

OBC Supplement – Technical Note

Disaggregation of Costs and Funding of the Preferred Option

1. Introduction

This Technical Note describes the various components of Sheffield & Rotherham's Preferred Option for tackling their NO₂-related air quality problems. It is designed to be a supporting document for the Outline Business Case which was generated by the Clean Air Zone Feasibility Study and submitted to the Joint Air Quality Unit (JAQU) in December 2018 and should therefore be read in conjunction with the main OBC.

It contains the following sections:

- Section 2 disaggregates and explains the cost estimates for the Preferred Option and the CAZ 3D alternative; and
- Section 3 provides a detailed description of the relevant assumptions used in the traffic emissions modelling of the Preferred Option (CAZ 3C+) and the CAZ 3D alternative

Note that the full Preferred Option is required to achieve area-wide compliance and as a result, it should be considered as an integrated package, rather than as a list of stand-alone measures. It is on this basis that it has been approved by the Cabinets in the two Authorities.

The evidence that the full Preferred Option package will achieve area-wide compliance by 2021 was provided in the various Air Quality deliverables submitted previously within the OBC and is not repeated again here.

The time taken to undertake a full run of the transport/emissions/georectification/air quality modelling (approximately 1 week per test) has precluded the individual appraisal of each individual component of the package. Any such 'unpicking' would also miss the 2nd-order effects for example the increased speeds created by goods vehicles rerouting to avoid the CAZ charge and the 2nd-order rerouting of vehicles to take advantage of this freed-up road space.

2. Further Disaggregation of the Funding Request

The Financial Case of the Outline Business Case submission for the Sheffield and Rotherham Clean Air Zone set out the costs, funding sources and timing of expenditure for the preferred option of a CAZ C plus additional measures. The full detail of the preferred option is available in Supporting Document SD17 (Contents of the Preferred Option).

This note sets out to further clarify the detail of the measures included in the preferred option and how this differs to the CAZ D scenario. The funding request is split out between capital and operational expenditure in Tables 1 and 7 in the OBC Financial Case.

The aggregation of costs is performed within the funding model spreadsheet which is provided as a supporting document SD11 (E2 – The Economic Models). An updated version of this funding model has been uploaded to Huddle v26 (June 2019).

Table 1 in the Financial Case of the 24 December 2018 OBC set out the broad capex themes for the Preferred Option (CAZ 3C⁺), as shown below:

Table 1. *Disaggregation of Capex for the Preferred Option (24 December 2018)*

Capex Item £'000s	Early Measure s Fund	OLEV Funding	Impleme ntation Fund	Clean Air Fund	Council Funded	TOTAL
CAZ Enforcement System& Infrastructure works	-	-	3,174	-	-	3,174
Measures: non-compliant vehicles support packages	485	-	6,184	3,303	-	9,972
Measures associated with Road- based Infrastructure	159	-	1,010	-	-	1,169
Measures associated with Parking	-	-	100	-	100	200
Charging infrastructure to support ULEV	1,160	1,913	-	-	163	3,235
Costs of Communications Campaign	80	-	1,686	-	-	1,766
Monitoring and Evaluation Costs	-	-	560	-	-	560
Project, Financial Mgmt & Prof Support	-	-	18,836	2,699	-	21,535
Contingency	-	-	534	-	-	534
TOTAL	1,884	1,913	32,084	6,002	263	42,144

Table 7 in the 24 December 2018 OBC set out the operational expenditure impacts of the Preferred Option (CAZ 3C⁺), as shown below:

Table 2. *Disaggregation of Opex for the Preferred Option (24 December 2018)*

Opex Item £'000s	Early Measure s Fund	OLEV Fundin g	Impleme ntation Fund	Clean Air Fund	Council Funded	TOTAL
CAZ Enforcement System - Back office running costs	-	-	2,064	-	-	2,064
Monitoring and Evaluation Costs	65	-	760	-	-	825
Programme, Project & Financial	3	-	81	194	-	279

Management & Prof Support						
Contingency	-	-	2,466 ¹	3,193	-	5,660
TOTAL	68	-	5,372	3,388	-	8,827

The total funding ask presented for the 24 December 2018 Preferred Option is summarised in table 3 below:

Table 3. *Total Funding Ask for the Preferred Option – Original OBC (as submitted on 24 December 2018)*

£'000s	Early Measures Fund	OLEV Funding	Implementation Fund	Clean Air Fund	Council Funded	TOTAL
Capex	1,884	1,913	32,084	6,002	263	42,144
Opex	68	-	5,372	3,388	-	8,827
TOTAL	1,952	1,913	37,456	9,388	263	50,971

The high level aggregation of categories presented in the OBC Financial Case was designed to illustrate the detail within the financial appendices in broader terms. This note aims to bridge the level of detail from the financial model to the aggregation within the OBC. The breakdown of the above are provided in the detailed table below which shows the individual measures that make up each of the items listed above and the revised financing strategy for each measure following JAQU guidance on 23rd May 2019.

The changes that have been made to the funding model since 24 December 2018 are as follows:

- a. The Opex contingency values have been updated to match the latest version of the Funding model – resulting in the cost of this component decreasing from £5.660m to £4.407m, a decrease of £1.253m
- b. A ‘sign’ error in the cost of providing incentives for SCC taxi drivers in 2019 was fixed, resulting in an increase in £857K (= 2 x £428,750) in the Implementation Fund ask;
- c. The revenue from the CAZ to decommission the cameras in the “CAZ Enforcement System & Infrastructure works” has now been reclassified as ‘capex’ (rather than ‘opex’), to match with the corresponding capex entry for the cost of this decommissioning.
- d. The investment in new buses in Sheffield for smaller operators was included at £30k *31 vehicles when it should have been calculated at £60k per vehicle. The £30k was the perceived user benefit value, not investment cost. The impact of this change is a £930k investment value, 30% assumed from the implementation fund. The increase to the support measures ask as a result is £279k.
- e. Following the award of the Clean Bus Technology Fund, the bus retrofits will now be funded via a combination of the £3m awarded through this CBTF grant and the remainder through the Implementation Fund.
- f. For the mitigation measures, guidance has been provided by JAQU as to where the funding for the measures should sit between the Implementation Fund and The Clean Air Fund. Whilst the

¹ The OPEX Contingency values in the 24 December 2018 OBC were based on V15 of the Funding Model and are inconsistent with the version of the spreadsheet submitted as supporting document SD11 (v17)

headline numbers have changed slightly as a result of the previous amendments; this change has simply reassigned the funding ask between the pools and not adjusted the total.

Following these changes, the top level disaggregation of the funding request for the Preferred CAZ C+ Option is as shown in the table below:

Table 4. *Total Funding Ask for the Preferred Option – Revised (14 June 2019)*

£'000s	Implementation Fund	Clean Air Fund	Other	TOTAL
Capex	22,850	12,966	7,059	42,875
Opex	5,299	2,079	68	7,446
TOTAL	26,149	15,045	7,127	50,321

The tables below provide a full disaggregation of the (undiscounted) costs (in 2018 prices) of the two packages of measures (Preferred Option CAZ 3C+ and CAZ 3D)² and highlights where there are differences between these two, either in the respective totals or in the allocation of these totals to the various funding streams.

The CAZ 3D option has been included as a comparative to the preferred option but has not yet been updated to reflect the most-recent transport modelling assumptions regarding the likely future profile of the private car fleet or the fleet upgrade assumptions applied to trips travelling through the CAZ area.

² See the main OBC for a full description of these Packages and their impacts.

Sheffield & Rotherham Clean Air Zone

Capex theme	Capex Item	Authority	CAZ C+				CAZ D			
			Individual Cost	Implementation Fund	Clean Air Fund	Other	Individual Cost	Implementation Fund	Clean Air Fund	Other
CAZ Enforcement System and Infrastructure works	Camera Installation	SCC	2,160	2,160			2,160	2,160		
	Signing	SCC	408	408			408	408		
	Back office Set-up	SCC	200	200			200	200		
	Decommissioning - camera & signing	SCC	406	406			406	406		
	<i>Charging revenue used to fund the removal of</i>	SCC	- 406	- 406			- 406	- 406		
			2,768	2,768	-	-	2,768	2,768	-	-
Measures: non-compliant vehicles support packages	Electric taxis for SCC (EMF)	SCC	485			485	485			485
	Retrofitting SCC Black cabs to LPG	SCC	1,400	1,400			1,400	1,400		
	Providing incentives to taxis	SCC	1,715		1,715		1,608		1,608	
	Providing incentives to taxis	RMBC	117		117		39		39	
	Implementing changes to taxi policy	RMBC	50	50			50	50		
	Retro-fit existing fleet - CBTF	SCC	3,000			3,000	3,000			3,000
	Retro-fit existing fleet - still to do	SCC	816	816			816	816		
	Retro-fit existing fleet - still to do	RMBC	918	918			918	918		
	New buses in Sheffield - Stagecoach	SCC								
	New buses in Sheffield - Smaller Operators	SCC	558	558			558	558		
Funding for the incentives to LGV Owners	SCC	2,050		2,050						
			11,109	3,742	3,882	3,485	8,873	3,742	1,646	3,485
Measures associated with Road-based Infrastructure	Signal timings SCC EMF	SCC	159			159	159			159
	Signal timings on Derek Dooley Way	SCC	100	100			100	100		
	Signal timings on Fitzwilliam Road	RMBC	80	80			80	80		
	Junction improvements and bus priority to s	RMBC	710	710			710	710		
	HGV Northbound on Wortley Road	RMBC	120	120			120	120		
			1,169	1,010	-	159	1,169	1,010	-	159
Measures associated with Parking	Implement a revised parking policy in SCC	SCC	200	100		100				
			200	100	-	100	-	-	-	-
Charging infrastructure to support ULEV	Public EV Charging Infrastructure - EMF	SCC	515			515	515			515
	Public EV Charging Infrastructure - EMF	RMBC	645			645	645			645
	Electric Taxi Charging Infrastructure (OLEV F	SCC	650			650	650			650
	Follow-up charging infrastructure for taxis	SCC	975			975	975			975
	Public EV Charging Infrastructure - New	SCC	225			225	225			225
	Public EV Charging Infrastructure - new	RMBC	150			150	150			150
ULEV Infrastructure for LGVs	SCC	75			75	75			75	
			3,235	-	-	3,235	3,235	-	-	3,235
Costs of Communications Campaign	EMF	SCC	40			40	40			40
	EMF	RMBC	40			40	40			40
	H&M Campaigns - 2019	SCC	264	264			264	264		
	H&M Campaigns - 2020	SCC	528	528			264	264		
	H&M Campaigns -2021	SCC	264	264						
	Targetting local goods vehicle owners (to enc	SCC	80	80						
	Stakeholder Engagement & Public Consultati	SCC	46	46			69	69		
	Stakeholder Engagement & Public Consultati	RMBC	35	35			25	25		
	Stakeholder Engagement & Public Consultati	RMBC					25	25		
	General Comms - OBC	SCC	83	83			125	125		
General Comms - FBC (per annum)	SCC	266	266			399	399			
Hearts & Minds/Ecostars on big HGV fleets	RMBC	120	120							
			1,766	1,686	-	80	1,251	1,171	-	80
Monitoring and Evaluation Costs	Strengthening the AQ Monitoring/Modelling	SCC	200	200			200	200		
	Strengthening the AQ Monitoring/Modelling	RMBC	200	200			200	200		
	Campaign Awareness Research	SCC	80	80			80	80		
	Behavioural Change Monitoring/Evaluation	SCC	80	80			80	80		
			560	560	-	-	560	560	-	-
Financial Management and Prof Support	Interest on the loans - car	SCC					13,292		13,292	
	Interest on the loans - taxi	SCC	12,450	12,450			11,338		11,338	
	Interest on the loans - buses	SCC	228		228		228		228	
	Interest on the loans - LGV	SCC	6,386		6,386		6,386		6,386	
	Interest on the loans - HGV	SCC	2,471		2,471		2,471		2,471	
			21,535	12,450	9,085	-	33,714	-	33,714	-
Contingency	Signing	SCC	82	82			82	82		
	Optimism Bias/Contingency on SCC Road Sch	SCC	52	52			52	52		
	Optimism Bias/Contingency on SCC Road Sch	RMBC	400	400			400	400		
			534	534	-	-	534	534	-	-
TOTAL CAPEX			42,875	22,850	12,966	7,059	52,104	9,785	35,360	6,959

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Opex theme	Opex Item	Authority	CAZ C+				CAZ D			
			Individual Cost	Implementation Fund	Clean Air Fund	Other	Individual Cost	Implementation Fund	Clean Air Fund	Other
CAZ Enforcement System - Back office running costs	Camera Maintenance	SCC	864	864			864	864		
	Back office Running Costs	SCC	1,200	1,200			3,475	3,475		
	<i>Charging revenue used to fund the Back Office</i>		- 1,200	- 1,200			- 3,475	- 3,475		
			864	864	-	-	864	864	-	-
Monitoring and Evaluation Costs	M&E - EMF	SCC	45	-		45	45	-		45
	M&E - EMF	RMBC	20	-		20	20	-		20
	Maintain existing ANPR cameras	SCC	68	68			68	68		
	Maintain existing ANPR cameras	RMBC	32	32			32	32		
	Regular analysis of ANPR data	SCC	240	240			240	240		
	Regular analysis of ANPR data	RMBC	120	120			120	120		
	Checking compliance with Rotherham schem	RMBC	60	60			60	60		
	Regular analysis of AQ data	SCC	120	120			120	120		
	Regular analysis of AQ data	RMBC	120	120			120	120		
			825	760	-	65	825	760	-	65
Project & Financial Management & Prof Support	Grant Management - EMF	SCC	3	-	-	3	3	-	-	3
	Managing the Various Incentive Programs	SCC	188	-	188		80	-	80	
	Managing the Various Incentive Programs	RMBC	6	-	6		2	-	2	
	Programme Management & Commercial Ser	SCC	1,467	1,467	-		1,834	1,834	-	
	Programme Management & Commercial Ser	RMBC	220	220	-		275	275	-	
			1,884	1,687	194	3	2,194	2,109	82	3
Contingency	Programme Management & Commercial Ser	SCC	293	293	-		367	367	-	
	Programme Management & Commercial Ser	RMBC	44	44	-		55	55	-	
	Interest on the taxi loans - Contingency	SCC	1,650	1,650	-		2,677	-	2,677	
	Interest on the other veh type loans - Contingency	SCC	1,885	-	1,885		4,544	-	4,544	
			3,873	1,988	1,885	-	7,642	422	7,220	-
TOTAL OPEX			7,446	5,299	2,079	68	11,525	4,155	7,303	68
Capex			42,875	22,850	12,966	7,059	52,104	9,785	35,360	6,959
Opex			7,446	5,299	2,079	68	11,525	4,155	7,303	68
TOTAL			50,321	28,149	15,045	7,127	63,630	13,940	42,663	7,027

Details of each measure in the Preferred Option are described in Supporting Document SD17 (Contents of the Preferred Option), while the funding assumptions behind each measure are summarised in "CALC_Current_Option" tab of the funding model (Supporting Document SD11).

The main costing assumptions that build up the measures and detail of what each measure includes are described in the headline bullets below:

The CAZ 3C+ Preferred Option Measures

- CAZ Enforcement System and Infrastructure works
 - Number of cameras: 108
 - Price of cameras (excluding installation): £14k per camera
 - Number of locations: 36
 - Price of installation (per location) £18k
 - Capital Cost of infrastructure (108 x £14k) + (36 x £18k) = £2,160k
 - Annual maintenance cost per location £6k x 36 locations = £216k operating expenditure per annum
- Electric taxis for SCC (EMF) – SCC
 - Early Measures Funding £485k for electric taxi trial in Sheffield (Other funding)

- Retrofitting SCC Black cabs to LPG – SCC
 - Cost of retro-fitting SCC black cabs: £10k per vehicle
 - Proportion of fleet upgrading to LPG: 17% (140 vehicles)
 - Total fleet: 823
 - Cost of measure: $£10k * (17\% * 823) = £1.4m$ from the Implementation Fund
 - Type of measure offered: Grant
- Providing incentives to taxis – SCC
 - Grant for the following incentives E.g. Free Initial and subsequent Compliance Test; Free Initial and subsequent Licence; MyTaxi app; Standards upgrade (LPG); For electric vehicles 2 year MOT and £500 fuel charging points
 - Includes $£1k$ per black cab * 770 vehicles (*17% of fleet upgraded to LPG = 140 cabs plus 77% upgraded to ULEV through 0% loans = 630 cabs*) = £770k
 - Plus $£500$ per car based taxi * 1,890 vehicles = £945k
 - Cost of measure: £1,715k from Clean Air Fund
 - Type of measure: In-kind contribution
- Providing incentives to taxis – RMBC
 - A range of grant incentives similar to above
 - $£250$ per non ULEV car based taxi in Rotherham * 466 vehicles (60% of fleet upgrade)
 - Fleet = 776 vehicles
 - Cost of measure: £116.5k from Clean Air Fund
 - Type of measure: In-kind contribution
- Implementing changes to taxi policy – RMBC
 - $£50k$ – from the Implementation Fund – to cover the costs of consulting on and introducing a change to Rotherham’s Taxi Licensing Policy, to ensure consistency with the corresponding SCC policy
- Retro-fit existing bus fleet – SCC
 - Non-Euro 6 diesel bus retrofit
 - 212 buses @ $£18k$ per vehicle
 - Cost of Measure: $£3,816k$: $£3m$ from Clean Bus Technology Fund, $£816k$ from Implementation Fund
 - Type of measure: Grant
- Retro-fit existing bus fleet – RMBC
 - 51 buses * $£18k$ per vehicle
 - Cost of Measure: $£918k$ from Implementation Fund
 - Type of measure: Grant
- New buses in Sheffield – Stagecoach
 - 20 new vehicles at $£175.9k$ per vehicle
 - Costs of measure: $£3,518k$
 - Complementary private sector investment
- New buses in Sheffield - Smaller Operators
 - 31 buses @ $£60k$ per vehicle
 - Cost of measure: $£ 1,860k$

- 30% funded through the Implementation Fund (£558k); 70% private sector investment (£1,302k)
 - Type of measure: Grant
- Funding for the incentives to LGV Owners – SCC
 - Size of fleet: 8,200 vehicles
 - 25% of fleet require incentive
 - £1k per vehicle
 - Cost of measure: £2,050k from Clean Air Fund
 - Type of funding: Grant
- Measures associated with Road-based Infrastructure:
 - Optimising the signal timings from an emissions perspective, the funding will enable further studies to be completed.
 - HGV restrictions on Wortley road in Rotherham
 - Junction improvements and bus priority measures to enhance the parallel route to Rawmarsh Hill in Rotherham
- Implementation of a revised parking policy in Sheffield
 - The modelling of the Preferred Option has assumed a 5-minute 'generalised time' has been added to the cost of parking inside Charging Area 3, to help encourage some of the car trips to choose alternative modes, which is likely to be implemented as an extension of the Controlled Parking Zone
 - This is unlikely to happen quickly enough under Business as Usual assumptions to help achieve compliance in 2021, so some funding will be required as part of the CAZ Implementation scheme to accelerate this parking restraint measure
 - A nominal £200,000 has been assumed in the funding model, split 50/50 between the Implementation Fund and local SCC funding, to support the initial preparatory work to identify the changes to the current controlled parking zones in Sheffield which are likely to provide the most cost-effective reduction in NO_x emissions within the areas at most risk of having non-compliant air quality
 - It is expected that the actual delivery of the resulting parking controls would be at worst cost-neutral (i.e. have costs which are covered by the increased parking revenue they generate), but this would be confirmed by the Study which is funded by the £200K highlighted above. There may also be a need for some short-term borrowing, to fund the new infrastructure before the additional parking or CAZ charging revenue is generated. This scheme will therefore need to be reviewed and refined between the submission of the OBC and FBCs, to reduce the various uncertainties.
- Charging infrastructure
 - The (current version of the) Preferred Option assumes the following additional charging infrastructure for electric vehicles:
 - The £1.16m package of funding to enhance the network of public chargers in Sheffield and Rotherham, funded by the Early Measures Fund;
 - The £650K package of Rapid Chargers for electric taxis in Sheffield, as detailed in a bid submitted to OLEV at the end of November 2018;

- A further 2 x £650K follow-up package of rapid chargers for Sheffield taxis, when the rate of uptake of plug-in electric taxis in Sheffield and the use of the initial set of on-street rapid chargers by the ‘early adopters’ of the first wave of electric taxis in Sheffield is known;
 - An additional £300K for public chargers in Sheffield – details to be confirmed by ‘Charger Strategy’ to be developed by SCC; - 75% of these costs are currently assumed to be covered by OLEV, with the remaining 25% to be funded by the private sector;
 - An additional £200K for public chargers in Rotherham – details to be confirmed by a ‘Charger Strategy’ to be developed for RMBC - these costs are currently assumed to be shared 75%/25% between OLEV and the private sector; and
 - An additional £100K of charging infrastructure for the operators of large fleets of (Light) Goods Vehicles in central Sheffield who are willing to switch to an electric fleet – details of likely demand and eligibility criteria etc. to be determined by the Statutory Public Consultation / Stakeholder consultation process – the current version of the funding model assumes these costs are split 75%/25% between OLEV and the fleet owners.
- **Communications Campaign**
 - The current assumptions regarding the Communications Plan and Hearts & Minds campaigns are summarised in the table below.

Table 5. *Current Estimate of the Preferred Option Communications -related Costs*

Component	Cost Estimate	
SCC Hearts & Minds Comms - EMF - SCC (already awarded)	£ 40,000	
SCC Hearts & Minds Comms - EMF - RMBC (already awarded)	£ 40,000	
H&M Campaigns - 2019 - SCC residents	£ 264,000	
H&M Campaigns - 2020 - SCC residents	£ 528,000	
H&M Campaigns - 2021 - SCC residents	£ 264,000	
Targetting goods vehicle owners (to encourage upgrading)	£ 40,000	pa
Stakeholder Engagement & Public Consultation - SCC	£ 46,000	
Stakeholder Engagement & Public Consultation -RMBC	£ 34,500	
General Comms - OBC	£ 83,400	
General Comms - FBC (per annum)	£ 88,700	
H&M/Ecostars campaigns to persuade other big fleets to upgrade - per annum	£ 60,000	pa

- **Monitoring and Evaluation**

- The current assumptions regarding measures designed to monitor the impacts of the various measures (e.g. to check that we are on track to achieve the fleet upgrades required to achieve the required reductions in traffic emissions) and to feed into the evaluation of the full CAZ package are summarised in the table below.

Table 6. *Proposed Components of the Monitoring and Evaluation Program*

Component	Cost Estimate	
M&E EMF - SCC (already awarded)	£	45,000
M&E EMF - RMBC (already awarded)	£	20,000
M&E_Maintain existing ANPR cameras_SCC	£	17,000 pa
M&E_Maintain existing ANPR cameras_RMBC	£	8,000 pa
M&E_Regular analysis of ANPR data - SCC	£	15,000 pq
M&E_Regular analysis of ANPR data - RMBC	£	7,500 pq
M&E_Checking compliance with Rotherham schemes	£	20,000 pa
M&E_Strengthening the AQ Monitoring/Modelling Teams_SCC	£	50,000 pa
M&E_Strengthening the AQ Monitoring/Modelling Teams_RMBC	£	50,000 pa
M&E_Regular analysis of AQ data_SCC	£	7,500 pq
M&E_Regular analysis of AQ data_RMBC	£	7,500 pq
M&E_Campaign Awareness Research_SCC	£	80,000
M&E_Behavioural Change Monitoring/Evaluation_SCC	£	80,000

- **Financial Management – Loan Finance Offer**

The OBC allows for a provision of funding enabling delivery of an interest free loan scheme to a proportion of the drivers that will be affected by the CAZ. The scheme has been modelled over a 5 year repayment period with a 7% cost of capital which forms the financial ask in the preferred option.

The 7% cost of capital is assumed to cover the commercial interest charged by a 3rd party loan finance provider and includes an allowance for bad debt included within this rate. This is an outline model and is currently being tested and developed further with intelligence

from the financial services market to formalise how this loan finance scheme would be delivered and the associated costs.

The OBC model loan book is calculated at £123m broken down as per below, further assumptions on the fleet and uptake per vehicle group are detailed below the table:

Table 7. Estimates of the Costs of Providing Interest Free Loans – Preferred Option (CAZ 3C⁺)

	Cost	Contingency
Loans for taxis	£ 71,145,360	£ 9,430,150
Predicted cost of these loans for taxis	£ 12,450,438	£ 1,650,276
Loans for buses	£ 1,302,000	£ 651,000
Loans for LGVs	£ 36,490,000	£ 7,298,000
Loans for HGVs	£ 14,120,000	£ 2,824,000
Total interest free Loans- Other	£ 51,912,000	£ 10,773,000
Predicted cost of these loans	£ 9,084,600	£ 1,885,275
Total interest free Loans issued (all categories)	£ 123,057,360	£ 20,203,150
Total Interest cost of loans (all categories)	£ 21,535,038	£ 3,535,551

- **Interest on the loans – taxis**
 - **Black cab ULEV** upgrade cost £50.6k (assumes £5k residual value for current vehicle)
 - 77% fleet upgrade = 630 vehicles
 - Black cab upgrade loan amount (£50,600 x 630) = £31,878k
 - **SCC Car based taxi ULEV** upgrade cost £19.8k
 - 98% fleet upgrade = 1,890 vehicles
 - Loan amount (£19,800 x 1,890) = £37,422k
 - **RMBC Car based taxi ULEV** upgrade:
 - 60% fleet upgrade = 466 vehicles
 - 20% offered loan
 - Loan amount (£19,800 x 466 x 20%) = £1,845k
 - Total loans to taxis (£31,878 + £37,422k +£ 1,845k) = £71,145k
 - **Cost of measure (interest) £12,450k funded from Implementation Fund**
- **Interest on the loans – buses**
 - 31 buses (smaller operators)
 - Cost of new bus £42k
 - Total loans to smaller bus operators (£42k x 31) : £1,302k
 - **Cost of measure (interest) £228k funded from Clean Air Fund**
- **Interest on the loans –LGV**
 - 50% of LGV fleet need interest free loan: 4,100 vehicles
 - £8.9k cost of vehicle upgrade
 - Total loans to LGVS (£8.9k x 4,100) = £36,490k
 - **Cost of measure (interest) £6,386k funded from Clean Air Fund**
- **Interest on the loans - HGV**
 - 20% rigid HGVs use interest free loan: 380 vehicles
 - £28k cost to upgrade Rigid HGV

- 10% Articulated HGVs use interest free loan: 100 vehicles
- £34.8k cost to upgrade Arctic HGV
- Total loans to LGVs ($£28k \times 380 + £34.8k \times 100$) = £14,120k

Cost of measure (interest) £2,471k funded from Clean Air Fund

- **Contingency – loan interest**
 - A contingency provision has been calculated for the loan interest within the model which is designed to account for an additional uptake in the loans and the associated interest cost.
 - For black cabs the worst case for loans has been calculated by taking the assumption that 100% of the fleet would need the loan not just the 77% after accounting for retrofits
 - For PHVs, an additional uptake of 2% in Sheffield and a further 4% in Rotherham
 - For buses, LGVs and HGVs, an assumption of an additional 20% has been used
 - This builds an additional loan value of £20,203k into the model to give a cost of interest on this contingency of £3,535k in total.
 - The OBC submission split this contingency between the Implementation Fund and Clean Air Fund 60/40; following JAQU guidance, the contingency provision is now allocated in the same way as the loan interest for the category is split as previously described, i.e.
 - Taxis – Implementation Fund
 - Buses – Clean Air Fund
 - LGVs – Clean Air Fund
 - HGVs – Clean Air Fund
- The 'ask' for **Project & Financial Management** is £1,884k, split over various components as follows:
 - Managing the Early Measures Fund grant: £3k (already awarded)
 - Managing the various incentives schemes: 5% of the predicted total value of the incentives being offered = $£3,765k \times 0.05 = £188k$ (SCC) and $£116.5k \times 0.05 = £6k$ (RMBC)
 - Programme Management & Commercial Services (SCC): £1,467k – see [Table 8Table 9](#) below for a detailed breakdown of this total
 - Programme Management & Commercial Services (RMBC): £220k (= 15% of the £1,467k SCC value)
- 20% contingency has been applied to the two Programme Management & Commercial Services costs (giving £293k and £44k respectively)
- £81,600 Contingency (=20%) has been added to the £408K estimated cost of the signage of the CAZ.
- 20% Optimism Bias/Contingency has been added to the estimated costs of the major highways works in Sheffield and Rotherham (£452k in total).

Table 8. Breakdown of the SCC Programme Management and Commercial Services Budget Estimate

CAZ - SCC & RMBC shared measures - programme and project delivery resource - 1st July 2019 > completion 2021					
V0.06					
Description	< 1st July 2019 (6mths)	2020 (12 months)	> 31st March 2021 (3 months)**	sub-total minus inflation	Notes
CAZ resource - SCC / RMBC shared					
Programme Manager (CDS) - 1 x FT equivalent	42,750	85,500	21,375	149,625	Per month cost (2018) inc % to cover back-fill via delivery partner. CDS resource sub-total £1,048,427
Project Management (CDS) - 2 x FT equivalent	99,996	199,992	49,998	349,986	
Budget Monitoring (CDS) - 50 hrs / month	9,000	18,000	4,500	31,500	
Business Support (CDS) - 100 hrs / month	12,000	24,000	3,000	39,000	
Project Officer support (CDS) - 1 x FT equivalent	38,478	76,956	19,239	134,673	
Stakeholder Coordination - 1 x FT equivalent	38,478	76,956	19,239	134,673	Combination of PM and Business support rate
Cost Management - 1 x FT equivalent	42,750	85,500	21,375	149,625	Assumes £400 fee / day for 7 days / month
Delivery partner back-fill admin fee				24,727	2.5% on CDS resource costs above
Commercial Services	12,000	24,000	6,000	42,000	Assuming same fee as per OBC / FBC
Financial Services	24,000	48,000	12,000	84,000	Assumed 3 x requirement to that for the OBC / FBC
Legal Services	12,000	24,000	6,000	42,000	
Technical - Highways & Transport - design, supervision, maintenance contract management (AMEY)				75,000	Nominal sum - 7.5% assuming delivery value of £1m
Technical - ANPR quality assurance, specialist support and system integration to support client / senior user				140,000	Nominal sum - assuming 7% on £2m capital delivery value
Technical - ANPR -system - strategic systems integration / coordination				70,000	Nominal sum - assuming 7% on £1m system / back office value
sub-total				1,466,809	
Plus 15% RMBC				220,021	15% of the SCC value
sub-total				1,686,831	
contingency allowance 20 %				337,366	
Total				2,024,197	1.0600
				Rounded value - SCC	
				1,467,000	
				Rounded value - RMBC	
				220,000	

CAZ C+ vs CAZ D Differences and Funding Approach

The costs and funding for the two packages of measures have been calculated in the same way; both scenarios cover the same measures on the whole with a few differences between the two. These differences are highlighted and summarised in the detailed table which appeared earlier in this document.

The key differences in the two scenarios and the funding allocation is summarised below in table 9.

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Table 9. Summary of the key differences between CAZ C+ and CAZ D

Item	Authority	CAZ C+				CAZ D				CAZ C+ vs CAZ D difference	CAZ D - CAZ C		
		Individual Cost	Implementation Fund	Clean Air Fund	Other	Individual Cost	Implementation Fund	Clean Air Fund	Other		IF	CAF	Funding allocation
Providing incentives to taxis	SCC	1,715	-	1,715	-	1,608	-	1,608	-	*	-	- 108	Same funding allocation
Providing incentives to taxis	RMBC	117	-	117	-	39	-	39	-	*	-	- 78	Same funding allocation
Funding for the incentives to LGV Owners	SCC	2,050	-	2,050	-	-	-	-	-	*	-	- 2,050	Not needed in CAZ D
Implement a revised parking policy in SCC	SCC	200	100	-	100	-	-	-	-	*	- 100	-	Not needed in CAZ D
H&M Campaigns - 2020	SCC	528	528	-	-	264	264	-	-	*	- 264	-	Same funding allocation
H&M Campaigns -2021	SCC	264	264	-	-	-	-	-	-	*	- 264	-	Not needed in CAZ D
Targetting local goods vehicle owners (to encourage upgrading)	SCC	80	80	-	-	-	-	-	-	*	- 80	-	Not needed in CAZ D
Stakeholder Engagement & Public Consultation - OBC	SCC	46	46	-	-	69	69	-	-	*	23	-	Same funding allocation
Stakeholder Engagement & Public Consultation - OBC	RMBC	35	35	-	-	25	25	-	-	*	- 10	-	Same funding allocation
Stakeholder Engagement & Public Consultation - FBC	RMBC	-	-	-	-	25	25	-	-	*	25	-	Needed in CAZ D
General Comms - OBC	SCC	83	83	-	-	125	125	-	-	*	42	-	Same funding allocation
General Comms - FBC (per annum)	SCC	266	266	-	-	399	399	-	-	*	133	-	Same funding allocation
Hearts & Minds/Ecostars on big HGV fleets	RMBC	120	120	-	-	-	-	-	-	*	- 120	-	Not needed in CAZ D
Interest on the loans - car	SCC	-	-	-	-	13,292	-	13,292	-	*	-	13,292	New in CAZ D
Interest on the loans - taxi	SCC	12,450	12,450	-	-	11,338	-	11,338	-	*	- 12,450	11,338	Moves to CAF in CAZ D
Back office Running Costs	SCC	1,200	1,200	-	-	3,475	3,475	-	-	*	2,275	-	Same funding allocation
<i>Charging revenue used to fund the Back Office</i>		- 1,200	- 1,200	-	-	- 3,475	- 3,475	-	-	*	- 2,275	-	Same funding allocation
Managing the Various Incentive Programs	SCC	188	-	188	-	80	-	80	-	*	-	- 108	Same funding allocation
Managing the Various Incentive Programs	RMBC	6	-	6	-	2	-	2	-	*	-	- 4	Same funding allocation
Programme Management & Commercial Services	SCC	1,467	1,467	-	-	1,834	1,834	-	-	*	367	-	Same funding allocation
Programme Management & Commercial Services	RMBC	220	220	-	-	275	275	-	-	*	55	-	Same funding allocation
Programme Management & Commercial Services - Contingency	SCC	293	293	-	-	367	367	-	-	*	73	-	Same funding allocation
Programme Management & Commercial Services - Contingency	RMBC	44	44	-	-	55	55	-	-	*	11	-	Same funding allocation
Interest on the taxi loans - Contingency	SCC	1,650	1,650	-	-	2,677	-	2,677	-	*	- 1,650	2,677	Revised allocation to fit vehicle sector
Interest on the other veh type loans - Contingency	SCC	1,885	-	1,885	-	4,544	-	4,544	-	*	-	2,658	loan interest allocation between funds
		23,708	17,647	5,961	100	37,016	3,438	33,578	-	*	- 14,209	27,618	

- Less incentives are offered to taxis in CAZ 3D, as the extension of the CAZ to include private cars reduces the need for full ULEV compliance of the taxi fleet. The cost of the scenarios therefore differs but the split between the CAF and IF funding remains the same. However, it is likely that the policy position on the need to upgrade the taxi fleet would be to achieve a ULEV standard so that a key fleet across the City Centre was upgraded to the most sustainable standards available, thereby aligning with the Road to Zero and the Climate Change Carbon reduction requirements. In practice if a CAZ 3D were required we would need funding as per the CAZ 3C⁺ for taxis and PHVs;
- No funding incentives offered to LGVs within CAZ 3D as the extension of the CAZ to include private cars reduces the need for the assumed level of compliance of the LGV fleet. This reduces the CAF ask in the CAZ D scenario;
- No parking policy change assumed in the CAZ 3D option – as we have assumed that applying the £10/day CAZ Charge to private cars will provide the necessary ‘incentive’ to reduce car use. This reduces the IF ask in the CAZ 3D scenario;
- Communications campaign costs are lower in the CAZ 3D, as there is less need to influence private car behavioural change through communications, as a large shift away from the most-polluting vehicles will be achieved via the CAZ charge. This reduction reduces the Implementation Fund ask in the 3D scenario; and
- The interest on the loans is £13m more due to offering financial support to private car drivers in the CAZ 3D scenario and would be funded from the CAF. The loan scheme for taxis is assumed to be funded via the Implementation Fund in the CAZ 3C⁺ option, due to the need to improve air quality at locations close to taxi ranks and on Arundel Gate, while these loans are considered to be more ‘discretionary’ for other vehicle types, due to the likelihood of achieving over-compliance (and are therefore allocated to the Clean Air Fund in the CAZ 3D package). This is the main swing between the funding pools plus the related contingency relating to the interest which has been split between the pots accordingly.

3. Further Details of the Representation of the Packages in the Transport & Emissions Models

The tables below summarise all of the components incorporated with the transport and/or emissions modelling for the Preferred Option (CAZ 3C+) and the CAZ 3D variant. Further details of these schemes and measures re provided in Supporting Document SD17 (Contents of the Preferred Option) of the OBC.

The tables also highlight the main differences between the two packages.

Category/ Mode	Local Authority	Component	Description of SRTM3B modelling		Change?
			Cordon 3 - CAZ C+	Cordon 3 - CAZ D	
CAZ	SCC	Area	Cordon 3, An area covering Sheffield Inner Ring Road.	Cordon 3, An area covering Sheffield Inner Ring Road.	
	SCC	Daily Charges	£10 LGV, £50 HGV	£10 cars & LGV, £50 HGV	✓
	Both (trips to/from CAZ)	Responses (JAQU or local)	Local - see below for details	Local - see below for details	
	Both (trips through theCAZ)	Responses (JAQU or local)	Local - see below for details	Local - see below for details	
Private Cars	SCC	Changes to fleet	Downward trend in diesel sales continues beyond 2018, leading to a further 4% shift from diesel to non-diesel cars - see 'Predicting Future Diesel' Technical Note for further details	55% of non-compliant vehicles which have to enter the CAZ upgrade to CAZ-compliant	✓
	SCC	Variable Demand Model (VDM) (Yes/No)	No	Yes	✓
	RMBC	Upgrading fleet	Latest Business as Usual assumptions regarding the future private car fleet	Latest Business as Usual assumptions regarding the future private car fleet	
	RMBC	Changes to matrix	None	None	
	RMBC	Variable Demand Model (VDM) (Yes/No)	No	Yes	✓
	External	Upgrading fleet	None	None	
	External	Changes to matrix	None	None	
	External	Variable Demand Model (VDM) (Yes/No)	No	Yes	✓
Taxis	SCC	Black Cabs - changes to fleet	After upgrades fleet is: LPG = 62.4% Electric = 31.2% Existing diesel black cabs = 6.4%	After upgrades fleet is: LPG = 62.4% Electric = 31.2% Existing diesel black cabs = 6.4%	
	SCC	Car-based - changes to fleet	60% upgrade to ULEV, 40% as expected fleet mix in 2021	60% upgrade to ULEV, 40% as expected fleet mix in 2021	
	RMBC	Car-based - changes to fleet	60% upgrade to ULEV, 40% as expected fleet mix in 2021	60% upgrade to ULEV, 40% as expected fleet mix in 2021	
	Both	Other modelling changes	None	None	
Buses	SCC	Changes to fleet	All buses upgraded to Euro 6 (or Euro 6 equivalent retrofit) in fleet mix	All buses upgraded to Euro 6 (or Euro 6 equivalent retrofit) in fleet mix	
	RMBC	Changes to fleet	All buses upgraded to Euro 6 (or Euro 6 equivalent retrofit) in fleet mix	All buses upgraded to Euro 6 (or Euro 6 equivalent retrofit) in fleet mix	
LGVs	Private_Sector	Changes to LGV Fleet	None over and above CAZ impact	None over and above CAZ impact	
	Private_Sector	Changes to matrix	None	None	
HGVs	Private_Sector	Changes to HGV Fleet	None over and above CAZ impact	None over and above CAZ impact	
	Private_Sector	Changes to matrix	None	None	

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Category/ Mode	Local Authority	Component	Description of SRTM3B modelling		Change?
			Cordon 3 - CAZ C+	Cordon 3 - CAZ D	
Roads	SCC	Signal timings SCC EMF	Not modelled	Not modelled	
	SCC	Signal timings on Derek Dooley Way	Improved in SATURN modelling to allow more free flowing traffic	Improved in SATURN modelling to allow more free flowing traffic	
	RMBC	50mph on Parkway	Included (as helps to ensure compliance in the CAZ 3C test)	Not included (as compliance achieved by the additional change to the car fleet)	✓
	RMBC	Signal timings on Fitzwilliam Road	Not modelled	Not modelled	
	RMBC	Junction improvements and bus priority to support bus diversion from Rawmarsh Hill	Change in bus flows included in model - but no junction improvements modelled	Change in bus flows included in model - but no junction improvements modelled	
	RMBC	HGV Northbound on Wortley Road	Banned northbound in SATURN model	Banned northbound in SATURN model	
	RMBC	Parkgate Link Road	Not included (as assumed not open by mid-2021)	Not included (as assumed not open by mid-2021)	
Parking	SCC	Changes in parking costs/availability	5 minute Increase in generalised costs in Sheffield City Centre zones	No change in parking costs included	✓
Fuel Profile of Private Car Fleet*	SCC	20% (C+) / 10% (D) switch from diesel to petrol (car) - picked up in the fleet changes	Keep same fleet age and profile but assume 20% of diesel car trips switch to non-diesel within Sheffield City Area (see %Diesel Technical Note* for details)	Keep same fleet age and profile but assume 10% of diesel car trips switch to non-diesel within Sheffield City Area (in addition to CAZ effect)	✓
	RMBC	10% switch from diesel to petrol (car) - picked up in the fleet changes	Keep same fleet age and profile but assume 10% of diesel car trips switch to petrol within RMBC Area*	Keep same fleet age and profile but assume 10% of diesel car trips switch to petrol within RMBC Area (in addition to CAZ effect)	
	Both	15% (C+) / 10% (D) switch from diesel to petrol (car) on parkway - picked up in the fleet changes	Keep same fleet age and profile but assume 15% of diesel car trips switch to petrol on the Parkway. This is to reflect the fact that 50% of the traffic is likely to come from Sheffield and 50% from Rotherham (excluding external trips)	Keep same fleet age and profile but assume 10% of diesel car trips switch to petrol on the Parkway (in addition to CAZ effect)	✓
Response of non-compliant vehicles which need to enter the CAZ Area					
	Both	Car	N/A	Local: Upgrade: 55%, Change Mode or Destination or Pay (based on Variable Demand Model (VDM)): 45%	✓
	Both	LGV	Local: Upgrade: 39% Pay: 61%	Local: Upgrade: 39% Pay: 61%	
	Both	HGV	JAQU: Upgrade: 83%, Pay: 13%, No Trip: 4%	JAQU: Upgrade: 83%, Pay: 13%, No Trip: 4%	
	Both	PHV	Local: Upgrade: 94%, Pay: 6%	Local: Upgrade: 94%, Pay: 6%	
	Both	Black Cab	Local: Upgrade: 82%, Pay: 18%	Local: Upgrade: 82%, Pay: 18%	
Response of non-compliant vehicles which travel through the CAZ Area					
	Both	All relevant vehicle types	50% of the upgrade rates applied to the vehicles travelling to/from the CAZ area described above	50% of the upgrade rates applied to the vehicles travelling to/from the CAZ area described above	

* Forecasting the future petrol/diesel split of private cars in the Baseline and Do Something fleets is discussed in detail in a separate Technical Note (Predicting Future Diesel)

4. Concluding Remarks

This note has provided a detailed disaggregation and justification of the requested funding of the CAZ 3C⁺ Preferred Option, with comparisons with the CAZ 3D variant, where appropriate.

The full Preferred Option has been carefully designed to achieve area-wide compliance with the 40µg/m³ of NO₂ limit value in the shortest possible time. As a result, it should be considered as an integrated package, rather than as a list of stand-alone measures. It is on this basis that it has been approved by both Sheffield City Council and Rotherham Metropolitan Borough Council.

Finally, while we have undertaken some local behavioural research, we believe that further consultation with the relevant non-compliant vehicle owners will be required before the FBC is finalised, to help refine the level of incentives required to achieve the level of fleet upgrades required to achieve compliance.

Should any further clarification on any aspect of the preferred option be required we would be happy to provide it. However, we hope that the further disaggregation of the individual measures, the breakdown of their cost, the explanation of how they have been appraised in our modelling and the further information on the relative NO_x reduction benefits arising that are provided in the relevant technical supporting documents are sufficient to enable you to support our Preferred CAZ 3C⁺ Option.