

NORTH SOMERSET COUNCIL DECISION



DECISION OF: THE EXECUTIVE MEMBER FOR HIGHWAYS AND TRANSPORT

WITH ADVICE FROM: DIRECTOR OF ENVIRONMENT, ASSETS AND TRANSPORT SERVICES

DECISION NO: 24/25 EAT 15

SUBJECT: BUS SERVICE IMPROVEMENT PLAN (BSIP) INFRASTRUCTURE SCHEME FOR QUEENSWAY JUNCTIONS AND THE B3440 SLIP ROADS

KEY DECISION: YES

REASON: The decision will result in the council incurring expenditure of over £500,000 and will be significant in terms of its effects on communities living or working in an area comprising two or more wards.

BACKGROUND:

Introduction

The Bus Service Improvement Plan (BSIP) is a joint initiative between North Somerset Council (NSC), the West of England Combined Authority (WECA), the Department for Transport (DfT) and bus operators.

Our communities tell us they want more reliable, frequent and affordable bus services. That's what we're working hard to deliver through our infrastructure schemes – improving junctions to offer better flow for all traffic, resulting in quicker, more reliable, bus services, that get people where they need to be more efficiently.

We want North Somerset communities to have a modern, efficient, reliable, and affordable public transport system they can enjoy for years to come. The BSIP is working to achieve this goal by delivering packages of joined-up improvements, from more frequent bus services to more affordable fares, which work alongside our new bus service and sustainable travel infrastructure schemes, to benefit residents and communities.

Together, these changes will help make bus travel the first public transport choice, and more financially sustainable longer-term, helping to protect our vital services for the future.

Current UK Government funding for improving bus services through the Bus Service Improvement Plan is available only for a short time. But its long-term legacy will be more reliable, efficient and frequent bus services, new electric buses which are better for the environment, and more financially secure bus services, fit for our growing population, now and in the future.

Our infrastructure schemes are designed to enhance and protect residents' bus services, and promote more sustainable travel for years to come, by:

- introducing dedicated bus lanes and intelligent traffic signals to give bus users priority in key areas, and at peak times. These changes help make bus services quicker, more reliable, and more affordable for residents – and more financially viable for bus operators to keep running, requiring lower or no public subsidy
- incorporating better crossings and pavements for pedestrians, cyclists and others using lower-carbon forms of transport. This will improve the travel experience, encouraging more people to walk, wheel and cycle wherever possible, and making it easier to get to bus stops in some locations
- creating attractive new transport hubs in communities, offering a range of facilities such as secure cycle parking, real-time information displays and electric charging points, and bringing a place-making boost to town and village centres
- and replacing or improving existing stops and shelters on priority routes – making the experience of waiting for, and making, travel connections better for residents.

Our current targets across the West of England area are summarised in the following table:

Category	Target	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Target by 2025
Bus journey times	Reduce average bus journey times (minutes) on designated corridors by 2% by 2025 and by 10% by 2030	61	*63	No data	55	56	61	62
Bus punctuality	Achieve 95% of services running on time, defined as being no more than 1 minute early or 5 minutes late, by 2030. Target for 2024/25 is 82%	*77%	N/A	74%	71%	67%	72%	82%
Passenger growth	Return to pre-pandemic patronage levels by 2025 and grow patronage by at least 24% from that level by 2030	-	*70.2m	22.5m	46.8m	55.3m	63.7m	70m
Bus Passenger satisfaction	Increase bus passenger satisfaction to 89% for 2025 and 95% for 2030	85%	*86%	No data	No data	78%	79%	89%
Bus fleet de-carbonisation	By the end of 2023 all buses operating in the BSIP area will meet the Euro VI emission standard	No data	No data	48.2%	88.6%	96%	98%	100%
Bus fleet de-carbonisation	By 2030, at least 75% of the local fleet will be either zero-emission or ultra-low emission and by 2035 all buses will be zero-emission buses (ZEBs).	No data	No data	0%	0%	3.6%	6.6%	N/A

These targets will be monitored using the following methodology:

Level	Pre-monitoring	During works	Post monitoring
Scheme monitoring	<ul style="list-style-type: none"> • Bus journey times • Bus patronage • General traffic speeds • General journey time 	<ul style="list-style-type: none"> • Keep log of issues raised • Monitor alternative routes 	<ul style="list-style-type: none"> • Bus journey times • Bus patronage • General traffic speeds • General journey time
Corridor monitoring	<ul style="list-style-type: none"> • Bus journey times • Bus reliability • Bus patronage • General traffic speeds • General journey times 	<ul style="list-style-type: none"> • Monitor bus journey times during works on corridor 	<ul style="list-style-type: none"> • Bus journey times • Bus reliability • Bus patronage • General traffic speeds • General journey times
North Somerset monitoring	<ul style="list-style-type: none"> • Bus journey times • Bus patronage • On-time performance 	<ul style="list-style-type: none"> • Bus journey times • Bus patronage • Passenger satisfaction 	<ul style="list-style-type: none"> • Bus journey times • Bus patronage • On-time performance

	<ul style="list-style-type: none"> • Passenger satisfaction • Bus emission standards 	<ul style="list-style-type: none"> • Bus emission standards 	<ul style="list-style-type: none"> • Passenger satisfaction • Bus emission standards
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In order to meet these targets, the BSIP’s capital-funded infrastructure schemes are designed to work hand-in-hand with initiatives to improve passenger journeys, such as fare offers and more frequent services. These initiatives are funded through a separate BSIP grant of £57 million, which was jointly awarded to NSC and the West of England Combined Authority (WECA) to deliver in partnership. The BSIP is governed by an Enhanced Partnership between North Somerset, the Combined Authority, the other Highway Authorities in the West of England area, bus operators, and other key stakeholders. It is intended that, through the EP process, capital and revenue investment from NSC and WECA is met with comparable investment in improvements to services by the bus operators.

The indicative BSIP funding was subject to a final Department for Transport (DfT) outline review of the proposed schemes, which concluded in June 2022 and resulted in the confirmation of funding being granted in November 2022. With this confirmation of funding being later than anticipated, a change request was submitted and accepted by the DfT to extend the deadline for delivery of investment to October 2025. A subsequent change request has been accepted by DfT to extend the deadline of investment to March 2026.

In order to deliver North Somerset’s Bus Service Improvement Plan (BSIP) capital-funded infrastructure schemes, a variety of contractual arrangements are required. The initial schemes were delivered through the council’s Term Service Contract. The remaining bus priority schemes are to be delivered through a Design and Build contract awarded to Alun Griffiths Contractors Ltd. The decision to award the contract was made by the October 2023 Executive Committee. The October 2023 decision requires a subsequent Executive Member decision at the design stage before commencing delivery of each scheme.

Please note: The BSIP funding from UK Government is ringfenced. This means it cannot be used to pay for any non-BSIP related council activities, such as filling potholes, or other council services.

Pause and review

In April 2024 we paused the live programme of BSIP infrastructure projects, such as junction updates, and the introduction of new bus lanes. The pause followed months of engagement with local communities on early proposals for schemes in Backwell, Clevedon, Rownham Hill, Lime Kiln, Churchill and Worle High Street – aimed at improving congestion, enhancing local travel experiences and creating infrastructure needed for now and in the future.

During this 2024 pause and review period, the only new BSIP infrastructure project being delivered was at the A370 Wood Hill junction, as part of the Congresbury congestion scheme.

The 2024 pause and review period was implemented in order to:

- assess completed schemes to monitor their effectiveness and learn any lessons to apply to future works

- consider any changes we needed to make to our approach as a result of then new Department for Transport guidance on bus priority (LTN1/24)
- continue to engage with communities and their representatives about the range of proposed schemes
- gather further data and undertake testing in areas where this is needed in order to make a decision

set a new timeline for decisions for approval of remaining schemes to allow fuller consideration of each scheme and reduce scheme-related disruption to the local road network for residents.

The assessment of delivered schemes' effectiveness, the 'lessons learned' from the delivery of the Brockley Combe scheme, and our review of the DfT LTN1/24 guidance, were all considered by the council's Transport, Climate and Communities Scrutiny Panel in July 2024. This ensured the BSIP programme was able to fully benefit from the review, by enabling us to draw on the additional data, and carry learning forward into future, approved, schemes.

Changes agreed to the BSIP programme as a result of the 2024 pause and review period include:

- reducing the scope of current proposals for several schemes, including Martcombe Road near the M5 roundabout, Southern Way in Clevedon and Rownham Hill near Bristol, and removing the Portbury Hundred scheme completely
- continuing to monitor completed infrastructure schemes to understand their impact and draw out any lessons learned for future schemes
- undertaking a comprehensive review of the effectiveness of the programme delivery to identify areas of improvement for the remainder of the funding period
- developing a bus lanes policy to clarify restrictions and work towards a default position of motorcycles being allowed to use these unless a particular local issue prevents it
- continuing to develop the engagement approach to deliver improvements in the way stakeholders and the wider community are communicated with.

The evolved designs for the Queensway and B3440 schemes have also been directly influenced by the additional review and analysis undertaken in the 2024 BSIP pause period.

Both during, and since concluding, this period, we have:

- continued to engage with local communities and their representatives on the next schemes, including for transport hubs, within the programme
- developed policies against new national guidance, which were reviewed at an all-councillor session, hosted by the Transport, Climate and Communities Policy and Scrutiny Panel, in January 2025.

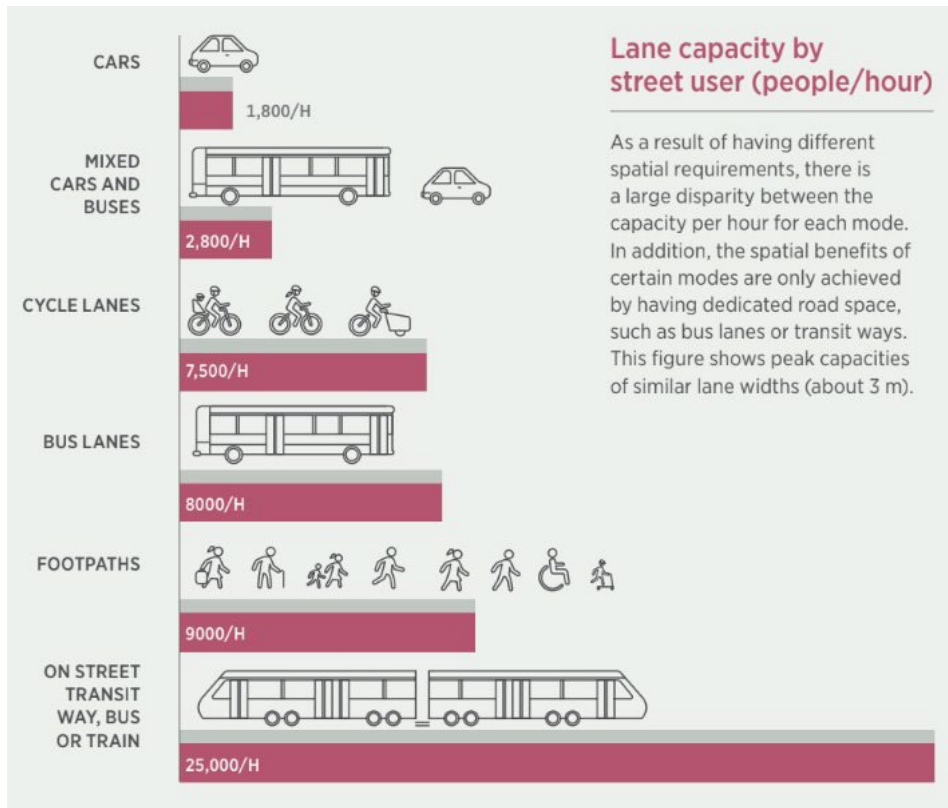
With the 2024 pause and review period complete, our BSIP infrastructure programme is now moving forward, with improvements and updates under way, planned, and proposed, across North Somerset. This means some of the next infrastructure schemes in the programme are now set for an Executive Member decision.

A370 corridor

The A370 is a major arterial transport route running through North Somerset and connects Weston-super-Mare to Bristol. At Junction 21, the A370 into Weston carries approximately 60,000 vehicles per day. Further along the corridor, it carries approximately 10,000 to 14,000

vehicles per day. The A370 commonly suffers from congestion in the morning and evening peak periods, which is exacerbated in the summer months due to increased holiday traffic. It can also be significantly affected by displaced traffic from incidents affecting the M5 motorway or the A38.

Buses have the capacity to carry a large number of passengers within existing road space. On the A370, approximately 14,500 people are transported each day by 13,000 non-bus vehicles, whereas around 3,000 to 3,600 people are transported by around 110 buses per day. Increasing the capacity of bus services using the A370 is a key means of reducing the impact of future growth on congestion of our road network.



The A370 corridor is currently served by six scheduled bus routes on top of community transport and school buses, totalling up to 23 buses an hour – the X1, X5, 6, 7, the X8 and the A3.

- The X1 service between Weston-super-Mare and Bristol serves the whole of the A370 corridor, and carries around 150,000 passengers per month, at a frequency of up to one bus every 15 minutes
- Bristol International Airport operates the A3 between Weston-super-Mare and the airport, which now has a frequency of one bus every hour, and patronage is over 10,000 per month and growing
- The X5 service connects Weston-super-Mare to Yatton, Clevedon, and Portishead and carries around 18,000 passengers monthly at a frequency of one bus every 75 minutes

- Three of the Weston-super-Mare town services, the 6, 7 and 9, also use the corridor between the town centre and Queensway junction. The 6 operates at a 30-minute frequency and carries around 13,000 monthly passengers, and the 7 operates at a 20-minute frequency with around 80,000 passengers per month. The 9 operates 3 trips a day and carries around 500 monthly passengers.
- The X8 service between Nailsea and Bristol uses the corridor between Backwell and Long Ashton. It carries around 13,000 passengers monthly at an hourly frequency. (Note: these services do not use the junctions at Queensway).

Focusing on the X1, X5 and A3 services, the highway improvements that the BSIP aims to collectively bring to the A370 at Queensway, Smallway, Wood Hill, Brockley Combe, Backwell and Long Ashton Bypass, as well as the traffic signal upgrades in various locations, will deliver an operational cost reduction that should allow a commercial operator to retain the current 15-minute frequency without ongoing subsidy from the Council or government. This requires an average 22-minute round-trip journey time reduction. The schemes at Long Ashton Bypass, Brockley Combe and Wood Hill have been delivered and are contributing to the required journey time savings. However, remaining schemes are required to yield the necessary corridor improvements.

In March 2024, North Somerset successfully secured £2.1 million in Government funding to support the introduction of 24 electric buses. This investment will bring new buses to the X1 and X4 routes. This exciting development means that in 2025, electric buses will be a common sight along the A370 corridor. The buses will deliver enhanced comfort and reliability, along with reducing carbon emissions. Helping us evidence our commitment towards being a carbon neutral area by 2030.

As well as journey time savings, the bus priority measures are intended to provide improvements to journey reliability and punctuality and encourage more people who can choose to use the bus to do so.

Corridor business case elements

To understand the effects of congestion on the A370, bus and general traffic journey times were analysed between the Interchange bus stop (in Weston-super-Mare) and the Blackmoors Lane / Winterstoke Road bus stop (in Bristol) in both directions. While the two bus stops on the Bristol-side of the corridor have different names, they are in similar locations on either side of the Cumberland Basin junction in Bristol. This covers a nearly 19 mile-long section of the A370. The analysis took into consideration four 4-week time periods in November 2022, June 2023, November 2023, and June 2024. The detailed bus journey time and general traffic journey time for these time periods are displayed in Appendix 2, Table 1 (bus journey time) and Table 2 (general traffic journey time).

Bus journey times towards the Weston Interchange vary generally by around four minutes, however it experiences a brief morning peak between 7am and 9am where journey times can vary by between 6.5 to 10 minutes, with an average journey time of 56 minutes and 26 seconds. The largest peak is visible in the afternoon-to-evening period, starting roughly at 2pm until 6pm, where journey times generally vary by six to 14 minutes, with an average of around 1 hour and 2 minutes.

Bus journey times travelling towards Bristol peak mostly in the morning between 7am and 9am, when journey times can vary by between six and 14 minutes, with an average journey time of 1 hour and 11 minutes. The afternoon-to-evening peak is much less visible and on average a bus journey would take 1 hour and 1 minute.

The existing punctuality data for the affected services is below:

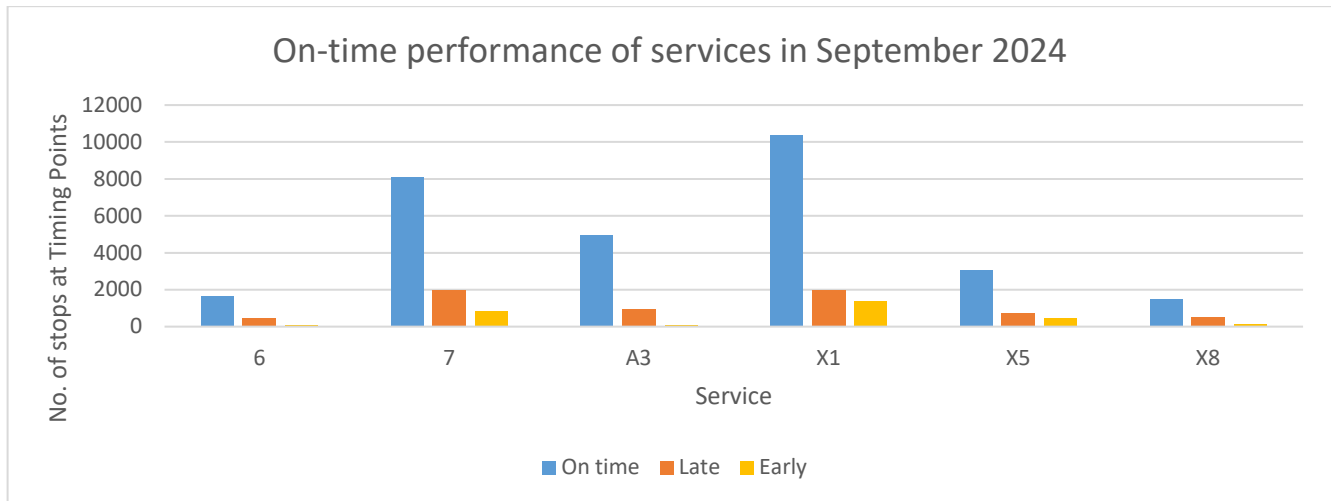


Figure 1: Punctuality data for bus services operating at Queensway junctions and/or B3440 slip-roads

Around 25 per cent of the 6, 7, and X1 services, and around 28 per cent of the X5 services are currently not running on time (defined through national measures as being between 1 minute ahead of schedule and 5 minutes behind schedule). This is considered a significant barrier to people who might use these services.

General traffic journey times towards Bristol from Weston-super-Mare are generally between 27 minutes and 35 minutes outside of the peaks. However, during the AM peak this can increase to between 55 and 59 minutes, a difference of over 20 minutes. The PM peak shows a slightly reduced peak of around 50 to 55 minutes.

In the Weston-bound direction between the Bristol boundary and Weston-super-Mare Interchange, general traffic experiences a 30-to-41-minute journey time outside of the peaks. The slowest peak is in the PM peak, with a journey time that can increase to between 50 and 59 minutes. In the AM peak this is significantly faster, with a slowest journey time of between 40 and 44 minutes.

In general, both bus and general traffic journey times have deteriorated slightly over the last two years. The difference between bus and general traffic is more pronounced in the Bristol-bound direction, especially in the AM peak. However, it is also present in the Weston-bound direction, but the difference between the AM and PM peak is less significant.

The differences in journey times between peak and off-peak periods, and between general traffic and buses, demonstrates that useful bus journey time savings can be found on this corridor through congestion reduction and bus priority schemes.

Schemes for the Queensway junctions and B3440 slip roads

Queensway’s junctions with Walford Avenue and Bristol Road experience significant congestion. Delays are particularly prevalent outbound towards the M5’s Junction 21 (J21) in

the morning peak, and inbound towards Worle and Weston-super-Mare in the evening peak. The resulting congestion has a major impact on road users and bus journey times. For example, bus timetables have to allow an extra 12 minutes to journey from Worle Interchange to St Georges Turn at peak times.

A scheme at this location aims to improve the Queensway junctions and adjacent roads to reduce journey times for general traffic, and through the inclusion of some bus priority measures could make a significant difference to bus journey times both during and outside peak periods.

Existing traffic data and delays to impact to bus services

To understand the existing issues at the Queensway junction, and to understand the likely benefits of improvements there, extensive traffic monitoring has been undertaken. Bus journey time and general traffic journey time data has been collected for four 4-week periods in November 2022 and 2023, and June 2023 and 2024. These periods provide data outside of school holidays and Christmas, and present different weather conditions for different times of the year.

Data was collected for several different segments of bus routes around the Queensway junction and B3440: between the two bus stops on the A370 on each side of Junction 21 and the B3440 (Rolstone Turn and St. George's Turn), between the Queensway junction and the B3440 (Worle Terminus and St. George's Turn), and across Summer Lane roundabout towards the Queensway junction (Thorn Close and Worle Terminus). The detailed journey times for both buses and general traffic are displayed in Appendix 2 in Table 3, Table 5 and Table 7 (bus journey times) and Table 4, Table 6 and Table 8 (general traffic journey times).

On average, the bus journey time across the Junction 21 (J21) gyratory and the B3440 fly-over are around 2.5 minutes. Generally, the AM peak shows greater variability in the Bristol-bound direction, with a peak journey time of around 4.5 minutes. The PM peak has more variability in the Weston-bound direction, with a peak journey time of around 5 minutes.

General traffic journey times across the J21 gyratory and B3440 are relatively similar to bus journey times on the same section of road, with off peak averages of just over 2 minutes. Like the bus journey times, the Bristol-bound direction sees a clear AM peak, and the Weston-bound direction sees a larger PM peak. Journey times at these peaks are around 4 minutes and 4.5 minutes respectively. Average delays towards Bristol are around 15 to 20 seconds for buses compared to general traffic. In the Weston-bound direction there is little difference in journey times, with the PM showing a benefit for buses which can probably be attributed to the existing bus lane towards the J21 gyratory.

The bus journey time between St. George's Turn and Worle Terminus, across Queensway junction is on average around 2 minutes in the off peak and inter peak periods in the Weston-bound direction. In the Bristol-bound direction, this increases to around 2 to 2.5 minutes. During the Am and PM peak, buses travelling towards Weston experience similar delays of around one minute, with the average journey time being around 2.5 minutes. In the Bristol-bound direction, buses experience a significantly worse AM peak with delays of around 3 minutes, and journey times of around 5 minutes. We have noted significantly worse journey times in November 2023, with an average delay of over 10 minutes. This may be due to traffic conditions, drainage issues and significant flooding events that month. The graph below shows the variability of bus journey times taken from GPS data in November 2023.

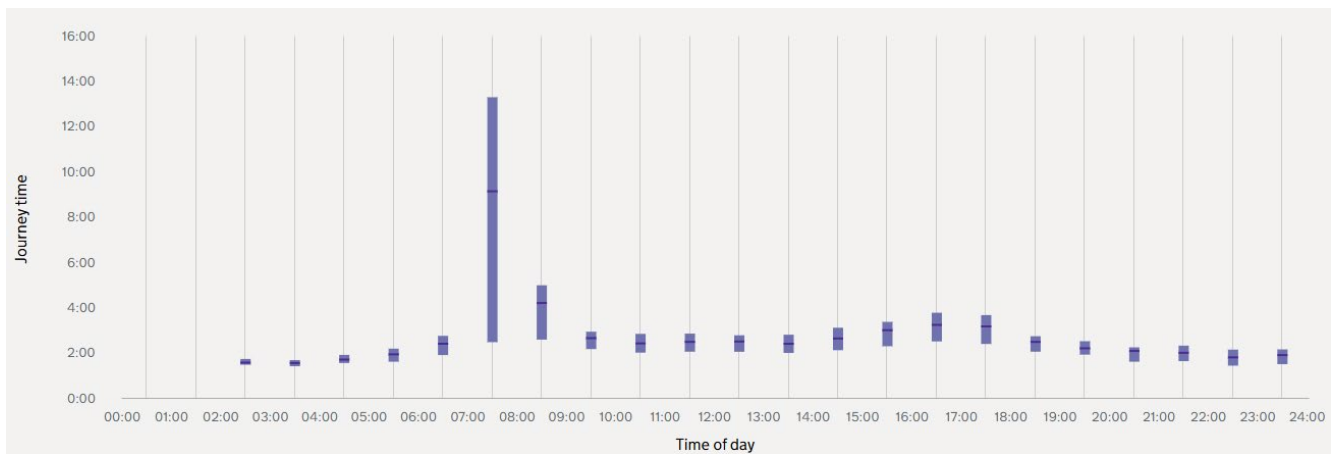


Figure 2: Graph showing the mean, 25th percentile, and 75th percentile bus journey times per hour between Worle Terminus and St. George's Turn in November 2023

General traffic journey times between St. George's Turn and Worle Terminus are on average 30 seconds to 1 minute faster than bus journey times across the junction, with an average journey time off peak of just over one minute. In the Weston-bound direction the AM and PM peak are generally similar, with a peak journey time of around 2 minutes and 10 seconds, however, the PM peak does seem to have deteriorated in the last year, adding around 20 to 30 seconds on average. In the Bristol-bound direction, the AM peak is generally worse than the PM peak (with the exception of June 2024), with an average peak journey time of around 4 minutes, with a PM peak journey time of around 2 to 2.5 minutes.

The W6 service runs between Weston-super-Mare Interchange and Worle Terminus and takes a different route across the Summer Lane roundabout and Queensway junction before entering the Terminus. In the Weston-bound direction, the service does not use the Queensway junction. Unfortunately, due to technical issues the bus journey time data available for this section is around 30-to-50% of all trips, which may skew the bus journey times reported slightly.

Generally, bus journey times on the W6 route across the Summer Lane roundabout and Queensway junction are around 2 minutes off peak. The AM and PM peak experienced on this section is quite variable, between over 2 minutes to nearly 5 minutes in the AM peak and between 2.5 and 3.5 minutes in the PM peak.

General traffic journey times between Thorn Close and Worle Terminus is on average 30 seconds faster than bus journey times, with an average journey time of just over 1.5 minutes off peak. In the AM peak, traffic at peak times takes around just over 2 minutes to travel across Summer Lane roundabout and Queensway junction, with the PM peak journey time of between 2.5 and 3 minutes.

The journey time variability at the junction demonstrates the potential benefits of a congestion reduction and bus priority scheme at this location.

Scheme identification

At the Queensway junctions the following options were considered:

- 1) Incorporation of bus lanes into the existing highway layout – rejected due to insufficient space. It was considered that benefits would likely be low with an unacceptable impact to general traffic. Not progressed.
- 2) Revised signal junction using a ‘clean slate’ approach – signals would enable elements of bus priority but the overall benefits would be low as the existing signal configuration is inherently inefficient. Not progressed.
- 3) Replacement of signals with roundabouts at both Bristol Road and Walford Avenue junctions to maximise benefits both during and outside of peak periods. Incorporating bus lanes into the design would provide bus priority at busy periods. This option was considered to be preferred and was progressed.

On the B3440 slip-roads between Queensway junctions and J21, the following options were considered:

- 1) Inbound bus lane on the exit slip-road from A370 Somerset Avenue towards Worle – expected to provide significant benefits during peak periods when queues form on this section of road.
- 2) Bus lane on the A370 entry slip-road from Worle towards Somerset Avenue – starting as close to Shepherds Way as possible, and extending to either:
 - a. The top of the slip-road, to maintain the capacity of the B3440/A370 signal junction. This is the preferred option.
 - b. The B3440/A370 signal junction – this was considered too detrimental to the capacity of the junction and was not developed further.
 - c. J21 roundabout - this was considered too detrimental to the capacity of the junctions and A370 and was not developed further.
- 3) Signal upgrades at the B3440/A370 Somerset Avenue junction to include bus priority – approaching buses would be detected and signal timings adjusted automatically to give extra time to allow the bus through the junction with priority over other movements. This is considered effective and forms part of the preferred option.

The preferred option which was progressed to initial design was therefore a combination of the preferred options described above, and comprised the following elements:

- 1) Roundabouts to replace traffic signals at Queensway junctions with Walford Avenue and Bristol Road, with bus lanes at several locations to provide bus priority.
- 2) Bus lanes on both B3440 slip-roads to and from the A370.
- 3) Bus priority signal upgrade at the B3440/A370 Somerset Avenue junction

Separately, National Highways are delivering improvements to the M5 at J21. When finished in 2026, this will provide a twin-lane entry to M5 northbound, giving a useful increase in capacity to the junction which will provide benefits upstream on the local highway network.

Design development

The proposed updated design is appended to this report.

The Queensway and B3440 scheme has evolved following design and modelling work.

The preferred option detailed above was reviewed by the Executive Member for Highways, and the Transport, Climate and Communities Policy and Scrutiny Panel, in July 2023. This concept design was shared with local ward members, Weston-super-Mare Town Council, and other stakeholders such as North Worle Forum, between July 2023 and autumn 2024.

The initial concept design has been reviewed by the appointed design consultants and has been amended to reflect feedback from various consultation exercises. The response to stakeholder and public feedback is summarised in the Consultation section of this report.

The refined design now proposes a more classically shaped southern roundabout, while most of the bus lanes originally planned to work in conjunction with the roundabouts have been removed. A single southbound bus lane has been retained approaching Walford Avenue from Queensway.

The new B3340 design has also evolved, with changes made to amend the length of the bus lanes on both slip-roads, achieving a better compromise between benefits, safety, and impact to other traffic.

The key features of the amended proposed scheme for the Queensway junction improvements are:

- replacing the signalised junction at the Bristol Road and B3440 junction with a roundabout, to allow freer movement of traffic through the junction
- replacing the signalised junction at Walford Avenue with a roundabout to allow freer movement of traffic through the junction
- creating a westbound 'auxiliary lane' to provide unrestricted traffic movements from the Weston Road Railway Overbridge by allowing vehicles to bypass the roundabout towards Bristol Road
- creating a westbound dual carriageway on Bristol Road to increase capacity and accommodate unrestricted vehicle movements exiting the auxiliary lane
- creating an eastbound dual carriageway on Bristol Road to increase general traffic capacity
- a 60-metre southbound bus lane on Queensway to provide bus priority on the approach to the Walford Avenue junction
- improving walking, cycling and wheeling facilities by upgrading the existing staggered 'Toucan' crossing to a 'straight through' provision on Walford Avenue
- improving walking, cycling and wheeling facilities with a new crossing on the Queensway where the National Cycle Route 33 crosses
- widening the Victory Roundabout along the north and northeast edge to increase capacity and efficiency
- add enhanced signing and lining on the approaches to the Summerhouse roundabout to support more efficient traffic flow.

The key features of the scheme to improve the B3440 slip roads are:

- creating 265 metres of bus lane to provide inbound bus priority into Weston-super-Mare from the A370 Somerset Avenue dual carriageway slip road, to the Bristol Road overbridge.
- creating 130 metres of bus lane to provide outbound bus priority out of Weston-super-Mare from south of the Shepherds Way junction to the top of the A370 Somerset Avenue dual carriageway slip road.

Benefits realisation

The final concept design has been tested to understand its impact on bus journey times and general traffic.

Replacing the existing traffic signal-controlled junctions with roundabouts will enable the junction to operate more fluidly, making significant reductions to off-peak delays and driver frustration caused by the complexity of the existing junction and the associated delays inherent with traffic signal control. During peak periods, the proposed changes will maximise the throughput of the junction within local constraints. Bus lanes on the B3440 slip-roads will maximise journey time improvements for bus services at peak times, working in conjunction with the junction improvements to maximise the overall benefits.

Congestion reduction

The existing junction and BSIP proposed design have been junction capacity tested in order to understand the changes in junction performance which are likely to occur as a result of this scheme. The junctions have been assessed using an industry-standard modelling tool (LinSig) and the scheme area has been tested using a strategic industry-standard modelling tool (VISSIM) to understand the impact on junction capacity, queuing, network capacity and the average amount of delay experienced by vehicles passing through the junction.

The assessment of the BSIP scheme identifies how the junction is likely to operate in the future, including the operation of the two new roundabouts, bus priority signals and pedestrian crossings.

Traffic data from October 2022 has been used to inform the assessment. Information has been collated from a Junction Turning Count survey which tells us the number and type of vehicles turning through the junction (e.g. cars, buses, HGVs etc.) all of which has all been accounted for within the model. The 2022 data has been used owing to the fact that this data was readily available to the council at the start of the project. This is a proportionate approach, given the purpose of the modelling exercise is to test the implications of the proposed BSIP scheme in comparison with the existing layout.

The modelling exercise has also considered a 2027 scenario, which includes likely changes to traffic flows resulting from projected development, Banwell Bypass opening, and changes to M5 Junction 21 by National Highways.

It is important to note that the junction's performance at peak times is heavily influenced by downstream congestion, such as at J21 itself and at the Victory and Summerhouse roundabouts in Worle. While improvements to Victory roundabout are included in the proposed scheme, J21 will remain a constraint for outbound traffic particularly during the morning peak period.

Inbound traffic (J21 to Queensway)

The graph below is output from the VISSIM model and shows existing and projected inbound evening peak period queue lengths in the 2022 and 2027 base scenarios (i.e. the existing road layout). The queue lengths are measured from the existing traffic signals at Queensway's junction with Bristol Road.

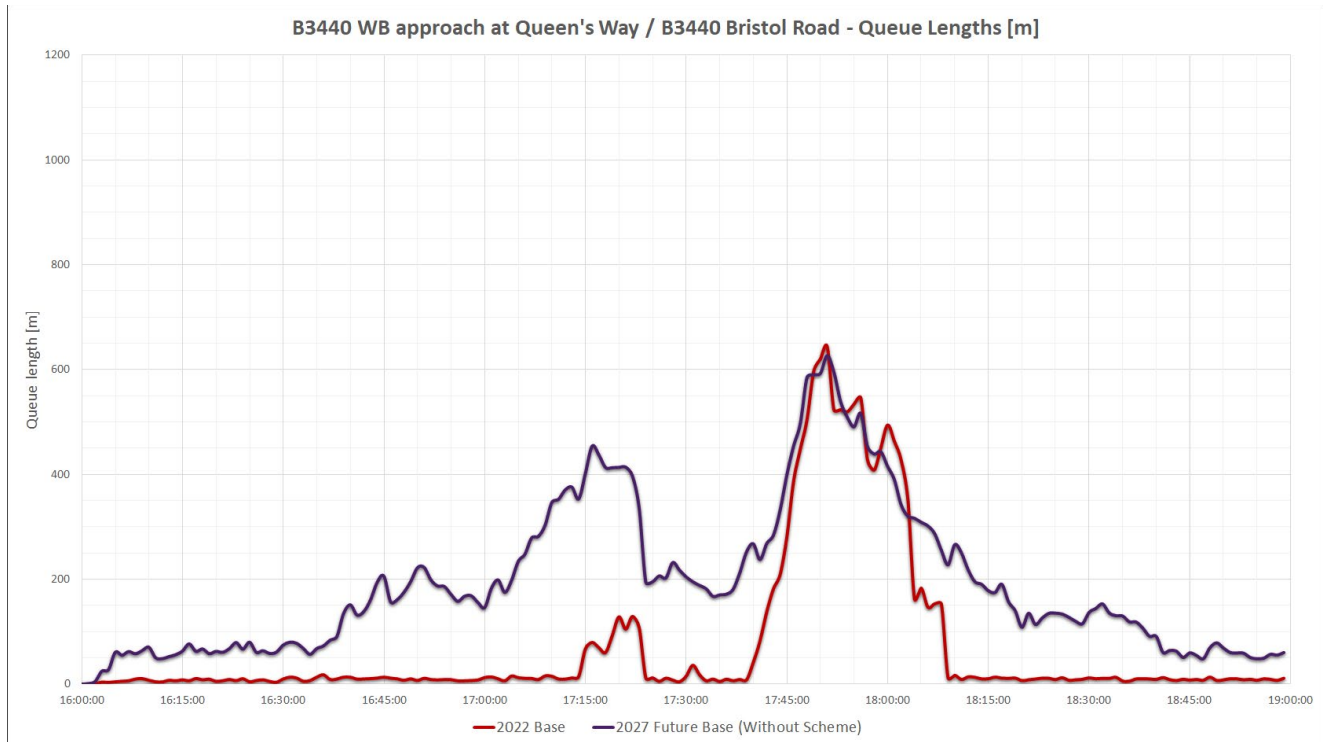


Figure 3: Graph comparing modelled queue lengths for inbound traffic approaching Queensway junctions, for 2022 and predicted 2027 traffic flows.

The graph shows that, without changes to the junction, although the peak queue length won't increase due to changed traffic flows by 2027, the peak period will become much wider with delays experienced over a much greater part of the evening period. This would have a significant impact to journey times for general traffic and buses.

The proposed changes to the junctions outlined in this report have also been modelled using the same techniques to understand their impact to the congestion at the junction. The graph below compares the projected queues following implementation of the proposals using the predicted 2027 flows, compared with the 2022 and 2027 baselines shown above.

B3440 WB approach at Queen's Way / B3440 Bristol Road - Queue Lengths [m]

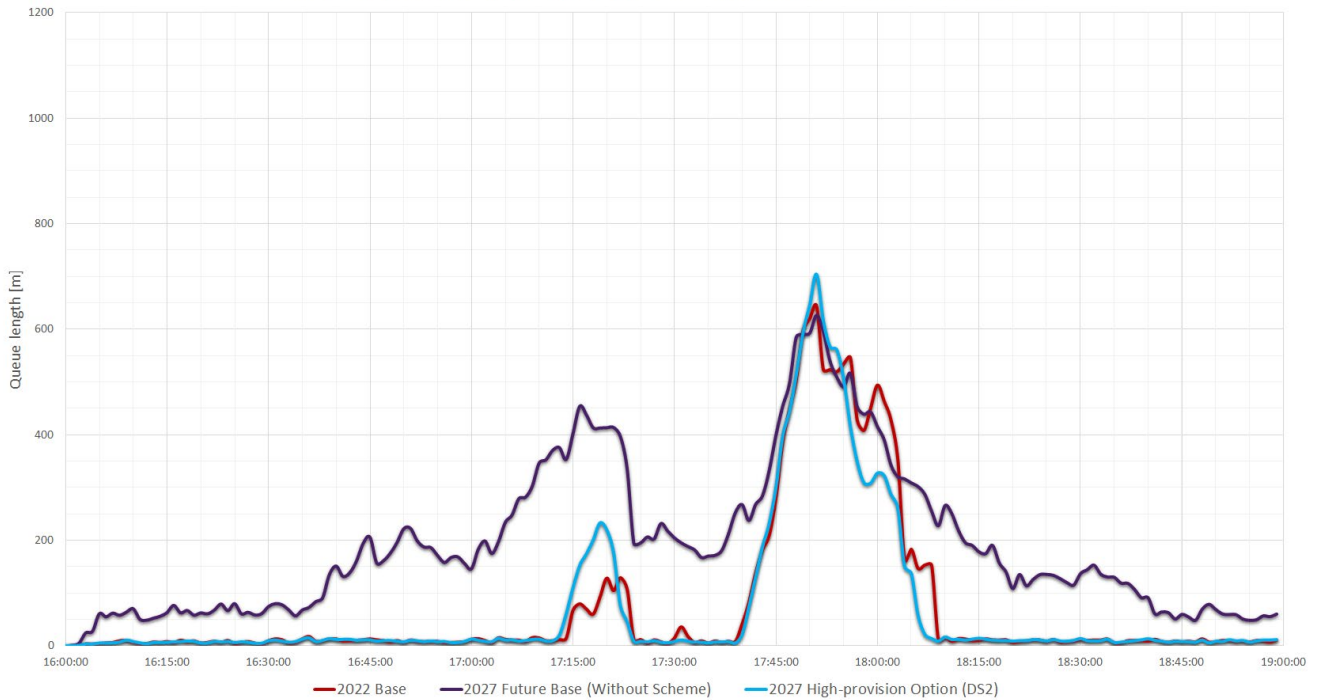


Figure 4: Graph comparing modelled queue lengths for inbound traffic approaching Queensway junctions, for 2022 and predicted 2027 traffic flows using existing road layout, and 2027 traffic flows using proposed road layout.

The model predicts a slightly longer queue at the busiest time (17:50) with the proposed changes, however otherwise shows a much-improved position compared to the 2027 baseline queues which would be expected without the scheme.

The model does not consider changes to driver behaviour – it is likely that drivers would learn to avoid the busiest time, resulting in a slightly wider peak than shown above, reducing the queue length at the very busiest times.

Outbound traffic (Queensway to J21)

The following graph shows the outbound morning peak queue lengths from the B3440/A370 merge for the 2022 and 2027 base scenarios, and the proposed scheme using 2027 traffic flows (Note: the proposed scheme is the “high-provision option DS2” shown in a cyan colour, the “low provision option DS1” is not being progressed). The graph also shows the predicted flows at 15-minute intervals through the peak periods on the secondary dashed line graphs.

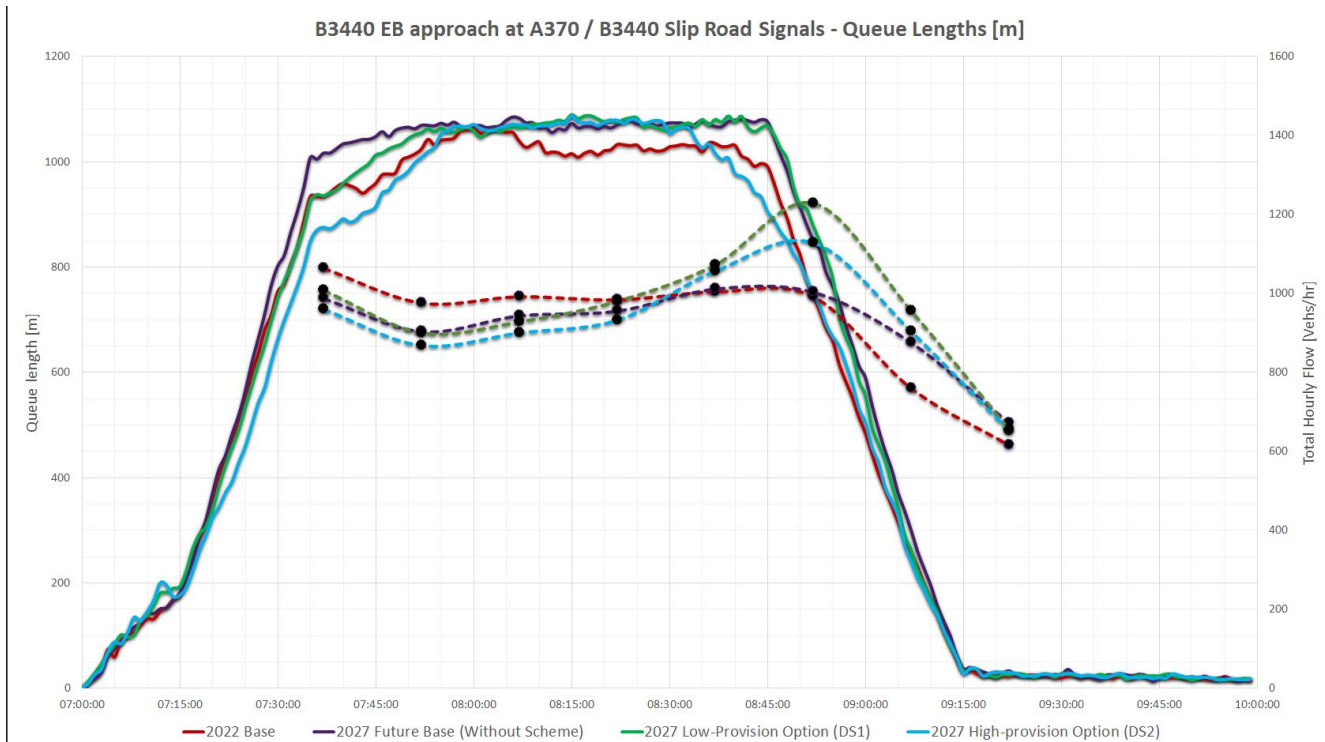


Figure 5: Graph comparing modelled queue lengths for outbound traffic approaching the B3440/A370 junction, for 2022 and predicted 2027 traffic flows using existing road layout, and 2027 traffic flows using proposed road layout. Note: the “low provision option DS1” is not being progressed.

Although the performance of the Queensway junction remains constrained by the capacity of the signals at the B3440 merge and J21 itself, the scheme does provide a benefit to outbound traffic flow. The proposed scheme is demonstrated to have similar peak queue lengths to the other tested scenarios, however with a narrower peak period with the longest queues starting later and finishing earlier than even the existing 2022 scenario.

Off-peak

A significant benefit of the proposed changes will be a reduction in delays outside of the morning and evening peak periods when traffic is not constrained by downstream factors such as J21. The existing traffic signal junction is complex and takes several minutes to go through its cycle, meaning that drivers can perceive that they have been delayed unnecessarily. The conversion of the junction to a roundabout system will significantly reduce off-peak delays.

To demonstrate off-peak improvements, the proposals have been assessed using a second industry-standard modelling tool (LinSig) to understand the impact on junction capacity, queuing, and the average amount of delay experienced by vehicle passing through the junction.

The model of the existing junction has been closely matched to the current on-street operation, based on information provided by NSC’s Traffic Signals team. As the BSIP scheme is to introduce give-way controls at the junction (compared to the existing traffic signal control), parameters for “give-way” junctions have been applied within the model. This is based on measurements from the proposed junction designs using an industry standard approach. The modelling also identified the frequency of the pedestrian crossings within the junction network.

Traffic data from January 2024 has been used to inform the assessment. Information has been collated from Junction Turning Count (JTC) surveys for both the Bristol Road / Queensway junction and the Queensway / Walford Avenue junction, which tells us the number and type of vehicles moving through the network (e.g. cars, buses, HGVs etc.) all of which has all been accounted for within the model.

As described in the sections above, it is important to acknowledge that the nearby roads are very congested at peak times. The capacity models which have been created for the existing and BSIP scheme arrangements are not able to fully account for interactions between junctions. However they are able to provide a picture of the scale of change expected at the junction itself, which, as shown in the graphs below, is expected to be a significant improvement in terms of reduced queuing and journey delays approaching the junction network.

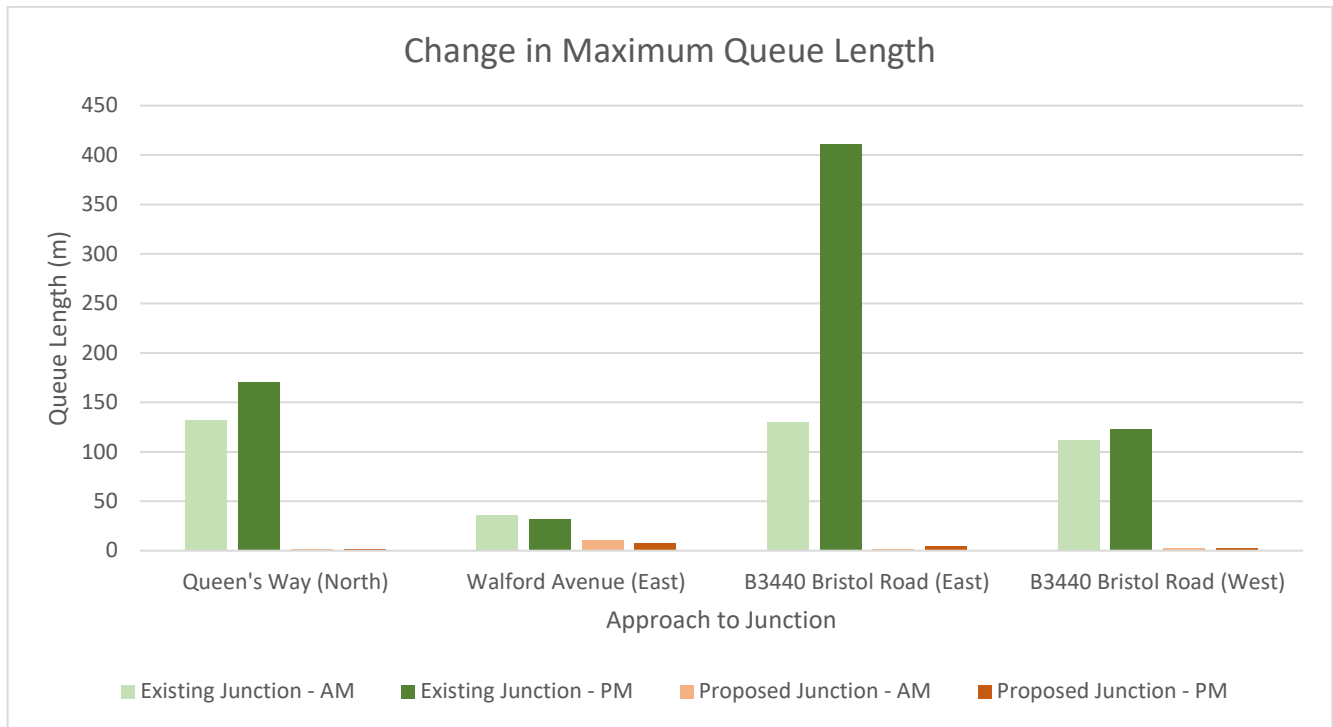


Figure 6: Modelled queue lengths at Queensway junctions for existing and proposed layouts, assuming no downstream queuing. Note: Results are the worst-case across lanes on each approach arm.

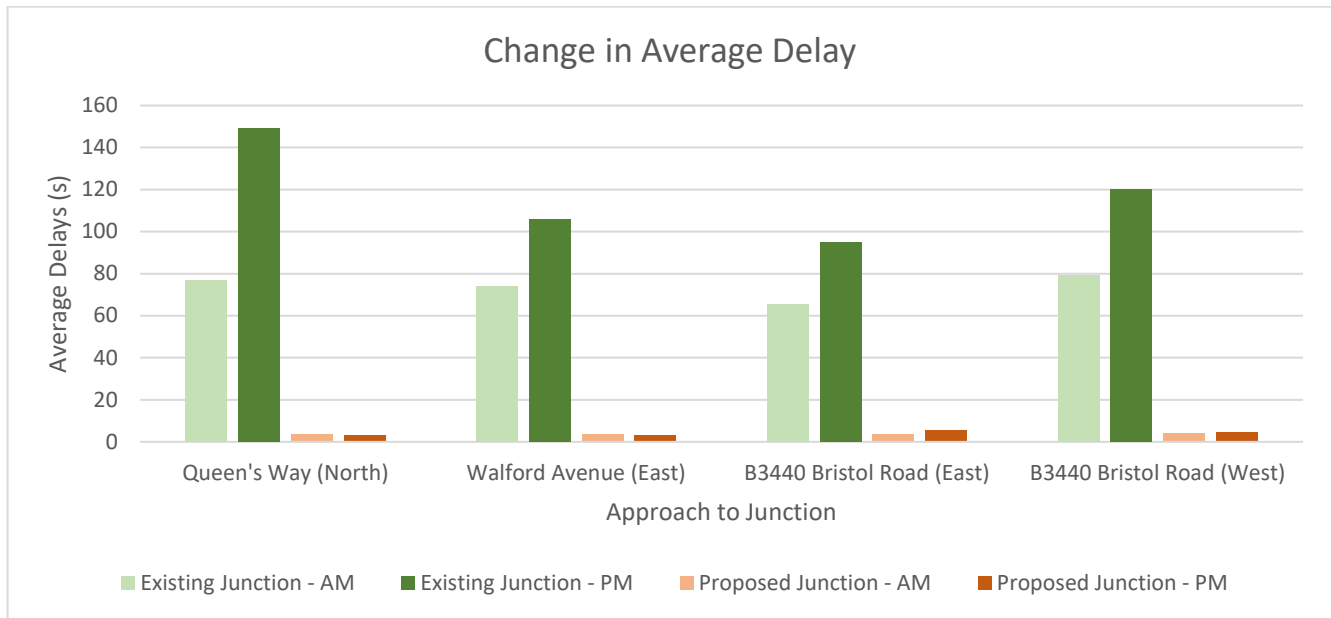


Figure 7: Modelled average delays at Queensway junctions for existing and proposed layouts, assuming no downstream queuing. Note: Results are the worst-case across lanes on each approach arm

The LinSig modelling demonstrates a significant improvement in the junction’s theoretical performance by converting from signals to roundabouts, using flows at peak periods. It can therefore be expected that outside of peak times, the delays and queuing experienced by drivers will be significantly reduced.

Bus benefits

The existing delays experienced by bus services, described in this report, demonstrate the potential for significant improvements to bus journey times and reliability through making changes at the Queensway junctions and on B3440.

For the purposes of this analysis, we will use the example of an X1 bus travelling through the scheme area, between Worle terminus and the bus stops at Rolstone Turn.

As described elsewhere in this report, GPS data shows that existing bus journey times and delays are tidal, with Bristol-bound journeys taking significantly longer in the AM peak, while Weston-super-Mare bound journeys take longer in the PM peak.

The proposed changes will benefit bus services in three ways:

- improvements to the general capacity of the junctions will directly benefit buses
- bus lanes allow buses to bypass queues and save time when the road network is busy
- the A370/B3440 traffic signals will have the capability to change their sequencing, and give priority to approaching buses, when safe to do so. The traffic lights do this by sensing the buses’ GPS data, which then triggers them to change. This will help journey times at all times of day.

The resulting benefits from these elements are cumulative and are described below.

Bristol-bound buses

The proposed design for the Queensway junction includes a bus lane of 60 metres length on Queensway going south to the new roundabout at Walford Avenue. At an assumed speed of 20mph, buses will take approximately 7 seconds to travel along each bus lane as opposed to queuing for access to the roundabout. In a traffic queue, the same distance would take 27 seconds at 5mph. The 20 second calculated maximum benefit has been factored to account for variability in traffic – the assumption is therefore that buses will experience a typical (mean) 13 second time saving at busy times. Smaller benefits would be expected at quiet times.

The conversion of the traffic signals to roundabouts is unlikely to yield significant outbound journey time improvements during the morning peak, because of queuing downstream. However, during the evening peak it's expected that outbound buses will save significant amounts of time by not being held by traffic signals. This is calculated to be a typical 79 second improvement during the evening peak, and 52 seconds benefit off-peak.

The proposed 130m long outbound bus lane on B3440 will provide a typical 32 second improvement during the morning peak, by allowing buses to pass queuing vehicles.

At the B3440 / A370 Somerset Avenue traffic signals, linking the traffic signals to bus GPS trackers will enable the signals to give priority to approaching buses. This is calculated to save a typical 59 seconds during the morning peak period, and a 39 second improvement at other times.

Weston-bound buses

Buses coming from J21 during the evening peak period will benefit from the 270m bus lane on the B3440 slip-road, between Somerset Avenue and the railway bridge at Bristol Road. This is calculated to provide a typical 66 second benefit to buses during the peak period.

The proposed conversion of the Queensway junctions to a roundabout system and improvements at Victory Roundabout will provide benefits to vehicles travelling inbound at all times, but especially during the evening peak period. This is calculated to be a typical 79 second improvement during the evening peak period, and 52 seconds at other times.

Cumulative benefits

The tables below collate the various benefits described above, demonstrating a very significant to bus journey times particularly in peak periods.

Queensway	Journey time change (seconds, mean)	
	Off-peak	Peak
Benefit from 60m bus lane passing queuing traffic @ 20mph	-9	-13
Reconfiguration of Queensway two signal junction to two roundabouts	-52	-79
TOTAL (East direction):	-61	-92
Reconfiguration of Queensway two signal junction to two roundabouts	-52	-79
TOTAL (West direction):	-52	-79
TOTAL (round-trip):	-113	-172

B3440	Journey time change (seconds, mean)	
	Off-peak	Peak
Benefit from 130m bus lane passing queuing traffic @ 30mph	0	-32
Bus Priority signals at B3440 merge with PDR	-39	-59
TOTAL (East direction):	-39	-91
Benefit from 270m bus lane passing queuing traffic @ 30mph	0	-66
TOTAL (West direction):	0	-66

TOTAL (round-trip):	-39	-158
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	Journey time change (seconds, mean)	
	Off-peak	Peak
TOTAL (round-trip):	-153	-330

Figure 8: Anticipated bus journey time benefits from proposed changes

In summary, it is expected that the changes will create significant journey time savings for bus services traveling in both directions through the Queensway junctions and B3440 slip-roads. This equates to large cumulative benefits given the prevalence of services using this corridor (8 buses/hour). There will also be benefits to other buses using the surrounding network including Worle interchange from upgrading the junctions to two roundabouts.

It is expected that the changes will also provide increased service reliability and punctuality by reducing the variability of journey times through the junction.

Additional benefits and conclusion

The proposed changes to the Queensway junctions and B3440 slip-roads are expected to provide a significant benefit to bus journey times and reliability during and outside peak periods. These upgrades will complement other work under way to improve bus travel in the area. This includes planned upgrades to Worle Interchange, including high-quality shelters, real-time information, seating and lighting, alongside other infrastructure schemes to improve connectivity between key routes.

Whilst the improvements for general traffic are constrained by downstream restrictions, particularly outbound where the traffic signals and roundabouts at J21 are likely to remain over-capacity, the changes will make significant improvements for traffic flows outside of peak periods and for the inbound direction. In all scenarios, the changes provide an improvement over the existing layout when tested using projected 2027 traffic flows.

New pedestrian and cycle facilities will improve the existing provision for active travel users in this part of Weston-super-Mare.

The proposed scheme will provide significant maintenance for highway infrastructure within the scheme area. Extensive carriageway resurfacing, drainage improvements, new traffic

signals at crossings and street lighting improvements will all provide a benefit for road users, while easing the pressure on local maintenance budgets.

Delivery programme

The next steps are the continuation of preliminary and detailed design processes, before reviewing the contractor's target cost in spring 2025. Statutory consultation to make the necessary Traffic Regulation Orders (TROs) will take place in early spring 2025. We expect the works to start on site in late spring 2025. The main scheme works are expected to take a total of eight months (subject to on-site conditions and requirements).

DECISION:

- To approve the design for the Queensway junctions and B3440 slip roads improvements schemes
- To authorise officers to proceed with implementing the BSIP infrastructure schemes for the Queensway junctions and B3440 slip roads,
- Approve the project funding virement.

REASONS:

To help improve general road capacity and traffic flow at this location, in tandem with other improvements on the network, and realise the journey time and reliability improvements necessary to ensure the commercial sustainability of local bus routes.

OPTIONS CONSIDERED:

- 1) A discussion around the alternative options considered for improvements at this location is provided in this report (see Scheme Identification).
- 2) Doing nothing is not considered a practical alternative due to existing congestion and delays to bus services at this location, combined with the likelihood of future growth exacerbating those issues if not dealt with using this funding opportunity.

FINANCIAL IMPLICATIONS:

The October 2023 Executive Committee decision has authorised the award of the design and delivery phases of the project to Alun Griffiths, to a total value of £15.4million. Therefore, no financial decision is required at this stage.

Costs

Scheme costs are estimated to be £8.4 million, including a risk/contingency budget, which is within the overall available budget for the BSIP schemes. This includes all design work and surveys required for various aspects of the scheme such as drainage, Statutory Undertakers Apparatus and environmental mitigations. Costs will be charged to KDT150 project code BSIP006.

The current identified grant funding for this scheme is £6.435m - the increased costs of £1.965m will be met from other bus priority projects within the overall BSIP grant allocation.

Funding

In May 2022 the Department for Transport (DfT) awarded North Somerset Council (NSC) an indicative £47.8 million in capital funding to spend wholly on bus infrastructure schemes within North Somerset.

LEGAL POWERS AND IMPLICATIONS

The Highways Act 1980 provides the council with the necessary powers to make changes to the public highway.

The Road Traffic Regulation Act 1984 provides the council with the necessary powers to implement bus lanes and other traffic restrictions on the public highway. This is achieved by making Traffic Regulation Orders (TROs), for which there is a defined statutory process.

The Traffic Management Act 2004 provides the council with the powers to enforce bus lanes and related restrictions.

CLIMATE CHANGE AND ENVIRONMENTAL IMPLICATIONS

The wider BSIP programme, including the infrastructure scheme discussed in this report, will contribute to enhancing the reliability and attractiveness of the public transport network, with the aim of enabling more people to choose bus travel, thereby reducing the number of car journeys that need to be taken within North Somerset and beyond.

The BSIP has ambitious targets to:

- reduce bus journey times by 2 per cent by 2025 and by 10 per cent by 2030
- achieve 95 per cent of services running on time, defined as being no more than one minute early or five minutes late, by 2030
- return to pre-pandemic patronage levels by 2025 and grow patronage by at least 24 per cent from that level by 2030
- increase passenger satisfaction to 89 per cent for 2025 and 95 per cent for 2030
- aim for all buses to be zero emission by 2030.

The scheme for the Queensway junctions and B3440 slip-roads will contribute towards achieving these targets, supporting a sustainable bus network, and encouraging modal shift from private cars to public transport, which will contribute towards the council's climate change and environmental objectives.

CONSULTATION

There have been widely publicised discussions about the potential to develop the Queensway junctions for over a decade. In October 2023, a [press release](#) was issued, and published on the council's website and social media channels, announcing the Queensway and B3440 junctions as among ten locations being considered for bus priority infrastructure schemes.

In relation to this specific scheme for improving the Queensway junctions and B3440 slip roads, there has been consultation with our Executive and ward members, Weston-super-Mare town councillors (March 2024), North Worle Forum (October 2024).

There has also been engagement with bus operators, and the proposals have been shared and discussed with community stakeholders as part of overarching BSIP communications activity,

Early and ongoing feedback on the plans has been positive overall, as the congestion issues at these junctions are well-known.

In December 2023 the scheme design was shared with First Bus who were supportive of the proposals. A further, supportive discussion was held more recently with First in October 2024.

The designs for the Queensway and B3440 schemes have been directly influenced by detailed discussions with community representatives, as well as additional review and analysis through the 2024 BSIP pause period. As a direct result of this extensive work, the schemes have been refined to:

- improve pedestrian crossings at Queensway and Walford Avenue
- include the Summerhouse and Victory roundabouts improvements
- remove the unused bus lane on Bristol Road
- review the length of bus lanes on the B3440 slip-roads to ensure the greatest benefit to buses while minimising impact to other traffic.

Summary of future/remaining engagement

The next stage of communications and engagement on an approved scheme will include further briefings for ward members, Weston-super-Mare Town Council, and St George's Parish Council, a publicised information display for local residents and businesses to view the designs, and a dedicated information pack to be shared with the business community. The purpose of this information pack will be to invite businesses within the impacted area to let us know of any logistical considerations they might have that we need to factor in during the scheme's delivery.

We also intend to prepare and issue a schedule of press releases and supporting social media to promote and keep people informed about the delivery of the scheme, encouraging them to get ahead and plan their journeys.

Any ad-hoc, mid-scheme updates will be shared with local members, Weston-super-Mare Town Council, St Georges Parish and on social media as necessary along the course of the programme. We will be working with Alun Griffiths' own engagement team to monitor progress.

Traffic Regulation Orders (TROs) will be advertised on the council website in the spring, which will give the public a statutory period of 3 weeks to submit a formal response to the plans, should they wish to do so. In addition, these plans and updates will be shared through the council's Bus Times newsletter for local representatives, council website, and social media.

RISK MANAGEMENT

There is effective project and programme management led by officers with support by an external consultancy to aid in both design and contract management.

There is an agreed internal governance function to oversee decision making which includes regular reporting through appropriate boards.

A Quantified Risk Assessment (QRA) has been prepared for the scheme which will be reviewed at key milestones throughout both the design and build process. The QRA will be reviewed and updated on completion of the preliminary design. The risk register is a live document for the duration of the programme.

Key risks

The following risks were identified as key risks in the initial risk workshop:

- **Statutory Undertakers Apparatus (SUs)** – As with all construction projects, the location of buried services and the potential need to divert or protect those during works present a key risk during the initial stages. This risk is being managed as far as possible by engaging with the SUs at an early stage, and, where possible, designing out any significant works.
- **Journey time delays, complaints, disruption during works** – The works to the Queensway junctions and B3440 slip roads will take approximately eight months. This is a key commuter and bus corridor, and a link from the M5 to large parts of Weston-super-Mare, and therefore we are preparing stakeholders to expect and prepare for a notable impact during the construction period. This risk will be managed by careful planning during the pre-construction phase and mitigated during the construction of the works. Where temporary road closures are needed (such as for resurfacing), this will be coordinated with National Highways and undertaken at night, to minimise disruption as far as possible. However, other traffic management will be in place throughout the works.
- **Drainage and culvert** – The location, condition and suitability of existing drainage (particularly an existing culvert) is a key risk. This risk will be managed at all stages of the scheme, throughout design and construction. This risk will be managed through investigation, CCTV and cleansing which will mitigate any significant issues associated with these works.
- **Traffic redistribution** – There is a possibility that changing the junction type from signals to roundabouts may affect how traffic uses the road network in this area. For example, in the morning peak the signals currently favour traffic coming from Queensway over traffic from Bristol Road. A roundabout design is likely to prioritise traffic from Bristol Road. This could result in a redistribution of traffic on local roads as drivers seek the fastest route to J21. This type of impact will be modelled during the design stage and mitigated if the risk is expected to be realised.

EQUALITY IMPLICATIONS

Have you undertaken an Equality Impact Assessment? Yes.

The assessment shows there are positive or neutral outcomes for this scheme for all users, albeit with low or negligible levels of impact across the various groups. Mostly it will aid disabled people, people on low incomes, and younger and older age groups, by helping to improve public transport viability.

CORPORATE IMPLICATIONS

The North Somerset Council Corporate Plan 2024-28 includes key commitments to:

- deliver the Climate Emergency Strategy and action plan and progress towards net zero by 2030
- deliver large-scale projects that improve the infrastructure and sustainability of North Somerset
- continue to invest in our highways and transport network to connect places and communities
- deliver on public transport improvements and support more cycling and walking across North Somerset to help decarbonise travel and promote preventative public health and encourage healthy lifestyles.

This includes *'offering transport choices that make the most of our infrastructure and provide opportunities for better use of public transport'*.

Regionally, the council is a member authority of the Western Gateway Sub-national Transport Body (STB) and has recently adopted our Strategic Transport Plan 2024-2050. This firmly sets out the wider region's commitment to act on the essential decarbonisation of our transport networks with one of the five overarching principles being 'Decarbonisation and Air Quality' and sets the target to achieve a shift of 17% of current vehicle kilometres to sustainable modes.

Sub-regionally, as part of the West of England region, the Council's overarching transport strategy is the Joint Local Transport Plan 4 (JLTP4), that clearly states the direction of travel for decarbonising our transport network:

- 'to transform our region, we will need to be flexible, agile and brave in our approach to the climate emergency'
- to 'take action against climate change and address poor air quality', as one of the five key objectives
- to recognise the need to 'provide transformational alternatives' to car driving
- to 'consider ways to manage demand possibly through congestion charging, emissions charging and workplace parking levy-type schemes', as a sub-region.

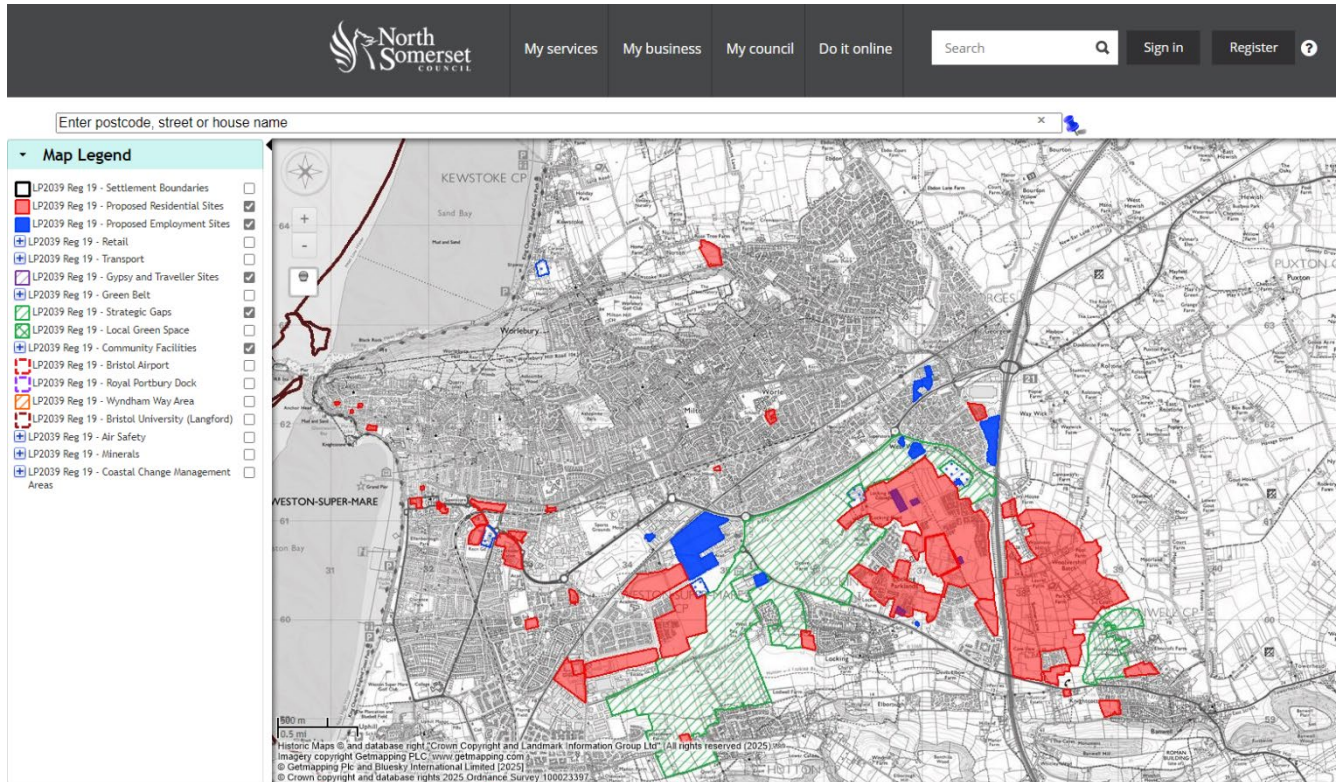
More specifically for public transport, the plan commits to:

- reinventing public transport through mass transit, smart ticketing and making it more user friendly, convenient, safe, direct and attractive linking key destinations to enable everyone to use it
- rethinking how we use our existing transport corridors including reallocating more road space to buses, pedestrians and cyclists
- demand management measures to influence travel choice and raise revenue to reinvest in alternatives
- first and last mile-type solutions to provide a linked-up transport network.

The emerging North Somerset Local Plan continues the strong 'predict and provide' approach to transport decarbonisation through its sustainable transport strategy, by proposing

development in locations where sites will be required to reduce the need to travel and reduce car dependency, by being located close to existing facilities and connecting into existing and improved sustainable transport networks – providing more options to get around.

The map below shows the land proposed to be allocated for residential development (in red) and employment (in blue). While there is not significant development proposed in immediate vicinity to the proposed BSIP scheme at Queensway, there is significant growth proposed for Weston-super-Mare as an overall urban area.



In December 2024, central government updated the National Planning Policy Framework (NPPF) with the aim of enabling local planning authorities and the development industry to deliver more homes to reduce the national shortage. This has meant a return to mandatory housing targets and has resulted in North Somerset Council needing to identify an additional 8,500-9,000 homes on top of the approximately 15,000 homes already identified in the Reg 19 Plan consulted on in 2023-24. This NPPF update includes the need to identify residential development within Green Belt land if no other appropriate locations can be identified.

For North Somerset, approximately 9,000 additional houses need to be identified (on top of the circa 15,000 already identified in the Reg19 version of the emerging Local Plan). Future proofing our bus network for bus priority would be a sensible investment to provide alternatives to already congested journeys by bus and car around the Worle and Queensway area, particularly in the morning peak period. Once the additional sites have been finalised for inclusion in the emerging Local Plan, strategic transport modelling will be updated. This will enable the Council to understand the impacts from the full scale of proposed Local Plan development (including the additional sites) and allow for the identification of transport mitigation schemes. These schemes will enable the developments to be delivered consistent with the objectives of the Local Plan and its Spatial Strategy for sustainable developments.

APPENDICES

Scheme concept plan.

BACKGROUND PAPERS

[Report to The Executive – 20th October 2021 - Update on the Development of a Joint Bus Service Improvement Plan \(BSIP\) with the West of England Combined Authority and Bus Operators](#)

[Report to The Executive – 22nd June 2022 – North Somerset Bus Service Improvement Plan](#)

[Executive Committee – 18th October 2023 - Bus Service Improvement Plan \(BSIP\) - Contract Award of Design and Build Contractor](#)


SIGNATORIES:

DECISION MAKER(S):

Signed:  Executive Member for Highways and Transport

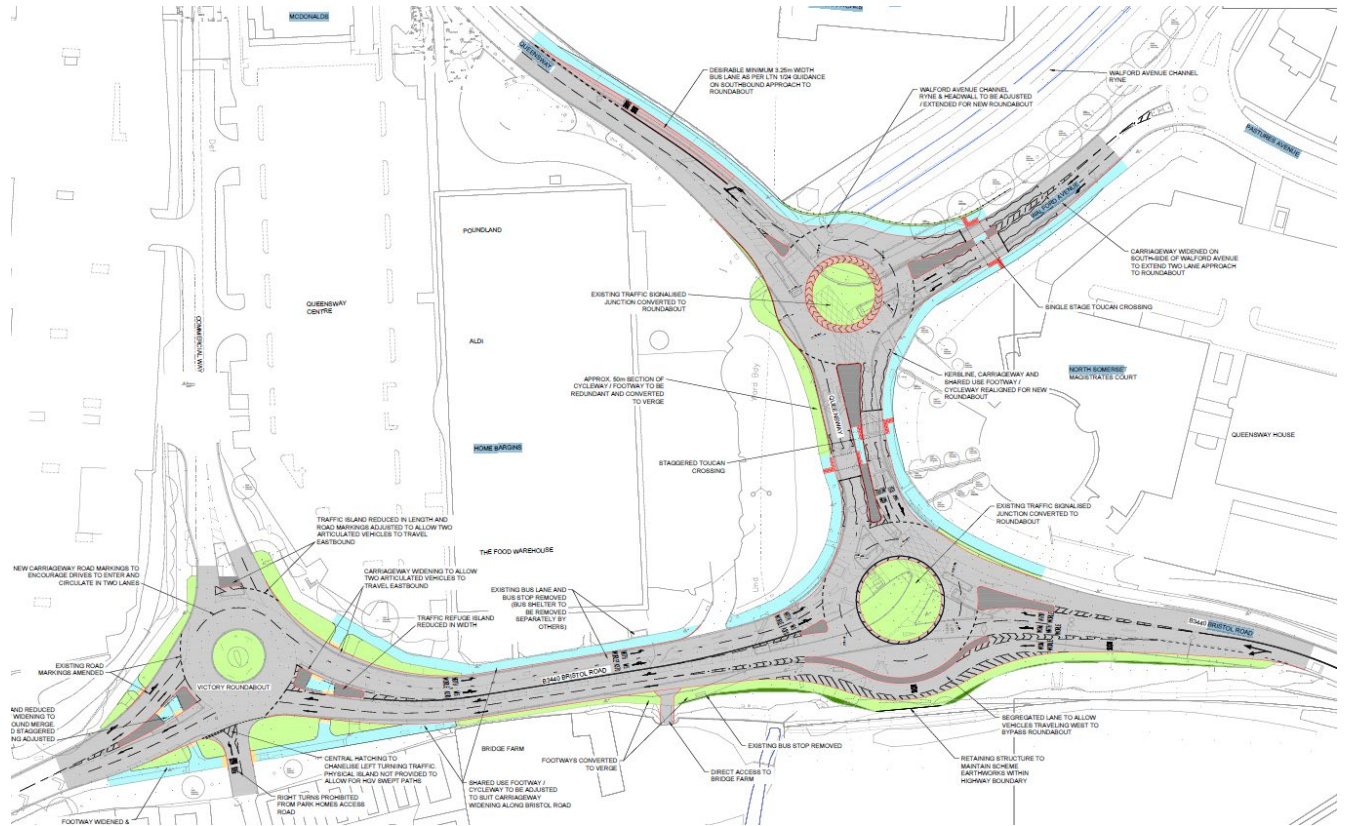
Date: 30 January 2025

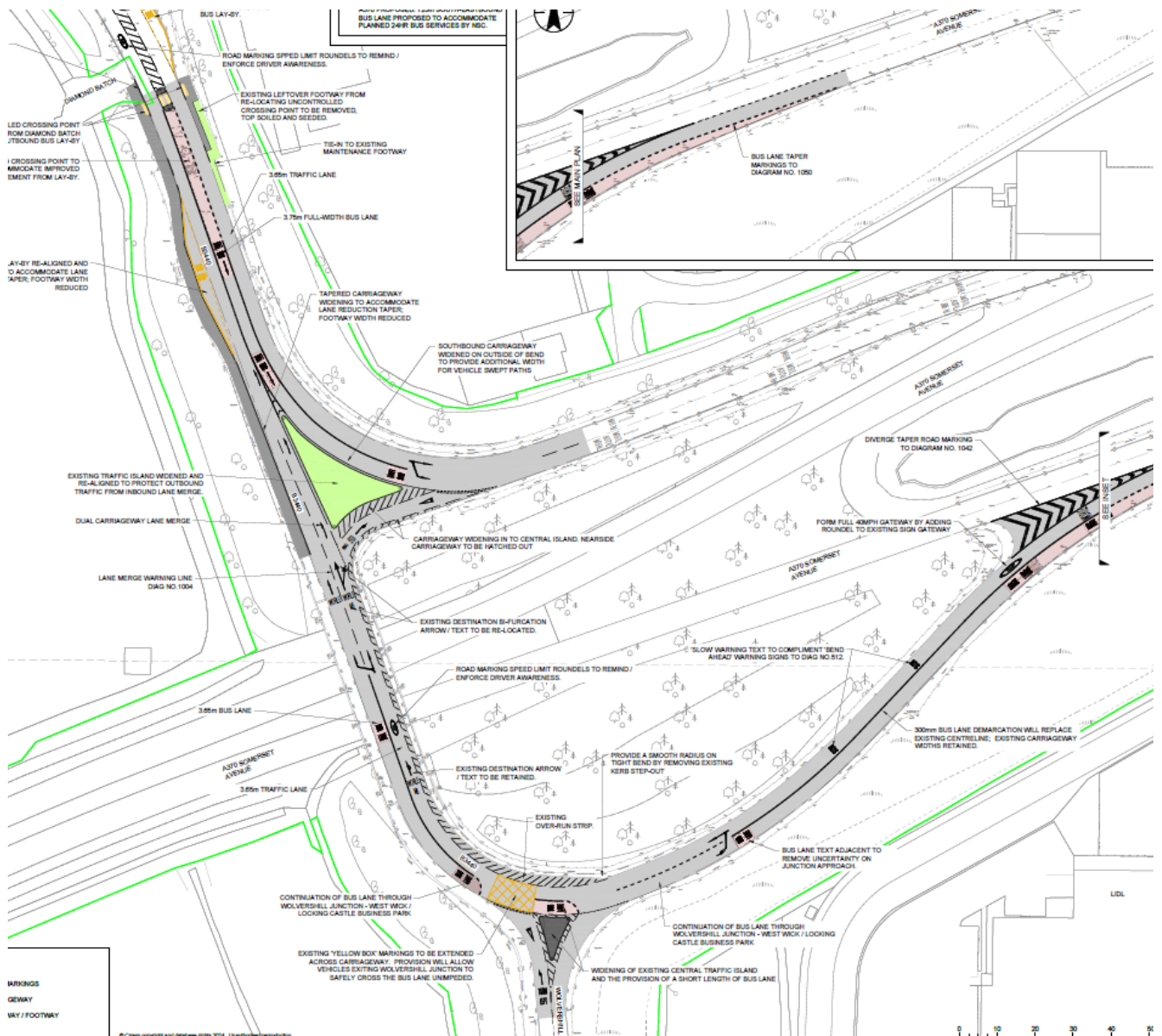
WITH ADVICE FROM:

Signed:  Director of Environment, Assets and Transport Services

Date: 30 January 2025

Appendix 1 – Proposed design





Appendix 2: Bus and general journey time tables

Table 1 : Bus journey times on A370 between Weston Interchange and Blackmoors Ln / Winterstoke Rd bus stops

Bus journey times							
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Bristol-bound (Interchange to Winterstoke Rd)	Nov-22	Off peak	5:00-6:00	00:45:35	00:44:06	00:47:13	00:03:07
		AM peak	7:00-8:00	01:05:28	01:00:28	01:11:30	00:11:02
		Inter peak	13:00-14:00	00:52:03	00:48:32	00:52:41	00:04:09
		PM peak	15:00-16:00	00:58:30	00:51:49	01:01:08	00:09:19
	Jun-23	Off peak	5:00-6:00	00:45:07	00:43:23	00:47:12	00:03:49
		AM peak	7:00-8:00	01:09:26	01:05:30	01:12:27	00:06:57
		Inter peak	13:00-14:00	00:53:33	00:50:33	00:55:32	00:04:59
		PM peak	15:00-16:00	01:01:59	00:59:17	01:04:41	00:05:24
	Nov-23	Off peak	5:00-6:00	00:48:28	00:45:13	00:49:22	00:04:09
		AM peak	7:00-8:00	01:18:17	01:10:29	01:25:17	00:14:48
		Inter peak	13:00-14:00	00:53:46	00:50:28	00:55:46	00:05:18
		PM peak	15:00-16:00	01:02:23	00:58:28	01:06:07	00:07:39
	Jun-24	Off peak	5:00-6:00	00:47:45	00:46:19	00:49:26	00:03:07
		AM peak	7:00-8:00	01:10:45	01:06:45	01:16:01	00:09:16
		Inter peak	13:00-14:00	00:57:08	00:52:30	00:57:02	00:04:32
		PM peak	15:00-16:00	01:01:20	00:58:22	01:03:51	00:05:29
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Weston-bound (Blackmoors Lane to Interchange)	Nov-22	Off peak	19:00-20:00	00:45:30	00:42:38	00:47:33	00:04:55
		AM peak	7:00-8:00	00:57:24	00:52:26	01:00:05	00:07:39
		Inter peak	10:00-11:00	00:48:36	00:45:57	00:49:58	00:04:01
		PM peak	16:00-17:00	01:00:01	00:56:36	01:03:05	00:06:29
	Jun-23	Off peak	19:00-20:00	00:47:01	00:44:45	00:49:08	00:04:23
		AM peak	7:00-8:00	00:52:12	00:49:09	00:55:11	00:06:02
		Inter peak	10:00-11:00	00:50:33	00:47:25	00:52:30	00:05:05
		PM peak	16:00-17:00	01:00:41	00:55:32	01:04:51	00:09:19
	Nov-23	Off peak	19:00-20:00	00:45:40	00:43:02	00:47:36	00:04:34
		AM peak	7:00-8:00	01:00:38	00:54:31	01:05:08	00:10:37
		Inter peak	10:00-11:00	00:50:38	00:47:49	00:53:28	00:05:39
		PM peak	16:00-17:00	01:02:25	00:56:50	01:08:06	00:11:16
	Jun-24	Off peak	19:00-20:00	00:48:45	00:46:14	00:50:35	00:04:21
		AM peak	7:00-8:00	00:55:43	00:53:53	00:58:01	00:04:08
		Inter peak	10:00-11:00	00:52:52	00:50:16	00:54:59	00:04:43
		PM peak	16:00-17:00	01:04:05	01:00:35	01:07:25	00:06:50

Table 2: General traffic journey time on A370 between Weston Interchange and Blackmoors Ln / Winterstoke Rd bus stops

General traffic journey times							
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Bristol-bound (Interchange to Winterstoke Rd)	Nov-22	Off peak	5:00-6:00	00:32:51	00:27:26	00:34:24	00:06:58
		AM peak	7:00-8:00	00:46:45	00:31:59	00:48:22	00:16:23
		Inter peak	13:00-14:00	00:43:13	00:32:32	00:43:43	00:11:11
		PM peak	15:00-16:00	00:49:18	00:32:49	00:50:48	00:17:59
	Jun-23	Off peak	5:00-6:00	00:32:11	00:26:50	00:33:57	00:07:07
		AM peak	7:00-8:00	00:45:53	00:31:33	00:46:57	00:15:24
		Inter peak	13:00-14:00	00:42:08	00:31:43	00:43:09	00:11:26
		PM peak	15:00-16:00	00:48:20	00:33:02	00:50:02	00:17:00
	Nov-23	Off peak	5:00-6:00	00:33:36	00:27:49	00:35:36	00:07:47
		AM peak	7:00-8:00	00:56:02	00:34:03	00:59:20	00:25:17
		Inter peak	13:00-14:00	00:43:04	00:32:06	00:44:57	00:12:51
		PM peak	15:00-16:00	00:51:49	00:33:50	00:54:05	00:20:15
	Jun-24	Off peak	5:00-6:00	00:33:33	00:27:27	00:35:43	00:08:16
		AM peak	7:00-8:00	00:45:44	00:31:48	00:48:32	00:16:44
		Inter peak	13:00-14:00	00:45:57	00:32:13	00:45:14	00:13:01
		PM peak	15:00-16:00	00:51:44	00:33:24	00:54:02	00:20:38
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Weston-bound (Blackmoors Lane to Interchange)	Nov-22	Off peak	19:00-20:00	00:37:39	00:30:09	00:39:04	00:08:55
		AM peak	7:00-8:00	00:39:24	00:30:23	00:40:36	00:10:13
		Inter peak	10:00-11:00	00:40:55	00:31:14	00:41:20	00:10:06
		PM peak	16:00-17:00	00:48:16	00:33:26	00:49:38	00:16:12
	Jun-23	Off peak	19:00-20:00	00:36:49	00:29:20	00:38:13	00:08:53
		AM peak	7:00-8:00	00:38:47	00:29:54	00:39:51	00:09:57
		Inter peak	10:00-11:00	00:40:42	00:31:20	00:41:56	00:10:36
		PM peak	16:00-17:00	00:51:19	00:32:55	00:53:18	00:20:23
	Nov-23	Off peak	19:00-20:00	00:39:16	00:30:50	00:41:10	00:10:20
		AM peak	7:00-8:00	00:42:23	00:31:16	00:44:01	00:12:45
		Inter peak	10:00-11:00	00:41:46	00:31:50	00:43:53	00:12:03
		PM peak	16:00-17:00	00:54:01	00:34:46	00:59:36	00:24:50
	Jun-24	Off peak	19:00-20:00	00:38:25	00:29:50	00:40:45	00:10:55
		AM peak	7:00-8:00	00:40:16	00:30:26	00:42:35	00:12:09
		Inter peak	10:00-11:00	00:41:45	00:31:51	00:44:01	00:12:10
		PM peak	16:00-17:00	00:50:25	00:33:11	00:51:31	00:18:20

Table 3: Bus journey times across Junction 21 and B3440 between Rolstone Turn and St. George's Turn

Bus journey times							
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Bristol-bound (St. George's Turn - Rolstone Turn) 0.9mi	Nov-22	Off peak	19:00-20:00	00:02:13	00:02:04	00:02:25	00:00:21
		AM peak	7:00-8:00	00:03:25	00:02:42	00:04:02	00:01:20
		Inter peak	10:00-11:00	00:02:18	00:02:04	00:02:24	00:00:20
		PM peak	16:00-17:00	00:03:13	00:02:30	00:03:28	00:00:58
	Jun-23	Off peak	19:00-20:00	00:02:14	00:01:59	00:02:30	00:00:31
		AM peak	7:00-8:00	00:03:42	00:02:53	00:04:25	00:01:32
		Inter peak	10:00-11:00	00:02:30	00:02:10	00:02:47	00:00:37
		PM peak	16:00-17:00	00:03:13	00:02:43	00:03:39	00:00:56
	Nov-23	Off peak	19:00-20:00	00:02:18	00:02:04	00:02:31	00:00:27
		AM peak	7:00-8:00	00:04:11	00:03:13	00:05:00	00:01:47
		Inter peak	10:00-11:00	00:02:25	00:02:09	00:02:42	00:00:33
		PM peak	16:00-17:00	00:03:06	00:02:35	00:03:22	00:00:47
	Jun-24	Off peak	19:00-20:00	00:02:16	00:02:07	00:02:27	00:00:20
		AM peak	7:00-8:00	00:03:36	00:02:44	00:04:24	00:01:40
		Inter peak	10:00-11:00	00:02:39	00:02:19	00:02:53	00:00:34
		PM peak	16:00-17:00	00:02:57	00:02:34	00:03:14	00:00:40
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Weston-bound (Rolstone Turn - St. George's Turn) 0.9mi	Nov-22	Off peak	19:00-20:00	00:02:07	00:01:52	00:02:17	00:00:25
		AM peak	8:00-9:00	00:02:05	00:01:49	00:02:16	00:00:27
		Inter peak	10:00-11:00	00:02:06	00:01:56	00:02:13	00:00:17
		PM peak	17:00-18:00	00:02:51	00:02:14	00:03:18	00:01:04
	Jun-23	Off peak	19:00-20:00	00:02:12	00:02:00	00:02:28	00:00:28
		AM peak	8:00-9:00	00:02:21	00:02:08	00:02:35	00:00:27
		Inter peak	10:00-11:00	00:02:14	00:02:03	00:02:23	00:00:20
		PM peak	17:00-18:00	00:03:00	00:02:16	00:03:51	00:01:35
	Nov-23	Off peak	19:00-20:00	00:02:14	00:02:01	00:02:29	00:00:28
		AM peak	8:00-9:00	00:02:24	00:02:09	00:02:34	00:00:25
		Inter peak	10:00-11:00	00:02:06	00:01:58	00:02:14	00:00:16
		PM peak	17:00-18:00	00:04:00	00:02:22	00:05:26	00:03:04
	Jun-24	Off peak	19:00-20:00	00:02:17	00:02:04	00:02:27	00:00:23
		AM peak	8:00-9:00	00:02:21	00:02:07	00:02:29	00:00:22
		Inter peak	10:00-11:00	00:02:17	00:02:05	00:02:27	00:00:22
		PM peak	17:00-18:00	00:03:37	00:02:23	00:04:51	00:02:28

Table 4: General traffic journey times across Junction 21 and B3440 between Rolstone Turn and St. George's Turn

General traffic journey times							
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Bristol-bound (St. George's Turn - Rolstone Turn) 0.9mi	Nov-22	Off peak	19:00-20:00	00:01:57	00:01:42	00:02:07	00:00:25
		AM peak	7:00-8:00	00:03:22	00:02:41	00:04:01	00:01:20
		Inter peak	10:00-11:00	00:02:10	00:01:56	00:02:18	00:00:22
		PM peak	16:00-17:00	00:02:49	00:02:20	00:02:57	00:00:37
	Jun-23	Off peak	19:00-20:00	00:01:57	00:01:46	00:02:06	00:00:20
		AM peak	7:00-8:00	00:03:23	00:02:35	00:04:05	00:01:30
		Inter peak	10:00-11:00	00:02:14	00:02:00	00:02:24	00:00:24
		PM peak	16:00-17:00	00:02:51	00:02:23	00:03:12	00:00:49
	Nov-23	Off peak	19:00-20:00	00:01:57	00:01:45	00:02:07	00:00:22
		AM peak	7:00-8:00	00:03:46	00:02:52	00:04:33	00:01:41
		Inter peak	10:00-11:00	00:02:10	00:01:56	00:02:20	00:00:24
		PM peak	16:00-17:00	00:03:05	00:02:26	00:03:20	00:00:54
	Jun-24	Off peak	19:00-20:00	00:01:56	00:01:44	00:02:05	00:00:21
		AM peak	7:00-8:00	00:03:14	00:02:28	00:03:50	00:01:22
		Inter peak	10:00-11:00	00:02:17	00:02:00	00:02:26	00:00:26
		PM peak	16:00-17:00	00:02:48	00:02:20	00:03:12	00:00:52
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Weston-bound (Rolstone Turn - St. George's Turn) 0.9mi	Nov-22	Off peak	19:00-20:00	00:02:04	00:01:49	00:02:15	00:00:26
		AM peak	8:00-9:00	00:02:15	00:01:59	00:02:28	00:00:29
		Inter peak	10:00-11:00	00:02:05	00:01:51	00:02:16	00:00:25
		PM peak	17:00-18:00	00:03:33	00:02:34	00:04:09	00:01:35
	Jun-23	Off peak	19:00-20:00	00:01:57	00:01:44	00:02:06	00:00:22
		AM peak	8:00-9:00	00:02:15	00:01:59	00:02:27	00:00:28
		Inter peak	10:00-11:00	00:02:04	00:01:51	00:02:13	00:00:22
		PM peak	17:00-18:00	00:03:13	00:02:18	00:04:03	00:01:45
	Nov-23	Off peak	19:00-20:00	00:02:09	00:01:51	00:02:19	00:00:28
		AM peak	8:00-9:00	00:02:31	00:02:05	00:02:44	00:00:39
		Inter peak	10:00-11:00	00:02:06	00:01:52	00:02:17	00:00:25
		PM peak	17:00-18:00	00:04:41	00:02:58	00:05:53	00:02:55
	Jun-24	Off peak	19:00-20:00	00:02:03	00:01:47	00:02:14	00:00:27
		AM peak	8:00-9:00	00:02:15	00:01:58	00:02:25	00:00:27
		Inter peak	10:00-11:00	00:02:08	00:01:53	00:02:19	00:00:26
		PM peak	17:00-18:00	00:03:44	00:02:28	00:04:50	00:02:22

Table 5: Bus journey times across Queensway junction between Worle Terminus and St. George's Turn

Bus journey times							
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Bristol-bound (Terminus - St. George's Turn) 0.4mi	Nov-22	Off peak	5:00-6:00	00:02:38	00:01:49	00:03:20	00:01:31
		AM peak	7:00-8:00	00:05:19	00:03:04	00:06:53	00:03:49
		Inter peak	10:00-11:00	00:02:44	00:01:52	00:03:15	00:01:23
		PM peak	16:00-17:00	00:04:04	00:02:59	00:04:46	00:01:47
	Jun-23	Off peak	5:00-6:00	00:01:51	00:01:36	00:02:02	00:00:26
		AM peak	7:00-8:00	00:04:47	00:02:21	00:05:07	00:02:46
		Inter peak	10:00-11:00	00:02:25	00:01:59	00:02:46	00:00:47
		PM peak	16:00-17:00	00:02:39	00:02:14	00:03:01	00:00:47
	Nov-23	Off peak	5:00-6:00	00:01:58	00:01:38	00:02:13	00:00:35
		AM peak	7:00-8:00	00:09:10	00:02:30	00:13:19	00:10:49
		Inter peak	10:00-11:00	00:02:27	00:02:02	00:02:52	00:00:50
		PM peak	16:00-17:00	00:03:16	00:02:32	00:03:48	00:01:16
	Jun-24	Off peak	5:00-6:00	00:02:06	00:01:45	00:02:20	00:00:35
		AM peak	7:00-8:00	00:03:59	00:02:19	00:05:19	00:03:00
		Inter peak	10:00-11:00	00:02:46	00:02:12	00:03:09	00:00:57
		PM peak	16:00-17:00	00:03:33	00:02:30	00:04:21	00:01:51
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Weston-bound (St. George's Turn - Terminus) 0.4mi	Nov-22	Off peak	20:00-21:00	00:01:44	00:01:26	00:01:58	00:00:32
		AM peak	8:00-9:00	00:02:09	00:01:45	00:02:29	00:00:44
		Inter peak	11:00-12:00	00:01:57	00:01:35	00:02:16	00:00:41
		PM peak	16:00-17:00	00:02:19	00:01:55	00:02:36	00:00:41
	Jun-23	Off peak	20:00-21:00	00:01:52	00:01:35	00:02:08	00:00:33
		AM peak	8:00-9:00	00:02:11	00:01:52	00:02:32	00:00:40
		Inter peak	11:00-12:00	00:02:06	00:01:45	00:02:26	00:00:41
		PM peak	16:00-17:00	00:02:24	00:01:57	00:02:49	00:00:52
	Nov-23	Off peak	20:00-21:00	00:01:53	00:01:33	00:02:10	00:00:37
		AM peak	8:00-9:00	00:02:40	00:02:06	00:03:11	00:01:05
		Inter peak	11:00-12:00	00:02:00	00:01:39	00:02:24	00:00:45
		PM peak	16:00-17:00	00:02:44	00:02:19	00:03:10	00:00:51
	Jun-24	Off peak	20:00-21:00	00:01:58	00:01:38	00:02:14	00:00:36
		AM peak	8:00-9:00	00:02:26	00:01:55	00:02:50	00:00:55
		Inter peak	11:00-12:00	00:02:10	00:01:43	00:02:28	00:00:45
		PM peak	16:00-17:00	00:02:44	00:02:08	00:03:02	00:00:54

Table 6: General traffic journey times across Queensway junction between Worle Terminus and St. George's Turn

General traffic journey times							
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Bristol-bound (Terminus - St. George's Turn) 0.4mi	Nov-22	Off peak	5:00-6:00	00:01:04	00:00:51	00:01:15	00:00:24
		AM peak	7:00-8:00	00:02:57	00:01:38	00:03:57	00:02:19
		Inter peak	10:00-11:00	00:01:29	00:01:07	00:01:44	00:00:37
		PM peak	16:00-17:00	00:02:06	00:01:24	00:02:26	00:01:02
	Jun-23	Off peak	5:00-6:00	00:01:04	00:00:52	00:01:15	00:00:23
		AM peak	7:00-8:00	00:02:40	00:01:23	00:03:21	00:01:58
		Inter peak	10:00-11:00	00:01:28	00:01:08	00:01:43	00:00:35
		PM peak	16:00-17:00	00:01:42	00:01:15	00:02:02	00:00:47
	Nov-23	Off peak	5:00-6:00	00:01:06	00:00:53	00:01:16	00:00:23
		AM peak	7:00-8:00	00:03:10	00:01:28	00:04:28	00:03:00
		Inter peak	10:00-11:00	00:01:29	00:01:08	00:01:46	00:00:38
		PM peak	16:00-17:00	00:02:09	00:01:30	00:02:37	00:01:07
	Jun-24	Off peak	5:00-6:00	00:01:04	00:00:52	00:01:14	00:00:22
		AM peak	7:00-8:00	00:02:20	00:01:24	00:02:46	00:01:22
		Inter peak	10:00-11:00	00:01:41	00:01:15	00:01:59	00:00:44
		PM peak	16:00-17:00	00:02:35	00:01:43	00:03:19	00:01:36
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
Weston-bound (St. George's Turn - Terminus) 0.4mi	Nov-22	Off peak	20:00-21:00	00:01:09	00:00:56	00:01:23	00:00:27
		AM peak	8:00-9:00	00:01:44	00:01:18	00:02:08	00:00:50
		Inter peak	11:00-12:00	00:01:20	00:01:03	00:01:35	00:00:32
		PM peak	16:00-17:00	00:01:48	00:01:26	00:02:08	00:00:42
	Jun-23	Off peak	20:00-21:00	00:01:09	00:00:56	00:01:21	00:00:25
		AM peak	8:00-9:00	00:01:43	00:01:18	00:02:05	00:00:47
		Inter peak	11:00-12:00	00:01:25	00:01:06	00:01:41	00:00:35
		PM peak	16:00-17:00	00:01:46	00:01:22	00:02:07	00:00:45
	Nov-23	Off peak	20:00-21:00	00:01:10	00:00:56	00:01:22	00:00:26
		AM peak	8:00-9:00	00:02:05	00:01:28	00:02:35	00:01:07
		Inter peak	11:00-12:00	00:01:26	00:01:06	00:01:42	00:00:36
		PM peak	16:00-17:00	00:02:14	00:01:45	00:02:41	00:00:56
	Jun-24	Off peak	20:00-21:00	00:01:09	00:00:54	00:01:21	00:00:27
		AM peak	8:00-9:00	00:01:50	00:01:22	00:02:11	00:00:49
		Inter peak	11:00-12:00	00:01:26	00:01:06	00:01:43	00:00:37
		PM peak	16:00-17:00	00:02:04	00:01:36	00:02:27	00:00:51

Table 7: Bus journey times for the W6 route between Thorn Close and Worle Terminus

Bus journey times							
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
W6 Terminus-bound* (Thorn Close - Terminus) 0.4mi	Nov-22	Off peak	18:00-19:00	n/a**			
		AM peak	8:00-9:00				
		Inter peak	11:00-12:00				
		PM peak	16:00-17:00				
	Jun-23	Off peak	18:00-19:00	00:02:02	00:01:50	00:02:12	00:00:22
		AM peak	8:00-9:00	00:02:49	00:02:13	00:03:19	00:01:06
		Inter peak	11:00-12:00	00:02:08	00:01:54	00:02:18	00:00:24
		PM peak	16:00-17:00	00:03:03	00:02:24	00:03:34	00:01:10
	Nov-23	Off peak	18:00-19:00	00:02:09	00:01:48	00:02:16	00:00:28
		AM peak	8:00-9:00	00:03:43	00:02:01	00:04:56	00:02:55
		Inter peak	11:00-12:00	00:01:52	00:01:39	00:02:02	00:00:23
		PM peak	16:00-17:00	00:02:03	00:01:42	00:02:22	00:00:40
	Jun-24	Off peak	18:00-19:00	00:01:56	00:01:40	00:02:02	00:00:22
		AM peak	8:00-9:00	00:02:00	00:01:47	00:02:11	00:00:24
		Inter peak	11:00-12:00	00:02:09	00:01:52	00:02:19	00:00:27
		PM peak	16:00-17:00	00:02:06	00:01:41	00:02:25	00:00:44

*Results might be skewed as data only contains between 30-50% of all trips

**Data availability too low to report results

Table 8: General traffic journey times between Thorn Close and Worle Terminus

General traffic journey times							
Direction	Date	Peak	Time	Mean	25th percentile	75th percentile	Variability
W6 Terminus-bound* (Thorn Close - Terminus) 0.4mi	Nov-22	Off peak	18:00-19:00	00:01:37	00:01:18	00:01:51	00:00:33
		AM peak	8:00-9:00	00:02:15	00:01:28	00:02:32	00:01:04
		Inter peak	11:00-12:00	00:01:25	00:01:14	00:01:34	00:00:20
		PM peak	16:00-17:00	00:02:32	00:01:55	00:03:06	00:01:11
	Jun-23	Off peak	18:00-19:00	00:01:41	00:01:16	00:01:53	00:00:37
		AM peak	8:00-9:00	00:01:58	00:01:20	00:02:21	00:01:01
		Inter peak	11:00-12:00	00:01:30	00:01:17	00:01:38	00:00:21
		PM peak	16:00-17:00	00:02:35	00:01:51	00:03:06	00:01:15
	Nov-23	Off peak	18:00-19:00	00:01:39	00:01:23	00:01:51	00:00:28
		AM peak	8:00-9:00	00:02:11	00:01:24	00:02:11	00:00:47
		Inter peak	11:00-12:00	00:01:26	00:01:17	00:01:33	00:00:16
		PM peak	16:00-17:00	00:02:03	00:01:40	00:02:20	00:00:40
	Jun-24	Off peak	18:00-19:00	00:01:32	00:01:17	00:01:45	00:00:28
		AM peak	8:00-9:00	00:01:36	00:01:19	00:01:47	00:00:28
		Inter peak	11:00-12:00	00:01:28	00:01:15	00:01:38	00:00:23
		PM peak	16:00-17:00	00:02:06	00:01:35	00:02:23	00:00:48