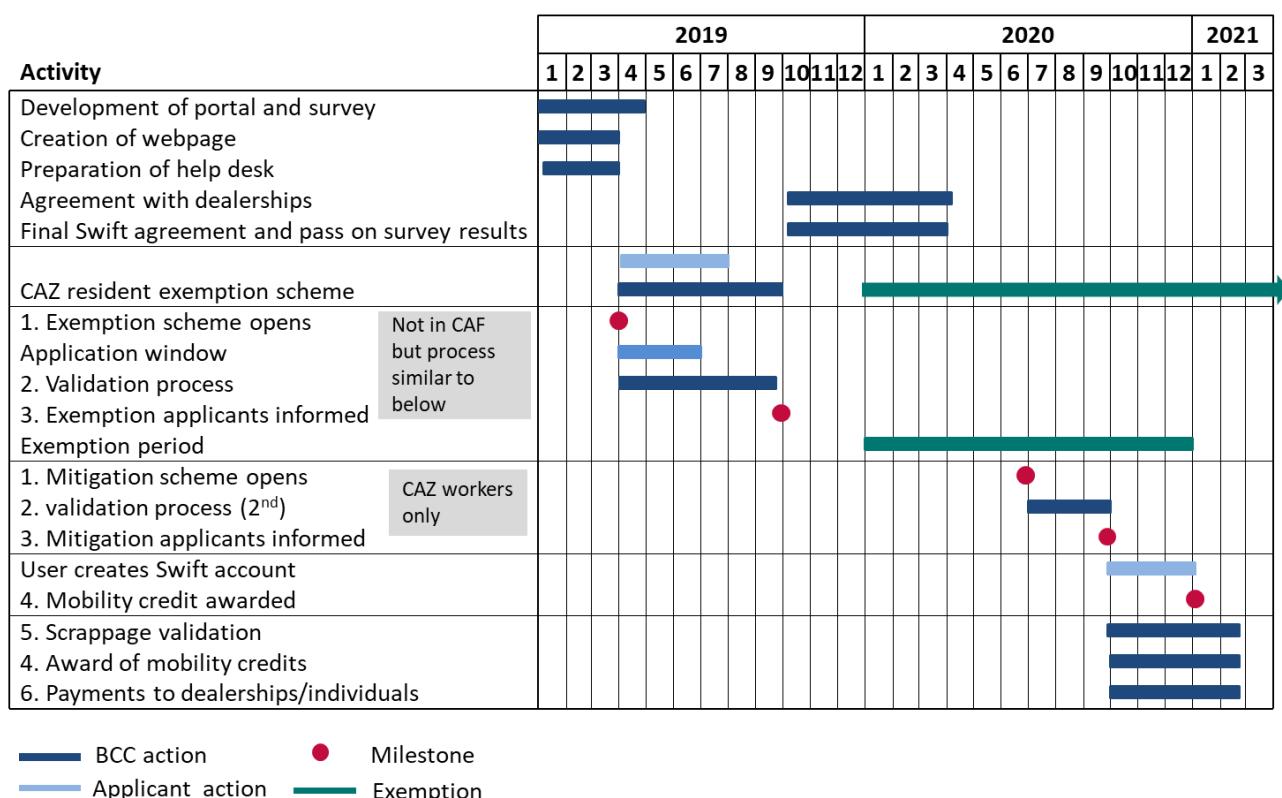


Figure 9 Proposed timeline for social mitigation measures

4.5 State aid considerations

The mobility credit does not contradict State aid rules as the assistance is being provided to individuals not engaged in economic activity and no other State aid is being provided to contribute towards the Swift card system. The measure is also not providing money towards a certain public transport operator over another and the user will have full choice over how they utilise this credit, this includes the choice to use the credit on any public transport operator covering trains, buses, trams and bicycles. The fact that the Swift card is accepted on all public transport operators means that no market distortion will occur. The operators included on the Swift scheme include the following:

- **Bus operators:** Arriva, Banga Travel, Claribel Coaches, Corporate Express, Diamond Bus, Discount Travel Solutions, Evergreen Coaches, First, Grosvenor Coaches, iGo, Johnsons of Henley, Landflight (Silverline), Let's Go!, Midland Classic, National Express Coventry, National Express West Midlands, Ring and Ride, RK Travel, Select Bus Services, Social Travel, Stagecoach, Sunny Travel, Thandi Transport, The Green Bus, The Green Transport Co, Travel de Courcey, Travel Express, Walsall Community Transport
- **Train operators:** Arriva Trains Wales, Chiltern Railways, Cross Country, London Northwestern Railway, Virgin Trains, West Midlands Railway
- **Tram operators:** West Midlands Metro
- **Shared Bicycle operators:** Nextbike UK

There is a possibility that some operators will benefit more than others as a result of the scheme, though the final choice of which operator is used will be the individual's and not the council so there is no direct benefit.

In the case that an individual decides to utilise the scrappage money to purchase a compliant vehicle, there is no restriction on the manufacturer or type of vehicle that is eligible, so no organisation is disproportionately benefited over another. The dealerships themselves do not receive a direct financial benefit from scrappage scheme so there is no transfer of resources from the state to an economic operator. The only restriction on the type of vehicle that can be purchased is that it must not already be eligible for the government's Plug in Car Grant or Plug in Van Grant to avoid additionality issues.

4.6 Value for Money

4.6.1 Quantified benefits

Table 8 shows the total value for money for M1a and M1b combined. This shows very small disbenefits in total upgrade cost and air quality, though these are negligible and probably below the resolution of the economic model. The welfare Consumer Surplus is offset as fewer trips must now be re-routed or cancelled, though the increased number of vehicles on the road means that the travel time and Vehicle Operating Cost Consumer Surplus is negative as a result of the measures. In total this measure represents negative value for money to the amount of -£5.2 million. However, the Council believes this is more than offset by the non-quantified benefits outlined in 4.6.2.

Table 8 Quantified value for money for M1a and M1b combined

CS category	CS with exemptions only	CS with exemptions and mitigations	Impact of mitigations on CS	Explanation
Upgrade cost	-£52,814,806	-£52,923,794	-£108,988	Higher upgrade rate due to scrappage scheme, offset by financial support.
Welfare	-£58,386,002	-£55,198,704	£3,187,298	Less trips are re-routed/cancelled
User charge	-£18,858,240	-£17,544,906	£1,313,334	High compliance rate so less CAZ charges paid
Air quality	£50,172,323	£49,901,646	-£270,677	Although higher compliance rate, increased number of vehicles means negligible disbenefit
Travel time/VOC	£69,734,101	£60,431,774	-£9,292,327	Increased traffic and congestion
		Total	-£5,171,360	

The above represents an extreme case where every individual opts to replace their vehicle through the scrappage scheme. In reality a proportion of individuals will instead opt for the mobility package option, to estimate the impact of this it is useful to consider another extreme case; where all individuals decide to scrap their vehicle but instead opt for the £2,000 mobility credit option. In this case, (as described in 3), these benefits are quantified using an assumption that the funding made available will directly offset negative consumer surplus in a 1:1 ratio. However, when admin costs are included this reduced this ratio below 1. The total funding ask for M1a and M1b £17.33 million, so using this methodology the scheme is providing £17.33 million of benefits to scheme participants. When admin costs are considered, the total scheme cost is £18.19 million. When this is considered, for every £1 of funding allocated, £0.95 worth of benefits are received by individuals in total, this represents a negative VfM value of -£847,499. It should be noted that M1a represents a better value for money with a ratio of benefit received to money spent of 0.96 compared to 0.94 for M1b.

In summary:

- Considering the combined value for money for M1a and M1b, if all vehicles choose to scrap their vehicles and replace it with a compliant vehicle the total quantified value for money is **-£5,171,360**. If all scrap their vehicle and choose the mobility credit option, the quantified value for money is **-£847,499**.
- This does not account for those within M1a who decide not to scrap their vehicle and instead choose the £1,000 mobility credit. This cannot be quantified as the assumptions for the administrative costs

are combined for M1a. However, it is expected that this would result in an improvement in the value for money, this is because of the reduced administrative burden resulting from not implementing the scrappage scheme would bring the total scheme cost closer to the benefits received.

The true quantified value for money lies somewhere between these two values, the Council does not possess evidence on individual's preference between the available options and an important part of the measure is to provide flexibility for individual choice. Therefore, the Council does not wish to speculate on the relative uptake between the scrappage scheme and mobility credit. However, the Council does believe that much of the negative impacts of the scheme quantified in Table 8 will be offset by a proportion of the individuals choosing the mobility credit (both £1,000 and £2,000 options). An important factor in this is that those who are most reliant on their personal car are those most likely to choose to replace their vehicle, those that are less reliant on their personal vehicle are more likely to opt for the mobility credit. It is likely that, without support from the mitigation, those who are reliant on their vehicle will continue to drive into the CAZ, either with their current non-compliant vehicle or a new upgraded vehicle. For this subset of individuals this particular mitigation measure will not impact their behaviour, therefore the 'Travel time/VOC' component of the value for money will be the similar with or without the implementation of the mitigation measure. The portion of individuals who opt for the mobility package will reduce the negative impact on travel time and Vehicle Operating Costs and so the Council believes the two options are complementary to one another.

4.6.2 Additional non-quantified benefits

There are a number of benefits associated with both the scrappage scheme and mobility credit:

General:

- Removes barriers to entry in the workplace. The scheme assists low income individuals in commuting to work, without this help the financial burden as a result of the CAZ may prevent these individuals from making this journey. This would have the effect of limiting the opportunities of low-income individuals, limiting their career progression and preventing social mobility.
- Removes disincentive for employees. Employers within the CAZ are at risk of losing staff as a result of the CAZ measures if staff prefer to work in a location that does not subject them to CAZ charges. This prevents an exodus of staff from the City centre and protects current jobs. Supporting these businesses, 99% of which are SMEs¹⁰, in turn supports the local economy and prevents a loss of economic growth.

Scrapage scheme:

- Protects night shift workers. Night shift workers often provide critical public services, especially in the health service, without which there would be a dangerous reduction in the service available to the public. These workers are often on low incomes and so unable to afford to commute as a result of the CAZ measures. The irregular hours also make public transport unsuitable. This measure provides a solution to these individuals and ensures a safe level of health service continues in Birmingham.
- Reduces local transport poverty. If an individual's options for travel are limited, they will face social restrictions. A report from UCL¹¹ has concluded that a lack of mobility in this respect is inextricably linked to social disadvantage and exclusion and has a detrimental impact on quality of life. This will be especially important for commitments such as regular religious ceremonies, if individuals are restricted in attending these it will prevent them from participating in their local community.
- Removal of older and highly polluting vehicles from the vehicle stock. This has positive health impacts on the population in general, increasing productivity and reducing financial burden on the health service.
- Monetary stimulus of the local economy. The scrappage scheme encourage individuals to purchase a second-hand vehicle from a local dealership, this in turn provides fiscal stimulus to the local economy with a knock-on impact on local income and jobs.

¹⁰ NOMIS labour statistics

¹¹ UCL: Transport and Poverty – A review of the evidence, 2014

- Supports women. The DIA identified women as being disproportionately impacted by the CAZ as they are more likely to feel uncomfortable or unsafe taking public transport. This provides assistance in upgrading their vehicle so that this will not become an issue.

Mobility credit:

- Encourages the switch to public transport. This has numerous benefits:
 - Maximises emissions reductions creating significant health benefits
 - Reduces congestion on Birmingham's roads which reduces travel times, increases productivity, improves road safety, and has a further positive impact on emission reductions. This was quantified for the scrappage scheme, but the quantified benefits are not included in the quantified value for money for the mobility credit.
 - Increases revenue on the local transport system meaning more can be reinvested in improving the public transport network throughout the West Midlands.
 - Saves the individual money. Public transport is in most cases cheaper than vehicle ownership, by encouraging the switch to public transport this measure will increase long term disposable income in local areas with a resulting increase in economic growth in the local economy.
- Encourages the use of bicycles on the local bike sharing scheme. This provides revenue, so this service can be improved resulting in emission free journeys through the centre of the city. This also has associated health benefit associated with exercise.

4.7 Quantification of scheme

The quantification methodology for the support schemes for workers and individuals outside the CAZ are detailed next.

4.7.1 M1a: Individuals working within the CAZ

Birmingham has developed a detailed traffic model; PRISM¹² (See Strategic and Economic case for description). This model contains forecasts of the number of trips into the CAZ for the purpose of work split by mode of travel and income band. From PRISM, the number of individuals traveling by car (drivers counted not passengers) with an annual income of less than £30,000 was estimated at 23,566. This is based on a total number of daily car trips of 57,500 which is supported by another sources, particularly one of DfT's modelling tools; TEMPro¹³. The TEMPro model estimates that there are 149,466 jobs within the CAZ, with a 35% car mode share resulting in 52,313 daily car trips to work. On average, it is expected that the morning peak traffic has a higher share of personal transport so considering other uncertainties, this supports the results from PRISM. The model uses future forecasts for population, jobs as well as information on planning development and expected trip costs to estimate the number of trips completed by various demographic sub sections. The model is currently being used to support multiple projects being developed in the wider West Midlands area.

£30,000 was used as a cut off as BCC deemed that this would be the upper limit of individuals who would require support in adapting to the CAZ. For reference, the median full-time weekly earnings are £569 equating to a median annual gross income of £29,588¹⁴. Although the salary cap is above the national median, and therefore by definition supporting more than just low-income workers, BCC deems it important to set the salary cap at this level for a number of reasons. Firstly, an important aspect of this measure is to support local businesses operating in the CAZ as well as the individuals themselves, and concern from business regarding loss of their employees was a major finding from the consultation. As the salary cap is set just above the nation average, it provides for a wide range of employees mitigating this concern from businesses

Another justification for setting the cap at this level is to support key workers, a key priority of the Council's when designing the package of mitigation measures. Data from Birmingham Children's Hospital show that 84% of their staff who work antisocial hours earn a salary of less than £30,000, the Hospital states that these

¹² <http://www.prism-wm.com/>

¹³ TEMPro: Trip End Model Presentation Program (DfT traffic model)

¹⁴ Office for National Statistics – Employment and labour market, earnings and working hours

staff are necessary to deliver a safe and operational service and their retention must be an absolute priority for any measure targeting workers within the CAZ. Additional data from the NHS trust within Birmingham shows there are 1,439 nurses and health visitors (a proxy for key workers) working for the trust. Most staff classified within this group are highly skilled clinicians and as such are most mostly NHS pay band 6 or above. Out of the 9 pay bands within this level, 3 are under £30,000 and 6 are over. This suggests that a large proportion of key workers working at the trust will be earning over £30,000. To reiterate, the Council considers it absolutely vital to provide support to key workers. The consultation response from the health service cited a study of their staff which showed a significant portion of those with non-compliant vehicles would consider changing working location as a response to the CAZ. To prevent this, and to continue to provide a safe level of health service in the city centre, the financial support offered must be broad and cover the majority of key health workers. The Council believes the £30,000 salary eligibility cap fulfils this criteria.

The expected proportion of non-compliant vehicles in 2020 is taken from the ANPR data and shows that 23% of cars travelling into the CAZ would be non-compliant in 2020 if no CAZ was introduced. This is the number of people who will be impacted by CAZ charges. This proportion is applied to give an estimate on the number of individuals with an annual salary of less than £30,000 who travel into the CAZ for work in a non-compliant vehicle. Figure 10 graphically displays the quantification process used.

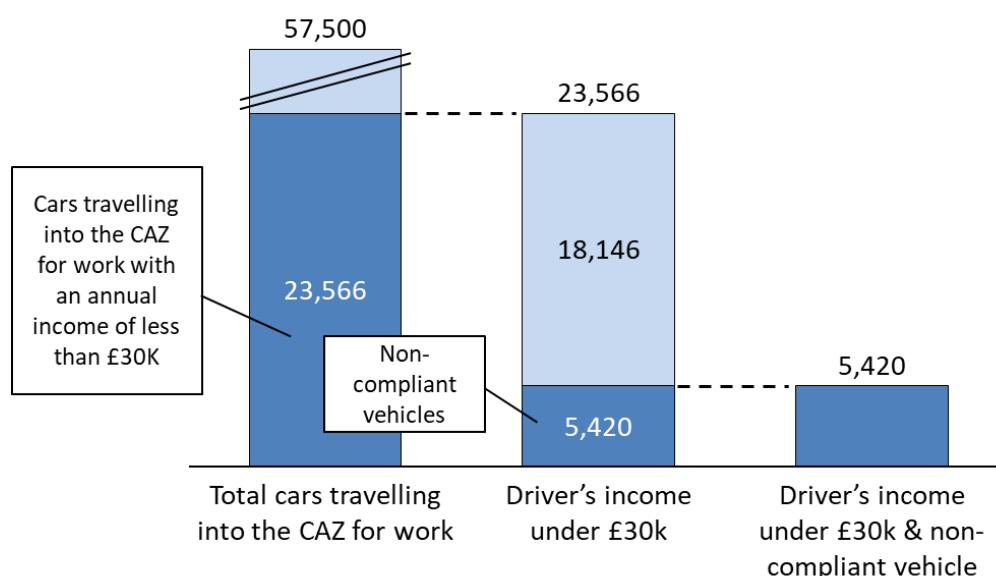


Figure 10 Quantification process to estimate number of low-income residents in the West Midlands who live and work within the CAZ

This results in a rounded total of 5,420 individuals who will be supported through this scheme. As stated previously, key workers are a priority group to be targeted by this measure. On a national scale, around 15% of the national workforce are employed as a key worker. This has been partially validated within Birmingham from data provided by the Birmingham Community Healthcare NHS Foundation Trust which showed roughly 15% of its workforce were defined as key workers. If this is applied, along with the non-compliant rate used above, (23%) to the 57,500 daily trips it results in an estimate of 1,934 key workers travelling into the CAZ with a non-compliant vehicle. This leaves 3,486 remaining places to be allocated to low income non-key workers.

At a maximum award value of £2,000 (the value if the individual chooses the scrappage scheme) this equates to a total ask of £10.84 million. Some individuals will choose the £1,000 mobility credit, so the funding ask is likely to support more than the 5,420 individuals estimated above. This is a deliberate overestimation to mitigate for:

- Errors on the assumptions, most importantly the non-compliant assumption. As the scheme is targeting individuals on low annual salaries, they are more likely than the average worker to own a

non-compliant vehicle (lower capital costs of older vehicles). This means that the 23% non-compliance rate is likely an underestimate. There is also a risk that the number of employees on less than £30,000 in an underestimate due to part time workers, so this will also be accounted for. The number of key workers could also be an underestimate as there are 2 large hospitals with operations inside the CAZ, this suggests that the proportion of key workers within the area will be higher than the national average.

- Additional money can be used to support those who live outside the CAZ in transitioning to compliant vehicles as the funding ask for this group is very limited in comparison to the size of the group in total.

In the case where an individual's vehicle is worth more than £2,000, they are unlikely to see the scrappage scheme as economically beneficial and would be better placed to sell their vehicle on the second-hand market and use the funds to buy a compliant vehicle. However, this is not expected to impact the uptake of the scheme as they will still be able to claim the £1,000 mobility credit, which will hopefully encourage the use of public transport despite owning a compliant vehicle. The format of the measure means if individuals would rather sell their vehicle on the private market, then the funding will be allocated instead to another individual to take advantage of the scheme. In general, as the measure prioritises low-income individuals with non-compliant vehicle, it is expected that most vehicle values will be below the £2,000 scrappage value.

4.7.2 M1b: Individuals living outside the CAZ

The quantification process for this group is difficult for a number of reasons, predominantly as a result of the large total size of group (residents outside the CAZ) and the lack of process by which to segregate this group to identify those that need support (those who frequently must enter the CAZ with a non-compliant vehicle and are unable to afford to upgrade). Initially, a general scrappage scheme for individuals from low income households within Birmingham was proposed, however where possible, BCC does not wish to limit measures to Birmingham residents and recognises that the city centre is a cultural hub for the entirety of the West Midlands. The DIA has identified the negative impact on residents who currently enter the CAZ regularly with a non-compliant vehicle, this is especially pronounced for those living in the areas immediately surrounding the CAZ. As a whole BCC is unable to support this group fully as it would not be politically viable to limit support measure geographically (e.g. to areas bordering the CAZ) and any widespread measures would be prohibitively expensive as well as having a negative impact on air quality. Therefore, to provide support for this group a number of places must be provided for that has an acceptable impact on air quality and then an attempt to be made to allocate these places to the individuals who are in most need of support. BCC recognises that this will only support a small proportion of those who will be negatively impacted but sees this as the only way to support residents living outside the CAZ without an excessive funding ask or unacceptable impacts on air quality. To arrive at the number of exemptions/mitigations to award to this group, BCC used the previous estimates on expected total emissions impact associated with social mitigations and subtracted the amount forecast for the workplace scheme. This was then translated into number of vehicles; it was found that 3,250 vehicles could be provided for whilst keeping within estimated emission levels outlined in previous versions of the proposal. The proposal therefore continues to be in line with the previous figures set out in the September 10th Cabinet Report, i.e. emissions stay within acceptable air quality impact tolerances.

3,250 scrappage scheme awards equates to a funding ask of £6.5 million. BCC anticipates a few issues with limiting support to this amount. Most importantly, this is only a fraction of the total group size and BCC wish to avoid a situation where the majority of individuals who apply for the scheme rejected due to lack of availability. To mitigate against this, the criteria will be clearly communicated during the application stage to prevent those applying who will clearly not be awarded support. There is also the possibility that the Council could look to provide more funds for support from the CAZ surplus revenue so that more people can be supported.

5 M2: Financial support for Birmingham's taxi trade

In this section the results from eh DIA will be discussed and used as justification of the introduction of M2a, M2b and M2c. Each of these measures will then be explained in detail before a collective Value for Money analysis at the end of the chapter.

5.1 Summary of distributional impact report

The distributional analysis report has identified the issues faced by the majority of the Hackney carriages registered in Birmingham. These result from a change in licencing conditions coming into force in January 2020 which mandate CAZ compliant vehicles in order to be able to operate. Out of the fleet of 1280 Hackney carriage vehicles, a minimum of 1,140 vehicles will have to be replaced due to these new licensing conditions (and an extra 69 also need action but have the option to retrofit to LPG, being TX4 under 14 years old). The options that are faced by the drivers are limited and expensive. This is further complicated by current plans for a 2026 licencing condition to be introduced mandating ULEV vehicles meaning a Euro 6 Hackney carriage bought in 2020 could be operated only for 6 years. BCC has conducted extensive consultation with the Hackney carriage driver community and two preferential options have emerged;

- **Purchasing a second-hand vehicle and installing a retrofit solution:** This will be limited to a vehicle under 15 years of age in 2020 (Euro 4 minimum). Feedback from the driver community suggests a second-hand Euro 4 vehicle will be in the region of £12,000¹⁵ with an additional £12,500 for installation of the retrofit technology¹⁶ totalling £24,500 (Incl. VAT). Following the conversion of 65 Hackney carriages to LPG in 2016-17, the local community is familiar with this technology and its real-world performance.
- **Purchasing/leasing a new ULEV taxi:** There is currently only one ULEV Hackney carriage on the market with a retail price of £55,599¹⁷ (including VAT, accounting for the national grant). The majority of drivers have indicated they do not have access to the capital to afford this upfront payment. The manufacturer in question offers alternative forms of payment such as a personal contract purchase but as a result of the high interest rate that is used, the total amount payable can be as high as £67,744.

As well as the Hackney carriage drivers, who have been shown to be severely impacted by the CAZ measures, the distributional analysis has shown that other key groups would be negatively impacted by a reduction in Hackney carriages. These include:

- Disabled residents: DfT data shows adults with mobility difficulties are three times more likely to undertake a taxi trip than the average adult. The DIA showed that a significant proportion of LSOAs within the CAZ are in the top two quintiles for disability. As all Hackney carriages are wheelchair accessible but no private hire vehicles are, a reduction in Hackney carriages would have an adverse impact on disabled residents.
- Older residents are more likely to have a disability than any other age group and so Hackney carriages are important (as described above).
- The DIA has shown that women are more likely to use taxis and private hire vehicles than men, and it is anticipated that this particularly prevalent at night time hours due to security concerns. Therefore, any reduction in services as a result of the CAZ would have a negative impact on women.
- The DIA report states that 88% of Hackney carriage drivers reside in areas with the highest quintile of BAME residents and data provided by BCC shows that 90% of drivers identify themselves as BAME. Therefore, any negative impact on the Hackney carriage driver community would have a disproportionate impact on BAME communities within Birmingham.
- Element Energy analysis of Hackney carriage registered addresses shows that the majority of Hackney carriage drivers reside in the city's most deprived LSOAs meaning any negative impact on Hackney carriage drivers will have a disproportionate impact on deprived areas of Birmingham. Figure 11 shows the registered addresses of Birmingham's hackney carriage drivers overlaid on a map of LSOAs differentiated by their national deprivation index, more information can be found in the DIA.

¹⁵ Feedback from engagement with Birmingham taxi drivers. Pricing varies with mileage and condition of the vehicle, from £8,000 to £25,000 mostly, examples can be seen here [LINK](#)

¹⁶ <http://gascab.co.uk/gascab-explained/the-repowering-solution>

¹⁷ <https://www.levc.com/finance/tx-pcp-offers/>

The council sees the best way to mitigate against these negative impacts is to provide support to Hackney carriage drivers to ensure that they are able to continue to provide mobility services.

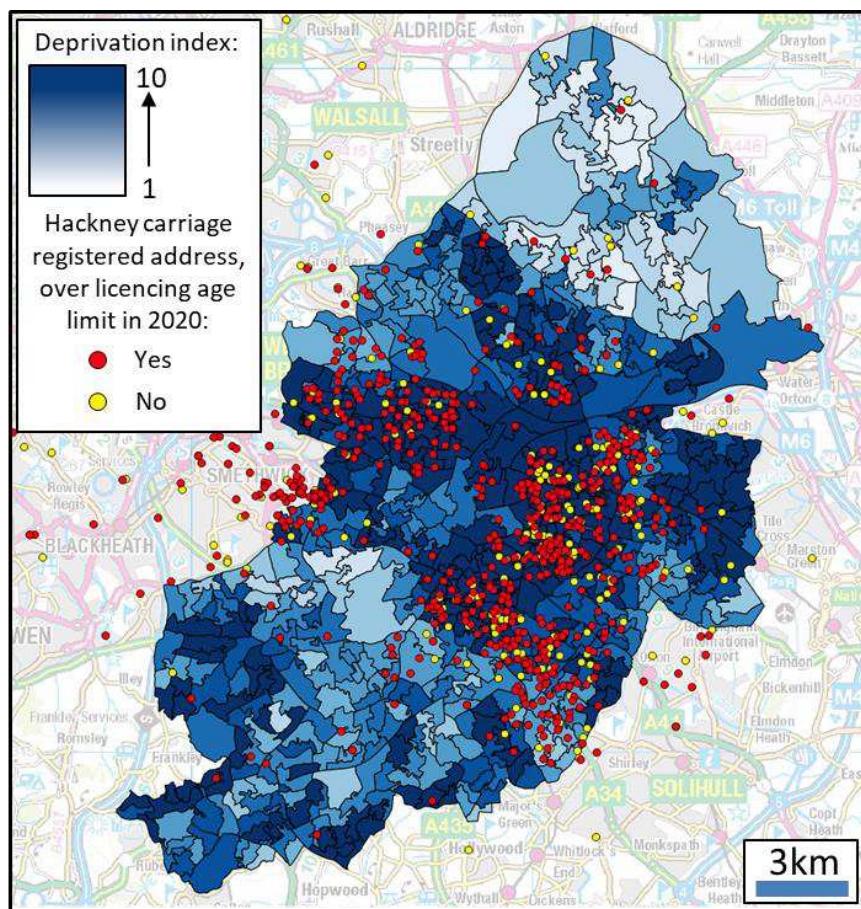
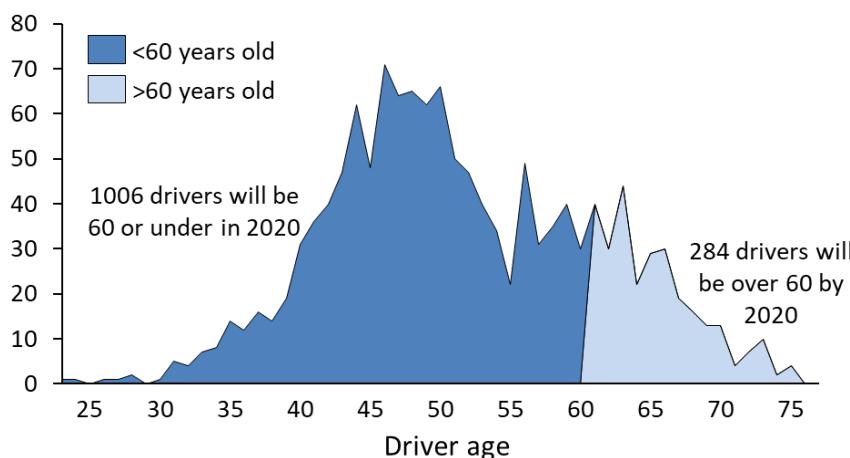


Figure 11 Map of Birmingham showing the registered addresses of Hackney carriage drivers by LSOAs ranked by their national deprivation index

The DIA outlines an important issue when considering the response of Hackney carriage drivers to the CAZ. There is a possibility that many will choose to retire, and this has to be considered when providing options for Hackney carriage drivers. All options that are open to drivers forced to change their vehicle require significant capital expenditure and this will be hard to justify for drivers that are close to retirement. Another factor that is a barrier to drivers wishing to change vehicle is that the technology options will be untested by the majority of drivers and will require a significant deviation from the driving experience they are accustomed to. This is especially relevant for ULEV vehicles. Research has shown that there is a natural bias against new technologies, and it is important to overcome this so that drivers feel comfortable with options open to them.

2020 forecast of Birmingham's Hackney Carriage drivers by age



HC fleet as of May 2018

Average 51 years

Median 50 years

Figure 12 Age profile of current taxi drivers forecast to 2020

Combining the need to provide for drivers approaching retirement as well provide a service whereby drivers can become comfortable with the technology before committing to a purchase, the Council is asking CAF funding to purchase or lease 50 ULEV taxis which will then be leased to licenced Birmingham hackney carriage drivers.

Private Hire Vehicle (PHV) drivers will face many of the same issues identified as impacting Hackney carriage drivers. In 2020, the proposed new licensing conditions will require PHVs to be CAZ compliant as well as enforcing an 8-year age limit. The enforcement of this age limit alone will result in 89% of the current fleet of PHVs being no longer eligible for licencing by the Council and when the emissions standards are also considered this results in only 162 vehicles out of a total stock of 4,321 being eligible for licence in 2020. This leaves 4,159 vehicles which must be upgraded.

The range of vehicle choice available to PHV drivers is larger than that available to Hackney carriage drivers, and this, combined with generally cheaper vehicle prices and a larger second-hand market, means the impact of the CAZ will be less severe than that experienced by Hackney carriage drivers. However, those with non-compliant vehicles still face significant upgrade costs and there is a risk that many will no longer be able to operate as PHV drivers as a result of the licencing changes.

As with Hackney carriage drivers, Private Hire Vehicle drivers predominantly reside in areas which are in the first quintile for both BAME residents and deprivation. Figure 13 and Figure 14 show the distribution of Birmingham Private Hire Vehicle drivers in each quintile for BAME residents and deprivation. This stresses the impact that will be felt by some of the city's most vulnerable areas and the importance of providing support to these individuals.

Through industry communication and feedback channels, the Council has also received a high volume of requests citing this issue as an area of concern. The Council therefore wishes to support the PHV trade in transitioning to a compliant fleet of vehicles through offering a specific mitigation measure which targets this group.

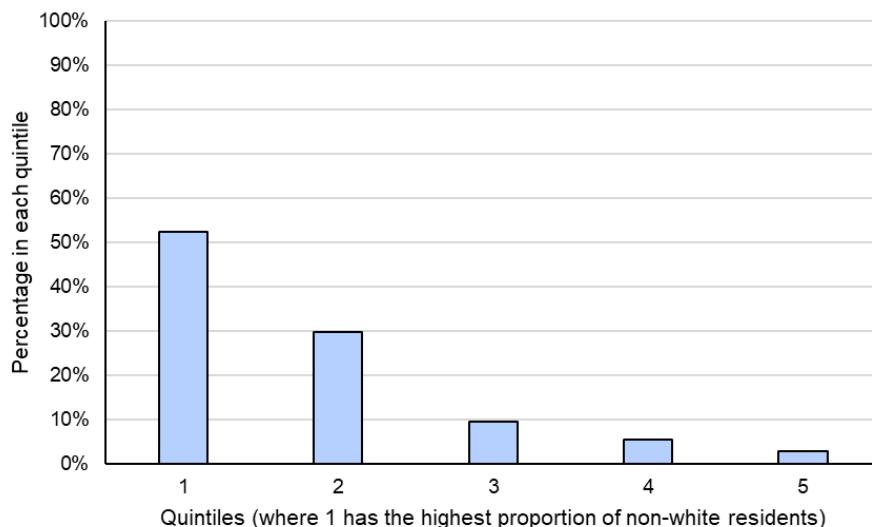


Figure 13 Share of Private Hire Taxis Registered within each Quintile of BAME Community in Birmingham (DIA report)

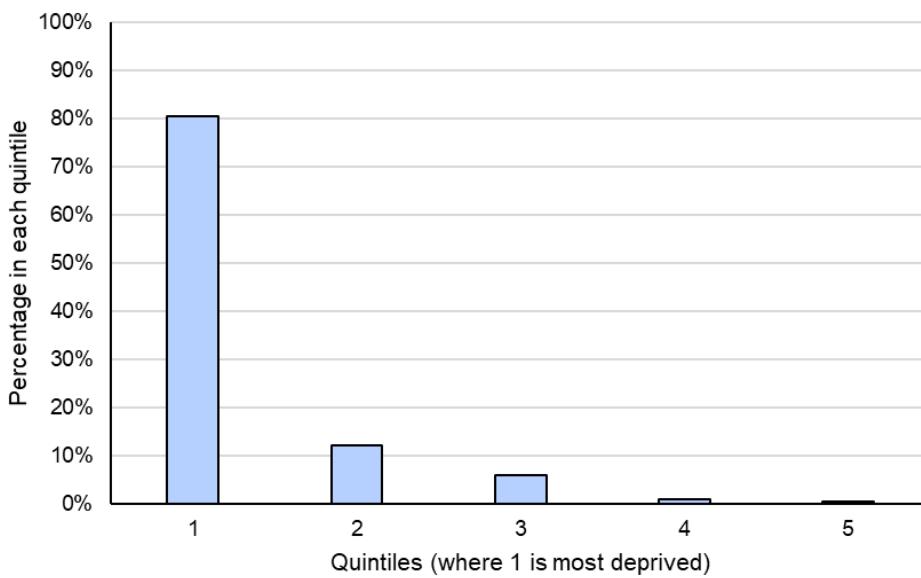


Figure 14 Share of Private Hire Vehicles Registered within each Quintile Deprivation in Birmingham Compared to the England and Wales Average (DIA report)

From the DIA, three key groups within the taxi community have emerged which will require support in adapting to the new licencing conditions. These are listed below alongside the measures which are proposed to support each group.

- **M2a: Hackney carriage drivers upgrading their vehicle.** The council proposes to offer financial support to drivers to contribute to the operational costs of a ULEV taxi or towards the installation of a compliant retrofit technology
- **M2b: Hackney carriage drivers nearing retirement, unable to upgrade or unconvinced on the benefits of ULEV taxis.** The council proposes to introduce a leasing scheme to remove the burden of ownership from these financially vulnerable drivers.
- **M2c: Private Hire Vehicle Drivers upgrading their vehicle.** The Council proposes to offer financial assistance to contribute towards the upgrade cost of a compliant HEV or ULEV vehicle.

5.2 M2a: Financial support for Hackney carriage drivers

5.2.1 Description of mitigation measure

To help taxi drivers adapt to these new licencing conditions and to transition to compliant vehicles, BCC is requesting CAF funding to provide Birmingham city licenced taxi drivers with a £5,000 support package to contribute to either:

- The running costs of a new ULEV taxi, this will help the drivers in question with on-going operational payments. The items listed below, along with their expected annual costs, have been considered when assessing the correct value of the support package, these total between £9,900 - £14,900 over 4 years. From this evidence BCC believes £5,000 is an attractive offer to drivers without being excessive, covering somewhere between 33%-50% of the operational costs over 4 years. Items considered are as follows¹⁸:
 - Insurance: £1,300 – £1,800 pa
 - Vehicle maintenance: £200 - £500 pa
 - Taxi rank access payments (e.g. proposed annual payment to access Birmingham New Street station): Up to circa £200 pa
 - Licencing fees: £120 pa
 - Vehicle electricity costs (public and home charging): £600 - £1,000 pa
 - Home charge point (incl. installation fees and government grant): £200 -£400 one-off payment
- Retrofitting an eligible vehicle in order to reach compliance. This process has already been established by BCC with 65 vehicles being retrofitted to LPG as part of a scheme carried out in 2016-2017, funded by the Clean Vehicle Technology Fund. In this instance, a £5,000 lump sum would be provided to the driver to carry out the retrofit. The retrofit technology and providers will not be prescribed but will have to be on the Clean Vehicle Retrofit Accreditation Scheme list. Only the LPG conversion is in an advanced stage of being accredited as of October 2018. The £5,000 funding amount covers 42% of the estimated cost of the retrofit solution, not including the cost of purchasing an eligible TX4 vehicle. Although this still requires the driver to contribute around £7,000, the grant significantly reduces the capital outlay and this proposal has received widespread positive feedback from the hackney carriage driver community. For reference, only 69 vehicles within the current fleet will be eligible for a LPG retrofit, others must first purchase a eligible vehicle.

Figure 15 shows the estimated total cost of ownership before and after the mitigation measure is applied. This assumes a driver must first purchase a Euro 4 Hackney carriage before carrying out the retrofit technology, this assumption has been made as only a limited number of the current fleet are eligible for a retrofit, the majority of drivers will need to first purchase an eligible vehicle if they wish to receive the proposed retrofit funds.

¹⁸ Sources: BCC licencing team (taxi rank and licensing fee); feedback from Hackney carriage driver community (insurance and maintenance); Element Energy estimates (electricity costs, home charging points)

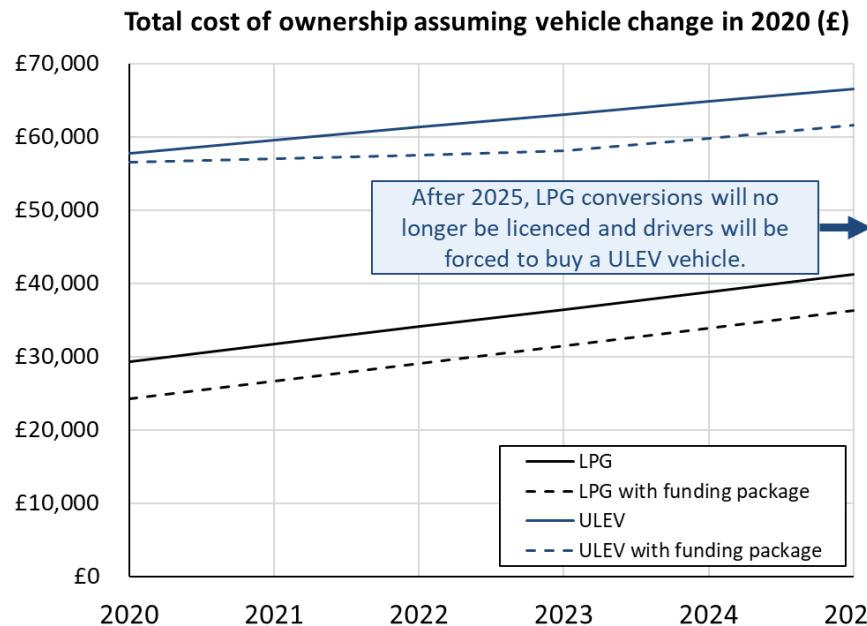


Figure 15 Total cost of ownership with and without the funding package for the two preferred options expressed by the Hackney carriage community; 1) buying a Euro 4 vehicles and installing a retrofit solution 2) Buying a ULEV vehicle. It should be noted that after 2025, LPG vehicles will no longer be licenced, and drivers will have to then purchase a ULEV vehicle to be licensed.

BCC recognises that for both options available to Hackney carriage drivers a cost differential exists between the final cost that the driver will face and the support they will receive from the Council.

With the operational support package, the payments do not assist with the upfront costs and drivers will be required to fund the [purchase or lease of a ULEV](#) vehicle themselves, the upfront cost is significant with the only currently available ULEV Hackney carriage retailing at £55,599 (incl. VAT and Plug in Taxi grant).

The [retrofit option](#) requires a smaller capital outlay from the drivers but could still be seen as a barrier for those on low incomes. Assuming the purchase of a retrofit eligible vehicle (estimated at £12,000) followed by the installation of the retrofit technology (£7,000 incl. £5,000 funding) the total cost to the driver is £19,000. For some drivers, the financial investment required in both cases could be seen as prohibitive and may prevent the uptake of the scheme, particularly for low income drivers who will be least able to afford the capital investment. The council acknowledges that even with support drivers may struggle with the costs associated with upgrading their vehicle, however does think that offering drivers a larger funding amount or weighting the funding award relative to the driver's income is a feasible solution. Hackney carriage drivers are amongst the most negatively impacted groups and, as described in the DIA, face only a limited number of viable options, all requiring capital investment. In recognition of this, the £5,000 funding award proposed is significantly higher than proposed awards to other individuals (maximum £2,000 per person for individuals working inside the CAZ). The council has tried to provide drivers with as wide a range of options as possible to ease the transition to a compliant vehicle but unfortunately providing a higher funding award is not seen as good value for money.

The proposed funding amount also compares favourably with comparable policies in other cities, summarised below:

- **Bristol:** vehicle owners are offered a benefits package worth £3,636 over a 5-year period upon the purchase of a ULEV Hackney carriage. The benefits are provided as subsidies covering a number of fees required to operate a taxi in Bristol.
- **Southampton:** the Council offers cashback to drivers in return for replacing their private hire vehicle or Hackney carriage with a low emission alternative. The cashback incentive depends on the vehicle (Full electric = £3,000, Plug in Hybrid = £2,000, Full hybrid = £1,500, wheel chair accessible Euro 5/6 petrol with capacity 5 or more = £1,500)

5.2.2 Delivery plan

The delivery plan will vary depending on whether the driver is requesting funds for a retrofit technology or for offsetting the costs of a ULEV vehicle:

- **Eligibility and validation:** Any hackney carriage driver currently licenced with Birmingham City Council will be eligible for this scheme and it will be operated on a first come – first served basis. The validation process will most likely be conducted in person, at the Council's licencing office. The validation is expected to be a simple process of checking the driver in question against the Councils database of licensed drivers and vehicles.
- **Retrofit technology:** once an application is approved the driver will then register with the technology provider and book a timeslot for the retrofit to be carried out. This will be dependent on a vehicle inspection to confirm the vehicles eligibility for the retrofit technology conducted by an independent garage. £5,000 will be deducted from the final price of the installation which the technology provider can then claim back from BCC with valid evidence of the process. This information will also be needed for the BCC licencing team as the vehicle will not be permitted to be licenced without this retrofit technology.
- **Operational finance package for ULEV vehicles:** for this scheme, any driver who purchases a ULEV Hackney carriage after September 2018 will be eligible to receive the funding amount. BCC recognises that providing funding to those who have already purchased a ULEV vehicle by definition does not influence behaviour in line with the mitigation measure. However, it is proposed that these drivers are included in the funding package as not to unfairly penalise early adopters of ULEV taxis by denying them access to funding. The number of taxis that this condition will cover is expected to be very small, for reference there has been only a single ULEV taxi order to date (as of October 2018). Once the driver has purchased/leased the vehicle they will provide evidence of the transaction to BCC who will then validate it with the manufacturer. Starting in January 2020, BCC will then provide 4 consecutive annual payments of £1,250 to the driver. Before each payment the driver must provide evidence that they are still operating the ULEV taxi and that it is still licenced by the council. Where possible, this will be provided as benefits rather than as a cash payment, a good example of this is the licencing fee which the council can easily provide free of charge to a ULEV driver. However, the council does not propose to provide the entire funding through benefits as this would involve complex arrangements with 3rd parties (e.g. insurers, maintenance providers etc.), a cash payment will therefore be provided to make up the difference and bring the total to the £1,250 annual funding amount.

There will be no need to require proof of sale/scrappage of the old non-compliant vehicle as it can no longer be licenced within Birmingham as a result of new licencing conditions coming into force in January 2020. . If sold outside of Birmingham it could still be licenced elsewhere and driven into the CAZ, however it would not be permitted to use any of the taxi ranks and would be required to pay the CAZ charges. This is not an ideal outcome, however the same can be said for non-compliant vehicles currently registered outside of Birmingham and this measure would not worsen this impact. The resources required for identification and validation of eligible vehicles is expected to be minimal as the BCC taxi licencing team have full records of each vehicle and are regularly in contact with the Hackney carriage driver community. The full delivery plan is summarised below in Figure 16.

In both cases there may be supply constraints which prevent the delivery of compliant vehicles to drivers before the January 2020 deadline. In the case of the LPG retrofits, feedback from the only accredited garage (who's staff was involved in the LPG trial, see case study 1), indicated that once around 8 staff have been fully trained, they will be able to conduct 10-20 retrofit installations a week. Over a 4-month delivery period, this equates to 175 – 350 vehicles. For ULEV taxis, the supply is currently limited to a single provider and, as increased demand is exempted from other cities (particularly London), the supply of sufficient vehicles to the Birmingham market is not guaranteed. The council propose to tackle this through a range of solutions:

- The application process will be continuous cycle, those that apply early will be assessed at the time and if possible approved before the end of the application period. This will allow drivers who apply

early to install the retrofit or order a ULEV taxi before the expected delivery period. This will spread out demand and allow a higher number of vehicles to be upgraded before the introduction of the CAZ in 2020.

- If a driver has been accepted onto the scheme but supply constraints mean that they are unable to upgrade their vehicle then the Council propose the following:
 - Drivers' current vehicle will be offered a temporary licencing extension until the date of their vehicle upgrade, an appropriate time limit (e.g. 6 months) will need to be set for this option.
 - Drivers will be prioritised on the council leasing scheme, this will allow them to utilise the leasing vehicles while waiting for the upgrade to their own vehicle
 - The solution will likely involve a mix of the two options above depending on driver preference and the length of time that the driver in question must wait for their vehicle upgrade.

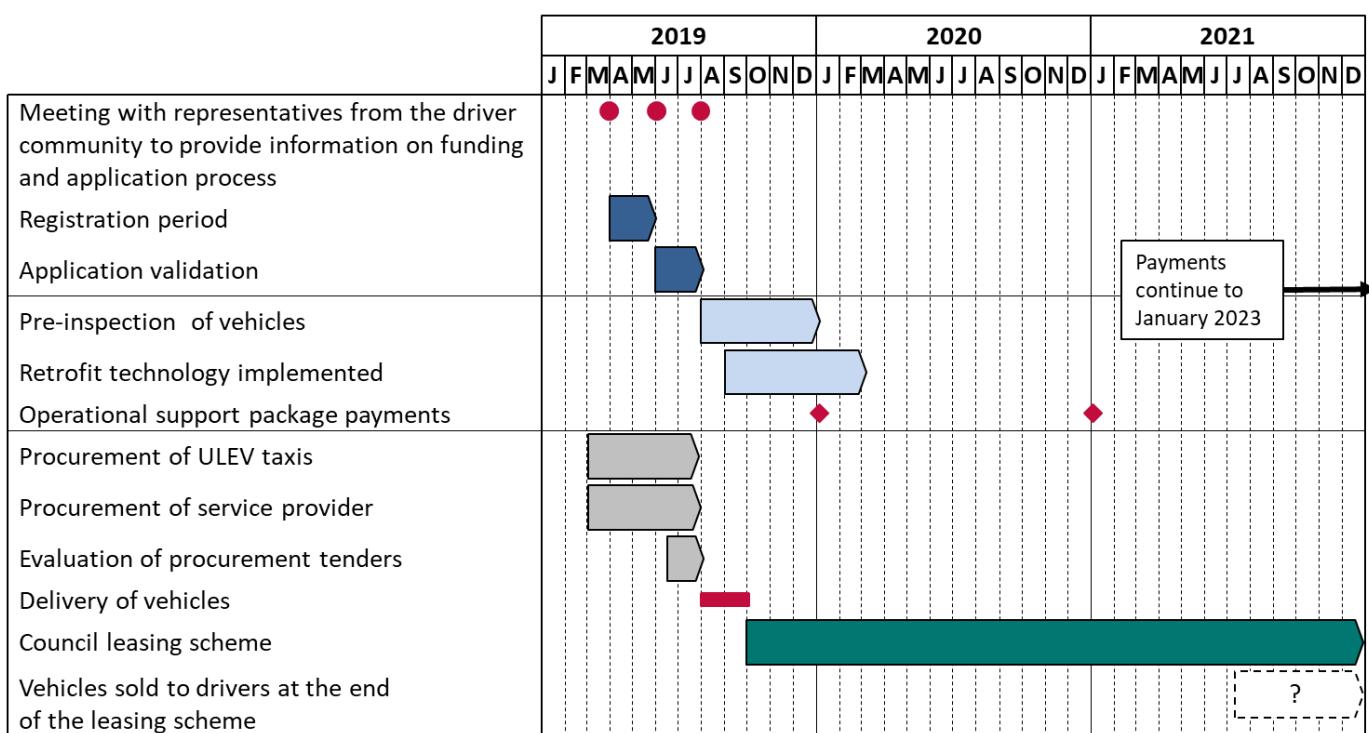


Figure 16 Proposed delivery plan for the Hackney carriage operational support package and council leasing scheme mitigation measures

Case study 1: Birmingham City Council LPG Hackney carriage retrofit trial

From 2015 until 2017, the Council carried out a trial which converted the city's most polluting Hackney carriages from diesel to LPG. The success of the trial as well as the numerous lessons learnt give a high degree of confidence in the deliverability of the LPG retrofit part of the mitigation measure. A summary of the project is provided below:

- The Council utilised £500,000 of funding, provided by DfT to address air quality issues, to convert 65 highly polluting diesel taxis to LPG.
- A local garage was given training to acquire the skills to carry out the procedure and the UK's first supply chain was created for the conversion of TX vehicles to LPG.
- The project was developed in close coordination with the Hackney carriage driver community. The general consensus was a preference for LPG over electric taxis and as result of this feedback LPG was decided upon.
- Emissions testing was conducted at accredited centres, results showed that on average, vehicle NOx and PM emissions were reduced by 80% and 99% respectively.
- The lessons learnt were primarily in establishing the supply chain, which caused repeated delay to the project. Now that this has been completed, the Council envisages a much smoother process with future retrofits. The project also showed the importance of pre-inspection of the vehicles, to ensure a sufficiently good condition – this is taken into consideration in the new scheme with an inspection check included in the process, and a limit of the vehicle's age that is eligible.
- The taxi driver survey conducted in 2017 on 32 drivers showed that 97% would recommend the conversion though most drivers also said other drivers would not take up the solution without some funding support.

5.2.3 State aid considerations

BCC has identified issues in aiding Hackney carriage drivers in purchasing/leasing a new ULEV taxi. These result from the fact there is currently only one provider of a ULEV taxi and already a government taxi grant in place, which leads to additionality issues as well as possible market distortion. When combined with government support, the amount that ends up being transferred to the taxi company in question could result in State aid issues. Therefore, an approach has been taken which seeks to offset the operational costs of Taxis rather than the purchase cost. A similar scheme is in the process of being implemented by Southampton City Council and BCC will seek input from a legal team to ensure that this approach does not violate State aid regulations.

For the provision of funds to contribute towards a compliant retrofit technology, BCC has experience in providing funding for this purpose during the LPG retrofit trial it conducted in 2016-17. In this case, BCC offered the full amount for the retrofit and hence BCC is confident that State aid issues will not arise from offering a cash amount which is less than half the cost of the retrofit technology. The financial assistance of £5,000 is well below the De Minimis amount and drivers will be required to sign a declaration stating they have not received State aid over this threshold in the last 3 years.

Lastly, the Hackney carriage trade is highly localised and there is no competition from taxi owners or operators from other Member States. It therefore can in no way impact trade between Member States and as a result, this measure does not constitute State aid.

5.2.4 Quantification of package

BCC has detailed data on the current taxi fleet and therefore can make an accurate estimate on the number taxis that will require support. Out of the fleet of 1,280 Hackney carriages in operation in Birmingham, 7 meet Euro 6 emission standards with a further 64 fitted with an LPG retrofit technology that brings emissions down to CAZ compliance level. There are 69 additional vehicles which are currently eligible for this retrofit technology which leaves 1,140 vehicles which will have to be completely replaced. BCC does not plan to offer

a support package for every vehicle that is forced to be replaced, this is for two reasons. Firstly, a number of drivers may choose to retire instead of investing the necessary capital to purchase a compliant vehicle. To retire in the near future (<10 years) in any case, it will not make financial sense to invest in a new vehicle if they will not operate for a sufficient length of time to recuperate their initial expense. Analysis contained in the distributional analysis report shows that 284 of the current taxi drivers will be over 60 years of age in 2020 (see **Error! Reference source not found.**) and could see retirement from Hackney carriage driving as the preferential option, if all chose to retire their vehicles this would leave 996 vehicles on the road. Secondly, a recent taxi demand survey¹⁹ showed that, even accounting for the expected increase in demand, the Hackney carriage fleet could reduce by 25% and still comfortably meet demand. If this is applied to the current fleet it suggests 960 vehicles are sufficient to support the mobility needs of Birmingham. As a result of these factors Birmingham is asking for a finance package to support 1000 vehicles. There have been concerns raised around affordability issues resulting in a lower uptake of the scheme than expected. However, due to the narrow range of options available to drivers it is assumed that at least 1,000 drivers will be interested signing up to the funding scheme rather than giving up their licence. This uptake assumption is supported by:

- The Council's engagement with the taxi community which suggest that majority of drivers will choose to continue to operate as a Birmingham Hackney carriage driver after the CAZ is implemented.
- The DIA has shown that over 90% of Hackney carriages in the current fleet will need to be replaced after January 2020 to continue to be licenced by the Council. The limited vehicle upgrade options faced by drivers, as well as affordability issues, means that drivers upgrading their vehicle will face financial strain. Feedback from the driver community suggests that only a small minority have the necessary capital to upgrade without financial assistance. This is compounded by evidence which shows that a high proportion of Hackney carriage drivers live in areas of the highest income deprivation in Birmingham.
- If the majority of drivers wish to continue operating in Birmingham, and evidence shows that most will struggle to upgrade without financial assistance, it is a reasonable assumption that most drivers will choose to join a scheme which provides financial assistance in upgrading.
- Taxi drivers are arguably the hardest hit by the CAZ, and the Council wishes to ensure that all drivers who wish to upgrade their vehicle have access to assistance. The Council therefore feels strongly that providing support for 1,000 Hackney Carriages is the correct approach.

If each driver entering the scheme receives £5,000 in funding, then the total cost of the scheme comes to £5 million.

5.3 M2b: Hackney carriage leasing scheme

5.3.1 Description of mitigation measure

As well as providing financial support to aid Hackney Carriage drivers in upgrading their vehicle, the Council has identified three additional areas where the Hackney carriage trade will need support in response to the introduction of the CAZ:

1. Drivers who are nearing retirement and therefore unable spread the initial financial cost over the full life cycle of the vehicle.
2. Drivers who are considering upgrading to a ULEV vehicle but are not convinced by the benefits.

To cater for these groups the Council is asking funding from the CAF to support a Hackney carriage leasing scheme. This will serve two purposes, the majority of the leased vehicles will support drivers who are unable to afford vehicle upgrade costs, this will particularly focus on driver who are nearing retirement. A smaller sub-section of vehicles will be reserved for a Try-Before-You-Buy scheme, where drivers considering purchasing ULEV vehicle can trial a ULEV taxi for a limited period of time.

¹⁹ Birmingham City Council – Hackney Carriage Unmet Demand Survey, August 2017

5.3.2 Delivery plan

The council is proposing to run a procurement exercise to purchase the vehicles and another to source a service provider who will run the leasing scheme. This seen as necessary as the Council does not currently have the necessary skills or experience in house to operate a scheme such as this. There are a number of potential models which could be followed, the most promising are:

- **The council purchases the vehicles and leases them to the services provider.** This will be good value for money as the up-front purchase means there will be no finance fees involved. The service provider will then lease the vehicles from the council at a fixed rate or share the resulting revenue. The service provider will be the point of contact with the drivers and lease the vehicles at market rate as not to distort competition.
- **The council will procure a service provider who is also responsible for procuring the ULEV vehicles.** In this case, the council will provide capital funding to the service provider which will directly offset the costs of purchasing or leasing the vehicles. The service provider will offer a revenue share to the council in return for the funding amount.

In both cases a proportion of the funding amount will return to the council. This could be:

- used to help private hire vehicles transition to ULEVs as they are unsupported by the proposed list of mitigations and will face many of the same problems as Hackney carriage drivers when licencing conditions change in 2020;
- used towards charging solutions for taxi drivers (both Hackney Carriages and Private Hire Vehicles) that do not have off-street parking;
- used to reduce the budget ask for later years.

The proposed leasing scheme will serve two purposes:

- **Provide a ‘try-before-you-buy’ scheme** to drivers considering making the switch to an electric vehicle. This will educate drivers on the benefits of EVs and remove any inherent bias against that technology that may exist. This will be operated on a short-term basis, where drivers will have use of the vehicle for a limited time (likely to be 2-3 weeks), during this time their vehicle will be taken off the road to keep the number of operating hackney carriages in Birmingham constant. A key part of the service provider procurement will be to assess their capability and willingness to operate this part of the scheme, the charge to drivers will be only nominal to cover operational costs but will not look to make a profit from the lease fees.
- **Provide a lease service** prioritising drivers close to retirement: this will allow drivers to lease the taxis and avoid the high upfront costs associated with purchasing a new ULEV vehicle. The aim of this scheme is to avoid the forced retirement of a significant proportion of the current fleet of Hackney carriage drivers. Although drivers over the age of the age of 60 will be prioritised, the scheme will be open to all hackney carriage drivers registered with the Council. It is proposed that these vehicles are leased are on a per day or even per hour basis, this is in response to feedback from the Hackney carriage driver community which showed that drivers have a broad range of working hours, especially older drivers who are close to retirement. By leasing the vehicle over short time periods, it maximises the utilisation of each vehicle providing benefit to the maximum number of drivers. This is designed to replace the use of non-compliant vehicles which will no longer be licenced by BCC. The procurement process of the service provider will be partly assessed on the lease rates that are offered, with a strong emphasis placed on providing value for money for drivers. However, the council recognise that the service provider needs to benefit financially from the arrangement and market rates are expected.

Out of the 50 vehicles requested, 10 will be initially allocated to the ‘try-before-you-buy’ scheme and 40 will be allocated to the short-term lease program. The Try-Before-You-Buy scheme is expected to be highly utilised during the latter half of 2019 and at the beginning of 2020 when the bulk of vehicles must be replaced. However, after this period, the demand for a Try-Before-You-Buy service will reduce, at which point the Council will then allow the service provider to transfer these 10 vehicles to the short-term leasing scheme in line with reduced demand. As the Council will use the CAF funding to either procure the vehicles or provide to the service provider to offset the vehicle costs, the vehicles will return to the council after the leasing scheme

commences. The council then intends to sell the vehicles onto the second-hand market to further boost ULEV uptake in Birmingham's Hackney carriage fleet. It is proposed that the leasing scheme is operated until 2025.

5.3.3 State aid considerations

In order to comply with State aid regulations, the council will issue a tender to procure the 50 vehicles. An option being explored is implementing this tender in two rounds of 25 vehicles to provide the opportunity to purchase the vehicles from different manufacturers and provide a choice of vehicles to the drivers, however it may make more administrative sense and for simplicity sake to complete the procurement in a single round. By procuring the service provider it ensures that a fair market rate will be offered on the leasing scheme without causing market distortion. Both tenders will be written and delivered in full compliance with public procurement regulations.

Although there is currently only one company providing ULEV taxis, more are expected to reach market before mid-2019 and this tender will provide the opportunity for the market to offer the best possible solution to the provision of these vehicles. Considering the small market size of electric taxis, a strong emphasis will be placed on the value for money aspect of the tender.

The lease arrangement will be set at a market rate as not to distort the market by offering favourable terms below what the market is able to offer. The tender process for the suppliers of the Hackney carriages as well as for the operator of the leasing scheme is a commercial arrangement, therefore the 'Market Economic Operator Principle' would apply and the measure would not be classified as State aid.

5.3.4 Quantification of package

The Council believes that 50 vehicles is a suitable to meet the expected demand for this service. The 10 taxis earmarked for the Try-Before-You-Buy scheme, is relatively conservative compared to the number of vehicles that have been requested by other cities when the scale of Birmingham taxi fleet is considered. For example, Sheffield have received early measures funding for the purchase of 10 ULEV taxis and Coventry are planning a Try-Before-You-Buy scheme with 6 ULEV taxis. This compares to a maximum fleet size of 859 and 857 for Coventry and Sheffield respectively. There is also strong justification for the 40 taxis included as part of the short-term leasing service as analysis of Birmingham's licencing data shows that many drivers currently use a similar model of operation. The licencing statistics show that at least 216 registered drivers do not own their own vehicle

This shows that a large proportion of the current driver community is using a leasing, sharing or renting model to operate. Assuming that this trend continues after 2020 and considering that the vast majority of Hackney carriage vehicles must be replaced, it suggests that there will be sufficient demand to support a 40-vehicle leasing scheme.

From current market offer, it is estimated that the vehicles will cost in the region of £55,000 which equates to a total scheme cost of £2.75 million.

5.4 M2c: Financial support for Private Hire Vehicle driver

5.4.1 Description of Mitigation measure

This financial support will be in the form of a £2,000 contribution towards a HEV or ULEV CAZ compliant vehicle. The funding support has been limited to this to maximise the air quality benefits resulting from this measure. Numerous studies have shown that the real-world driving emissions of Euro 6 diesel cars far exceed legal limits, in some extreme cases over 12 times the legal Euro 6 limit. The council therefore wishes to take advantage of the stock turnover that will result from the CAZ and incentivise vehicles which will deliver meaningful air quality benefits. To maximise the impact of this funding and to ensure the financial support will be used towards vehicles which have longevity in the stock, a condition on the maximum age of the vehicle will be set at 3 years (as of 2020). Considering the 8-year age limit, this will ensure that vehicle purchased through this funding scheme will be able to operate up to at least 2025.

As stated, the Council's preference is for this measure to be reserved for drivers upgrading to HEVs or ULEVs, however the Council is open to feedback on this issue. If it is felt that this excludes low income PHV drivers from making use of this offer due to the higher upfront costs of ULEV vehicles, then Euro 6 diesel and petrol vehicles can also be included in the eligible list of vehicles. If this is the case, the Council would look to implement a graded funding system whereby ULEVs would receive a larger funding amount than regular vehicles. For example, an individual upgrading to a ULEV could receive £2,000 support whereas a driver upgrading to a Euro 6 would receive only £1,000 support. This would retain the incentive for drivers to switch to low emission vehicles when upgrading.

5.4.2 Delivery plan

The delivery plan for the measure will be as follows:

1. Drivers will register their interest in the scheme with the Council's licencing team. To register they will be required to contact the licencing department directly and verify that they are a licenced PHV driver with a non-compliant vehicle currently licenced by the Council as a PHV since at least September 2018.
2. Once the information has been verified and approved the individual will be given confirmation that they have been accepted onto the funding scheme. The Council will keep a database of approved drivers as well as a record of their current non-compliant vehicle.
3. After receiving approval, the individual will then purchase a vehicle which meets the criteria of the funding award. The vehicle must be; CAZ compliant, under 3 years of age in January 2020 and comply with all other council PHV licencing conditions. Aside from this, the individual is free to choose the vehicle of their choice.
4. The individual will then provide proof of vehicle upgrade to the council, this will either be in the form of a valid sales receipt or alternately a leasing contract.
5. The council will validate the evidence to ensure the new vehicle meets all the funding requirements and once this has been confirmed will provide a £2,000 funding award to the individual.

5.4.3 State aid considerations

The Council believes this measure will not breach state aid regulations for a number of key reasons. Firstly, the amount given to each driver is below the de minimis amount, and, as in other measure, drivers will be required to sign a document declaring that the total amount of government funding they have received is under the de minimis amount. Secondly, aside from the funding criteria, individuals will have a full choice of upgrade vehicle on which to spend the funding amount. Other than the condition stating the vehicle must be a HEV or ULEV (PHEV or BEV) the Council will not make specifications relating to powertrain or brand. This will ensure that no market distortion occurs as a result of the introduction of this measure, as by 2020 there is expected to be a significant market offering within this specification. However, it also recognised that due to the late addition of this measure into the mitigation package, the full details are yet to be finalised and that more work needs to be done to ensure compliance with state aid regulations.

If a driver decides to upgrade to a BEV, there are potentially additional issues as this support will be combined with the national Plug in Car Grant. However, the Council also sees the importance of incentivising BEVs during the transition to compliant vehicles and does not want to implement a system whereby non-plug in vehicles are incentivised over BEVs. Other cities, such as Southampton and Leeds, have been successful in implementing a scheme which provides a cash payment to Private Hire Vehicle owners who upgrade their vehicle. In Southampton's case they offer £3,000 cashback to a PHV driver who upgrades to a fully electric vehicle (BEV). The Council will consult with other cities, a specialist state aid lawyer and DEFRA to ensure that all state concerns are covered before the FBC submission.

Lastly, the Private Hire Vehicle trade is highly localised and there is no competition from taxi owners or operators from other Member States. It therefore can in no way impact trade between Member States and as a result, this measure does not constitute State aid.

5.4.4 Quantification of package

To quantify how many funding awards should be provided the council has had to make some broad assumptions:

- All current drivers will continue to operate as Private Hire Vehicle drivers after the introduction of the CAZ.
- Those that do not own their own vehicle (short term rentals or vehicle sharing) will continue to operate in this manner but will not take responsibility for the upgrading of a non-compliant vehicle. This will be the responsibility of the vehicle owner.
- Vehicle owners who are upgrading their vehicle as a result of the new licencing conditions will make use of the funding available rather than upgrading fully at their own expense.
- A small proportion of vehicles will upgrade through natural vehicle stock turnover before this funding scheme is introduced. The age profile of the current stock is assumed to remain constant until 2020.

Using these broad assumptions, the number of funding awards required is estimated by taking the number of Private Hire vehicle owners (3,649) and applying the expected proportion of non-compliant vehicles within the PHV stock (95%), this results in 3,466 vehicles needing to be upgraded. As there is no cost or sacrifice associated with the scheme, it is assumed that all eligible Private Hire Vehicle owners will make use of this scheme, the council is therefore asking for funding to support 3,500 individuals which at £2,000 per funding award comes to a total of £7 million.

5.5 Value for Money

The value for money analysis for M2a, M2b and M2c has been grouped for efficiencies sake.

5.5.1 Quantified benefits

As described in 3, these benefits are quantified using an assumption that the funding made available will directly offset vehicle upgrade costs in a 1:1 ratio. However, when admin costs are included this reduced this ratio below 1. The total funding ask for M2a, M2b and M2c is £14.75 million, so using this methodology the scheme is providing £14.75 million of benefits to the taxi community. When admin costs are considered, the total scheme cost is £15.03 million. When this is considered, for every £1 of funding allocated, £0.98 worth of benefits are received by the taxi community, this represents a negative VfM value of -£276,595.

However, the Council believe this is more than offset by the non-quantified benefits that will result from the measure.

5.5.2 Additional non-quantified benefits

General benefits:

- Preventing job losses in the taxi community. The DIA has identified the significant financial burden that faces taxi drivers who are forced to upgrade their vehicle. By providing financial assistance, this measure prevents job losses which in turn has a number of positive impacts:
 - Prevents negative impacts on BAME residents. The majority of hackney carriage and PHV drivers define themselves as BAME, and job losses will disproportionately affect the BAME community.
 - Provides support to Birmingham's poorest areas. Analysis of registered taxi driver's addresses show that they predominantly reside in the city's most deprived areas. This measure protects jobs in vulnerable communities and prevents further negative economic impacts.
 - Prevents local economic contraction. Job losses will result in lower disposable income, lower spending at local businesses and a contraction in local economic growth.
 - Protects dependent businesses. The taxi trade provides custom to many local businesses, these include repair garages, MOT centres, specialist insurers etc. By retaining jobs within the

trade, it also protects the revenue enjoyed by these dependent businesses, in turn protecting local jobs and providing a boost to the local economy.

- Continuing the service that taxi drivers provide to Birmingham residents. As outlined in the DIA, taxi drivers provide vital services to a number of different user groups, particularly; elder residents, disabled residents and women.
- Prevents negative publicity. Were a large proportion of taxi drivers to go out of business as a result of the CAZ measures, it would create negative publicity around both the Council's and Government's lack of support for this vulnerable group. This will be especially true during the Commonwealth games which will be hosted in Birmingham in 2022.

M2a

- Supporting the EV industry. The plug-in taxi industry is in its infancy; by supporting the market at this stage, this measure will increase uptake, and act as a catalyst to increase national uptake. This will result in emission reductions on a national scale. An increased number of EV taxis will also increase public awareness of electric vehicles in general, encouraging an increase in local uptake of ULEVs.
- Creating local jobs. Local garages will be used to carry out the retrofit installations and to fulfil the large volume of orders resulting from this measure they will need to hire additional staff. It is estimated that at least 8 full time staff will be required to meet the demand from Birmingham.
- Establishing Birmingham as a leader of retrofit technology. The success of this measure will hopefully lead other cities to follow Birmingham and provide incentives for the taxi community to retrofit their vehicles. Birmingham has an opportunity to create specialist jobs in this area, the number of which will grow with the increasing demand for retrofit solutions. This will have positive impacts on the local economy.

M2b

- Support for local business. Part of the leasing scheme will be to tender a company to run the leasing scheme, local businesses will be prioritised in this process which promotes local jobs and provides economic stimulus into the local economy.
- Revenue stream for the council. The measure will return some revenue in the form of the lease fees which drivers pay to use the service and a portion of this revenue will be returned to the Council. This can be used to invest in further air quality improvements, for example in supporting the taxi trade switch to ULEV vehicles. This measure therefore provides support to the primary target (vulnerable Hackney carriage drivers), but also provides large secondary benefits as result of this revenue stream.

M2c

- Monetary stimulus of the local economy. The scheme encourages individuals to purchase a vehicle from a local dealership, this in turn provides fiscal stimulus to the local economy with a knock-on impact on local income and jobs.

6 M3: 'Free miles' for ULEV LGVs on BCC's public charging network

6.1 Summary of distributional impacts

The distributional impact analysis identified SMEs with a heavy reliance on LGVs, either through operating vans themselves or product delivery, as being negatively impacted by the CAZ measures. It is expected that most businesses operating within the CAZ will be reliant on road transport in some form. Mitigating against these impacts is difficult, as many trips into the CAZ are an essential to the core of the businesses operations and upgrading to a new vehicle requires significant capital expenditure.

Vans are also large contributor to the poor air quality currently seen in Birmingham and upgrading to a compliant vehicle is no guarantee of a reduction in emissions. The EQUA air quality index has shown that some Euro 6 diesel vans have such high real word emissions that they are not comparable to any Euro

standard and have NOx emissions of roughly 12 times the Euro 6 limit²⁰. As a result of this, the Council believes it is important to encourage businesses to upgrade to the cleanest vehicles which will maximise the air quality impacts of the CAZ.

6.2 Description of mitigation measure

An important issue is ensuring that when businesses are bringing in new vehicles into their fleet that they are choosing vehicles with the lowest possible emission standards, preferentially promoting ULEV vehicles where possible. To support this choice, BCC is proposing providing 'free miles' on the forthcoming public network due to be installed in conjunction with BCC's EV development partner (partner to be announced, procurement on-going as of October 2018). This will provide an incentive for fleet managers to choose ULEVs over traditional compliant vehicles which have been shown, in some cases, to emit over 12 times the legal Euro 6 NOx emissions. This credit is designed to cover a years' worth mileage using the following calculation: average van mileage of 20,623km²¹ at 0.2kWh/km²² equals an annual demand ~4,000kWh, assuming a price of 25p/kWh on the public charging network this gives a total cost of £1,000 per vehicle. This measure does not directly reduce negative impacts of the CAZ but instead encourages the switch to cleaner forms of transport (quantified in a later section), additionally, unlike the other measures, there are no eligibility criteria specifically targeting vehicles that enter the CAZ. As a result, BCC plan to limit the measure to drivers/fleets within the Birmingham area to limit the funding ask and ensure that the resulting clear air benefits are concentrated in Birmingham itself.

6.3 Delivery plan

The delivery plan for this mitigation is expected to be simple and any plug-in van registered to an address within Birmingham will be eligible for the scheme. Once the vehicle is purchased, the owner of the vehicle can apply for the award by providing details of the vehicle purchase, proof of registration address and proof of vehicle ownership. They will then be provided with a reference code to register with the EV network provider who will issue the credit amount to their account. This credit can then be used on Birmingham's public charging network. It is proposed that the funding be available until depleted, if funding remains after 3 years (January 2023) then the remaining amount will be returned to DEFRA.

6.4 State aid considerations

As in other measures, the funding award is below any State aid thresholds and so BCC does not anticipate issues in this respect. As part of receiving the award, the company in question will have to sign a declaration stating that the total amount of state aid received over a 3-year period does not exceed the threshold. The company selected as BCC's EV development partner may indirectly benefit from this funding as it is designed to boost electric vehicle usage as well as providing an incentive to use the public charging network. However, the EV development partner is being selected through an open tender process, and part of the requirements is to create a city-wide strategy to encourage EV uptake through collaboration with the council as well as demonstrating value for money. It is therefore expected that this measure will be covered in this strategy. The successful applicant must commit to ensuring State aid regulations are adhered to at every stage, and BCC are confident that this mitigation measure can be included as part of the development partners responsibility.

6.5 Value for Money

6.5.1 Quantified benefits

As described in 3, these benefits are quantified using an assumption that the funding made available will directly offset vehicle upgrade costs in a 1:1 ratio. However, when admin costs are included this reduced this ratio below 1. The total funding ask for M3 is £0.75 million, so using this methodology the scheme is providing £0.75 million of benefits to van fleet owners in Birmingham. When admin costs are considered, the total

²⁰ <https://equaindex.com/>

²¹ DfT Data Table TRA0201 Road Traffic by vehicle type & DfT Data Table Veh0102 - Licensed vehicles by body type Great Britain and United Kingdom

²² Nissan e-NV200 real world range estimated to be 200 km with 40kWh battery, $40/200 = 0.2\text{kWh/km}$.
<https://www.parkers.co.uk/vans-pickups/advice/2018/electric-van-guide/>

scheme cost is £0.84 million. When this is considered, for every £1 of funding allocated, £0.89 worth of benefits are received by van owners, this represents a negative VfM value of -£92,300.

However, the Council believe this is more than offset by the non-quantified benefits that will result from the measure.

6.5.2 Additional non-quantified benefits

- Reduction of emissions. Euro 6 vans have been shown to have real world emissions far exceeding legal limits (in some cases as high as 12 times the legal limit), encouraging the switch to ULEV vans will reduce emissions significantly and ensure the maximum possible benefit results from the forced upgrade of a company's van fleet.
- Supporting local businesses. As well as the assistance the fleet owner receives in upgrading their vehicle the measure will also benefit non-fleet owners. The majority of businesses within Birmingham use freight or delivery services in some form, by assisting van owners upgrade vehicle this measure also prevents CAZ charged being applied to deliveries and then passes on to the end consumer. This measure therefore provides economic benefits for a large range of local businesses.
- Encouraging use of the public charging network. Birmingham is in the process of procuring an EV infrastructure provider who will be responsible for installing rapid charge points across the city. However, utilisation of these charge points is one of the key investment risks for the successful company. By encouraging the use of public charging infrastructure, the measure provides more financial certainty for the development partner meaning they can be more ambitious in the rollout of public infrastructure. This in turn will encourage general uptake of plug in vehicles leading to the associated emissions and health benefits.
- Encourage the use of electric vehicles. Incentivising the early uptake of electric vehicles will increase awareness and assist the market in its earliest stages. The Council expects that once business experience the benefits of EVs first hand, this will have a positive impact on EV sales within the city. The use of electric vehicles by employees will also increase awareness of the technology in general, further encouraging uptake.
- Reduce operational costs for businesses. Electric vehicle running costs are significantly lower than for traditional vehicles, the savings that businesses achieve can be invested elsewhere promoting growth of local businesses. For self-employed van drivers, a reduction in running costs will lead directly to higher disposable income again boosting the local economy.
- Reduction in noise pollution.

6.6 Quantification of package

The level of uptake of this mitigation measure depends entirely on ULEV uptake within Birmingham. The UK e-van offer is limited, with only 8 OEM models on the Plug in Van Grant list (plus 2 conversions, which typically have quite a low driving range). The supply is expected to improve by 2020, with new UK models such as the LEVC range-extender van, as well as models currently available in Europe becoming available in right-hand drive version. For reference, there are over 30 e-van models for sales in Europe²³.

Element Energy has created an in-depth behavioural choice model to forecast the uptake of plug-in cars and vans in the UK market ([ECCo²⁴](#), a tool in use by the Department for Transport). The outputs of this model have been adjusted to Birmingham's van fleet with the assumption that the ratio of vans sales in Birmingham to the total stock of UK vans remains constant (DfT registration statistics suggest that currently 7% of the 2017 UK van sales were registered within Birmingham). The results show that, without financial support from the council, the number of BEV vans within Birmingham is expected to be around 1,250 in 2020 and will not reach 2,000 BEV vans until 2024. BCC wish is to bring this date forward to the early 2020's. ECCo was used to forecast the impact of a £1,000 reduction in running costs in the first year of purchase. It shows that when fleet drivers receive a £1,000 discount in their electricity costs in the first year, the target of 2,000 BEV vans is

²³Joint Research Centre: *Electric vehicles in Europe from 2010 to 2017: is full -scale commercialisation beginning? An overview of the evolution of electric vehicles in Europe*, 2018

²⁴ ECCo: http://www.element-energy.co.uk/sectors/low-carbon-transport/project-case-studies/#project_1

reached the start of 2023. To that effect, the Council is requesting a financial package to support 750 vehicles, which at £1,000 per vehicle equates to a total of £750,000.

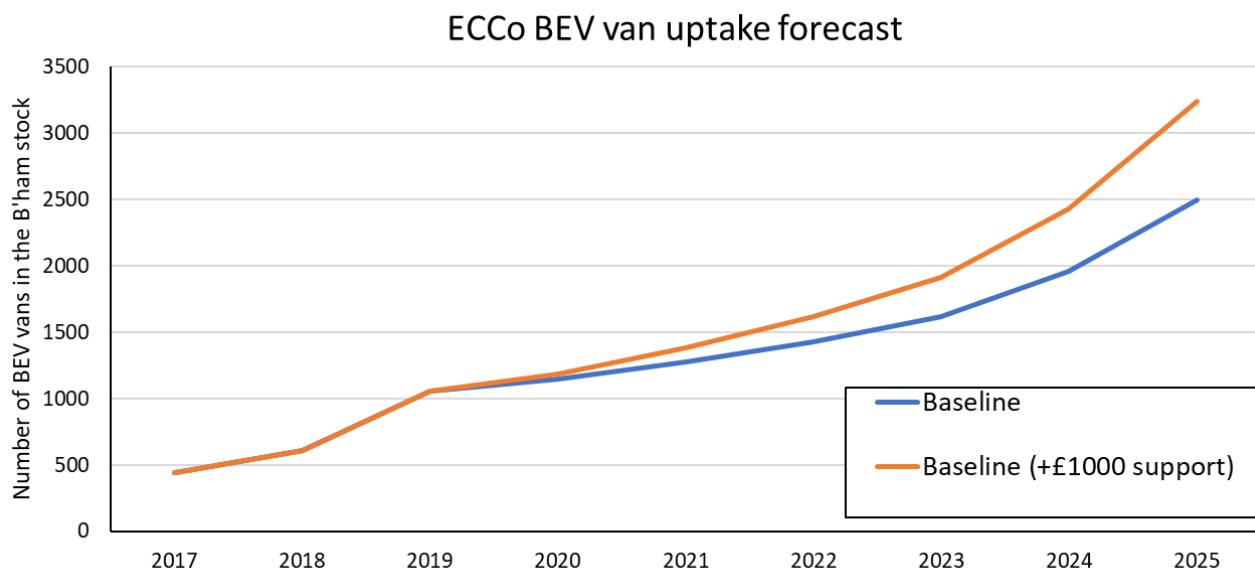


Figure 17 BEV van forecast comparing baseline uptake to a scenario where electricity costs are reduced by £1,000 in the first year of operation

7 M4: HGV & Coach compliance fund

7.1 Summary of distributional impact on group

The DIA report has identified HGVs and coaches as an area of concern for several reasons. The most pressing of these is the high capital costs involved with upgrading to a compliant vehicle which could prove unfeasible for small businesses who currently own non-compliant vehicles. Figure 18 shows the results of Element Energy's analysis of new Euro 6 vehicle prices and showcases the high capital cost facing businesses. Feedback from fleet managers within Jacobs 'Freight and Logistics report' showed that the majority of vehicle turnover cycles are between 5-7 years and most expect to reach compliance in the early 2020's with nearly all reaching compliance by 2025. The high vehicle costs involved mean that this vehicle turnover is a key part of the companies' financial plans and business model. For this reason, companies, especially SMEs, may find it difficult to adapt and bring compliant vehicles into their fleet in such a short timescale. This is especially true if their current business plan relies on purchasing older second-hand vehicles as the supply of second-hand compliant HGVs is limited. As well as limited supply, the prices of second-hand HGVs have risen sharply, feedback from the Leeds consultation reports that in some cases the price of second-hand compliant HGVs has increased three-fold since the governments CAZ plans have been introduced. SMEs are also more likely to have smaller more specialist fleets and so will be less likely to be able to re-route compared to larger fleets. The same problems also apply to non-scheduled coach fleets who also face similar high capital costs and a limited choice of vehicle options. In general, non-scheduled coaches are expected to be less affected by CAZ charges as a result of their general operations involving a higher proportion of long-distance intercity travel as opposed to HGVs which may exclusively operate in the city centre.

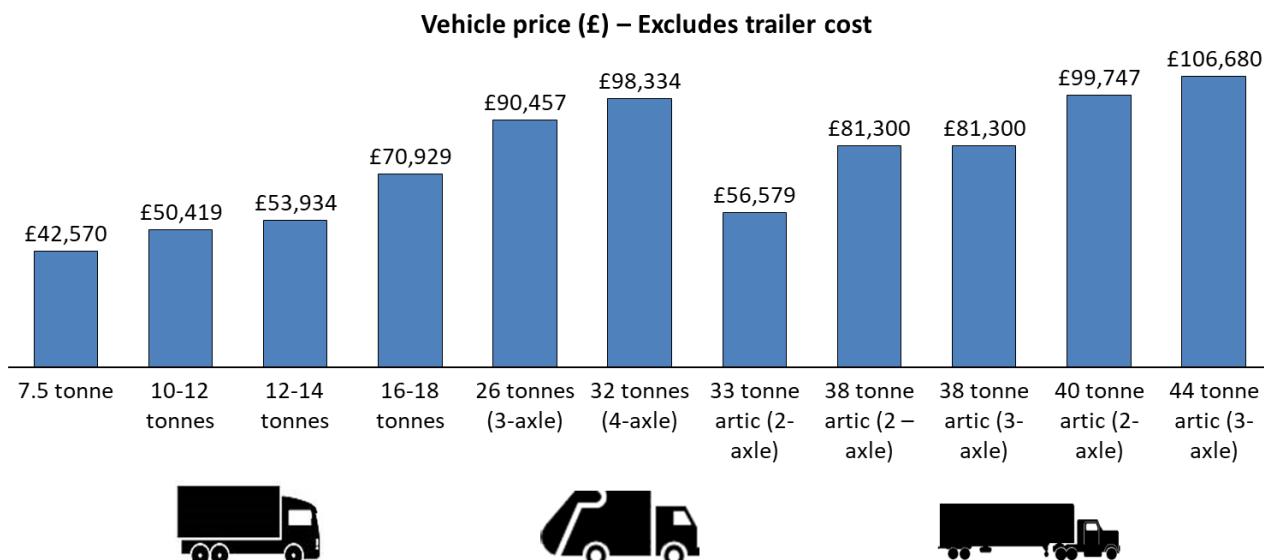


Figure 18 Diagram showing average costs of new Euro VI HGVs. Source: Element Energy analysis of HGV market

There will be fleets whose day to day operations will require them to regularly enter the CAZ but will not be able to afford to upgrade to a compliant vehicle in the timeframe set out. For these businesses paying the CAZ charge will be the only option, and the high costs associated with this could result in the profitability of business becoming questionable. BCC has received feedback from local businesses to this effect in the ongoing consultation, with 72% of businesses (90% of which were SMEs), out of a total of 384 organisations who partook in the survey, stating that the CAZ will create difficulties for businesses. For reference there are 395 businesses who are located in LSOAs within or bordering the CAZ²⁵. This conclusion is supported by an earlier freight and logistics report carried out by Jacobs²⁶, which states that the natural turnover of most fleets will occur in the early 2020's and that to upgrade prior to this will put financial burden on fleet owners.

7.2 Description of mitigation measure

To protect these businesses as well as the jobs they provide the residents of Birmingham and the wider West Midlands, BCC is requesting clean air funds to provide a funding pot to subsidise the transition of HGV and coach fleets to compliant vehicles. This funding is technology neutral and can be used towards retrofitting vehicles with compliant technology or alternatively towards the purchase or lease costs of a new or second-hand compliant vehicle. This method has been adopted as there is still uncertainty around retrofit technology for HGVs, especially considering the many different engine configurations found in HGVs. With this approach companies are still provided for, even if retrofit technology for their specific vehicle does not reach maturity in time. It is also in response to feedback that Leeds City Council received from fleets citing serious issues concerning retrofit technology for HGVs. These included:

- The technology is untried and untested
- Vehicles will be off the road for the time it takes to retrofit the vehicle
- The technology providers specify the servicing requirements are undertaken regular and exclusively through themselves. Fleets are concerned that these will be excessively expensive.
- The cost of the retrofit is very high in comparison to the cost of the vehicle.

By making the funding technology neutral it allows fleets to judge for themselves the most appropriate route to compliance and provides for fleets who own vehicles where no retrofit technology exists.

The funding from the CAF will be used to fund an open competition in which fleets bid for an award of £15,000. This amount is based on estimates from retrofit providers of a cost of around £13,000-£19,000 per vehicle, the funding will be capped at the cost to the company, either of the retrofit solution or compliant

²⁵ Nomis – Official Labour Market Statistics

²⁶ Jacobs: Clean Air Zone - Freight & Logistics, 2017

vehicle (i.e. a retrofit solution costing £13,000 will not receive the full £15,000 funding as it is higher than the cost technology, they will instead be awarded £13,000). If the funding is used towards a new or second-hand vehicle then the proportion of the cost that could be fulfilled by the award will vary depending on the cost of the vehicle that is purchased/leased. Companies will only be eligible for a maximum of 2 funding awards, and this will not distinguish parent companies, holding companies, sister companies etc. (i.e. a company group will be eligible for maximum 2 vehicles). An open competition format allows the measure to be extended beyond just Birmingham and BCC propose that it be open to any company with a fleet that is registered within the West Midlands and the selection criteria will be used to target those most impacted by the CAZ measures. This recognises that in some instances, fleets registered outside of Birmingham will regularly enter the CAZ and therefore be equally impacted as Birmingham vehicles. The competition selection criteria will be established as part of the scheme delivery plan, this will be handled by the Business Enterprise team within the Council who have significant experience in creating funding criteria which corresponds to the needs of business as well as being suited to a fair and transparent assessment process; for more information on the Business Enterprise team see Cast study 2. The funding criteria will ensure that the businesses in most need are targeted with the funding awards, this will consider the following information from companies:

- **The economic impact on the company of the CAZ charges.** This will consider the size of the company, the size of its HDV fleet, its ability to absorb the cost of transferring to a compliant vehicle (capital reserves), company financial information (profit loss, revenue etc.) and its ability to reroute/redistribute its fleet to avoid the CAZ (vehicle type and duty cycle, vehicle routes etc.).
- **Proof of financial stability.** It's vital that any financial support that is distributed go towards businesses which will continue to operate in Birmingham for the foreseeable future, as a result the council will require proof of financial stability. Company accounts will be requested for this purpose
- **Proof of operations within Birmingham.** This will require the company to provide evidence that the vehicle in question is in operation within Birmingham and in particular operating with the CAZ. There is a range of documents which can be supplied as evidence (e.g. service contracts, letter of support from clients, parking fees etc.), the Council will provide a list of acceptable documents and it will be the responsibility of the company to provide adequate evidence.
- **Additional plans of the company to become compliant.** This will take in to account the planned changes to a company's fleet outside the money requested from the open competition. For example, if a company is planning to retrofit additional vehicles from its own finances this will be viewed positively. This is in place to encourage behaviour change; however, the Council fully acknowledges that some of the most vulnerable businesses will be least able to afford to deliver additional compliant vehicles. It therefore will ensure that this is a secondary assessment criterion, the priority will be first and foremost to support vulnerable businesses.

The funding amount is expected to be sufficient to cover the majority of the cost of a retrofit installation, however for those where this is not possible, or where the business decides to purchase/lease a new vehicle, the amount offered is significantly less than the cost to upgrade vehicle. Similar to both M1 and M2, there has been concerns raised that this will present affordability issues for businesses, especially SMEs who will be less able to afford the high upfront capital costs. This is exacerbated by the high vehicle costs associated with HDV vehicles. Although recognising this as an issue, the Council does not propose to offer a higher funding amount as this would not represent good value for money. The competition format of the measure ensures that, through carefully designed scheme eligibility criteria, the Council will be able to target the funding at those that are most in need. For an SME, £15,000 is a significant contribution towards a vehicle upgrade. Offering a higher amount of funding would make the scheme expensive relative to other mitigation measures and ultimately result in less fleets being supported. The Council has therefore prioritised supporting the number of fleets which it has deemed are in need of support with a decent funding award amount rather than supporting fewer fleets with a larger funding amount.

7.3 Delivery plan

The implementation plan is broken down into 6 key delivery steps as shown in Figure 19 below.

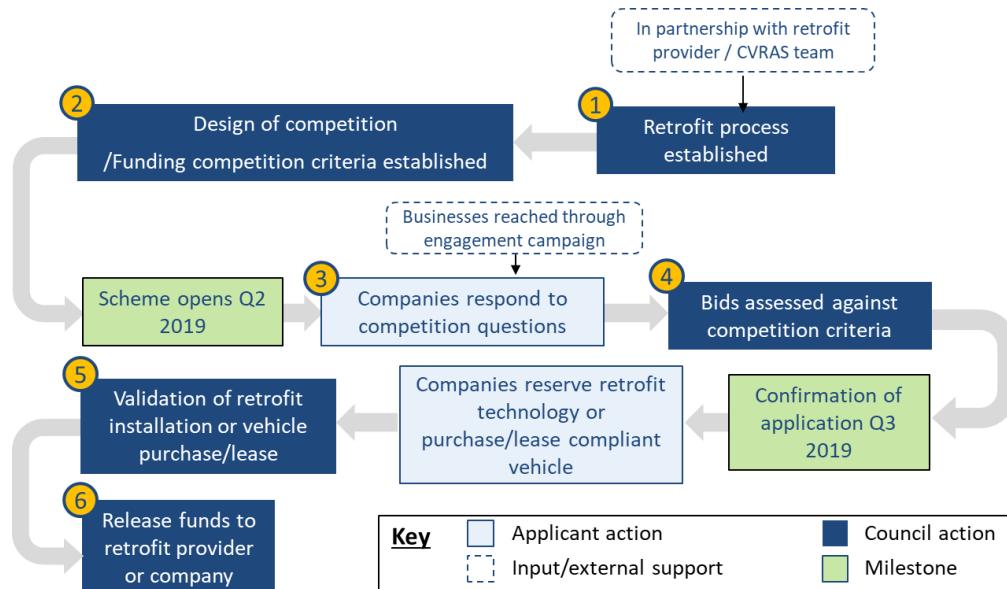


Figure 19 Delivery plan for HDV compliance fund mitigation measure

Before the measure is implemented it will be key to ensure that all fleets are aware of the funding on offer and the requirements in order to apply for the funding. This will integrate with the marketing and educational campaign described later and the aim will be to make contact with all fleets operating in the Birmingham area. This will ensure all eligible parties are aware of the funding on offer, and all interested fleets register their interest to enter the competition. They will also be asked to enter the number, engine and vehicle model/configuration of their non-compliant vehicles. This will allow BCC to build up a list of non-compliant vehicles that can be communicated to retrofit/repower technologies providers, helping them identifying the configurations for which it makes the most economic sense to develop solutions. The information passed would not identify the fleets in question to respect anonymity, unless fleets express an interest in being contacted by suppliers. This will be followed by the delivery of the mitigation measure:

- Establish the retrofit process:** This will involve reaching an agreement with retrofit providers that they are willing to be a partner in the scheme to offer retrofit solutions and receive part funding from the council. This is not anticipated to be difficult process, BCC have experience with this type of arrangement, conducting a similar scheme for retrofitting taxis in 2016/2017. There is also motivation for providers to cooperate as the scheme will boost demand for their services.
- Competition design:** A key aim when designing the specification will be to make the assessment process as simple as possible, as such, non-qualitative question types will be prioritised. It is expected that this will be aided by the Business Enterprise team who have experience in writing and designing funding assessments.
- Response to applications:** Once the application document is finalised it will be distributed to fleets who expressed interest and a deadline will be set for the response submissions. There are two options by which this could be implemented;
 - BCC's tender portal used for the council's public contract tenders
 - The permit application software (described in Section 5.0 of the FBC) which allows applicants to upload documents and respond to questions
- Assessment of applications:** This is likely to be around 2 months in duration where the bids will be assessed against the criteria set out in the specification. It is suggested that BCC's Business Enterprise department are responsible for the delivery of this project, they have significant experience of delivering projects of this magnitude and some examples of successful implementation is shown in the case study at the end of the chapter. They have significant experience in allocating funding to businesses in the Birmingham area to support them in their growth (e.g. relocating, training and capital cost assistance) and have to date distributed £40 million to over 500 local businesses. Part of this process is a detailed assessment of each applicant, including the financial viability of their funding

ask. This experience has good synergies with work required to implement the HDV compliance fund, and many of the required process have already been established in their prior experience.

5. **Validation of retrofit or vehicle purchase/lease:** If the retrofit option is selected this will be an automatic process between the council and the technology provider. If the company decides to purchase/ lease a compliant vehicle then it will be a simple process of providing evidence in the form of
 - a. a sales receipt (or certification of destruction) of the replaced vehicle.
 - b. registration details of the newly purchased/leased vehicle.

6. Funds are released to retrofit provider or business

If retrofit technology does not reach maturity in time for the implementation date of the CAZ a successful funding applicant who opted for the retrofit option has 3 options:

1. Use the funding award to instead contribute towards the capital/lease costs of a compliant new or second-hand vehicle
2. Wait for a retrofit solution to come to market, this is permissible as the funding award will be designed to have an expiration date of January 2021 (as described below). If a retrofit solution does not come to market in this time period, the company in question can revert to option 1.
3. If the retrofit solution does not reach market maturity and the company does not want to use the funding towards a compliant vehicle (option 1), then the funding will return to the funding pool and the highest-ranking unsuccessful applicants will be contacted and awarded the funding.

There is potential for interested fleets to also be eligible for an exemption if the vehicles are registered within the CAZ or there is a pre-existing finance agreement in place (see section 2.3). BCC proposes that the funding be awarded with an expiration date of October 2020 and the retrofit technology or the purchase/lease of a compliant vehicle be allowed to be implemented at any point in this time frame. This allows those eligible for an exemption to be able to continue to operate their vehicle until the end of the sunset period at which point they can utilise the funding to transfer to a compliant vehicle. The time between the deadline for the funding application (October 2019) and the end of the exemption period (January 2020) will be used to ensure a timely delivery of the award and will also allow time for an operator on the reserve list to receive the award if an original awardee decides not to proceed. The full implementation plan, including the delivery steps detailed above, is set out below in Figure 20.

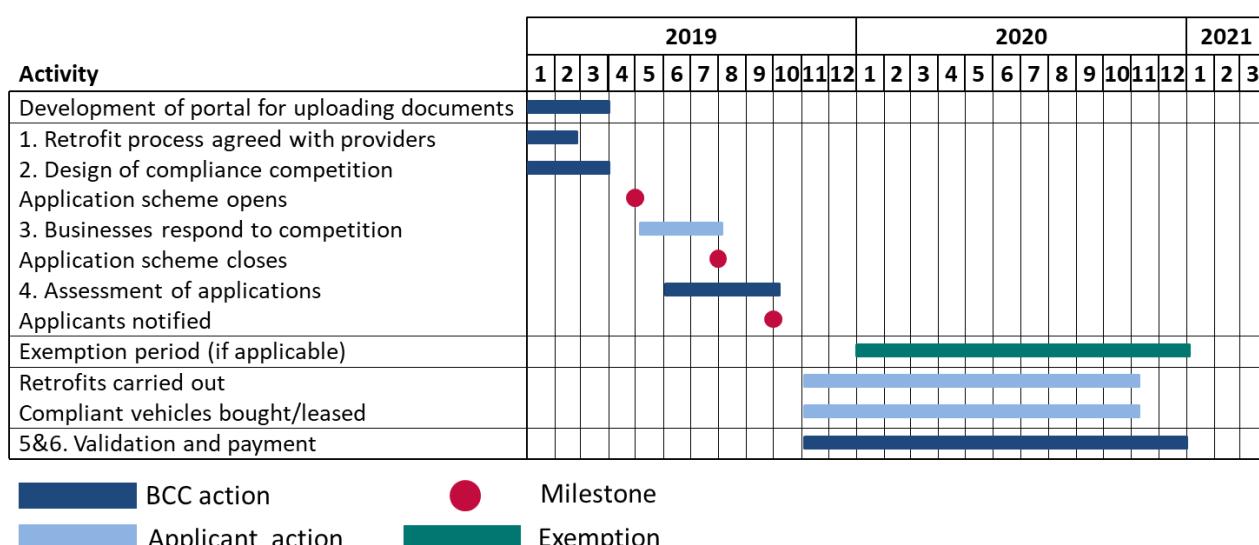


Figure 20 Proposed delivery plan for the HGV compliance fund mitigation measure

Case study 2: Business Enterprise team

The Business enterprise team have a track record of delivering projects of scale which allocate funding to SMEs in the West Midlands area. Below are a few relevant examples of successful projects all of which gives confidence in their ability to deliver the measure effectively.

Green Bridge Supply Chain Programme (GBSCP), 2012 – 2015

- Funding scheme offering SME supply chain companies operating in the green economy funding awards of £20,000 - £1,000,000.
- Received 1,600 enquiries and 611 applications resulting in 380 approved and funded projects
- Total funding amount was £75 million matched by £100 million of private investment.

Business Innovation Programme (BIP), 2012 – 2015

- Offered funding of £10,000 - £20,000 to SME's investing in innovative products
- Total funding amount of £9 million with a further £5.3 million generated from the private sector
- 166 companies supported resulting in 267 additional jobs and a total £52 million to be generated by 2020

Business Development Programme (BDP) 2012 – 2015

- Offered £10,000 - £20,000 of funding to SME's to assist in expanding operations, relocating or improving access to new markets
- Total funding amount of £8 million, which supported 390 SME's and created 455 new jobs
- Generated £65 million of Gross Added Value in 2014, this is expected to reach £73 million by 2020

Consistent in all funding programs run through the Business Enterprise team:

- On-line application systems including extensive application information
- Legal, financial and project assessment of each application in line with all relevant regulations
- Investment panel to review and discuss applications as well as recommend funding approval
- Close follow up to ensure money awarded is spent in line with funding guidelines.

7.4 State aid considerations

BCC will ensure that the HGV funding competition is designed to be in full compliance with State aid rules. As the funding award is below the threshold limit for aid to freight and road transport organisations, as well as the fact that fleet managers will have full choice on the path to compliance that they choose to pursue, state aid issues are not anticipated to arise. Additionally, recipients of the award will be required to sign a document declaring that the total amount of financial benefit received from the government within the last 3 years is within state aid limits. A similar process was implemented during BCC's LPG retrofit trial with Hackney carriage drivers. BCC will seek legal advice during the entire process to ensure State aid regulations are adhered to at every stage.

7.5 Value for Money

7.5.1 Quantified benefits

As described in 3, these benefits are quantified using an assumption that the funding made available will directly offset vehicle upgrade costs in a 1:1 ratio. However, when administrative costs are included this

reduced this ratio below 1. The total funding ask for M4 is £10.05 million, so using this methodology the scheme is providing £10.05 million of benefits to HDV fleet owners in the West Midlands. When admin costs are considered, the total scheme cost is £10.29 million. When this is considered, for every £1 of funding allocated, £0.98 worth of benefits are received by HDV fleets, this represents a negative VfM value of -£242,613.

However, the Council believe this is more than offset by the non-quantified benefits that will result from the measure.

7.5.2 Additional non-quantified benefits

- Improving air quality. Unlike vans, the real-world emissions of HGVs have been shown to be under the legal Euro standard limits. Therefore, by assisting businesses to upgrade to CAZ compliant vehicles this will have a meaningful impact on emissions within the CAZ and contribute to Birmingham reaching compliance in the shortest possible time.
- Protecting local businesses. The DIA has identified the financial burden that businesses will face as a result of the CAZ. The CAZ charges will put significant strain on the operational profitability of a business and upgrading vehicle involves large capital costs, out of reach to many small businesses. Combined this puts business, especially small businesses, at financial risk. If these businesses were to fail as a result of the CAZ it would have large ramifications on the local economy resulting in a loss of local jobs and the stunting of economic growth within Birmingham. This measure protects these businesses and ensures they can continue to operate therefore preventing any possible negative economic consequences. It also protects local jobs and prevents the replacement of these services from larger national fleets which have the advantage of a newer and compliant vehicle fleet.
- Protecting local services. The businesses that are most at risk are small highly specialist fleets as they are totally reliant on the use of their vehicle, but their specialist nature make the capital costs of upgrading often very high. They are also limited in their options as it is less likely that a retrofit solution will be developed for low volume vehicles such as these. A lot of these specialist vehicles carry out vital services (e.g. rubbish collection, construction vehicles, cranes etc.), if these fleets were no longer able to operate due to affordability issue this would put these services at risk.
- Reducing costs for business and individuals. If non-compliant fleets are unable to upgrade for financial reasons and therefore forced to pay the CAZ charges to continue operating, they are likely to pass at least part of these cost on to the end consumer. For HGVs, this is likely to be other businesses, the majority of which are SMEs within Birmingham. For coaches, the increased cost will be passed on to the public, especially low-income individuals who are more likely to be traveling via coach. This measure prevents these potential price increases and provides economic stimulus to the local area.

7.6 Quantification of scheme

The number of HGVs that are expected to require this financial assistance is based upon Element Energy's analysis of the governments fleet registration service as well as ANPR data showing the current levels of non-compliant HGVs entering the CAZ as well as the frequency of entry.

ANPR data shows that in single week, 2,855 unique non-compliant HGVs are expected to enter the CAZ if no additional measures are considered (i.e. no CAZ D is introduced). Of these, the behavioural modelling suggests that 29% will be able to re-route their operations and avoid the zone which leaves 2,027 vehicles which must upgrade or pay the CAZ charge. It is possible that as a result of the funding included in the mitigation measure a smaller proportion of vehicles will decide to re-route their operations and instead prefer to upgrade. It has not been possible to model this impact. However, this is estimated that these cases would be rare as

- There is an administrative burden with entering the competition
- The fund would not cover all the replacement cost (and some of the retrofit cost not covered , i.e. vehicle off road for 1-2 weeks)

Meaning companies should prefer to re-route if they have the option. Furthermore, the number of awards is set before the start of the competition, limiting the overall impact to a set amount.

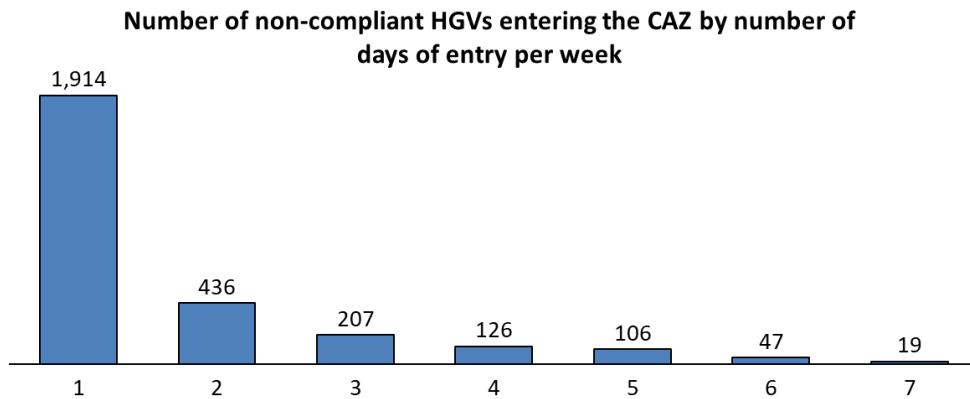


Figure 21 Number of non-compliant HGVs entering the CAZ by frequency of entry (days entered per week)

As shown in the distributional analysis report, upgrading to a new vehicle or to a lesser extent installing retrofit technology is only cost effective if the vehicle enters the CAZ a sufficient number of times per week. Fleet analysis by Element Energy suggests that only vehicles entering the CAZ more than once a week will see upgrading to compliant vehicle or fitting retrofit technology as an economically advantageous solution. To put this into context, a vehicle entering the CAZ once a week, using currently proposed CAZ charges of £50/day, will pay £2,600 a year in CAZ charges. This compares favourably with the upgrade costs of bringing a compliant vehicle into the fleet and also of the retrofit solution (HGV retrofit is estimated to cost ~£19,000 leaving a £4,000 surplus after the funding award is considered), this is before accounting for the inconvenience and lost revenue when the vehicle is off the road during installation. As most fleets expect to reach compliance through natural vehicle turnover in the early 2020s²⁷, this suggests that those who only enter once a week would be likely to prefer to pay the CAZ charges and replace their vehicle in line with normal procedures.

The duty cycle of the vehicles, especially the expected frequency of entry, will also be an important marking criterion in the competition for the funding award as this directly relates to the financial impacts of the CAZ on the company. For these reasons it is assumed that only companies with vehicles entering the CAZ more than once a week will apply, or be eligible to apply, to receive the funding award amount. ANPR data shows only 33% of non-compliant vehicle entering the CAZ do so more than one day a week (see Figure 21), when this is applied to the 2,027 vehicles mentioned above this results in a total of 669 vehicles estimated to be in need of this funding. Considering the above factors, BCC believes funding provision should be made for 670 vehicles. If £15,000 is provided to each vehicle, it results in a total scheme cost of £10.05 million. ANPR data does not distinguish coaches from buses so the number of non-compliant coaches currently entering the CAZ is unknown. However, government registration data shows that only 4 fleets are registered in the CAZ. This suggests that the number of coach fleets requiring the funding will be small in comparison to HGV fleets.

The 670 vehicles that will be offered funding are only a small proportion of total HGV/coaches operating in Birmingham and the wider West Midlands. Evidence from Element Energy's analysis of government licencing statistics shows that there are 1,973 companies operating a total of 19,918 HGVs registered in Birmingham. When expanded to the West Midlands, the data shows that 3,023 companies operate 27,058 HGVs registered in the West Midlands. The number of coach fleets is significantly smaller (Birmingham: 247 companies operating 1,208 vehicles, West Midlands: 294 operating 8768 vehicles). Figure 22 shows the position of HGV fleets in the West Midlands and within the provisional CAZ area.

²⁷ Jacobs: Clean Air Zone - Freight & Logistics, 2017

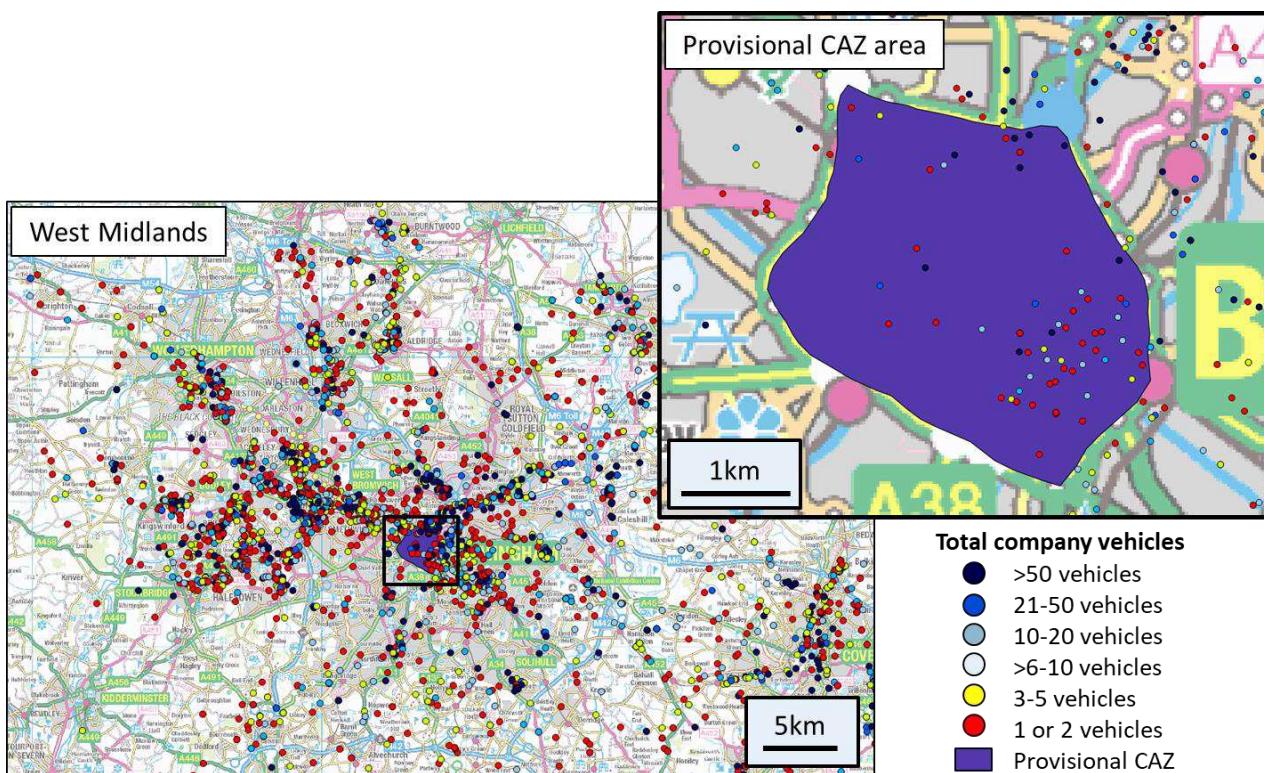


Figure 22 Map of the West Midlands showing the HGV fleet locations by the total number of vehicles owned by the company

8 M5: Marketing and engagement campaign

8.1 Summary of distributional impact

The distributional impact has identified low income residents, Hackney carriage drivers and SMEs which rely on HGV/LGVs for their day to day operations as some of the groups who are particularly vulnerable to the CAZ introduction. The mitigation measures are designed to address the negative impacts on these groups. However, a key factor determining the success of these measures will be ensuring that the relevant groups have full access to information regarding the measures and are aware of their various options relating to reaching compliance. This will be especially important for hard to reach groups which would most likely include low income residents and some smaller SMEs, especially as these are the groups most likely to be negatively impacted by the CAZ.

8.2 Description of mitigation measure

BCC is proposing a marketing and engagement campaign targeting all key groups, especially those who are covered by the 6 other mitigation measures included in the shortlist. The key priorities are to:

- Outline the CAZ measures and describe in detail how each group will potentially be affected by this. This will ensure that each group is made fully aware of the impact that the CAZ measures will have on their individual operations and allow them to judge their best course of action in response.
- Outline the options that each group have to reach compliance. This is important to ensure that individuals/businesses are aware of all compliant technologies and can objectively assess them against their individual needs. It also gives individuals/businesses knowledge of the widest range of options and support available to them. An example of this could be a regularly updated list of the available ULEV LGVs on the market with the prices and specification for each. This would enable individuals/businesses to make a comparison of the total cost of ownership for new Euro 6 LGVs available to them. Vehicles prioritised will be taxis (both Hackney carriages and private hire vehicles), LGVs and HGVs.
- Describe different schemes and initiatives available to help individuals/businesses reach compliance to ensure full awareness of the total costs when incentive schemes and additional measures are

accounted for. This also provides a platform for the council to promote the mitigation measures that have been put in place, who is eligible for each scheme and the process of applying to each. This point is especially important to target harder to reach groups who the Council may find it difficult to make contact with through traditional channels.

- Provide details and maps of refuelling/recharging sites, along with the necessary technical info (e.g. dispensing pressure, opening hours etc.)

The aim is to develop and implement an overarching marketing and engagement campaign incorporating an accessible and easy to understand webpage, a targeted social media campaign and visible city-wide advertising. This will be delivered under the umbrella of the council's Brum Breathes and Business Breathes campaigns.

8.3 Delivery plan

This campaign will be promoted through the Birmingham Connected Business Travel Network, which has an established stakeholder database and works in conjunction with the council's Business Development Team to ensure that a wide range of individuals and organisations are reached. The Business Travel Network has an existing strand around fleet and freight, and this campaign will increase and complement the tools and resources already available through this. The Birmingham Connected team regularly engages with businesses and organisations across the city through email updates, stakeholder briefings and providing support with travel planning. This campaign will be integrated into these services and activities.

BCC has already secured €100,000 through the TRIS project²⁸, to develop a brand, a website targeting businesses and a 3-month social media campaign. Following a competitive tender, a consortium made of Clever Cherry and Element Energy has been selected. Clever Cherry is a communication company, they are in charge of the branding and marketing strategy development. They are supported in writing up the relevant webpage content by Element Energy who have been responsible for the fleet analysis behind the distributional impact analysis as well as the designing and quantification of the mitigation measures described here. The campaign is planned to launch in January 2019 and continue until 31st December 2019 (although the website license allows it to be maintained until September 2020). During this time Birmingham will regularly update content with news items and developments relating to the CAZ or any of the mitigation measures.

CAF funding would be needed to:

- Extend the campaign to December 2021 (website updates, social media) and to private vehicle users
- Increase travel planning support to businesses/SMEs most likely to be negatively impacted by the CAZ through the Birmingham Connected Business Travel Network.
- Enable engagement with other key groups within the CAZ, including low-income residents, community groups, places of worship and educational establishments to promote mitigations available to them.

8.4 State aid considerations

Clever Cherry and Element Energy have been awarded a previous contract to carry out relevant aspects of the Business Breathes campaign. This was an open competition which followed state aid guidance. This contract could be extended for continuity (in line with BCC procurement rules), or a new tender could be held for the extension and future delivery from October 2020.

The Brum Breathes campaign is run by the Council's team so there are no State aid issues.

8.5 Value for Money

Unlike the other mitigation measures there is no direct benefit that can be quantified from the engagement campaign. However, it results in significant indirect benefits and most importantly improves the value for money for all other measures by maximising the impact that each has on its target group. The value for money is therefore assessed through the effectiveness of the campaign relative to its goal of reaching all individuals and business who are impacted by the CAZ.

²⁸ Transition Regions towards Industrial Symbiosis <https://www.interregeurope.eu/tris/>

Table 9 below demonstrates the value for money of this measure by outlining the estimated reach relative to the cost of the measure as well as details of the groups that will be targeted and the previous experience the Council has in delivering similar measures. In summary, this illustrates that the measure represents good value for money in line with previous campaigns, and that the Council has a proven track record of effective engagement and impact from using this approach in the past.

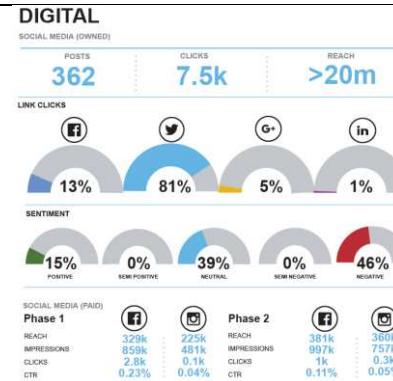
Additional value for money is achieved as the physical advertising included in the implementation budget has been negotiated at a reduced price (£50,000 per year, normally £80,000). This will enable clear advertising messages and signage to be placed at key locations, e.g. near to Tyseley Energy Park and to further help engagement of local businesses and individuals.

Table 9 Detail of engagement campaigns items outlining the value for money for the main cost items

Item	Reach	Cost per reach	Detail	Previous experience
£57,500 to extend the Business Breathes campaign	This relates to the Business Breathes website and campaign that will launch in January 2020. It will reach >10,000 businesses, thanks to the social campaign, outdoor campaign and publicity from industry bodies (FTA, RHA, BVRLA, CPT, FSB)	<£50 per business	<p>This covers:</p> <ul style="list-style-type: none"> • £10,000 for PR support, to be spread out across this campaign as required. • £7,500 social media campaign • £40,000 for website account management, content development, social media campaign and hosting fees. This is already funded to September 2020 and will enable for this to continue over the remaining campaign period. 	<p>Clever Cherry is communication company with a solid track record of successful campaigns.</p> <p>A good example of the excellent service that this measure will deliver is the feedback received from industry from a recent consultation (21/11/2018) regarding the 'Business Breathes' campaign. This included representatives from the Federation of Small Businesses, Corporation of Passenger Transport, British Vehicle Rental and Leasing Association, Road Haulage Association and the Freight Transport Association. Examples of the feedback received are listed below:</p> <ul style="list-style-type: none"> • "I wish all CAZ cities had this, can you add other cities?" • "This is the best and most advanced (CAZ communication campaign) I've seen" • "Very clear layout and very comprehensive content" • "Very pleased about this initiative, we know from our members that they desperately need something like this" • "Many small businesses don't know about the CAZ and their options, the

				<ul style="list-style-type: none"> “The refuelling map will be of use to fleets all over the UK so this is great” “Birmingham is very lucky to have something like this” <p>This quality of service will be present throughout the entire engagement campaign ensuring the maximum benefit is achieved from the funding awarded from the CAF.</p>
£150,000 for business engagement over 3 years from 2019. This will be provided through the Birmingham Connected Business Travel Network and will focus on businesses most affected by the CAZ, especially SMEs. It will ensure dedicated resource is available for the promotion of the forthcoming Business Breathes campaign and support access of this.	<p>125 business directly engaged</p> <p>55 bronze accreditations</p> <p>20 silver accreditations</p> <p>Access to 1,200+ direct stakeholder network</p>	<p>Intensive support:</p> <ul style="list-style-type: none"> • £400 per business supported to sign up only • £800 per business supported through to bronze • £1,400 per business supported through to silver <p>Light touch and wider engagement:</p> <ul style="list-style-type: none"> • £16 per business per year 	<p>This cost covers 0.6 of a post to:</p> <ul style="list-style-type: none"> • engage with businesses on clean air and sustainable travel • help them to use the online travel planning tool STARSfor • help them to engage their staff in travel planning initiatives • ensure that they know how to access relevant additional CAZ mitigations. <p>Initially, the focus will be on STARSfor sign up and CAZ awareness raising activity; in later phases focus will shift to completion of travel plan initiatives and STARSfor accreditation (bronze, silver, gold).</p> <p>Year 1:</p> <ul style="list-style-type: none"> • sign up 70 businesses (approx. 1 day of contact time per business) • remaining 53 days for planning, outreach and ‘light touch’ support to businesses less affected by CAZ. <p>Year 2:</p> <ul style="list-style-type: none"> • sign up 35 businesses (1-day contact time) 	<p>Since development of the Business Travel Network offer, the Transport Behaviour Change team have developed a ‘light touch’ offer available to all businesses across the city and provided intensive support to identified stakeholders where resources have been available.</p> <p>This core offer comprises:</p> <ul style="list-style-type: none"> • Regular stakeholder emails from Birmingham Connected, containing relevant transport, resilience and behaviour change information. • Online and social media information from Birmingham Connected, again containing relevant transport, resilience and behaviour change information. • Free access to STARSfor plus online library of ‘how to’ resources and travel planning guidance. <p>In addition, the team has cultivated strong relationships with key stakeholders who can further disseminate and champion information, such as BIDs, Chamber of</p>

			<ul style="list-style-type: none"> • achieve 35 bronze accreditations (1-day contact time) • remaining 53 days for planning, outreach and 'light touch' support to businesses less affected by CAZ. <p>Year 3:</p> <ul style="list-style-type: none"> • sign up 20 businesses (1-day contact time) • achieve 20 bronze accreditations (1-day contact time). • achieve 20 silver accreditations (1.5-day contact time). • remaining 53 days for planning, outreach and 'light touch' support to businesses less affected by CAZ. 	Commerce, larger employers and larger trip attractors. Current direct reach of approximately 1,200 email addresses, but indirect reach much larger via wider networks.
£35,000 for stakeholder events, including additional sessions organised to raise awareness of mitigation measures in advance of the CAZ being introduced. This approach was very well received during the CAZ consultation and there is an expectation that it will continue.	350 businesses	£100 per business	<p>An estimated 14 events (8 in year 1, 4 in year 2, 2 in year 3) for approximately 60 delegates each. Allowing for repeat attendance, estimate 350 businesses represented.</p> <p>This will be aligned with any other work packages around CAZ (e.g. application process for mitigation measures), to raise awareness and increase understanding of how this programme is being implemented and ensure a high level of attendance.</p>	During the Clean Air Zone consultation, three main business/stakeholder events were held with attendance by 164 delegates from about 120 organisations.
£7,500 for social media support, to complement the above using established accounts already delivered by Birmingham City Council and Birmingham Connected.	Approximately 5k followers specifically interested in transport issues. Boosted to over £150k via BCC corporate	£0.10 per person following.	<p>Last 28 days:</p> <p>Birmingham Connected Facebook:</p> <ul style="list-style-type: none"> • 262 total followers • 6,393 reach • 1,882 post engagements <p>Birmingham Cycle Revolution Facebook:</p> <ul style="list-style-type: none"> • 2,347 total followers 	Report of BCC corporate social media during CAZ consultation:

	<p>channels.</p> <p>Further boosted by combined reach.</p>	<ul style="list-style-type: none"> • 1,818 reach • 256 post engagements <p>Birmingham City Council Facebook:</p> <ul style="list-style-type: none"> • 15,757 total followers <p>Birmingham Connected Twitter:</p> <ul style="list-style-type: none"> • 2,110 total followers • 80,200 tweet impressions <p>Birmingham Cycle Revolution Twitter:</p> <ul style="list-style-type: none"> • 2,142 total followers • 25,300 tweet impressions <p>Birmingham 20mph Twitter:</p> <ul style="list-style-type: none"> • 1,290 total followers • 51,500 tweet impressions <p>Birmingham City Council Twitter:</p> <ul style="list-style-type: none"> • 149,829 total followers 	 <table border="1"> <thead> <tr> <th colspan="2">SOCIAL MEDIA (OWNED)</th> </tr> </thead> <tbody> <tr> <td>POSTS</td> <td>362</td> </tr> <tr> <td>CLICKS</td> <td>7.5k</td> </tr> <tr> <td>REACH</td> <td>>20m</td> </tr> <tr> <td colspan="2">LINK CLICKS</td> </tr> <tr> <td>(F)</td> <td>13%</td> </tr> <tr> <td>(T)</td> <td>81%</td> </tr> <tr> <td>(G)</td> <td>5%</td> </tr> <tr> <td>(In)</td> <td>1%</td> </tr> <tr> <td colspan="2">SENTIMENT</td> </tr> <tr> <td>POSITIVE</td> <td>15%</td> </tr> <tr> <td>SEMI POSITIVE</td> <td>0%</td> </tr> <tr> <td>NEUTRAL</td> <td>39%</td> </tr> <tr> <td>SEMI NEGATIVE</td> <td>0%</td> </tr> <tr> <td>Negative</td> <td>46%</td> </tr> <tr> <td colspan="2">SOCIAL MEDIA (PAID)</td> </tr> <tr> <td colspan="2">Phase 1</td> </tr> <tr> <td>REACH</td> <td>52.8k</td> </tr> <tr> <td>IMPRESSIONS</td> <td>85.8k</td> </tr> <tr> <td>CLICKS</td> <td>2.8k</td> </tr> <tr> <td>CTR</td> <td>0.23%</td> </tr> <tr> <td colspan="2">Phase 2</td> </tr> <tr> <td>REACH</td> <td>22.5k</td> </tr> <tr> <td>IMPRESSIONS</td> <td>48.1k</td> </tr> <tr> <td>CLICKS</td> <td>0.1k</td> </tr> <tr> <td>CTR</td> <td>0.04%</td> </tr> </tbody> </table>	SOCIAL MEDIA (OWNED)		POSTS	362	CLICKS	7.5k	REACH	>20m	LINK CLICKS		(F)	13%	(T)	81%	(G)	5%	(In)	1%	SENTIMENT		POSITIVE	15%	SEMI POSITIVE	0%	NEUTRAL	39%	SEMI NEGATIVE	0%	Negative	46%	SOCIAL MEDIA (PAID)		Phase 1		REACH	52.8k	IMPRESSIONS	85.8k	CLICKS	2.8k	CTR	0.23%	Phase 2		REACH	22.5k	IMPRESSIONS	48.1k	CLICKS	0.1k	CTR	0.04%
SOCIAL MEDIA (OWNED)																																																							
POSTS	362																																																						
CLICKS	7.5k																																																						
REACH	>20m																																																						
LINK CLICKS																																																							
(F)	13%																																																						
(T)	81%																																																						
(G)	5%																																																						
(In)	1%																																																						
SENTIMENT																																																							
POSITIVE	15%																																																						
SEMI POSITIVE	0%																																																						
NEUTRAL	39%																																																						
SEMI NEGATIVE	0%																																																						
Negative	46%																																																						
SOCIAL MEDIA (PAID)																																																							
Phase 1																																																							
REACH	52.8k																																																						
IMPRESSIONS	85.8k																																																						
CLICKS	2.8k																																																						
CTR	0.23%																																																						
Phase 2																																																							
REACH	22.5k																																																						
IMPRESSIONS	48.1k																																																						
CLICKS	0.1k																																																						
CTR	0.04%																																																						
£60,000 for community engagement over 3 years from 2019. This will be provided through the Birmingham Connected team in conjunction with colleagues from Public Health and Communications. It will ensure dedicated resource is available for promotion of mitigation measures to key audiences such as low-income residents, community groups and	<p>30 community groups engaged (intensive support)</p> <p>150 Clean Air champions recruited, trained and supported to deliver activities</p> <p>Access to 1,000+ community groups through BVSC and other networks</p>	<p>This cost covers 0.25 of a post to:</p> <ul style="list-style-type: none"> • engage with community groups on clean air and sustainable travel • ensure that they know how to access relevant additional CAZ mitigations • help them to access available resources, such as 'No Idling' toolkit and air quality monitoring kits for community use • help them to engage their volunteers and service users in. <p>Main focus will be on community organisations located within or in close proximity to the CAZ, to raise awareness of the impact of this on them and detail support available.</p>	<p>The Transport Behaviour Change team has an established record of engaging with and supporting community groups in their work promoting sustainable travel options.</p> <p>They have strong relationships with charities and third sector organisations who are well placed to support this agenda, such as London Sustainability Exchange, Climate Action Network West Midlands, Friends of the Earth Birmingham, Clean Air Parents Network, and British Lung Foundation.</p> <p>Community engagement activity has already taken place as part of the CAZ consultation and through an air quality monitoring pilot.</p> <p>In addition, the team have supported a wide range of community groups to take action</p>																																																				

places of worship.				through the 20mph Slower is Safer campaign and delivered cycling activities through Big Birmingham Bikes and Women on Wheels.
£45,000 for community events and other activities, including equipment for air quality monitoring by some of these groups to aid engagement. Previous experience suggests that an outreach approach where we look to co-produce events and activities is the most effective way of engaging with and disseminating messages to communities, and harder to reach groups in particular.	180 info stands provided to community events/settings 30 training sessions delivered 30 community groups involved in air quality monitoring 3 celebration events organised		Information stands with detail on the introduction and implementation of the CAZ, mitigations and exemptions, and alternative travel options will be provided as part of a Clean Air Roadshow. An estimated 180 sessions (90 in year 1, 60 in year 2, 30 in year 3) will be arranged. This will be aligned with any other work packages around CAZ (e.g. application process for mitigation measures), to raise awareness and increase understanding of how this programme is being implemented and ensure a high level of attendance. Further sessions will be arranged to train up Clean Air Champions and support them to undertake activities, such as 'No Idling' campaigns and air quality monitoring	See above
£30,000 for engagement with educational establishments (schools & colleges) in and near to the CAZ over 3 years from 2019. This will be provided by the School Travel team as part of the existing Modeshift STARS initiative (including national accreditation).	90 schools trained to use Clean Air Cops resources over three years. 14,040 pupils reached.	£333 per school £2.14 per pupil	Two events per schools term: <ul style="list-style-type: none"> • half day event to train teachers (10-12 schools) to use the Clean Air Cops resource • half day celebration event rewarding schools for progress on travel plan initiatives <p>Calculations below assume average 60 year 5 children per school per year.</p> <p>Year 1:</p> <ul style="list-style-type: none"> • Train 30 new school, give out 1800 books • Give 1080 books to 18 school previously 	This work sits in the context of the Transport Behaviour Change team's ongoing engagement with schools using the Modeshift STARS travel planning tool (200 schools signed up to date). All LA schools receive information on travel and clean air via regular postings on schools noticeboard. In the last 8 months, 18 schools have been trained and received Clean Air Cops books for pupils in year 5.

		<p>trained.</p> <p>Year 2:</p> <ul style="list-style-type: none">• Train 30 new school, give out 1800 books• Give 2880 books to 48 school previously trained. <p>Year 3:</p> <ul style="list-style-type: none">• Train 30 new school, give out 1800 books• Give 4680 books to 78 school previously trained. <p>Total books needed (equates to pupils reached) for project approx. 14,040. Cost to print approx. £4,500.</p> <p>Remaining £25,500 to run events, approx.:</p> <ul style="list-style-type: none">• £1,000 per training event• £1,800 per celebration event.	
--	--	--	--

8.6 Quantification

In terms of number of stakeholders that Birmingham aim to reach through this campaign, the target is to make information available to every individual or business that is impacted by the CAZ. That is to say, every individual and business within the West Midlands that owns a non-compliant vehicle and travels into the CAZ forms the target audience for this campaign.

For the delivery of this measure it is estimated that £380,000 will be required. This has calculated from the additional level of engagement that will be required with key audiences, and is based on quotes already received:

- £40,000 for the Business Breathes website account management, content development and hosting fees. This is already funded to September 2020 and will enable for this to continue over the remaining campaign period.
- £10,000 for PR support, to be spread out the Business Breathes campaign as required.
- £15,000 for social media support [£7,500 for the Business Breathes that is launching in January 2020 and £7,500 for the Brum Breathes campaign].
- £150,000 for business engagement over 3 years from 2019. This will be provided through the Birmingham Connected Business Travel Network and will focus on businesses most affected by the CAZ, especially SMEs. It will ensure dedicated resource is available for the promotion of the forthcoming Business Breathes campaign and support access of this.
- £35,000 for stakeholder events, including additional sessions organised to raise awareness of mitigation measures in advance of the CAZ being introduced. This approach was very well received during the CAZ consultation and there is an expectation that it will continue.
- £60,000 for community engagement over 3 years from 2019. This will be provided through the Birmingham Connected team in conjunction with colleagues from Public Health and Communications. It will ensure dedicated resource is available for promotion of mitigation measures to key audiences such as low-income residents, community groups and places of worship.
- £45,000 for community events and other activities, including equipment for air quality monitoring by some of these groups to aid engagement. Previous experience suggests that an outreach approach where BCC look to co-produce events and activities is the most effective way of engaging with and disseminating messages to communities, and harder to reach groups in particular.
- £30,000 for engagement with educational establishments (schools & colleges) in and near to the CAZ over 3 years from 2019. This will be provided by the School Travel team as part of the existing Modeshift STARS initiative (including national accreditation).

This amounts to £380,000 (excluding VAT) over a 3-year period. A full breakdown of the cost items included the CAF ask are shown in Table 10.

Table 10 Full breakdown of cost items included in the marketing and engagement campaign

Campaign	Cost item	2019/20	2020/21	2021/22	Total
Business Breathes campaign	Business Breathes web hosting/management	£0	£20,000	£20,000	£40,000
	Social media support	£2,500	£2,500	£2,500	£7,500
	PR Support	£4,000	£4,000	£2,000	£10,000
Business behaviour	Business engagement	£50,000	£50,000	£50,000	£150,000

change campaign	Stakeholder events	£20,000	£10,000	£5,000	£35,000
Brum Breaths campaign	Community engagement	£20,000	£20,000	£20,000	£60,000
	Community events	£10,000	£10,000	£10,000	£30,000
	Air quality monitoring (equip.)	£5,000	£5,000	£5,000	£15,000
	Social media support	£2,500	£2,500	£2,500	£7,500
	Educational establishments	£10,000	£10,000	£10,000	£30,000
	Total	£131,500	£141,500	£132,000	£385,000

9 M6: Resident parking schemes

9.1 Summary of distribution analysis

Residents parking was not identified in the DIA, however the Council's transport team have requested its inclusion due to concerns around the impacts of the CAZ raised during the consultation. There is a concern regarding the potential for a high volume of cars to be parked around the outskirts of the CAZ to avoid the charge.

Unfortunately, the traffic modelling conducted as part of the emissions analysis only accounted for full trips between two defined end points, it is therefore unable to forecast individuals driving to the margin of the CAZ and completing their journey on foot. As a result, it is not possible to quantify the expected impact on parking congestion in areas surrounding the CAZ.

Whilst the impact of parking around the city centre is likely to be low, the Council believes it is prudent to be prepared and able to respond to any issues which may arise following the implementation of the CAZ.

9.2 Description of mitigation measures

The options to mitigate the negative impacts on residents who live in close proximity to the CAZ have been outlined in detail in a recent report from Jacobs²⁹. The report assesses a combination of different parking measures in mitigating any negative impacts but does not recommend one measure over the other. The measures analysed include:

- Controlled parking zone
- Restricted parking zone
- Residents parking scheme or permit parking zone
- Waiting or loading restrictions (on a street by street basis)

The advantages and disadvantages of each option are shown below in Table 11.

²⁹ Birmingham Clean Air Zone: Potential parking restrictions options (Jacobs, September 2018)

Table 11 Advantages and disadvantages of parking control measures assessed in Jacobs 'Potential parking restrictions' report

Parking measure	Advantages	Disadvantages
Controlled parking zone (CPZ)	<ul style="list-style-type: none"> • Simplified traffic orders • An indication to drivers that all road space is controlled • An indication to drivers of the type of parking available (e.g. pay and display). • Pay and display could provide an income stream for the council; • Signs prescribed in the TSRGD can be used. 	<ul style="list-style-type: none"> • Unrealistic to expect drivers to remember the times of operation of the zone if there has been a considerable distance (or time) between passing a zone entry sign and parking • Yellow road markings and bay road markings required in CPZ Type (a) are visually intrusive; • Difficulty in clearing roads of vehicles and other obstructions to enable installation of road markings in such large quantities; • Costs associated with installing pay machines (if required); • Due to the size of the zone(s), residents may still struggle to find suitable parking provision near to their home; • Due to the size of the zone(s) residents may be able to use their parking permits at other locations within the zone other than close to their home.
Restricted parking zone (RPZ)	<ul style="list-style-type: none"> • Simplified traffic orders • No requirement for yellow road markings and therefore costs are less, and it is less disruptive to implement 	<ul style="list-style-type: none"> • Can be confusing for motorists who are generally less familiar with RPZ than CPZ • Risk that motorists would inadvertently park where restrictions apply, especially if there is a considerable distance between where they wish to park and the gateway signs (e.g. 1 mile) • Traffic Sign Manual states that "Restricted Parking Zones are suitable only for single streets or clearly defined small areas"
Residents parking scheme/permit parking zone (PPZ)	<ul style="list-style-type: none"> • No need for entrance/gateway signs in PPZ so cost to implement is lower (temporary signs may be required when the restrictions are first introduced) • Lack of road markings associated with PPZ means there is less cost and disruption to implement such zones • Residents have an improved opportunity to park near their property 	<ul style="list-style-type: none"> • Could result in a fragmented scheme with different restrictions on different streets • May be some areas where the supply of parking is insufficient to satisfy the demand caused by residents' vehicles alone. In this case, the Authority may find itself in a position where it needs to limit the residents' freedom to keep unlimited numbers of taxed vehicles on the street • Residents are restricted to parking within their own zone and cannot use adjacent areas when capacity is exceeded • It is likely that each PPZ would require local public consultation and approval.
Waiting or loading restrictions	It is assumed that elements of this would be required for the through routes where restrictions are currently not in place, however would not be generally adopted throughout the area under consideration.	

BCC considers that a distance of 1 mile (approximately a 20-minute walk) could be an area within which commuters and long stay parking motorists from outside the area could choose to park their vehicles.

The design of this measure recognises that parking control is unlikely to be necessary across the whole area and may only be needed in sections of the identified area. The areas that do require support will have different requirements based on the nature of the local parking pressure and therefore could require different parking measures to be implemented from the above list. As a result, BCC propose that a ‘reactive fund’ be held by the council and used to implement the appropriate parking measure to assist the residents when the demand arises. To assess what areas require support, the council would engage with local residents. When a certain number of issues are raised and reflect a decrease in the residents’ access to parking, the council will conduct an assessment of that particular area to judge the best measure to reduce parking pressure for residents.

9.3 Delivery plan

As stated, the measure is designed to be a ‘reactionary fund’ and does not require immediate action until the impacts on residents parking can be fully assessed. The process of implementing the measure involves the following steps:

- Communication channels would be established between the council and residents of areas bordering the CAZ. This would integrate with the communication campaign (see section 8) to provide a platform for residents to raise issues with a decrease in the supply as a result of the CAZ. There are several options for this; one being to use the existing process for logging complaints and service requests.
- These responses would be monitored and when a sufficient number were received from a certain area the council would assess the local issue. The feasibility and effectiveness of each parking measure will be analysed to conclude the best solution for the area in question.
- The council will then implement this solution through their in-house design team and it will be operated by the in-house parking enforcement team who have significant experience in such projects.

This will be designed to be a continuous cycle, starting in line with the implementation of the CAZ and is proposed to continue for a period of three years, by which time the negative impact is expected to be reduced as a consequence of a higher proportion of compliant vehicles.

9.4 State Aid consideration

The scheme will use funds through public contractors, ones already used in similar projects funded by the council, so no state aid concerns are expected. The funds are also to be used to improve public services and do not provide direct financial benefits to any individuals or businesses.

9.5 Value for Money

As described in 3, these benefits are quantified using an assumption that the funding made available will directly offset vehicle upgrade costs in a 1:1 ratio. However, when administrative costs are included this reduces this ratio below 1. The total funding ask for M6 is £5 million, so using this methodology the scheme is providing £5 million of benefits to residents in areas surrounding the CAZ. When admin costs are considered, the total scheme cost is £5.04 million. When this is considered, for every £1 of funding allocated, £0.99 worth of benefits are received by the resident community, this represents a negative VfM value of -£36,831.

9.6 Quantification of scheme

The total length of road included in the 1-mile CAZ radius is 365km (312km not including motorways and A-roads). For the purpose of costing each item, a total zone was assumed. This is for comparison purposes only and it is not suggested that one parking measure be applied to the entire zone. The estimated costs are shown in the next table.

Table 12 Cost estimates of different controlled parking options

Cost item	Controlled parking zone (type a)	Controlled parking zone (type b)	Restricted parking zone	Permit zone
Entrance Signs	<p>For the purposes of this costing exercise it was assumed that 770 would be required based on:</p> <ul style="list-style-type: none"> • 120m from CAZ • 250m from suburban Birmingham • 400m from A-roads 	For the purposes of this costing exercise it was assumed that 770 would be required	For the purposes of this costing exercise it was assumed that 770 would be required	Not required
Exit Signs	For the purposes of this costing exercise it was assumed that 770 would be required on new posts	For the purposes of this costing exercise it was assumed that 770 would be required on new posts	For the purposes of this costing exercise it was assumed that 540 would be required on new posts	Not required
Upright Signs	<p>Required at each bay. One should be located at no more than 15m from the end of the bay. If the bay exceeds 30m in length, then additional upright signs should be located at every 30m.</p> <p>For the purposes of this costing exercise it was assumed there would be 64 upright signs per km or road. 50% on new posts.</p>	<p>For the purpose of this costing exercise it was assumed there would be 4 upright signs on each road. 70% would be on new posts.</p>	<p>The spacing between consecutive signs, whether or not they are on the same side of the road, should be no more than 30 m. The signs may be mounted on lamp columns, separate posts or possibly on walls.</p>	<p>Required at each bay</p> <p>For the purposes of this costing exercise it was assumed there would be 42 upright signs per km or road. 50% on new posts</p>
Yellow Road Markings	An allowance of 480m per km was made	<p>Not Required</p> <p>However, an allowance of 100m per km was made</p>	<p>Not Required</p> <p>However, an allowance of 100m per km was made</p>	<p>Not Required</p> <p>However, an allowance of 100m per km was made</p>

Bay Marking	Yes An allowance of 700m per km was made	Not Required However, an allowance of 75m per km was made	Not required. Parking Bays may be provided. An allowance of 75m per km was made	Not required. Disabled parking bays may be requested. An allowance of 75m per km was made
Cost to Implement assumes 266.22km of road and optimism bias of 44% NOTE: costs associated with disruption to apply road markings not assessed	£20,000,000	£13,000,000	£13,000,000	£10,000,000

These estimates suggest that to implement a controlled parking zone across the entire targeted zone would cost in the region of £10-20 million. BCC proposes to ask for funding to cover 25% of the roads included in the zone (78km), which comes to an upper estimate of £5million. BCC believe that this amount will be sufficient to mitigate any negative impacts on resident's ability to park that may arise as a result of the CAZ. BCC recognises that there is a possibility that the amount required to implement the necessary parking schemes will be higher or lower than the £5 million asked from the CAF:

- In a case where the funding required exceeds the amount received from the CAZ, BCC propose to fund additional traffic measures through revenue received from the CAZ charges.
- Where the funding received from the CAF exceeds the amount required to implement the necessary parking schemes, the outstanding amount will be returned to the government in 2022.

10 Administrative cost and spending profile

In this section, the following items are detailed:

- The cost to put in place and run the proposed mitigation measures, referred to as the 'administration costs';
- The spending profile of both the administration costs and direct costs.

10.1 Administrative costs

A centrally resourced approach was taken when calculating the administrative cost for the mitigation measures and exemptions. It is envisaged that a 'CAZ team' will be assembled who have responsibility for:

- Establishing the application systems required for individuals/businesses to submit their application for mitigation measures and exemptions.
- Assessing and validating applications

- Implementing the mitigation measures
 - Providing help desk services to respond to inbound queries
 - Reporting (internally and to JAQU)

This team will have responsibility for all mitigation measures and exemptions with two exceptions:

- **Support for Hackney carriage and Private Hire Vehicle drivers (M2a, M2b & M2c):** Taxi drivers are unique in that they are a well-defined group with strong communication channels with the council taxi licensing team. There is an annual licencing procedure and the council will communicate directly with the drivers themselves. Feedback from the drivers' community, as well the BCC's experience in communicating with taxi drivers, suggests that the best method of engagement will be a postal campaign with the drivers given the options to apply for the mitigations in person or by post. It therefore makes sense that the Birmingham licencing team have responsibility for implementing the measure as they have an established relationship with the drivers.
 - **HDV compliance fund (M5):** The HDV compliance fund requires specialist skills in creating, assessing and communicating the fund criteria as well as the due diligence involved in allocating large funding awards to businesses. The Business Enterprise team within BCC have significant experience in this area and it is proposed they will have responsibility for delivering this measure.

The total funding to cover administrative costs requested from the CAF is £2,591,012, this is broken down into:

- CAZ team costs: £789,561 (including £307,875 of software costs and State aid legal fees of £100,000 over 2 years)
 - Hackney carriage support costs: £268,876
 - HDV support costs: £242,613

Note this includes the costs for implementing the exemptions as well as the mitigations. Out of the total administrative budget of £2,698,731 it is expected that £1,495,837 will be required to implement the mitigations and £1,202,893 will be required to implement the exemptions. It should be noted that although the total is provided above, this is divided into an administrative budget for each measure. Therefore, if DEFRA decides that one or more of the measures do not meet the funds criteria and wishes them to be removed, their contribution to the administrative budget can also be easily removed, Table 13 shows the administrative budget broken down by each individual mitigation and exemption. Figure 23 shows a summary of the resource need on a month by month basis, the underlying assumptions that were used to arrive at this timeline are explained in the following sections.

Figure 23 Summary of resource need

There is significant uncertainty associated with the assumptions which underpin this estimate, as a result an optimism bias of 15% has been applied. This figure was used after conducting sensitivity analysis on the base assumptions that feed into each estimate.

Table 13 Total administrative budget broken down by individual measures and exemptions

Mitigation	Total hours	Proportion of CAZ team cost	Admin cost	Funding ask	Funding ask incl. admin	VfM ratio
M1a CAZ workers	5,562	20%	£ 432,498	£ 10,840,000	£ 11,272,498	96%
M1b Residents outside CAZ	5,337	19%	£ 415,002	£ 6,500,000	£ 6,915,002	94%
M2 Taxi support			£ 276,595	£ 14,750,000	£ 15,026,595	98%
M3 Free LGV miles	1,187	4%	£ 92,300	£ 750,000	£ 842,300	89%
M4 HGV fund			£ 242,613	£ 10,050,000	£ 10,292,613	98%
M5 Engagement campaign			£ -	£ 380,000	£ 380,000	100%
M6 Parking scheme	474	2%	£ 36,831	£ 5,000,000	£ 5,036,831	99%
Total mitigations	12,559	45%	£ 1,495,838	£ 48,270,000	£ 49,765,838	97%
E1 + E3 Commercial vehicles in CAZ	720	3%	£ 55,991	£ -	£ 55,991	-
E2 + E4 Commercial vehicles with finance	1,440	5%	£ 111,979	£ -	£ 111,979	-
E5 CAZ residents	840	3%	£ 65,321	£ -	£ 65,321	-
E6 CAZ workers	2,900	10%	£ 225,509	£ -	£ 225,509	-
E7 Residents outside CAZ	8,700	31%	£ 676,521	£ -	£ 676,521	-
E8 Hospital visitors	857	3%	£ 66,619	£ -	£ 66,619	-
E9a Community and school	2	0%	£ 176	£ -	£ 176	-
E9b Disabled vehicles	10	0%	£ 778	£ -	£ 778	-
Total exemptions	14,749	55%	£ 1,202,894	£ -	£ 1,202,894	-
		Total	£ 2,698,731	£ 48,270,000	£ 50,968,731	

10.2 CAZ team administrative costs

This general mitigation and exemption team will execute all tasks associated with implementing the mitigations and exemptions (excluding the 2 exceptions mentioned above). These tasks can broadly be categorised into:

- **Establishing the application process:** This will involve drafting the communication content sent to each target group and developing the system for individuals and businesses to apply for exemptions/mitigations. This will most likely be delivered through an external software system which will allow individuals and businesses to upload their applications for all mitigations and exemptions.
- **Help desk resources:** This task involves responding to inbound queries from individuals and businesses. This is forecast to occur in two batches, the first in 2019 Q3 & Q4 and the second in 2020 Q2 & Q3. This corresponds to the mitigations and exemptions starting in 2020 and 2021 respectively. The total resources needed have been estimated using a bottom up approach using the assumptions around the number of phone calls/emails per application for each mitigation and exemption.
- **Application assessment:** Once the applications have been received each will have to be validated and assessed leading to a decision on whether to award the individual/business a mitigation or exemption. The resources needed have been calculated from a bottom up approach with an assumption on the number of applications which can be assessed per hour by one full time employee (FTE) made for each mitigation and exemption. These assumptions are related to the number of documents that must be validated for each application and compared to a baseline of 15 Parking Charge Notices per hour per FTE³⁰.
- **Implementation of measure:** The final task is to implement the measure, this will mainly concern the mitigations as the implementation of the exemptions is largely confined to providing a list of registrations vehicles to be included on the white list. The exception to this is for visitors to hospitals within the CAZ, as this is done on a day-by-day basis there will need to be a provision of resources to handle on going implementation. This is calculated by estimating the full-time employees needed to successfully implement each mitigation.

Table 14 Description of the assessment and implementation delivery steps associated with each mitigation and exemption

Ref	Description of assessment delivery steps	Description of implementation delivery steps
M1a	Validate: Workplace address, income, vehicle registration, proof of address, key worker status	Communication emails, liaising with dealerships, liaising with Swift, validating scrappage/vehicle purchase, releasing funds to dealerships/Swift
M1b	Validate: Income, vehicle registration, proof of address	Communication emails, liaising with dealerships, liaising with Swift, validating scrappage/vehicle purchase, releasing funds to dealerships/Swift
M4	Validate: vehicle purchase, company address	Liaising with BCC EV infrastructure provider, releasing funds
M7	Record parking requests	Analyse parking request data and direct where controlled parking measures are to be implemented
E1 & E3	Validate: Company address, vehicle registration address, vehicle ownership	Add to white list
E2 & E4	Validate: Company address, vehicle registration address, vehicle ownership, finance agreement	
E5	Validate: Proof of address, vehicle ownership	

³⁰ Rate observed in the Birmingham parking team

E6	Validate: Income, vehicle registration, proof of address	
E7	Validate: Income, vehicle registration, proof of address	
E8	Validate proof of hospital visit	Verifying hospital visit and creating temporary white list
E9a	Validate: Vehicle registration	
E9b	Validate DVLA disabled status	Add to white list

Table 14 summarises the delivery steps required for each mitigation and exemption. This was used as the basis to arrive at the assumptions outlined in Table 15. The method used to calculate the administrative costs starts with an assumption around the number of applications that will be received for each mitigation/exemption, as well as the number of successful applications that will move forward to the implementation phase. These assumptions can be broadly categorised into the following sections (colour coordinated to match Table 15);

1. **Well quantified and non-competition format:** The number of eligible vehicles is well understood and supported by real world data, so the number of applications can be estimated with a reasonable degree of certainty. The number of successful applications can be assumed to be the same as the number of original applications as there is clear eligibility and no competition between applicants. Examples include; M4, E1, E3, E5 & E9.
2. **Poorly quantified and non-competition format:** In these cases, the number of eligible vehicles is not well understood due to data unavailability. In these cases, a broad conservative estimate was made. However, as there are clear eligibility criteria in place, the number of successful applicants is expected to be similar to the number of successful applicants. Examples include: M7, E2, E4, E6 & E8
3. **Competition formats:** Here the number of successful applicants is set in line with the expected need within each group as described in the quantification section of each measure. However, there is a large uncertainty around the number of applicants. The numbers used are conservative estimates. Examples include: M1a, M1b & E7

Table 15 Bottom up assumptions used to calculate administrative resource required (colour code indicates level of certainty in the quantification)

Exemption/mitigation	No. of total applications (estimated)	No. of successful applications	Establishing application process	Help desk resources – Application stage	Help desk resources – Implementation stage (only successful applications)	Assessments (applications per hour per FTE)	Implementation of measure (FTEs)
M1a: CAZ workers	10,000	5,500	2 FTEs needed to establish the application process.	0.2 phone calls & 0.4 emails per application	1 phone call per application	5	2
M1b: Residents outside CAZ	10,000	3,250				5	2
M3: Free LGV miles	1,000	1,000			1 email per application	10	0.3
M6: Residents parking scheme	1,000	1,000				50	0.1
E1 & E3: Commercial vehicles registered in CAZ	3,000	3,000	Included in above	0.2 phone calls & 0.4 emails per application	No help desk required	5	Covered in whitelist process
E2 & E4: Commercial vehicles with existing finance agreements	6,000	6,000				5	
E5: CAZ residents	7,000	7,000		0.2 phone calls & 0.4 emails per application		10	
E6: CAZ workers	10,000	5,500		0.2 phone calls & 0.4 emails per applications		4	
E7: Residents outside CAZ	30,000	3,250		0.2 phone calls & 0.4 emails per applications	1 phone call per 10 applications 1 email per 10 applications	4	
E8: Hospital visitors	35,000	35,000				100	0.1
E9: Community, school and disabled vehicles	2,150	2,150		No help desk required		-	Covered in whitelist process

The above assumptions give an estimate for the total resources needed per task for each mitigation. number of hours is then divided evenly over the expected time frame for each task as shown in

Help desk cost timeline - Application		Distribution of resource need																	
		2019						2020						2021					
Mitigation	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	
M1a	CAZ workers																		
M1b	Residents outside CAZ																		
M3	Free LGV miles																		
M6	Parking scheme																		
E1 + E3	Commercial vehicles in CAZ																		
E2 + E4	Commercial vehicles with finance																		
E5	CAZ residents																		
E6	CAZ workers																		
E7	Residents outside CAZ																		
E8	Hospital visitors																		
E9a	Community and school																		
E9b	Disabled vehicles																		
Help desk cost timeline - implementation		Distribution of resource need												2021					
		1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
M1a	CAZ workers																		
M1b	Residents outside CAZ																		
M3	Free LGV miles																		
M6	Parking scheme																		
E1 + E3	Commercial vehicles in CAZ																		
E2 + E4	Commercial vehicles with finance																		
E5	CAZ residents																		
E6	CAZ workers																		
E7	Residents outside CAZ																		
E8	Hospital visitors																		
E9a	Community and school																		
E9b	Disabled vehicles																		
Application assessment timeline		Distribution of resource need												2021					
		1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
M1a	CAZ workers																		
M1b	Residents outside CAZ																		
M3	Free LGV miles																		
M6	Parking scheme																		
E1 + E3	Commercial vehicles in CAZ																		
E2 + E4	Commercial vehicles with finance																		
E5	CAZ residents																		
E6	CAZ workers																		
E7	Residents outside CAZ																		
E8	Hospital visitors																		
E9a	Community and school																		
E9b	Disabled vehicles																		
Implementation timeline		Distribution of resource need												2021					
		1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
M1a	CAZ workers																		
M1b	Residents outside CAZ																		
M3	Free LGV miles																		
M6	Parking scheme																		
E1 + E3	Commercial vehicles in CAZ																		
E2 + E4	Commercial vehicles with finance																		
E5	CAZ residents																		
E6	CAZ workers																		
E7	Residents outside CAZ																		
E8	Hospital visitors																		
E9a	Community and school																		
E9b	Disabled vehicles																		

Figure 24.

Figure 24 Timeline of tasks to deliver the mitigation and exemption measures

An average of 131 hours per FTE per month is assumed³¹ to arrive at the total number of FTEs required per month. The required resources are then categorised into staff pay grades. To calculate this, an assumption was made that there will be a core team of 4 members (G5: Project manager, G3: administrative officer, G2: 2 x graduates) who will be present throughout the delivery of the project, the Council believes it is important to have a core group present throughout the project to act as the main point of delivery. This group will be in place until February 2021, at which point the bulk of the delivery tasks will have been completed. After this the core group will be reduced to 2 members (G4: Project manager, G2: Graduate). Any additional resources

³¹ 7.3 hours/day x 5 days/week x 52/12 (weeks/month) x 48/52 (accounts for annual leave) – 4.3 sick days

above this will be assumed to consist of a 50:50 split between G3 and G2 pay grades. In reality, the variable demand for resources, with high demand over short time scales, means the Council might find it difficult to resource internally in the required timeframe and might bring in external resources such as agency workers. The total resource costs use the salary bands listed below, these include a multiplier of 2.9 in all cases to account for the total cost of an employee.

- G2: £55,449 per year
- G3: £73,843 per year
- G4: £96,093 per year
- G5: £121,353 per year

Figure 25 shows the resulting estimate for the volume of resource required over the duration of the delivery period. In total, this results in a total administrative cost of £1,479,797. Added to this will be the cost to the council to procure and operate the application software. Current quotes attained by the council suggest this will be in the region of £20,000 to procure with a further fee of £2.50 per application made on the system. Across all mitigations and exemptions just over 115,000 applications are expected which results in a service fee of £308,000 (£288,000+ £20,000), if included it increases the total budget required to £1,787,672 however there is an option to pass the service fee costs onto the individual or business as an application fee, though this is yet to be decided upon. When the total hours needed for the mitigations are compared to that of the exemptions it shows that 45% of this administrative cost is expected to be devoted to mitigation measures resulting in an administrative budget for the mitigations alone of £801,043

Full time employees needed	2019												2020												2021															
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12				
Application set up	4	4	4										2	2	2																									
Total help desk							2.3	2.3	2.4	2.4	2.4	2.3	2.3	0.3	0.3	0.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.0	2.0	2.0	1.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Assessment							23.9	24.0	24.0	24.0	24.0	24.0	24.0	0.3	0.3	0.3	0.3	7.9	7.9	7.9	7.9	7.9	7.9	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Implementation							0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Hackney carriage resource	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
HDV fund resource	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Total CAZ team	0	0	4	4	4	2	26	27	27	27	3	3	3	3	3	6	6	14	14	14	14	7	7	7	6	0														
Total CAZ team	0	0	4	4	4	4	26	27	27	27	4	4	4	4	4	4	6	6	14	14	14	14	7	7	7	6	2													
Total all measures	0	0	7	10	10	10	32	33	33	33	10	10	10	7	7	15	15	15	15	8	8	8	7	3	3	2														

Full time employees by pay	2019												2020												2021													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
G2	2	2	2	2	13	13	13	13	2	2	2	2	2	2	2	3	3	7	7	7	7	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	
G3	1	1	1	1	12	12	12	12	1	1	1	1	1	1	1	1	2	2	6	6	6	6	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
G4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
G5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Figure 25 Distribution of resources needed to deliver mitigation and exemption measures under the responsibility of the CAZ team

10.2.1 Taxi administrative costs (M2a, M2c)

As the proposed leasing scheme (M2b) is likely to be outsourced to a 3rd party, the administrative costs will be largely confined to the Hackney carriage financial support package (M2a) and the financial support for Private Hire Vehicles (M2c). The full tasks required to deliver this measure are described in Section 5, it is expected that the majority of the delivery steps (e.g. validation of applications, allocating funds etc.) will have to be done manually. This is a result of the taxi driver community's preference for face-to-face applications and the need to validate applications against the Councils licencing database. The Birmingham taxi licencing team have reviewed the delivery steps in detail and compared it the resourcing needed for current tasks, from this they have estimated that 3 additional full-time employees will be required to deliver the leasing scheme and financial support package (1 x G4, 1 x G3 & 1 x G2). The process will commence in March 2019 and the bulk of delivery work will be completed by February 2020, after which the delivery team can be reduced. Towards the end of 2019 an assessment will be carried out on the resource needed going forward, it is expected that a reduced resource will be needed after February 2020, most likely less than one FTE, so it will make financial sense to move any remaining delivery steps into the CAZ team (see Section 10.2). The total administrative costs required to cover the salaries of the three additional employees is estimated as £276,595 based on the

salary levels described above. This amount includes an additional £10,000 which will be required to run the leasing partner procurement exercise.

10.2.2 HDV compliance fund administrative costs (M6)

As described above the HDV compliance fund (M6) will be delivered by the Business Enterprise team. The delivery steps for the fund (described in Section 7.3) have been reviewed in detail by the Business Enterprise team and they have used their existing activities to estimate the additional resources they will require to deliver the measure. The estimate of resources is as follows:

- 1X GR5 Project Manager (£60,476 pa including on costs) – Tasked with the overall management of Fund
- 2X GR4 Project Officers (£47,646 x 2 pa including on costs)- Responsible for; answering enquiries, implementing the application system, assessing applications, documenting and monitoring progress and handling claims.

The 3-person delivery team will be required for 12 months (March 2019 – March 2020), after this point the team will reduce to 1 project officer who will monitor the allocation of funds, handle any inbound queries as well as delivering awards that have been delayed until the end of 2020 due to exemptions. They will be in place for an additional 12 months until February 2021. Any additional short-term demand for resources can be covered by the CAZ team. The total administrative cost required to implement the fund is £242,613.

10.3 Spending profile for mitigations

Table 16 Spending profile of the proposed CAZ mitigation measures categorised by funding type and financial year (£million)

Mitigation measure	Funding type	'19/20	'20/21	'21/22	'22/23	'23/24	Total
M1a Mobility support for Workers	Revenue	-	£10.84	-	-	-	£10.84
M1b Mobility support for residents outside the CAZ	Revenue	-	£6.50	-	-	-	£6.50
M2a Hackney carriage support package	Revenue	£3.13	£0.63	£0.63	£0.63	-	£5.00
M4 Free miles' for ULEV LGVs	Revenue	£0.15	£0.15	£0.15	£0.15	£0.15	£0.75
M6 Marketing and engagement campaign	Revenue	£0.13	£0.13	£0.12		-	£0.38
Total revenue		£3.41	£18.24	£0.89	£0.78	£0.15	£23.47
M2b Council Hackney Carriage leasing scheme	Capital	£2.75	-	-	-	-	£2.75
M2c Private Hire Vehicle upgrade support	Capital	£7.00					£7.00
M5 HGV/coach compliance fund	Capital	£5.03	£5.03	-	-	-	£10.05
M7 Residents parking scheme	Capital	£1.00	£1.00	£1.00	£1.00	£1.00	£5.00
Total capital		£15.78	£6.03	£1.00	1	1	£24.80
All Administrative costs (incl. exemptions)	All	£1.77	£0.79	£0.14	£0.00	£0.00	£2.70
Total		£20.95	£25.06	£2.04	£1.78	£1.15	£50.97