

Appendix A – Options Assessment Report

Portway Park & Ride Access FBC

Options Assessment Report

MAY 2023



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Arcadis LLP

Prepared For:
Bristol City Council



Version Control

Issue	Revision No.	Date Issued	Description	Reviewed By
1	1	10/11/2022	Draft	AM
1	2	18/11/2022	BCC comments addressed	IB
1	3	21/11/2022	Section 2.1.5 updated	IB, AM
1	4	11/05/2023	Updated to include revised option	IB, AM

This report dated 12 May 2023 has been prepared for Bristol City Council (the "Client") in accordance with the terms and conditions of appointment dated 01 September 2022 (the "Appointment") between the Client and **Arcadis LLP** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.



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1 Introduction

Bristol City Council (BCC) commissioned Arcadis to develop the Full Business Case (FBC) for the Portway Park and Ride (P&R) site along the A4 dual carriageway.

This Options Assessment Report (OAR) details the proposed long-list options for the project and the sifting process undertaken in order to reach a preferred option. This scheme seeks to make improvements for bus services travelling to and from the north and west of the A4 Portway to the Portway P&R site.

2 Study Background

The Portway P&R site is located along the A4 Portway, the main dual carriageway connecting Bristol City Centre with Avonmouth and the M5. The A4 Portway corridor already benefits from bus priority on the inbound side of the carriageway as do parts of A4 Hotwell Road and A4 Anchor Road. This project looks to allow provisions for bus services to access and egress the site from the north and west.

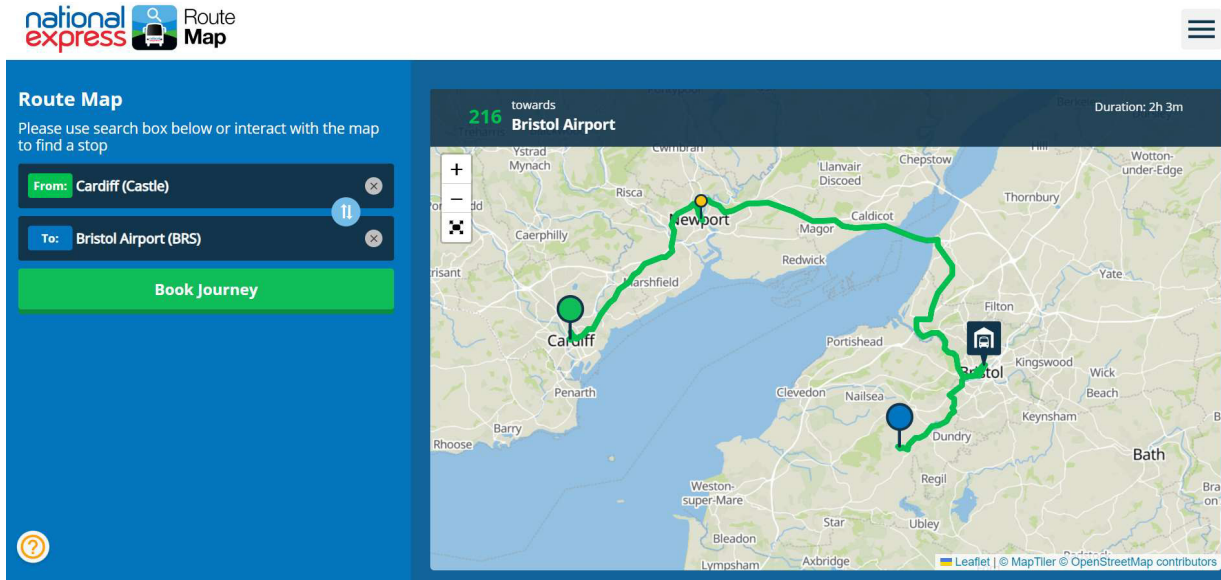
The Portway P&R is the main location providing bus service along the A4 Portway linking Bristol City Centre with Avonmouth and the M5. The service is operated by First Bus and runs seven days a week. Running from 06:00 to 19:43 Monday to Friday, 07:00 to 19:22 on Saturdays and 09:00 to 18:44 on Sundays and public holidays. It departs from the Shirehampton, Portway P&R site every 15 minutes on weekdays, 20 minutes on Saturdays, 30 minutes on Sundays and bank holidays and takes 46 minutes to complete the loop. This route is shown in Figure 1. There are currently no other services using the site and this service will not be impacted by a new access and egress.



¹Figure 1 Portway Park and Ride Bus Route

There has been an increase in the use of the A4 Portway by coach services in the last 15 years. This includes the establishment of the hourly national express service from South Wales to Bristol Airport (BRS). This route is shown in Figure 2

¹ Source: <https://www.firstbus.co.uk/bristol-bath-and-west/routes-and-maps/bristol-park-ride>



²Figure 2 National Express Route Cardiff to Bristol Airport

The A4 Portway has also had an increase in the number of inter-urban bus services using it in recent years. In September 2020, the X5 from Clevedon and Portishead was running hourly throughout the day and achieving a journey time of 31 minutes between Portishead and the heart of Bristol. This is compared to a 51-minute journey time, off-peak, on the traditional route using the A369. However, this route has since been shortened so it does not use the A4 Portway and only travels between Weston Super Mare and Portishead.

Currently the access arrangements at the P&R site cause problems for:

- Event shuttlebuses travelling from the site to the YTL Arena (currently under construction at the Brabazon Hangar, Filton)
- Rail replacement services to cater for the new rail platform (opens early 2023)
- The sites' future use by new, or existing services

2.1 Planned and Forecast Services in the Area

Bristol City Centre to Avonmouth and Severnside Metrobus

The Bristol City Centre to Avonmouth and Severnside metrobus extension will stop at the P&R site providing improved commuting options and connectivity for employees at businesses in Severnside and Avonmouth. The scheme builds on the extensive existing bus priority on the A4 Portway, with the extended bus priority, enhanced stops and upgraded metrobus services. Further bus priorities including potential bus-only links would be needed into Severnside but this route would not be expected until 2036. The Portway Park and Ride site will be pivotal in the delivery of these ambitions, acting as a hub linking the A4 Portway with the A401 'St Andrews Way'.

Mixed Use Development

Access 18 is a mixed-use development located northeast of the P&R site. The development is expected to attract many trips as people commute to various industrial, commercial and employment sites nearby. The current infrastructure of the P&R site does not allow bus services from serving Access 18 and therefore does not support sustainable travel to the development.

² Source: https://routemap.nationalexpress.com/search/between/cardiff_castle/bristol_airport_brs

Portway P&R Site Expansion

A new railway station platform adjacent to the existing Portway P&R site on the Severn Beach Line (SBL) is set to open in early 2023. Parallel to the opening of the rail platform, the existing Portway P&R site will be expanded, unlocking provision for a further 270 car parking spaces, increasing usage of the railway station. The improved P&R site will support the new station with rail replacement services when necessary.

Yeoh Tiong Lay (YTL) Arena

The new YTL Arena Complex will be a multi-use entertainment and leisure venue located at the existing Brabazon Hangers, North of Bristol City Centre. At maximum capacity, the arena will hold up to 17,000 people for music events as well as offices, food retail, non-food retail, leisure and training centre. The target opening year for the development is 2025/2026. The development can provide a maximum of 2,334 car parking spaces, as per the Site Allocations and Development Management Policies 2014³, for both staff and visitors, of which, a multi-storey car park with 1,700 car parking spaces is committed. It is proposed that during busy events, the Portway P&R will provide shuttle bus services to the YTL Arena.

2.2 Local Plans and Strategies

The Portway P&R improvements form an integral part of many regional, local transport and development plans and policies which are described below. The main issue preventing the P&R site from fulfilling these policies and plans is its design. It does not support connectivity to local bus networks, particularly from the Avonmouth direction, and the nearby port. Furthermore, the current arrangement also prohibits services travelling from or to Portbury, Severnside, North Somerset and South Gloucestershire to connect to the rail network.

The Joint Local Transport Plan (JLTP4)

The plan details the vision for transport in the West of England up to 2036. It discusses the transport challenges in the West of England such as increased travel demand, poor air quality and strain on road and rail networks.

The JLTP4 plan includes specific policies relating to the A4 Portway including:

- Building on the extensive bus priority measures already in place along the A4 Portway to cater for a future metrobus route from Bristol City Centre to Severnside
- Expanding the Portway P&R site

The report highlights the delays on the already congested M5 junctions which are likely to result in a diversion of trips on to the other routes, including the A4 Portway leading to increased congestion along the A4 Portway corridor, Avonmouth direction, and the nearby port.

West of England Bus Service Improvement Plan

The plan specifically mentions the A4 Portway with the following vision:

- Upgrade the existing P&R site to a transport hub and align with the new railway station, providing segregated bus infrastructure and LTN 1/20 compliant cycle infrastructure to improve existing links.

West of England Bus Strategy

Regarding P&R services, the strategy says: Existing sites will be expanded, and new sites provided. These sites will be designed to fit the emerging strategic network and operate as transfer locations for connecting bus services and key interchanges between other transport modes.

³ <https://www.bristol.gov.uk/files/documents/5718-cd5-2-brislington-meadows-site-allocations-and-development-management-policies/file>

City Region Sustainable Transport Settlement (CRSTS) SOBC

The A4 Portway has been identified as a high priority public transport corridor in phase one of the City Region Sustainable Transport Settlement (CRSTS) and the West of England Combined Authority (WECA) Bus Infrastructure Programme.

West of England Transport Delivery Plan

The plan hopes to achieve the following at the P&R site:

Provide P&R and transport hubs in the right places around our region to offer reliable transport interchange, cross regional bus services and sustainable access to our urban centres for those where the car from home is the only option.

Bristol Transport Strategy

The Bristol Transport Strategy (2019) sets out planned improvements to the transport network throughout the city by 2036. The report makes specific reference to enhancing bus routes by connecting Portway P&R with Severnside.

The objectives of the Bristol Transport Strategy reflect the more localised issues and opportunities along the A4 Portway corridor project, aiming to increase frequency and journey time reliability of the public transport network, improve air quality and reduce congestion.

The City Centre Framework

Bristol's City Centre Framework (CCF) sets out proposals to improve movement, public realm and the approach to regeneration and development in the city centre.

Within the framework are 23 aims, most of which can be traced back to the needed changes to transport infrastructure facilities and 6 of which specifically mention changes to the highway network, in particular. *Aim 6: New and expanded P&R Services under CCF Public Transport aims.*

The corridor has the capacity to deliver infrastructure changes that prioritise public transport and other modes of sustainable transport over general traffic.

Local Cycling and Walking Infrastructure Plan

The West of England Local Cycling and Walking Infrastructure Plan (LCWIP) sets out to provide high quality infrastructure to ensure the West of England is a region where cycling and walking are the preferred choice of travel for shorter trips.

The A4 Portway corridor has the capacity to deliver infrastructure changes that prioritise active travel and other modes of sustainable transport over general traffic.

2.3 Stakeholder Engagement

BCC produced different products and a webpage to understand public views about their travel issues along the route. The products included a survey with a freepost envelope, postcards and posters. The survey was available from the 29th of June until the 17th of August 2022. In addition to the public consultation, BCC consulted key stakeholders such as Stagecoach, First Bus and Bristol Walking Alliance for their thoughts and comments.

Virtual key stakeholder workshops were conducted which involved a short presentation about the A4 Portway corridor and what the council was trying to achieve, followed by a discussion looking at the challenges and opportunities along the route from a transport perspective. The views from the public and key stakeholders were summarised in an early engagement report and aided the development of the project plan.

3 Project Aim and Objectives

The proposed project will deliver infrastructure changes to the Portway P&R site that allows bus services to access and egress the site from the north and west.

The project objectives for providing the Portway P&R access are summarised as follows:

1. To deliver a P&R facility that has the capacity to accommodate event shuttlebuses for the YTL Arena in time for the Arena opening in 2024
2. Safeguard the possibility of running new or additional services from the Portway P&R site northbound to serve Avonmouth, Weston Super Mare, Portbury, Portishead, Severnside, South Gloucestershire, North Somerset, South Wales etc
3. Increase the proportion of trips that are made by bus
4. Reduce levels of air pollution and CO2 emissions through mode shift from private car to public transport

4 Long List of Options

Following a proportionate informal optioneering process, a total of eight high-level options were developed which are listed in Table 1. Within the table, the impact of implementing each of the options has been evaluated, highlighting the key benefits and disbenefits.

Table 1 Long List of Options

Option No.	Option Description	Impacts of the Option
0	Do Nothing	<ul style="list-style-type: none"> • Does not meet project aims and objectives but is required to be taken forward to compare against the with scheme scenario.
1	All bus movements at the existing junction	<ul style="list-style-type: none"> • Increased queuing times for outbound traffic • Loss of trees on the north side of the carriageway • Increased diversions of utilities • Shifted main carriageway location closer to residential properties leading to loss of the verge
2	Left turn out and right turn in at the new T-Junction	<ul style="list-style-type: none"> • Buses caught in traffic due to exiting with all vehicles. • Possibility of cars accessing new bus lane and taking advantage of it as a right turn out of the existing junction. • Difficulty maintaining P&R operations while work is in progress
3	New junction western end and left turn out at existing junction	<ul style="list-style-type: none"> • A reverse camber of 7%, creating a turn too severe for buses to make • Major loss of trees on south side of carriageway
4	Left turn out for buses and right turn in for buses	<ul style="list-style-type: none"> • Unsafe pedestrian movements • Stop line for buses increasing intergreen time for west running lanes

Option No.	Option Description	Impacts of the Option
5	Left turn out, right turn in for buses with the addition of a triangular island	<ul style="list-style-type: none"> Does not directly affect car park exit road during construction Less impact on the P&R operations during construction. Tree removal extensive (20+ required for removal)
6	This option adds a triangular island to Option 4 and additional lane in and out of the P&R site	<ul style="list-style-type: none"> Stop line for exiting buses is set so far back into the P&R site that waiting buses will block the sites' internal informal pedestrian crossing
7	Separate bus lane and car exit lane	<ul style="list-style-type: none"> Safety concerns about the multiple exit lanes Difficulties for vehicles to manoeuvre to the correct lane for the next junction
8	Additional exit lane for the existing car park	<ul style="list-style-type: none"> Loss of vegetation / trees and car parking bays Difficulties with the traffic merging over a short distance. Difficulties keeping car park in operation while work is in progress

5 Short List of Options

Several of the long-list options were discounted based on their impact (as described in Table 1). Options 1, 2 and 3, were selected to form the short list of options and consequently further developed. Option 2 was further developed into two variations. Table 2 below describes each of the four options. Designs of the options were developed and these drawings can be found in Appendices A and B.

Table 2 Short List of Options

Option No.	Option Description
0	Do Nothing
1-011	Buses travelling to and from Avonmouth / M5 direction can access and egress the P&R site using single entry/exit point.
2-012	This is a T-Junction arrangement including a flipped staggered crossing to make small space for right turn area for buses. This includes a straight across crossing for pedestrians and new wayfinding signage.
2A-013	This is a variation of Option 2-012 (T-Junction arrangement). This included moving the staggered crossing towards junction with Grove Leaze. Grove Leaze to be closed in one way for general traffic. By doing this, it creates a larger space for buses turning right.
3-014	This includes a new right turn lane for buses entering the site. The pedestrian crossing is moved to the eastern side of the current bus access / egress junction.

6 Sifting Process

A proportionate sifting exercise was undertaken on the short-listed options. A ‘light touch’ multi-criteria sifting process was established to determine a preferred option. The sifting exercise factors such as deliverability, cost, impact on plantation etc. were considered and scored to provide an overall assessment.

Table 3 assesses each short-listed option against different factors to reach the preferred option.

Table 3: Short List Sifting

Factors	Option Number			
	1-011	2-012	2A -013	3-014
Supports Project Objectives	5	5	5	5
Risk (Higher the score= lower the risk)	1	4	3	3
Fits with local, regional and national policies	3	5	4	3
Likely to be deliverable	3	4	3	3
Likely to be affordable	1	4	3	3
Minimal construction disruption	3	3	2	2
Likely to be Publicly Acceptable	4	4	2	1
Total Score	20	29	22	20

The Do-Nothing has not been scored but it was automatically required to be taken forward.

The scoring mechanism was based on the following criteria:

- 0 – Does not meet the criteria
- 1 – Slightly meets criteria
- 2 – Somewhat meets the criteria

- 3 – Meets the criteria
- 4 – Strongly meets the criteria
- 5 – Very strongly meets the criteria

Option 2-012 scored the highest of all the short-listed options. This was due to the option fitting better with local, regional and national policy objectives, being more affordable and being more deliverable than the other options. Option 2A -013 has the second highest score, however, this is not as publicly acceptable, deliverable or affordable than Option 2-012. Options 1-011 and 3-014 scored the lowest of all the short-listed options, this is because they are not likely to be affordable and publicly acceptable respectively.

7 Preferred Option

Option 2-012 was selected as the preferred option after achieving the highest score of all the options assessed using the multi-criteria framework sifting process. This option was predominantly more affordable and deliverable than the other short-listed options.

The preferred option drawing is presented in Appendix A. This option widens the current bus egress to include a new left turn lane for buses exiting P&R towards Avonmouth. The existing corner horizontal alignment radius for left turning buses into the P&R site is increased to enable larger buses to access. The gates at the bus entrance to the site will remain in their current position, but will be replaced with new, wider gates and a new, signalised, straight through pedestrian crossing will be constructed here.

The staggered pedestrian crossing on the A4 Portway will be flipped, moving the crossing over the westbound carriageway further west, which will allow the central reservation to be reduced to provide room for a waiting area for buses turning right into the P&R site. The splitter island at the current bus access / egress will be re-aligned to allow buses approaching from the west to make the right turn into the site.

The old footway and the bus stop layby on the A4 westbound carriageway will be broken out and re-seeded. A section of grass verge will be made into an extended hard standing area, with flush kerbs installed for cycle access. New wayfinding signage will be installed including new cycle signs, a drawing of this has been included in Appendix A.

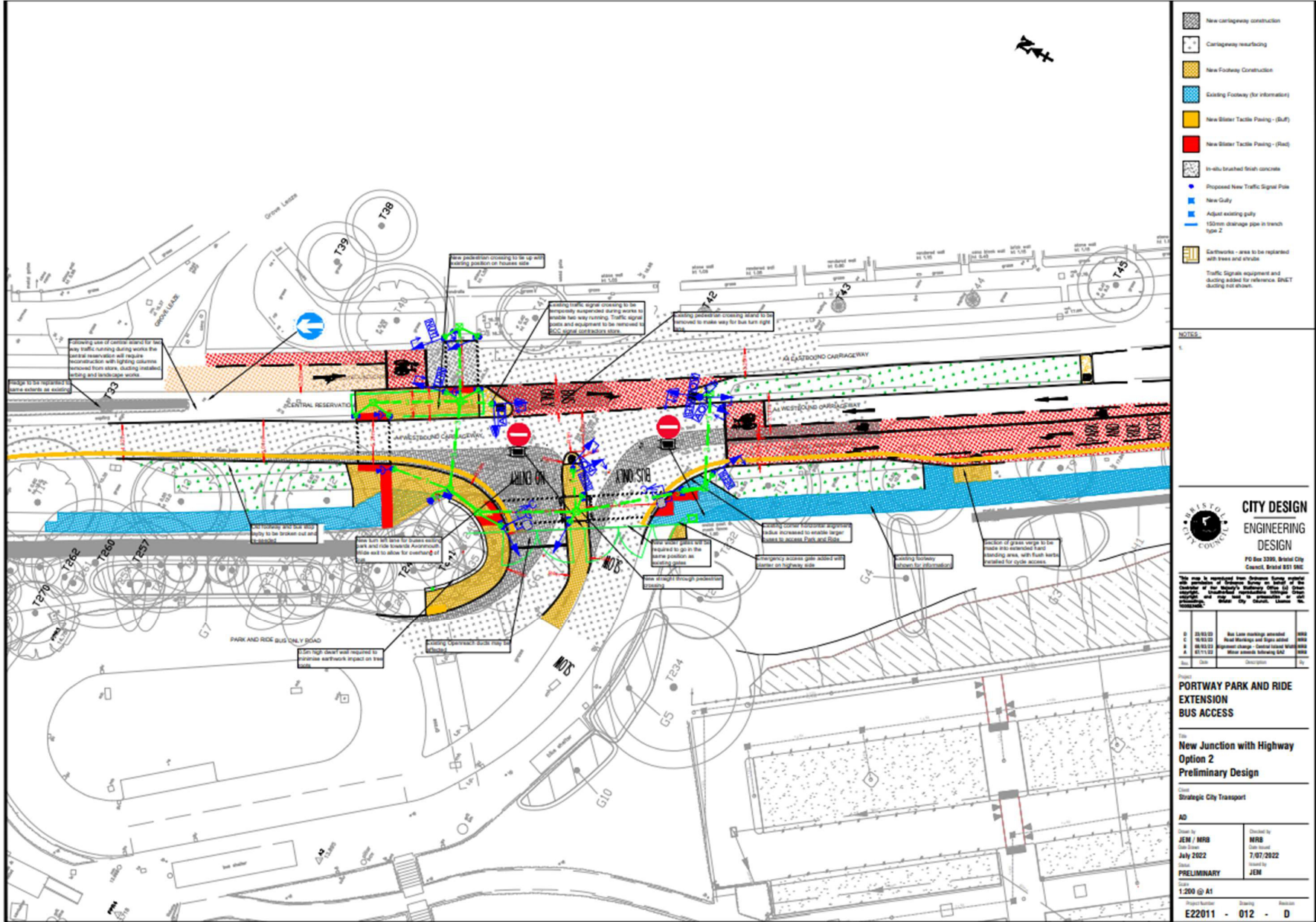
8 Conclusion

In this options assessment report, a long list of options was created for the Portway P&R Access scheme. These options were then discounted and options 1, 2 and 3 were further developed to produce four short-listed options. A preferred option, Option 2-012, was then selected after using a 'light touch' multi-criteria sifting process. Following selection of the preferred option, detailed design, modelling and economic appraisal will be undertaken. This will culminate in a Full Business Case being produced for the scheme.



Appendix A

Preferred Option – Option 2-012



	New Carriageway Construction
	Carriageway Surfacing
	New Footway Construction
	Existing Footway (for information)
	New Sliver Tactile Paving - (Suft)
	New Sliver Tactile Paving - (Rad)
	In-situ brushed finish concrete
	Proposed New Traffic Signal Pole
	New Gully
	Adjust existing gully
	150mm drainage pipe in trench type 2
	Cartworks - area to be replaced with trees and shrubs
	Traffic Signals equipment and ducting added for reference. SNET ducting not shown.

NOTES:

1. This plan is a preliminary design. It is intended to provide a general indication of the proposed works and is not to be used for construction purposes. It is subject to change without notice.

CITY DESIGN ENGINEERING DESIGN
 PD Box 3390, Bristol City Council, Bristol BS1 9BC

0	10/03/22	See Issue Markings attached	0002
1	16/03/22	Road Markings and Signs added	0003
2	08/04/22	Improvement Change - General Road Works	0004
3	01/11/22	Minor amendments following S&L	0005
Rev	Date	Description	By

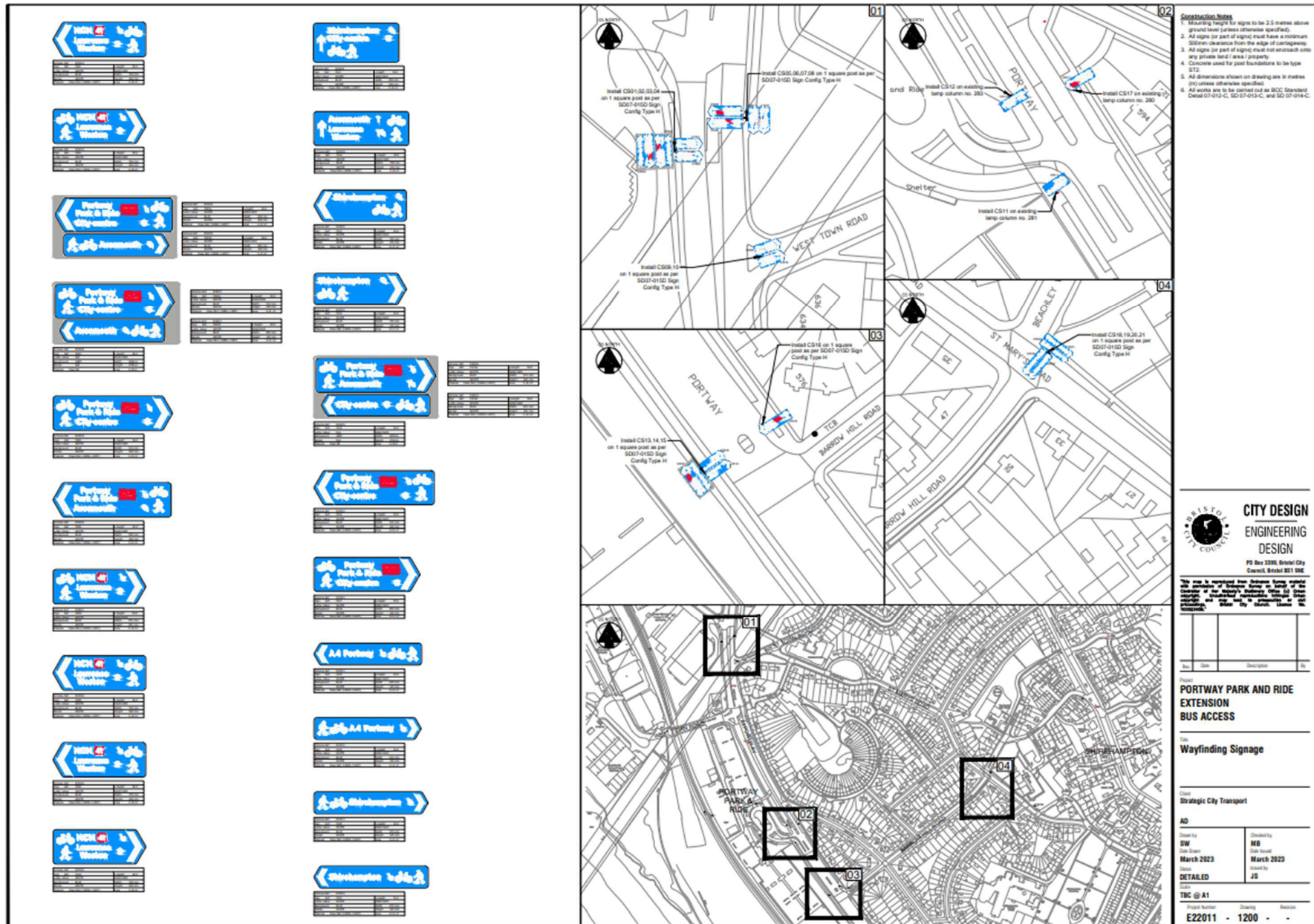
Project: PORTWAY PARK AND RIDE EXTENSION BUS ACCESS

Title: New Junction with Highway Option 2 Preliminary Design

Client: Strategic City Transport

AD			
Drawn by:	JEM / NRB	Checked by:	NRB
Date Drawn:	July 2022	Date Checked:	7/07/2022
Status:	PRELIMINARY	Issued by:	JEM
Scale:	1:200 @ A1		

Project Number: E22011 - 012 - D



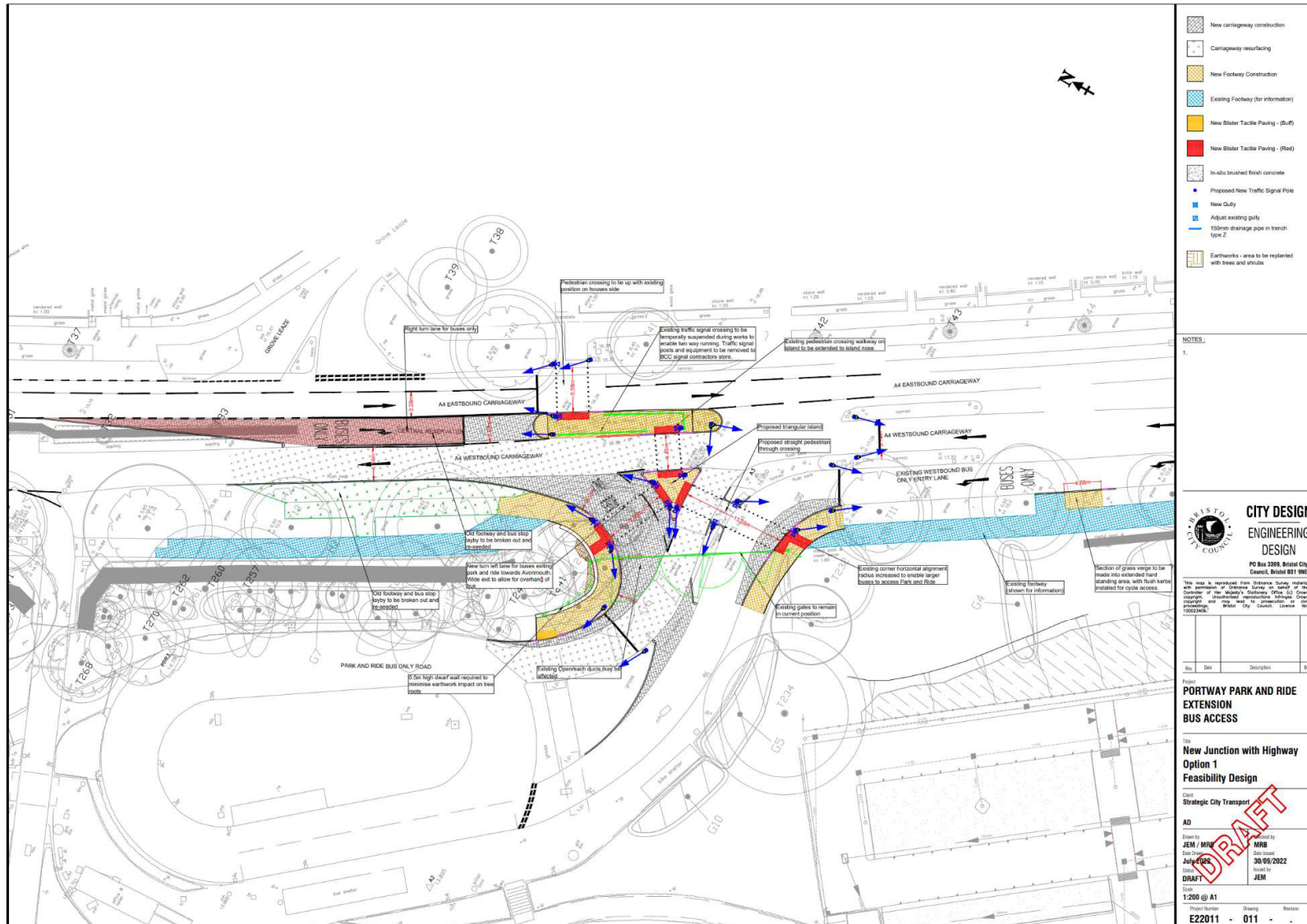


Appendix B

Other short-listed options

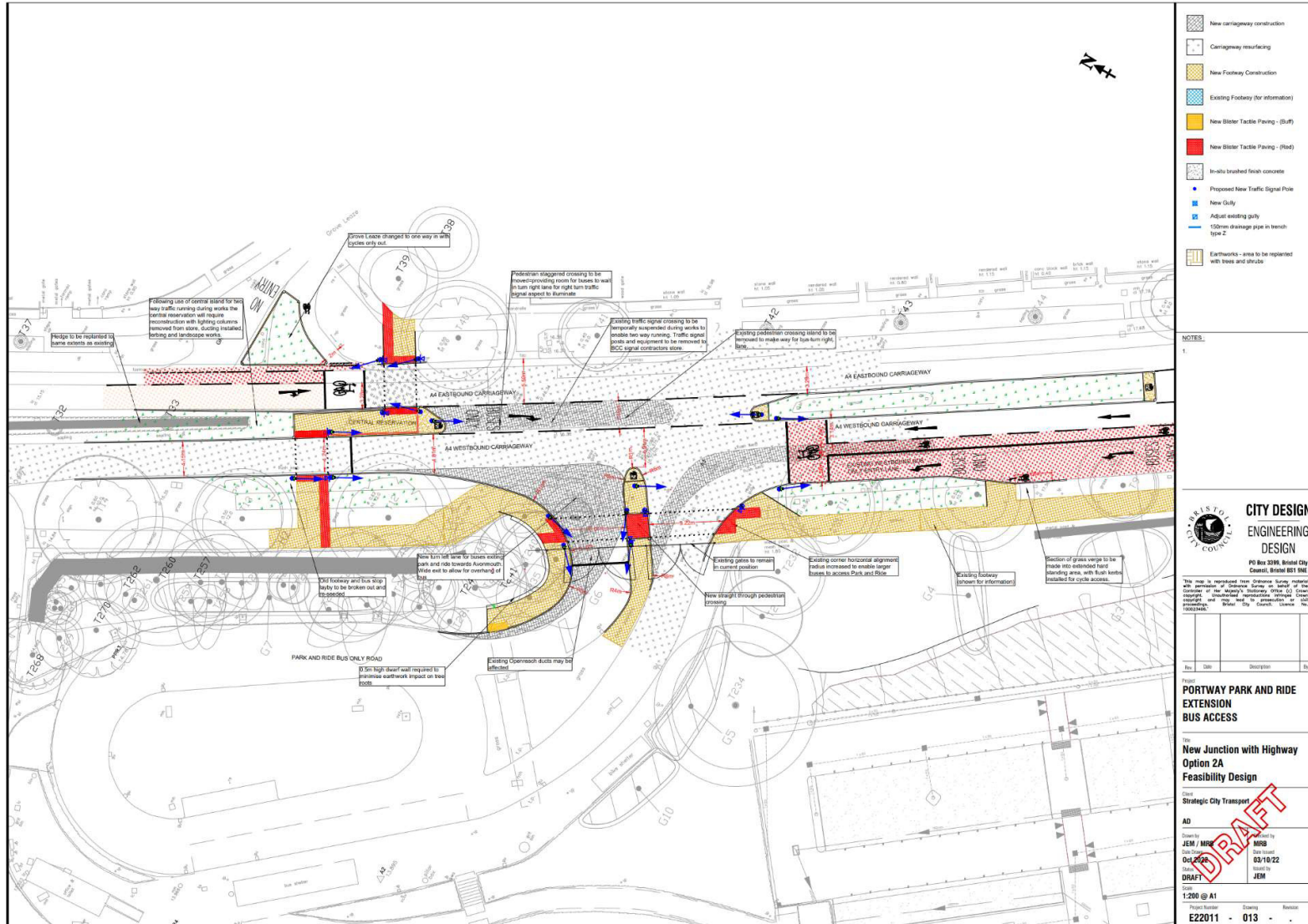
Portway Park and Ride Access – Options Assessment Report

Option 1-011



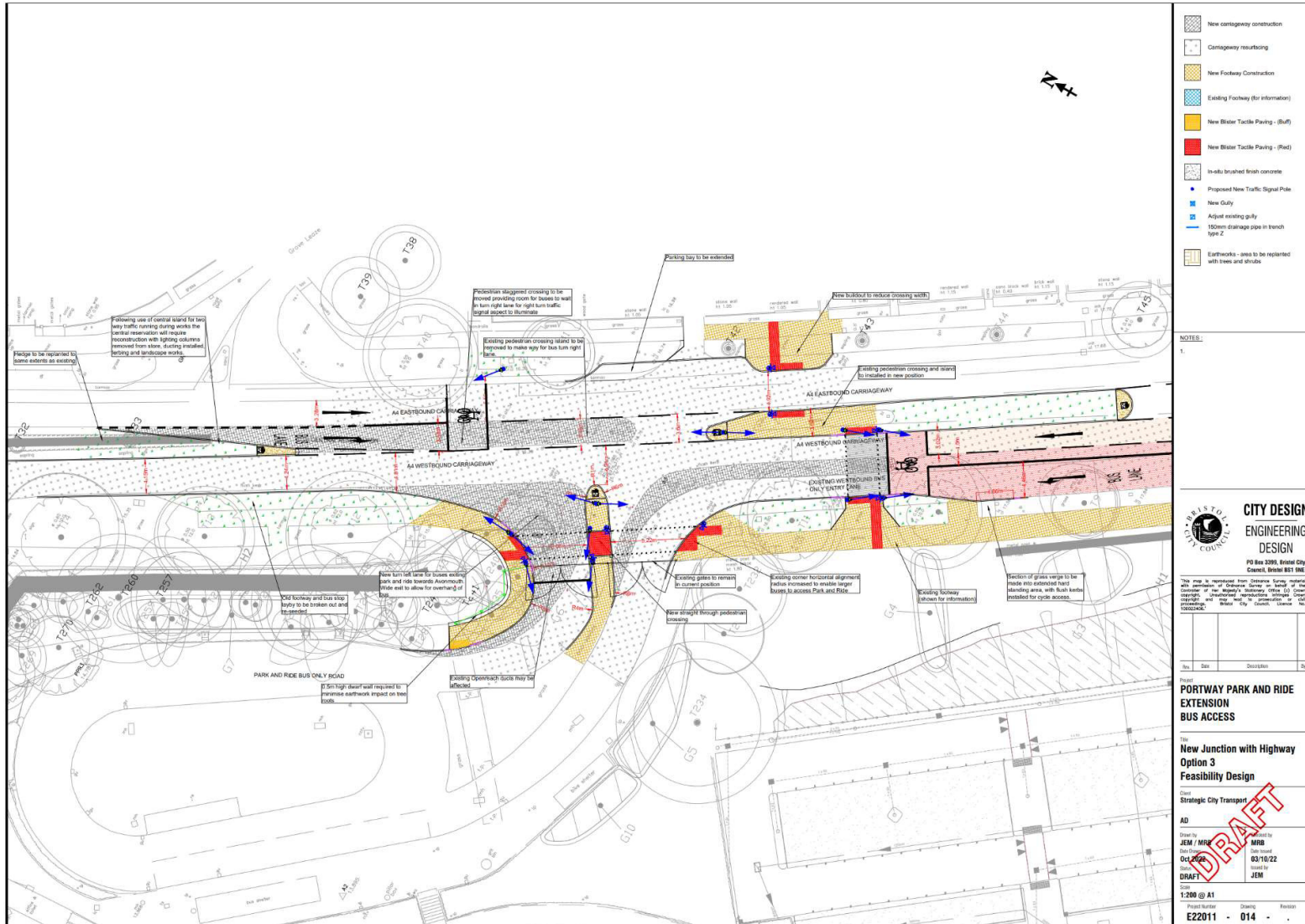
Portway Park and Ride Access – Options Assessment Report

Option 2A-013



Portway Park and Ride Access – Options Assessment Report

Option 3-014



NOTES:

1.

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No.	Date	Description	By

Report: **PORTWAY PARK AND RIDE EXTENSION BUS ACCESS**

Project: **New Junction with Highway Option 3 Feasibility Design**

Client: **Strategic City Transport**

AD: **JEM / MRE** (Designed by)
MKB (Checked by)
 Date Drawn: **03/10/22**
 Date Issued:
 Scale: **DRAFT**
 Title: **1:200 @ A1**
 Project Number: **E22011 - 014 - .**

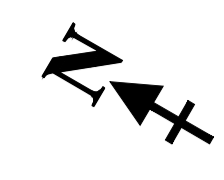
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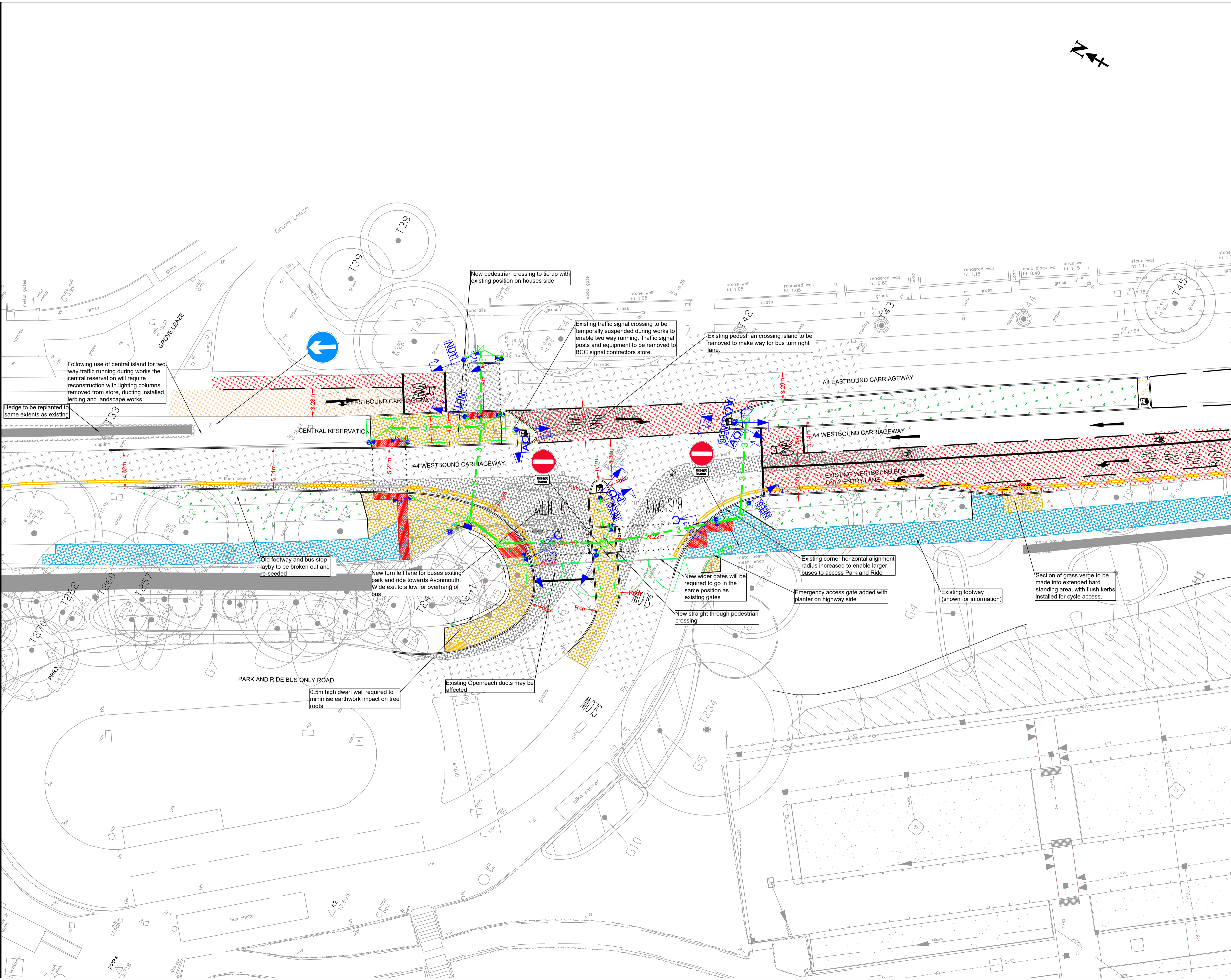
Appendix B – Preferred Option Design



-  New carriageway construction
-  Carriageway resurfacing
-  New Footway Construction
-  Existing Footway (for information)
-  New Blister Tactile Paving - (Buff)
-  New Blister Tactile Paving - (Red)
-  In-situ brushed finish concrete
-  Proposed New Traffic Signal Pole
-  New Gully
-  Adjust existing gully
-  150mm drainage pipe in trench type Z
-  Earthworks - area to be replanted with trees and shrubs
-  Traffic Signals equipment and ducting added for reference. BNET ducting not shown.

NOTES:

1.



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Rev.	Date	Description	By
D	23/03/23	Bus Lane markings amended	MRB
C	10/03/23	Road Markings and Signs added	MRB
B	08/03/23	Alignment change - Central Island Width	MRB
A	07/11/22	Minor amends following Q&A	MRB

PORTWAY PARK AND RIDE EXTENSION BUS ACCESS

Title
New Junction with Highway Option 2 Preliminary Design

Client
 Strategic City Transport

AD

Drawn by JEM / MRB	Checked by MRB
Date Drawn July 2022	Date Issued 7/07/2022
Status PRELIMINARY	Issued by JEM

Scale
1:200 @ A1

Project Number E22011	Drawing 012	Revision D
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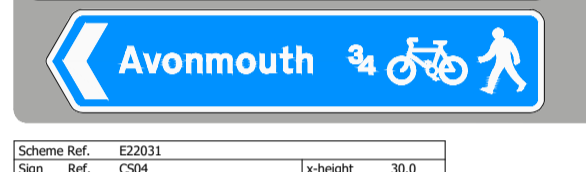
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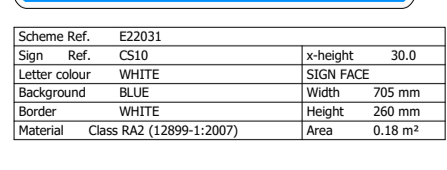
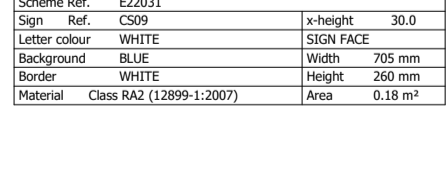
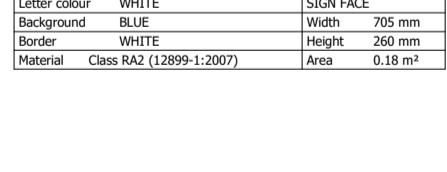
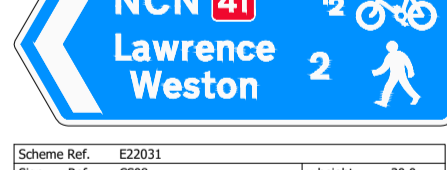
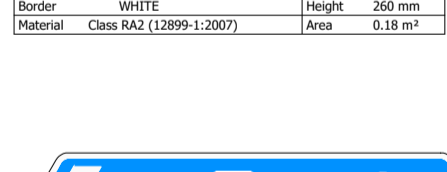
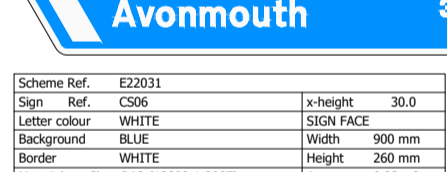
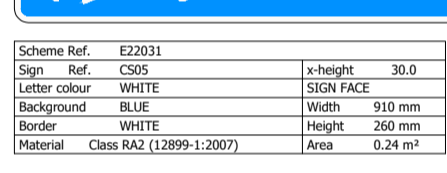
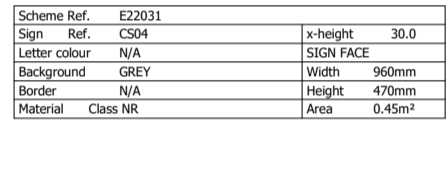
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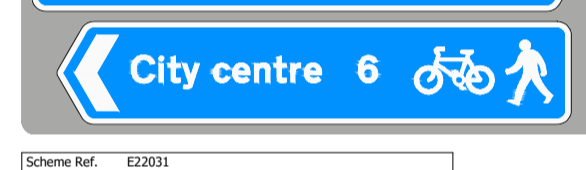
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Material	Class RA2 (12899-1:2007)
Area	0.24 m ²



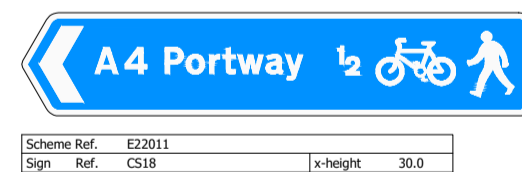
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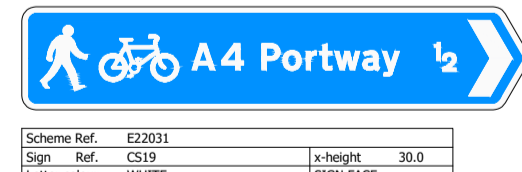
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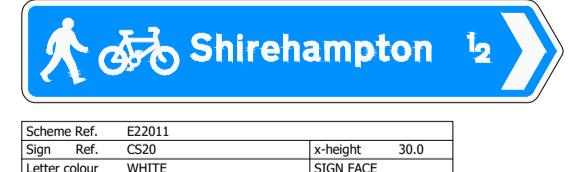
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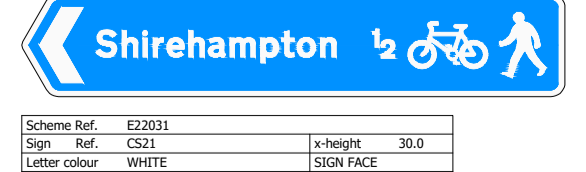
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Material	Class RA2 (12899-1:2007)
Area	0.14 m ²



Scheme Ref.	E22011
Sign Ref.	CS19
Letter colour	WHITE
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Material	Class RA2 (12899-1:2007)
Area	0.13 m ²



Scheme Ref.	E22011
Sign Ref.	CS20
Letter colour	WHITE
Background	BLUE
Border	WHITE
Material	Class RA2 (12899-1:2007)
Area	0.14 m ²



Scheme Ref.	E22011
Sign Ref.	CS21
Letter colour	WHITE
Background	BLUE
Border	WHITE
Material	Class RA2 (12899-1:2007)
Area	0.14 m ²



- Construction Notes**
1. Mounting height for signs to be 2.5 metres above ground level (unless otherwise specified).
 2. All signs (or part of signs) must have a minimum 500mm clearance from the edge of carriageway.
 3. All signs (or part of signs) must not encroach onto any private land / area / property.
 4. Concrete used for post foundations to be type ST2.
 5. All dimensions shown on drawing are in metres (m) unless otherwise specified.
 6. All works are to be carried out as BCC Standard Detail 07-012-C, SD 07-013-C, and SD 07-014-C.

CITY DESIGN
ENGINEERING DESIGN

PO Box 3399, Bristol City Council, Bristol BS1 9NE

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Rev.	Date	Description	By

PORTWAY PARK AND RIDE EXTENSION BUS ACCESS

Wayfinding Signage

Client: **Strategic City Transport**

AD	Checked by MB
Drawn by SW	Date Issued March 2023
Date Drawn March 2023	Issued by JS
Status DETAILED	

Scale: TBC @ A1	Project Number: E22011	Drawing: 1200	Revision: -
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Appendix C – Appraisal Summary Table

Appraisal Summary Table

Date produced: 4 7 23

Contact:

Name of scheme:	Portway Park and Ride	Name	Toby Clayton
Description of scheme:	The Scheme widens the current bus egress to include a new left turn lane for buses exiting P&R towards Avonmouth. The existing corner horizontal alignment radius increased to enable larger buses to access P&R. The gates at the bus entrance to the site will remain in their current position, but will be replaced with new, wider gates and a new, signalised, straight through pedestrian crossing will be constructed here. The staggered pedestrian crossing on the A4 Portway will be flipped, moving the crossing over the westbound carriageway further west, which will allow the central reservation to be reduced to provide room for a waiting area for buses turning right into the Park and Ride site. The splitter island at the current bus access / egress will be re-aligned to allow buses approaching from the west to make the right turn into the site. The old footway and the bus stop layby on the A4 westbound carriageway will be broken out and re-seeded. A section of grass verge will be made into an extended hard standing area, with flush kerbs installed for cycle access. New wayfinding signage will be installed including new cycle and pedestrian signs.	Organisation	Bristol City Council
		Role	Promoter/Official

Impacts	Summary of key impacts	Assessment				
		Quantitative		Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Value of journey time changes(£)		N/A	N/A	
		Net journey time changes (£)				
		0 to 2min	2 to 5min			> 5min
	Reliability impact on Business users			Slight beneficial		
	Regeneration			Neutral		
	Wider Impacts			Neutral		
Environmental	Noise			N/A	N/A	
	Air Quality			N/A	N/A	
	Greenhouse gases	Change in non-traded carbon over 60y (CO2e)		N/A	N/A	
		Change in traded carbon over 60y (CO2e)				
	Landscape	Scoped out		N/A		
	Townscape	Scoped out		N/A		
	Historic Environment	Scoped out		N/A		
	Biodiversity	Scoped out		N/A		
Water Environment	Scoped out		N/A			
Social	Commuting and Other users	Value of journey time changes(£)		Slight beneficial	N/A	
		Net journey time changes (£)				
		0 to 2min	2 to 5min			> 5min
		Reliability impact on Commuting and Other users			Slight beneficial	
		Physical activity			Slight beneficial	
		Journey quality			Slight beneficial	
		Accidents			Slight beneficial	N/A
	Security			Neutral	N/A	
	Access to services			Slight beneficial	N/A	

	Affordability	It is unlikely that there will be an impact or change on the affordability of public transport systems as no impact is expected on user charges for public transport services. A mode shift from private car to public transport could reduce congestion in the area. This is likely to reduce vehicle operating costs and fuel consumption which would benefit car users. However, the level of modal shift expected is likely to be small.		Neutral		N/A
	Severance	Severance will be improved by providing new crossing facilities at the entrance to the P&R site and across the A4 Portway carriageway.		Slight beneficial		N/A
	Option and non-use values	N/A		N/A		
Public Accounts	Cost to Broad Transport Budget	Capital scheme cost				
	Indirect Tax Revenues	Vehicles travelling more efficiently due to reduced congestion would result in modest reductions in indirect tax revenues to the central government (from fuel duty).		Slight beneficial		

Key:

	Information not used
	Redacted information

Appendix D – Environmental Impact Assessment

A4 Portway Park and Ride

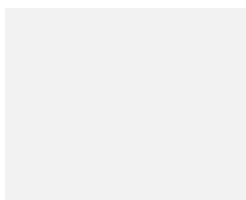
Environmental Appraisal

Document Ref: [Click or tap here to enter text.](#)

Revision: P01

APRIL 2023

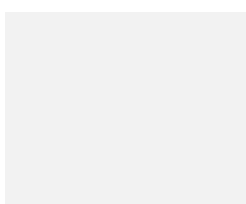
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A4 Portway Park and Ride Portway Park and Ride

Environmental Appraisal

Author Jack Tilley

Checker

Reviewer Sally Newbold

Approver Kevin Stubbs

Document Ref. Click or tap here to enter text.

Date APRIL 2023

Version Control

Version	Date	Author	Checker	Reviewer	Approver	Changes
P01	26/4/23	JT				

This report dated 28 April 2023 has been prepared for Bristol City Council (the “Client”) in accordance with the terms and conditions of appointment dated **Click here to enter a date.**(the “Appointment”) between the Client and **Arcadis Consulting (UK) Limited** (“Arcadis”) for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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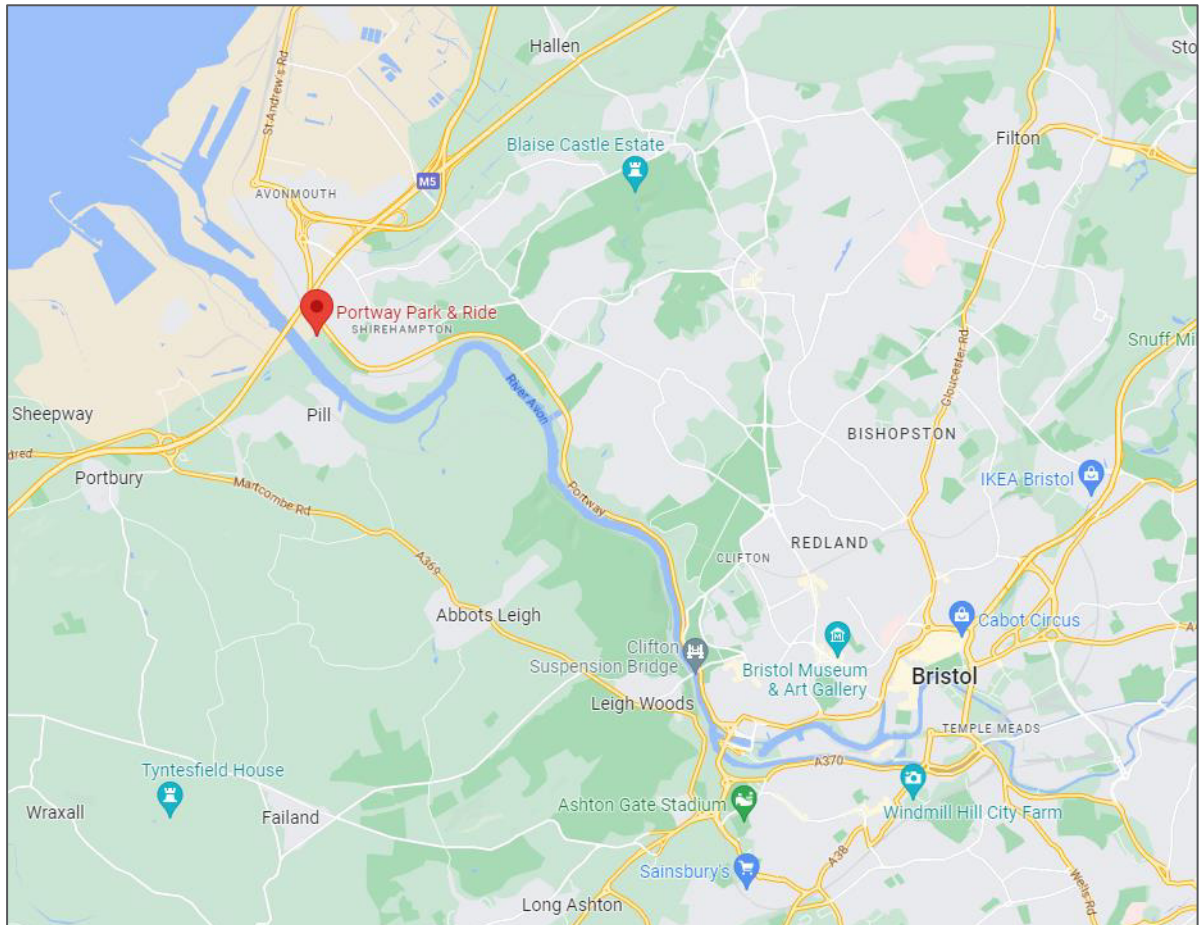
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1 Introduction

1.1 The Site and the Scheme

1.1.1 Arcadis Consulting (UK) Limited has been commissioned by Bristol City Council (BCC) to develop the Full Business Case (FBC) for works to the existing Portway Park and Ride (P&R) site (see Figure 1) along the A4 Portway dual carriageway, which connects Bristol city centre with the Avonmouth to the northwest.

Figure 1 - Site Location



1.1.2 The existing Portway P&R site operates a bus service from a single operator connecting Bristol City Centre with Avonmouth, and the M5 (See Figure 2¹). The service is operated by First Bus and runs every day. Currently there are no other services that run from this P&R site.

¹ Source: <https://www.firstbus.co.uk/bristol-bath-and-west/routes-and-maps/bristol-park-ride>

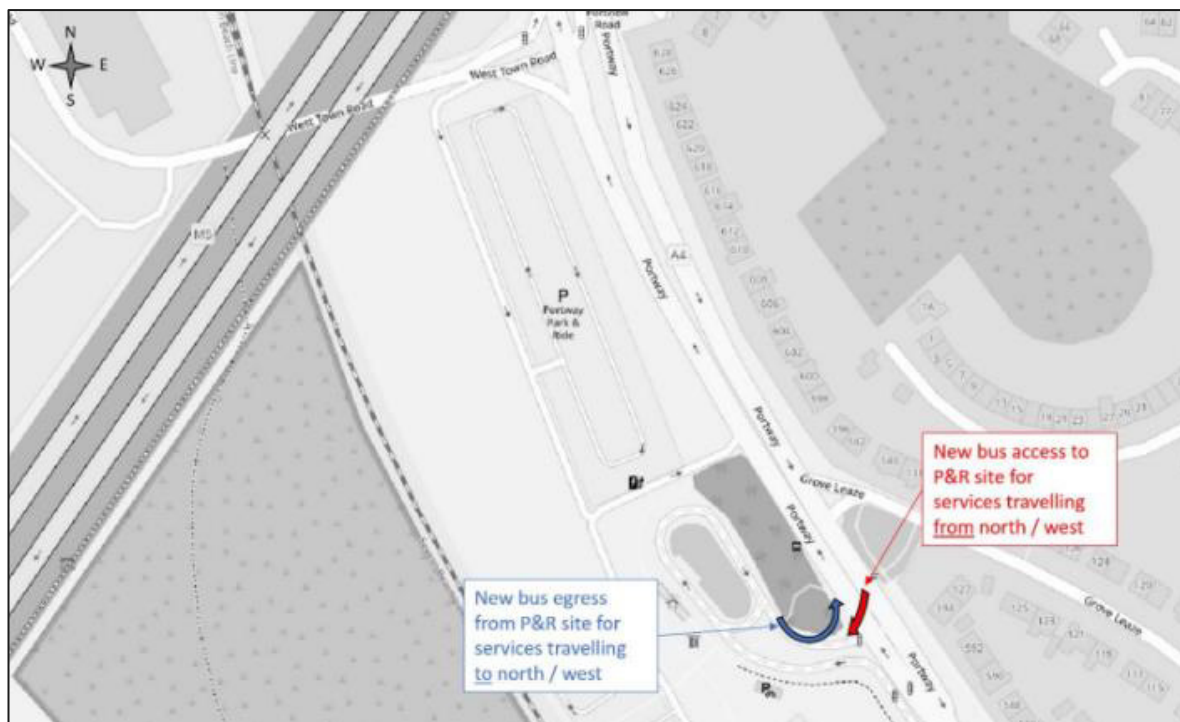
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Figure 2 - Bristol Park and Ride route map



1.1.3 The works proposed (hereafter referred to as ‘the Scheme’) comprise changes to current access and egress arrangements at the site to allow use of the site by a wider range of bus services and operators. Currently, buses can only make a left turn into the site from Bristol and a right turn out of the site towards Bristol (i.e. to and from the south). The Scheme will provide a right turn into the site from the north and a left turn out to the north (see Figure 3).

Figure 3 - The Scheme



1.1.4 The Scheme will include a new right turn into the site from the north and a left turn out of the site to the north. Construction of the Scheme will involve earthworks with potential to generate dust emissions. The work site will be approximately 3136m², however this does not include the oval bus lane but does include the entry and exit lanes. Enabling works will have an area of approximately 1720m² to enable works on the southern side, with the central islands having an area of 648m². In order to complete these works the removal of seven trees will be required, with the exact location of these trees outlined in the Arboriculture Impact Assessment². The seven trees will be replaced on the P&R site in conjunction with the Bristol Tree Replacement Standard, set out in the Local Policy. A requirement for the temporary removal of three further trees is necessary during the construction phase, these trees are located in the central reservation and will be replaced in the same location upon completion of the works. According to the junction modelling, the Scheme will not lead to a material change to traffic flows or traffic speed.

1.2 Methodology

1.2.1 This report sets out the environmental appraisal undertaken as part of the FBC. This appraisal has been undertaken in accordance with the West of England Combined Authority (WECA) Transport Appraisal Guidance advice note³ and Department for Transport (DfT) environmental impact appraisal guidance. A key part of this guidance is to undertake an appraisal in a proportionate manner, enabling a light-touch approach, where appropriate. where minor highway changes are proposed and the impacts are likely to be minor, a proportionate qualitative assessment is appropriate. On proportionality, for smaller interventions a lighter-touch appraisal is recommended.

² Source: [PDF AIA TPP - Portway Park & Ride - 29.11.22 Updated.pdf](#)

³ Source: <https://www.westofengland-ca.gov.uk/wp-content/uploads/2020/05/WECA-transport-appraisal-advice-v2.0-30-04-20.pdf>

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- 1.2.2 Based on the small-scale nature of the proposed works, and the guidance on proportionality, this environmental appraisal is light-touch and qualitative, as defined by DfT and WECA guidance.
- 1.2.3 For schemes that are going to result in a change in the public highway, the potential for noise and air quality impacts during operation should be scoped and assessed as appropriate. Appraisals will need to consider the likely overall change in noise levels and air quality impacts, outlining how the scheme impact on specific locations and receptors such as households and key amenities including educational, healthcare, community and recreational facilities. Noise Important Areas (NIAs) that have the potential to be impacted (i.e., within 600m of the proposed works), in relation to changes in traffic volume or speed, require an appraisal.
- 1.2.4 The Scheme does not exceed road network scoping thresholds as set out in the WECA guidance as there will be no change to traffic levels or speed. However, there are environmental designations, such as Noise Important Areas (NIAs), and receptors present within the 600m and 200m buffers specified. Therefore, the WECA guidance suggests a further but proportionate appraisal is required. Similarly, WECA guidance states that greenhouse gas impacts should be assessed for all schemes which will result in changes to the public highway.
- 1.2.5 The following table sets out the topics scoped out of the assessment:

Table 1 - Topics scoped out

Topic	Why has it been scoped out
Landscape	DfT TAG Unit A3 report ⁴ focuses on landscape character, however in this instance the Scheme is in a townscape, therefore it would not change the landscape character or impact visually on receptors. For these reasons it has landscape has been scoped out.
Townscape	DfT TAG Unit A3 report states that the requirement of an appraisal on Townscape depends on the nature of the scheme. Considering that this access improvement is minor and will not result in permanent realignment and is located in an urban area near major roads such as the M5, therefore, the Scheme would not impact the character of the townscape and has been scoped out.
Historic Environment	Within the area of the Scheme, there is a distinct lack of historic designations present, and therefore the Historic Environment will not be impacted. There is the potential for unknow archaeology to be impacted, however due to the small nature of the Scheme, impacts are unlikely. Therefore, Historic Environment has been scoped out.
Biodiversity	Due to the small nature of the Scheme, and mitigation measures specified in relation to vegetation and tree planting, the impacts on species and habitats will be limited. There is a distinct lack of environmental designations within the area of the Scheme, the only environmental designations within a 600m radius of the Scheme are a Site of Importance for Nature Conservation and four listed buildings. However, due to their distant proximity to the Scheme and the small nature of the works, these designations will not be impacted. Therefore, biodiversity will not be impacted and has been scoped out.
Water Environment	Due to the small nature of the Scheme, there is not a permanent realignment to the highway, meaning that there is not a change to the amount of hardstanding, therefore the floodplain will not be impacted. Therefore, water environment has been scoped out.

⁴ Source: [TAG UNIT A3 Environmental Impact Appraisal \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/642222/TAG_UNIT_A3_Environmental_Impact_Appraisal.pdf)

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1.2.6 The assessment will therefore focus on a qualitative consideration of air quality, noise and greenhouse gases.

1.3 Environmental Baseline

1.3.1 The A4 Portway connects Bristol City Centre with the M5 to the northwest. The A4 Portway P&R site is located adjacent to the A4 and the M5, west of Shirehampton (See Appendix A).

1.3.2 The A4 Portway runs next to the River Avon which has been designated as a Site of Nature Conservation Interest (SNCI). An SNCI is a local designation for sites containing features of substantive nature conservation value at a local scale. The A4 Portway also runs through the Avon Gorge, which is designated at a national level as a Site of Special Scientific Interest (SSSI) by Natural England, under the Wildlife and Countryside Act 1981. The Avon Gorge has also been designated as a Special Area of Conservation (SAC) on an international level.

1.3.3 The Avon Gorge has a long history of grazing, dating back to the Anglo-Saxon periods, which has helped shape much of the landscape. The gorge also has a history of quarrying which took place between the 17th and 19th centuries. To the north of the A4 Portway there is part of a historic Roman settlement, and Kings Weston House Park and Garden, which is also Grade II listed⁵.

1.3.4 According to the Bristol City Council interactive planning policy map⁶ there are five conservation areas (CA) along the A4 corridor. From North to south these include the following:

- Kings Weston and Trym Valley CA which covers a section of the A4 Portway to the east of Shirehampton and finishing at Sylvan Way.
- Sea Mills CA which covers the section of the A4 Portway from Sylvan Way to just south of bridge crossing the River Trym.
- Sneyd Park CA which covers the section of the A4 Portway from just south of the bridge crossing the River Trym to the start of the Avon Gorge.
- The Downs CA which covers the section of the A4 Portway from the northern part of the Avon Gorge to the A4 Hotwell Road junction with Cabot Way/Bennett Way.
- Clifton CA covers the A4 Hotwell Road from the junction with the A3029/Cabot Way to Jacobs Wells Road Roundabout.

1.3.5 The A4 Portway falls within a Flood Zones 1, 2, and 3⁷. The A4 Portway P&R site and the Scheme fall within Flood Zone 1. Flood Zone 1 represents the land assessed as having a 'low risk' of fluvial or tidal flooding, or less than 1 in 1,000 annual probability (<0.1%).

⁵ Source: <https://historicengland.org.uk/listing/the-list/map-search?clearresults=True>

⁶ Source: <https://maps.bristol.gov.uk/policies/>

⁷ Source: <https://flood-map-for-planning.service.gov.uk/confirm-location?eastings=352730&northings=177585&placeOrPostcode=BS11>

2 Environmental Appraisal

2.1 Noise

Baseline

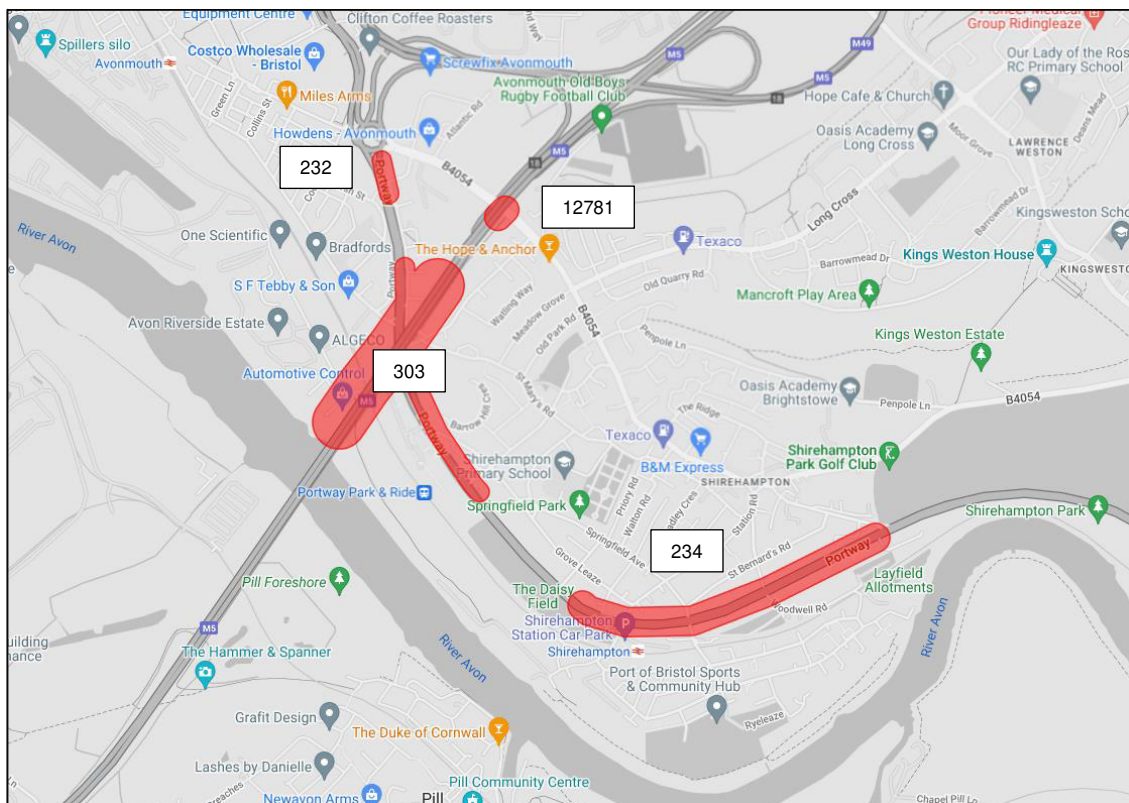
2.1.1 Noise from transport sources is measured in dB(A). Paragraph 7.4.1 of WebTAG defines noise as follows:

“Noise annoyance is defined by the World Health Organisation as ‘a feeling of displeasure evoked by noise’. Noise nuisance from transport sources can adversely affect the quality of living of local communities. Vibration is a similar effect, but instead of being transmitted by air, it is transmitted by the earth. Noise is normally considered as an approximate indicator for both noise and vibration, since its effects are normally felt more strongly.”

2.1.2 Average noise levels (dB) along the A4 Portway are 75.0+ dB. At the A4 Portway P&R site, there is an average noise level of between 60 and 69.9 dB. East of the site, at residential receptors, there is an average dB between 55.0 and 59.9⁸.

2.1.3 The location of NIAs (Roads) within 600m of the Scheme, which include Noise Important Area ID: 232, 12781, 303, and 234, are shown below in Figure 4. The Scheme is located within NIA ID: 303.

Figure 4 - NIAs (shown in red) with ID next to designations within 600m of the Scheme



Noise Receptors

⁸ Source: <http://www.extrium.co.uk/noiseviewer.html>

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2.1.4 The site and the noise receptors within 600m of the Scheme can be seen below in Appendix A.

2.1.5 As shown in Appendix A, there are residential receptors located within 600m of the site which have the potential to be impacted by the Scheme. Educational receptors such as Shirehampton Primary School and Avonmouth Church of England Primary School are located to the east and north of the site area, respectively. Healthcare receptors include Kingsmead Lodge Nursing Home, which is located approximately 300m north of the site area, adjacent to NIA ID: 303. There are also community and recreational facilities such as St Mary's Park and Springfield Park.

Effects on Noise Receptors and Designations

2.1.6 During construction, the construction activities may increase noise levels within the vicinity of the site. However, it is considered that noise impacts during construction would be intermittent, localised and temporary in nature. Appropriate construction site management practices would be implemented through a CEMP to minimise noise and vibration impacts including timings of works to minimise disturbance during anti-social hours.

2.1.7 The Scheme may generate noise during the operation phase; however, the size of the Scheme and nature of the changes means noise during operation will be minor to neutral. The Scheme will not lead to changes to traffic flows or traffic speed. Therefore, impacts on NIAs and receptors identified will be minor to neutral during the operation phase.

2.2 Air Quality

Baseline

2.2.1 Part IV of the Environment Act (1995) requires the UK Government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The AQS sets out objectives that are maximum ambient concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. The ambient air quality standards and objectives are given statutory backing in England through the Air Quality (England) Regulations 2000, and the Air Quality (England) (Amendment) Regulations 2002. The Air Quality Standards (England) Regulations (2010) sets out the ambient air quality legislation as set out within the EU Directive 2008/50/EC on ambient air quality.

2.2.2 The pollutants of most concern near roads are nitrogen dioxide (NO₂) and particulate matter less than 10 microns in diameter (PM₁₀) in relation to human health and oxides of nitrogen (NO_x) in relation to vegetation and ecosystems.

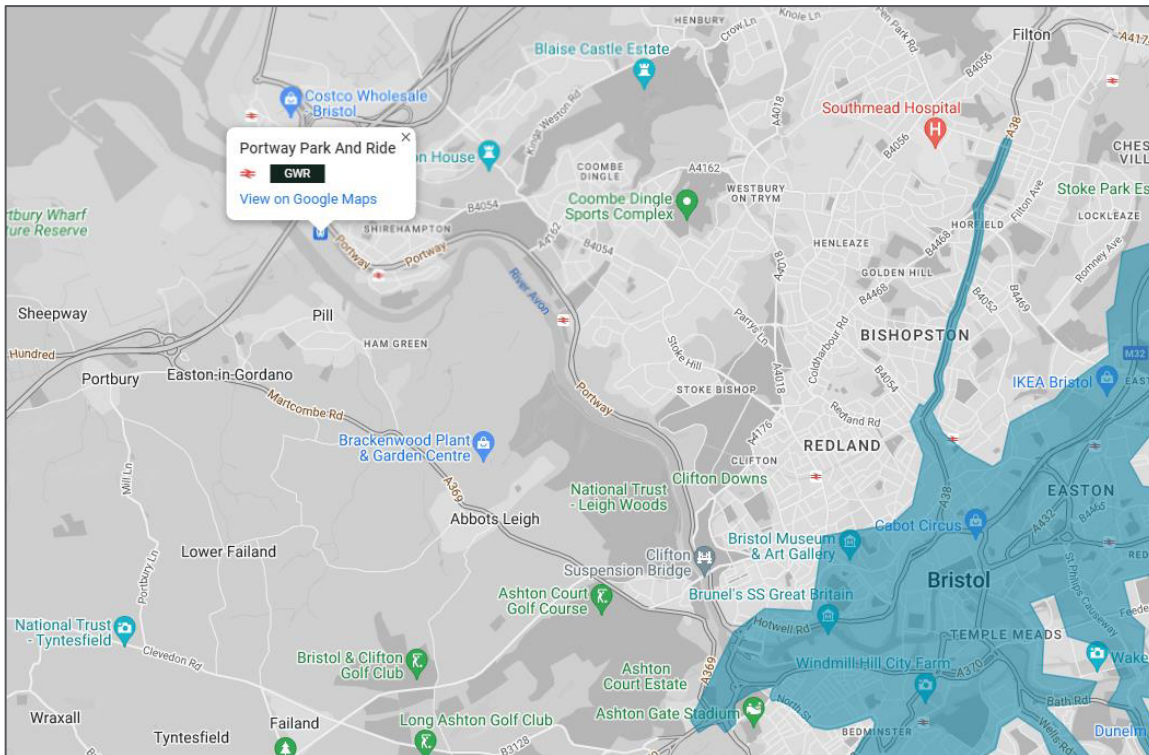
2.2.3 Under the Local Air Quality Management (LAQM) regime local authorities have a duty to make periodic reviews of local air quality against the AQS objectives. Where a local authority's review and assessment of local air quality indicates that AQS objectives are not expected to be achieved, local authorities are required to designate an Air Quality Management Areas (AQMA). An Air Quality Action Plan (AQAP) must then be formulated, outlining a plan of action to meet AQS objectives in the AQMA. Across the UK, the annual mean data trend between 2007 to 2019 demonstrates that the NO₂ concentration both in urban and rural monitoring sites has improved.

2.2.4 The Bristol Air Quality Management Area (AQMA) was announced in 2001 due to exceedances in Nitrogen Dioxides (NO₂) annual mean and particulate matter (PM₁₀) 24-hour mean and is located approximately 6km southeast of the P&R near the A4 Hotwell Road junction with Bristol Gate and

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Brunel Way (see Figure 5). There are no Air Quality Management Areas (AQMAs) located within the site or wider study area.

Figure 5 - Location of the closest AQMA (shown in blue) and the proposed works



Air Quality Receptors

- 2.2.5 The site and the air quality receptors within 200m of the Scheme are shown in Appendix A.
- 2.2.6 As shown in Appendix A, there are residential receptors located to the north and east of the site which have the potential to be impacted by the Scheme.

Effects on Air Quality Receptors and Designations

- 2.2.7 Dust impacts may occur as a result of construction activities. However, potential impacts will be reduced as far as reasonably practicable with the implementation of suitable mitigation measures, set out in a Construction Environmental Management Plan (CEMP). A dust risk assessment may be required to determine appropriate mitigation measures.
- 2.2.8 Traffic levels and traffic speed are not expected to change as a result of the Scheme. Therefore, there will be no changes in emissions based on the available information.

2.3 Greenhouse Gases

Baseline

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2.3.1 In 2019, 27% of the net greenhouse gas (GHG) emissions in the UK were estimated to originate from the transport sector, through primarily carbon dioxide (CO₂) emissions from petrol and diesel emissions in road transport. The UK Met Office (UKCP09) predict that due to climate change the UK is likely to experience warmer, wetter summers, leading to an increased occurrence of storm events, high winds and heavy precipitation, leading to the risk that infrastructure networks are disrupted. BCC and WECA have set climate emergency goals to reach net zero carbon by 2030, which is 20 years earlier than current national targets.

2.3.2 Traffic using the A4 Portway/A4 Hotwell Road currently produces GHG emissions in the form of CO₂. A Site Improvement Plan from Natural England has identified nitrogen deposition and other pollutants, originating from the A4 Portway, as a key issue facing environmental designations.

Greenhouse Gases Receptors

2.3.3 The site and the GHG receptors within 200m of the Scheme are shown in Appendix A.

2.3.4 As shown in Appendix A, receptors are the same as the air quality receptors. There are residential receptors located to the north and east of the site which have the potential to be impacted by the Scheme.

Effects on Receptors

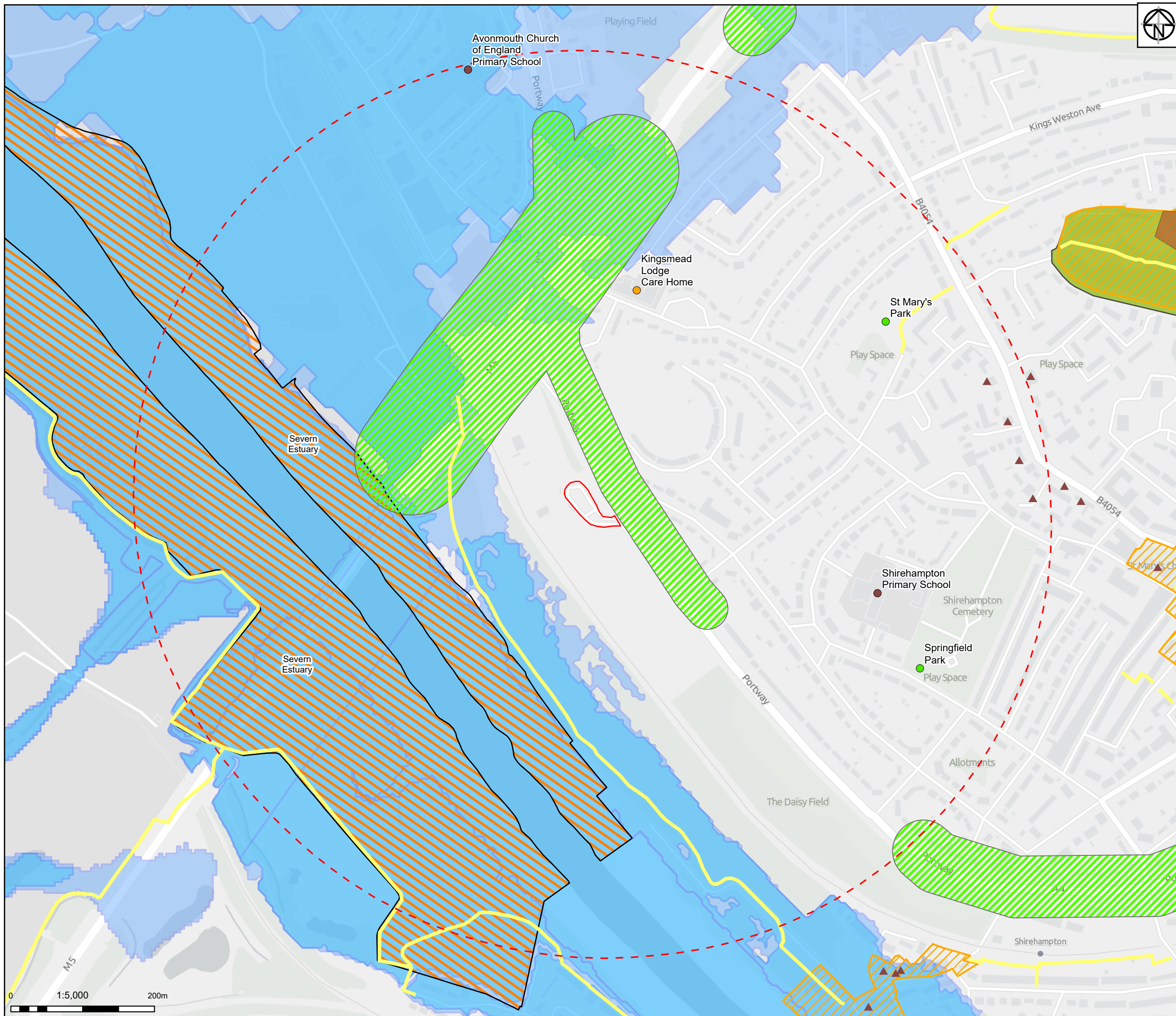
2.3.5 Traffic levels and traffic speed are not expected to change as a result of the Scheme. Therefore, there will be no changes in emissions based on the available information.

3 Conclusion

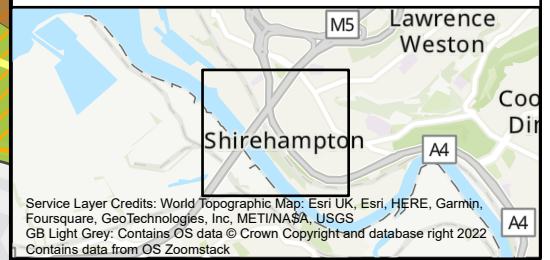
- 3.1.1 Within the site of the Scheme and the wider 600m buffer, there are no Scheduled Monuments, Registered Historic Landscapes, Historic Parks and Gardens, Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar Sites, Sites of Special Scientific Interest, Local Nature Reserves (LNR), or National Nature Reserves (NNR).
- 3.1.2 Within the site of the Scheme and the 600m buffer, there are no SSSIs, Ramsar Sites, NNRs, LNRs, SPAs, SACs, or Ancient Woodlands.
- 3.1.3 The Scheme is located in a NIA and close to other NIAs within the wider study area. The construction activities may increase noise levels within the vicinity of the site. However, it is considered that noise impacts during construction would be intermittent, localised and temporary in nature. Appropriate construction site management practices would be implemented through a CEMP to minimise noise and vibration impacts including timings of works to minimise disturbance during anti-social hours.
- 3.1.4 There are no AQMAs located within the site or the within 200m of the wider study area. Construction of the Scheme will involve earthworks with potential to generate dust emissions. However, appropriate construction site management practices (e.g., dust dampening; appropriate stockpiling of excavation material) would be monitored and managed through the implementation of a CEMP.
- 3.1.5 In summary, the Scheme will have a minor to neutral impact on the NIA. Receptors will have minor to neutral impacts. This is due to the small-scale nature of the works. Additionally, providing the aforementioned practices are adopted, both the construction and operation phases are likely to have minor to neutral impacts in terms of noise, air quality and greenhouse gases on relevant designations or receptors.

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Appendix A – Environmental Constraints Plan



- Legend**
- Site Boundary
 - 600m Study Area
 - Public Rights of Way
 - Registered Parks and Gardens
 - Listed Buildings
 - ▲ Grade II
 - Flood Zone 2
 - Flood Zone 3
 - Noise Priority Area – Road (within 600m)
 - Site of Importance for Nature Conservation
 - Ancient Woodland
 - Conservation Area
 - Sensitive Receptors
 - Care Home
 - Parks
 - Schools



Rev	Date	Description	Drawn	Check	Approv
01	04/05/23	INITIAL ISSUE	RP	JT	KS

Client:

PROJECT:
A4 PORTWAY OBC

Site: Bristol P&R entrance
Client: Bristol City Council

Registered office:
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EC3M 4BY

Coordinating Office:
2 Glass Wharf
Temple Quay
Bristol
BS2 0FR

www.arcadis.com

Title:

**A4 Portway P&R –
Environmental Constraints Plan**

Designed	J. Tilley	Date	04 MAY 23	Signed	
Drawn	R. Pakhare	Date	04 MAY 23	Signed	
Checked	J. Tilley	Date	04 MAY 23	Signed	
Approved	K. Stubbs	Date	04 MAY 23	Signed	
Scale:	1:5,000	Datum:	AOD		
Original Size:	A3	Grid:	OS		
Suitability Code:	S2	Project Number:	10053585		
Suitability Description: For Information					
Drawing Number:	TBC			Revision:	P01

Arcadis Consulting (UK) Limited

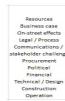
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Appendix E – Risk Register

Portway P&R Bus Access Improvements
 Rev: 2 26/06/2023
 Scheme: Portway P&R Bus Access
 Milestone: FBC
 Works Cost:



Likelihood		
1	= Almost Certain	95.0%
2	= Likely	50.0%
3	= Possible	25.0%
4	= Unlikely	12.5%
5	= Rare	5.0%

ENTER QRA QUANTITIES IN THESE COLUMNS

No.	Risk Ref	Description	Category	Support	Stage at which Risk occurs	Mitigation owner	Support	Initial Risk					Proximity (date)	Approach Avoid, Accept, Reduce, Transfer	Mitigation Measures	DATE OF UPDATE	Status	Residual Risk					Reason for closure & comments	Likelihood (%)	Financial			Delay			Workshop Comments										
								Impact		Prob.								RAG	Cost	Time	Perf	Rating			Score	RAG	Cost	Time	Perf	Rating		Score	RAG	Min (€k)	Max (€k)	Likely (€k)	Min (mths)	Max (mths)	Likely (mths)	Delay Cost (€k)/Month	
								Cost	Time	Perf	Rating	Score																													
1	risk 1	Tender returns are priced higher than anticipated cost estimates	Financial	EngDesign	Tender	BCC		H	3	H	3	M	5	H	11.00	11.00	28/05/2024	Avoid	Detailed design to be costed up including the costs for the civils, street lighting, signal infrastructure, Bill of Quantities based on the Highways framework prices. Contingency and risk allowance included in the funding request to cover increases in tender returns	18-May-23	Open	M	2	M	2	M	4	M	5.33	5.33	50.0%										
2	risk 2	Chosen contractors delivery programme longer than anticipated once commissioned	Programme	EngDesign	Programme	BCC		H	3	H	3	L	1	H	7.00	7.00	28/05/2024	Avoid	BCC EngDesign to refine the programme based on detailed design outputs. Desired programme to be transparent in the tender documents. Time contingency allowed at the end of the programme for overrun.	18-May-23	Open	M	2	M	2	L	1	M	3.33	3.33	25%				0.5	1	0.25	30			
3	risk 3	Programme of works is longer than the funding window for the project (March 2027). This could be a risk to the funding of the project if there elements left to be delivered post-funding window	Financial	WECA Programme Manager	Programme	BCC		H	3	H	3	M	2	H	8.00	8.00	31/03/2027	Avoid	BCC PM has developed a programme for the duration of the project, through to delivery and beyond to include monitoring and evaluation. The programme will be updated regularly to ensure accuracy. The BCC PM will flag opportunities to accelerate tasks, and risks that could cause delay to tasks at bi-weekly meetings with the WECA programme manager. Programme to be updated at key gateways, and the construction programme will be superimposed on to the programme once it has been received.	18-May-23	Open	M	2	M	2	L	1	M	3.33	3.33	12.5%										
4	risk 4	Scope of work increases due to unforeseen issues with utilities and/or other services under the surface of the site.	Construction	EngDesign	Construction	BCC		H	3	H	3	H	3	H	9.00	9.00	04/09/2024	Avoid	Prior to the tender period the design will have been subjected to C4 utility searches to understand whether any diversionary works will be needed. These searches should improve our knowledge of the utilities that are affected by the works and reduce the risk finding 'unknown' utilities when the project moves to the construction phase	18-May-23	Open	M	2	M	2	M	2	M	4.00	4.00	40.0%				0.25	0.5	0.2				
5	risk 5	A cable strike may occur during the construction phase. The impact of this risk would be on the programme as a delay to the works would be in place until Health and Safety had cleared the site.	Construction	EngDesign	Construction	BCC		M	2	H	3	M	2	H	7.00	7.00	04/09/2022	Avoid	Prior to the construction the BCC PM will work with the BCC Engineering Team to arrange the relevant utility searches up to CS's. Trial pits have been completed at the site as part of the utility searches, and further trial pits will be completed as part of the construction process.	18-May-23	Open	L	1	M	2	L	1	M	2.67	2.67	5.0%				0.125	0.25	0.0125	30			
6	risk 6	The construction methodology may require the closure of the bus access junction into the Portway Park and Ride site. This will impact on the performance of the park and ride site for the duration of the works as the bus stop and passengers will have to be moved to a temporary location.	Operational	BCC Programme manager	Construction	BCC		L	1	L	1	H	3	H	5.00	5.00	04/09/2024	Transfer	Work with BCC design team to understand whether there are alternative options to the construction methodology. BCC design team to provide further information about construction phasing, and the task durations within the construction. Early engagement to be held with WECA Bus Services team and Stagecoach	18-May-23	Open	L	1	L	1	M	2	H	4.00	4.00	95.0%										
7	risk 7	Chosen contractor unable to fulfil the contract (either through lack of resource, supplies, refusing works, or goes bust during the term of the contract). This could impact on the programme in having to mobilise the second place bidder on the contract, delay to the programme could incur cost implications. The second place bid on the tender may be more expensive than the first choice contractor	Construction	EngDesign	Construction	BCC		H	3	H	3	M	2	H	8.00	8.00	04/09/2024	Avoid	Work with BCC Design team to prepare the contracts before they are released for tender. BCC PM and BCC EngDes to ensure sufficient details on the project are contained in the procurement package so that potential bidders understand the requirements of the project. Each bid submitted will be subjected to a rigorous assessment to ensure that the bid meets the requirements of the contract and that the contractor has the capacity, resources, supplies, and materials to fulfil the works. A contract bond has been included in the cost estimate at 10% of the contract value, that insures the project against any failure to deliver on the contract requirements from the contractor behalf.	18-May-23	Open	M	2	M	2	M	2	M	4.00	4.00	12.5%				1	3	0.375	30			
8	risk 8	Site constraints demand a complex build methodology, which may result in the requirement for additional Temporary Traffic Management measures to be installed. Additional TTM would incur additional cost, and may incur some delay on the construction programme to set up / take down additional TTM	Financial	EngDesign	construction	BCC		H	3	M	FALSE	L	1	H	6.00	6.00	04/09/2024	Reduce	BCC EngDes to produce a design for the 'enabling works' which is inclusive of the traffic management. These enabling works will be required to ensure the Portway is kept free flowing in two directions whilst maintaining safe working distances. The designs for the enabling works will be inclusive of the TM required. The designs for the enabling works are to be made available to all potential bidders through the tender process and the cost of the TM to be included with the scheme cost	27-Apr-23	Open	M	2	L	1	L	1	M	2.67	2.67	25.0%				1	3	0.75	30			
9	risk 9	Failure to approve the Full Business Case at BCC cabinet and / or Combined Authority Directors level incurs a delay on the programme and presents the risk of additional costs associated with delay	Programme	BCC / WECA Programme Managers	Business Case	BCC		H	3	H	3	L	1	H	7.00	7.00	26/09/2023	Avoid	Early and ongoing engagement with key decision makers, and stakeholders on the design of the scheme, and with regards to the progress of the business case. Decision makers to be reminded of the benefits / outputs regularly. Risk built into the programme to cover any delays with political approvals of the business case	20-Apr-23	Open	M	2	M	2	L	1	M	3.33	3.33	12.5%				0.5	1	0.125	30			
10	risk 10	Change in political leadership may lead to delays, such as a review of the scheme. This delay could incur additional cost.	Political	WECA Programme Manager	Throughout	BCC		M	2	M	2	M	2	M	4.00	4.00	01/05/2024	Accept	Should the risk present itself a review of the project would need to be conducted and a way forward would need to be agreed with WECA and BCC Decision makers	18-May-23	Open	M	2	M	2	M	2	L	2.00	2.00	12.5%				1	3	0.375	30			
11	risk 11	Insolvency of suppliers or other supply chain issues could incur additional cost and / or delay to the project	Financial	EngDesign	Construction	BCC		H	3	H	3	H	3	M	6.00	6.00	11/06/2024	Reduce	Robust procurement process including supplier assessment including financials. Need to take into account suppliers over-stretching themselves on similar schemes elsewhere. Use of financial bonds where appropriate.	18-May-23	Open	M	2	M	2	M	2	L	2.00	2.00	5.0%				0.25	0.5	0.025	30			
12	risk 12	BCC and/or WECA no longer see the project as necessary in the delivery of long term aims for the region and consequently halt proceedings which could cause delay to the programme, and incur costs associated with this delay.	Political	BCC	Throughout	WECA		M	2	M	2	M	2	L	2.00	2.00	N/A	Avoid	Project has a strategic fit within the region. The project is coherent with the objectives as set out in the Joint Local Transport Plan 4. Ongoing dialogue with BCC management and WECA colleagues to ensure that strategic alignment is clear. Time contingency placed at the end of the programme to allow for delay.	20-Apr-23	Open	L	1	L	1	L	1	L	1.00	1.00	5.0%				1	3	0.15	30			
13	risk 13	Geo-technical conditions show an underestimation of the additional earth works and conditions required. Additional cost, and potentially time to be incurred if further geotechnical work required.	Technical / Design	EngDesign	Design	BCC		M	2	H	3	H	3	M	5.33	5.33	04/09/2024	Avoid	Understanding of the geotechnical conditions is fairly well understood from previous projects at the Park and Ride site. Cost contingency to be allowed for further geotechnical work. Time contingency allowed for in programme for further geotechnical work	20-Apr-23	Open	M	2	L	1	M	2	M	3.33	3.33	12.5%				0.25	0.5	0.0625	30			
14	risk 14	The submission of a late FBC could mean that the project misses the target date for BCC Cabinet, and WECA directors meeting. This risk would cause delay in the programme of the current FBC stage, and also the construction stage. Delays in the programme also have the potential to incur cost implications.	Programme	Arcadis	Business case	BCC		M	2	H	3	H	9	M	9.33	9.33		Avoid	Programme for the project, and the current stages, has been developed. PM to deploy strict programme adherence techniques. Regular review of the programme to identify programme risks and opportunities to accelerate tasks. The programme includes a time contingency to allow for delays in the political approval process.	20-Apr-23	Open	L	1	M	2	M	2	L	1.67	1.67	12.5%				1	3	0.375	30			
15	risk 15	A delay in the WECA assurance process could, or failure to approve the business case could cause delay in the programme which could result in the project missing the deadline for directors. This delay could also have a cost implication	Programme	Arcadis	Business Case	BCC		H	3	H	3	H	3	H	9.00	9.00		Avoid	Early engagement was held with the Combined Authority's Grant Assurance team on the preferred option, modelling and appraisal methodology. Appraisal Specification Report has been submitted of the Grant Assurance Team. Programme has been developed to include a time contingency to allow for delays in the approval of the business case.	20-Apr-23	Open	M	2	M	2	M	2	M	4.00	4.00	25.0%				1	3	0.75	30			
16	risk 16	The severity of Covid-19 (or other nationally significant event) could increase which may result in additional restrictions and/or reduced resources that may cause impact to the delivery of the project	Programme	EngDesign	Throughout	BCC		M	2	M	2	M	2	M	4.00	4.00		Reduce	Early contractor engagement to ensure early programming. Remote work practices have become more established and consequently more efficient. BCC contractor framework requires contractors to increase safety within their working environments - engagement with contractors has assured that covid safe working methods are now established. CDM regulations are to be adhered to through-out the project	20-Apr-23	Open	L	1	L	1	L	1	L	1.00	1.00	12.5%				0.5	1	0.125	30.0			

No.	Risk Ref	Description	Category	Support	Stage at which Risk occurs	Mitigation owner	Support	Cost	Time	Perf	Rating	Score	RAG	Proximity (date)	Approach Avoid, Accept, Reduce, Transfer	Mitigation Measures	DATE OF UPDATE	Status	Cost	Time	Perf	Rating	Score	RAG	Reason for closure & comments	Likelihood (%)	Min (E)	Max (E)	Likely (E)	Min (mths)	Max (mths)	Likely (mths)	Delay Cost (E)/Month	Workshop Comments				
17	risk 17	Delays in the availability of the highway for street-works due to new network management arrangements and highway bookings. Other utilities may have made their reservations first.	Construction	EngDesign	programme	BCC		M 2	H 3	H 3	H	8.00	8.00	12/06/2024	Reduce	Need early programme of works and book in as soon as possible. Allow some time contingency in programme for delays. Provisional Advanced Authorisation "PAA" Street works permit to be submitted now to pencil in the works	18-May-23	Open	L 1	M 2	M 2	L	1.67	1.67		5.0%				1	3	0.15	30					
18	risk 18	Street lighting and / or traffic signal costs escalate due to global material shortages creating instability in pricing. Pricing has been driven up. There is a risk to the cost of the works and potentially the programme if additional time is required during the tender processes to find cost effective alternative suppliers	Finance	BCC HEAT & Traffic Signals	Tender	BCC		H 3	H 3	M 2	H	8.00	8.00		Reduce	Detailed design will provide a cost, in order to mitigate an appropriate financial contingency will be added. Ongoing engagement with BCC lighting team and Traffic signals for early indication of cost and supply issues. These costs will then be refined as the detail of the design progresses. There is an element of acceptance that the cost of materials and supplies has increased by a large amount with CPI over the past few years	20-Apr-23	Open	M 2	M 2	L 1	M	3.33	3.33		30.0%	13.4			0.5	1	0.3	2					
19	risk 19	The submission of a weak/inadequate FBC that does not meet the DfT TAG, or WECA GA requirements (low BCR for example) could result in a negative decision, consequently impacting on the funding received and subsequently the scope of the project, or there may be the requirement of a resubmission, which could impact on the programme, and incur additional costs if there are	Financial/Programme	Arcadis	Business Case	BCC		H 3	H 3	H 3	H	9.00	9.00		Avoid	Ongoing communication with WECA regarding the requirements. Requirements have been agreed to assure that a robust FBC is presented to WECA grant assurance and the WECA Joint committee. Arcadis have submitted and received feedback on a Appraisal Specification Report (business case methodology) from the Combined Authority's Grant Assurance Team	20-Apr-23	Open	M 2	M 2	M 2	M	4.00	4.00		12.5%				1	3	0.375	30					
20	risk 20	Chemical works in Avonmouth (near) COMAH site - Major chemical leak / issue on one of these sites could result in the project having to down tools until the chemical leak has been resolved	Construction	EngDesign	Construction	BCC		M 2	H 3	M 2	L	2.33	2.33	04/09/2024	Accept	Safe working practices and information about chemical spillages included in the construction pack for the chosen contractor. Direct mitigation of chemical spillage risk outside the control of the project team	18-May-23	Open	L 1	M 2	L 1	L	1.33	1.33		5.0%				0.25	0.5	0.025	30					
21	risk 21	Other unforeseen contractor compensation events based on changing network requirements	Construction	EngDesign	Construction	BCC		H 3	M 2	M 2	M	4.67	4.67	04/09/2024	Reduce	Early conversations with BCC network management team to understand their requirements to maintain network capacity. Also to understand local build requirements, and wider requirements	18-May-23	Open	M 2	L 1	L 1	L	0.00	0.00		10.0%	11.2					0						
22	risk 22	Removal of trees is determined by the bird nesting season which could impact the programme or additional cost for ecologist time	Construction	EngDesign	Construction	BCC		M 2	H 3	L 1	M	4.00	4.00	04/09/2024	Reduce	Ecologist to assess the site for tree removal in winter 23/24 as advanced works before the construction phase of the project. Arboriculture Impact Assessment, Arboricultural Method Statement, and Preliminary Ecological Appraisal to inform the removal of the trees	18-May-23	Open	L 1	M 2	L 1	L	1.33	1.33		95.0%	0.5					0						
23	risk 23	Construction start delayed to avoid bird nesting seasons	Construction	EngDesign	construction	BCC		M 2	H 3	L 1	H	6.00	6.00	04/09/2024	Avoid	Ecologist to assess the site for tree removal in winter 23/24 as advanced works before the construction phase of the project. Arboriculture Impact Assessment, Arboricultural Method Statement, and Preliminary Ecological Appraisal to inform the removal of the trees. Specialist working packages to be adopted during the bird nesting season	18-May-23	Open	L 1	M 2	L 1	M	2.67	2.67		25.0%				0.5	1	0.25	30					
24	risk 24	Enhanced site security measures during the construction period required as the usual security measures are compromised - this could incur additional cost to the project	Financial	EngDesign	Construction	BCC		H 3	L 1	M 2	H	6.00	6.00	04/09/2024	Avoid	Site security priority to be outlined to the chosen contractor within the construction package. Contractor to ensure that site is secure when vacant and correct TM plans used.	18-May-23	Open	M 2	L 1	M 2	M	3.33	3.33		12.5%												
25	risk 25	Cost increases or delays in construction schedule may result in scheme exceeding the cost estimate	Financial		Construction	BCC		H 3	M 2	L 1	H	6.00	6.00	04/09/2024	Avoid	Working closely with the contractor to ensure there are no delays within the initial programme. Early identification of expected delays can help avoid unnecessary delays.	18-May-23	Open	M 2	M 2	M 2	M	4.00	4.00														
26	Risk 26	Nationwide unpredictability of material costs and uplifts due to current high inflation levels.	Financial		Construction	BCC		H 3	L 1	L 1	H	5.00	5.00	04/09/2024	Accept	Appropriate inflation has been accounted for in the financial case.	18-May-23	Open	M 2	L 1	M 2	M	3.33	3.33														
27	Risk 27	Bus service operators do not use the new access.	Financial		Construction	BCC		M 2	L 1	H 3	H	6.00	6.00	04/09/2024	Avoid	Early engagement with bus operators to understand their willingness for using the new P&R access. Discuss requirements for BSIP or funding to encourage operators to use the site. Ongoing engagement as part of the West of England Enhanced Partnership (legally binding agreement with bus operators in the region to provide better ticketing and passenger information, lower fares, investment in bus priority measures and new and improved services).	18-May-23	Open	L 1	L 1	M 2	M	2.67	2.67														
28	Risk 28	The scheme does not result in increased use of buses.	Financial		Construction	BCC		M 2	L 1	M 2	H	5.00	5.00	04/09/2024	Avoid	Working with bus operators, BCC teams and other stakeholders on the behavioural change and modal shift.	18-May-23	Open	L 1	L 1	M 2	M	2.67	2.67														
29	risk 29	Uncertainty over future demand for public transport.	Financial		Construction	BCC		L 1	L 1	M 2	H	4.00	4.00	04/09/2024	Reduce	Ongoing review of changing demand, relating to public transport.	18-May-23	Open	L 1	L 1	M 2	M	2.67	2.67														

Key:
 Redacted information

Contingency : Current Conting

Appendix F – Cost Breakdown

E22011 Portway Park & Ride - New Bus Access
Cost Estimate (Preliminary Design) - 3rd May 2023

Element	Cost Estimate (£)	Comments
Civils Works		Average cost obtained from 4 contractors on the BHAMAWF 2021-2025 Framework (includes provision for civils works to accommodate some utility diversions works associated with BNET/National Grid/BT Openreach.
Contract Bond		1% of the total esitimated civils works cost.
Fees - Engineering Design Team		15% estimate based on the Civils works value. Includes site investigation, preliminary design, detailed design, supervision of construction works, and contract management.
Fees - Street Lighting Team		Estimated cost - Street Lighting Team to confirm precise cost.
Fees - Traffic Signals Team		Estimated cost - Traffic Signals Team to confirm precise cost.
Utility Diversion Works		Cost is an estimate based on the received C3 feedback to date. Need to progress it to C4 / C5 in order to obtain more accurate prices.
Street lighting Contractor		Quote based on Bill of Quantities from Schedule of Rates
Traffic signal Contractor		Quote based on Bill of Quantities from schedule of rates - Contract name: Supply, Installation, and maintenance of equipment and infrastructure for the control and management of traffic and related services (WoEITS2)
Traffic signal Contractor - loops		Allowance in the event the loops are deemed required, subject to detailed design.
Temporary bus stop		Precise cost is dependant on the exact requirements deemed for temporary bus stops - to be confirmed during the detailed design phase.
BNET		
TRO - Completed scheme		Estimated likely cost - TRO Team confirmed that this is sound estimate for this level of design
TTRO - Interim		Estimated likely cost.
Removal of trees		For tree removal, hedge removal, hedge replacement and other earthworks
Tree planting		
Landscape Architect Fees		To cover design, procurement and site supervision
Ecologist		
Inflation		Allowance of 25% of the Civils works (planned to start in 2024) to account for the ongoing steep inflation.
TOTAL :		

Appendix G – Economics Inputs and Outputs

Inputs and Outputs – Committed Service 10 and 11

Impacts Proforma

This sheet includes the scheme related details and the scheme assumptions used for calculating the benefit-cost ratio. The scheme details and scheme impacts are to be filled by the user. Users may revise default scheme assumptions if local evidence is available. In such cases, additional sources or supporting evidence must be provided. The inputs provided should start from the scheme opening year, Year 1. In the absence of data for the opening year, closest possible year should be used or alternative methodology justified.

Enter the values
Select from drop down menu

Scheme details

Scheme name text Portway P&R FBC
 Scheme promoter text Bristol City Council
 Appraisal year selection 2023 current year
 Scheme opening year selection 2025
 Appraisal period years 30 60 years for bus schemes
 Local area type From 'Area type_LookUp' Other Urban

Scheme impacts: BUS

Is the demand input in unit of person trips? yes/no Yes
 Average bus occupancy factor AM peak hour 1 PM peak hour 1 Inter-peak hour 1 Night 1
If the previous input is 'No' and the demand is in unit of bus trips, input average bus occupancy for each time period and provide supporting evidence/ reference. Else provide this input as 1

Year year Year 1 2025 Year 2 2026 Year 3 2027 Year 4 2028 Year 5 2029 Year 6 2030 Year 7 NA Year 8 NA Year 9 NA Year 10 NA

		Year 1		2025				Year2				2026				Year 3				2027				Year 4				2028				Year 5				2029				Year 6				2030			
		AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night										
Time Period	hh:mm - hh:mm					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
Peak period expansion factor	factor					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
DM	Number of trips without scheme	per day	0			0							0											0											0												
DS	Number of trips with scheme	per day	5			10						15											19											24					29								
DM	Total bus travel time without scheme	hours																																													
DS	Total bus travel time with scheme	hours per trip																																													

Scheme assumptions: *(can be revised with supporting justification)*

Appraisal base year year 2010
 Annualisation - AM peak hour days 253
 Annualisation - PM peak hour days 253
 Annualisation - Inter-peak hour days 253
 Annualisation - Night days 365
 Average length of bus trips - bus in London km 5.31 National Travel Survey Data 2021 (NTS0303)
 Average length of bus trips - other local bus km 9.20 National Travel Survey Data 2021 (NTS0303)
 Bus diversion factor - car % 24% TAG data book A5.4.6 (January 2023 v1.20.2)
 Bus diversion factor - taxi % 12% TAG data book A5.4.6 (January 2023 v1.20.2)
 Car occupancy rate factor 1.61 TAG data book A1.3.3 (January 2023 v1.20.2)
 Taxi occupancy rate factor 2.40 TAG unit A5.4 (2.2.11)
 Discount rate (0-30 years) % 3.50% TAG data book A1.1.1 (January 2023 v1.20.2)
 Discount rate (31-75 years) % 3.00% TAG data book A1.1.1 (January 2023 v1.20.2)
 Indirect tax correction factor 1.19 TAG data book A1.3.1 (January 2023 v1.20.2)

Analysis of Monetised Costs and Benefits (in £'000s)

All entries are discounted present values, in 2010 prices and values

Benefits/ Costs	Year 1 2025	Year 2 2026	Year 3 2027	Year 4 2028	Year 5 2029	Year 6 2030	Year 7 NA	Year 8 NA	Year 9 NA	Year 10 NA	Full appraisal period (2025 - 2055)
<i>Index of the year</i>	3	4	5	6	7	8	-	-	-	-	33
Journey time benefits							-	-	-	-	
Congestion benefit							-	-	-	-	
Infrastructure maintenance							-	-	-	-	
Accident							-	-	-	-	
Local air quality							-	-	-	-	
Noise							-	-	-	-	
Greenhouse gases							-	-	-	-	
Indirect taxation							-	-	-	-	
Investment costs							-	-	-	-	
Operating costs							-	-	-	-	
Private contributions							-	-	-	-	
PVB							-	-	-	-	
PVC											
BCR											

Key:

	Information not used
	Redacted information

Inputs and Outputs – Aspirational Service 10 and 11

Impacts Proforma

This sheet includes the scheme related details and the scheme assumptions used for calculating the benefit-cost ratio. The scheme details and scheme impacts are to be filled by the user. Users may revise default scheme assumptions if local evidence is available. In such cases, additional sources or supporting evidence must be provided. The inputs provided should start from the scheme opening year, Year 1. In the absence of data for the opening year, closest possible year should be used or alternative methodology justified.

Enter the values
Select from drop down menu

Scheme details

Scheme name text Portway P&R FBC
 Scheme promoter text Bristol City Council
 Appraisal year selection 2023 current year
 Scheme opening year selection 2025
 Appraisal period years 30 60 years for bus schemes
 Local area type From 'Area type_LookUp' Other Urban

Scheme impacts: BUS

Is the demand input in unit of person trips? yes/no Yes
 Average bus occupancy factor
 AM peak hour 1 PM peak hour 1 Inter-peak hour 1 Night 1
 If the previous input is 'No' and the demand is in unit of bus trips, input average bus occupancy for each time period and provide supporting evidence/ reference. Else provide this input as 1

Year year
 Year 1 2025 Year 2 2026 Year 3 2027 Year 4 2028 Year 5 2029 Year 6 2030 Year 7 NA Year 8 NA Year 9 NA Year 10 NA

	Time Period	hh:mm - hh:mm	Year 1		2025		Year2		2026		Year 3		2027		Year 4		2028		Year 5		2029		Year 6		2030		
			AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	
	Peak period expansion factor	factor																									
DM	Number of trips without scheme	per day	0				0					0								0				0			
DS	Number of trips with scheme	per day	8				16					23							39				47				
DM	Total bus travel time without scheme	hours																									
DS	Total bus travel time with scheme	hours per trip																									

Scheme assumptions: (can be revised with supporting justification)

Appraisal base year	year	2010	
Annualisation - AM peak hour	days	253	
Annualisation - PM peak hour	days	253	
Annualisation - Inter-peak hour	days	253	
Annualisation - Night	days	365	
Average length of bus trips - bus in London	km	5.31	National Travel Survey Data 2021 (NTS0303)
Average length of bus trips - other local bus	km	9.20	National Travel Survey Data 2021 (NTS0303)
Bus diversion factor - car	%	24%	TAG data book A5.4.6 (January 2023 v1.20.2)
Bus diversion factor - taxi	%	12%	TAG data book A5.4.6 (January 2023 v1.20.2)
Car occupancy rate	factor	1.61	TAG data book A1.3.3 (January 2023 v1.20.2)
Taxi occupancy rate	factor	2.40	TAG unit A5.4 (2.2.11)
Discount rate (0-30 years)	%	3.50%	TAG data book A1.1.1 (January 2023 v1.20.2)
Discount rate (31-75 years)	%	3.00%	TAG data book A1.1.1 (January 2023 v1.20.2)
Indirect tax correction	factor	1.19	TAG data book A1.3.1 (January 2023 v1.20.2)

Analysis of Monetised Costs and Benefits (in £'000s)

All entries are discounted present values, in 2010 prices and values

Benefits/ Costs	Year 1 2025	Year 2 2026	Year 3 2027	Year 4 2028	Year 5 2029	Year 6 2030	Year 7 NA	Year 8 NA	Year 9 NA	Year 10 NA	Full appraisal period (2025 - 2055)
<i>Index of the year</i>	3	4	5	6	7	8	-	-	-	-	33
Journey time benefits							-	-	-	-	
Congestion benefit							-	-	-	-	
Infrastructure maintenance							-	-	-	-	
Accident							-	-	-	-	
Local air quality							-	-	-	-	
Noise							-	-	-	-	
Greenhouse gases							-	-	-	-	
Indirect taxation							-	-	-	-	
Investment costs							-	-	-	-	
Operating costs							-	-	-	-	
Private contributions							-	-	-	-	
PVB							-	-	-	-	
PVC											
BCR											

Key:

	Information not used
	Redacted information

Inputs and Outputs – Committed Service 9

Impacts Proforma

This sheet includes the scheme related details and the scheme assumptions used for calculating the benefit-cost ratio.
 The scheme details and scheme impacts are to be filled by the user. Users may revise default scheme assumptions if local evidence is available. In such cases, additional sources or supporting evidence must be provided.
 The inputs provided should start from the scheme opening year, Year 1. In the absence of data for the opening year, closest possible year should be used or alternative methodology justified.

Enter the values
 Select from drop down menu

Scheme details

Scheme name text Portway P&R FBC
 Scheme promoter text Bristol City Council
 Appraisal year selection 2023 current year
 Scheme opening year selection 2025
 Appraisal period years 30 60 years for bus schemes
 Local area type From 'Area type_LookUp' Other Urban

Scheme impacts: BUS

Is the demand input in unit of person trips? yes/no Yes
 Average bus occupancy factor
 AM peak hour PM peak hour Inter-peak hour Night
 1
 If the previous input is 'No' and the demand is in unit of bus trips, input average bus occupancy for each time period and provide supporting evidence/ reference. Else provide this input as 1

Year year
 Year 1 2025 Year 2 2026 Year 3 2027 Year 4 2028 Year 5 2029 Year 6 2030 Year 7 NA Year 8 NA Year 9 NA Year 10 NA

	Time Period	hh:mm - hh:mm	Year 1		2025				Year 2				2026				Year 3				2027				Year 4				2028				Year 5				2029				Year 6				2030			
			AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night										
	Peak period expansion factor	factor	1				1					1					1					1					1					1					1											
DM	Number of trips without scheme	per day	826				826					826					826					826					826					826					826											
DS	Number of trips with scheme	per day	853				881					908					935					962					989					989					989											
DM	Total bus travel time without scheme	hours	0.56				0.56					0.56					0.56					0.56					0.56					0.56					0.56											
DS	Total bus travel time with scheme	hours per trip	0.5				0.5					0.5					0.5					0.5					0.5					0.5					0.5											

Scheme assumptions: (can be revised with supporting justification)

Appraisal base year year 2010
 Annualisation - AM peak hour days 253
 Annualisation - PM peak hour days 253
 Annualisation - Inter-peak hour days 253
 Annualisation - Night days 365
 Average length of bus trips - bus in London km 5.31 National Travel Survey Data 2021 (NTS0303)
 Average length of bus trips - other local bus km 13.70 Distance between Avonmouth and Bristol City Centre
 Bus diversion factor - car % 30% RAND
 Bus diversion factor - taxi % 12% RAND
 Car occupancy rate factor 1.61 TAG data book A1.3.3 (January 2023 v1.20.2)
 Taxi occupancy rate factor 2.40 TAG unit A5.4 (2.2.11)
 Discount rate (0-30 years) % 3.50% TAG data book A1.1.1 (January 2023 v1.20.2)
 Discount rate (31-75 years) % 3.00% TAG data book A1.1.1 (January 2023 v1.20.2)
 Indirect tax correction factor 1.19 TAG data book A1.3.1 (January 2023 v1.20.2)

Analysis of Monetised Costs and Benefits (in £'000s)

All entries are discounted present values, in 2010 prices and values

Benefits/ Costs	Year 1 2025	Year 2 2026	Year 3 2027	Year 4 2028	Year 5 2029	Year 6 2030	Year 7 NA	Year 8 NA	Year 9 NA	Year 10 NA	Full appraisal period (2025 - 2055)
<i>Index of the year</i>	3	4	5	6	7	8	-	-	-	-	33
Journey time benefits							-	-	-	-	
Congestion benefit							-	-	-	-	
Infrastructure maintenance							-	-	-	-	
Accident							-	-	-	-	
Local air quality							-	-	-	-	
Noise							-	-	-	-	
Greenhouse gases							-	-	-	-	
Indirect taxation							-	-	-	-	
Investment costs							-	-	-	-	
Operating costs							-	-	-	-	
Private contributions							-	-	-	-	
PVB							-	-	-	-	
PVC											
BCR											

Key:

	Information not used
	Redacted information

Inputs and Outputs – Aspirational Service 9

Impacts Proforma

This sheet includes the scheme related details and the scheme assumptions used for calculating the benefit-cost ratio. The scheme details and scheme impacts are to be filled by the user. Users may revise default scheme assumptions if local evidence is available. In such cases, additional sources or supporting evidence must be provided. The inputs provided should start from the scheme opening year, Year 1. In the absence of data for the opening year, closest possible year should be used or alternative methodology justified.

Enter the values
Select from drop down menu

Scheme details

Scheme name text Portway P&R FBC
 Scheme promoter text Bristol City Council
 Appraisal year selection 2023 current year
 Scheme opening year selection 2025
 Appraisal period years 30 60 years for bus schemes
 Local area type From 'Area type_LookUp' Other Urban

Scheme impacts: BUS

Is the demand input in unit of person trips? yes/no Yes
 Average bus occupancy factor
 AM peak hour PM peak hour Inter-peak hour Night
 1
 If the previous input is 'No' and the demand is in unit of bus trips, input average bus occupancy for each time period and provide supporting evidence/ reference. **Else provide this input as 1**

Year year
 Year 1 2025 Year 2 2026 Year 3 2027 Year 4 2028 Year 5 2029 Year 6 2030 Year 7 NA Year 8 NA Year 9 NA Year 10 NA

		Year 1				Year 2				Year 3				Year 4				Year 5				Year 6				Year 7			
		AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night				
Time Period	hh:mm - hh:mm																												
Peak period expansion factor	factor	1				1				1				1				1				1							
DM Number of trips without scheme	per day	826				826				826				826				826				826							
DS Number of trips with scheme	per day	868				910				953				995				1037				1079							
DM Total bus travel time without scheme	hours	0.65				0.65				0.65				0.65				0.65				0.65							
DS Total bus travel time with scheme	hours per trip	0.53				0.53				0.53				0.53				0.53				0.53							

Scheme assumptions: (can be revised with supporting justification)

Appraisal base year year 2010
 Annualisation - AM peak hour days 253
 Annualisation - PM peak hour days 253
 Annualisation - Inter-peak hour days 253
 Annualisation - Night days 365
 Average length of bus trips - bus in London km 5.31 National Travel Survey Data 2021 (NTS0303)
 Average length of bus trips - other local bus km 13.70 Distance between Avonmouth and Bristol City Centre
 Bus diversion factor - car % 30% RAND
 Bus diversion factor - taxi % 12% RAND
 Car occupancy rate factor 1.61 TAG data book A1.3.3 (January 2023 v1.20.2)
 Taxi occupancy rate factor 2.40 TAG unit A5.4 (2.2.11)
 Discount rate (0-30 years) % 3.50% TAG data book A1.1.1 (January 2023 v1.20.2)
 Discount rate (31-75 years) % 3.00% TAG data book A1.1.1 (January 2023 v1.20.2)
 Indirect tax correction factor 1.19 TAG data book A1.3.1 (January 2023 v1.20.2)

Analysis of Monetised Costs and Benefits (in £'000s)

All entries are discounted present values, in 2010 prices and values

Benefits/ Costs	Year 1 2025	Year 2 2026	Year 3 2027	Year 4 2028	Year 5 2029	Year 6 2030	Year 7 NA	Year 8 NA	Year 9 NA	Year 10 NA	Full appraisal period (2025 - 2055)
<i>Index of the year</i>	3	4	5	6	7	8	-	-	-	-	33
Journey time benefits							-	-	-	-	
Congestion benefit							-	-	-	-	
Infrastructure maintenance							-	-	-	-	
Accident							-	-	-	-	
Local air quality							-	-	-	-	
Noise							-	-	-	-	
Greenhouse gases							-	-	-	-	
Indirect taxation							-	-	-	-	
Investment costs							-	-	-	-	
Operating costs							-	-	-	-	
Private contributions							-	-	-	-	
PVB							-	-	-	-	
PVC											
BCR											

Key:

	Information not used
	Redacted information

Inputs and Outputs – YTL Arena

Impacts Proforma

This sheet includes the scheme related details and the scheme assumptions used for calculating the benefit-cost ratio. The scheme details and scheme impacts are to be filled by the user. Users may revise default scheme assumptions if local evidence is available. In such cases, additional sources or supporting evidence must be provided. The inputs provided should start from the scheme opening year, Year 1. In the absence of data for the opening year, closest possible year should be used or alternative methodology justified.

Enter the values
 Select from drop down menu

Scheme details

Scheme name text Portway P&R FBC
 Scheme promoter text Bristol City Council
 Appraisal year selection 2023 current year
 Scheme opening year selection 2025
 Appraisal period years 60 60 years for bus schemes
 Local area type From 'Area type_LookUp' Other Urban

Scheme impacts: BUS

Is the demand input in unit of person trips? yes/no Yes

Average bus occupancy factor

	AM peak hour	PM peak hour	Inter-peak hour	Night	
	1	1	1	1	If the previous input is 'No' and the demand is in unit of bus trips, input average bus occupancy for each time period and provide supporting evidence/reference. Else provide this input as 1

Year year

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2026	NA	NA	NA	NA	NA	NA	NA	NA	NA

	hh:mm - hh:mm	factor	2026				NA				NA				
			AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	AM peak hour	PM peak hour	Inter-peak hour	Night	
DM	Peak period expansion factor		17:00 - 18:00				0	17:00 - 18:00				0	0	0	0
DS	Number of trips without scheme	per day	3				0	3				0	0	0	0
DM	Number of trips with scheme	per day	1350												
DS	Total bus travel time without scheme	hours	0.4160												
DS	Total bus travel time with scheme	hours per trip	0.3827												

Scheme assumptions: (can be revised with supporting justification)

Appraisal base year year 2010

Annualisation - AM peak hour days 253
 Annualisation - PM peak hour days 17
 Annualisation - Inter-peak hour days 253
 Annualisation - Night days 365

Average length of bus trips - bus in London km 5.31 National Travel Survey Data 2021 (NTS0303)
 Average length of bus trips - other local bus km 9.20 National Travel Survey Data 2021 (NTS0303)

Bus diversion factor - car % 24% TAG data book A5.4.6 (January 2023 v1.20.2)
 Bus diversion factor - taxi % 12% TAG data book A5.4.6 (January 2023 v1.20.2)

Car occupancy rate factor 1.61 TAG data book A1.3.3 (January 2023 v1.20.2)
 Taxi occupancy rate factor 2.40 TAG unit A5.4 (2.2.11)

Discount rate (0-30 years) % 3.50% TAG data book A1.1.1 (January 2023 v1.20.2)
 Discount rate (31-75 years) % 3.00% TAG data book A1.1.1 (January 2023 v1.20.2)
 Indirect tax correction factor 1.19 TAG data book A1.3.1 (January 2023 v1.20.2)

Analysis of Monetised Costs and Benefits (in £'000s)

All entries are discounted present values, in 2010 prices and values

Benefits/ Costs	Year 1 2025	Year 2 2026	Year 3 2027	Year 4 2028	Year 5 2029	Year 6 2030	Year 7 NA	Year 8 NA	Year 9 NA	Year 10 NA	Full appraisal period (2025 - 2055)
<i>Index of the year</i>	3	4	5	6	7	8	-	-	-	-	33
Journey time benefits							-	-	-	-	
Congestion benefit							-	-	-	-	
Infrastructure maintenance							-	-	-	-	
Accident							-	-	-	-	
Local air quality							-	-	-	-	
Noise							-	-	-	-	
Greenhouse gases							-	-	-	-	
Indirect taxation							-	-	-	-	
Investment costs							-	-	-	-	
Operating costs							-	-	-	-	
Private contributions							-	-	-	-	
PVB							-	-	-	-	
PVC											
BCR											

Key:

	Information not used
	Redacted information

Inputs and Outputs – AMAT

Active Mode Appraisal Toolkit User Interface Intervention

Intervention-specific information

User input required for all interventions

Intervention name	A4 Portway Park and Ride
Intervention promoter	Bristol City Council

Key

	User input required for all interventions
	User input required for all cycling interventions
	User input required for all walking interventions
	Default assumptions (can be revised with supporting justification)

Please fill in the 'Intervention details' to obtain a benefit cost ratio for an intervention. If local evidence is available, users may revise the default assumptions below but must also provide additional sources or supporting evidence to justify any changes (column H). A worked example is provided in the accompanying AMAT User Guidance document to provide the user with a step-by-step guide to completing an assessment using AMAT.

Intervention details

Appraisal year	2023	Current year
Intervention opening year	2025	
Last year of funding	2025	
Appraisal period	30	years
Local area type	Other Urban	

The appraisal period should correspond to the expected asset life. This should not exceed 60 years. For applying Marginal External Costs used in mode shift calculations. Choices: London, Inner and Outer Conurbations, Other Urban, Rural, National Average

Mode information

Please fill out the cycling and walking sections where relevant. If a intervention does not directly affect the number of users of a specific mode, the relevant section should be left blank. Ideally, forecast trip numbers should be based on counts representing an average weekday in spring or autumn to avoid seasonal bias. Both automatic and manual counts can be used. The number of trips currently (without the intervention in place) and expected (with the intervention in place). These sections require projections of the number of users in a 'Do-something' scenario (with the intervention in place) can be based on data from evaluations of historical interventions, case studies, or surveys. If the user does not have current or proposed numbers, please refer to the AMAT User Guide on potential sources of data to inform your assessment. For behaviour change schemes: 'How much of an average...trip will use the intervention?' should be set to zero and there should be no change in the Current and Proposed infrastructure.

Cycling

User input required for all cycling interventions

Number of trips without the proposed intervention		per day
Number of trips with the proposed intervention		per day
How much of an average cycling trip will use the intervention?		%
Current cycling infrastructure for this route		
Proposed new cycling infrastructure for this route		
Are any additional shower facilities being added?		
Are any additional secure storage facilities being added?		

Evidence/Source

	maximum 100%

Walking

User input required for all walking interventions

Number of trips without the proposed intervention	716	per day
Number of trips with the proposed intervention	785	per day
How much of an average walking trip will use the intervention?	10.00%	%
Current walking infrastructure for this route		
Street lighting		
Kerb level		
Crowding		
Pavement evenness		
Information panels	No	
Benches		
Directional signage	No	
Proposed walking infrastructure for this route		
Street lighting		
Kerb level		
Crowding		
Pavement evenness		
Information panels	Yes	
Benches		
Directional signage	Yes	

	maximum 100%

787.6

Assumptions

Default assumptions (can be revised with supporting justification)

Default TAG assumptions have already been entered. Users should only revise these if they can provide supporting evidence. Any additional evidence should be described in column H.

Decay rate	0.00%	%
------------	-------	---

TAG A5.1 explains that the impact of a cycling intervention is likely to diminish year by year following investment. The decay rate has been set at 0% for an infrastructure investment. For revenue-funded initiatives, such as cycle training or personalised travel planning, the decay rate may be positive. The default assumption is that 0% of new users are already active. This means all new users experience intervention-related health impacts.

Cycling

Average length of trip	4.84	km	National Travel Survey Data 2012-14
Average speed	15	km/h	National Travel Survey Data 2016
Proportion of cyclists who are employed	56.40%	%	National Travel Survey Data 2018
Proportion otherwise using a car	24.00%	%	As recommended in a 2022 study - see section 3.7.1 in TAG A5.1
Proportion otherwise using a taxi	6.00%	%	As recommended in a 2022 study - see section 3.7.1 in TAG A5.1

Please provide local evidence
Please provide local evidence

Walking

Average length of trip	1.1	km	National Travel Survey Data 2012-2014
Average speed	5	km/h	National Travel Survey Data 2016
Proportion of pedestrians who are employed	56.40%	%	National Travel Survey Data 2018
Proportion otherwise using a car	24.00%	%	Assumed to be the same as cycling diversion factors
Proportion otherwise using a taxi	6.00%	%	Assumed to be the same as cycling diversion factors

Please provide local evidence
Please provide local evidence

Additional Information

Return journeys	90%	%	National Travel Survey Data 2018
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A return journey involves going to and from your destination using the same route. Trips that make up return journeys will appear twice in the daily trip count (opposite directions).

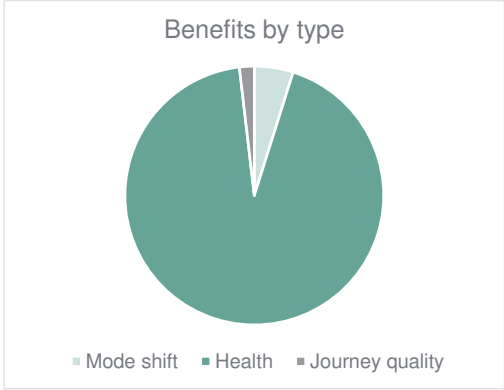
Background growth rate in trips	0.75%	%	National Travel Survey Data 2006-2016
Period over which this growth rate applies	20	years	Assumption based on TAG

This is an annualised growth rate for increases in active travel trips. This could be due to an increase in population, changes in demographics or travel trends.

Number of days for which intervention data is applicable per year	253	per year	Number of working days per year (365 minus weekends minus public holidays)
Car occupancy rate	1.6		Source: National Travel Survey 2002-16
Taxi occupancy rate	2.4		Source: TAG Data Book 2010

Promoters may want to change this depending on the intervention. For example, if the intervention is designed to shift modes from car to walking or cycling the occupancy rates may be higher.

Analysis of Monetised Costs and Benefits (in £'000s)		Benefits by type:	
Congestion benefit		Mode shift	4.9%
Infrastructure maintenance		Health	93.3%
Accident		Journey quality	1.8%
Local air quality			
Noise			
Greenhouse gases			
Reduced risk of premature death			
Absenteeism			
Journey ambience			
Indirect taxation			
Investment costs			
Operating costs			
Private contributions			
PVB			
PVC			
BCR			



Key:

	Information not used
	Redacted information

Inputs and Outputs – AMAT Journey Quality Only

Active Mode Appraisal Toolkit User Interface Intervention

Intervention-specific information

User input required for all interventions

Intervention name	A4 Portway Park and Ride
Intervention promoter	Bristol City Council

Key

	User input required for all interventions
	User input required for all cycling interventions
	User input required for all walking interventions
	Default assumptions (can be revised with supporting justification)

Please fill in the 'Intervention details' to obtain a benefit cost ratio for an intervention. If local evidence is available, users may revise the default assumptions below but must also provide additional sources or supporting evidence to justify any changes (column H). A worked example is provided in the accompanying AMAT User Guidance document to provide the user with a step-by-step guide to completing an assessment using AMAT.

Intervention details

Appraisal year	2023	Current year
Intervention opening year	2025	
Last year of funding	2025	
Appraisal period	30	years
Local area type	Other Urban	

The appraisal period should correspond to the expected asset life. This should not exceed 60 years. For applying Marginal External Costs used in mode shift calculations. Choices: London, Inner and Outer Conurbations, Other Urban, Rural, National Average

Mode information

Please fill out the cycling and walking sections where relevant. If a intervention does not directly affect the number of users of a specific mode, the relevant section should be left blank. Ideally, forecast trip numbers should be based on counts representing an average weekday in spring or autumn to avoid seasonal bias. Both automatic and manual counts can be used. The number of trips currently (without the intervention in place) and expected (with the intervention in place). These sections require projections of the number of users in a 'Do-something' scenario (with the intervention in place) can be based on data from evaluations of historical interventions, case studies, or surveys. If the user does not have current or proposed numbers, please refer to the AMAT User Guide on potential sources of data to inform your assessment. For behaviour change schemes: 'How much of an average...trip will use the intervention?' should be set to zero and there should be no change in the Current and Proposed infrastructure.

Cycling

User input required for all cycling interventions

Number of trips without the proposed intervention		per day
Number of trips with the proposed intervention		per day
How much of an average cycling trip will use the intervention?		%
Current cycling infrastructure for this route		
Proposed new cycling infrastructure for this route		
Are any additional shower facilities being added?		
Are any additional secure storage facilities being added?		

Evidence/Source

	maximum 100%

Walking

User input required for all walking interventions

Number of trips without the proposed intervention	716	per day
Number of trips with the proposed intervention	716	per day
How much of an average walking trip will use the intervention?	10.00%	%
Current walking infrastructure for this route		
Street lighting		
Kerb level		
Crowding		
Pavement evenness		
Information panels	No	
Benches		
Directional signage	No	
Proposed walking infrastructure for this route		
Street lighting		
Kerb level		
Crowding		
Pavement evenness		
Information panels	Yes	
Benches		
Directional signage	Yes	

787.6

Assumptions

Default assumptions (can be revised with supporting justification)

Default TAG assumptions have already been entered. Users should only revise these if they can provide supporting evidence. Any additional evidence should be described in column H.

Decay rate	0.00%	%
------------	-------	---

TAG A5.1 explains that the impact of a cycling intervention is likely to diminish year by year following investment. The decay rate has been set at 0% for an infrastructure investment. For revenue-funded initiatives, such as cycle training or personalised travel planning, the decay rate may be positive. The default assumption is that 0% of new users are already active. This means all new users experience intervention-related health impacts.

Cycling

Average length of trip	4.84	km	National Travel Survey Data 2012-14
Average speed	15	km/h	National Travel Survey Data 2016
Proportion of cyclists who are employed	56.40%	%	National Travel Survey Data 2018
Proportion otherwise using a car	24.00%	%	As recommended in a 2022 study - see section 3.7.1 in TAG A5.1
Proportion otherwise using a taxi	6.00%	%	As recommended in a 2022 study - see section 3.7.1 in TAG A5.1

Please provide local evidence
Please provide local evidence

Walking

Average length of trip	1.1	km	National Travel Survey Data 2012-2014
Average speed	5	km/h	National Travel Survey Data 2016
Proportion of pedestrians who are employed	56.40%	%	National Travel Survey Data 2018
Proportion otherwise using a car	24.00%	%	Assumed to be the same as cycling diversion factors
Proportion otherwise using a taxi	6.00%	%	Assumed to be the same as cycling diversion factors

Please provide local evidence
Please provide local evidence

Additional Information

Return journeys	90%	%	National Travel Survey Data 2018
-----------------	-----	---	----------------------------------

A return journey involves going to and from your destination using the same route. Trips that make up return journeys will appear twice in the daily trip count (opposite directions).

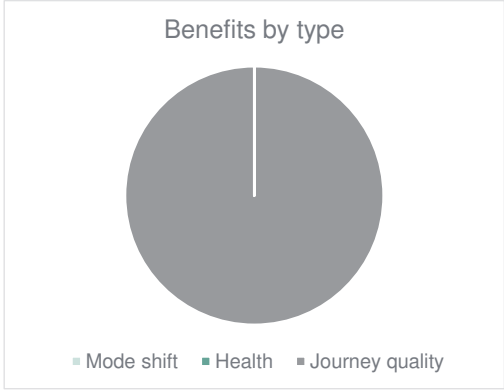
Background growth rate in trips	0.75%	%	National Travel Survey Data 2006-2016
Period over which this growth rate applies	20	years	Assumption based on TAG

This is an annualised growth rate for increases in active travel trips. This could be due to an increase in population, changes in demographics or travel trends.

Number of days for which intervention data is applicable per year	253	per year	Number of working days per year (365 minus weekends minus public holidays)
Car occupancy rate	1.6		Source: National Travel Survey 2002-16
Taxi occupancy rate	2.4		Source: TAG Data Book 2010

Promoters may want to change this depending on the intervention. For example, if the intervention is designed to shift modes from car to walking or cycling the occupancy rates may be higher.

Analysis of Monetised Costs and Benefits (in £'000s)		Benefits by type:	
Congestion benefit		Mode shift	0.0%
Infrastructure maintenance		Health	0.0%
Accident		Journey quality	100.0%
Local air quality			
Noise			
Greenhouse gases			
Reduced risk of premature death			
Absenteeism			
Journey ambience			
Indirect taxation			
Investment costs			
Operating costs			
Private contributions			
PVB			
PVC			
BCR			



Key:
 Information not used
 Redacted information