



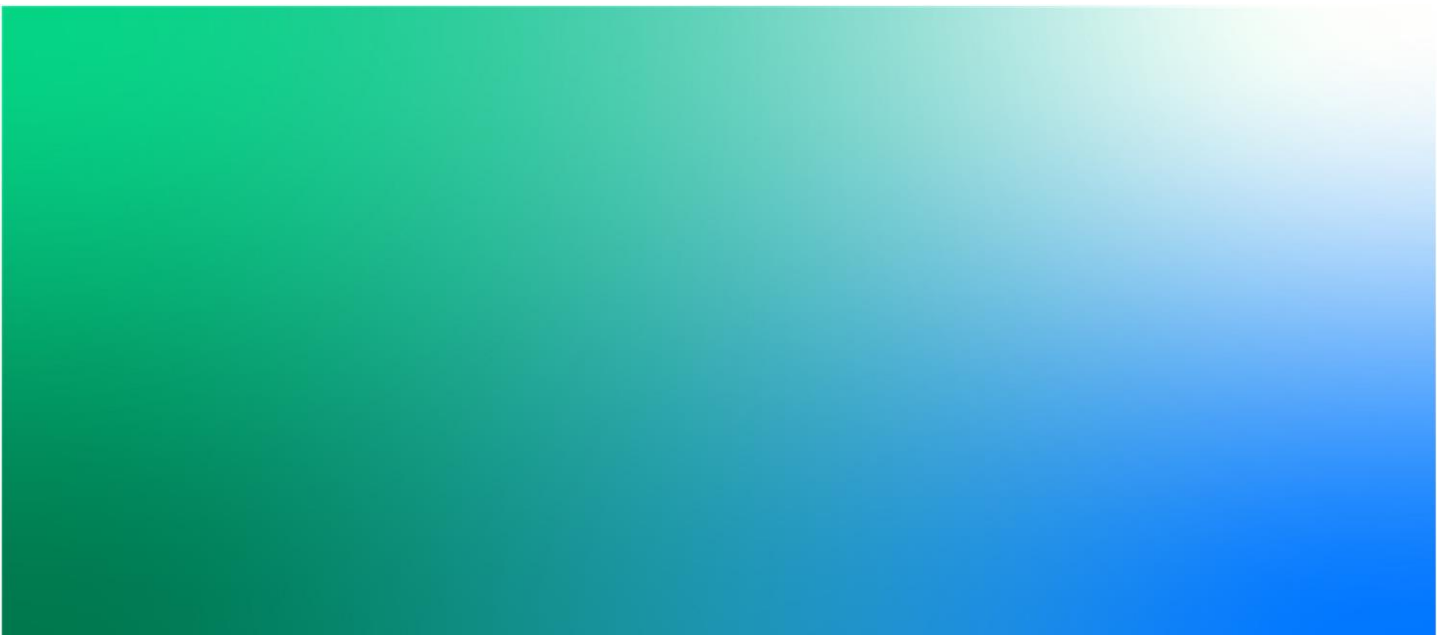
**Bristol City Council Clean Air Plan  
Full Business Case**

**Finance Report**

**FBC-41 | 12**

**July 2021**

**Bristol City Council**



## Bristol City Council Clean Air Plan

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# 1. Introduction

## 1.1 Disclaimer

The financial case sets out the anticipated costs of the scheme based on the current scheme design (including both charging and non-charging measures) as of June 30th 2021. It will set out the current understanding of the financial situation and outline the resources available for the project including all available funding sources (the primary sources of funding considered in the financial model are the Clean Air Fund and Implementation Fund).

A financial model was prepared to profile the scheme costs (capital and operational) against the funding sources and revenue from the CAZ. This model provides an approximation of the level of revenue that could be accumulated from the CAZ. The financial model is based on the traffic and air quality modelling outputs, and so the accuracy will be no greater than the accuracy of the transport and air quality models, which contain a number of limitations. Further, the financial model is predicated on key operational assumptions provided by BCC based on their experience of administering similar projects (in particular, parking and bus lane enforcement). The financial model is suitable to indicate whether the revenue from the CAZ is likely to be sufficient to cover the operating costs based on these key assumptions, but it does not give an accurate forecast of the revenue from the scheme. Jacobs does not therefore take responsibility for the accuracy of this financial model.

## 1.2 Background and Context

Poor air quality is the largest known environmental risk to public health in the UK<sup>1</sup>. Investing in cleaner air and doing more to tackle air pollution are priorities for the EU and UK governments, as well as for Bristol City Council (BCC). The Mayor of Bristol has often cited Bristol's 'moral and legal duty' to improve air quality in the city and the administration recognises that achieving improved air quality is not solely a transport issue. Notwithstanding the Council's work on a Clean Air Zone, efforts have been made to make citizens more aware of – and take personal responsibility for – various sources of air pollution, from traffic fumes to solid fuel burning. The Mayor has articulated a 'call to action' for local people, businesses and organisations to consider how small changes can make a significant difference in cutting toxic fumes across the city. BCC has monitored and endeavoured to address air quality in Bristol for decades and declared its first Air Quality Management Area in 2001. Despite this, Bristol has ongoing exceedances of the legal limits for Nitrogen Dioxide (NO<sub>2</sub>) and these are predicted to continue until around 2027 without intervention.

The added context is that of the COVID-19 pandemic. Recent research suggests that poor air quality may be correlated with higher death / infection rates from COVID-19. This is further compounded by growing evidence that suggests that those from black, Asian and minority ethnic communities are more at risk of catching and dying from the virus and the fact that individuals from these communities are more likely to live in areas where air quality is poor. The challenge of maintaining public health and supporting economic recovery while also achieving legal air quality levels after lockdown restrictions are lifted will remain live and intersecting issues for the foreseeable future.

The UK Government continue to transpose European Union law into its Environment Bill<sup>2</sup>, to ensure that certain standards of air quality continue to be met, by setting air quality assessment levels (AQALs) on the concentrations of specific air pollutants. It's very unlikely that these AQALs will differ to EU Limit Values prescribed by the European Union's Air Quality Directive and transcribed in the UK's Air Quality Standards Regulation 2010. Therefore, these Limit Values will remain in enforcement post-Brexit. In common with many EU member states, the EU Limit Value for annual mean nitrogen dioxide (NO<sub>2</sub>) is breached in the UK and there are on-going breaches of the NO<sub>2</sub> limit value in Bristol. The UK government is taking steps to remedy this breach in as short a time as possible, with the aim of reducing the harmful impacts on public health. Within this objective, the Government has published a UK Air Quality Plan and a Clean Air Zone Framework, both originally published in 2017 (noting there have been subsequent revisions). The latter document provides the expected approach for local authorities when implementing and operating a Clean Air Zone (CAZ). The following business cases have been submitted to JAQU for the Clean Air Plan; Strategic Outline Case (April 2018), and an Outline Business Case (November 2019 and updated between April and June 2020). The Full Business Case (FBC) was submitted in February 2021.

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<sup>1</sup> Public Health England (2014) Estimating local mortality burdens associated with particular air pollution.

<https://www.gov.uk/government/publications/estimating-local-mortality-burdens-associated-with-particulate-air-pollution>

<sup>2</sup> Environment Bill 2019-21 <https://services.parliament.uk/bills/2019-21/environment.html>

### **1.3 Purpose of this Report**

This document is written to support the updated Full Business Case and acts as a detailed appendix to the financial case presented in the main FBC document. It outlines the funding and expenditure requirements for the CAP, as well as outlining wider financial impacts and consequences of the proposed arrangement for BCC and Government. It is underpinned by a financial model (appended to this report), which profiles the scale and sources of proposed funding alongside the timing of expenditure. Explicitly, it details the revenue and capital needs (and associated profile) to deliver the project, within the context of the BCC's wider financial situation.

Earlier versions of this report were published in January 2019, October 2019 and June 2020 in support of the developing economic case published as part of the Strategic Outline Case, Outline Business Case, Revised Outline Business Case and draft Full Business Case.

This document reflects the updated Bristol Clean Air Zone modelling, including the modelled impacts of the Bristol Street Space Schemes on the Bristol highway network and Small CAZ D.

## 2. General Structure and Assumptions

### 2.1 Model Structure

In line with the Defra/DfT Joint Air Quality Unit (JAQU) Guidance<sup>3</sup>, the financial model comprises the following elements:

- Funding Profile – outlining the profile for capital and revenue funding requirements, split by funding source (including Implementation Fund, Clean Air Fund, BCC and other funding opportunities).
- Capital Expenditure Summary – providing detail on the cost and spending profile for capital assets delivered as part of Clean Air Plan implementation, split by funding source (as above).
- Operational Summary – providing detail on the cost and spending profile for ongoing operation of the Clean Air Plan, set against any revenues generated by the scheme elements to arrive at a net cash flow position.
- Impact on BCC Accounts – assessing the impact of the Clean Air Plan on BCC' income and expenditure account and balance sheet.

In addition to these standard financial model components, the model also contains a detailed Bill of Quantities (BoQ), which drives the cost estimates for CAPEX and OPEX. The BoQ is underpinned by the cost estimates provided in FBC33 'Project Costs' in Appendix J of the FBC. Further, the model provides detailed analysis around the costs associated with enforcing CAZ regulations and dealing with any contraventions, based on BCC advice and experience on similar projects (e.g. car parking/bus lane enforcement). Detailed consideration of these issues is required due to the convoluted and potentially costly nature of enforcement, particularly related to the Penalty Charge Notice (PCN) process for individuals in contravention of the Clean Air Plan's proposed regulations. More detail on this analysis is provided below.

### 2.2 Approach to Analysis

A financial model was developed for the preferred intervention option, i.e.

- Small Area Class D CAZ (charging non-compliant cars, buses, coaches, taxis, HGVs and LGVs);
- Fast Track measures;
  - a) Closure of Cumberland Road inbound to general traffic; and
  - b) Holding back traffic to the city centre through the use of existing signals.

The financial modelling for the operational phase of the CAP assumes that the CAZ scheme is in operation over two horizons:

- Short operational period from June 2022 to December 2024<sup>4</sup>; and
- Ten year operation from June 2022 to May 2031 (i.e. end of appraisal period).

The shorter operational period recognises that the CAP is anticipated to reduce the annual mean concentrations of NO<sub>2</sub> to below the EU limit value threshold by 2023. Continuing the scheme until September 2024 will allow a further period of consolidation of NO<sub>2</sub> concentrations, supporting a stabilised, long-run concentration level within the EU limit values. The longer operational period is also considered to reflect the potential for the CAP to be extended into a long-term programme and to ensure steady-state compliance with EU limit values. This longer operational period could provide transport operators with a more stable environment in which to make investment decisions.

With reference to the longer term operational period in particular, it is acknowledged that the schemes are forecast to achieved compliance well before 2030. Hence, the scale of revenues and costs are both expected to diminish towards the end of the appraisal period.

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<sup>3</sup> Outline Business Case Workshop, May 2018

<sup>4</sup> Given that compliance is assumed to be achieved by end of 2023, the shorter operational period is defined as June 2022 to December 2024 (i.e. 'compliance year + 1')

### 3. Capital Expenditure Summary

A central estimate for scheme implementation cost is £53.2 million (2021 prices). Given some capital expenditure (CAPEX) is expected to take place in 2022, a minor inflation adjustments is made to this estimated cost to generate outturn costs of £54.1 million<sup>5</sup>. Note that around 12% of the capital funding request will be targeted towards the Implementation Fund. The remainder will be targeted towards the Clean Air Fund.

Tables 3.1 and 3.2 present a summary of how the CAPEX estimate is built up, split by broad theme and funding source. A more detailed breakdown of CAPEX costs is provided in BoQ format in FBC33: Project Costs, which forms Appendix J of the FBC.

Table 3-1: CAPEX by broad theme and funding source (£2021 prices)

CAPEX Item	Implementation Fund	Clean Air Fund	Total
Enforcement System	773,521		<b>773,521</b>
Street Works	1,932,939		<b>1,932,939</b>
CAZ Project Delivery and Ongoing Operational Management Team (staff resources)	1,552,881		<b>1,552,881</b>
CAZ Publicity and Advertising	462,200		<b>462,200</b>
Other CAPEX	20,149		<b>20,149</b>
Non-Charging Measures - Implementation Fund	630,250		<b>630,250</b>
Non-Charging Measures – Clean Air Fund		46,629,169	<b>46,629,169</b>
QRA (P80)	1,225,000		<b>1,225,000</b>
<b>Total</b>	<b>6,596,940</b>	<b>46,629,169</b>	<b>53,226,109</b>

Table 3-2: CAPEX by broad theme and funding source (£outturn prices)

CAPEX Item	Implementation Fund	Clean Air Fund	Total
Enforcement System	787,058		<b>787,058</b>
Street Works	1,966,766		<b>1,966,766</b>
CAZ Project Delivery and Ongoing Operational Management Team (staff resources)	1,575,398		<b>1,575,398</b>
CAZ Publicity and Advertising	470,289		<b>470,289</b>
Other CAPEX	20,502		<b>20,502</b>
Non-Charging Measures - Implementation Fund	641,279		<b>641,279</b>
Non-Charging Measures – Clean Air Fund		47,445,180	<b>47,445,180</b>
QRA (P80)	1,225,000		<b>1,225,000</b>
<b>Total</b>	<b>6,686,290</b>	<b>47,445,180</b>	<b>54,131,470</b>

The scale and profile of expenditure is outlined in Table 3-3 which provides a more comprehensive Capital Expenditure Summary for the project. Further detail on cost estimation is provided in FBC33 which forms Appendix J of the FBC.

<sup>5</sup> CAPEX inflation is estimated at 3.5% per calendar year, based on BCIS tender price forecasts

Table 3-3: Capital Expenditure Summary (£)

Capital Expenditure Summary	Current Prices	100% Cost Passback	£m
<b>ENVIRONMENTAL STUDIES</b>			
<ul style="list-style-type: none"> <li>EA (EA 122)</li> <li>EA (EA 123)</li> <li>EA (EA 124)</li> <li>EA (EA 125)</li> <li>EA (EA 126)</li> <li>EA (EA 127)</li> <li>EA (EA 128)</li> <li>EA (EA 129)</li> <li>EA (EA 130)</li> <li>EA (EA 131)</li> <li>EA (EA 132)</li> <li>EA (EA 133)</li> <li>EA (EA 134)</li> <li>EA (EA 135)</li> <li>EA (EA 136)</li> <li>EA (EA 137)</li> <li>EA (EA 138)</li> <li>EA (EA 139)</li> <li>EA (EA 140)</li> <li>EA (EA 141)</li> <li>EA (EA 142)</li> <li>EA (EA 143)</li> <li>EA (EA 144)</li> <li>EA (EA 145)</li> <li>EA (EA 146)</li> <li>EA (EA 147)</li> <li>EA (EA 148)</li> <li>EA (EA 149)</li> <li>EA (EA 150)</li> <li>EA (EA 151)</li> <li>EA (EA 152)</li> <li>EA (EA 153)</li> <li>EA (EA 154)</li> <li>EA (EA 155)</li> <li>EA (EA 156)</li> <li>EA (EA 157)</li> <li>EA (EA 158)</li> <li>EA (EA 159)</li> <li>EA (EA 160)</li> <li>EA (EA 161)</li> <li>EA (EA 162)</li> <li>EA (EA 163)</li> <li>EA (EA 164)</li> <li>EA (EA 165)</li> <li>EA (EA 166)</li> <li>EA (EA 167)</li> <li>EA (EA 168)</li> <li>EA (EA 169)</li> <li>EA (EA 170)</li> <li>EA (EA 171)</li> <li>EA (EA 172)</li> <li>EA (EA 173)</li> <li>EA (EA 174)</li> <li>EA (EA 175)</li> <li>EA (EA 176)</li> <li>EA (EA 177)</li> <li>EA (EA 178)</li> <li>EA (EA 179)</li> <li>EA (EA 180)</li> <li>EA (EA 181)</li> <li>EA (EA 182)</li> <li>EA (EA 183)</li> <li>EA (EA 184)</li> <li>EA (EA 185)</li> <li>EA (EA 186)</li> <li>EA (EA 187)</li> <li>EA (EA 188)</li> <li>EA (EA 189)</li> <li>EA (EA 190)</li> <li>EA (EA 191)</li> <li>EA (EA 192)</li> <li>EA (EA 193)</li> <li>EA (EA 194)</li> <li>EA (EA 195)</li> <li>EA (EA 196)</li> <li>EA (EA 197)</li> <li>EA (EA 198)</li> <li>EA (EA 199)</li> <li>EA (EA 200)</li> </ul>			
<b>RESIDENT SERVICES</b>			
<ul style="list-style-type: none"> <li>EA (EA 201)</li> <li>EA (EA 202)</li> <li>EA (EA 203)</li> <li>EA (EA 204)</li> <li>EA (EA 205)</li> <li>EA (EA 206)</li> <li>EA (EA 207)</li> <li>EA (EA 208)</li> <li>EA (EA 209)</li> <li>EA (EA 210)</li> <li>EA (EA 211)</li> <li>EA (EA 212)</li> <li>EA (EA 213)</li> <li>EA (EA 214)</li> <li>EA (EA 215)</li> <li>EA (EA 216)</li> <li>EA (EA 217)</li> <li>EA (EA 218)</li> <li>EA (EA 219)</li> <li>EA (EA 220)</li> <li>EA (EA 221)</li> <li>EA (EA 222)</li> <li>EA (EA 223)</li> <li>EA (EA 224)</li> <li>EA (EA 225)</li> <li>EA (EA 226)</li> <li>EA (EA 227)</li> <li>EA (EA 228)</li> <li>EA (EA 229)</li> <li>EA (EA 230)</li> <li>EA (EA 231)</li> <li>EA (EA 232)</li> <li>EA (EA 233)</li> <li>EA (EA 234)</li> <li>EA (EA 235)</li> <li>EA (EA 236)</li> <li>EA (EA 237)</li> <li>EA (EA 238)</li> <li>EA (EA 239)</li> <li>EA (EA 240)</li> <li>EA (EA 241)</li> <li>EA (EA 242)</li> <li>EA (EA 243)</li> <li>EA (EA 244)</li> <li>EA (EA 245)</li> <li>EA (EA 246)</li> <li>EA (EA 247)</li> <li>EA (EA 248)</li> <li>EA (EA 249)</li> <li>EA (EA 250)</li> <li>EA (EA 251)</li> <li>EA (EA 252)</li> <li>EA (EA 253)</li> <li>EA (EA 254)</li> <li>EA (EA 255)</li> <li>EA (EA 256)</li> <li>EA (EA 257)</li> <li>EA (EA 258)</li> <li>EA (EA 259)</li> <li>EA (EA 260)</li> <li>EA (EA 261)</li> <li>EA (EA 262)</li> <li>EA (EA 263)</li> <li>EA (EA 264)</li> <li>EA (EA 265)</li> <li>EA (EA 266)</li> <li>EA (EA 267)</li> <li>EA (EA 268)</li> <li>EA (EA 269)</li> <li>EA (EA 270)</li> <li>EA (EA 271)</li> <li>EA (EA 272)</li> <li>EA (EA 273)</li> <li>EA (EA 274)</li> <li>EA (EA 275)</li> <li>EA (EA 276)</li> <li>EA (EA 277)</li> <li>EA (EA 278)</li> <li>EA (EA 279)</li> <li>EA (EA 280)</li> <li>EA (EA 281)</li> <li>EA (EA 282)</li> <li>EA (EA 283)</li> <li>EA (EA 284)</li> <li>EA (EA 285)</li> <li>EA (EA 286)</li> <li>EA (EA 287)</li> <li>EA (EA 288)</li> <li>EA (EA 289)</li> <li>EA (EA 290)</li> <li>EA (EA 291)</li> <li>EA (EA 292)</li> <li>EA (EA 293)</li> <li>EA (EA 294)</li> <li>EA (EA 295)</li> <li>EA (EA 296)</li> <li>EA (EA 297)</li> <li>EA (EA 298)</li> <li>EA (EA 299)</li> <li>EA (EA 300)</li> </ul>			
<b>PUBLICITY AND ADVERTISING</b>			
<ul style="list-style-type: none"> <li>EA (EA 301)</li> <li>EA (EA 302)</li> <li>EA (EA 303)</li> <li>EA (EA 304)</li> <li>EA (EA 305)</li> <li>EA (EA 306)</li> <li>EA (EA 307)</li> <li>EA (EA 308)</li> <li>EA (EA 309)</li> <li>EA (EA 310)</li> <li>EA (EA 311)</li> <li>EA (EA 312)</li> <li>EA (EA 313)</li> <li>EA (EA 314)</li> <li>EA (EA 315)</li> <li>EA (EA 316)</li> <li>EA (EA 317)</li> <li>EA (EA 318)</li> <li>EA (EA 319)</li> <li>EA (EA 320)</li> <li>EA (EA 321)</li> <li>EA (EA 322)</li> <li>EA (EA 323)</li> <li>EA (EA 324)</li> <li>EA (EA 325)</li> <li>EA (EA 326)</li> <li>EA (EA 327)</li> <li>EA (EA 328)</li> <li>EA (EA 329)</li> <li>EA (EA 330)</li> <li>EA (EA 331)</li> <li>EA (EA 332)</li> <li>EA (EA 333)</li> <li>EA (EA 334)</li> <li>EA (EA 335)</li> <li>EA (EA 336)</li> <li>EA (EA 337)</li> <li>EA (EA 338)</li> <li>EA (EA 339)</li> <li>EA (EA 340)</li> <li>EA (EA 341)</li> <li>EA (EA 342)</li> <li>EA (EA 343)</li> <li>EA (EA 344)</li> <li>EA (EA 345)</li> <li>EA (EA 346)</li> <li>EA (EA 347)</li> <li>EA (EA 348)</li> <li>EA (EA 349)</li> <li>EA (EA 350)</li> <li>EA (EA 351)</li> <li>EA (EA 352)</li> <li>EA (EA 353)</li> <li>EA (EA 354)</li> <li>EA (EA 355)</li> <li>EA (EA 356)</li> <li>EA (EA 357)</li> <li>EA (EA 358)</li> <li>EA (EA 359)</li> <li>EA (EA 360)</li> <li>EA (EA 361)</li> <li>EA (EA 362)</li> <li>EA (EA 363)</li> <li>EA (EA 364)</li> <li>EA (EA 365)</li> <li>EA (EA 366)</li> <li>EA (EA 367)</li> <li>EA (EA 368)</li> <li>EA (EA 369)</li> <li>EA (EA 370)</li> <li>EA (EA 371)</li> <li>EA (EA 372)</li> <li>EA (EA 373)</li> <li>EA (EA 374)</li> <li>EA (EA 375)</li> <li>EA (EA 376)</li> <li>EA (EA 377)</li> <li>EA (EA 378)</li> <li>EA (EA 379)</li> <li>EA (EA 380)</li> <li>EA (EA 381)</li> <li>EA (EA 382)</li> <li>EA (EA 383)</li> <li>EA (EA 384)</li> <li>EA (EA 385)</li> <li>EA (EA 386)</li> <li>EA (EA 387)</li> <li>EA (EA 388)</li> <li>EA (EA 389)</li> <li>EA (EA 390)</li> <li>EA (EA 391)</li> <li>EA (EA 392)</li> <li>EA (EA 393)</li> <li>EA (EA 394)</li> <li>EA (EA 395)</li> <li>EA (EA 396)</li> <li>EA (EA 397)</li> <li>EA (EA 398)</li> <li>EA (EA 399)</li> <li>EA (EA 400)</li> </ul>			
<b>RISK</b>			
<ul style="list-style-type: none"> <li>EA (EA 401)</li> <li>EA (EA 402)</li> <li>EA (EA 403)</li> <li>EA (EA 404)</li> <li>EA (EA 405)</li> <li>EA (EA 406)</li> <li>EA (EA 407)</li> <li>EA (EA 408)</li> <li>EA (EA 409)</li> <li>EA (EA 410)</li> <li>EA (EA 411)</li> <li>EA (EA 412)</li> <li>EA (EA 413)</li> <li>EA (EA 414)</li> <li>EA (EA 415)</li> <li>EA (EA 416)</li> <li>EA (EA 417)</li> <li>EA (EA 418)</li> <li>EA (EA 419)</li> <li>EA (EA 420)</li> <li>EA (EA 421)</li> <li>EA (EA 422)</li> <li>EA (EA 423)</li> <li>EA (EA 424)</li> <li>EA (EA 425)</li> <li>EA (EA 426)</li> <li>EA (EA 427)</li> <li>EA (EA 428)</li> <li>EA (EA 429)</li> <li>EA (EA 430)</li> <li>EA (EA 431)</li> <li>EA (EA 432)</li> <li>EA (EA 433)</li> <li>EA (EA 434)</li> <li>EA (EA 435)</li> <li>EA (EA 436)</li> <li>EA (EA 437)</li> <li>EA (EA 438)</li> <li>EA (EA 439)</li> <li>EA (EA 440)</li> <li>EA (EA 441)</li> <li>EA (EA 442)</li> <li>EA (EA 443)</li> <li>EA (EA 444)</li> <li>EA (EA 445)</li> <li>EA (EA 446)</li> <li>EA (EA 447)</li> <li>EA (EA 448)</li> <li>EA (EA 449)</li> <li>EA (EA 450)</li> <li>EA (EA 451)</li> <li>EA (EA 452)</li> <li>EA (EA 453)</li> <li>EA (EA 454)</li> <li>EA (EA 455)</li> <li>EA (EA 456)</li> <li>EA (EA 457)</li> <li>EA (EA 458)</li> <li>EA (EA 459)</li> <li>EA (EA 460)</li> <li>EA (EA 461)</li> <li>EA (EA 462)</li> <li>EA (EA 463)</li> <li>EA (EA 464)</li> <li>EA (EA 465)</li> <li>EA (EA 466)</li> <li>EA (EA 467)</li> <li>EA (EA 468)</li> <li>EA (EA 469)</li> <li>EA (EA 470)</li> <li>EA (EA 471)</li> <li>EA (EA 472)</li> <li>EA (EA 473)</li> <li>EA (EA 474)</li> <li>EA (EA 475)</li> <li>EA (EA 476)</li> <li>EA (EA 477)</li> <li>EA (EA 478)</li> <li>EA (EA 479)</li> <li>EA (EA 480)</li> <li>EA (EA 481)</li> <li>EA (EA 482)</li> <li>EA (EA 483)</li> <li>EA (EA 484)</li> <li>EA (EA 485)</li> <li>EA (EA 486)</li> <li>EA (EA 487)</li> <li>EA (EA 488)</li> <li>EA (EA 489)</li> <li>EA (EA 490)</li> <li>EA (EA 491)</li> <li>EA (EA 492)</li> <li>EA (EA 493)</li> <li>EA (EA 494)</li> <li>EA (EA 495)</li> <li>EA (EA 496)</li> <li>EA (EA 497)</li> <li>EA (EA 498)</li> <li>EA (EA 499)</li> <li>EA (EA 500)</li> </ul>			
<b>Total</b>			



## 4. Operational Summary

The operational summary reconciles the revenue generating potential of the project with the cost of ongoing operation and enforcement of the CAZ and maintenance of capital assets.

### 4.1 Strategic Assumptions

The operational model is underpinned by key assumptions that are presented throughout the subsequent operational summary section below. However, for ease of reference, the key assumptions are also consolidated into the following list:

- Non-compliant buses, coaches, taxis, private hire vehicles (PHVs), HGVs, LGVs and cars are all charged for travel into/through the small area CAZ boundary. CAZ charges are imposed as follows:
  - £9 for cars, taxis, PHVs and LGVs;
  - £100 for buses, coaches and HGVs
- No change in CAZ charges are assumed over the appraisal period. The current CAZ charges proposed are kept constant for the entire appraisal period. In contrast, operational costs are assumed to increase at the prevailing rate for general operational costs (2.9% per annum<sup>6</sup>) and staff costs (2.9% per annum<sup>7</sup>)
- Operational phase begins in June 2022. The forecast number of non-compliant vehicles in 2021 are used as a proxy for non-compliant vehicles in 2022. Further, 2023 and 2031 volumes of non-compliant vehicles are adopted directly from transport modelling outputs, with non-compliant vehicles forecasts for intervening years based on interpolation also undertaken as part of transport modelling. Note that given the traffic modelling outputs provide average annual daily flows, the 2022 non-compliant vehicles are profiled from June 1<sup>st</sup> to December 31<sup>st</sup> only, rather than for the full year.
- To reflect the introduction of exemptions from CAZ charges, some 11% of unique non-compliant cars that would otherwise be expected to pay the CAZ charge are exempt in the first year of operation (June 2022-May 2023). Informed by traffic modelling, this reflects the proportion of non-compliant cars registered to low income households that are interacting with the CAZ for work/education purposes and residents of the CAZ that travel out of the zone for work<sup>8</sup>.
- To reflect the anticipated roll out of the financial assistance schemes as part of the CAF bid, the following further adjustments are made to the basic non-compliant vehicle forecast for the duration of the appraisal:
  - 19% reduction in non-compliant cars
  - 95% reduction in non-compliant taxis
  - 48% reduction in non-compliant LGVs
  - 79% reduction in non-compliant buses/coaches
  - 18% reduction in HGVs
- A contravention rate of 5% is applied to capture non-compliant vehicles that do not pay the charge and are instead issued with a penalty charge notice (PCN). The contravention rate remains static across the appraisal period. This assumption reflects BCC's experience of contravention of other schemes (e.g. car parking, bus lane enforcement), but also the wider national experience provided by contravention of schemes such as ULEZ and Dartford Crossing.
- Based on BCC's experience of the contravention and resulting PCN process, some 65% of vehicles issued with a PCN are assumed to pay the resulting charge. The vast majority pay at the discount rate (92% at £60, plus

<sup>6</sup> As per retail price index published by OBR

<sup>7</sup> As per retail price index published by OBR

<sup>8</sup> It is accepted that the proposed exemptions are more far-reaching than the two specific exemptions factored into the analysis here. However, due to a lack of data, it is not possible to accurately forecast the potential impact of exemptions on other user groups. The analysis therefore presents a conservative view on the potential reduction in non-compliant vehicles paying the CAZ charge in the first year of operation due to the introduction of exemptions.

the original CAZ charge), with the residual contraveners paying at the full rate (8% at £120, plus the original CAZ charge). Of the 35% of contraveners that do not pay the charge, the following outcomes are anticipated:

- 46% of PCNs cancelled; no charge incurred
  - 6% issued with a Charge Certificate (50% increase on full PCN rate)
  - 15% followed up with Traffic Enforcement Centre (TEC) proceedings (at full PCN rate)
  - 34% of PCNs written off
- First time offenders are not charged or issued with PCNs. Instead, individuals are issued with a warning letter only.
  - All charge and PCN income is assumed to be accrued in the same month that the non-compliant vehicle enters the CAZ. No delay or deferment of charge or PCN income is assumed<sup>9</sup>.
  - As advised by BCC, PCN operations incur costs of £0.30 per PCN for Traffic Penalty Tribunal (TPT) charges, £1.43 per PCN for stationary and supplies and £0.85 per PCN for postage. A multiplier of 1.35 is applied to postage costs to reflect additional communication efforts resulting from unresponsive contraveners.
  - Further, BCC advised that staff costs to manage PCN operations include civil enforcement officers (CEOs, c. £54,587 per annum per role) and appeals officers (c. £54,587 per annum per role). Based on current operations, BCC indicated that 50,000 PCNs per annum necessitated 2 CEOs and 3 Appeals Officers, suggesting a ratio of 1 CEO per 25,000 PCNs and 1 Appeals Officer per c. 17,000 PCNs. BCC will be monitoring closely the volumes of contraventions from Bath & Birmingham, and will respond accordingly, if it concludes that the levels of contravention and the staffing resources are significantly different to what has been modelled.
  - A proportion of revenue secured through CAZ charge payments are transferred to JAQU. Although the exact figure has not been determined at this stage, a 10% and 20% transfer of CAZ charge revenue is considered.

This range of assumptions to shape the base scenario and resulting core scenario for operational analysis outlined below.

## 4.2 Revenue Generation

### 4.2.1 Overview

The Clean Air Zone Framework states that local authorities should not set the level of charge as a revenue raising measure. The Transport Act 2000 requires any excess revenue that may arise from charges above the costs of operation to be re-invested to facilitate the achievement of local transport policies. These should aim to improve air quality and support the delivery of the ambitions of the zone. The revenue re-investment reserve described below provides a mechanism for utilising any excess revenue generated within these parameters.

In this context the project is expected to lead to some revenue generation in the early years as a result of the CAZ-related charges levied on non-compliant vehicles. Revenue generation is a function of two interconnected components:

- The number of non-compliant vehicles entering the CAZ and paying the respective charge based on vehicle type.
- The number of non-compliant vehicles entering the CAZ, not paying the respective charge based on vehicle type and instead facing a fine via the PCN process.

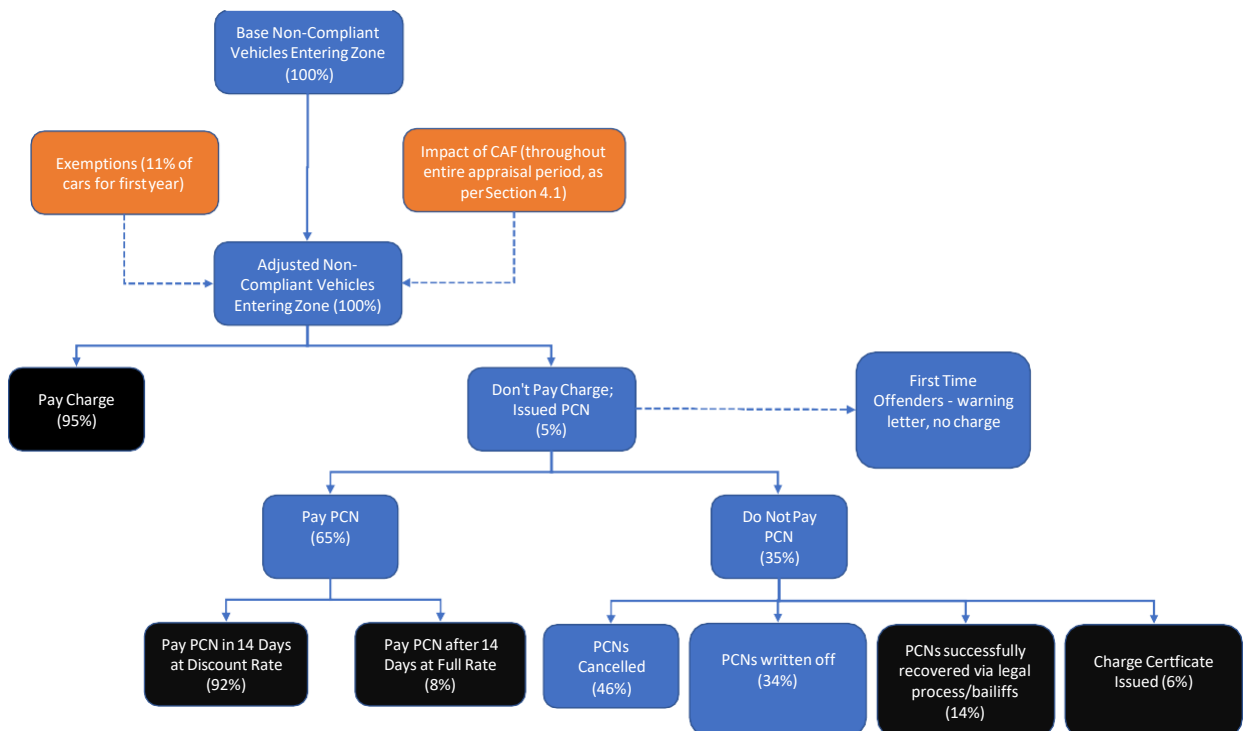
The overarching framework for revenue generation as a result of CAZ is underpinned by the assumptions specified in Section 4.1 and outlined in Figure 4.1. The various revenue generating streams emanating from the starting

<sup>9</sup> It is accepted that this approach to profiling revenue represents a simplification of the charge and fine payment process. However, in the absence of detailed evidence regarding the extent of deferment or delay in payments, including potentially lengthy delays related to tribunal and legal activity associated with some PCN payments, a simplified approach to revenue forecasting was considered most robust.

position of the number of non-compliant vehicles are discussed within this chapter, including further explanation of key assumptions in this calculation.

An initial estimate is made here based on reasonable estimates of key assumptions, established through benchmarking against other local schemes (e.g. bus lane enforcement and parking charge experience in Bristol) and wider experience. However, it should be noted that there is a considerable level of uncertainty in these assumptions since a CAZ scheme that involves charging non-compliant vehicles has not yet been implemented within the UK. Hence, a number of sensitivity scenarios are in development which will consider variations in key assumptions. These sensitivity tests will need to be considered in detail to understand the range of potential range of revenue generation.

Figure 4.1: CAZ Revenue Generation Framework



### 4.2.2 Non-Compliant Vehicles Entering the Zone

The profile of non-compliant vehicles entering the CAZ zone is outlined in Table 4.1, based on outputs from traffic modelling. These figures account for all anticipated behavioural responses to the proposed scheme, including altering route to avoid the zone, cancelling a trip entirely, and switching the mode of transport used for the journey. The analysis demonstrates that the volume of non-compliant traffic falls quickly from project implementation in 2022.

Whilst the traffic and air quality modelling indicate that compliance with air quality is achieved in 2023, the ten-year operation component of Table 4-1 demonstrates that a significant number of non-compliant trips persist throughout the appraisal period. This provides further justification for ongoing consideration of a ten year operational period, alongside the short operational period within which NO<sub>2</sub> concentrations are expected to fall within EU limit values.

Table 4-1: Base Non-Compliant Vehicle Trips Subject to CAZ Charge

Number of Non-Compliant Vehicle Trips Subject to CAZ Charge											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Cars	383,081	430,915	381,529	0	0	0	0	0	0	0	1,195,526
Taxis	1,420	1,833	1,598	0	0	0	0	0	0	0	4,850
LGV	254,225	276,156	244,869	0	0	0	0	0	0	0	775,250
HGV rigid	25,870	24,909	21,970	0	0	0	0	0	0	0	72,750
Buses	7,912	8,057	7,022	0	0	0	0	0	0	0	22,991
<b>Total</b>	<b>672,508</b>	<b>741,871</b>	<b>656,989</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,071,368</b>
<b>Ten Year Operation</b>											
Cars	383,081	430,915	381,529	331,793	282,680	234,164	185,986	135,796	89,865	17,965	2,473,774
Taxis	1,420	1,833	1,598	1,362	1,127	901	676	451	225	0	9,592
LGV	254,225	276,156	244,869	213,583	182,296	152,357	120,468	90,824	61,299	13,195	1,609,271
HGV rigid	25,870	24,909	21,970	19,032	16,093	13,280	10,468	7,656	4,843	840	144,961
Buses	7,912	8,057	7,022	5,987	4,952	3,962	2,971	1,981	990	0	43,834
<b>Total</b>	<b>672,508</b>	<b>741,871</b>	<b>656,989</b>	<b>571,756</b>	<b>487,147</b>	<b>404,664</b>	<b>320,569</b>	<b>236,706</b>	<b>157,223</b>	<b>32,000</b>	<b>4,281,433</b>

### 4.2.3 CAZ Charge

The drivers of the non-compliant vehicles presented in Table 4-1 are, until the CAZ is removed, liable to pay a variable charge depending on type of vehicle. The charging schedule for the scheme is outlined in Table 4-2. It is set at the minimum level that is expected to induce changes in travel behaviour (i.e. a shift away from use of non-compliant vehicles) to the extent that concentrations of NO<sub>2</sub> comply with the EU Limit Values as quickly as possible. The process for determining the appropriate charging level was informed by the Stated Preference Survey outlined in Appendix F.

Table 4-2: Charging Schedule

Vehicle Type	Charge
Cars/PHVs/Taxis	£9.00
LGVs	£9.00
Buses/Coaches	£100.00
HGVs	£100.00

### 4.2.4 CAZ Charge Payment

Case study evidence of road-charging operations and enforcement reveals that not all individuals pay the required charge and are therefore in contravention of the scheme. As there is no direct precedent for the CAZ in the UK, it is not possible to estimate the contravention rates from an existing CAZ scheme. In the absence of a direct comparison, BCC is of the view that current patterns of contravention relating to bus lane enforcement and car parking, combined with wider evidence from charging schemes in other locations (e.g. ULEZ/Dartford Crossing) represent the best proxies to apply to potential CAZ contravention. Such evidence based on local and wider traveller behaviour suggests that a contravention rates of 5% could apply to CAZ charging. This assumption is considered to be robust, prudent and comparable to assumptions made for CAZ schemes in other locations. In line with historic patterns of contravention, this contravention rate is assumed to remain stable across the appraisal period.

Based on the contravention rate assumptions discussed above, Table 4-3 outlines the number of vehicles anticipated to pay the appropriate CAZ charge, pivoting from the base number of non-compliant vehicles subject to the CAZ charge outlined in Table 4-1. As noted in Section 4.1, some 11% of car traffic is expected to be exempt from CAZ charges in the first year of operation. This will reduce the volume of non-compliant vehicles paying the CAZ charge, as outlined in Table 4-4. Further, the CAF-based financial assistance schemes intended to support the upgrading of non-compliant vehicles to compliant vehicles will also reduce the scale of vehicles paying the CAZ charge suggested in Table 4-3. Table 4-5 provides an adjusted estimate of vehicles paying the CAZ charge, taking into account the impact of both exemptions and the CAF-based financial assistance schemes. The exemptions and CAF-adjusted approach to estimating the operational position of the CAP is adopted as the 'core' scenario presented in the remainder of Section 4. This is considered a conservative view of potential revenue generation from the CAZ, given that it significantly reduces the potential scale of non-compliant vehicles through exemptions and financial assistance schemes. Nevertheless, the base non-compliant data and the exemptions-adjusted data (i.e. without further adjustments for the impact of CAF) underpin two of the sensitivity tests presented in Section 4.5.

Pivoting from the derived 'core' scenario, the resulting number of vehicles in contravention of the CAZ regulations and issued with a PCN is outlined in Table 4-6. Note that the number of vehicles contravening the CAZ regulations and issued with a PCN in Table 4-6 reflects the proposed BCC policy to waive any fine associated with an issued PCN for first time contravention offences. Instead, first time offenders will be issued with a warning letter only. Hence the 5% non-payment rate in Table 4-6 accounts for first-time offenders, and all figures relating to the number of PCNs paid or avoided reported in subsequent tables is also net of first-time offenders.

Table 4-3: Base Number of Vehicle Trips Paying the CAZ Charge

Number of Vehicle Trips Paying the CAZ Charge											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Payment Rate	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	
Cars	363,927	409,370	362,453	0	0	0	0	0	0	0	1,135,750
Taxis	1,349	1,741	1,518	0	0	0	0	0	0	0	4,608
LGV	241,514	262,348	232,626	0	0	0	0	0	0	0	736,488
HGV	24,577	23,664	20,872	0	0	0	0	0	0	0	69,113
Bus/Coaches	7,516	7,654	6,671	0	0	0	0	0	0	0	21,841
<b>Total</b>	<b>638,882</b>	<b>704,778</b>	<b>624,139</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,967,799</b>
<b>Ten Year Operation</b>											
Payment Rate	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	
Cars	363,927	409,370	362,453	315,203	268,546	222,456	176,687	129,006	85,371	17,067	2,350,086
Taxis	1,349	1,741	1,518	1,294	1,070	856	642	428	214	0	9,113
LGV	241,514	262,348	232,626	202,903	173,181	144,739	114,444	86,282	58,234	12,535	1,528,808
HGV	24,577	23,664	20,872	18,080	15,288	12,616	9,944	7,273	4,601	798	137,713
Bus/Coaches	7,516	7,654	6,671	5,688	4,704	3,764	2,823	1,882	941	0	41,642
<b>Total</b>	<b>638,882</b>	<b>704,778</b>	<b>624,139</b>	<b>543,168</b>	<b>462,790</b>	<b>384,431</b>	<b>304,540</b>	<b>224,871</b>	<b>149,362</b>	<b>30,400</b>	<b>4,067,361</b>

Table 4-4: Exemptions-Adjusted Number of Vehicle Trips Paying the Charge

Number of Vehicle Trips Paying the CAZ Charge											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Payment Rate	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	
Cars	324,134	390,852	362,453	0	0	0	0	0	0	0	1,077,438
Taxis	1,349	1,741	1,518	0	0	0	0	0	0	0	4,608
LGV	241,514	262,348	232,626	0	0	0	0	0	0	0	736,488
HGV	24,577	23,664	20,872	0	0	0	0	0	0	0	69,113
Bus/Coaches	7,516	7,654	6,671	0	0	0	0	0	0	0	21,841
Total	599,089	686,259	624,139	0	0	0	0	0	0	0	1,909,488
<b>Ten Year Operation</b>											
Payment Rate	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	
Cars	324,134	390,852	362,453	315,203	268,546	222,456	176,687	129,006	85,371	17,067	2,291,774
Taxis	1,349	1,741	1,518	1,294	1,070	856	642	428	214	0	9,113
LGV	241,514	262,348	232,626	202,903	173,181	144,739	114,444	86,282	58,234	12,535	1,528,808
HGV	24,577	23,664	20,872	18,080	15,288	12,616	9,944	7,273	4,601	798	137,713
Bus/Coaches	7,516	7,654	6,671	5,688	4,704	3,764	2,823	1,882	941	0	41,642
Total	599,089	686,259	624,139	543,168	462,790	384,431	304,540	224,871	149,362	30,400	4,009,050

Table 4-5: Exemptions and CAF-Adjusted Number of Vehicle Trips Paying the Charge

Number of Vehicle Trips Paying the CAZ Charge											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Payment Rate	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	
Cars	263,333	317,536	294,464	0	0	0	0	0	0	0	875,332
Taxis	68	87	76	0	0	0	0	0	0	0	231
LGV	126,406	137,311	121,754	0	0	0	0	0	0	0	385,472
HGV	20,153	19,405	17,115	0	0	0	0	0	0	0	56,672
Bus/Coaches	1,588	1,618	1,410	0	0	0	0	0	0	0	4,616
Total	411,548	475,956	434,819	0	0	0	0	0	0	0	1,322,323
<b>Ten Year Operation</b>											
Payment Rate	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	
Cars	263,333	317,536	294,464	256,077	218,172	180,727	143,544	104,807	69,357	13,865	1,861,883
Taxis	68	87	76	65	54	43	32	21	11	0	456
LGV	126,406	137,311	121,754	106,198	90,642	75,755	59,899	45,160	30,479	6,561	800,165
HGV	20,153	19,405	17,115	14,826	12,536	10,345	8,154	5,964	3,773	654	112,925
Bus/Coaches	1,588	1,618	1,410	1,202	994	795	597	398	199	0	8,800
Total	411,548	475,956	434,819	378,368	322,398	267,666	212,226	156,349	103,819	21,081	2,784,229



Table 4-6: Number of Vehicle Trips in Contravention of CAZ Regulations and Issued with PCN (net of first time offenders)

Number of Vehicle Trips in Contravention of CAZ Regulations											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Payment Rate	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	
Cars	12,912	15,570	14,439	0	0	0	0	0	0	0	42,921
Taxis	3	4	4	0	0	0	0	0	0	0	12
LGV	5,706	6,198	5,496	0	0	0	0	0	0	0	17,399
HGV	849	817	721	0	0	0	0	0	0	0	2,386
Bus/Coaches	69	70	61	0	0	0	0	0	0	0	200
Total	19,539	22,660	20,720	0	0	0	0	0	0	0	62,919
<b>Ten Year Operation</b>											
Payment Rate	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	
Cars	12,912	15,570	14,439	12,557	10,698	8,862	7,039	5,139	3,401	680	91,296
Taxis	3	4	4	3	3	2	2	1	1	0	23
LGV	5,706	6,198	5,496	4,793	4,091	3,419	2,704	2,038	1,376	296	36,117
HGV	849	817	721	624	528	436	343	251	159	28	4,755
Bus/Coaches	69	70	61	52	43	34	26	17	9	0	382
Total	19,539	22,660	20,720	18,030	15,363	12,754	10,113	7,447	4,945	1,004	132,573

#### **4.2.5 CAZ Charge Income**

Combining the CAZ charges in Table 4-2 with the number of vehicles paying the CAZ charge under the 'core' scenario in Table 4-5 and reprofiling the analysis to reflect financial years rather than calendar years demonstrates that the CAZ charge could generate a stream of revenue over the appraisal period that amounts to £17.5 million at the end of a short operational period, or £36.1 million in 2031 across the ten year operational period. Note that for the longer operational period in particular, the scale of CAZ charge income declines rapidly over time from £7.2 million in the first year of operation (2022/23) to £0.1 million at the end of the appraisal period (2031/32).

Table 4-7: Direct CAZ Income – From CAZ Charge Payments (£'000s)

Direct CAZ Income											
Vehicle Type	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Short Operation</b>											
Total	7,163	6,097	4,219	0	0	0	0	0	0	0	17,478
<b>Ten Year Operation</b>											
Total	7,163	6,097	5,418	4,684	3,958	3,246	2,529	1,816	1,125	101	36,135

#### 4.2.6 CAZ Charge Contravention – PCN Process

Those vehicles that contravene the CAZ payment process will be issued with a PCN that levies a fine in line with the charging order. In line with The Road User Charging Schemes (Penalty Charges, Adjudication and Enforcement) (England) Regulations 2013, the charging order will specify a fine of £120 per vehicle (reduced to £60 if paid within fourteen days), plus the initial CAZ charge. In theory, all vehicles in contravention of the CAZ payment process will be subject to the PCN fine. However, BCC experience of the PCN process for other fining mechanisms (in particular car parking and bus lane enforcement) reveals that the PCN payment rate is around 65%. Adopting this benchmark, the number of vehicles expected to pay the PCN is outlined in Table 4-8.

Of the 65% of vehicles that pay the PCN, BCC experience also suggests that 92% pay at the reduced payment rate (i.e. within fourteen days, £60 plus initial CAZ charge). The residual 8% of payments are at the full payment rate (i.e. after the fourteen-day window, £120 plus the initial CAZ charge). The number of vehicles paying at the reduced and full PCN payment rate are outlined in Table 4-9 and Table 4-10 respectively.

As only 65% of people receiving a PCN are expected to pay the fine levied against them, the residual 35% of PCN recipients make representations against the PCN and have it cancelled, written off or are referred to the Traffic Penalty Tribunal (TPT) System. BCC experience suggests that:

- 46% of all non-paid PCNs are cancelled after a successful representation which results in no revenue generation for BCC.
- 34% of all non-paid PCNs are not recovered and are written off instead, which results in no revenue generation for BCC
- 14% of all non-paid PCNs are recovered via the TEC process or other legal action (e.g. bailiffs).
- 6% of all non-paid PCNs are followed by a charge certificate, which adds 50% to the fine levied.

Within this context, Table 4-11 presents the number of non-paid PCNs expected to be cancelled or written off and Table 4-12 outlines the number of non-paid PCNs successfully recovered via the TPT, other legal processes or through issuance of a charge certificate.

#### 4.2.7 CAZ Contravention Income

Combining the number of reduced fine PCN payments (Table 4-9) the number of full fine PCN payments (Table 4-10 and Table 4-12 [including the 50% premium fine on Charge Certificates where appropriate]) and the associated fine levels (£60 plus initial CAZ charge for reduced fines and £120 plus initial charge for full fines), it is possible to estimate indirect CAZ income related to PCN payments. Reprofiled to reflect financial years rather than calendar years, Table 4-13 demonstrates that the PCN process could generate a stream of revenue over the appraisal period that amounts to £3.8 million at the end of a short operational period, or £8.0 million in 2031 across the ten year operational period. Note that for the longer operational period in particular, the scale of PCN income declines rapidly over time from £1.5 million in the first year of operation (2022/23) to £0.02 million at the end of the appraisal period (2031/32).

#### 4.2.8 CAZ Revenue Generation

Combining the direct CAZ income with the indirect CAZ income the CAZ could gross £21.3 million at the end of a short operational period, or £44.2 million in 2031 across the ten year operational period, as set out in Table 4-14. Note that for the longer operational period in particular, the scale of total income generation declines rapidly over time from £8.7 million in the first year of operation (2022/23) to £0.1 million at the end of the appraisal period (2031/32).

It should be noted that the revenue generation predicted in Table 4-14 is reliant on a number of key assumptions which are not certain. BCC have made reasonable attempts to estimate these assumptions based on similar schemes administered locally, but since a CAZ of this type has not yet been implemented or has only yielded a

small sample of data<sup>10</sup>, the available evidence is limited and hence the forecasts are uncertain. As noted above, a range of detailed sensitivity tests are presented in Section 4.5 to help understand the impact of amending key assumptions on the forecast revenue generation.

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<sup>10</sup> E.g. Bath and Birmingham CAZ schemes have been operational for a few months only

Table 4-8: Number of Vehicle Trips Paying the PCN

Number of Vehicle Trips Paying the PCN											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Cars	8,393	10,121	9,385	0	0	0	0	0	0	0	27,899
Taxis	2	3	3	0	0	0	0	0	0	0	8
LGV	3,709	4,029	3,572	0	0	0	0	0	0	0	11,309
HGV	552	531	468	0	0	0	0	0	0	0	1,551
Bus/Coaches	45	46	40	0	0	0	0	0	0	0	130
Total	12,700	14,729	13,468	0	0	0	0	0	0	0	40,897
<b>Ten Year Operation</b>											
Cars	8,393	10,121	9,385	8,162	6,954	5,760	4,575	3,340	2,211	442	59,343
Taxis	2	3	3	2	2	1	1	1	0	0	15
LGV	3,709	4,029	3,572	3,116	2,659	2,223	1,757	1,325	894	192	23,476
HGV	552	531	468	406	343	283	223	163	103	18	3,091
Bus/Coaches	45	46	40	34	28	22	17	11	6	0	248
Total	12,700	14,729	13,468	11,719	9,986	8,290	6,574	4,841	3,214	652	86,173

Table 4-9: Number of Vehicle Trips Paying the Reduced PCN Fine

Number of Vehicle Trips Paying the Reduced Rate PCN											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Cars	7,747	9,342	8,663	0	0	0	0	0	0	0	25,753
Taxis	2	3	2	0	0	0	0	0	0	0	7
LGV	3,423	3,719	3,297	0	0	0	0	0	0	0	10,439
HGV	509	490	432	0	0	0	0	0	0	0	1,432
Bus/Coaches	41	42	37	0	0	0	0	0	0	0	120
<b>Total</b>	<b>11,723</b>	<b>13,596</b>	<b>12,432</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37,751</b>
<b>Ten Year Operation</b>											
Cars	7,747	9,342	8,663	7,534	6,419	5,317	4,223	3,083	2,041	408	54,778
Taxis	2	3	2	2	2	1	1	1	0	0	14
LGV	3,423	3,719	3,297	2,876	2,455	2,052	1,622	1,223	825	178	21,670
HGV	509	490	432	375	317	261	206	151	95	17	2,853
Bus/Coaches	41	42	37	31	26	21	16	10	5	0	229
<b>Total</b>	<b>11,723</b>	<b>13,596</b>	<b>12,432</b>	<b>10,818</b>	<b>9,218</b>	<b>7,652</b>	<b>6,068</b>	<b>4,468</b>	<b>2,967</b>	<b>602</b>	<b>79,544</b>

Table 4-10: Number of Vehicle Trips Paying the Full PCN Fine

Number of Vehicle Trips Paying the Full Rate PCN											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Cars	646	779	722	0	0	0	0	0	0	0	2,146
Taxis	0	0	0	0	0	0	0	0	0	0	1
LGV	285	310	275	0	0	0	0	0	0	0	870
HGV	42	41	36	0	0	0	0	0	0	0	119
Bus/Coaches	3	4	3	0	0	0	0	0	0	0	10
<b>Total</b>	<b>977</b>	<b>1,133</b>	<b>1,036</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,146</b>
<b>Ten Year Operation</b>											
Cars	646	779	722	628	535	443	352	257	170	34	4,565
Taxis	0	0	0	0	0	0	0	0	0	0	1
LGV	285	310	275	240	205	171	135	102	69	15	1,806
HGV	42	41	36	31	26	22	17	13	8	1	238
Bus/Coaches	3	4	3	3	2	2	1	1	0	0	19
<b>Total</b>	<b>977</b>	<b>1,133</b>	<b>1,036</b>	<b>901</b>	<b>768</b>	<b>638</b>	<b>506</b>	<b>372</b>	<b>247</b>	<b>50</b>	<b>6,629</b>



Table 4-11: Number of Non-Paid PCNs Cancelled or Written Off

Number of Non-Paid PCNs Cancelled or Written Off											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Cars	3,615	4,360	4,043	0	0	0	0	0	0	0	12,018
Taxis	1	1	1	0	0	0	0	0	0	0	3
LGV	1,598	1,735	1,539	0	0	0	0	0	0	0	4,872
HGV	238	229	202	0	0	0	0	0	0	0	668
Bus/Coaches	19	20	17	0	0	0	0	0	0	0	56
Total	5,471	6,345	5,802	0	0	0	0	0	0	0	17,617
<b>Ten Year Operation</b>											
Cars	3,615	4,360	4,043	3,516	2,995	2,481	1,971	1,439	952	190	25,563
Taxis	1	1	1	1	1	1	0	0	0	0	7
LGV	1,598	1,735	1,539	1,342	1,146	957	757	571	385	83	10,113
HGV	238	229	202	175	148	122	96	70	44	8	1,331
Bus/Coaches	19	20	17	15	12	10	7	5	2	0	107
Total	5,471	6,345	5,802	5,048	4,302	3,571	2,832	2,085	1,385	281	37,121

Table 4-12: Number of Non-Paid PCNs Ordered to Pay Full Fine Through TPT, other legal processes or Charge Certificate

Number of Non-Paid PCNs Recovered											
Vehicle Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
<b>Short Operation</b>											
Cars	904	1,090	1,011	0	0	0	0	0	0	0	3,004
Taxis	0	0	0	0	0	0	0	0	0	0	1
LGV	399	434	385	0	0	0	0	0	0	0	1,218
HGV	59	57	50	0	0	0	0	0	0	0	167
Bus/Coaches	5	5	4	0	0	0	0	0	0	0	14
<b>Total</b>	<b>1,368</b>	<b>1,586</b>	<b>1,450</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,404</b>
<b>Ten Year Operation</b>											
Cars	904	1,090	1,011	879	749	620	493	360	238	48	6,391
Taxis	0	0	0	0	0	0	0	0	0	0	2
LGV	399	434	385	336	286	239	189	143	96	21	2,528
HGV	59	57	50	44	37	30	24	18	11	2	333
Bus/Coaches	5	5	4	4	3	2	2	1	1	0	27
<b>Total</b>	<b>1,368</b>	<b>1,586</b>	<b>1,450</b>	<b>1,262</b>	<b>1,075</b>	<b>893</b>	<b>708</b>	<b>521</b>	<b>346</b>	<b>70</b>	<b>9,280</b>

Table 4-13: Indirect CAZ Income – From PCN Fine Payments

Indirect CAZ Income											
Vehicle Type	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Short Operation</b>											
Total	1,518,804	1,359,697	945,286	0	0	0	0	0	0	0	3,823,787
<b>Ten Year Operation</b>											
Total	1,518,804	1,359,697	1,214,420	1,051,591	890,691	732,083	571,751	412,638	260,459	24,276	8,036,410

Table 4-14: Total CAZ Income

Total CAZ Income											
Vehicle Type	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Short Operation</b>											
Total	8,681,807	7,456,297	5,163,808	0	0	0	0	0	0	0	21,301,912
<b>Ten Year Operation</b>											
Total	8,681,807	7,456,297	6,632,238	5,735,165	4,848,449	3,978,225	3,100,506	2,228,467	1,385,321	124,980	44,171,454

## **4.3 Operational Costs**

### **4.3.1 Overview**

Operational costs will be incurred by BCC across a range of activities:

- Systems operations and maintenance
- Camera, communications, signage and buildings maintenance
- CAZ delivery and ongoing operational management
- Monitoring and evaluation
- Decommissioning
- PCN production
- CAZ publicity and advertising

The majority of these operational costs are accrued on either a fixed, annual basis for the lifecycle of the project or as one-off costs. However, some cost items relating to PCN production activities and systems operations and management are contingent on variations in vehicle non-compliance and contravention as outlined in the section above and are therefore worthy of more detailed discussion.

### **4.3.2 PCN Administration Costs**

The non-compliance and contravention rate estimates presented above demonstrate that large volumes of vehicles could enter the CAZ and avoid paying the relevant charge in a single year. This volume of contraventions would require a significant administrative effort to process and enforce the charging order. For example, every PCN generated by vehicles in contravention of the charging order generates workload in terms of civil enforcement, reviewing ANPR footage, preparing and distributing correspondence.

In terms of PCN preparation, the CAZ-related PCN process could necessitate significant recruitment of administrative staff, potentially on short-term and temporary contracts to reflect the sharp decline in contravention rates Table 4.4. Based on BCC's existing PCN processes (for issuing parking and bus lane enforcement fines), the following staffing requirements would be generated by the significant PCN process:

- 2 civil enforcement officer (CEO) per 50,000 PCNs
- 3 appeals officer per 50,000 PCNs

Applying these benchmarks to the forecast number of PCN's required as a result of the project will indicate the number of full-time equivalent administrative roles that would need to be filled across the CAZ operation period. The bulk of these roles would be obsolete over time as vehicular compliance improves, hence the potential focus on short-term and temporary contracts.

Further, a permanent TPT senior officer would be required across the operation of the CAZ. Applying BCC average staff costs for these roles (including salary and direct overheads), the council could incur additional wage costs of £0.8 million under the short operational period, rising to £2.2 million over the longer operational period.

Administration costs will also arise from BCC's obligation to make a financial contribution to the TPT process, stationery and supplies (processing) and PCN postage (distribution) of each PCN. BCC advise that benchmark costs for these activities (based on car parking and bus lane enforcement experience) are:

- PCN Generation - £0.30 per PCN towards the ongoing existence of this independent panel
- Stationery and Supplies - £1.43 per PCN for printing and processing
- PCN postage - £0.85 per PCN for distribution

Note that an additional multiplier of 1.35 is applied to the PCN postage costs to reflect the need for follow-up communications on some individual cases. Adopting these benchmarks, the number of PCNs issued would lead to additional costs of between £0.2 million (shorter operational period) and £0.5 million (longer operational period) (Table 4-15).

### **4.3.3 Summary**

Inclusive of the variable staffing and PCN process costs outlined above, the core estimate for the scheme's operational costs including all cost items is between £6.8 million (shorter operational period) and £17.7 million (longer operational period) (2021 prices). This estimate increases to between £7.2 million and £20.1 million taking into account inflation (labour costs inflated at 2.9% per annum and other operating costs inflated at 2.9%, both in line with OBR's retail price index growth forecast). Table 4-16 presents a summary of how this OPEX estimate is built up, split by broad theme.

A more detailed breakdown of OPEX costs is provided in BoQ format in Appendix J. The timing of expenditure is outlined in Table 4-17, which provides a more comprehensive Operational Expenditure Summary for the project.

Table 4-15: Additional Costs Arising from PCN Process (Outturn Prices)

Type of Additional Cost	Administration Costs Arising from PCN Process (£s)										
	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Short Operation</b>											
PCN Generation	8,561	7,928	5,636	0	0	0	0	0	0	0	22,124
Stationery and supplies	40,806	37,788	26,864	0	0	0	0	0	0	0	105,459
PCN postage	32,745	30,323	21,557	0	0	0	0	0	0	0	84,625
<b>Total</b>	<b>82,112</b>	<b>76,039</b>	<b>54,058</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>212,208</b>
<b>Ten Year Operation</b>											
PCN Generation	8,561	7,928	7,287	6,494	5,662	4,789	3,849	2,861	1,861	179	49,472
Stationery and supplies	40,806	37,788	34,737	30,957	26,988	22,829	18,348	13,636	8,873	853	235,814
PCN postage	32,745	30,323	27,874	24,841	21,656	18,319	14,723	10,942	7,120	685	189,229
<b>Total</b>	<b>82,112</b>	<b>76,039</b>	<b>69,899</b>	<b>62,293</b>	<b>54,305</b>	<b>45,938</b>	<b>36,920</b>	<b>27,439</b>	<b>17,855</b>	<b>1,717</b>	<b>474,515</b>

Table 4-16: OPEX by broad theme and funding source (£)

OPEX Item	Short Operation		Ten Year Operation	
	2021 Prices (£)	Outturn Costs (£)	2021 Prices (£)	Outturn Costs (£)
Systems Operations and Maintenance	4,906,104	5,104,390	13,604,620	15,247,748
Camera, Comms, Signage and Building Maintenance and Operation - OPEX	789,138	839,634	2,749,256	3,218,776
Monitoring and Evaluation	389,869	449,713	389,869	449,713
Decommissioning at Scheme End - OPEX	554,924	622,150	554,924	738,562
PCN Production	200,262	212,208	421,664	474,515
<b>Total</b>	<b>6,840,297</b>	<b>7,228,095</b>	<b>17,720,333</b>	<b>20,129,314</b>

Table 4-17: Operational Expenditure Summary

**Short Operation**

	2021 Prices										Total	Forecast Outturn Prices										Total
	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32		2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	
Systems Operations and Maintenance	1,797,406	1,818,479	1,290,219	0	0	0	0	0	0	0	<b>4,906,104</b>	1,837,910	1,898,502	1,367,979	0	0	0	0	0	0	0	<b>5,104,390</b>
Camera, Comms, Signage and Building Maintenance and Operation - OPEX	254,561	305,473	229,105	0	0	0	0	0	0	0	<b>789,138</b>	264,222	325,792	249,620	0	0	0	0	0	0	0	<b>839,634</b>
Monitoring and Evaluation	40,611	48,734	48,734	48,734	48,734	48,734	48,734	48,734	8,122	0	<b>389,869</b>	42,153	51,975	53,483	55,034	56,630	58,272	59,962	61,701	10,505	0	<b>449,713</b>
Decommissioning at Scheme End - OPEX	0	0	554,924	0	0	0	0	0	0	0	<b>554,924</b>	0	0	622,150	0	0	0	0	0	0	0	<b>622,150</b>
PCN Production	79,305	71,342	49,615	0	0	0	0	0	0	0	<b>200,262</b>	82,112	76,039	54,058	0	0	0	0	0	0	0	<b>212,208</b>
<b>Total</b>	<b>2,171,883</b>	<b>2,244,028</b>	<b>2,172,596</b>	<b>48,734</b>	<b>48,734</b>	<b>48,734</b>	<b>48,734</b>	<b>48,734</b>	<b>8,122</b>	<b>0</b>	<b>6,840,297</b>	<b>2,226,396</b>	<b>2,352,308</b>	<b>2,347,289</b>	<b>55,034</b>	<b>56,630</b>	<b>58,272</b>	<b>59,962</b>	<b>61,701</b>	<b>10,505</b>	<b>0</b>	<b>7,228,095</b>

**Ten Year Operation**

	2021 Prices										Total	Forecast Outturn Prices										Total
	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32		2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	
Systems Operations and Maintenance	1,797,406	1,818,479	1,690,630	1,597,066	1,499,151	1,377,166	1,295,428	1,214,226	1,135,660	179,409	<b>13,604,620</b>	1,837,910	1,898,502	1,802,500	1,742,895	1,677,511	1,583,102	1,535,558	1,488,922	1,445,402	235,447	<b>15,247,748</b>
Camera, Comms, Signage and Building Maintenance and Operation - OPEX	254,561	305,473	305,473	305,473	305,473	305,473	305,473	305,473	305,473	50,912	<b>2,749,256</b>	264,222	325,792	335,240	344,962	354,966	365,260	375,853	386,752	397,968	67,760	<b>3,218,776</b>
Monitoring and Evaluation	40,611	48,734	48,734	48,734	48,734	48,734	48,734	48,734	8,122	0	<b>389,869</b>	42,153	51,975	53,483	55,034	56,630	58,272	59,962	61,701	10,505	0	<b>449,713</b>
Decommissioning at Scheme End - OPEX	0	0	0	0	0	0	0	0	0	554,924	<b>554,924</b>	0	0	0	0	0	0	0	0	0	738,562	<b>738,562</b>
PCN Production	79,305	71,342	63,744	55,213	46,782	38,467	30,054	21,717	13,749	1,290	<b>421,664</b>	82,112	76,039	69,899	62,293	54,305	45,938	36,920	27,439	17,855	1,717	<b>474,515</b>
<b>Total</b>	<b>2,171,883</b>	<b>2,244,028</b>	<b>2,108,581</b>	<b>2,006,485</b>	<b>1,900,140</b>	<b>1,769,839</b>	<b>1,679,689</b>	<b>1,590,150</b>	<b>1,463,004</b>	<b>786,534</b>	<b>17,720,333</b>	<b>2,226,396</b>	<b>2,352,308</b>	<b>2,261,122</b>	<b>2,205,183</b>	<b>2,143,412</b>	<b>2,052,571</b>	<b>2,008,292</b>	<b>1,964,814</b>	<b>1,871,730</b>	<b>1,043,486</b>	<b>20,129,314</b>

#### **4.4 Net Operational Position**

In line with JAQU guidance, the intention – as far as it is possible – is to cover all operating costs (i.e. those related to running and administering the CAZ itself) through revenue generated by the scheme.

Based on the scale and timing of revenue generation and operational costs reported in Table 4-14 and 4-16 respectively, Table 4.18 outlines the net operational cashflow associated with the Clean Air Plan, under the core scenario for each intervention option. The analysis indicates that cumulatively, revenue generation will exceed operational costs, resulting in a net operational surplus of between £14.1 million (short operation, outturn costs) and £24.0 million (ten year operation, outturn costs) across the appraisal periods.

However, the scheme is forecast to generate a net operational deficit in later years of the project's operation. For the short appraisal period, a deficit relates to ongoing costs associated with an eight-year monitoring and evaluation period. For the ten year appraisal period, a deficit is incurred in the final years of operation as most vehicles become compliant but high fixed costs of operation are retained. It is intended that the net operational deficit identified in the later years of the appraisal period can be covered by the anticipated net operational surplus identified above.



Table 4-18: Net Cash Flow Position: Core Scenario (Outturn Prices)

Net Cash Flow Position (£'000s)													
Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Short Operation</b>													
Operational Income	0	0	8,682	7,456	5,164	0	0	0	0	0	0	0	21,302
CAZ-Related OPEX <sup>11</sup>	0	0	2,226	2,352	2,347	55	57	58	60	62	11	0	7,228
Net Operating Position	0	0	6,455	5,104	2,817	-55	-57	-58	-60	-62	-11	0	14,074
<b>Ten Year Operation</b>													
Operational Income	0	0	8,682	7,456	6,632	5,735	4,848	3,978	3,101	2,228	1,385	125	44,171
CAZ-Related OPEX	0	0	2,226	2,352	2,261	2,205	2,143	2,053	2,008	1,965	1,872	1,043	20,129
Net Operating Position	0	0	6,455	5,104	4,371	3,530	2,705	1,926	1,092	264	-486	-919	24,042

<sup>11</sup> Note that although the CAZ is assumed to switch off after one year after compliance is achieved (i.e. December 2024), ongoing monitoring and evaluation costs will persist for eight years, hence the ongoing OPEX after December 2024.

Table 4.18 represents the current best estimate for operational revenues and costs. However, acknowledging that Clean Air Plans are a nascent concept and that there is no longstanding precedent or direct benchmark for the timing and scale of revenues in particular<sup>12</sup>, a significant degree of uncertainty can be attached to the above analysis (see Section 4.5 Sensitivity Testing).

Notwithstanding this uncertainty, the core analysis demonstrates that the CAZ revenue is sufficient to cover operational costs of the scheme under both operational period scenarios. In fact, the proposed Clean Air Plan is forecast to generate a considerable positive cash flow over the appraisal period. Any cashflow surplus associated with the scheme will be ringfenced for the following purposes, in order of priority:

- Deficit coverage for ongoing and long-term operational expenditure, particularly in latter years of operation when the various schemes are anticipated to face an operational deficit, as well as decommissioning.
- Creation of a reinvestment reserve to support:
  - Any underestimation of operational costs.
  - Delivery of BCC's 'Liveable Neighbourhoods' aspirations (estimated cost range £45m to £283m);
  - Supplementary schemes to the CAF measures, as well providing an opportunity to further invest in engagement with businesses and local residents affected by the schemes. For example, this funding source would support or extend some of the following measures which may form part of the CAF bid:
- Increase, improve, update Legible City Signage on key radials and in city centre; and
- An 'unintended consequences' fund for minor local implementations such as one-ways; and
- Support for additional buses to the Bristol Royal Infirmary.

Within this context, the residual cash position for the CAP in Bristol is expected to be neutral throughout the appraisal periods, as demonstrated in Tables 4.19 and 4.20.

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<sup>12</sup> Noting that the Bath and Birmingham CAZ schemes are still in their infancy; and in any case have different specifications in terms of geographic scale and/or vehicular coverage compared to the Bristol CAX.

Table 4-19: Residual Cash Flow Position – Short Operation (£'000s)

Net Cash Flow Position (£'000s) Outturn Values													
Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
Net Cashflow	0	0	6,455	5,104	2,817	-55	-57	-58	-60	-62	-11	0	14,074
Deficit Coverage <sup>13</sup>	0	0	302	0	0	0	0	0	0	0	0	0	302
Reinvestment Reserve (residual monies)	0	0	6,153	5,104	2,817	0	0	0	0	0	0	0	14,074
<b>Residual Cash Position</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Table 4-20: Residual Cash Flow Position – Ten Year Operation (£'000s)

Net Cash Flow Position (£'000s) Outturn Values													
Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
Net Cashflow	0	0	6,455	5,104	4,371	3,530	2,705	1,926	1,092	264	-486	-919	24,042
Deficit Coverage	0	0	1,405	0	0	0	0	0	0	0	0	0	1,405
Reinvestment Reserve (residual monies)	0	0	5,050	5,104	4,371	3,530	2,705	1,926	1,092	264	0	0	24,042
<b>Residual Cash Position</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<sup>13</sup> To cover ongoing and long-term operational expenditure, particularly in latter years of operation when the various schemes are anticipated to face an operational deficit, as well as decommissioning.

## 4.5 Sensitivity Testing

In light of the significant uncertainty and lack of precedent regarding operation of Clean Air Plan's, extensive sensitivity testing is being undertaken to better understand the potential range of net operating positions for the project, based on variance in key assumptions. The following key sensitivities are considered:

- Base Non-Compliant Traffic Analysis: no consideration of exemptions or CAF impacts on base traffic flows.
- Base + Exemptions Non-Compliant Traffic Analysis: consideration of exemptions but not CAF impacts on base traffic flows.
- Sensitivity Test 1: As per 'core' scenario, but with 20% JAQU revenue payment instead of 10%
- Sensitivity Test 2: As per 'core' scenario, but increase in contravention rate from 5% to 20%
- Sensitivity Test 3: As per 'core' scenario, but reduction in CAZ and PCN Charges by 50%
- Sensitivity Test 4: As per 'core' scenario, but reduction in non-compliant traffic flows by 25% compared to core scenario
- Sensitivity Test 5: As per 'core' scenario, but increase in non-compliant traffic flows by 25% compared to core scenario
- Sensitivity Test 6: As per 'core' scenario, but exponential profile of non-compliant traffic flow reduction rather than more gradual profile suggested by traffic modelling
- Sensitivity Test 7: Combination of Sensitivity Tests 3, 4 and 6, plus an assumption that the contravention rate declines at an exponential rate rather than stabilising at 5% across the appraisal period, representing a worst-case revenue generating scenario that has:
  - 20% JAQU revenue payment instead of 10%
  - Reduction in CAZ and PCN Charges by 50%
  - Reduction in non-compliant traffic flows by 25% compared to core scenario
  - Exponential profile of non-compliant traffic flow reduction rather than more gradual profile suggested by traffic modelling
- Sensitivity Test 8: As per 'core' scenario, but reduction in non-compliant traffic flows to 82% of 'core' scenario levels, reflecting traffic patterns for Bristol in wake of COVID19 pandemic. Details of the changes in traffic levels associated with COVID-19 are reported in the Clean Air Zone Board Report – Traffic Behaviour 2019-2020 (Appendix S of the Option Assessment Report)
- Sensitivity Test 9: As per 'core' scenario, but with an increase in CAZ & contravention charges of 25% to reflect the possibility of increase the charges if the level of compliance is not achieved.

The outputs of these sensitivity tests in terms of outturn cashflow is presented in the following table. The outputs demonstrate that a change in the profile of non-compliant traffic reduction and the value of the CAZ/PCN charges are the key drivers of net operating position. In particular, any acceleration in the reduction of non-compliant traffic over time (as modelled through Sensitivity Test 6 and captured as part of Sensitivity Test 7) has a particularly significant impact on operating position.

Table 4-21: Sensitivity Test Outputs (Outturn Values, £'000s)

Option/ Scenario	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Short Operation</b>												
Base	0	10,495	8,111	4,792	-55	-57	-58	-60	-62	-11	0	23,095
Base + Exemptions	0	9,956	8,032	4,792	-55	-57	-58	-60	-62	-11	0	22,477
Core Scenario	0	6,455	5,104	2,817	-55	-57	-58	-60	-62	-11	0	14,074
Sensitivity Test 1	0	5,739	4,494	2,395	-55	-57	-58	-60	-62	-11	0	12,326
Sensitivity Test 2	0	9,254	7,652	4,589	-55	-57	-58	-60	-62	-11	0	21,193
Sensitivity Test 3	0	2,473	1,681	446	-55	-57	-58	-60	-62	-11	0	4,297
Sensitivity Test 4	0	4,556	3,477	1,661	-55	-57	-58	-60	-62	-11	0	9,392
Sensitivity Test 5	0	8,402	6,759	3,928	-55	-57	-58	-60	-62	-11	0	18,787
Sensitivity Test 6	0	3,760	595	-1,117	-55	-57	-58	-60	-62	-11	0	2,936
Sensitivity Test 7	0	503	-799	-1,556	-55	-57	-58	-60	-62	-11	0	-2,154
Sensitivity Test 8	0	5,101	3,945	1,984	-55	-57	-58	-60	-62	-11	0	10,728
Sensitivity Test 9	0	7,951	6,474	3,768	-55	-57	-58	-60	-62	-11	0	17,891
<b>Ten Year Operation</b>												
Base	0	10,495	8,111	6,916	5,768	4,612	3,447	2,305	1,127	34	-875	41,942
Base + Exemptions	0	9,956	8,032	6,916	5,768	4,612	3,447	2,305	1,127	34	-875	41,323
Core Scenario	0	6,455	5,104	4,371	3,530	2,705	1,926	1,092	264	-486	-919	24,042
Sensitivity Test 1	0	5,739	4,494	3,829	3,062	2,309	1,601	839	82	-599	-929	20,429
Sensitivity Test 2	0	9,254	7,652	6,644	5,490	4,345	3,238	2,143	994	32	-865	38,927
Sensitivity Test 3	0	2,473	1,681	1,326	897	479	99	-332	-760	-1,123	-976	3,763
Sensitivity Test 4	0	4,556	3,477	2,902	2,309	1,669	1,037	401	-233	-795	-946	14,377
Sensitivity Test 5	0	8,402	6,759	5,796	4,767	3,772	2,765	1,784	760	-178	-891	33,737
Sensitivity Test 6	0	3,760	595	-736	-1,255	-1,477	-1,589	-1,661	-1,718	-1,718	-1,029	-6,829

Table 4-21: Sensitivity Test Outputs (Outturn Values, £'000s)

Option/ Scenario	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
Sensitivity Test 7	0	503	-799	-1,260	-1,449	-1,549	-1,615	-1,670	-1,722	-1,720	-1,030	-12,311
Sensitivity Test 8	0	5,101	3,945	3,318	2,668	1,972	1,286	594	-94	-708	-939	17,143
Sensitivity Test 9	0	7,951	6,474	5,593	4,585	3,595	2,653	1,655	663	-243	-897	32,028

## 5. Financial Statements

The budget, funding and cashflow statements for the core scenario of the preferred option are outlined in Table 5-1 to Table 5-3 for the short operational period scenario and Table 5-4 to Table 5-6 for the longer operational period scenario. The key findings of the financial statements are (in forecast outturn prices):

- The budget statement demonstrates that the aggregate net operating income is in surplus across both appraisal period, leading to the development of a revenue reinvestment reserve amounting to between £14.1 million (short operational period) and £24.0 million (ten-year operational period).
- The funding statement demonstrates that the implementation and operation of the preferred option will require £54.1 million in external capital funding. The Implementation Fund (£6.7 million) and Clean Air Fund (£47.4 million) are the proposed central government funding streams.
- The cashflow statement demonstrates that the net cashflow is positive at an aggregate level over the appraisal period

Table 5-1: Budget Statement – Short Operation (Outturn Values)

Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Operating Income</b>													
Operating Revenue	0	0	8,682	7,456	5,164	0	0	0	0	0	0	0	21,302
Operating Grant	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Operating Expenses</b>													
Operating Costs	0	0	2,226	2,352	1,725	55	57	58	60	62	11	0	6,606
Decommissioning	0	0	0	0	622	0	0	0	0	0	0	0	622
Total	0	0	2,226	2,352	2,347	55	57	58	60	62	11	0	7,228
<b>Net Operating Income</b>	0	0	6,455	5,104	2,817	-55	-57	-58	-60	-62	-11	0	14,074
<b>Use of Net Income</b>													
Deficit Coverage	0	0	302	0	0	0	0	0	0	0	0	0	302
Reinvestment Reserve	0	0	6,153	5,104	2,817	0	0	0	0	0	0	0	14,074
<b>Residual Cash Position</b>	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 5-2: Funding Statement – Short Operation (Outturn Values)

Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Implementation Fund</b>													
Capital	0	4,992	1,694	0	0	0	0	0	0	0	0	0	6,686
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	4,992	1,694	0	0	0	0	0	0	0	0	0	6,686
<b>Clean Air Fund</b>													
Capital	0	35,380	12,065	0	0	0	0	0	0	0	0	0	47,445
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	35,380	12,065	0	0	0	0	0	0	0	0	0	47,445
<b>Total</b>													



Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
Capital	0	40,372	13,759	0	0	0	0	0	0	0	0	0	54,131
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	40,372	13,759	0	0	0	0	0	0	0	0	0	54,131

Table 5-3: Cashflow Statement – Short Operation (Outturn Values)

Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
Capital Grant from IF/CAF	0	40,372	13,759	0	0	0	0	0	0	0	0	0	54,131
Operating Revenue	0	0	8,682	7,456	5,164	0	0	0	0	0	0	0	21,302
Revenue Grant from IF/CAF	0	0	0	0	0	0	0	0	0	0	0	0	0
Capital Costs	0	40,372	13,759	0	0	0	0	0	0	0	0	0	54,131
Operating Costs	0	0	2,226	2,352	1,725	55	57	58	60	62	11	0	6,606
Decommissioning	0	0	0	0	622	0	0	0	0	0	0	0	622
Net Cashflow	0	0	6,455	5,104	2,817	-55	-57	-58	-60	-62	-11	0	14,074

Table 5-4: Budget Statement – Ten Year Operation (Outturn Values)

Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Operating Income</b>													
Operating Revenue	0	0	8,682	7,456	6,632	5,735	4,848	3,978	3,101	2,228	1,385	125	44,171
Operating Grant	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Operating Expenses</b>													
Operating Costs	0	0	2,226	2,352	2,261	2,205	2,143	2,053	2,008	1,965	1,872	305	19,391
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	739	739
Total	0	0	2,226	2,352	2,261	2,205	2,143	2,053	2,008	1,965	1,872	1,043	20,129
<b>Net Operating Income</b>	0	0	6,455	5,104	4,371	3,530	2,705	1,926	1,092	264	-486	-919	24,042
<b>Use of Net Income</b>													

Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
Deficit Coverage	0	0	1,405	0	0	0	0	0	0	0	0	0	1,405
Reinvestment Reserve	0	0	5,050	5,104	4,371	3,530	2,705	1,926	1,092	264	0	0	24,042
<b>Residual Cash Position</b>	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 5-5: Funding Statement – Ten Year Operation (Outturn Values)

Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
<b>Implementation Fund</b>													
Capital	0	4,992	1,694	0	0	0	0	0	0	0	0	0	6,686
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	4,992	1,694	0	0	0	0	0	0	0	0	0	6,686
<b>Clean Air Fund</b>													
Capital	0	35,380	12,065	0	0	0	0	0	0	0	0	0	47,445
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	35,380	12,065	0	0	0	0	0	0	0	0	0	47,445
<b>Total</b>													
Capital	0	40,372	13,759	0	0	0	0	0	0	0	0	0	54,131
Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	40,372	13,759	0	0	0	0	0	0	0	0	0	54,131

Table 5-6: Cashflow Statement – Ten Year Operation (Outturn Values)

Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
Capital Grant from IF/CAF	0	40,372	13,759	0	0	0	0	0	0	0	0	0	54,131
Operating Revenue	0	0	8,682	7,456	6,632	5,735	4,848	3,978	3,101	2,228	1,385	125	44,171
Revenue Grant from IF/CAF	0	0	0	0	0	0	0	0	0	0	0	0	0
Capital Costs	0	40,372	13,759	0	0	0	0	0	0	0	0	0	54,131
Operating Costs	0	0	2,226	2,352	2,261	2,205	2,143	2,053	2,008	1,965	1,872	305	19,391

Operational Item	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	Total
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	739	739
Net Cashflow	0	0	6,455	5,104	4,371	3,530	2,705	1,926	1,092	264	-486	-919	24,042

## 6. Summary and Conclusions

The financial analysis of the Clean Air Plan options demonstrates that the capital cost of implementation will amount to £54.1 million (outturn values). BCC is requesting 12% of this funding from the Implementation Fund to support capital expenditure. BCC is requesting the residual funding from the Clean Air Fund to support capital expenditure on mitigation measures.

From an operational perspective, the financial analysis demonstrates that CAZ revenue is sufficient to cover operational costs for all Clean Air Plan options based on core scenario analysis. However, there is significant uncertainty around the timing, profile and scale of CAZ revenue generation. Sensitivity testing demonstrates that changes to profiling of the reduction in non-compliant traffic have the largest impact on the operational position of the Clean Air Plan. For example, significant acceleration in the reduction of non-compliant vehicles (e.g. because the rate of vehicle upgrading or behavioural choices towards non-car travel materialise faster than forecast) could significantly reduce CAZ income and transform any operational surplus into an operational deficit.

In summary, the total request to central government for the delivery of the Clean Air Plan can be summarised as follows:

- £54.1 million in capital grant funding, of which:
  - £6.7 million from the Implementation Fund
  - £47.4 million from the Clean Air Fund

Under the core scenario for financial modelling, both operational period scenarios can achieve a net operational surplus of between c. £14.1 million and c. £24.0 million over the appraisal period. It is intended that any surplus can be used for the following purposes, in order of priority:

- Deficit coverage for ongoing and long-term operational expenditure, particularly in latter years of operation when the various schemes are anticipated to face an operational deficit, as well as decommissioning.
- Creation of a reinvestment reserve to support:
  - Any underestimation of operational costs.
  - Delivery of BCC's 'Liveable Neighbourhoods' aspirations (estimated cost range £45m to £283m);
  - Supplementary schemes to the CAF measures, as well providing an opportunity to further invest in engagement with businesses and local residents affected by the schemes. For example, this funding source would support or extend some of the following measures which may form part of the CAF bid:
- Increase, Improve, update Legible City Signage on key radials and in city centre;
- An 'unintended consequences' fund for minor local implementations such as one-ways; and
- Support for additional buses to the Bristol Royal Infirmary.