A4 Portway

Outline Business Case

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Bristol City Council

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1 Introduction

1.1 Project Description

This Outline Business Case (OBC) sets out the case for the implementation of improved transport infrastructure along the A4 Portway in Bristol. The Scheme reflects the priorities of Bristol City Council (BCC) and West of England Combined Authority (WECA) in prioritising public transport and other modes of sustainable transport to enhance connectivity along the key arterial corridor into Bristol which experiences congestion.

1.2 Location and Strategic Context

The A4 Portway is a key traffic route connecting the M5 to Bristol South featuring signposted routes to Bristol Airport and North Somerset bypassing the city centre. The Eastern part of the corridor at Hotwells connects to the A370 corridor as a key strategic route between the City Centre and North Somerset. While focusing on road traffic, the A4 Portway also provides access to Railway stations including Avonmouth, Portway P&R (Including the P&R service), Shirehampton, and Sea Mills. With excellent links to public transport, the A4 Portway has the potential to provide a prime route for walking and cycling through the historic Avon Gorge for leisure and tourism purposes.

The study area of this project is outlined in Figure 1-1. The project proposals extend from Mardyke Wharf along the A4 Hotwell Road and the A4 Portway, under the M5 bridge, and end just before the Portway Roundabout. Key junctions along the A4 Portway, based on high traffic flows and interactions with the A4 Portway, are also included in the geographic scope of the project as shown in *Figure 1-1*.

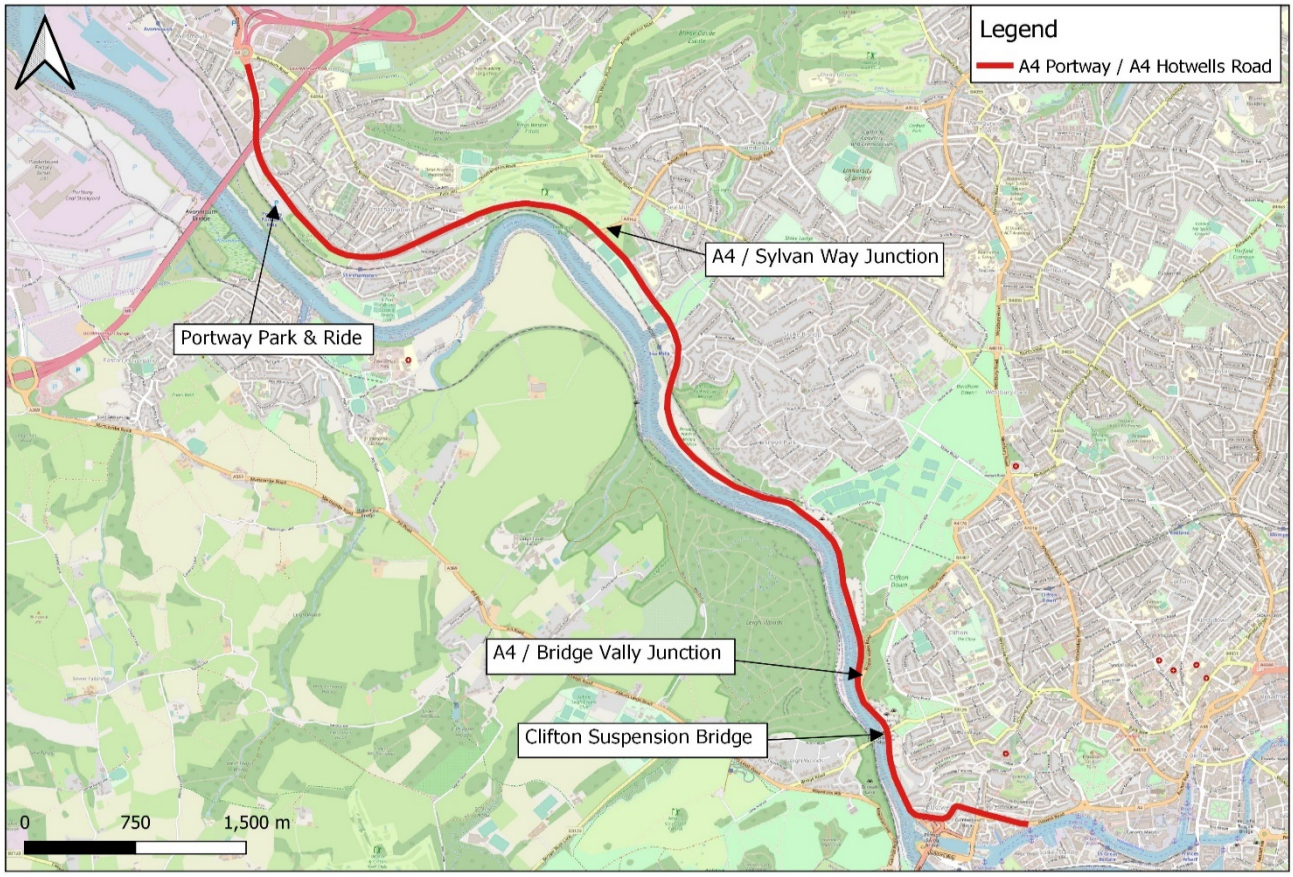


Figure 1-1 A4 Portway OBC – Study Area

1.3 Context

The Bristol Transport Strategy (2019)[1] sets out the council's vision for Bristol to be a *'well-connected city that enables people to move around efficiently with increased transport options that are accessible and inclusive to all'.* The strategy details the planned improvements to the transport network throughout the city to 2036. It also sets out how they will carry out the following:

- Improve transport to meet increased demand from the growth in housing, jobs, and regeneration
- Create an inclusive transport system that provides realistic transport options for everyone
- Create healthy places, promoting active transport, improving air quality, and implementing a safe systems approach to road safety.
- Create better places that make better use of our streets and enable point to point journeys to be made efficiently.
- Enable reliable journeys by minimising the negative impacts of congestion and increasing network efficiency and resilience.
- Support sustainable growth by enabling efficient movement of people and goods, reducing carbon emissions, and embracing new technologies.

A key outcome for Bristol City Council is *'increasing the efficiency of transport corridors, moving the largest number of people in the space available'* which would also tackle congestion and its effect on air quality, making Bristol a better place for all.

The initial Scheme objectives, set out by BCC, were:

1. Improving the journey time, punctuality, and reliability of bus services along the corridor by delivering total segregation and other bus priority measures whilst giving consideration to the strategic nature of this corridor for private vehicles
2. Increase the proportion of trips made by bus, cycling, walking, and wheeling
3. Reduce levels of air pollution and CO_2 emissions
4. Enhance streetscape, public spaces, and urban environment where possible

The council's vision for the A4 Portway corridor is for it to support efforts to create a *'transport network that supports the local economy, enhances the urban environment and contributes to high quality, people friendly places.'* Improvements to the A4 Portway will help achieve this vision, overcome regional challenges, and continue the transition to increased use of sustainable modes of transport such as walking, cycling and public transport.

The A4 Portway improvements Scheme and vision are further supported by a range other policies and strategies, including the West of England Bus Strategy which identified the A4 Portway as a high priority public transport corridor and aims to create *'a better, faster, more reliable and accessible bus services across the region.'* The West of England JLTP4 also specifies the desire to have a metrobus route along the A4 Portway. Furthermore, the West of England Local Cycling and Walking Infrastructure Plan supports this with its aim to *transform active travel in the West of England* and the West of England Joint Local Transport Plan 4 that *sets out how to achieve a well-connected sustainable transport network.* The link between this Scheme and various policy and strategy documents is presented in Section 2.3.

[1] Bristol Transport Strategy

1.4 Project Scope

Project Background and Current Proposals

The A4 Portway is a key route linking Bristol city centre and key trip attractors to the south of the city with the strategic road network, M5 and M49, and employment centres in Avonmouth and the Avonmouth Severnside Enterprise Area (AESA). It has been identified as a high priority public transport corridor in phase one of the City Region Sustainable Transport Settlement (CRSTS) and the WECA Bus Infrastructure Programme, with potential to deliver a rapid bus transit route. Currently, it suffers from high levels of congestion as a result of the high proportion of commuter trips made into the city by car which are further described in 2.1. It also serves as a diversionary route for the M5 motorway. This project seeks to improve and add to the current transport infrastructure along the A4 Portway to prioritise public transport and other modes of sustainable transport over general traffic.

Current Proposals

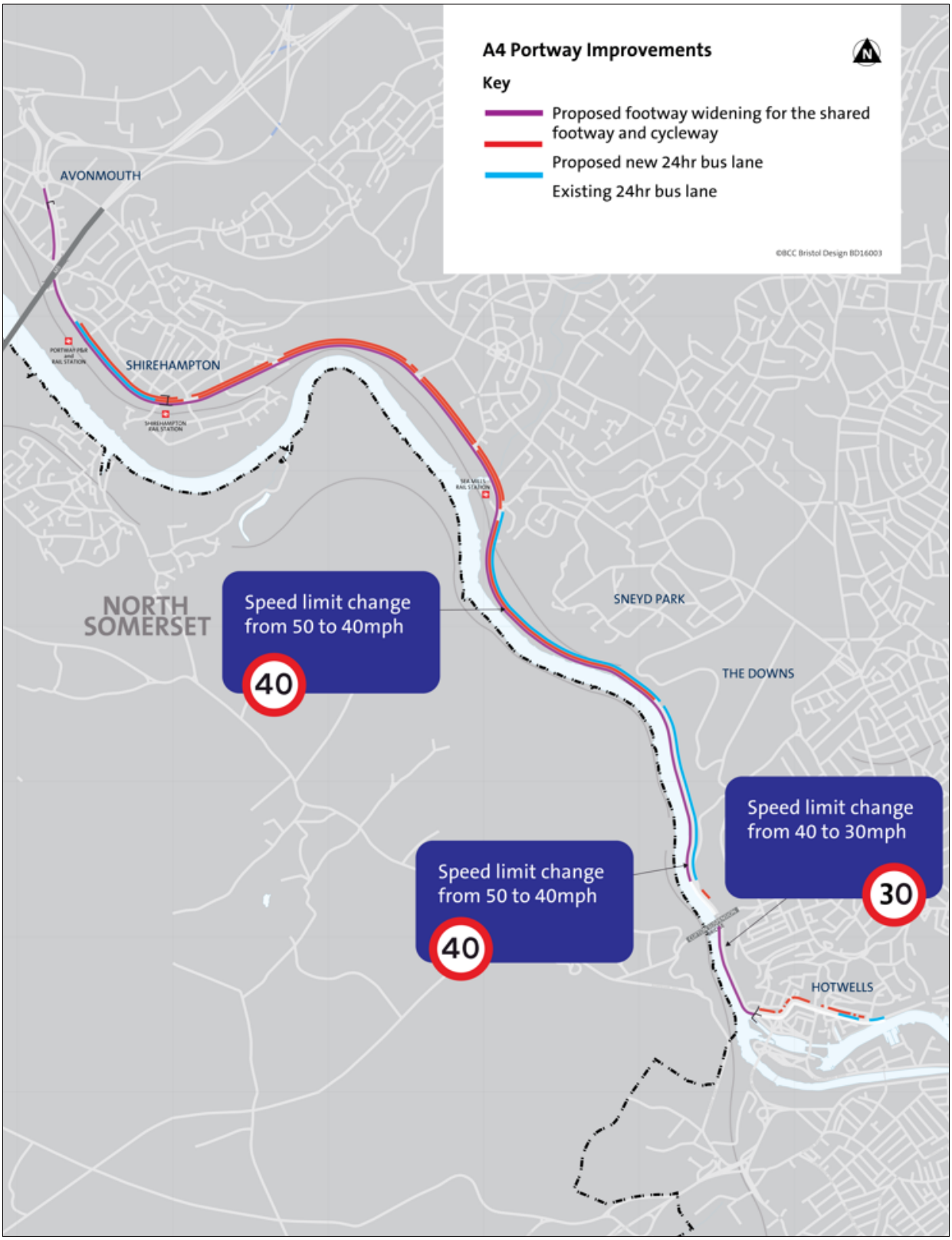
The scope for this project is the delivery of infrastructural changes to the A4 Portway that make public transport, cycling, and walking people's natural choice as the mode of travel to enhance social, wellbeing, economic and environmental outcomes. The Options Assessment Report (Appendix A), developed by Arcadis and BCC, demonstrates an option that maximises the benefits of the study objectives, by providing upgraded facilities for pedestrians and cyclists as well as bus priority, within the CRSTS budget.

The proposed key scheme elements include:

- A 24-hour inbound bus lane along most of the route to connect the section that currently exists.
- A 24-hour outbound bus lane to extend the small section that exists by the Portway Park & Ride entrance.
- Widening the existing footway, on the Portway southwest side, (shared use path) to provide better walking and cycling facilities.
- Reduction of the speed limit from 50 to 40 just south of Roman Way to just north of Bridge Valley Road.

These key elements are displayed in Figure 1-2, the scheme also involves localised improvements near crossings and junctions. It is noted that these elements are dependent on each other to provide a scheme along the A4 Portway that promotes a step change in behaviour change, as providing enhancements to bus (in both directions) and active travel will encourage people to switch from car travel.

Figure 1-2 A4 Portway Proposals



2 Strategic Case

2.1 The Case for Change

The following section outlines the case for change and the need for intervention, developed with reference to early stakeholder engagement and recommendations by BCC.

Current Situation, Challenges and Opportunities

Improving the current situation along the A4 Portway corridor is critical if existing issues of public transport congestion, delay and reliability are to be improved. As such, the service gaps are outlined below, listed as challenges and opportunities: see Appendix B for the problems, issues, and opportunities statement. Due to the nature of the topics presented, not all of the sub-sections will necessarily have a challenge and opportunity.

Current Public Transport Provision

The A4 Portway currently features the number 9 bus route connecting Shirehampton Park to Brislington Park and Ride via Sea Mills Roman Way. The service is a key route for commuters and to access essential services and operates 5 times per hour daily.

The Portway Park and Ride is connected to the recently opened (August 1st 2023) Portway Park and Ride railway station. This rail line also serves Shirehampton and Sea Mills stations along the Portway, and provides a key commuting service connecting employment area in Bristol City centre (At Bristol Temple Meads), Avonmouth, and Weston Super Mare, all with a frequency of 2 trains per hour on weekdays and Saturdays and hourly on Sundays. Increasing Railway patronage is a key element of BCCs road to net zero.

Congestion and Bus Delays: Challenge

Currently, buses are experiencing significant delays due to congestion, especially along the A4 Hotwell Road. In the A4 Portway Early Engagement Report (Appendix C), 81.5% of survey respondents reported that reducing congestion was of medium to high importance along main transport routes such as the A4 Portway. Furthermore, 50.67% of respondents reported ‘there is too much congestion’ between the Bridge Valley Road Junction and Jacob’s Wells Road Roundabout of the A4 Portway.

Observations during peak hour site visits in August 2022, and October 2023, identified queuing and delay to bus services along the corridor and inbound in the AM and outbound in the PM peak period, this is a particular problem in the areas along the corridor that currently do not have bus lane provision (Figure 2-1). There is also congestion around Hotwell Road where there is also no bus priority, meaning that buses get delayed in the congestion in the area. Google Maps gives travel time variation of between 20 and 45 minutes in the AM and PM peak periods inbound indicating that there can be significant delays in general traffic, and this will have a knock on impact on bus journey time and reliability.

Figure 2-1 Observed congestion during site visits

The impact of this observed congestion is shown in the bus delay data (Figure 2-2 and Figure 2-3) for services along the A4 Portway/A4 Hotwell Road corridor provided by First Bus's on-board trackers and show the level of bus delay during both AM and PM peak times, respectively (*Please note that Figure 2-2 and 2-3 have been redacted from this version of the OBC due to containing commercially sensitive data*). The delay is measured as the difference between the fastest and slowest median pace within the time period (seconds per metre).

This data is from the previous provider First Bus, this service has now been taken over by Stagecoach as the Service number 9. However, the data provided in this section shows congestion along the A4 Portway and how this impacts bus delays.

DfT Bus Open Data Service also provides real journey time data for bus services using GPS trackers on each public bus service vehicle. Data for the Stagecoach number 9 service from Shirehampton Portway Park & Ride to Brislington Park & Ride has been used in this document to give an indication of bus journey delay along the corridor. This data provides further evidence of bus delays along the route when assessing journey times during the AM and PM peak relative to the interpeak periods (Figure 2-4)

Figure 2-2 Bus delays for the A4 Portway Park and Ride Service inbound route (AM Peak) - Redacted

Figure 2-3 Bus delays for the A4 Portway Park and Ride Service inbound route (PM Peak) - Redacted

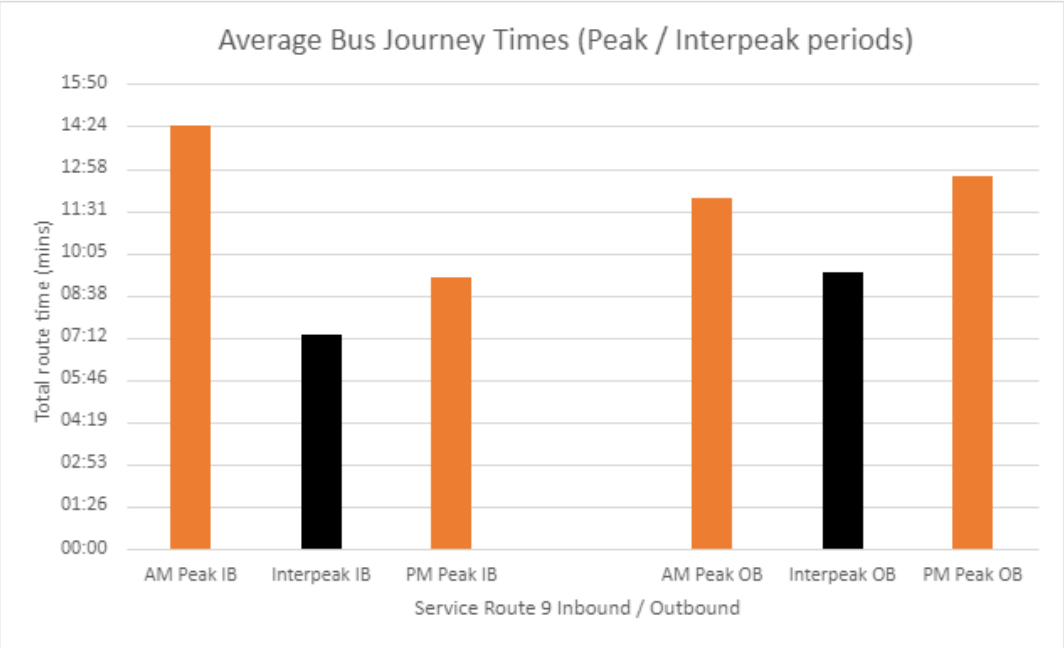


Figure 2-4 Bus Open Data Service 9 Journey Time – [obtained from Vehicles – 9 - Portway P&R - Bristol City Centre - Brislington P&R – bustimes.org]

Information obtained from FirstBus provided actual journey times against the estimated timetable. This data is limited due to the dataset not including all stops with large data gaps. Figure 2-4 therefore presents whole journey time available from bustimes.org to provide comparison between peak and interpeak period journey times.

Figure 2-4 presents average realtime journey times collected over three weekdays (Tuesday, Wednesday, Thursday) for AM and PM peak period bus journeys, versus interpeak period (11am-1pm) bus journeys. The inbound journeys include data from the section from the bus stops at Shirehampton Park & Ride, to Sea Mills, Roman Way. The Outbound journeys include data from Hotwells, Merchant Road to Shirehampton, Station

Road. Figure 2-5 shows the sections of the inbound and outbound route that the journey time data was available for and doesn't currently have bus lane provision.

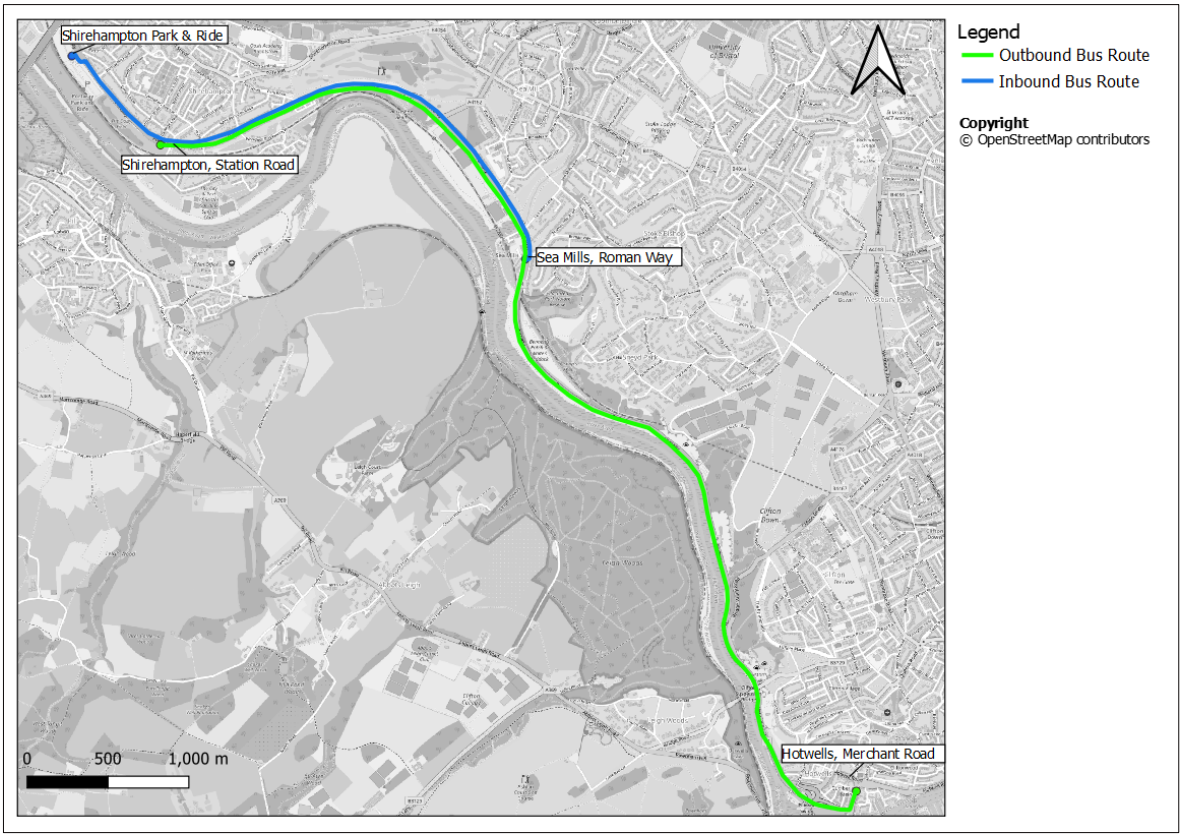


Figure 2-5 Sections of bus route used for journey time analysis

The journey time data, shown in Figure 2-, shows that the inbound journey during the AM peak takes over 7 minutes (96%) longer than the same journey during the interpeak period. The outbound journey during the PM peak takes over 3 minutes (35%) longer than the same journey during the interpeak period. Even allowing for additional boarding and alighting of passengers during the peak periods, this indicate substantial delay to bus services along the route.

Bus Occupancy: Challenge

Occupancy rates of buses along the A4 Portway/A4 Howells corridor between October and December 2019 for the AM and PM peaks have been provided by First Bus. The data (collected from ticketing information at every stop for every bus trip) is shown below in Figure 2-6 and Figure 2-7 (*Please note that Figures 2-6 and 2-7 have been redacted from this version of the OBC due to containing commercially sensitive information*).. This shows that current bus occupancy levels are low along the outer section of the A4 Portway compared to within Bristol.

The figures below show that the A4 Portway section of the corridor experiences average occupancy levels of between 1 and 100 passengers per hour, in both AM and PM peaks. Where services run through Hotwells, they experience higher levels of average occupancy during the AM peak with the average inbound occupancy per hour between 251-500 passengers. During the PM peak, the average occupancy for services running through Hotwells is higher in the outbound direction.

A concern was also raised as part of the early engagement on this Scheme regarding the low bus occupancy levels along the A4 Portway. Whilst there is no direct evidence to determine why bus occupancy levels are lower along this corridor, it is recognised that areas with higher car ownership, poorer public transport service and low-density population, such as areas along the A4 Portway, generally have lower bus use. This indicates

there is a challenge in encouraging people to use public transport along the A4 Portway between the Portway Park and Ride and the outskirts of Bristol City Centre.

Figure 2-6 FirstMove bus occupancy (Oct - Dec 2019) AM Peak (08:00) - Redacted

Figure 2-7 FirstMove bus occupancy (Oct - Dec 2019) PM Peak (17:00) - Redacted

Increasing Bus Occupancy: Opportunity

There is an opportunity, along the A4 Portway, to encourage greater bus patronage on existing services that utilise the A4 Portway by improving bus reliability, journey times, punctuality, and user experience (improved bus stop shelters and real time information) to make it a more attractive and safer route for public transport. Infrastructure improvements being put forward as part of this project, alongside the passenger environment on board buses will encourage greater bus patronage. This will also complement other infrastructure development in the area such as the Portway Park and Ride extension and the new railway station at the park and ride site. Furthermore, there is also an opportunity to increase the number of services using the A4 Portway.

Modal Share: Challenge

Modal share data shows that car use is high, particularly among those commuting from areas further away from the city centre, and the modal share in public transport is low. This is evidenced in Table 2-1 and shows that the proportion of people travelling by bus to work has fallen between 2011 and 2021 for those areas outside Bristol City Centre, whilst the proportion of people driving has increased. However, for areas such as Filton and Frome Vale, which are similar distances outside of Bristol compared to Shirehampton, bus use has increased between the 2011 and 2021 Census. A feasible explanation is that there are more frequent and reliable services along those routes. There is a move away from the 'predict and provide' to the 'vision and validate' model in order to provide schemes that enable people to change their mode share to more sustainable modes. This scheme is one of a number of schemes coming forward which are a move away from the old 'predict and provide' model to ensure mode share challenges within the City are addressed.

Current Walking and Cycling Provision

The existing footway is identified as a shared footway cycleway, but many sections are very narrow (less than 1.4m wide), in poor condition and are impeded by vegetation, particularly on sections between Portway Park & Ride - Shirehampton Station (shown in Figure 2-8), and Valerian Close – Sea Mills Station.

Figure 2-8 Photos of narrow footway/cycleway between Shirehampton and Portway Park & Ride

To the south west of the corridor, near Hotwells, there are sections of footway identified and signposted as shared footway / cycleway that are less than 2m wide and obstructed by lighting columns, barriers and highway infrastructure for prolonged periods, (shown in Figure 2-9).

Figure 2-9 Narrow, obstructed shared footway/cycleway on Hotwell Road

Pedestrian and Cycle Infrastructure: Challenge

This does not meet recommended deisgn guidance, such as LTN 1/20, creating a poor quality pedestrian and cycling environment, causing conflict between users and discourages walking and cycling along the route.

The lack of appropriate crossing provision along the Portway corridor also limits connections with the wider walking, cycling and LCWIP network on the opposite side of the carriageway to the existing pedestrian and cycle provision.

Cycling Numbers: Challenge

Data derived from the 2011 and 2021 Census data (Table 2-1) shows that at present, the proportion of people cycling to work is low (4.7% in Shirehampton, and 3.9% in Sea Mills) which could be attributed in part to insufficient infrastructure and concerns for safety along the route. By contrast, areas within the city centre feature a significantly greater number of cyclist commuters (10.4% in Eastville, and 8.5% in St. Andrews). This could be linked to the significant investment in active travel infrastructure with over 300 cycle parking spaces and cycle lanes on all major roads in the city[2]. A comparison in Table 2-1 has also been made with areas within a similar cycle distance to Shirehampton and Sea Mills and along a key corridor into Bristol. This shows that areas such as Filton and Frome Vale have a similar or higher proportion of people who travel to work by bicycle despite being similar distances from the City Centre.

[2] https://www.bristol247.com/news-and-features/features/is-bristol-a-cycle-friendly-city/#:~:text=%E2%80%9CWe're%20known%20as%20one,the%20city%2C%E2%80%9D%20said%20Chaskelson.

Table 2-1 2011 and 2021 Travel to Work Census data (Percentage of People Who Travel to Work by Mode)

	Comparison MSOA				A4 Portway Corridor MSOAs										City Centre	
	Filton South Gloucestershire 018		Frome Vale Bristol 012 & 013		Shirehampton Bristol 008		Sea Mills Bristol 007		Stoke Bishop Bristol 015		Clifton Bristol 030		Hotwells Bristol 034		Bristol City Centre Bristol 032 (60 and 61 for 2021)	
	2011	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**
Bus, minibus, or coach	5.8	6.7	6.0	6.9	6.8	5.7	6.5	5.4	2.7	2.4	3.3	2.4	3.6	4.6	4.0	5.7
Driving a car or van	37.0	41.7	36.6	40.2	41.7	48.7	42.0	44.7	31.5	29.2	25.3	19.1	19.7	17.3	12.6	13.1
Passenger in a car or van	3.4	3.6	3.1	3.4	4.4	5	4.4	4	2.1	2.1	1.2	1.1	1.2	1.2	1.1	1.05
Bicycle	4.3	4.1	4.1	5.2	3.6	4.7	3.1	3.9	3.0	3.8	5.1	4.4	5.3	5.7	3.0	3.7
On foot	10.7	9.9	7.1	6.9	7.4	9.5	3.9	4.4	4.8	5.3	24.8	16.4	23.1	16	24.8	21.2

Averages have been used for areas with multiple MSOA codes.

Mode of travel data was also obtained in the public engagement survey results. This data is presented below in Figure 2-10. The percentages vary from the Census data due to a different number of categories, and multiple answers selected per respondent, the data shows a majority of respondents travel along the Portway as 'car drivers'. There is also a high representation of cyclists and walking.

18. What is your main form of transport you usually use along this route? (Tick all that apply)

		Response Percent	Response Total
1	Walk	28.44%	399
2	Bicycle (ebike)	36.35%	510
3	Scooter (e-scooter)	2.35%	33
4	Bus/Metrobus	13.11%	184
5	Park & Ride	14.83%	208
6	Train	12.26%	172
7	Car / Van driver	66.93%	939
8	Car / Van passenger	14.47%	203
9	Taxi	3.64%	51
10	Motorcycle	3.14%	44
11	Other (please specify):	4.21%	59
		answered	1403
		skipped	35

Figure 2-10 Engagement Response - Transport Mode

Whilst the response to the public engagement presented a high proportion of walking and cycling, this may be an overrepresentation of daily journeys along the Portway. It does however, suggest that there is a suppressed demand and more people would like to use the Portway by foot and cycle.

Personal Injury Collission (PIC) Data was obtained for the latest 5 year period available long the A4 Portway study area. Collisions involving pedestrians and cyclinsts are presented in Figure 2-.

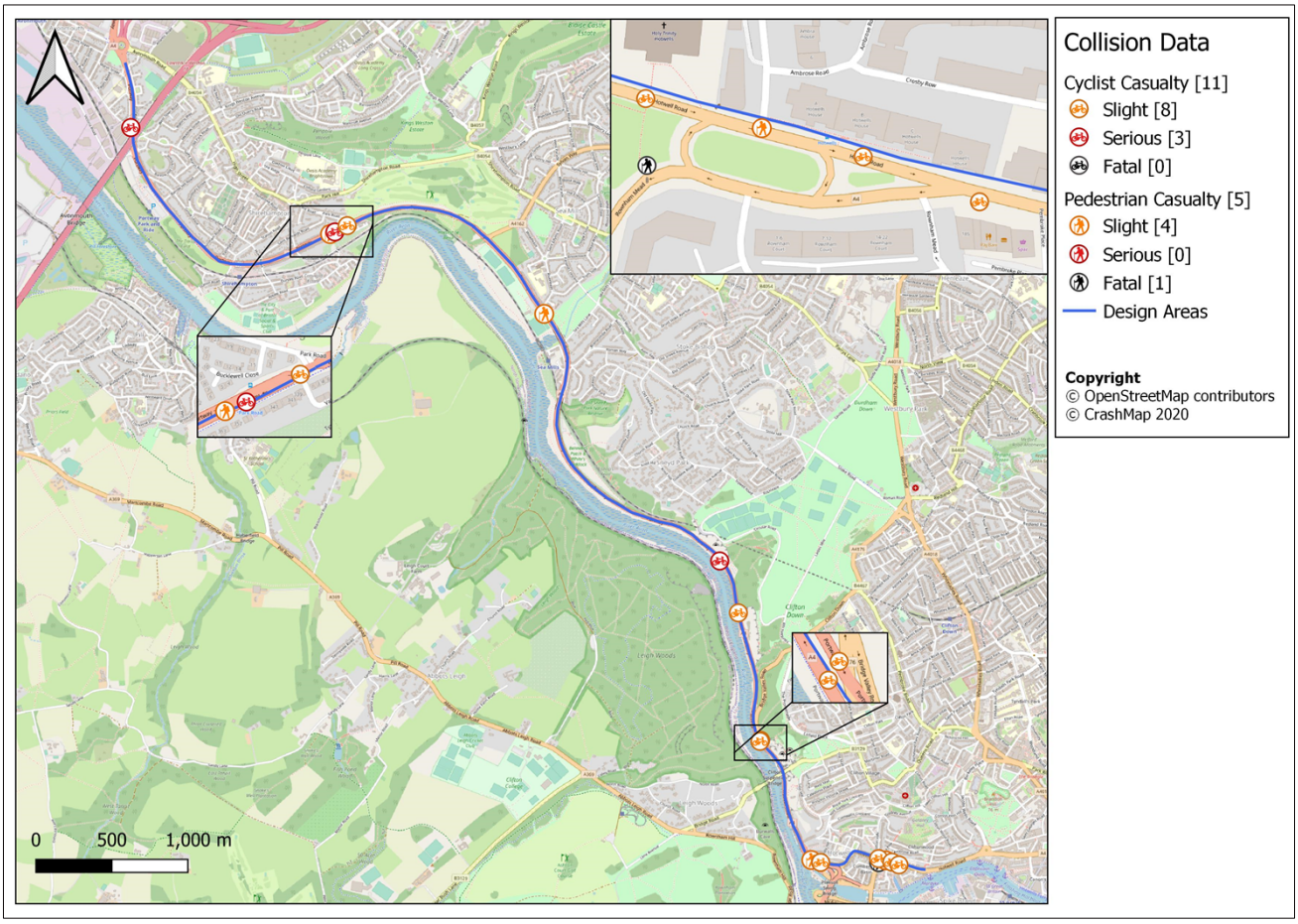


Figure 2-11 A4 Portway Collisions with Pedestrians and Cyclists (2018-2022)

Collision rates (with active travel users) are generally low on the A4 Portway, as shown in Figure 2-11. However, this is likely to be perceived safety concerns, because of the unappealing pedestrian and cycling environment, leading to low user levels. A number of collisions have still been reported involving pedestrians and cyclists around some of the key junctions. It is to be noted that accidents from 2023 were not available at the time of writing.

Cycling Numbers: Opportunity

With further investment in active travel along the A4 Portway, the number of cyclists could increase. The propensity to Cycle Tool shows that in the 'Go Dutch' scenario the Avonmouth and Sea Mills area could have similar propensity to cycle as other areas within the City Centre (Figure 2-12). This is supported by a study by Sport England that found 61 of 84 active travel interventions led to increased patronage[3]. Furthermore, the route is flat, following the river, and approximately 5 miles in length, shorter than the average UK commute length of 9.8miles[4]. Cycle counts (at Hotwell Road near Cumberland Basin between 2016 and 2019) show the number of people commuting along the Portway is increasing (Figure 2-13).Therefore, there is further opportunity for number of commuters cycling along the A4 Portway to increase with improved and dedicated cycling infrastructure[5]. Figure 2-12 presents the Propensity to Cycle Tool with an approximate route drafted over the top in red.

[3] https://sportengland-production-files.s3.eu-west-2.amazonaws.com/s3fs-public/active-travel-full-report-evidence-review.pdf
[4] https://bikebiz.com/strava-reveals-average-british-cycle-commute-length/amp/
[5] https://www.fleetnews.co.uk/fleet-faq/what-are-the-proposed-uk-clean-air-zones-caz

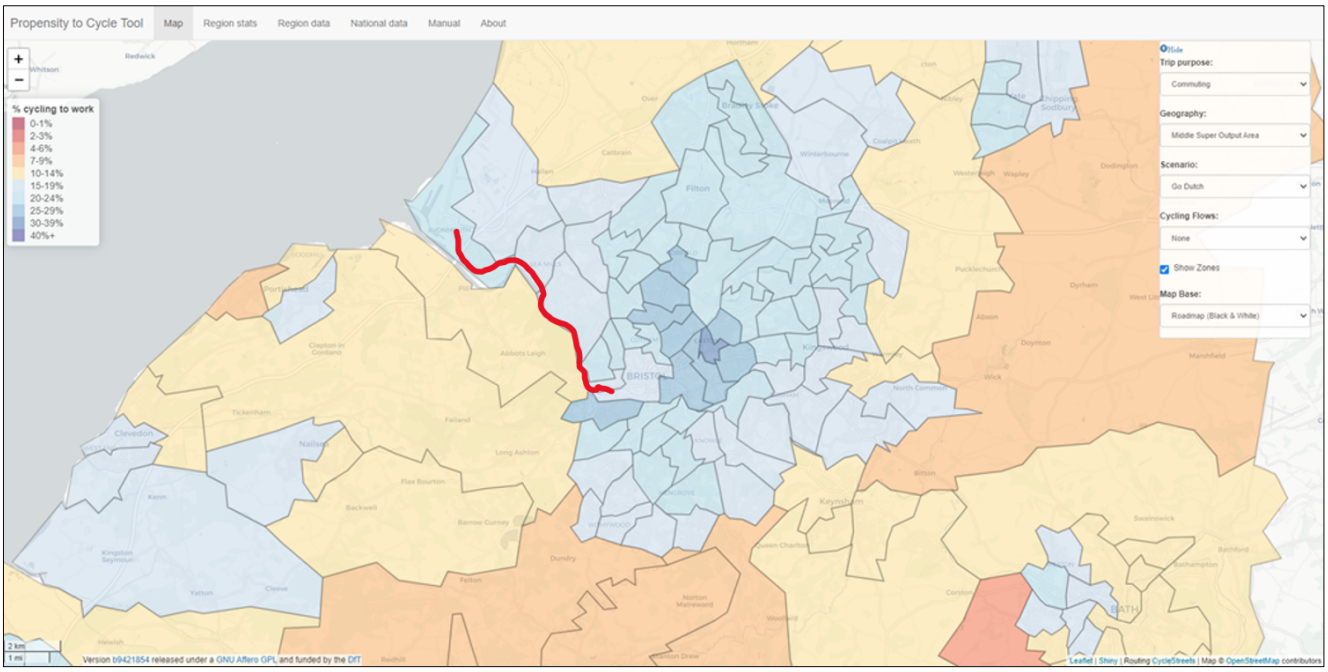


Figure 2-12 2011 Census Propensity to Cycle Tool data for Bristol close to the A4 Portway with approximate route overlayed

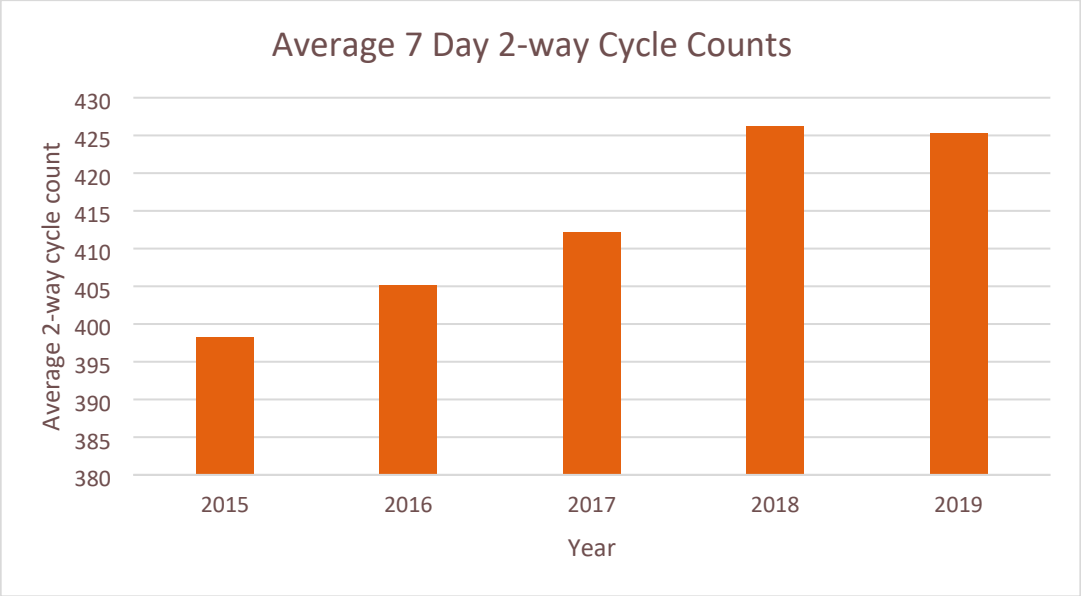


Figure 2-13 A4 Portway cycle data 2016-2019, Hotwell Road near Cumberland Basin

Walking and Cycling Infrastructure: Opportunity

There is the opportunity to make considerable improvements to the pedestrian infrastructure such as footways and crossing islands along parts of the A4 Portway improvement Scheme. This will help encourage active travel users by providing a safe environment to walk and cycle. These improvements would include localised widening, trimming vegetation and improvements to the quality of the surface of the footway.

High Car Ownership: Challenge

Car ownership in Stoke Bishop, Shirehampton and Sea Mills is high compared to Hotwells and Harbourside, as these areas have a significantly greater percentage of households with no access to a car or van. Furthermore, those areas along the A4 Portway corridor outside of the City Centre (Shirehampton, Sea Mills and Stoke Bishop) have all seen increases in car ownership, especially those owning three or more cars, this is displayed in Table 2-2. The challenge for the corridor is how to encourage modal shift in areas of high car ownership, to more sustainable modes of transport, and how to provide better connectivity through public transport, walking, and cycling in areas of lower car ownership. The area along the A4 Portway corridor has been compared to areas a similar distance from Bristol City Centre, Table 2-2 shows that there is a slightly higher car ownership along the A4 Portway Corridor.

High Car Ownership: Opportunity

There is the opportunity for this scheme to provide high quality travel alternatives to and from Bristol by alternative modes to private car. This scheme provides more reliable, faster, and more frequent services into Bristol by public transport and provides higher quality active travel infrastructure. Therefore, this improves transport equality in the areas surrounding the A4 Portway and allows those travelling into Bristol along the corridor to make alternative mode choices.

Table 2-2 Car Availability in Study Area and compared to areas a similar distance (Percentage of households with access to a car)

	Comparison MSOAs				A4 Portway Corridor MSOAs										City Centre	
	Filton South Gloucestershire 018		**Frome Vale Bristol 012 & 013**		**Shirehampton Bristol 008**		**Sea Mills Bristol 007**		**Stoke Bishop Bristol 015**		**Clifton Bristol 030**		**Hotwells Bristol 034**		**Bristol City Centre Bristol 032 (60 and 61 for 2021)**	
	2011	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**	**2011**	**2021**
No cars or vans in household %	23.4	22.8	25.35	21.75	23.4	21.4	18.8	15.3	8.2	10.4	21.9	25.9	31	33	47.7	50.7
1 car or van in household %	45.3	42.1	45.6	46.0	47.4	45.7	45.2	46.2	41.5	40.9	49.3	47.5	47.3	47.9	39.1	38.9
2 cars or vans in household %	23.4	24.4	22.45	24.25	23.2	25.2	28.6	27.7	27.7	36.8	22.5	21.4	17.3	15.5	10.4	8.2
3 or more cars or vans in household %	7.8	10.7	6.6	8.0	6.0	7.7	7.4	10.9	11.1	11.8	6.2	5.3	4.3	3.6	2.8	2.2

Interface with the Bristol CAZ: Opportunity

The south-eastern part of the A4 Portway, where the corridor transitions into the A4 Hotwell Road, falls under the Bristol CAZ which opened in November 2022 (Figure 2-1414). The CAZ aims to reduce public exposure to nitrogen dioxide through restrictions on the highest polluting vehicles, encouraging the use of cleaner vehicles and encouraging people to walk, cycle and use public transport. Therefore, there is an opportunity for improvements to public transport and active travel infrastructure along the A4 Portway to help accommodate the increased volume of users which could happen following a behaviour change due to the implementation of the CAZ.

Figure 2-1414 Bristol CAZ

Air Pollution: Challenge

A site improvement plan has been developed by Natural England which has found nitrogen and other pollutant deposits primarily sourced from the A4 Portway. The Bristol AQMA lies within the south-eastern part of the corridor and encapsulates the A4 Hotwell Road from the junction with Bristol Gate/Brunel Way to Jacobs Wells Road and beyond (Figure 2-15).

Improved Air Quality: Opportunity

An improvement in public transport journey times and improvements to active transport infrastructure along the A4 Portway could promote a mode shift from car, leading to a reduction in traffic, consequently improving air quality.

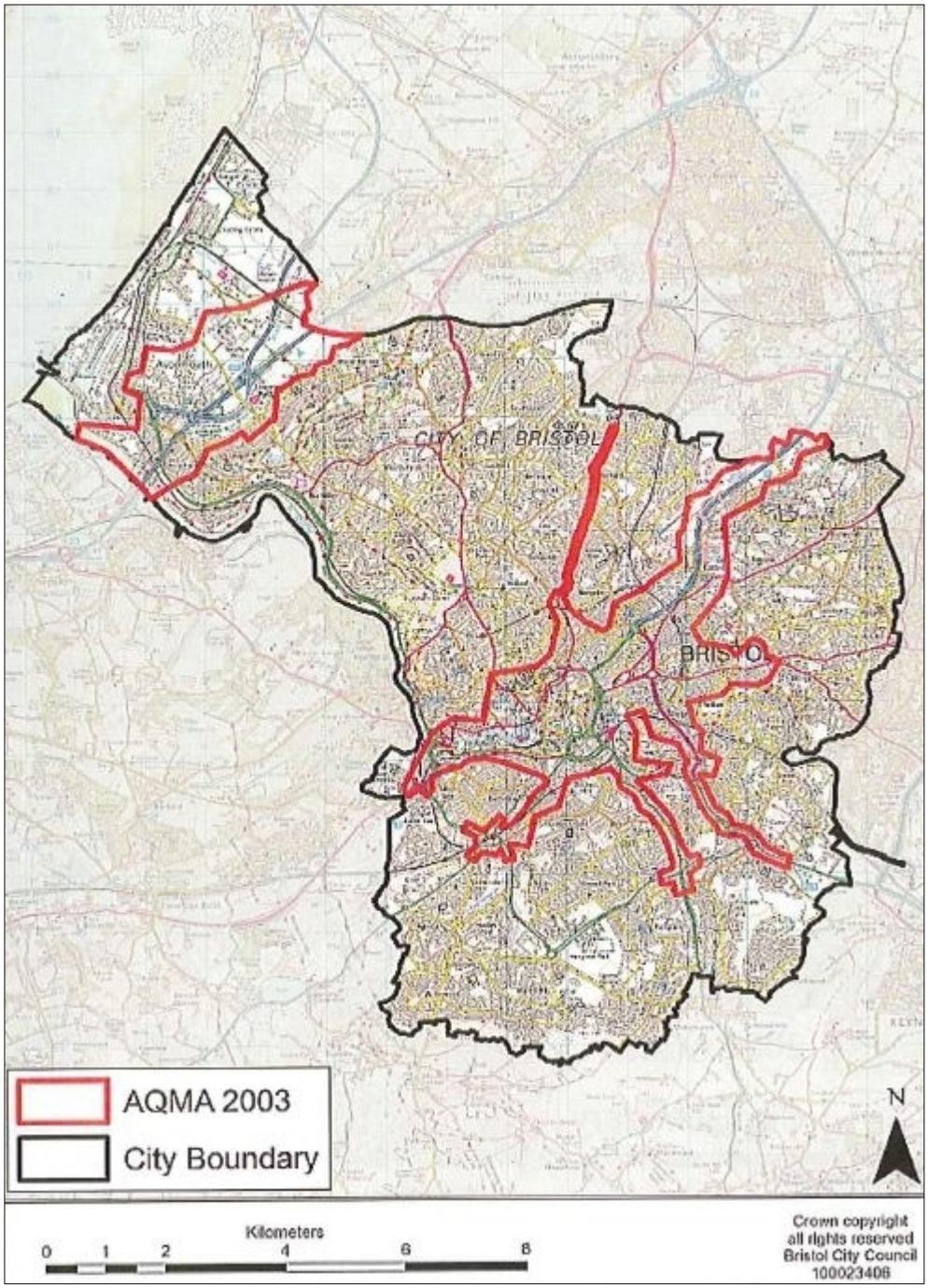


Figure 2-15 Bristol AQMA

Road Width: Challenge

The current total carriageway width varies along the corridor, but in many parts is over 20m, consisting of 4 traffic lanes, central reservations or hatching, and sided by narrow verges and a footway on the River Avon side of the carriageway.

Road space allocation is currently inconsistent along the corridor, with a patchwork of bus lane sections, a combination of 1 and 2 traffic lanes, some sections of narrow advisory cycle lanes and some on-street parking,

Figure 2-16 shows a cross-section photograph of the carriageway from the over footbridge by Shirehampton Station. It shows the existing variety of road space allocation with sections of 2 traffic lanes in each direction, sections of intermittent bus lane, on-street parking and narrow advisory cycle lanes. During site visits many buses were observed straddling lanes and encroaching into parking and cycle lanes.

Figure 2-16 - Photo of carriageway cross-section near Shirehampton Station

The current road space allocation is inefficient and inconsistent. At present, road space allocation has a bias towards private cars, this limits the efficiency of bus movements and attractiveness of active travel, thus makes it unappealing as an alternative mode to private car.

Road Space Re-allocation: Opportunity

Within the Scheme development, work has been undertaken to reconfigure the road space. There is the opportunity to increase the efficiency of bus journeys and encourage active travel users by re-allocating the road space to prioritise more sustainable modes, while improving equality to all user groups. This also provides an opportunity to improve accessibility to users without a car to access jobs, education, social activities, and healthcare. Road space re-allocation will also enhance road safety and reduce fear and intimitdation by improving the walking and cycling environment and making the corridor less car and HGV dominated.

Enhancing the efficiency and continuity of space along the A4 Portway will also future proof the corridor for further population growth and development as set out in the policy and strategic section, which includes reference to the emerging Local Plan, in the area to promote sustainable travel options.

2.2 Need for Intervention

The current infrastructure provision is not sufficient to meet growing transport demands and the council's ambitions for its transport corridors – detail on the existing bus services along the Portway can be found in Appendix D. The A4 Portway between Avonmouth and Bristol city centre is congested in certain areas (as evidenced in The Case for Change) and a high proportion of travel to work trips for those living along the corridor are undertaken by private car (as displayed in Table 2-1). In addition, the existing inbound and outbound bus services also suffer delays, displayed in Figure 2- and Figure 2-, as a result of the congestion issues on the A4 Portway.

If no interventions are undertaken along the A4 Portway Corridor with regards to the improvement of active travel provisions and public transport initiatives, the current issues on the A4 Portway are going to increase in their severity leading to the following adverse outcomes:

- Increased bus journey time delays
- Reduced bus occupancy
- Active travel becomes more unattractive
- High private car use
- Increased incidences of adverse health effects through poor air quality
- Reduced wellbeing
- Reduced accessibility by public transport between communities
- Increased safety concerns for walking and cycling

The Scheme coming forwards now is described as a high priority corridor in the BSIP and is needed to support other improvements in the area, such as the new Portway Park and Ride Access, new rail station and expansion of the Portway Park and Ride and avoid the adverse outcomes listed above.

If there is no fast and reliable service into Bristol, this area will not meet targets to increase bus travel within the city and the bus usage may not recover from the impacts of COVID-19. The targets set out in Bristol Net Zero by 2030 plan include:

- A maximum of 20% of total journeys by car
- A suggested 25% of journeys by public transport
- A suggested 55% of journeys by active travel

The Joint Transport Study notes Bristol needs to reduce the percentage of people commuting by car by 43% in 2036 (baseline 2017) just to maintain traffic at its currently level. Furthermore, there will be no opportunity to improve cycling and walking infrastructure and, therefore Bristol may be unable to meet active travel ambitions to boost cycling and walking.

In order to deal with the existing congestion challenges and avoid the adverse outcomes listed above, the proposed interventions along the A4 Portway support BCC's and WECA's objectives of promoting public transport on the A4 Portway and shifting users to a more sustainable mode of travel such as bus, cycling and walking. This will bring the desired outcomes such as, increasing the efficiency of the A4 Portway corridor, creating resilient communities, supporting the local economy, and helping to deliver high-quality people friendly places.

In addition, 2021 Census data shows that along the A4 Portway corridor, cycling levels are low. If nothing is done along the corridor to provide an attractive and safe cycle route into Bristol, cycling levels will remain low and there will be a missed opportunity to enable a mode shift onto active travel modes.

Furthermore, Bristol has an AQMA which encapsulates the south-eastern part of the corridor and therefore, if nothing is done to provide attractive, viable forms of public transport and active travel along the A4 corridor into Bristol, those travelling into Bristol will have limited travel options and will continue to use private car, exacerbating the current air quality issues within the city centre. Improving the public transport network will help improve equity in the region by connecting the more deprived communities in Bristol to key amenities within the city. Improvements proposed by the scheme will provide residents without access to a car with a safe affordable means of transport to access better healthcare, jobs, and education.

There is a need for intervention to ensure that the A4 Portway can deal with the pressures it may face in the future. Due to the scale and type of intervention needed, the private sector cannot fund the measures required to address the problems with public transport, congestion, and active travel along the A4 Portway corridor. To access funding available through CRSTS the project must be delivered by 2027. Delivery to this timescale will also help to meet BCC's carbon neutral targets and Bristol Net Zero Strategy targets as well as support the ongoing improvements (such as Park and Ride expansion and new rail station) in the area.

2.3 Scheme Objectives and Strategic Fit

The alignment of the initial Scheme objectives with policies and strategies and the refinement of the Scheme objectives are presented and discussed in this section.

Policy Alignment

The A4 Portway improvements scheme is supported by a range of policies and strategies, in particular the West of England Bus Strategy, Joint Local Transport Plan 4 (JLTP4), Bristol Transport Strategy and West of England Local Cycling and Walking Infrastructure Plan. Also, the scheme exceeds the expectations presented in JLTP4 as there is desire to have a 'metrobus' scheme along the A4 Portway, but this scheme aims to go above and beyond this by providing full bus segregation.

Appendix E provides a summary of the relevant national, regional, and local transport and planning policy / strategy and how this Scheme aligns with these. This is summarised in Table 2-3 and shows that this Scheme and its objectives align with many major policy and strategy documents both locally, regionally, and nationally.

Table 2-3 Policy Summary

Policies	Initial Scheme Objectives			
	Improve journey time, punctuality, and reliability	Increase the proportion of trips made by bus, cycling and walking	Reduce levels of air pollution and CO2 emissions	Enhance the streetscape, public spaces, and urban environment
West of England Local Cycling and Walking Infrastructure Plan		✓	✓	✓
West of England Joint Local Transport Plan 4 (JLTP4), 2020		✓	✓	✓
Bristol One City Plan	✓		✓	✓

Policies	Initial Scheme Objectives			
	Improve journey time, punctuality, and reliability	Increase the proportion of trips made by bus, cycling and walking	Reduce levels of air pollution and CO2 emissions	Enhance the streetscape, public spaces, and urban environment
Bristol Development Framework: Core Strategy	✓		✓	✓
National Planning Policy Framework (NPPF)		✓		✓
Bus Back Better: National Bus Strategy for England	✓	✓		
Gear Change		✓		
Bristol Transport Strategy 2019	✓	✓	✓	✓
West of England Bus Strategy	✓	✓		
City Region Sustainable Transport Settlement (CRSTS) SOBC		✓		
The City Centre Framework	✓		✓	✓
Bristol Council Corporate Strategy	✓	✓		
Bristol One City Climate Strategy (Bristol Net Zero by 2030)		✓	✓	

Scheme Objectives

The aim for the A4 Portway Scheme is to:

Deliver infrastructure changes to the A4 Portway that make public transport, cycling, and walking people's natural choice in mode of travel to enhance social, wellbeing, economic and environmental outcomes.

The initial Scheme objectives set out in Section 1.2 have been updated to reflect the CRSTS funding objectives and the wider BCC policies for active and cleaner transport to reduce the use of private vehicles and reallocating road space for sustainable modes. They have also been further refined to ensure they are SMART (Specific, Measurable, Achievable, Relevant and Time-bound). The new scheme objectives are as follows:

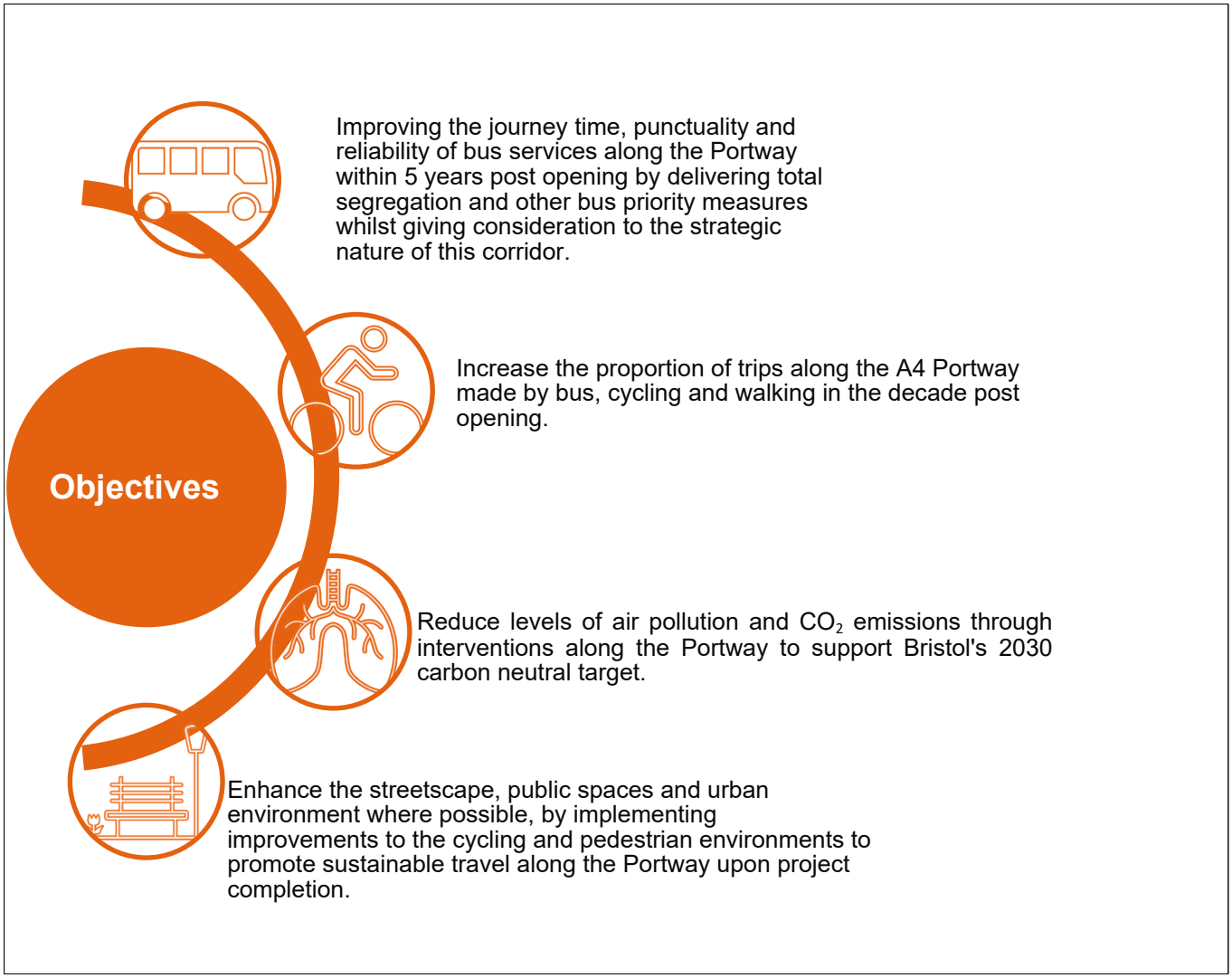


Figure 2-17 Scheme Objectives

A logic map has been produced to show how the problems, issues, and challenges link to the Scheme and CRSTS objectives. This logic map also shows how the Scheme and CRSTS objectives link to opportunities within the A4 Portway and then how these turn into outputs and link to the Critical Success Factors listed below.

Critical Success Factors (CSFs) and Logic Map

In addition to the Scheme's and CRSTS objectives, a series of critical success factors have been included to gauge the success of the project and their alignment to the Scheme and CRSTS objectives. The logic map presented in Figure 2-18, shows the CSFs and how these CSFs are linked to elements of the project including Scheme and CRSTS objectives (listed in boxes with a black outline), opportunities and outcomes.

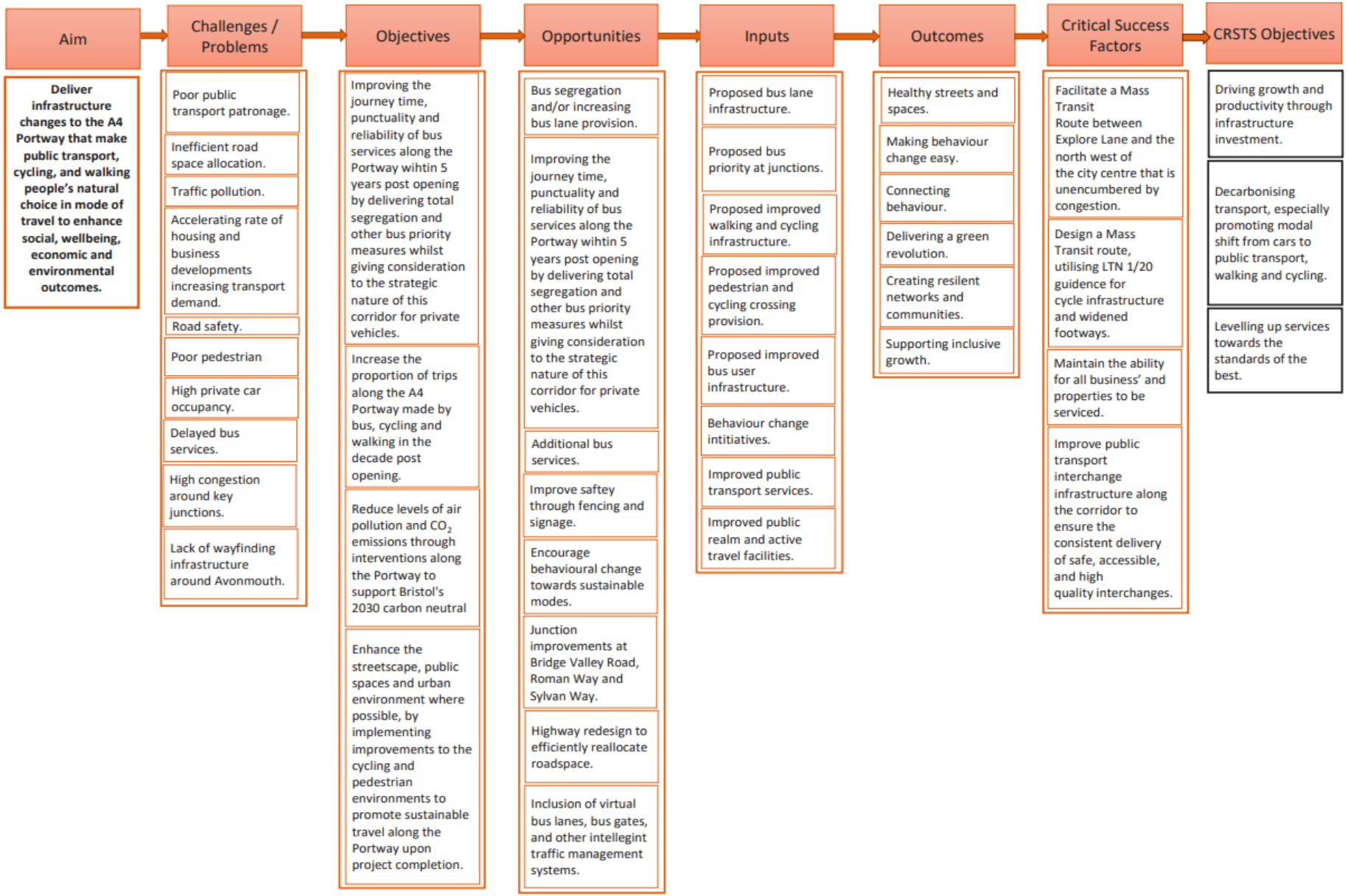


Figure 2-18 Logic Map

2.4 Expected Benefits

The expected benefits of the Scheme are the following:

- Bus journey time improvements for current users
- A mode shift from car to bus or active travel and the consequential decongestion benefits, reduction in emissions, noise, and improvement in air quality on the A4 Portway
- Modal shift towards walking and cycling will also result in health benefits such as reduced risk of premature death and absenteeism
- Journey quality improvements for pedestrians and cyclists
- Improvements in safety for pedestrians and cyclists

It is noted that the main benefits will be bus journey time improvements for those services using the A4 Portway. However, as mentioned previously, it is noted that there are high bus occupancy levels around the Hotwells Road/Anchor Road section as this is used by a wide range of services. Therefore, with the proposed bus priority improvements, this corridor is likely to provide the largest benefits in bus journey time improvements.

2.5 Option Development

Within the CRSTS SOBC, WECA developed a programme of infrastructure projects orientated towards improving the availability and accessibility of public transport and encouraging the uptake of walking and cycling. The programme was aimed to improve public transport connectivity with investment in improving transport hubs, bus prioritisation measures and walking and cycling infrastructure which in turn will improve bus frequency, journey times and reliability. Furthermore, the programme aimed to take a proactive approach in tackling climate change and in balancing socio-economic opportunities across the region.

The options listed in the Programme SOBC were split into seven work packages, the relevant Work Packages (WP) for this Scheme were WP1 and WP2, improving sustainable transport corridors, which included various types of interventions, covering different modes with a focus on bus and active modes, on the most important routes across the region. The Portway Sustainable Transport Corridor and Hub was a project that was identified as a priority corridor within the SOBC.

Since the development of the SOBC, a wide range of options were developed that had the potential to achieve the Scheme objectives. As part of the optioneering process, a high-level long-list of options was developed and analysed in line with the Department for Transport (DfT) Transport Analysis Guidance (TAG) framework. These were informed by extensive stakeholder engagement, including routine consultation with BCC's Highways Teams and by identifying problems and opportunities along the Portway corridor. Full detail on the optioneering and sifting methodology and development of the OAR can be found in Section 3 – the Economic Case.

Wider initiatives, which contribute to supporting mode shift alongside this project, are being implemented through various policies already in place. Further details on the options appraisal process are described in the Economic Case and the Options Assessment section.

2.6 Equality and Diversity Impact Assessment

An Equality and Diversity Impact Assessment (EqIA) has been carried out and is provided in Appendix F. The EqIA shows that BCC have not identified any disproportionate impacts to protected characteristics from the proposal at this stage. However, BCC is aware of existing issues for local citizens based on their characteristics, available to Bristol City Council through

data held, which BCC will seek to address and mitigate where possible through project design and delivery.

There are a number of benefits to protected characteristics which have been described below:

- Increasing the proportion of journeys made by public transport, walking and cycling will bring about improvements in air quality, particularly affecting those protected groups who live in densely populated areas.
- It is anticipated that the improvements included in this scheme will help encourage bus patronage and reduce the amount of people that use cars, consequently improving the air quality along the route. Better air quality will also benefit the health and wellbeing of residents local to the route.
- Through potential walking and cycling infrastructure improvements, it is anticipated that the scheme will encourage active travel and improve health and wellbeing.
- Improving bus services, making them quicker, more efficient and broadening the network coverage will have beneficial impacts to all groups but particularly groups that are more reliant on buses as their primary mode of transport. This particularly applies to younger people, women, parents/carers with young families and disabled people. A good network will enable all groups to access jobs, education and other services and opportunities.
- Improving the physical accessibility to/from stops will particularly benefit disabled people and parents/carers with young families.
- The proposals are helping to create a safe and secure environment where passengers can wait for the bus, by potentially implementing CCTV, lighting, and real time information at bus stops which will help many of the protected characteristics feel more safe and secure around the Portway.

There are also some potential disbenefits which are as follows:

- There is a potential for negative impacts to be experienced by private car users as a result of proposals that develop as part of the Portway Strategic Corridor project. However, aligned with the project objectives, road space re-allocation gives priority to sustainable transport methods which will contribute to the reliability and punctuality of bus services, low public transport journey times, improved air quality through a reduction in traffic, and improved health and wellbeing through the uptake in active travel methods.

2.7 State Aid Considerations

This Scheme is considered to be state aid compliant in accordance with details provided in State Aid: The Basics Guide, issued by the Department for Business, Innovation and Skills in 2015. The proposed works will benefit the local highway network, support, and enable growth in the region and improve the health and wellbeing of the population.

Assistance for the project has been granted by the state and will be undertaken using state resources within the local authority's budget. The assistance does not give an advantage to any undertakings over others and does not provide any undertaking that could be acquired during the normal course of business. In addition, the assistance does not distort or have the potential to distort any competition and does not affect trade between member states.

2.8 Consultation

BCC carried out an early engagement exercise in August 2022, which asked people about the issues they face when travelling along the route. People who live or travel along the A4 Portway were encouraged to take part in the early engagement exercise. This was to find out how this main route into the city can be improved to help buses move quickly through traffic and make cycling and walking safer and more enjoyable.

On the topic of buses, people generally commented that they want to feel more connected to the north of the city and they want buses to be more frequent. People liked the Portway Park & Ride but did not always use it as it was not open on a Sunday or later in the evening. People thought

the bus lanes would be a good addition and helped make the buses more reliable but would still like more buses available to connect to wider areas.

In response to questions on walking, people said the vegetation in places could be cut back as the pavements are too narrow in places, crossing points could be more frequent on the route particularly by bus stops, and the speed of traffic is too high and can make it unpleasant to walk along the route.

Many people who commented on cycling said they wanted a segregated cycle lane in both directions along the A4 Portway. Cyclists and pedestrians often have conflicts as there is no separated cycle lane. People felt the existing shared path and the cycle route are very poorly surfaced with frequent potholes left by the remains of trees. People also said the shared use path is too bumpy and has a poor quality surface for cycling on. Further details of the early engagement are provided in Appendix C.

A detailed engagement in October/November 2023 followed on from the early engagement in Summer 2022. Feedback from the early engagement helped shape the proposals that people were asked to comment on in the detailed engagement.

There was promotional material presented in the local area, as well as two virtual stakeholder workshops and drop in sessions. A survey was launched on Monday 2 October 23 until Sunday 12 November 23 which allowed six weeks for comment and was designed by the team to capture views from residents, businesses and anyone who lives and uses the route.

The key takeaways from the engagement exercise were as follows:

- Majority in support for the footway widening, speed limit reduction, inbound bus lane.
- Positive comments from bus users on the inbound bus lane but confusion about the outbound bus lane and why it was being proposed.
- Support for improved pedestrian and cycle provision.

- Concerns that the additional bus lanes could result in more traffic queuing.
- Some respondents supported the proposed scheme but called for further improvements to pedestrian and cycle infrastructure.
- Concerns over shared-use infrastructure for pedestrians and cyclists.
- Removal of parking spaces to accommodate the Park and Ride bus stop.

The following response was provided by BCC to show why the outbound bus lane is being considered:

- *"The results of the survey show that 50.8% of respondents rate the outbound bus lane either "poor" or "very poor" while 49.1% of respondents rated the outbound bus lane "fair," "good" or "very good."*
- *After consideration of this response rate, and an assessment of alternative options it has been decided that the outbound bus lane will continue to feature in the proposals as part of the OBC. The outbound bus lane presents benefits that include the creation of a bus rapid transit route along the A4 Portway that goes above and beyond the standards set by the metrobus initiative, providing buses that travel along the Portway with improved journey times, better reliability and frequency through continuous bus priority, factors that are essential in encouraging the modal shift. Continuous bus priority measures along the Portway both inbound and outbound will safeguard these outcomes and benefits in all future scenarios be it continued growth in traffic or closure of the M5. Additional benefits will be to coaches, taxis, private hire vehicles, and cyclists, with 74.4% the latter user group (cyclists) responding to the survey identifying the outbound bus lane as a "fair," "good," or "very good" proposal.*

Following the public consultation, BCC and the project team gave further consideration to the scheme design options. Options considered in relation to the outbound bus lane are presented in Table 2-4.

Table 2-4 Options considered in relation to the outbound bus lane, following public consultation

Option	Reasoning for discounting
Do nothing	To not implement the outbound bus lane could cause problems for bus reliability, journey times, and frequency in future years, exacerbating barriers to modal shift. By not implementing the bus lane the current situation of car dependency would persist and potentially increase as sustainable travel options along the route would not be the attractive method of travel. High car dependency would continue to attract issues such as congestion and poor air quality. To do nothing and allow the current situation to worsen would create problems for the city and the region as they strive to carbon neutrality, therefore, to do nothing should not be considered an acceptable option.
Segregated cycling facility	One option that had previously been considered was a fully segregated off carriageway cycling facility along the route. The decision was made to sift out the option for a segregated cycle lane based on the cost it would incur to install it for the length of the route, and the fact that it would not be possible to provide a continuous segregated cycle facility along the whole route. The option was considered to include a segregated cycle facility along longer sections of the route where the space was permitting to do so, however in adopting this measure disbenefit would be realised for buses as they become caught up in general traffic. Based on these reasons the inclusion of a segregated cycle lane is not considered to be an acceptable option.
Outbound bus lane	The other option being proposed is the implementation of an outbound bus lane, the core benefits of which have been set out in the paragraph above.

The full consultation report is provided in Appendix G.

2.9 Constraints

The following are constraints on the scheme:

- The proposed works are to be delivered within the Highway Boundary under permitted development and therefore, the highway boundary is a physical constraint as works will need to be contained within this area.
- The availability of funding is a constraint, if the CRSTS funding required to deliver this scheme is not available then this Scheme cannot be delivered.
- The A4 Portway is a main arterial road into and out of Bristol and there is a need to maintain running lanes during construction. Therefore, this is a constraint during the construction period and will need to be reflected in the construction programme.
- A requirement of the CRSTS funding is that the money needs to be spent by March 2027. Therefore, the scheme will need to be ready for opening by the end of March 2027.

2.10 Risks

The are 5 risks which have a high likelihood and are therefore designated as ‘top risks’. These consider:

- Uncertain future economic conditions leading to an increase in costs
- Future trends in travel behaviour
- Public support for the scheme
- Traffic delays along the corridor due to extensive traffic management
- Drainage surveys costing more than anticipated
- Drainage surveys showing that the drains along the Portway are in poor condition, causing more work and higher costs than anticipated
- Additional temporary traffic management needing to be installed

- Scheme cost estimate still in excess of funding envelope following the development of the FBC could result in the descoping of some elements of the scheme

These risks and their associated mitigations are provided in the Management Case in Table 6-3 and the full risk register is provided in Appendix H.

2.11 Dependencies

The following are scheme dependencies:

- There is a wider network of cycling infrastructure being delivered as part of the LCWIP. The shared footway and upgraded toucan crossing as part of this scheme will be dependent on delivery of the other cycle infrastructure within Bristol to connect to the wider cycling network and deliver behaviour change in Bristol.
- The Western Harbour regeneration project is part of the wider area identified in the local plan review for Growth and Regeneration within the city. The Western Harbour project area is at the western end of Bristol's Floating Harbour. It is located at the western end of Bristol's Floating Harbour and is adjacent to the A4 Portway as it becomes the A4 Hotwell Road. The Western Harbour project will seek to tackle the issues of aging infrastructure, housing and sustainability within the area. The proposals being put forward as part of the A4 Portway Corridor Project will compliment and contribute to the intended outcomes of the Western Harbour Project. The Western Harbour project is currently in the masterplanning stage and aims to have planning approvals in 2027.
- As part of the Avon Flood Strategy flood defences are being considered which will run adjacent to Cumberland Basin Road. The Avon Flood Strategy is currently going through the business case process and site investigations are taking place. The opportunity for collaborating the delivery of the Avon Flood Strategy and the A4 Portway Corridor project was considered, however this was not deemed possible due to project constraints.
- The City Centre Development and Delivery Plan is a guide for setting out long term visions for the future of the City centre, defining the key changes required in the coming years, encourage the co-ordination of the long term changes and define key principles that can guide development. The City Centre Development and Delivery Plan is focused on the Broadmead and Castle Park areas within the City Centre. Improvements made to bus journey times along the A4 Portway could enhance the intended outcomes of forthcoming improvements in Broadmead and Castle Park.
- Active Travel Schemes: As part of the Active Travel Fund Tranche four, localised walking and cycling improvement schemes are being developed, including one along Hotwell Road (from the Mardyke Pub) to Deanery Road (near College Green). At this stage this project has only secured funding for scheme development, further funding for delivery will need to be sourced. Details of the designs are yet to be confirmed for the scheme, but improvements made to the walking and cycling infrastructure on the A4 Portway Corridor scheme will enhance the outputs of the Active Travel Fund scheme.

This scheme is also dependent on the Portway Park and Ride bus access scheme to deliver modal shift to bus along the whole Portway corridor. Providing a new access for right turning in and left turning out buses as the Portway Park and Ride is likely to attract bus services to use the Portway and this scheme will help allow fast, efficient, and reliable services for those using the route. Therefore, this scheme is needed alongside the Portway Park and Ride bus access for behaviour change to public transport to be realised along the A4 Portway. The FBC for the Portway Park and Ride has been approved and the project is transitioning into the delivery stage in 2024.

2.12 Summary of Strategic Case

This section has outlined the Strategic Case for the A4 Portway Corridor scheme. The points below summarise the key issues and strategic reasons the scheme is needed:

- Currently, there is congestion on the A4 Portway which has an impact on bus journey times, therefore, this scheme will provide fast and reliable bus services to and from Bristol for current passengers and make the bus service more attractive to new passengers.

- Attracting new passengers to bus services along the A4 Portway will enable reduced reliance on cars as a mode of transport. This will help Bristol meet targets set out in Bristol Net Zero of a maximum of 20% of total journeys by car and a suggested 25% of journeys by public transport.
- Currently travel to work by bicycle is low for those living along the A4 Portway in comparison to other areas in Bristol of a similar distance, despite being in a commutable distance to Bristol by bicycle. The current environment is unattractive and there is an opportunity to provide safer and more attractive cycle network, linking to proposed wider schemes in the LCWIP to enable a cycle network promoting mode shift to active travel.
- Bristol has an AQMA which encapsulates the south-eastern part of the corridor and therefore, if nothing is done to provide attractive, viable forms of public transport and active travel along the A4 corridor into Bristol, those travelling into Bristol will have limited travel options and will have little choice but to continue to use private car, exacerbating the current air quality issues within the city centre.
- Improving the public transport network will help improve equity in the region by connecting the more deprived communities (Shirehampton and Sea Mills) to key amenities within the city and providing residents without access to a car with a safe affordable means of transport to access better healthcare, jobs, and education.
- The scheme is supported by many local, regional, and national policies and strategies. It meets many targets and objectives set out in policies and strategies both locally and regionally. Without this scheme it is unlikely that this corridor will be able to meet aims and objectives set out in these policies and strategies mentioned in Section 2.3 and Appendix E.
- This scheme also complements other schemes in the area including the Portway Park and Ride bus access.

To reiterate the strategic aim of the scheme (set out in Section 2.3) it is to:

'Deliver infrastructure changes to the A4 Portway that make public transport, cycling, and walking people's natural choice in mode of travel to enhance social, wellbeing, economic and environmental outcomes'.

In summary, as the strategic aim of this scheme is to prioritise public transport and improve the active travel offer, to enhance mode shift, improve air quality, reduce carbon emissions, and promote transport equity, the impact on private vehicle users will not be a prime consideration in the economic case of the scheme, aligning with the Spending Objective Analysis Statement (Section 3.5).

3 Economic Case

3.1 Introduction

This economic case section identifies the proposals that deliver the best public value to society, including wider social and environmental effects. The long list of options has been appraised in terms of how well they meet the spending objectives and critical success factors for the Scheme and the short list is examined in further detail to select the preferred option. The preferred option then undergoes an economic appraisal to determine the value for money.

3.2 Options Assessment

In order to determine the measures that need including within the longlist a minimum requirements assessment was undertaken. Those requirements with the highest priority are deemed “Must have,” the next level of priority is termed “Should have”, the third level of priority is “Could have” and the lowest level of priority is deemed to be “Would have”. This helped determine which must, should or could be included as part of the solution and therefore, the preferred way forward. WECA’s A4 Portway Strategic Corridor minimum requirements document is provided in Appendix I.

Following identification and circulation of potential longlist options by the Arcadis team, a ‘Collaborative Longlist Review Workshop’ was held and attended by over 20 internal BCC and National Highways stakeholders. During a successful and productive hybrid workshop session a longlist of options was identified through discussions of the problems and opportunities along the Portway. BCC also ran an early engagement period with residents and stakeholders that fed into the generation of a longlist of options.

Following comments and amendments from the workshop, 164 options were identified which were split into the six design areas along the corridor, as displayed in Figure 3-1.

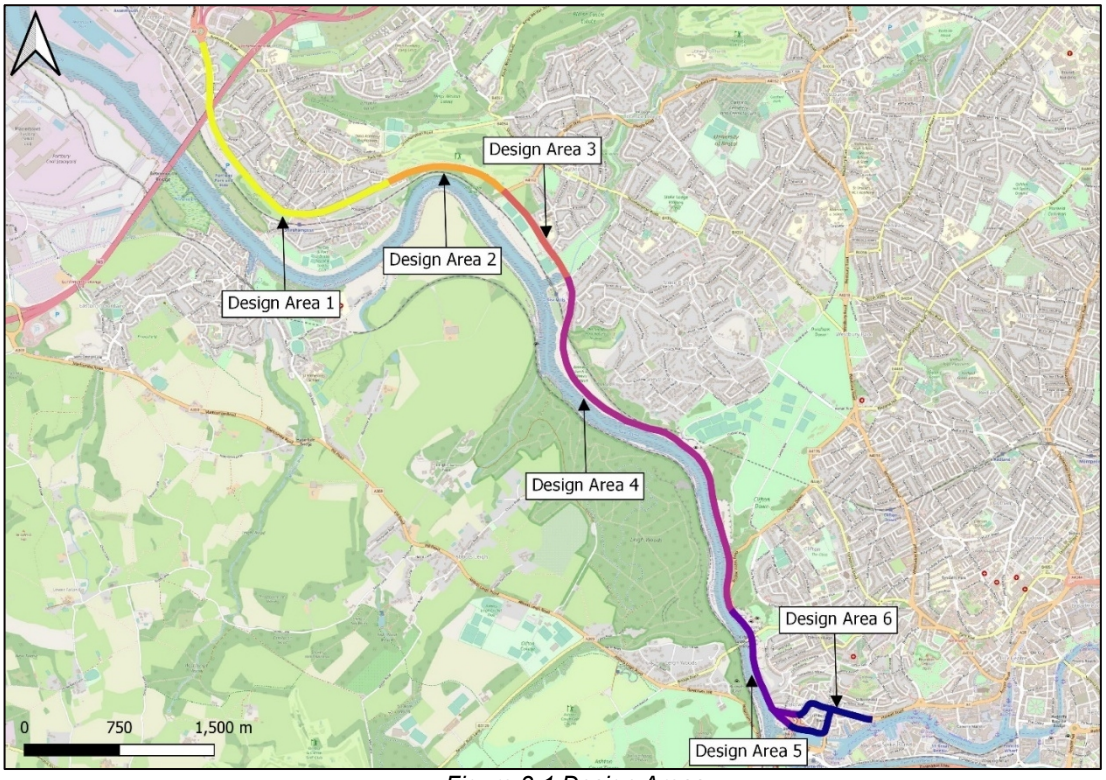


Figure 3-1 Design Areas

A sifting process (shown in Figure 3-2), which involved a multi-criteria assessment tool and a compatibility matrix and scoring of all options, was undertaken to determine the shortlisted options. Options were assessed by how well they aligned with the strategic objectives for the project and their deliverability. This formed the sifting criteria which helped to broadly assess the benefits that each option would accrue for different users of A4 Portway and Bristol city centre.

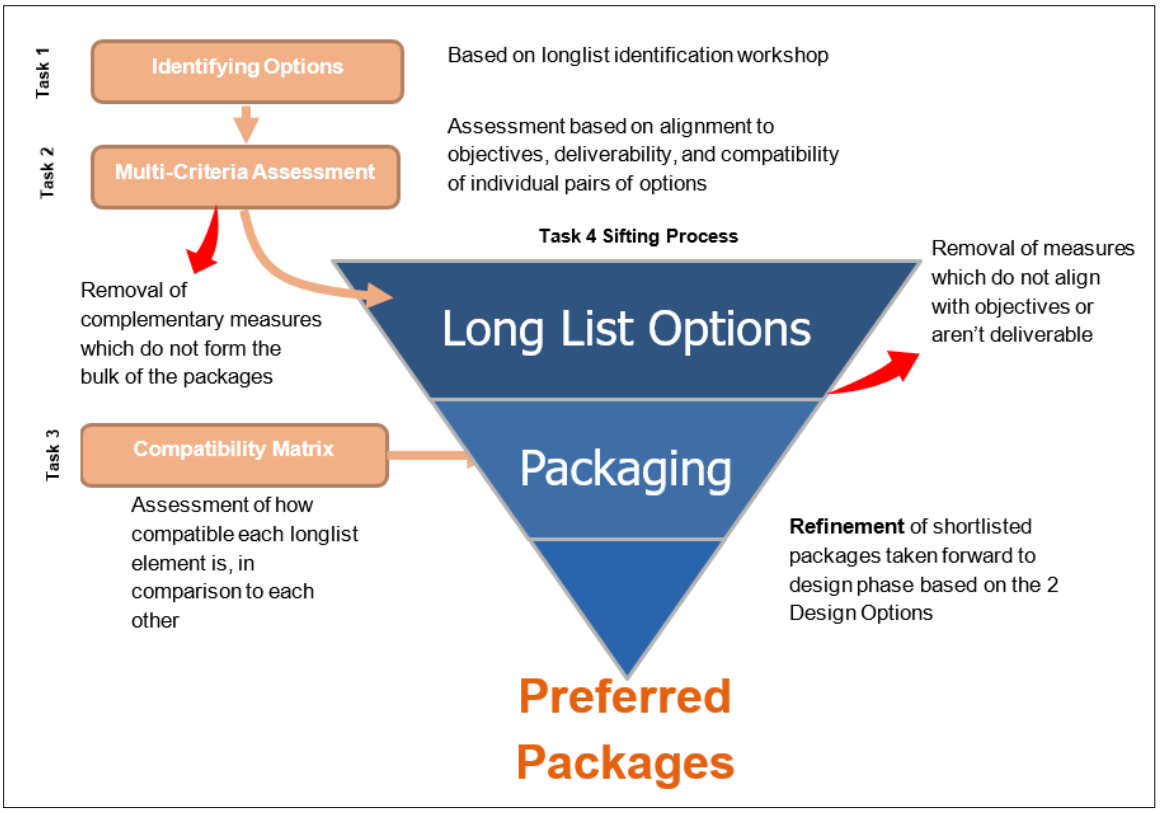


Figure 3-2 Sifting Process

The longlist of 164 measures was sifted by the project team focusing on the 'Objective' scoring to identify options that aligned most with the Scheme objectives. To score these objectives, they were split into qualitative metrics, based on a five-point scale scored from +2 to -2. The objectives and deliverability scores were weighted equally. If a longlist measure was considered to 'strongly conflict' with an objective or had a 'Showstopper risk' then it was removed from the longlist, as it was unsuitable for inclusion.

In total:

- 25 measures were removed from the longlist as they were considered unsuitable, due to conflict with objectives or not considered deliverable
- 77 measures were removed from the longlist as they were considered to be more 'complementary' rather than essential to achieving the objectives of the Scheme
- 46 measures remained in the shortlist

A compatibility matrix was developed to check for incompatibilities and inter-dependencies between the longlisted measures to identify improvement measures that can, could or could not be implemented together as part of the project. A copy of the compatibility matrix is shown in the OAR included in Appendix A and a screen shot of the compatibility matrix is provided below.

Design Area	Sifting framework reference	Compatibility ref.	Location	Description	1	2	3	4	5	6	7	8	9
Design Area 1	4	1	All bus lanes	Ensure the proposed bus lanes are 4.5m wide to accommodate cyclists		G	G	G	A	A	G	R	R
	1	2	Inbound from A4/B4054 Roundabout to DA1 eastern limit (west of Park Road)	Inbound bus lane	G		G	G	G	A	G	G	G
	8	3	Inbound from A4/B4054 Roundabout to DA1 eastern limit	Inbound bus lane to provide cycle facility	G	G		G	G	G	G	R	R
	5	4	Outbound from DA1 eastern limit (west of Park Road) to existing Bus	Outbound bus lane	G	G	G		G	G	G	G	G

Figure 3-3 Compatibility Matrix

A 'Red, Amber, Green, Must' (RAG+M) assessment was undertaken on all pairs of measures. This exercise was completed to identify any conflicting measures within a design area and across the whole corridor, and therefore identify which measures could be implemented together in a package to form a shortlist option or would introduce deliverability or benefit realisation risks.

Following sifting by the compatibility matrix, the shortlisted measures were identified and packaged into three options, Do Nothing, Do Something and Do Maximum. Packaging of the shortlisted measures was undertaken to create indicative Schemes across the corridor for further development. This is displayed in

Table 3-1. Further details of this process can be found in the OAR in Appendix A.

Table 3-1 Short list options

Packages	Description
Do Nothing	• Includes Portway Park and Ride Bus Access and other committed plans • Aim to improve the existing conditions e.g., signage, re-surfacing, maintenance
Do Something (Blend of scenarios)	• Additional public transport priority measures provision • Minor widening to facilitate a shared foot/cycle way • Minor junction improvements • New Portway Park and Ride access for buses

Do Maximum (Inbound and Outbound provision)	• All route control • Significant widening of the footway to accommodate a segregated two-way cycleway • New Portway Park and Ride access for buses

Within the short-list of options, the Do Nothing was discounted as it did not align with the project objectives. The Do Maximum was also discounted due to budget constraints, as indicative cost estimates exceeded the funding available for the project. As a result, the 'Do Something' scenario was identified as the most suitable and is the preferred option. It meets the scheme objectives in delivering a modal shift from private cars to public transport and active travel, reducing air pollution and maximising user benefit. The components of the preferred option are presented in Table 3-2.

The design areas consist of their individual delivery element shown in the table below with key focus points on elements such as public transport, active travel, and general design to optimise each design area which will enhance the A4 Portway as a whole. For further details, please refer to the OAR in Appendix A.

Table 3-2 Preferred Option

Design Area	Mode	Proposed Scheme Elements
Design Area 01	Public Transport	New inbound bus lane New outbound bus lane Removal of central hatching/central island and some on-street parking. Removal of right turn waiting at Barrow Hill Road.
	Active Travel	Upgrade outbound footway share use standard
Design Area 02	Public Transport	New inbound bus lane New outbound Bus Lane Increase the capacity at Sylvan Way creating a dedicated left turn and dedicated right turn lane.
	Active Travel	Upgrade shared use footway/cycleway informed by LTN 1/20 guidance
Design Area 03	Public Transport	New outbound bus lane New inbound bus lane
	Active Travel	Upgrade crossing facilities for cycling and walking Upgrade shared use footway/cycleway informed by LTN 1/20 guidance

Design Area	Mode	Proposed Scheme Elements
Design Area 04	Active Travel	Upgrade/improve existing islands for pedestrians and cycle crossing Upgrade existing shared footway/ cycle using LTN 1/20 guidance to encourage further use Reduce speed limit from 50mph to 40mph New trees
Design Area 05	Public Transport	Redesign existing arrangement to provide width for road space reallocation
	Active Travel	Upgrade existing shared use path to LTN 1/20 to encourage further use Reduce existing 40mph speed limit to 30 mph.
Design Area 06	Public Transport	Remove on-street parking to provide width for road space reallocation New inbound bus lane
	Active Travel	Provide a parallel crossing across Merchant's Road / Cumberland Basin

The preferred option details and plans are provided in Appendix J.

3.3 Appraisal Methodology

A proportionate approach to the economic appraisal has been undertaken, this has taken into account the scale of intervention alongside likely costs and benefits of the scheme in alignment with the Appraisal Specification Report (ASR).

The economic appraisal is split into five main areas:

- Impacts on highway traffic through the introduction of the bus priority infrastructure
- Bus journey time impacts through introduction of inbound and outbound bus lanes and priority infrastructure
- Mode shift benefits from an increase in bus patronage
- Bus journey quality improvement impacts
- Active travel benefits through the addition of high-quality pedestrian and cycle infrastructure along the A4 Portway

To calculate the above impacts for the economic appraisal, a Transport Analysis Guidance (TAG) compliant bespoke spreadsheet tool based on the Small Scheme Appraisal Toolkit (SSAT) has been used. The SSAT is considered an appropriate methodology as small bus infrastructure schemes are specifically referenced in the SSAT guidance.

The bespoke tool calculates the following type of benefits:

- Marginal External Costs (MEC)s from mode shift away from car to bus travel
- Journey time impacts for bus
- Journey time impacts on highway traffic

The Active Mode Appraisal Toolkit (AMAT) will be used to calculate impacts associated with additional walking and cycling infrastructure introduced as part of the scheme. Further details on the assessment undertaken are provided in section 3.4.

Marginal External Costs

The following monetised MECs savings were calculated through increased bus use and the resulting decrease in highway kilometres travelled:

- Congestion
- Air quality
- Greenhouse Gases
- Indirect tax

The change in person bus trips between the Do-Minimum and Do-Something in the opening year and horizon year is calculated. This number is converted to a change in the number of highway trips using a diversion factor and an average vehicle occupancy.

Journey Time Savings

The bespoke spreadsheet calculates bus and highway journey time impacts. The difference in travel time is calculated using the opening year and horizon year demand and time inputs. For bus users the annual journey time benefits are calculated using the rule of a half to account for new users. The benefits are monetised using the opening year and horizon year values of time weighted by journey purpose.

Assumptions

The following assumptions, in line with TAG, were made within the bespoke tool:

- Base Year - 2010
- Opening year - 2026[6]
- Appraisal period –60 years
- Discount rate - 3.5% for the first 30 years and then 3% after that
- Annualisation Factor – 253
- Journey purpose - split based on person trips from TAG Data Book v1.21, May 2023
- Values of Time - TAG Data Book v1.21, May 2023
- TAG External costs - TAG Data Book v1.21, May 2023
- Occupancy Rates - Occupancy per vehicle kilometre travelled TAG Data Book v1.21, May 2023
- Diversion Factors – Car 24%, Taxi 12% TAG Data Book v1.21, May 2023

The impacts have been quantified using the following toolkits:

- Bespoke version of the Small Scheme Appraisal Toolkit (SSAT)
- Active Mode Appraisal Toolkit (AMAT)

[6] It is to be noted that the opening year is 2026 as it is likely the construction work will be broken up into packages, with some of the work being completed in 2026 and some of the work being completed in 2027.

3.4 Demand Forecast and Economic Impacts Appraisal Approach

The modelling is split into the following areas:

Highway Modelling – A spreadsheet based model was developed to combine link characteristics and junction data, both input and output, from LinSig. The spreadsheet model includes basic inputs such as speed limit, link length and travel time. Changes made to these basic inputs aides in understanding the 'with scheme' impacts. The model assumes free flow conditions on links between the junctions and junction delays modelled in LinSig. The modelling does not take into account the impact of any mode shift away from private vehicles.

Bus Journey Time Modelling for the addition of Bus Lanes - To predict any bus journey savings the 'with scheme' average time was calculated with free flow conditions (between links) and a ratio of bus speed vs speed limit assumption.

DfT Bus Open Data[7] was used to analyse actual bus journey times. The BusTimes website[8] collates this Bus Open Data into services and has been used to obtain the Stagecoach 9 service from Shirehampton Park & Ride to Brislington Park & Ride during AM peak/Inter peak/ PM peak services over 3 weekdays. This data has been used to ascertain approximate differences in average journey times between peak hour and interpeak bus journey times.

Allowances have been made to account for additional boading and alighting times during the peak period vs the interpeak (5 seconds per bus stop). Reductions in bus vehicle speed has also been incorporated into modelling, however buses are not anticipated to tavel at inexcess of 40mph in the current sections of 50mph speed limits.

Changes in bus delay at junctions has been identified from the Linsig models. Any journey time improvements have been taken as the link time saving plus any delay saving at the junctions.

The modelled years are as follows:

- Opening Year - 2026
- Horizon Year - 2041

The time periods modelled are as follows:

- AM – 7:00 – 10:00
- IP – 10:00 – 15:30
- PM – 15:30 – 18:30

The three scenarios have been modelled as follows:

- **Core** – This will use current turning flow counts factored by single Bristol-related Tempro8 growth for each time period and for the Opening Year (2026) and Horizon Year (2041)
- **Low** – An 8% and 17.4% reduction of the current flow from the core scenario for 2026 and 2041 respectively, based on the methodology outlined in TAG Unit M4 Section 4.2.
- **High** – A 8% and 17.4% increase of the current flow from the core scenario for 2026 and 2041 respectively, based on the methodology outlined in TAG Unit M4 Section 4.2.

These scenarios were run through a series of Linsig junctions to obtain changes in journey time which have then been used in a bespoke spreadsheet model.

[7] DfT Bus Open Data (Bus Services Act 2017: bus open data - GOV.UK (www.gov.uk))
[8] Bus Times – www.bustimes.org Bus Times

Bus User Demand - Base level bus demand was calculated using patronage data received by First Bus and Travelwest. Each of the routes impacted by the scheme has had the relevant level of patronage estimated using assumptions to determine the number of passengers on the bus between the relevant stops. The data provided only included entrants to the bus for both the inbound and outbound services for 30-minute time slots during the day. This meant an assumption was required to determine existing levels of patronage on the bus i.e. those that had not left the bus before reaching the relevant stretch of bus route for the scheme. An assumption of 30% was used so 30% of those who entered the bus before the relevant bus stops are assumed to be still on the bus. Given that the scheme is located close to Bristol city centre, it seems reasonable that most passengers are likely to remain on the bus to access the city centre.

The patronage data received from September 2023 is classified as a neutral month and is therefore appropriate to be used as base data. The bus patronage used as part of the economic assessment was grown from the September 2023 numbers calculated. This is considered a reasonable assumption given the WECA strategy to return to pre-pandemic levels by 2025 and grow patronage by at least 24% from that level by 2030.

In addition, 510 passengers are expected to use the Stagecoach number 9 route due to changes at the Portway P&R outlined in the A4 Portway P&R FBC. This reflects the impact of proposed service enhancements to the Stagecoach number 9 service (extending to Avonmouth). This figure was extracted from this document and profiled over the AM/IP/PM periods using the patronage data previously outlined. This resulted in an additional:

- 156 AM trips
- 145 IP trips
- 168 PM trips

These were added to the Do Minimum and Do Something patronage previously calculated.
In order to forecast bus user demand in the Do Something scenario, a generalised journey time approach was developed using elasticities from *Bus fare and journey time elasticities and diversion factors for all modes, A rapid evidence assessment, RAND* and based on journey times provided from the modelling. This method provided the number of new bus passengers as a result of the scheme. No forecast growth has been applied to bus patronage, this is considered a conservative assumption and therefore appropriate for this assessment. Figure 3-4 outlines the bus demand used for each of the services whist Figure 3-5 outlines the RAND journey time elasticities.

Figure 3-4 Bus Demand

B9_Inbound						
2026	AM	PM		2041	AM	PM
DM	304	542		DM	304	542
DS	313	575		DS	313	579

B9_Outbound						
2026	AM	PM		2041	AM	PM
DM	656	292		DM	656	292
DS	773	349		DS	783	350

B13_Inbound						
2026	AM	PM		2041	AM	PM
DM	5	2		DM	5	2
DS	5	2		DS	5	2

B13_Outbound						
2026	AM	PM		2041	AM	PM
DM	6	12		DM	6	12
DS	6	14		DS	6	14

B505_Inbound						
2026	AM	PM		2041	AM	PM
DM	18	31		DM	18	31
DS	18	32		DS	18	32

B505_Outbound						
2026	AM	PM		2041	AM	PM
DM	24	8		DM	24	8
DS	24	9		DS	24	9

BRX8_Inbound						
2026	AM	PM		2041	AM	PM
DM	27	25		DM	27	25
DS	27	26		DS	27	26

BRX8_Outbound						
2026	AM	PM		2041	AM	PM
DM	11	67		DM	11	67
DS	11	68		DS	11	69

WX1_Inbound						
2026	AM	PM		2041	AM	PM
DM	146	426		DM	146	426
DS	146	434		DS	146	434

WX1_Outbound						
2026	AM	PM		2041	AM	PM
DM	208	161		DM	208	161
DS	209	166		DS	209	166

U2_Inbound						
2026	AM	PM		2041	AM	PM
DM	17	20		DM	17	20
DS	17	21		DS	17	21

U2_Outbound						
2026	AM	PM		2041	AM	PM
DM	53	49		DM	53	49
DS	53	50		DS	53	50

WX4_Inbound						
2026	AM	PM		2041	AM	PM
DM	105	90		DM	105	90
DS	106	93		DS	106	93

WX4_Outbound						
2026	AM	PM		2041	AM	PM
DM	184	271		DM	184	271
DS	184	276		DS	184	276

WX6_Inbound						
2026	AM	PM		2041	AM	PM
DM	39	21		DM	39	21
DS	39	22		DS	39	22

WX6_Outbound						
2026	AM	PM		2041	AM	PM
DM	34	120		DM	34	120
DS	34	122		DS	34	122

Figure 3-5 RAND Journey Time Elasticities

Journey Time Elasticites

Journey Type	GJT Bus Elasticity	Source
Commute	-1.15	RAND
Leisure	-1.05	RAND
Work	-0.7	(LEEDS PR

Active Travel

To calculate the benefits for active travel, the DfT's Active Mode Appraisal Toolkit (AMAT) was used over a 30-year appraisal.

Cyclists

The scheme includes the provision of a 'to-standard' off carriageway shared footway and cycleway. Therefore, this is likely to improve journey quality for cyclists and also increase the number of cyclists using the A4 Portway leading to further benefits such as health, absenteeism, and decongestion.

Counts undertaken on the A4 Portway at Hotwell Road near the Cumberland Basin in 2020 showed an average of 494 cyclists per day across the year. It is acknowledged, given the proximity of this site to Bristol City Centre, that this count may include cyclists that have not used the A4 Portway. Therefore, this has been compared against 2011 Census Travel to Work data which showed that from Shirehampton and Sea Mills there were 128 cyclists travelling to and

from work into Bristol City Centre. However, from a closer location to the city centre such as Hotwells, there are approximately 224 trips into the city centre for work by bicycle. Therefore, utilising the count data and Census 2011 data, half of the daily count cyclists at Hotwells can be attributed to using some sections of the upgraded A4 Portway. Therefore, a total of 247 cycle trips were assumed as the without scheme numbers.

To predict the uplift in cyclists with the scheme, the Sustrans Infrastructure Impact Tool was used, this showed a 68% uplift in base numbers for off-road segregated cycle tracks, and therefore, forecasted 419 with scheme cycle trips. This was compared to other comparative studies, such as the *Cycle City Ambition Evaluation 2013 – 2018* which showed three schemes within cities increased cycling volumes between 42% and 72% that were likely to be attributable to the investment. The 68% uplift used for this scheme falls within the ranges of those comparative studies. The DfT's Capital Uplift toolkit has also been used to provided evidence on the expected uplift, this was at the lower end of the range at 48% which is within the range of the previously mentioned comparative studies.

The current infrastructure within AMAT is assumed as 'no provision.' Whilst there is some existing on-carriageway advisory cycle lanes and existing shared use footway/cycleways, these are sub-standard, do not cover the whole A4 Portway and have critical fails on the Cycling Level of Service. The 'with scheme' infrastructure within AMAT is displayed as 'off road segregated cycling provision.' Furthermore, within AMAT it is assumed that cyclists will use 50% of the new infrastructure Portway for their journey.

Pedestrians

The 'to standard' off carriageway shared footway and cycleway will improve conditions for pedestrians as well as cyclists. This will increase the number of people walking and cycling on the Portway.

A pedestrian count was undertaken at Hotwells near the Jacob Wells Road Roundabout. As with the cyclist count, it is acknowledged that, due to the proximity to Bristol city centre this may overestimate the number of pedestrians using the Portway. The count undertaken on the 3rd and 5th October 2023, showed an average of 1,351 pedestrians using Hotwell Road between 7am and 7pm. To represent the number of pedestrians using the A4 Portway, the without-scheme count used half of the Hotwell Road count, as per the method to determine the cyclist counts. Therefore, the without scheme pedestrian trips are 676.

Improving pedestrian infrastructure, through additional crossings will increase the number of pedestrians. Comparative studies presented in *Making the Case for Investment in the Walking Environment* showed that pedestrian improvements within Nottingham and Exeter had between a 30% and 56% uplift in pedestrians. The improvements on the Portway are lower scale compared to these studies and therefore, a 30% uplift on the without scheme counts was considered to represent a conservative estimate.

Due to the improvements to the A4 Portway, it is assumed that there will be journey quality benefits for pedestrians, including improved pavement evenness and dropped kerbs. These have been included within AMAT.

3.5 Spending Objective Analysis Statement (SOAS)

The TAG spending objective analysis guidance, released in November 2023, provides a comprehensive framework for evaluating the results and impacts of various transportation projects. The guidance emphasises the importance of aligning project objectives with broader policy goals, such as reducing carbon emissions and promoting sustainable travel. It also emphasises the importance of promoting modal shift towards more sustainable modes of transportation, such as cycling, walking, and bus travel, and provides recommendations for

achieving this shift. Additionally, the guidance emphasises the importance of considering the environmental impacts of transportation projects, particularly in terms of air pollution and CO2 emissions, and provides strategies for mitigating these impacts.

Following this guidance, the scheme objectives of the A4 Portway have been outlined alongside an assessment of the likely scheme impact.

Objective 1: Improving the journey time, punctuality, and reliability of bus services along the Portway within 5 years post-opening by delivering total segregation and other bus priority measures while considering the strategic nature of this corridor for private vehicles.

Expected Result: The bus rapid transit scheme is expected to improve the journey time, punctuality, and reliability of bus services along the Portway within 5 years post-opening. By implementing total segregation and other bus priority measures, the scheme aims to enhance bus operations and reduce delays. However, it should be noted that these improvements may come at the expense of private vehicles, as the scheme may introduce disbenefits such as reduced road capacity and restricted access. The strategic nature of the corridor for private vehicles will be taken into consideration, but some level of disruption to private vehicle traffic is unavoidable in order to prioritise bus services.

Objective 2: Increase the proportion of trips along the A4 Portway made by bus, cycling, and walking in the decade post-opening.

Expected Result: The bus rapid transit scheme is expected to increase the proportion of trips along the A4 Portway made by bus, cycling, and walking. The improvements in journey time, punctuality, and reliability of bus services, coupled with the provision of dedicated cycling lanes and enhanced pedestrian infrastructure, will make sustainable modes of transportation more appealing. These additional trips would have a corresponding decrease in private car trips due to modal shift. This has not been estimated as part of the economic assessment.

Objective 3: Reduce levels of air pollution and CO2 emissions through interventions along the Portway to support Bristol's 2030 carbon-neutral target.

Expected Result: The interventions planned along the Portway as part of the bus rapid transit scheme will reduce levels of air pollution and CO2 emissions. The improved journey time, punctuality, and reliability of bus services will encourage modal shift from private vehicles to buses, resulting in reduced vehicle emissions. Additionally, the promotion of cycling and walking is expected to further reduce reliance on motor vehicles. The reduction in emissions may come at the expense of increased congestion and longer travel times for private vehicles due to the disbenefits associated with the scheme.

Objective 4: Enhance the streetscape, public spaces, and urban environment where possible by implementing improvements to the cycling and pedestrian environments to promote sustainable travel along the Portway upon project completion.

Expected Result: The bus rapid transit scheme will enhance the streetscape, public spaces, and urban environment along the Portway. The planned improvements to the cycling and pedestrian environments will create a more attractive and pleasant space for sustainable travel. These enhancements require localised adjustments to road layouts and the allocation of space previously used by private vehicles.

Overall conclusions: The spending objective analysis of the bus rapid transit scheme along the Portway highlights the expected impacts and trade-offs associated with the project. While the scheme will improve bus services, promote sustainable travel, reduce emissions, and enhance the urban environment, there may be disbenefits to private vehicles. These disbenefits are unavoidable and considered a necessary trade-off to achieve the desired objectives of the project.

Effective monitoring and ongoing evaluation will be crucial to ensure that the desired outcomes are being achieved and to make any necessary adjustments to optimise the overall benefits of the scheme.

3.6 Highways Impacts

The highways disbenefits associated with the bus rapid transit scheme along the Portway have been estimated to total £161m. It is worth noting that journey time delay estimates were derived using LINSIG, a junction modelling tool. While LINSIG is a commonly used and reliable tool, it focuses on analysing individual junctions rather than providing a comprehensive assessment of network-wide effects. This approach may result in an overestimation of the disbenefits associated with the scheme. It is essential to recognise this limitation and consider the broader impacts and strategic nature of the corridor when evaluating the overall economic position of the scheme. Conducting a thorough and fair assessment, which includes a strategic highway model like SATURN, would provide a more accurate representation of the scheme's economic viability and value for money. The WECA Strategic Transport Model would have provided a more accurate estimate of highways disbenefits, but this approach was not considered necessary by WECA Assurance team as part of our early engagement sessions.

Due to the limitations described above and information provided within the Spending Objective Analysis Statement, it has been decided not to include the highways disbenefits as a part of the economic appraisal or the value for money statement.

3.7 Bus Journey Quality

Benefits will also accrue from the addition of real time information and improved shelters at bus stops. Benefits have been calculated using the previously defined patronage numbers for the Stagecoach number 9 route inbound and outbound.

In combination with the Bus Soft Factors provided within the TAG Databook (M3.2.1) which indicates that introduction of this infrastructure saves 2.55 minutes in generalised journey time. This is composed of 1.08 minutes for new bus shelters and 1.47 for real time passenger information (RTPI).

A benefit has been calculated over a 20-year appraisal period of £2.37m (in 2010 prices and values). A 20-year appraisal period has been used to take into account the expected lifespan of the proposed infrastructure. This has been added to the overall scheme benefits and is provided within the AMCB as a journey quality impact.

3.8 Costs

The processes in DfT TAG guidance, (Units A1-1: Cost-benefit Analysis and A1-2: Scheme Costs) have been followed, in order to calculate a Present Value of Cost (PVC) for each option appraised.

In line with TAG guidance, the following steps have been undertaken:

- Scheme cost (2023 prices);
- An Optimism Bias of 23% based on recent TAG Guidance for a highway / transport scheme at this stage;
- Optimism bias adjusted cost converted to 2010 prices;
- Inflation has been included at 10.77%
- Discounted to 2010 prices;
- Multiplied by the indirect taxation factor of 1.19 to ensure costs are in comparable market prices.

Costs can be defined as the total amount of money spent on constructing and maintaining the scheme.

Costs are categorised as capital costs, site maintenance costs, and service costs:

- Capital costs are construction costs, land costs, preparation costs (planning and designing the scheme) and supervision costs during the scheme construction.
- Maintenance costs are the costs of maintaining the scheme.

	2024	2025	2026	2027	2028	2029	2030	**Total**
CAPEX in 2023 prices	7,588,199	7,588,199						**15,176,398**
OPEX in 2023 prices			-326,729	-326,729	-326,729	-326,729	-326,729	**1,633,643**
2010 prices, undiscounted	5,688,699	5,688,699	-244,941	-244,941	-244,941	-244,941	-244,941	**10,152,693**
PVC	**3,514,375**	**3,395,531**	**-141,259**	**-136,482**	**-131,867**	**-127,407**	**-123,099**	**6,249,792**

3.9 Economic Appraisal Summary

Economic impacts have been assessed for both Highways and Bus modes. The nature of the scheme in reducing highways capacity will always lead to disbenefits resulting from cumulative impacts to private car users. However, the nature of the scheme will lead to significant modal shift away from private cars which cannot be captured using the current methodological approach to benefits assessment, as set out in the Appraisal Specification Report. Modal shift benefits will be calculated and assessed as part of the Full Business Case stage.

As described above, highways impacts have not been included as part of the core assessment for the A4 Portway, more details on this can be found in Section 3.6. As such, the AMCB table does not include the highways disbenefits associated with the scheme.

Appendices have been provided outlining TEE, PA and AMBC tables for three scenarios, these being:

- Core
- High
- Low

An AMCB table is provided in Table 3-3, this outlines the PVB, PVC, NPV and BCR positions for all scenarios outlined above. The Core BCR position without the highways disbenefits is 2.56. whereas with the disbenefits this drops to below 1 due to the cumulative disbenefits experienced by private vehicle users. Economic Appraisal Tables are provided in Appendix K with the Appraisal Summary Table (AST) provided in Appendix L.

Table 3-3 AMCB table

Analysis of Monetised Costs and Benefits

	Core_Bus_Only	Low_Bus_Only	High_Bus_Only	
Noise	0.01	0.01	0.00	*(12)*
Local Air Quality	0.09	0.29	0.09	*(13)*
Greenhouse Gases	1.76	1.40	0.96	*(14)*
Journey Quality	2.37	2.37	2.37	*(15)*
AMAT	3.51	3.51	3.51	
Physical Activity	-	-	-	*(16)*
Accidents	0.04	0.07	0.00	*(17)*
Economic Efficiency: Consumer Users (Commuting)	3.25	2.86	3.73	*(1a)*
Economic Efficiency: Consumer Users (Other)	3.75	3.30	4.15	*(1b)*
Economic Efficiency: Business Users and Providers	0.26	0.23	0.30	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	0.94	0.73	0.52	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Economic Efficiency: VOC benefits for Total Users	0.00	0.00	0.00	
Present Value of Benefits (see notes) (PVB)	15.97	14.77	15.63	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	6.25	6.25	6.25	*(10)*
Present Value of Costs (see notes) (PVC)	6.25	6.25	6.25	*(PVC) = (10)*
OVERALL IMPACTS				
Net Present Value (NPV)	9.72	8.52	9.38	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	2.56	2.36	2.50	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

3.10 Sensitivity Testing

High and Low sensitivities have been provided in Table 3-3. This indicates the BCR drops for both, with 2.36 and 2.50 for the Low the High, respectively. This difference is mainly due to a decrease in Greenhouse Gas and indirect and taxation benefits resulting from the additional patronage in the High scenario. Overall, there is minimal variation in the BCR position due to the sensitivity testing undertaken. TEE and PA tables for the High and Low scenarios are included within the appendices.

3.11 Qualitative Impacts

Reliability

Reliability is defined as a variation in journey times that transport users are unable to predict. Hence, reliability is confined to random effects, arising from either variability in recurrent congestion at the same period each day or variability in non-recurrent congestion such as incidents. To maintain a proportionate assessment and given the level of modelling of bus journey time impacts at this stage the impacts are described qualitatively. Providing dedicated bus infrastructure and bus lanes will reduce the likelihood of incidences where buses are delayed in congestion or incidents from general highway traffic. Therefore, improving reliability for buses along the whole corridor in the outbound and inbound directions. A mode shift of cars to public transport or cycling and walking will reduce the car trips along the A4 Portway and therefore, reduce incidences with congestion and accidents. However, this has been balanced with the highway disbenefits to traffic as a result of the bus priority measures. Therefore, the overall impact is slight beneficial.

Other Impacts

According to the Urban Transport Group in The Case for Active Travel *'Active travel can play a major role in freeing up valuable space to be used for activities which people attach more value to. Where space has been reallocated cities have seen large benefits, with increased footfall, economic activity, and land values.'* Schemes that encourage a shift to active modes and public transport were found to have a positive impact on land values, creating benefits beyond the physical scheme. This scheme will create a better environment for those cycling and walking along the A4 Portway, therefore, it is likely to have a beneficial impact on land values for those properties bordering the A4 Portway in Shirehampton and Sea Mills.

Construction Impacts

There is a planned construction period of 17 months (November 2025 – March 2027). The construction will occur on multiple design areas concurrently. However, given the importance of the A4 Portway as an arterial route traffic flow will be maintained at all times. Therefore, there will be congestion along the length of the A4 Portway during the construction period and there may be re-routing onto other arterial routes into Bristol as a result of the construction. Given traffic flow is likely to be maintained there is unlikely to be any significant mandatory diversions for the construction period.

Social Impacts

Social impacts cover the human experience of the transport system and its impact on social factors, not considered as part of economic or environmental impacts. Each social impact is required to be assessed as part of the appraisal and an assessment entered into the AST. The social impacts have been assessed qualitatively where they have not been monetised through the economic appraisal:

- **Accidents** – Transport interventions may alter the risk of individuals being killed or injured as a result of accidents. This scheme has localised improvements to junctions, which include upgrading crossing facilities along the A4 Portway, this is likely to reduce accidents with pedestrians. Furthermore, upgrading the cycle and pedestrian shared-use facilities along the A4 Portway will provide further segregation from traffic reducing accidents between motor vehicles, pedestrians, and cyclists. By providing a scheme aimed at mode shift away from cars this scheme is also likely to reduce accidents between vehicles (this has been monetised through marginal external costs). Therefore, the overall impact of this scheme is **moderate beneficial**.
  In addition, quantitative impacts have been assessed using AMAT which resulted in a benefit of £0.27m.
- **Physical Activity** – Improvements to the cycling infrastructure along the A4 Portway in the form of a share-use path will encourage people to cycle more, this has been monetised within the economic appraisal through health and absenteeism benefits. Furthermore, improved crossing facilities will attract more people to walk along the A4 Portway, therefore, the overall impact is **moderate beneficial**.
  In addition, quantitative impacts have been assessed using AMAT which resulted in a benefit of £2.15m. This is composed of absenteeism and reduced risk of premature death.
- **Severance** – Community severance is defined as the separation of residents from facilities and services they use within their community caused by substantial changes in transport infrastructure or by changes in traffic flows. Whilst the scheme encourages the use of public transport and active travel, which is likely to reduce car trips, this is unlikely to have a significant impact on severance. The scheme involves upgrading and new crossing facilities for pedestrians which may help pedestrians travel easier between each side of the A4 Portway. This includes changing Hung Road from a two stage to one stage crossing so people can cross the road easier and adding a new crossing at Roman Way. Therefore, the overall impact will be **moderate beneficial**.
- **Security** - Transport interventions may affect the level of security for transport users. The assessment of these impacts should reflect both changes in security and the likely numbers of users affected. Improved active travel facilities along the A4 Portway are more likely to attract new users cycling and walking, this will help improve informal surveillance along the A4 Portway Corridor. The improved pedestrian and cyclist environment, along with upgraded bus stops is also likely to improve the perception of personal security along with improvements to lighting and visibility. Therefore, the overall impact is **slight beneficial.**
- **Journey Quality** - Journey quality is a measure of the real and perceived physical and social environment experienced while travelling. This includes factors such as public information provision, perceptions of safety (e.g., street lighting, CCTV cameras, segregated cycle paths away from traffic), provisions for accessibility, physical crowding on public transport services, and so on. For the A4 Portway Scheme, there will be improved public information and wayfinding and consequently the improved perception of safety for pedestrians and cyclists. There is also likely to be reduced traveler stress through more reliable and faster journey times by bus. Therefore, the overall impact is **slight beneficial**.
  In addition, quantitative impacts have been assessed using AMAT which resulted in a benefit of £2.43m.
- **Accessibility** – According to TAG A4.1, accessibility is a term that has a multitude of meanings within the transport profession ranging from the physical access onto a public transport vehicle, the ability to get to a given place (for example a hospital), to the accessibility of information about a particular public transport service. The scheme is likely to improve accessibility for those who travel by public transport as it will improve journey times and reliability for public transport users. Furthermore, there may be the option for further services to be added as a result of the increased demand on current bus services because the scheme. This is likely to improve accessibility for those travelling by bus along the A4 Portway Corridor. The overall impact is **moderate beneficial**.
- **Personal Affordability** – Personal affordability is unlikely to be significantly impacted by this scheme, therefore, the overall impact is **neutral**.
- **Option and non-use values** – TAG A4.1 indicates that Option and non-use values should be assessed if the scheme being appraised includes measures that will

substantially change the availability of transport services within the study area, therefore, this is not assessed as part of this scheme.

Distributional Impacts

Distributional impacts (DIs) consider the variance of transport intervention impacts across different social groups. The analysis of DIs is mandatory in the appraisal process and is a constituent of the AST. Both beneficial and /or adverse DIs of transport interventions need to be considered, along with the identification of social groups likely to be affected. A screening of each of the indicators has been carried out (Appendix M) and then if they have been carried forward a qualitative appraisal has been undertaken given the level of modelling data available. A summary of the distributional impacts is presented below:

- **Air Quality** – From an environmental threshold perspective, this scheme is unlikely to have any material changes in vehicle flow, speed, or Heavy Goods Vehicle (HGV) content or changes in the alignment of the corridor. The reduction in total vehicle flows, increase in public transport and sustainable modes is likely to lead to the overall impact of **slight beneficial**.
- **Noise** - From an environmental threshold perspective, this scheme is unlikely to have any material changes in vehicle flow, speed or HGV content or changes in the alignment of the corridor. The reduction in total vehicle flows, increase in public transport and sustainable modes is likely to lead to the overall impact of **slight beneficial**.
- **User Benefits** – There are positive travel time impacts for those currently travelling by bus along the A4 Portway. This may have positive impacts for those in the more deprived areas surrounding Shirehampton and Sea Mills especially for those households without access to a car. The overall impact is likely to be **slight beneficial**.
- **Accidents** – Due to the provision of better and safer cycling and walking infrastructure there is likely to be a reduction in accidents with cyclist and pedestrian casualties. Whilst the better infrastructure will attract more pedestrian and cyclists, related to casualties it is likely the safer environment will reduce accidents with vulnerable casualties. The overall impact is likely to be **slight beneficial**.
- **Security** – There are some small changes to public transport waiting facilities as a result of the scheme which may positively impact public transport users. There are also likely to be some improvements to the perception of security for vulnerable pedestrians and cyclists due to the improved infrastructure, as mentioned in the social impacts section. Therefore, the overall impact is **slight beneficial.**
- **Accessibility** – There are positive impacts to accessibility, including journey time improvements through bus priority measures, this will have a positive impact for those without access to a car, especially those living in the more deprived areas of Shirehampton and Sea Mills. Therefore, the overall impact is **slight beneficial**.
- **Severance** – Severance considers the introduction or removal of barriers to pedestrian movement or any changes in vehicle, flow speed or HGV content. As mentioned in the social impacts section, the scheme involves the upgrading of crossings which will also include the addition of tactile paving and other enhancement to help those with disabilities. This will also help those without access to a car to cross the A4 Portway easier, which is a busy and main route into Bristol, reducing the perception of severance of this road. Therefore, the overall impact is **slight beneficial**.
- **Affordability** – There are unlikely to be any changes to ticket prices or significant changes to fuel and non-fuel operating costs as a result of this scheme, therefore, this has been screened out.

Environmental Impacts

An environmental screening and high-level assessment of the relevant indicators has been undertaken in accordance with TAG Unit A3. An environmental constraints plan is presented in Appendix N. The following are a summary of the results of this assessment, further details can be found in Appendix K**.**

- Noise – There are nine Noise Important Areas (NIA) allocated for roads within the 500m study area, these include the following:
    - NIA 232 – within the northern part of the route;
    - NIA 303 – within the northern part of the route;
    - NIA 12781 – 470m east of the northern part of the route;
    - NIA 234 – within the northern part of the route;
    - NIA 235 – within the northern part of the route;
    - NIA 236 – within the central part of the route;
    - NIA 14831 – within the southern part of the route;
    - NIA 12778 – 265m to the west of the southern part of the route; and
    - NIA 277 – 130m south of the southern part of the route.
- Noise Important Areas within the study area along the route and will require special consideration and potential mitigation if the study highlights any increase in noise levels, even if negligible. Providing better public transport and active travel infrastructure is likely to make these modes of transport more attractive and therefore provide a mode shift from car to public transport/active travel infrastructure reducing noise levels. Whilst this has not been quantified it is likely to outweigh any negative impacts from any changes in congestion and speeds. The overall impact is likely to be **slight beneficial**.
- Air Quality - The operational phase of the proposed scheme has the potential to affect air quality due to:
    - Changes in vehicle emissions associated with changes in the composition of traffic on the local road network.
    - Changes in vehicle emissions associated with changes in speed of traffic on the local road network; and
    - Changes in road layout which may bring road traffic emission sources closer to, or further away from, sensitive receptors.

  These changes have the potential to result in both adverse and beneficial impacts on existing and future sensitive receptors. However, it is likely that mode shift to more sustainable modes will outweigh any potential adverse impacts, whilst this has not been quantified it is likely this Scheme will have a **slight beneficial** impact on air quality.
- Greenhouse Gases - Providing better public transport and active travel infrastructure is likely to make sustainable modes attractive and therefore promote a mode shift away from car reducing Greenhouse Gases. Whilst this has not been quantified it is likely to outweigh any negative impacts from any changes in congestion and speeds. The overall impact is likely to be **slight beneficial**.
- Landscape - Potential operational phase impacts on landscape character and visual amenity may arise from:
    - Materials and surfacing proposed such as new red coloured surfacing to the bus lanes as well as tactile paving at crossing points.
    - Street Furniture such as proposed bollards and any additional signage.
    - Introduction of features such as raised tables.
    - Introduction of new or change to existing lighting; and
    - Removal or reduction in grass verges and vegetation.

  The overall impact is **negligible - slight adverse**.
- Historic Environment - There is the potential for adverse impacts on the value of designated and non-designated historic buildings due to changes to their setting during construction and operation. There is the potential for adverse effects on the setting of designated historic landscapes during the construction and operation phases. There would be some potential for adverse impacts to the value of archaeological remains due to changes to their setting during construction and operation. There may be the potential for the development to uncover and/or disturb hitherto unknown archaeological features within the route of the proposed scheme. The impacts to cultural heritage can be mitigated, through the preparation of the following: a Cultural Heritage Baseline Assessment (CHBA); and a Construction Environmental Management Plan. The overall impact is **slight adverse**.
- Biodiversity – The impact of the Scheme is **Neutral to Large Adverse** (but these impacts will vary dependent upon detailed design and the design should be iterated to prevent impacts to designated areas and habitats adjacent to the roadway, particularly in the

vicinity of Avon Gorge. Further assessment required when design and construction details confirmed.

- Water Environment - The majority of the site is located within Flood Zone 1 (with some areas of FZ 2 and 3 at the north-western end of the A4 Portway, near Avonmouth, and to the south-east in the vicinity of Sea Mills). Surface water flood risk is considered 'very low risk'. So overall, a mostly low risk of flooding from rivers, bar the two areas mentioned above. Surface water risk may increase due to the nature of the proposed works, however mitigation for surface flooding including SUDS to improve drainage where necessary is proposed as part of the scheme. The overall impacts are **insignificant/slight adverse**.

3.12 Value for Money Statement

Overall, the Value for Money of the scheme is considered to be High due to the consistent BCR above 2 throughout the various sensitivity testing and a Core position of 2.56. This does not take into account the disbenefits which will be experienced by private vehicles users as a result of the scheme. Justification has been provided for not including private vehicle disbenefit due to the methodology overestimating the disbenefits by a significant proportion and the strategic rationale for the scheme. Private vehicle disbenefits will be monitored and mitigated to the extent that it is feasible.

The spending objective analysis also highlights the expected impacts of the bus rapid transit scheme along the Portway, including improvements to bus services, promotion of sustainable travel, reduced emissions, and enhanced urban environment. It acknowledges the unavoidable disbenefits to private vehicles, which may have been overestimated using junction models. Balancing the needs of different road users and prioritising the corridor's strategic nature are crucial for the scheme's success in contributing to Bristol's sustainable transportation goals.

Considering the Core BCR, plus the qualitative economic benefits, with the agreed scheme objectives and the nature of the CRSTS funding, we conclude that the scheme appraisal outweighs the highways disbenefits. The strategic rationale for the scheme supports this conclusion by helping WECA achieve published mode share targets and encouraging people to move away from private transport.

4 Financial Case

4.1 Introduction

This section presents the financial case of the A4 Portway Scheme. The purpose of the financial case is to demonstrate the affordability and funding of the preferred option, including the support of stakeholders and customers, as required.

4.2 Chief Financial Officer Signoff

Although BCC is responsible for the delivery of the proposed intervention, the Combined Authority is the promoting body of the Scheme and therefore the financial signoff will be required from the Combined Authority. BCC has the responsibility for delivery of the Scheme, therefore BCC's own S151 Chief Financial Officer will be consulted prior to the tendering, awarding, and spending the CRSTS funding for this project.

4.3 Scheme Cost

Capital and revenue requirements

The sunk cost occurred before the submission of the OBC is outlined below in Table 4-1.

Table 4-1 Sunk costs

Cost	Amount
BCC Project Management/Officer	(Information redacted)
Business case and Design	(Information redacted)
Survey Costs	(Information redacted)
Total Sunk Cost	£993,076.88

A breakdown of the costs that yet to occur (excluding sunk costs) is provided below in Table 4-2.

Table 4-2 Spend Forecasting of Scheme

Item	Cost
Direct Works	(Information redacted)
Stats, professional and local authority fees	(Information redacted)
Inflation	(Information redacted)
Optimism Bias (23%)	(Information redacted)
Total	**12,753,276**

A QCRA has been produced, this has been provided in Appendix O. Optimism bias approach has been used as it provides a higher overall figure and is therefore considered a conservative assumption.

The total estimated Scheme outturn cost is **£12,753,276**. The full cost breakdown is provided in Appendix P.

Revenue Support Costs

There will be a requirement for revenue support costs to fund ongoing maintenance of the highways assets delivered as part of this scheme post scheme completion. It is not possible to specify where funding will come from for the maintenance of the highway following scheme completion as funding may be sourced from multiple revenue streams, or streams that have not yet been identified.

The ownership and maintenance of the highways assets delivered as part of this scheme will be transferred to the BCC Highways Team as part of the final stage in the Quality Assurance process.

4.4 Spend Profile and Funding Source

The spend profile for the Scheme is presented in the Table 4-3. It is noted that this includes a nominal allowance for monitoring and evaluation.

The funding source for Scheme delivery is CRSTS. The Scheme opening is assumed to be 2026.

Table 4-3 Spend Profile

Cost Heading	2023/24	2024/25	2025/2026	2026/2027
CRSTS Funding	£54,545.50*	£545,454.50*	£3,285,450	£9,476,826

*Cost estimate of £600,000 included for the development of the FBC which has not been included in the outturn cost estimate of £12,753,276 for the scheme.

5 Commercial Case

5.1 Introduction

This section presents the commercial case for the A4 Portway Corridor Scheme. The purpose of the commercial case of the business case is to demonstrate that the preferred option will result in a viable procurement and a well-structured deal between the public sector and its service providers. The commercial case describes the proposed procurement approach, risk allocation and contract management processes.

5.2 Procurement

FBC Development:

The remaining work for the development of the Full Business Case stage of the project includes, Full Business Case drafting, modelling using WERTM, detailed design including any additional investigations, audits, and surveys required, and the TRO process.

Use of Bristol City Council's Strategic Partner will be required for the development of the Full Business Case, Strategic Modelling, and detailed design. The agreement between Bristol City Council and the Strategic Partner will be handled through a variation order, to ensure consistency between the team developing the Outline Business Case and Preliminary Designs.

There is a possibility that trial holes, geotechnical studies and other investigations will be required for the development of the detailed design. Where these requirements present themselves, Bristol City Council will seek to obtain internal resources to complete the work in the first instance. Where the skillset does not exist within Bristol City Council, the project will seek support from framework suppliers. Should the knowledge and skillset not exist amongst the framework suppliers, the project will look to secure support externally in line with the Bristol City Council procurement guidelines.

All TRO work will be completed by internal BCC teams.

Tender Process

A detailed design of the A4 Portway Scheme will inform the tender process. It is anticipated that BCC will procure the works contract via a tender involving the four suppliers on the council's 'Bristol Highways Asset Management and Associated Works Framework (HAMAWF) 2021-25'. Given this only runs until 2025, there will be another similar framework in place with various 'Lots' from which schemes can call off to deliver works on the highway that will come into place as soon as the current HAMAWF expires in 2025. Details on the new framework commencing in 2025 are limited at this moment in time.

Street lighting infrastructure and works will be procured through the framework for Street Lighting, the current contractor is Centregreat. The management of the contract and calling off the contract lies with the Bristol City Council Highways Electrical Asset Team, with support from the BCC Procurement Team.

Traffic signals assets will be procured through the Yunex, WoEITS traffic signals maintenance and installation contract. BCC will manage this procurement process internally, with support from their Procurement team. The current programme for procurement is as follows:

- Tender preparation: 4th February 2025 – 28th April 2025
- Tender issue: 26th May 2025
- Tender period: 27th May 2025 – 4th August 2025

- Tender return: 4th August 2025
- Tender risk allowance: 5th August 2025 – 25th August 2025

Approaching suppliers on the Bristol City Council frameworks in the first instance is the preferred option for securing delivery partners. Use of the framework suppliers can help to ensure that the project is obtaining services at a competitive rates. Bristol City Council procurement guidelines also recommend that projects should approach framework suppliers in the first instance. Alternative procurement avenue are also being considered, such as spot tendering, as a contingency plan should issues be encountered with the Bristol City Council framework.

Payment Mechanisms

Payments will be paid in line with existing agreements between the Combined Authority and BCC. This will include BCC invoicing the Combined Authority in regular increments, either monthly or at key milestones, up to and not exceeding the maximum total for the Scheme. Along with monitoring the cumulative totals of invoicing for the Scheme, the Combined Authority will monitor the invoicing against the detailed cost estimates for each element to ensure payments remain on track to avoid overspend. The Combined Authority will require evidence of invoices to release the funding to BCC.

Risk Management Strategy

BCC will adopt a similar approach to its previous highway construction schemes with regards to risk allocation. Within the tender process BCC will set out that all bids submitted will be for a 're-measure' contract with regards to risk. Essentially, this means that BCC accepts most of the risk, for example if the contractor comes across utilities that were not mapped out in the utility process, there will be a requirement for BCC Engineering Design to re-measure the works and cost of mitigating these utilities.

5.3 Operation and Financial Viability

There will be an ongoing maintenance cost to the traffic signal infrastructure that presents a cost that will need to be absorbed by the project.

There will be an ongoing maintenance cost to the assets that are delivered on the highway and later adopted by the BCC Highways Maintenance Business as Usual schedule.

5.4 Key Contractual Arrangements

Social Value Act

The Combined Authority and BCC note the importance of the Social Value Act and wishes to demonstrate its commitment to the principles of the Act and to achieving the top 10 priorities listed below:-

1. Promote the local economy through the use of local suppliers and the voluntary and community sector in order to creatine and sustain new local jobs and apprenticeships.
2. Contribute to carbon reduction targets and use resources wisely.
3. Conserve and enhance the environment, supporting biodiversity, minimising pollution and waste and making best use of the environmental opportunities of work undertaken by our suppliers.
4. Promote the personal and physical health and the mental and emotional well-being of people within Bristol and the rest of West of England.

5. Support schools and colleges e.g., through new work placement schemes, providing mentors or assisting in mock interviews.
6. Increase participation in the Children's 6. Commissioner Takeover Challenge, find details here: https://www.childrenscommissioner.gov.uk/takeover-challenge/
7. Provide training, workplace experience and/or employment opportunities for: • People with Disabilities, • People with Learning Difficulties, • Care Leavers, • Young People who are not in Education, Employment or Training, or Others who may find access to employment more challenging or who may be under-represented in the workforce e.g., ex-offenders.
8. Support schools through the provision of business support services.
9. Reduce health and social care inequalities across the Bristol area.
10. Achieving a service delivery model which uses, engages, or supports the local community and voluntary sector including ideas such as adopting a local voluntary organisation as the provider's 'charity of the year.'

During the construction of the Scheme, it has been agreed that the framework sourced contractors will:

- Continue to achieve priority one through its procurement framework - any commissions or purchases for this project will contribute to priority one, however these could not be easily quantified.
- Continue to achieve priority two through its day-to-day operations – meaning that activities under this project will contribute to this priority, however these could not be easily quantified.
- Continue to achieve priority three through its day-to-day operations - so activities under this project will contribute to priority three, however these could not be easily quantified.

The Supply, installation and maintenance of equipment and infrastructure for the control and management of traffic and related services (WoEITS2)

WoEITS2 has been used to provide the schedule of rates for the supply and installation of traffic signal infrastructure for this Scheme. Should this OBC and the consequent FBC be approved, the WoEITS2 will be used to procure the traffic signals infrastructure and arrange the services for their installation.

BSH/HGW/ Highways Asset Management and Associated Works Framework 2021-2025

The framework will be in place for four years with 12 lots as follows:

- Lot 1: Machine Laid Surfacing
- Lot 2: Surface Dressing and Micro Asphalts
- Lot 3: Slurry Seal and Preventative Treatments
- Lot 4: Road Markings and High Friction and Coloured Surfacing
- Lot 5: Highways and Associated Works up to £150,000
- Lot 6: Highways and Associated Works over £150,000
- Lot 7: Minor Bridge Repairs & Retaining Wall Works to Highway Structures, Value: < £150K
- Lot 8: Structural Maintenance Repairs and Reconstruction Works to Bridges & Highway Retaining Walls Structures, Works Value: > £150K
- Lot 9: Maintenance Painting Works Bridges and associated Highway Structures
- Lot 10: Structural Steel Repairs and Replacement Works to Highway Structures
- Lot 11: Geotechnical and Soil Investigation Works on or adjacent to the Highway
- Lot 12: Traffic Management

The works required to deliver the proposals presented in this business case will fall under Lot 6 of the contract as they are in excess of £150,000 meaning that the works will be subjected to a competitive tender process. When the post 2025 contract framework becomes available the threshold and Lot will be confirmed.

Street Lighting Contract

The services within this contract include the maintenance and installation of road lighting and illuminated traffic signs. The contract duration is four years between 2021 and 2025. The details of the Street Lighting contract following 2025 are not yet clear, but it is anticipated that there will be a framework, similar to the current contract, in place ready to commence when the current contract finishes.

6 Management Case

6.1 Introduction

This section presents the management case of the A4 Portway Corridor Scheme. The purpose of the management case of the business case is to demonstrate that robust arrangements are in place for the delivery, monitoring, and evaluation of the Scheme, including feedback into the organisation's strategic planning cycle.

6.2 Promoter and Delivery Arrangements

Bristol City Council is seeking funding for the delivery of this Scheme from the CRSTS fund. Bristol City Council has responsibility for the development of this OBC and has the responsibility to deliver the Scheme, which will include responsibilities for development of the designs, technical approvals, and cost estimates.

The Combined Authority is the promoting body and sponsoring organisation. It has responsibility to ensure that the funds allocated are managed effectively to ensure that the benefits of the scheme are realised.

6.3 Project Governance and Delivery

WECA CRSTS governance structure as outlined in the CRSTS SOBC is presented in Figure 6-1.

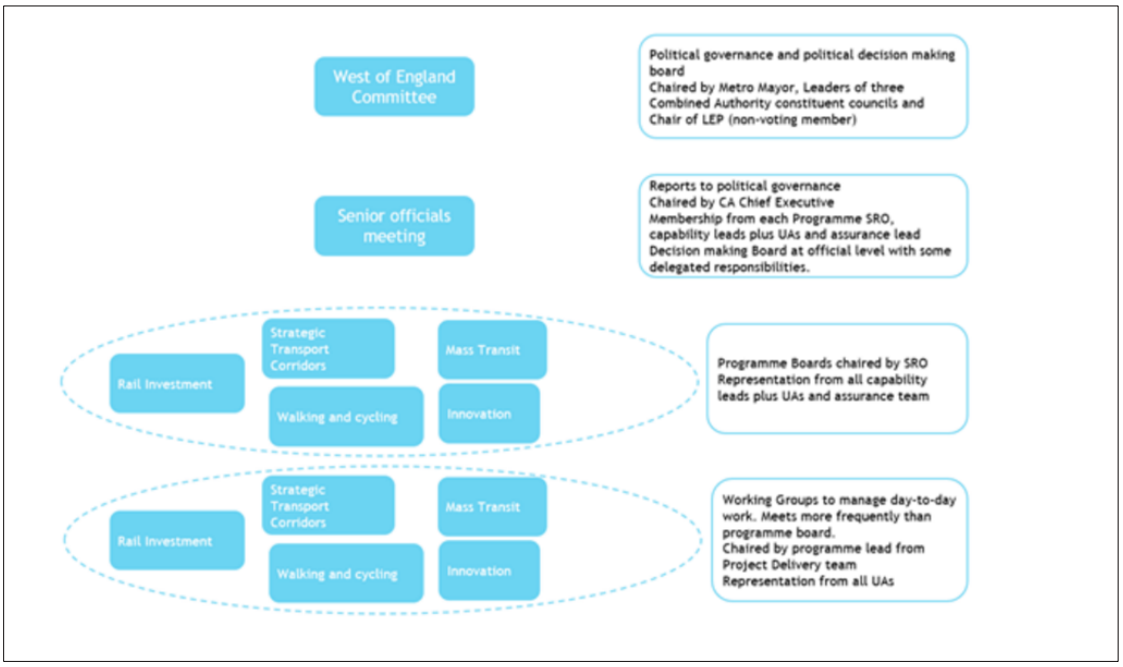


Figure 6-1 WECA Governance Structure

Governance

The governance approach to delivering the Scheme involves a multi-disciplinary team of representatives from BCC. BCC is responsible for the delivery of the Scheme itself, through a team of BCC Designers and their team of contractors. Senior Public Transport Officer and Project Manager Toby Clayton will be the BCC lead reporting to the Transport Strategy Manager and BCC Programme Manager Pete Woodhouse and the CRSTS Programme Manager (WECA).

The Combined Authority will provide the funding for the Scheme through CRSTS subject to a decision in its Joint Committee meeting, after the FBC is reviewed by the assurance team led by the Head of Grant Management & Assurance, Pete Davis.

Malcom Parsons, the Combined Authority's Head of Capital Delivery will be the SRO for this project. The CRSTS Programme Manager, reports into Malcolm and also leads the Strategic Corridor Programme Review Board, consisting of representatives from the Combined Authority and the other Unitary Authority's within the Combined Authority, including BCC Programme Manager Pete Woodhouse.

The BCC PM currently meets with the key supplier, Arcadis, with regards to progress of the development of the business case and design work on a weekly bases.This arrangement will continue into the development of the Full Business Case stage.

The project board currently meet on a weekly basis to discuss project progress and it is recommended that this continues when construction commences, revising frequency accordingly.

As the project progresses through the stages, any changes to scope, programme, cost, or risks etc will be captured by the BCC PM and escalated to the CRSTS Programme Manager and the Strategic Corridor Programme Review Board.

The project is subjected to a programme review meeting every two weeks with the funding body, WECA. The programme review meeting is attended by the CRSTS PMs, the WECA Programme Manager, and the WECA Infrastructure Director.

Other members of the BCC Project Team include resource from the following teams:

- Policy, Strategy, and Strategic Projects
- Traffic Signals
- Highways Electrical Asset Team
- Network Management
- Highways Maintenance
- Engagement and Active Travel
- Flood Risk Management
- Procurement
- Finance
- Legal
- Transport Development Management
- Public Transport
- Traffic Regulation Orders
- Ecology
- Landscape and Public Realm
- Engineering Design Consultancy
- Road Safety
- Road Safety – Walking and Cycling Infrastructure
- Tree Management

An organisation chart is included on the following page, Figure 6-2 (*Please note that Figure 6-2 has been redacted from this version due to containing sensitive information*).

Figure 6-2 Organisation Chart - Redacted

Delivery

BCC has a proven track record of delivering major transport infrastructure alongside considerable experience in:

- Delivering major transport schemes
- Successfully obtaining consents for major infrastructure schemes
- Developing and maintaining good working relationship with key partners and stakeholders
- Internal resourcing and governance requirements for major schemes

A few examples of BCC's successes in delivery transport infrastructure schemes are outlined in Table 6-1.

Table 6-1 Successful schemes delivered by BCC

Scheme	Summary
Ashton Vale to Temple Meads (AVTM) MetroBus	BCC assisted in the delivery of the metrobus project, which delivered three rapid bus transit routes in the West of England region. £250 million was allocated to the region's authorities, including BCC, SGC and North Somerset Council to deliver the scheme. AVTM is the route of the m2, connecting people in the southwest of the city, and North Somerset with employment centres and transport interchanges in the city centre. AVTM is unique in comparison to the other metrobus routes (m1 and m3), as the route required the installation of bus only roads and bus guideways (under the Transport and Works Act 1992).
North Fringe to Hengrove Park (NFHP) MetroBus	NFHP is also part of the metrobus project, the route of the m1 runs from Cribbs Causeway in South Gloucestershire to Hengrove Park in Bristol, via the City Centre. BCC helped to deliver the project including the installation of metrobus standard stops, bus only roads, and bus lanes. NFHP has been successful in connecting people in residential areas such as Hengrove with employment centres to the North of the city.
Bus Shelter Replacement Project (SRP)	Bus Shelter Replacement Project (SRP) – The overall objectives for the Bus Shelter Replacement Project were: (i) To provide and install circa 300 high quality replacement bus shelters for all current life-expired bus shelters in the City and to upgrade each stop platform simultaneously to the current accessible standard (raised kerb platform, safe haven paving). (ii) To improve public transport facilities in order to provide a more viable and accessible alternative to the private car. The project has delivered upgrades to 220 shelter sites within the BCC area utilising a contract with the shelter supplier Clear Channel UK ltd. Some sites were left out (approximately 40 sites) due to developer contributions ear marked to pay to upgrade those sites in the future and thus save the funding pot (prudential borrowing facility). Other sites where services no longer served the stops were also not upgraded. The project will conclude at the end of FY 20/21.

6.4 Programme Plan

The key project milestones are shown in Table 6-2. A full programme will be submitted alongside the Outline Business Case.

Table 6-2 Key project milestones

Milestones	Timeline
Submission of OBC to the Combined Authority	May 2024
BCC Cabinet or delegated approval	March 2024
Detailed Design	October 2024
Submission of the FBC to the Combined Authority	January 2025
Tender instruction	April 2025
BCC Cabinet or delegated approval for FBC sign off	January 2025
Expected funding decision	March 2025
Tender awarded	August 2025
Contractor mobilisation finish	November 2025
Construction completion	March 2027

6.5 Risks, Constraints and Dependencies

Risks

The project risk register has identified the main risks, mitigation measures and owners. The risk register was reviewed by BCC's design and costing teams. The management strategy will enforce a systematic approach to responding to the various risks during the project lifecycle and will continuously look to avoid, mitigate, transfer, or accept risks. In many cases, additional technical work or surveys, or early discussions with partners, will reduce or mitigate risks.

Risk control measures, such as preventive, corrective, directive or detective measures will be in place to treat risks. Delivery and contractor teams will be responsible for managing their risks and reporting any newly identified risks to the PM.

Risks escalated to Medium or High which could impact on the progress or financial position of the project will be referred by the BCC PM to the Combined Authority PM. The top risks are presented in Table 6-3 and a full breakdown of the risk register is presented in Appendix H.

Table 6-3 Top Risks

Description	Mitigation	Likelihood	Open/Closed
Uncertain future economic conditions may result in an increase to the cost of, labour, raw materials, and supplies. Uncertain market conditions may dictate the demand for materials, labour, and supplies which could result in long lead-in times, programme delays, and rising project costs	Through the tender process, ensure that all parties that have submitted a bid are able to resource and supply the work in the given timescales. RPI increase to be accounted for within the economic and financial cases of the business case, contingency derived from a QRA to be placed on construction costs. Inflation to be included within the business case.	High	Open
Multiple sites and extensive traffic management on the corridor during the construction phase could cause delay to traffic and temporarily reduce the resilience of the network. Resulting in poor provision for all users of the corridor. Unplanned amending and moving TM mid-construction could cause delay to the overall construction completion	it is accepted that there will be delay and a reduced resilience of the network / route during the construction period. Early engagement with network management team will take place to ensure that all TM and phasing is appropriate and allows traffic to continue to flow. phasing designs to be produced alongside the detail designs before going out to procurement. Working hours can be accounted for to minimise the impact on the network.	High	Open
Drainage surveys show that the drains along the Portway are in poor condition resulting in additional detailed design work, and an increase in scope of construction activities. This could have a large financial impact, and an impact on the scope.	BCC to commission a drainage survey to inform the detailed design. Contingency value added for drainage works during the construction in the QRA whilst the potential impact of this risk is still relatively unknown	High	Open
The cost of the drainage survey is more than budgeted for, which could result in the need to draw down more CRSTS funding to complete the survey, reducing the amount of funding available for construction	Early engagement with drainage survey suppliers to understand the cost of drainage survey for the corridor. Engagement with the Highway Maintenance team, flood team, and procurement team to understand and determine the appropriate procurement route	High	Open

Description	Mitigation	Likelihood	Open/Closed
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 TM	Traffic Management plans will be produced as part of the detailed design leading into the construction package. Phasing diagrams may also be required to break the work down into packages. These will be developed with the design team. Early engagement with the BCC Network Management team over the TM plans to ensure that impact on the network is minimised	High	Open
Outturn costs are not able to be reduced during the detailed design stage of the project, meaning that CRSTS funding is exceeded and other funding streams are required.	Cost refinement during the detailed design and further survey work. If the cost estimate cannot be reduced naturally then project team will consider descoping some elements of the scheme while maintaining project objectives, before construction starts. Project team will continue to try and identify other funding streams	High	Open
Extensive utility infrastructure could result in large amounts of detailed design work to be completed to run diversions resulting in programme delays and cost increases	It is accepted that there will be requirements for some utility works given the size of the project. Uncertainties around the utilities and the risks are to be reduced through C2,C3,C4 and C5 searches to provide certainty to designs and cost. Risk to be built into the cost estimate to cover utility diversions - contingency for utility works to be reduced with the level of detailed design work	High	Open

Constraints and Dependencies

There are several dependencies and constraints that need to be acknowledged in the delivery of the proposed intervention (the key ones are set out in the strategic case). These are as follows:

- BCC cabinet or delegated approval of the Scheme is required (i.e., any schemes with a construction cost in excess of £500,000 is a key decision that needs cabinet approval).
- The completion of the Scheme by March 2027 (CRSTS funding deadline)
- The proposed works are to be delivered within the Highway Boundary.
- Operation of the A4 Portway is to be maintained during the construction period.
- Portway Park and Ride Bus Access and walking and cycling schemes delivered as part of the LCWIP are scheme dependences.

6.6 Land Acquisition, Planning and Other Consents

As changes are within the Highway boundary and/or BCC owned land so no land acquisition is required. TROs will be required and the process to define these is ongoing and will be developed in advance of the FBC.

6.7 Project Assurance

The project board will provide project assurance for the whole project. The project will be subject to BCC's own internal audit processes as well as the Combined Authority's audit processes in accordance with the funding requirements. Regular reviews of the risk register will be undertaken, and lessons learnt sessions are held from other similar projects and the information from these is disseminated to the project team.

Before being signed off by the BCC Cabinet and WECA Committee, the OBC will have been reviewed and approved by the Transport Management Team, Growth and Regeneration Executive Directors, Cabinet Member for Transport, as well as professional services teams including Finance, Legal and Procurement.

Agreements in principle will be made between BCC and the delivery partner for the FBC and Detailed Design stage prior the the Cabinet and Committee meetings, so that once approvals have been granted on the OBC work on the FBC can commence soon after. Activities and processes required to complete the FBC are set out in the detailed project plan accompanying this business case, please see Appendix Q.

Risk has been built into the programme following gateway decision points on the OBC and FBC.

Active Travel England have been sent the concept designs for consideration however their feedback has not yet been received. Due to programme constraints there is a requirement to continue with the development of the project.

Further consultation will take place prior to the submission of the FBC. Following the confirmation of the preliminary designs and arrangement of the scheme, traffic regulation orders will be drafted for the scheme. Once the orders have been drafted they will be advertised for a three week period, where by stakeholders and residents can comment on the scheme. Stakeholders will be inclusive of community groups, emergency services, politicians and operators.

Resourcing and governance

A BCC Officer will be appointed to carry out the reports, with potential consultant support. Pre-scheme data should be collected once Full Scheme Approval has been granted. BCC will provide the contact details of the nominated officer once the project has received funding approval. BCC will be responsible for risk management and quality assurance.

Dissemination

Report will be shared with stakeholders and decision-makers via email, meetings, and briefings.

6.8 Benefit Realisation

The anticipated benefits of the Scheme, as set out in the Economic Case are:

- Decongestion benefits
- Bus journey time improvements
- Journey quality benefits for pedestrians
- Increased bus patronage

To ensure the benefits have been realised a post Scheme opening monitoring and evaluation will be carried out. This evaluation will allow the identification of the extent to which the Scheme objectives have been met. Once infrastructure is delivered along a corridor WECA will negotiate with the operators to deliver the services set out in the network plan and add them to the Enhanced Partnership as a formal arrangement

The monitoring and evaluation will assess the Scheme impacts on, but not limited to:

- Public transport patronage (bus)
- Bus journey times
- Pedestrian and cycle usage
- Traffic on the A4 Portway

6.9 Monitoring and Evaluation Arrangements

- The monitoring and evaluation plan is informed by the benefits from the Economic Case. The aim of the project monitoring and evaluation is to capture, analyse and present data evidencing the impact. The monitoring and evaluation plan is presented in

Table 6-4.

As part of the programme of monitoring, data will be collected (before and after Scheme construction), to assess how the impacts of the Scheme are progressing in relation to predictions. This data will be analysed to better understand the consequences and causality of the Scheme measures.

Delivery Plan

Three reports are proposed:

- Baseline report (due 2024/25): This report will present data recorded before the Scheme is opened to the public.
- 'One year after' report (due 2027): This report will be completed approximately 1 year after the Scheme is opened.
- Final report (due 2030): This report will be completed approximately 3 years after the Scheme is opened. It will build upon the "One Year After" report.

Table 6-4 Monitoring and Evaluation Plan

Item	Measurement	Data Collection Report	Frequency	Data source
Outturn costs	Monetary	1 year after 3 years after	Annual	BCC
Number of bus services using the A4 Portway Corridor	Number of bus services using the A4 Portway Corridor Patronage on associated bus services	1 year after 3 years after	Annual	BCC/ Bus operators

Item	Measurement	Data Collection Report	Frequency	Data source
Improved journey time by bus for users	Realtime information for bus services Passenger surveys	1 year after	Quarterly	Bus operators
Increase bus patronage on services using the A4 Portway	Bus patronage data Passenger Surveys	1 year after 3 years after	Quarterly	Bus operators
Increase pedestrian and cyclist numbers on the A4 Portway	Pedestrian and cyclist counts	3 years after	Annual	BCC
Reduction in traffic on the A4 Portway	Traffic counts	1 year after 3 years after	Quarterly	BCC

The monitoring and evaluation plan will also consider carbon impacts from construction, impact on traffic, bus, and active mode users during construction, traffic displacement onto alternative routes during operation, and air quality impacts during operation. Details on the monitoring of these items will be explored in the FBC stage.

6.10 Contingency Plans

The chosen contractor will have been subjected to a competitive tender process whereby their application to complete the works would have been assessed by BCC. As part of the assessment the contractor's capacity to complete the works will be examined, including resources, supplies, and materials.

If for any reason the contractor chosen to complete the work through the tender process is no longer able to fulfil the requirement of the contract within the 90-day period where quotes from the other tender applicants are still valid, the second placed tender applicant will be offered the works. If the tender winner is unable to fulfil the requirements of the contract outside of the period where other tender applications are valid, then the works may be subject to re-tendering.

As an NEC4 contract, the Bristol Highways Asset Management and Associated Works Framework 2021-25 (HAAWF) allows BCC to ask contractors to include a performance bond within the tender submissions. A performance bond is a way of ensuring a contractor's performance and the guarantor would take on the responsibility of payment to the client (BCC) should the contractor breach the contract. Typically, would cost the project between 1 – 3% of the construction value.

Appendix

- **Appendix A Options Assessment Report (Cabinet Report Appendix_A1.1)**
- **Appendix B A4 Portway Strategic Corridor - Problems, Issues and Opportunities Statement**
- **Appendix C Early Engagement Report (Cabinet Report Appendix B1 and B2)**
- **Appendix D Existing Bus Services along the Portway (Cabinet Report Appendix_A1.2)**
- **Appendix E Alignment to Local, Regional and National Policy (Cabinet Report Appendix_A1.3)**
- **Appendix F Equality and Diversity Impact Assessment (Cabinet Report Appendix_E1)**
- **Appendix G Detailed Consultation Report (Cabinet Report Appendix B1 and B2)**
- **Appendix H Risk Register (Cabinet Report Appendix_D1)**
- **Appendix I A4 Portway's minimum requirements (Cabinet Report Appendix_A1.4)**
- **Appendix J Preferred Options Plans (Cabinet Report Appendix_A1.5)**
- **Appendix K Economic Appraisal Tables, SSATs and AMATs (Cabinet Report Appendix_A11.1 to A11.3)**
- **Appendix L Appraisal Summary Table (Cabinet Report Appendix_A1.8)**
- **Appendix M Distributional Impact Screening Proforma (Cabinet Report Appendix_A10.0.0)**
- **Appendix N Environmental Constraints Plan, Memo, and TAG Worksheets (Cabinet Report Appendix_A10.1 to A10.3)**
- **Appendix O QCRA (Cabinet Report Appendix_A1.6)**
- **Appendix P Cost Breakdown** (*Please note that this appendix has been redacted due to it containing sensitive information and the summary of this appendix already being included in the report*)
- **Appendix Q Project Programme (Cabinet Report Appendix_A1.12)**

Please note: Due to the size of the appendices it was not possible to include them within this document, please see appendices in separate locations using references above.

Appendix A Options Assessment Report

Appendix B A4 Portway Strategic Corridor - Problems, Issues and Opportunities Statement

Appendix C Early Engagement Report

Appendix D Existing Bus Services along the Portway

Appendix E Alignment to Local, Regional and National Policy Cost Breakdown

Appendix F Equality and Diversity Impact Assessment

Appendix G Detailed Consultation Report Detailed Consultation Report

Appendix H Risk Register

Appendix I A4 Portway's minimum requirements Equality and Diversity Impact Assessment

Appendix J Preferred Options Plans

Appendix K Economic Appraisal Tables, SSATs and AMAT outputs

Appendix L Appraisal Summary Table

Appendix M Distributional Impact Screening Proforma

Appendix N Environmental Constraints Plan, Memo and TAG Worksheets

Appendix O QCRA

Appendix P Cost Breakdown

Appendix Q Project Programme

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