

6. Traffic and Transport

6.1 Introduction

- 6.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development with reference to Traffic and Transport. The chapter should be read in conjunction with **Chapter 2: Description of the Proposed Development** and with respect to relevant parts of other chapters including **Chapter 8: Air Quality**, where common receptors have been considered and where there is an overlap or relationship between the assessment of effects.
- 6.1.2 This chapter describes the assessment methodology; the baseline conditions existing at the application site; the mitigation measures required to prevent, reduce or offset likely significant effects; and the likely effects of the Proposed Development relating to access and movement.
- 6.1.3 A Transport Assessment (TA) has been submitted with the planning application and has been appended to this ES (refer to **Appendix 6A**). This chapter has been prepared on the basis of the detailed assessment reported in the TA and the reader is referred to the TA where further information is required. A suite of planning application documents has been submitted as part of the application which has also informed this chapter, including: Transport Assessment (TA), Draft Workplace Travel Plan (WTP), Parking Demand Study and Parking Strategy.
- 6.1.4 The TA (**Appendix 6A**) has been prepared in consultation with North Somerset Council (NSC), Bristol City Council (BCC), Bath and North-East Somerset (BaNES) and Highways England.
- 6.1.5 This chapter assesses the significant effects of the Proposed Development arising from the changes associated with the proposed 12 million passengers per annum (mppa) application over and above the permitted 10mppa consent.

Limitations of the assessment

- 6.1.6 The assumptions and technical limitations used in the preparation of the TA are set out in the TA (**Appendix 6A**).
- 6.1.7 As the emerging *West of England Joint Spatial Plan*¹ has yet to be adopted, additional traffic which may be added to the local highway network as a result of proposals outlined in the plan have not been accounted for within the modelled future traffic flows. The emerging *Joint Spatial Plan*¹ also extends to 2036, 10 years beyond the opening year of the Proposed Development and the period which has been considered within this assessment. Future traffic flows do incorporate growth associated with the currently adopted Local Plan² and which is therefore appropriate up to the opening year of 2026.
- 6.1.8 The assignment of traffic is undertaken using the transport modelling tool SATURN, which is a well-used and recognised industry wide tool used to inform and understand traffic movements and impacts. In this case, SATURN was used to identify the changes in traffic movements at specific junctions within the study area as a result of the Proposed Development. Not all road links are necessarily included within the model, with some very minor links which would not be expected to

¹ West of England Partnership (2017). West of England Joint Spatial Plan Publication Document, [online]. Available at: <https://www.jointplanningwofe.org.uk/consult/ti/JSPPublication/consultationHome> [Checked 31/07/18].

² North Somerset Council (January 2017). Core Strategy, [Online]. Available at: <https://www.n-somerset.gov.uk/wp-content/uploads/2015/11/Core-Strategy-adopted-version.pdf> [Checked 31/07/18].

be used by airport traffic, or links with slower recorded speeds, such as Brockley Lane (Link 5), having been omitted.

- 6.1.9 It is considered that the methodology used to inform this ES chapter provides a robust assessment of effects of the Proposed Development on highways. Local and strategic highway authorities have been engaged throughout the development of the methodology and subsequent assessment.

6.2 Relevant legislation, planning policy and technical guidance

Legislative context

- 6.2.1 The following legislation is relevant to the assessment of the effects on Traffic and Transport receptors:
- *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017* (as amended)³. Part 4 of Schedule 4 states that “A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health...” should be included within the environmental statement. Traffic and Transport has the potential to affect population and human health both directly e.g. through traffic collisions and indirectly through encouraging active travel.

Planning policy context

- 6.2.2 There are a number of policies and guidance documents at the national and local level that are relevant to the Traffic and Transport. In addition to policy referenced in **Chapter 5: Legislative and Policy Overview**, policy directly applicable to this technical specialism is listed in **Table 6.1**.

Table 6.1 Relevant policies and their implications for Traffic and Transport

Policy reference	Implications
National Planning Policy Framework (NPPF) 2018⁴	
Chapter 9	This paragraph relates to promoting sustainable transport and the importance of considering transport issues from an early stage in the development of a planning proposal.
Paragraph 109	States that “development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.”
Paragraph 111	Notes that “All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed”
National Planning Practice Guidance 2014⁵	
Travel Plans, Transport Assessments and Statements	This guidance sets out why travel plans, transport assessment and statements are important. It also outlines key principles to be taken into account in preparing a travel

³ The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

⁴ Ministry of Housing, Communities and Local Government (2018). National Planning Policy Framework, [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/728643/Revised_NPPF_2018.pdf [Checked 31/07/2018].

⁵ Ministry of Housing, Communities and Local Government (2014). National Planning Practice Guidance, [online]. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance> [Checked 31/07/18].

Policy reference	Implications
	plan, transport assessment or statement and ways in which these documents can be made to be as useful and accessible as possible, by ensuring that any information or assumptions should be set out clearly and be publicly accessible.
West of England Joint Spatial Plan Publication Document 2017⁶	
Policy 5 - Place Shaping Principles	Developments should provide and ensure access to infrastructure including public transport, that reduces the reliance on the use of the car.
West of England Joint Local Transport Plan 3 2011-2026⁷	
Box 2d Cross-boundary transport issues	Notes the following issues in relation to Bristol Airport: <ul style="list-style-type: none"> ● Accessibility from areas outside of the West of England; ● Promotion of rail/ coach link; and ● Congestion and road safety on the A38 corridor approaching the Airport from the south.
Box 7b Bristol Airport Surface Access Strategy	Notes current and future targets that Bristol Airport are progressing towards, a number of which have already been achieved. The purpose of this strategy is to make it easier to travel to Bristol Airport by public transport and other non-car modes.
North Somerset Council (NSC) Core Strategy January 2017⁸	
CS10 - Transportation and Movement	Policy states: <i>"Travel management policies and development proposals that encourage an improved and integrated transport network and allow for a wide choice of modes of transport as a means of access to jobs, homes, services and facilities will be encouraged and supported. Transport schemes should:</i> <ul style="list-style-type: none"> ● Enhance the facilities for pedestrians, including those with reduced mobility, and other users such as cyclists; ● Deliver better local bus, rail and rapid transit services in partnership with operators; ● Develop innovative and adaptable approaches to public transport in the rural areas of the district; ● Improve road and personal safety and environmental conditions; ● Reduce the adverse environmental impacts of transport and contribute towards carbon reduction; ● Mitigate against increased traffic congestion; and ● Improve connectivity within and between major towns both within and beyond North Somerset."
NSC Development Management Policies: Sites and Policies Plan Part 1 July 2016⁹	
DM24 – Safety, traffic and provision of infrastructure, etc. associated with development	Requires development to ensure that it will not prejudice highway safety or the operation of the highway network and that the impacts of new development are adequately mitigated. It outlines reasons as to why development may be refused on transport grounds where significant transport movements occur, this includes if it: <ul style="list-style-type: none"> ● "is likely to have a severe residual cumulative impact on traffic congestion or on the character and function of the surrounding area; or

⁶ West of England Partnership (2017). West of England Joint Spatial Plan Publication Document, [online]. Available at: <https://www.jointplanningwofe.org.uk/consult/ti/JSPPublication/consultationHome> [Checked 31/07/18].

⁷ West of England Partnership (2011). West of England Joint Local Transport Plan 3 2011-2016, [online]. Available at: <https://travelwest.info/projects/joint-local-transport-plan> [Checked 31/07/18].

⁸ North Somerset Council (January 2017). Core Strategy, [Online]. Available at: <https://www.n-somerset.gov.uk/wp-content/uploads/2015/11/Core-Strategy-adopted-version.pdf> [Checked 31/07/18].

⁹ North Somerset Council (July 2016). Sites and Policies Plan Part 1: Development Management Policies, [online]. Available at: <https://www.n-somerset.gov.uk/wp-content/uploads/2015/11/Sites-and-Policies-Plan-Part-1-Development-Management-Policies-July-2016.pdf> [Checked 01/08/18]

Policy reference	Implications
	<ul style="list-style-type: none"> is not accessible by non-car modes or cannot readily be integrated with public transport, cycleway and footpath links, and bridleways where appropriate. <p><i>Development which gives rise to a significant detrimental impact on travel patterns, or exacerbates existing transport problems, will only be permitted where acceptable counter measures or mitigation is possible"</i></p>
DM25 – Public rights of way, pedestrian and cycle access	Policy requires developments to protect and enhance the existing public rights of way network and strategic cycle routes and ensure the provision of new and improved multi-user routes connecting with new developments. It notes that development will only be permitted if it would not prejudice the implementation and continued use of strategic access routes.
DM26 – Travel Plans	Policy requires Travel Plans to be submitted for developments which generate significant amounts of movement.
North Somerset Council Supplementary Planning Documents	
<i>North Somerset Parking Standards November 2013</i> ¹⁰	This Supplementary Planning Document (SPD) defines and outlines NSC's approach to parking in new developments within North Somerset.
<i>Development Management Advise, Travel Plans November 2010</i> ¹¹	This SPD provides guidance on preparing Travel Plans associated with new development in North Somerset.

Technical guidance

6.2.3 A summary of the relevant technical guidance is given in **Table 6.2**.

Table 6.1 Technical guidance relevant to Traffic and Transport

Technical guidance reference	Summary of guidance
Guidelines for the Environmental Assessment of Road Traffic (1993) ¹²	<p>The Institute of Environmental Assessment published Guidelines for the Environmental Assessment of Road Traffic in 1993. These guidelines set out:</p> <ul style="list-style-type: none"> The aims of the guidelines; Environmental issues; Traffic issues; Determining the magnitude and significance of environmental impacts; Providing alternatives and mitigation; and Presentation of the ES.
Guidance on Transport Assessment (2007) ¹³	This guidance was withdrawn on the 22 October 2014 and superseded by "Transport evidence bases in plan making and decision taking". This

¹⁰ North Somerset Council (November 2013). Supplementary Planning Document, North Somerset Parking Standards, [online]. Available at: <https://www.n-somerset.gov.uk/wp-content/uploads/2015/11/parking-standards-supplementary-planning-document.pdf> [Checked 01/08/18].

¹¹ North Somerset Council (November 2010). Supplementary Planning Document, Development Management Advise, Travel Plans, [Online]. Available at: <https://www.n-somerset.gov.uk/wp-content/uploads/2015/11/travel-plans-supplementary-planning-document.pdf> [Checked 01/08/18]

¹² Institute of Environmental Assessment (1993). Guidance Notes No.1 – Guidelines for the Environmental Assessment of Road Traffic.

¹³ Department for Transport (2007). Guidance on Transport Assessments, [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/263054/guidance-transport-assessment.pdf [Checked 01/08/18].

Technical guidance reference	Summary of guidance
	new guidance is to help local planning authorities assess and reflect strategic transport needs in Local Plan making.
<i>Guidelines for Environmental Impact Assessment (2004)</i>¹⁴	This guidance is aimed at contributing to the improvement of environmental impact assessment (EIA) practice by setting out the requirements and the expectations relating to good practice.
<i>Design Manual for Roads and Bridges</i>¹⁵	Design Manual for Roads and Bridges (DMRB) Volume 11 sets out guidance for undertaking EIA. In particular, Section 3 sets out techniques to assess impact on various environmental aspects.

6.3 Data gathering methodology

Study area

- 6.3.1 An EIA should focus on the likely significant environmental effects of a development. While the Proposed Development will generate traffic across a very wide geographic area, likely significant effects will be more localised, as development traffic flows are highest at the site access and dissipate as they are distributed across the surrounding networks.
- 6.3.2 The TA (**Appendix 6A**) has undertaken an assessment of a study area which has been established through detailed scoping and engagement with key stakeholders, including local and strategic transport and highway authorities, as part of the pre-application process. The study area for the assessment of access and movement effects is based on the area where significant effects are possible.
- 6.3.3 The study area has been identified drawing from the *Guidelines for the Environmental Assessment of Road Traffic* ¹⁶ which notes the following rules in determining the scale and extent of the assessment:
- >30% increase in average 18-hour total vehicle annual average weekly traffic (AAWT) flows;
 - >30% increase in average 18-hour HGV AAWT flows; or
 - >10% increase in average 18-hour total vehicle AAWT flows in areas with sensitive receptors.
- 6.3.4 For the purposes of this assessment, 'sensitive receptors' have been defined as those which are categorised as medium, high or very high (refer to **Section 6.6** for further details).
- 6.3.5 Where there is less than a 10% change in traffic flow, it is unlikely that there will be any significant effects to sensitive receptors as such variance can occur on a daily basis.

¹⁴ Institute of Environmental Management and Assessment (2004). Guidelines for Environmental Impact Assessment, Institute of Environmental Management and Assessment, Lincoln.

¹⁵ Highways Agency (2008). Volume 11 - Design Manual for Roads and Bridges. Department of Environment, Transport and the Regions, [online]. Available at: <http://www.standardsforhighways.co.uk/ha/standards/dmr/vol11/section2.htm> [Checked 01/08/18].

¹⁶ Institute of Environmental Assessment (1993). Guidance Notes No.1 – Guidelines for the Environmental Assessment of Road Traffic.

- 6.3.6 In relation to effects on severance, pedestrian delay and amenity, and fear and intimidation, the study area is defined by the links shown on **Figure 6.2**.
- 6.3.7 The study area for the assessment of junction delays is based on traffic flows and potential effects identified in the junction assessment undertaken in the TA (**Appendix 6A**) which considers an agreed study area.
- 6.3.8 The study area used to assess the effects on accidents and road safety was agreed with NSC and Bristol City Council (BCC). The NSC study area encompasses the highway network surrounding Bristol Airport and nearby local villages including Yatton, Backwell, Claverham, Congresbury, Langford and Shipham. The BCC study area covers parts of south-west Bristol including the A4171, A3029, A38, Bishopsworth and Highridge. The study extent is presented on **Figures 7.6** and **7.7** in the TA (**Appendix 6A**). These study areas are based on those previously agreed and assessed for the previous 10mppa application and correspond to the traffic assignment of the proposals.

Desk study

- 6.3.9 A desk study was undertaken to determine baseline conditions including available public transport services, pedestrian and cyclist links, number and location of road collisions and the location of receptors.
- 6.3.10 A summary of the organisations that have supplied data, together with the nature of that data, is as follows:
- BAL:
 - ▶ 2009 planning application TA and ES (Application ref 09/P/1020/OT2);
 - ▶ Forecast flight schedules for 10mppa and 12mppa¹⁷;
 - ▶ 2017 staff travel survey results; and
 - ▶ Projected staff numbers and shift patterns.
 - CAA:
 - ▶ 2015 passenger survey results.
 - Sustrans National Cycle Network¹⁸:
 - ▶ Location of local cycle links.
 - Travel West¹⁹:
 - ▶ Bus service information.
 - Ordnance Survey (OS) Maps:
 - ▶ Location of highways, public rights of way (PRoW) and receptors (e.g. schools, care homes, hospitals).
 - Google Maps and Google Street View:

¹⁷ Data verified by Mott MacDonald

¹⁸ Sustrans National Cycle Network (2018) Sustrans, [online]. Available at: <https://www.sustrans.org.uk/> [Checked 20/10/18].

¹⁹ Travel West (2018). Travelwest, [online]. Available at: <https://travelwest.info/> [Checked 20/10/18].

- ▶ Location of highways, PRow and receptors (e.g. schools, care homes, hospitals).
- NSC:
 - ▶ Personal Injury Collision (PIC) data.
- BCC:
 - ▶ PIC data.
- Trip End Model Presentation Program (TEMPPro):
 - ▶ Industry standard tool for estimating trip growth.

Baseline data collection

6.3.11 A number of traffic surveys were undertaken on the highway network surrounding Bristol Airport, as agreed with NSC through the TA Scoping Report (refer to **Appendix B: Transport Assessment Scoping Report of Appendix 6A**) and subsequent engagement. Intelligent Data (ID) was commissioned to undertake Automated Traffic Count (ATC) and Classified Turning Count (CTC) surveys on the agreed links and junctions, as outlined in paragraph 6.4.9 – 6.4.10.

6.3.12 ATC surveys were carried out from 4 July to the 18 July 2018 and recorded 24-hour data. The locations of the ATCs are provided in **Figure 6.3**, the roads surveyed are as follows:

- A368 Dinghurst Road;
- A38 (North of Dinghurst Road);
- A368 Bath Road;
- A38 New Road;
- Brockley Lane;
- A370 Main Road (North);
- A370 Main Road (South);
- A370 (North of Colliters Way);
- A4174 Colliters Way (North);
- A38 Bridgwater Road (North);
- A4174 Colliters Way (South);
- A38 (North of West Lane);
- Barrow Street;
- West Lane;
- Downside Road;
- A38 (South of Silver Zone Car Park);
- Barrow Lane; and
- Hyatt's Wood Road.

6.3.13 CTC surveys were completed during the period between 10 July and 12 July 2018 at the following junctions:

- A38 signal junction with A368;
- A370 signal junction with Brockley Combe Road and Brockley Lane;
- A370 roundabout with A4174 Colliters Way;
- A38 roundabout with A4174 Colliters Way;
- A38 signal junction with Barrow Street;
- Downside Road junction with Bristol Airport;
- A38 junction with West Lane / A38 junction with Downside Road;
- A38 roundabout with Bristol Airport; and
- A38 roundabout with Silver Zone Car Parking.

6.3.14 The results of the ATC and CTC surveys were used to determine current baseline traffic flows occurring on key links and junctions within the study area and to model future traffic flows.

Future Baseline 'Without Development' (10mppa) and 'With Development' (12mppa) trip generation methodology

6.3.15 The methodology provides a robust assessment of the predicted transport impacts of the Proposed Development. The future baseline has been established using the following data sources:

- 24-hour classified turning counts carried out in July 2018 by Intelligent Data Collection Limited (ID);
- Employee Travel Survey (2017);
- CAA survey data (2015);
- CAA published data (2017);
- Bristol Airport ticket scanning data (2017);
- Bristol Airport published data; and
- Bristol Airport commercial data (2017).

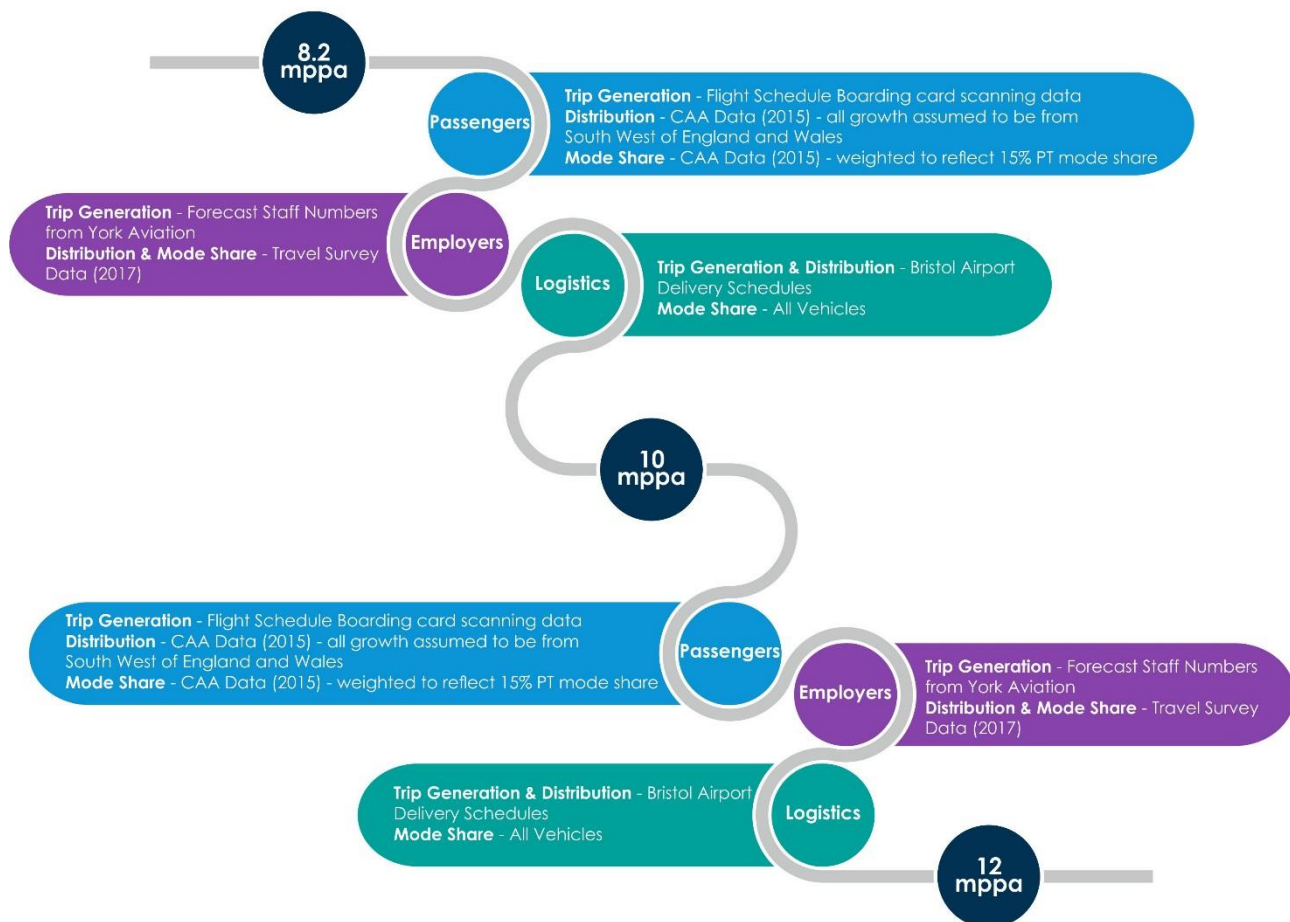
6.3.16 The assessment considers the net impact of the following three trip generators:

- Passengers;
- Staff; and
- Logistics/Operations.

6.3.17 **Section 5.2** of the Transport Assessment details the full methodology followed to establish a future baseline trip generation.

6.3.18 **Figure 6.4** demonstrates the trip generation process and sources of data used for each stage.

Figure 6.4 Trip generation methodology



- 6.3.19 The assessment focuses on the transport implications of the growth of Bristol Airport between the consented 10 mppa and the forecast 12 mppa.
- 6.3.20 Passenger trips have been calculated using a peak-week flight schedule in August, which provides the number of Arline seats available by hour. This has been used as a trip attractor, and the daily profile has been adjusted using terminal 'dwell time' information – i.e. the amount of time passengers spend inside the Bristol Airport terminal before or after a flight.
- 6.3.21 The daily profile of passengers has been distributed using the most recent CAA survey data from 2015, which provides surface origin and destination information. Mode share information by origin and destination has been applied to the passenger numbers to determine the number of journeys across the study area by each mode, by hour, but capped to an overall average of 15% by public transport.
- 6.3.22 Employee trips have been calculated similarly, using a peak estimation of Full Time Equivalents (FTEs) for August. Shift pattern information from Bristol Airport business partners has been used to quantify the proportion of FTEs that travel to Bristol Airport on any given day. The start and finish times have been used to create a daily profile of employee trips.
- 6.3.23 The 2017 Employee Travel Survey provides information on employee origin and destination, and method of travel to work, which has been applied to the FTE daily profile.
- 6.3.24 For logistics, information on fuel, car rental and operations deliveries have been quantified by BAL and business partners. Which were used to generate vehicle trip profiles for an average day.

6.3.25 The above has been carried out for the existing Bristol Airport operation, and for the consented 10 mppa and 12 mppa Development Proposals. Chapters 8 and 10 of the TA (**Appendix 6A**) detail the forecast trip generation for the 10 mppa and 12 mppa scenarios, to determine the net trip generation resulting from the Development Proposals.

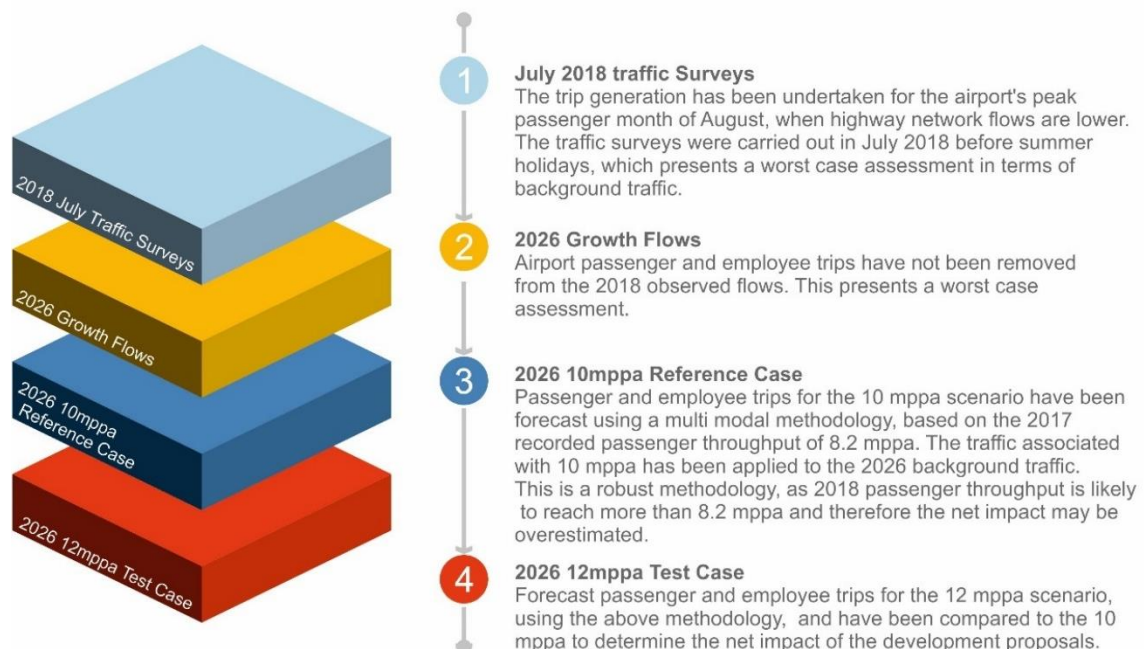
Assessment scenarios

6.3.26 The following scenarios have been assessed:

- 2026 reference case (10 mppa); and
- 2026 test case (12 mppa).

6.3.27 **Figure 6.5** demonstrates the highway network assessment methodology.

Figure 6.5: Highway network assessment methodology



6.4 Overall baseline

6.4.1 This section summarises current baseline conditions and how it is expected to evolve by 2026 (the year at which 12 mppa is anticipated to be reached), due to projected increases in traffic flows on the local highway network.

Current baseline

Highway network

6.4.2 The location of Bristol Airport within the context of the local highway network is illustrated on **Figure 6.6**.

6.4.3 Primary access to Bristol Airport is provided by two roundabouts on the A38. The northern roundabout provides access to the northern parts of Bristol Airport including the main terminal building, passenger pick up and drop off areas, current administration buildings, hotel and

operational facilities and both short and long stay parking areas. This is also the main access for public transport links to Bristol Airport.

- 6.4.4 The southern roundabout primarily provides access to Silver Zone long-stay car parking, the staff and visitor car park, aircraft maintenance areas, the Bristol and Wessex Aeroplane Club, Bristol Flying Centre and Western Power Distribution Helicopter Unit.
- 6.4.5 The A38 borders Bristol Airport to the east and runs in a north-east/ south-west direction. It provides a connection between Bristol City Centre and Taunton, connects to the M5 at Junction 22, to Weston-Super-Mare via the A368 and A370 and also provides connections to many North Somerset villages such as Langford, Pottershill and Sidcot. The M5 motorway is located approximately 11km west of Bristol Airport.
- 6.4.6 The A38 is predominantly single carriageway with speed limits that vary along its length (60mph to 30mph), passing through a number of settlements where the speed limit is reduced. A speed limit of 40mph and 50mph is in place on the carriageway adjacent to Bristol Airport at the northern and southern roundabouts respectively.
- 6.4.7 Downside Road, located along the northern boundary of Bristol Airport, connects the A38 to the A370 near Brockley. Downside Road passes through a small residential area, the properties of which are divided between the villages of Lulsgate Bottom and Downside. The A370 connects Bristol City centre and Weston-Super-Mare, via M5 Junction 21, passing to the west of Bristol Airport. There are several villages located along this route including Cleeve, Congresbury, Brockley and Backwell. The route also provides connections onto Yatton and Nailsea.

Baseline Traffic Flows

- 6.4.8 **Table 6.3** shows the two-way baseline traffic flows for 2018 presented as AAWT for 18-hour flows for all traffic and Heavy Goods Vehicles (HGVs), on links within the study area. The location of these links are presented in **Figure 6.2**.

Table 6.3 Baseline traffic flows

Link	Name	2018 All Traffic 18 hr AAWT	HGV 18 hr AAWT	% HGV Composition
1	A368 Dinghurst Road	7,995	413	5.2%
2	A38 New Road	14,970	642	4.3%
3	A368 Bath Road	5,463	401	7.3%
4	A38 (North of Dinghurst Road)	17,553	954	5.4%
5	Brockley Lane	1,573	59	3.7%
6	A370 Main Road (North)	13,552	688	5.1%
7	A370 Main Road (South)	16,456	744	4.5%
8	A370 (North of Colliters Way)	34,066	1,240	3.6%
9	A4174 Colliters Way (North)	23,590	1,080	4.6%
10	A38 Bridgwater Road (North)	11,659	580	5.0%
11	A4174 Colliters Way (South)	17,339	883	5.1%
12	A38 (North of West Lane)	23,751	971	4.1%

Link	Name	2018 All Traffic 18 hr AAWT	HGV 18 hr AAWT	% HGV Composition
13	Barrow Street	4,689	151	3.2%
14	West Lane	5,707	75	1.3%
15	Downside Road	6,081	228	3.8%
16	A38 (South of Silver Zone)	17,675	751	4.3%
17	Barrow Lane	3,499	95	2.7%
18	Hyatt's Wood Road	1,645	28	1.7%

Pedestrian and cycle network

- 6.4.9 Bristol Airport is located approximately 11km from Bristol City Centre and 18km from Weston super-Mare, which are the two closest main urban areas. There are also 13 villages within a 5km radius of Bristol Airport.
- 6.4.10 A pedestrian footway is provided on one or both sides of the A38 from Bristol City Centre to Bristol Airport, although the distance of the journey (~10km) makes walking trips between the two unlikely.
- 6.4.11 The footway along the A38 does not extend south of Bristol Airport for any substantial distance (approximately 40m) and there is a lack of formal pedestrian crossing points; making walking to Bristol Airport from Redhill, Wrington and other villages to the south less attractive. The absence of such crossings reflects the relatively rural location of these routes and the limited pedestrian movements in this location.
- 6.4.12 The extent of footways along the A38 and other main traffic routes are shown in **Figure 6.7**.
- 6.4.13 The A38 creates a degree of severance when passing through villages, given the lack of formal crossing points and relatively busy nature of the route. Potters Hill and Langford have no formal crossing points; however, there is one informal crossing point with an island located at the northern edge of the latter settlement. Lulsgate Bottom has a signalised crossing with dropped curbs, while there is also a dropped curb crossing on the north side of the A38 roundabout with Bristol Airport.
- 6.4.14 There are a number of PRoW and bridleways in the immediate vicinity of the application site which are primarily off road and so unlikely to be affected by changes in traffic flow. However, some pedestrians may be required to cross major traffic routes (such as the A38) where there are no nearby crossing facilities available to reach the linking PRoW on the opposite side.
- 6.4.15 Footpaths LA2/37/10/XG2 and LA2/37/10/X and bridleway LA19/77/70 are located north of Bristol Airport, on a section of the A38 where improvements works are proposed. Users of these PRoW could therefore potentially experience some disruption during the construction phase whilst these works are being undertaken.
- 6.4.16 The application site is situated to the south of National Cycle Route (NCR) 410 (Avon Cycleway); this is an on-road cycle route which has a small traffic free section where it runs along the A38 through Lulsgate Bottom. There is also an on-road cycle path (~1m wide) at the Downside Road/A38 junction which does not form part of this route.
- 6.4.17 The Avon Cycleway provides connections to settlements to the east and west of Bristol Airport including Brockley, Clevedon and Chew Stoke. It also connects to NCR 334 and NCR 26 which provide further connections to the north and south and to towns and cities such as Bristol, Yatton and Portishead. A map of the local strategic cycle network is presented in **Figure 6.8**.

- 6.4.18 Cycle facilities are available at Bristol Airport which consist of bicycle racks and a secure cycle store, situated at the Administration building and bicycle racks adjacent to the Staff Transport Hub. There are also shower facilities available for use, upon request, by employees and passengers.

Public transport network

Bus and coach services

- 6.4.19 The main bus stops at Bristol Airport are located directly outside of the main terminal building. Clear signage is provided within the airport which directs passengers to the bus stops and a departure board showing live bus times is also provided within the terminal building. Less frequent rural routes do not enter the airport itself but instead serve stops at Lulsgate Bottom on the A38, which is a short walk from Bristol Airport.
- 6.4.20 The bus services from Bristol Airport provide a range of connections to Bristol, Weston-super-Mare and Bath (services every 10 minutes to one hour) and also to surrounding local towns and villages such as Chew Magna, Congresbury and Yatton (one to 10 journeys per day).
- 6.4.21 Coach services are also available to Cardiff, Plymouth, London and Penzance (hourly to daily). The frequency of the bus and coach services from Bristol Airport can be found in **Table 6.4**.

Table 6.4 Bristol Airport bus and coach services

Service	Route	Frequency - Mon -Sat (daytime)	Frequency - Evenings and Sundays
135	Chew Stoke – Chew Magna – Winford – Lulsgate – Wrington – Congresbury – Weston-super-Mare	1 journey (Friday)	No service
672	Blagdon – Wrington – Lulsgate – Bedminster – Bristol	1-2 journeys	No service
A1 – Airport Flyer	Bristol Airport– Bristol	10 minutes	15 minutes (Sunday), 20 minutes (evening), 60 minutes (night)
A2	Bristol Airport – Bedminster – Bristol	30 minutes	30 minutes
A3 - Airport Flyer	Weston-super-Mare – Worle – Congresbury – Bristol Airport	60 minutes	60 minutes
A4 - Air Decker	Bath – Saltford – Keynsham – Brislington – Hengrove – Bristol Airport	30 minutes	30 minutes
A5	Winford – Felton – Bristol Airport – Wrington then either Congresbury – Yatton or Churchill – Winscombe	10 journeys (Monday-Friday)	No service
216	Cardiff – Newport – Bristol Airport	120 minutes	120 minutes
404	London – Heathrow Airport – Chippenham – Bath – Bristol Airport – Exeter – Newton Abbot – Torbay – Totnes – Plymouth – Truro – Falmouth – Penzance	No service	1 journey per evening
Falcon	Bristol – Bristol Airport – Bridgwater – Taunton – Cullompton – Exeter – Plymouth	60 minutes	120 minutes (evening), 60 minutes (Sunday)

- 6.4.22 The A1 'Airport Flyer' is the main bus service which runs from central Bristol to Bristol Airport and has the highest journey frequency. It provides connections to the Temple Meads train station and

Bristol bus station which allow for onward connections to the rest of the South West, Wales, London, the South Coast and the Midlands.

6.4.23

As well as providing transport links to Bristol Airport, the airport buses also provide key transport links for those living in the surrounding towns and villages. To help to further encourage the Airport's role as a public transport hub where residents of local villages can access the Airport Flyer services, a concessionary scheme for residents of selected areas of the local community is available for subsidised travel (up to a 60% reduction on fares) on services A1, A2 and A3 between Bristol Airport, Bristol and Weston-super-Mare for anyone living permanently in the following postcode areas:

- BS25 - Sandford and Winscombe;
- BS29 - Banwell;
- BS40 - Chew Valley and Blagdon;
- BS41 - Dundry;
- BS48 - Nailsea and Backwell; and
- BS49 - Yatton and Congresbury.

6.4.24

Eligible residents in these areas who are Diamond Card (English National Concessionary Travel Scheme (ENCTS)) holders, including the elderly and disabled, are able to travel free of charge on services A1, A2 and A3 at any time on production of a valid Diamond Card, although for the A1 and A3 services this is also subject to the production of Bristol Airport's concessionary travel scheme card.

National rail services

6.4.25

There is no rail station located at Bristol Airport, however there are nine stations located within 25km, most of which can be reached by bus services available from Bristol Airport (refer to **Table 6.5**).

Table 6.5 **National Rail Stations**

Station	Distance (km)	Bus Route	Journey Time (off peak)	Bus Frequency (off peak)
Nailsea and Backwell	4.5	None	n/a	n/a
Yatton	8.0	A5	43 minutes	Hourly
Parson Street	8.9	A1	14 minutes	Every 10 minutes
Bedminster	10.0	A1	21 minutes	Every 10 minutes
Bristol Temple Meads	11.4	A1	29 minutes	Every 10 minutes
Worle	14.2	A3	28 minutes	Hourly
Weston Milton	16.6	A3	35 minutes	Hourly
Weston-super-Mare	18.8	A3	44 minutes	Hourly
Bath Spa	24.6	A4	70 minutes	Half Hourly

- 6.4.26 The closest train station to Bristol Airport is Nailsea and Backwell, located less than 5km away. There is currently no direct bus service which runs between this station and Bristol Airport.
- 6.4.27 The next closest train station is located in Yatton. However, the journey time by bus to Bristol Airport from this station is longer than the bus journey time from train stations in Bristol such as Parsons Street, Bedminster and Bristol Temple Meads.
- 6.4.28 Parson Street and Bedminster stations, although slightly closer than Bristol Temple Meads, have limited services since they are local train stations. However, they do offer an hourly service between Bristol and Weston-super-Mare. Bristol Temple Meads is the main national rail station in the area and offers a wider choice of destinations and more frequent trains than the other stations in the area. Bristol Temple Meads can be reached from Bristol Airport using the A1 service which runs 24-hours a day, seven days a week. The destinations and frequencies of services available at Bristol Temple Meads are presented in **Table 6.6**.
- 6.4.29 Bath Spa bus station is located adjacent to the railway station and is connected to Bristol Airport by frequent service A4, although the journey time is longer (50-70 minutes) than connections to other stations. Onward journeys by train to Swindon, London Paddington and the South Coast are still likely to be quicker via Bristol Temple Meads.

Table 6.6 National Rail Services

Operator	Route	Frequency Mon – Sat (daytime)	Frequency – Evening and Sunday
Great Western Railway	Swindon, Reading, London Paddington	2 per hour	1-2 per hour
	Newport, Cardiff Central	2 per hour	1 per hour
	Salisbury, Southampton Central, Portsmouth and Southsea	1 per hour	1 per hour
	Weston-super-Mare	2 per hour	1 per hour
	Clifton Down, Avonmouth (some services continue to Severn Beach)	2 per hour	1 per hour
	Frome, Dorchester West, Weymouth	1 per 2 hours	4 journeys per day
	Worcester Shrub Hill, Great Malvern	1 per 2 hours	5-6 journeys per day
	Havant, Chichester, Brighton	1-2 journeys per day	3 journeys per day
	Exeter St. Davids, Plymouth (some services continue to Cornwall)	1-2 per hour	1-2 per hour
Cross Country	Cheltenham Spa, Birmingham New Street	2 per hour	2 per hour
	Stoke-on-Trent, Manchester Piccadilly	1 per hour	1 per hour
	Derby, Sheffield, Leeds, York, Newcastle, Edinburgh (some services continue to Glasgow)	1 per hour	1 per hour
South Western	Andover, Basingstoke, London Waterloo	3 journeys per day	1 journey per day

Accident data

- 6.4.30 The study area for the PIC data was agreed with NSC and BCC as part of the TA scoping process. The PIC records for NSC cover a 54-month period from 01 January 2014 to the 30 June 2018 and

the PIC records from BCC covers a 60-month period from 01 October 2013 to the 30 September 2018. This data is presented within the TA (**Appendix 6A**) and a summary provided in **Section 6.14**.

Future baseline

- 6.4.31 As traffic levels will increase by 2026, the current survey year (2018) does not provide a robust baseline for the assessment of the Proposed Development. Therefore, the 'without development' scenario for 2026 (including the consented growth to 10mppa) was considered to be the most suitable baseline to be used in this assessment. This approach was agreed for the TA (**Appendix 6A**) with NSC.
- 6.4.32 This future baseline has factored in traffic growth using TEMPro which has accounted for committed development allocated within the NSC adopted Local Plan and overall traffic growth predicted on the surrounding highway network. TEMPro has been used with the National Traffic Model (NTM) database for the North Somerset area to identify growth between 2018 and 2026. The resulting 2026 factors are set out in **Table 6.7**.

Table 6.7 TEMPro NTM adjusted traffic growth (2018 to 2026)

Level	07:00-10:00	10:00-16:00	16:00-19:00	00:00-07:00 19:00-00:00
South West	1.1295	1.1416	1.1270	1.1205
Somerset	1.1319	1.1483	1.1307	1.1248
North Somerset	1.1420	1.1628	1.1422	1.1368

- 6.4.33 Future baseline traffic flows are presented in **Table 6.8** (note that the % HGV composition remains unchanged from the current baseline presented in **Table 6.3**).

Table 6.8 Study area 2026 future baseline traffic flows

Link	Name	2026 All Traffic 18 hr AAWT - Without Development	2026 HGV 18 hr AAWT – Without Development	% HGV Composition
1	A368 Dinghurst Road	9,156	473	5.2%
2	A38 New Road	17,919	768	4.3%
3	A368 Bath Road	6,218	457	7.3%
4	A38 (North of Dinghurst Road)	20,916	1,137	5.4%
5	Brockley Lane	1,791	67	3.7
6	A370 Main Road (North)	15,424	783	5.1%
7	A370 Main Road (South)	19,069	862	4.5%
8	A370 (North of Colliters Way)	40,176	1,462	3.6%

Link	Name	2026 All Traffic 18 hr AAWT - Without Development	2026 HGV 18 hr AAWT – Without Development	% HGV Composition
9	A4174 Colliters Way (North)	28,253	1,293	4.6%
10	A38 Bridgwater Road (North)	14,415	718	5.0%
11	A4174 Colliters Way (South)	19,734	1,005	5.1%
12	A38 (North of West Lane)	29,582	1,210	4.1%
13	Barrow Street	5,337	172	3.2%
14	West Lane	7,077	94	1.3%
15	Downside Road	7,261	273	3.8%
16	A38 (South of Silver Zone)	21,055	895	4.3%
17	Barrow Lane	3,982	108	2.7%
18	Hyatt's Wood Road	1,873	32	1.7%

6.4.34 As part of the consented 10mppa development for Bristol Airport, a number of public transport services were agreed to be provided to support growth in sustainable modes of travel. These include:

- Eight buses an hour to Bristol City Centre;
- Two buses an hour to Weston-super-Mare;
- Develop proposals for services to Bath and Devon;
- Develop proposals for services to South Wales; and
- Set up a public transport fund to support local services.

6.4.35 At present, there are currently eight buses an hour available to Bristol, one to Weston-super-Mare, two to Bath and one to Plymouth in Devon. There is also one coach every two hours to Cardiff in south Wales.

6.4.36 BAL has also set up a public transport fund which supports the A5 local bus service providing connections between the local villages surrounding Bristol Airport.

6.5 Consultation

6.5.1 **Table 6.9** provides a summary of the Traffic and Transport issues about the Proposed Development that have been raised by consultees and the responses given.

6.5.2 Further to this, pre-application consultation has been undertaken in regard to the scope, methodology and assessment contained within the TA (**Appendix 6A**). This has been determined through detailed scoping and engagement with key stakeholders including NSC, BCC, BaNES, Highways England and Somerset County Council (SCC) as part of a formal and requisite pre-application process.

- 6.5.3 The TA Scoping Report was submitted on 15 August 2018 to the key stakeholders. The report was formally commented on by NSC and a response was submitted on 21 October 2018. The report, comments and responses are contained within Appendix B of the TA (**Appendix 6A**)

Table 6.9 Summary of issues raised during consultation regarding Traffic and Transport

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
<i>Traffic impact generated by the development proposals on the SRN, including the M5 and its junctions within North Somerset, and the local road network should be considered</i>	Backwell Parish Council	The location of links to be considered within the wider TA (Appendix 6A) have been agreed with NSC, BaNES and Highways England. This study area has been used to inform this assessment and has included impacts to the local and strategic highway network surrounding Bristol Airport.	Section 6.7 and Section 6.10 – 6.14
<i>The cumulative impact of added traffic on the road network system passing through the AONB should be assessed</i>	Mendip Hills Area of Outstanding Natural Beauty (AONB) Partnership	The study area for this assessment has been based on areas where traffic flows are predicted to change by >5%, a more conservative value than the 10% change suggested in IEMA guidance ¹² (10%). The modelled future traffic flows for 2026 have included committed developments and allocations included within the adopted NSC Local Plan. It is not predicted that traffic links within this AONB will experience changes in traffic flows of greater than 5% (links 1,2 and 3 are the closest links to the AONB and experience changes of <5%, changes are likely to lessen with distance from Bristol Airport) and therefore this has not been considered further within this assessment.	Section 6.7
<i>Highways England's primary considerations relate to the additional demand on the Strategic Road Network, particularly the M5 and its junctions, generated by growth to 12mppa and the impact of the car park expansions on the Airport's surface access strategy.</i>	Highways England	Links and junctions to be considered within the wider TA (Appendix 6A) have been agreed with Highways England. The assessment has included consideration of impacts on the strategic road network, in particular this has focussed on M5 Junctions 19 and 21 which were identified by Highways England. The proposed car parking requirement is informed by car park demand work undertaken by Teneo (Appendix 6A).	Section 6.7 and Section 6.10 – 6.14
<i>An assessment of transport related impacts of the proposal should be carried out and reported as described in the current Department for Communities and Local Government (DCLG) guidance on 'Travel Plans, Transport Assessments and Statements in decision-taking'</i>	Highways England	This DCLG guidance has been used to inform the TA (Appendix 6A) and assessment presented in this chapter.	Section 6.3
<i>A number of additional guidance documents could be used to inform the assessment, including the Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Impact Assessment (IEMA 2004), Guidance on Transport Assessment (DfT 2007) and DMRB Volume 11 Section 2 Part 15</i>	NCS	The methodology and assessment presented in this chapter is based upon best practice guidance, including the guidance noted by NCS.	Section 6.3, 6.7 and 6.9

Issue raised	Consultee(s)	Response and how considered in this chapter	Section Ref
<i>The ES should include details of the consultees who will be engaged in the EIA process and clarify the roles and responsibilities of each party involved in the scoping of both the EIA and the TA</i>	NSC	This chapter includes details of the consultees who have been engaged in agreeing the scope of the EIA with regard to traffic and transport. A summary of consultees involved in the scoping of the TA is also provided, further details are presented in the TA (see Appendix 6A). Where details are available, roles and responsibilities of these consultees have been included.	Section 6.6
<i>Clarification on the study area (to be considered within the EIA) should be provided</i>	NSC	The study area for this assessment has been defined based on the study area agreed for the TA (Appendix 6A) and using guidance provided by IEMA ¹² to refine this study area to determine where there may be potential for significant effects to occur.	Section 6.5 and 6.7
<i>Information could be expanded further to consider a wider public transport network (including air connections); and should also include details of sensitive receptors e.g. residential properties, schools and care homes and non-motorised user (NMU) networks</i>	NSC	The assessment presented in this chapter focuses on the environmental impacts that may occur to public transport networks in the local area, as per the study area agreed with NSC, BaNES and Highways England. Details on the location and potential impacts to sensitive receptors within the study area are provided.	Section 6.7 and Section 6.10 – 6.14
<i>Effects should include both construction phase and operational phase impacts</i>	NSC	Both construction and operational phases have been considered within the assessment.	Section 6.9 – Section 6.14
<i>Clarification could be sought as to how the 2018 baseline relates to the proposal to include consented and permitted development within the baseline</i>	NSC	As in the TA (Appendix 6A), this assessment focuses on the comparison of effects between the 'with development' scenario and 'without the development' scenario in 2026, when the 12mppa is anticipated to be reached.	Section 6.5
<i>Information should be provided as to how magnitude of impact to different receptors is assigned</i>	NSC	How magnitude is assigned for each assessment criteria is outlined within the methodology.	Section 6.9
<i>Assuming hazardous loads are moved in accordance with relevant best practice and legislation there is unlikely to be a potential for significant environmental effects</i>	NSC	Hazardous loads (e.g. aviation fuel) have been scoped out of the assessment. It is anticipated that such loads will be moved in accordance with current procedures undertaken at Bristol Airport such as the Joint Inspection Group (JIG) 1 – Aviation Fuel Quality Control and Operating Standards for Into-Plane Fuelling Services and JIG 2 – Aviation Fuel Quality Control and Operating Standards for Airport Depots. Fuel is also handled and moved in accordance with Energy Institute guidance and a Safety Management System document is implemented by North Air which includes undertaking regular reviews and audits to maintain safe working practices.	Section 6.7

6.6 Scope of the assessment

- 6.6.1 The following section outlines the scope of the assessment which is based on that agreed for the TA (**Appendix 6A**) with BCC, NSC, BaNES and Highways England via the formal EIA scoping process with NSC. This scope has been refined to determine where there is potential for significant effects to occur, utilising guidance outlined in **Section 6.2**.

Spatial scope

- 6.6.2 The spatial scope of the assessment of Traffic and Transport covers the area of the Proposed Development, together with the Zones of Influence (ZoIs) that have formed the basis of the study area described in **Section 6.3**.
- 6.6.3 The agreed study area for the TA (**Appendix 6A**) has been refined based on IEA guidance¹² to identify where there is potential for significant effects to occur and determine an appropriate spatial scope for the assessment of Traffic and Transport effects.
- 6.6.4 BAL has confirmed that annual passenger growth at Bristol Airport has been achieved primarily from the South West and Wales. In 2017, 77.2% of passengers were from the South West and 18.8% were from Wales²⁰. It is anticipated that this trend will continue as new flight destinations are offered from Bristol Airport in the future. Other airports in England and Wales will also be offering travel to new destinations in the future, limiting the potential for Bristol Airport's catchment to increase.
- 6.6.5 Further still, in the peak air travel month of August 2017, over 55% of passengers who travelled from the South West region were from the City of Bristol or Somerset (refer to **Appendix 6A** for further details).
- 6.6.6 **Table 6.10** shows the changes in traffic flows anticipated as a result of the Proposed Development, with the resulting changes used to inform the spatial scope of the assessment. This compares the 'without development' traffic flows (though this includes the consented growth to 10mppa) with the 'with development' traffic flows for 2026 (i.e. including the additional traffic flows associated with the Proposed Development to facilitate 12mppa).

²⁰ CAA passenger survey (2015) at Bristol Airport.

Table 6.10 Predicted changes in traffic flows due to operation of the Proposed Development

Link	Name	2026 All Traffic 18hr AAWT – Without Development	2026 All Traffic 18 hr AAWT - With Development	2026 HGV 18 hr AAWT - Without Development	2026 HGV 18 hr AAWT - With Development	% Change in All Traffic 18hr AAWT	% Change in HGV 18hr AAWT
1	A368 Dinghurst Road	9,156	9,219	473	473	0.7%	0.0%
2	A38 New Road	17,919	18,899	768	768	5.5%	0.0%
3	A368 Bath Road	6,218	6,218	457	457	0.0%	0.0%
4	A38 (North of Dinghurst Road)	20,916	21,959	1,137	1,137	5.0%	0.0%
5	Brockley Lane	1,791	1,791	67	67	0.0%	0.0%
6	A370 Main Road (North)	15,424	15,424	783	783	0.0%	0.0%
7	A370 Main Road (South)	19,069	19,448	862	862	2.0%	0.0%
8	A370 (North of Colliters Way)	40,176	41,736	1,462	1,482	3.9%	1.3%
9	A4174 Colliters Way (North)	28,253	29,813	1,293	1,313	5.5%	1.5%
10	A38 Bridgwater Road (North)	14,415	15,689	718	718	8.8%	0.0%
11	A4174 Colliters Way (South)	19,734	19,734	1,005	1,005	0.0%	0.0%
12	A38 (North of West Lane)	29,582	32,417	1,210	1,229	9.6%	1.6%
13	Barrow Street	5,337	5,337	172	172	0.0%	0.0%

Link	Name	2026 All Traffic 18hr AAWT – Without Development	2026 All Traffic 18 hr AAWT - With Development	2026 HGV 18 hr AAWT - Without Development	2026 HGV 18 hr AAWT - With Development	% Change in All Traffic 18hr AAWT	% Change in HGV 18hr AAWT
14	West Lane	7,077	7,723	94	94	9.1%	0.0%
15	Downside Road	7,261	7,640	273	273	5.2%	0.0%
16	A38 (South of Silver Zone)	21,055	22,098	895	895	5.0%	0.0%
17	Barrow Lane	3,982	3,982	108	108	0.0%	0.0%
18	Hyatt's Wood Road	1,873	1,873	32	32	0.0%	0.0%

- 6.6.7 None of the links within the study area have changes in 18 hr AAWT flows for total vehicles or HGVs which are greater than 10%. The A38 (North of West Lane) (Link 12) has the greatest increase in all traffic AAWT (9.6%) and the greatest increase in HGVs (1.6%), however HGVs still make up a low composition of the traffic on this link (3.8% of all vehicles).
- 6.6.8 In accordance with IEMA guidance¹², links which experience changes in flows of less than 10% should be scoped out of the assessment as such variance is likely to already occur on a daily basis. However, given that this is a transport infrastructure related Proposed Development, it was considered appropriate to undertake an assessment where there are changes of >5% in all vehicle or HGV 18hr AAWT. The following links have therefore been included within the scope of the assessment:
- Link 2 – A38 New Road;
 - Link 9 – A4174 Colliters Way (North);
 - Link 10 – A38 Bridgwater Road (North);
 - Link 12 – A38 (North of West Lane);
 - Link 14 – West Lane; and
 - Link 15 – Downside Road.

Temporal scope

- 6.6.9 The temporal scope of the assessment is consistent with the period over which the Proposed Development would be carried out and therefore covers the construction and operational periods. It is anticipated that construction will take place over an approximate 87-month period between April 2019 and June 2026, with full operation commencing later in 2026 when the 12mppa horizon is expected to be reached.
- 6.6.10 The assessment of environmental effects relating to Traffic and Transport during operation in 2026 has considered the following scenarios:
- Baseline (2018) – Current conditions;
 - 2026 'without development' – This represents the future baseline conditions that would be expected should the Proposed Development not be progressed; and
 - 2026 'with development' – This represents conditions that would be expected should the Proposed Development be progressed.

Potential receptors

- 6.6.11 *The Guidelines for the Environmental Assessment of Road Traffic*¹² have identified particular groups and locations which may be sensitive to changes in traffic flows.
- 6.6.12 This guidance has been used to define the sensitivity of receptors to traffic for the categories considered within this chapter (very high, high, medium, low and very low) and receptor sensitivity criteria is outlined in **Table 6.11**. These are general categories of receptors and it should be noted that each receptor assessed may have a different sensitivity to each specific effect considered within the EIA.

Table 6.11 Criteria for receptor sensitivity

Sensitivity	Description of Receptor
Very High	<ul style="list-style-type: none"> ● Road safety – locations with patterns of serious or fatal collisions
High	<ul style="list-style-type: none"> ● Schools, colleges and other educational institutions* ● Retirement/ care homes for the elderly or infirm ● Roads used by pedestrians with no footways ● Road safety – locations with patterns of slight collisions
Medium	<ul style="list-style-type: none"> ● Hospitals, surgeries and clinics ● Parks and recreational areas ● Retail areas ● Roads used by pedestrians with narrow footways
Low	<ul style="list-style-type: none"> ● Tourist and visitor attractions such as historical buildings ● Places of worship such as churches ● Other roads with active frontages and dwellings
Very Low	<ul style="list-style-type: none"> ● Open space (e.g. agricultural land)

*nurseries have been assumed to be included in this category

Likely significant effects

6.6.13 The Traffic and Transport effects that have been taken forward for assessment are summarised as follows:

- Severance;
- Fear and intimidation;
- Pedestrian delay and amenity;
- Driver Delay; and
- Accidents and safety.

6.6.14 The following Traffic and Transport related effects have been scoped out from further assessment because these are not considered likely to be significant or are considered elsewhere in this ES:

- Dust (considered within **Chapter 8: Air Quality**); and
- Hazardous loads (such loads are likely to relate to the movement of fuels e.g. petrol, diesel or jet fuel). Such loads are currently transported to and around the Bristol Airport site as part of the day to day operation of Bristol Airport, any additional loads required to enable the operation of the Proposed Development would be managed in accordance with current procedures and regulations.

- 6.6.15 The scoping out of both these aspects was agreed with NSC through the EIA Scoping Report (**Appendix 1A**) and subsequent Scoping Opinion (**Appendix 1B**).

6.7 Environmental measures embedded into the development proposals

- 6.7.1 A range of environmental measures have been embedded into the Proposed Development as outlined in **Section 3.2. Table 6.12** outlines how these embedded measures influence Traffic and Transport related effects.
- 6.7.2 An Outline Construction Environmental Management Plan (CEMP) (**Appendix 2B**) has been submitted with the application and this outlines mitigation measures to be implemented during the construction phase to reduce potential impacts on the local road network. The final CEMP for each phase of construction will include a Construction Traffic Management Plan which will outline site access routes and proposed routing of vehicles. Construction vehicles, particularly HGVs, will avoid the use of minor roads where possible.
- 6.7.3 As part of the Proposed Development, there are proposals to upgrade the A38, between the Northern Bristol Airport access roundabout and West Lane. These improvements will reduce congestion and delays and improve safety once they are operational.
- 6.7.4 At present, a signalised three-way junction is provided at the A38/Downside Road. However, it is proposed that this is upgraded to include two lanes on approach to the junction from Downside Road. The A38/West Lane junction will also be upgraded to a signalised junction so that only left turns can be completed from West Lane onto the A38. There will also be widening of the A38 on the approach to, and between, these two junctions.
- 6.7.5 A junction mitigation scheme for the A38 / Northern Bristol Airport roundabout has been proposed which consists of a dual lane exit into Bristol Airport and a dedicated left turn slip from Bristol Airport onto the A38 northbound.

Table 6.12 Summary of the embedded environmental measures

Receptor	Changes and effects	Embedded measures
All links	Mitigation measures are outlined in the CEMP (Appendix 2B) which will be implemented to reduce potential impact on the local road network during construction.	The implementation of the measures outlined in the CEMP (Appendix 2B) will help reduce potential for adverse effects to occur in relation to severance, fear and intimidation, pedestrian delay and amenity and accidents and road safety during the construction phase.
Links 12, 14 and 15	Upgrading of A38 / Northern Bristol Airport roundabout, A38/ Downside Road and A38/West Lane junction, and widening of the A38 on the approach to, and between, these two junctions. This will help reduce delay time drivers experience at the A38 / Northern Bristol Airport roundabout, A38/Downside junction and A38/West Lane.	The upgrading of these junctions and carriageways will help mitigate increases in driver delay times which might be experienced as a result of increases in using these links.
Links 12, 14 and 15	Upgrading of A38 / Northern Bristol Airport roundabout, A38/ Downside Road and A38/West Lane junction. This will help control vehicle movements on	Upgrades to these junctions will help reduce potential for accidents at these intersections.

Receptor	Changes and effects	Embedded measures
	these and reduce potential for collisions as a result of driver error.	
Link 14	Proposed shared footway/cycleway to be provided on the A38 between the north Bristol Airport junction and West Lane and at the junction with Downside Road.	Reduce potential local effects relating to pedestrian/cyclist amenity by providing a dedicated, off road path.

6.8 Assessment methodology

- 6.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Preparing the Environmental Statement**, and specifically in **Sections 4.5 to 4.7**. However, whilst this has informed the approach that has been used in this Traffic and Transport assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this assessment.
- 6.8.2 The assessment approach utilised in this chapter has been developed to fulfil the requirements of the EIA Regulations and has drawn upon guidance, as outlined in **Section 6.2**.
- 6.8.3 In accordance with this guidance and the scope of the assessment as agreed with Highways England, BaNES and NSC, this assessment has considered effects during the operation of the Proposed Development in relation to: severance; fear and intimidation; driver delay; pedestrian and cycle movement; and accidents and safety.

Significance criteria

- 6.8.4 The significance of the effects related to the Proposed Development during construction and operation has been determined on the basis of the sensitivity of the receptor, magnitude of change and whether this is temporary or permanent as well as beneficial or adverse.

Sensitivity of receptor

- 6.8.5 The IEMA guidance¹² identify groups and special interests which should be considered in the assessment which are outlined in **Section 6.6**.
- 6.8.6 The sensitivity of receptors along the six-transport links where there may be changes of >5% in all vehicle or HGV 18hr AAWT has been assessed. **Table 6.13** below identifies the receptors that are present on these links.

Table 6.13 Identified receptors and associated sensitivities

Link no.	Link Name	Receptors	Sensitivity	Link Sensitivity
2	A38 New Road	Roadway used by pedestrians with narrow footway	Medium	Medium
		Takeaway (Murphy's Fish bar)	Low	
		B&B (Clumber Lodge)	Low	
		Residential properties (10+)	Low	
		Open space	Very low	

9	A4174 Colliters Way (North)	Open space	Very low	Very low
10	A38 Bridgwater Road (North)	Residential properties (20+)	Low	Low
		Public house (the Kings Head and Cross Hands)	Low	
		Open space	Very low	
12	A38 (North of West Lane)	B&B (Beechewood)	Low	Low
		Public house (Fox and Goose)	Low	
		Residential properties (10+)	Low	
		Open space	Very low	
14	West Lane	Residential properties (10+)	Low	Low
		Public house (George & Dragon)	Low	
		Village Hall (Felton)	Low	
		Open space	Very low	
15	Downside Road	Recreational area (Tall Pines Golf Club)	Medium	Medium
		B&B (Tanda, Stoneleigh,)	Low	
		Residential properties (20+)	Low	
		Open space	Very low	
		Open space	Very low	

6.8.7 Receptors considered, and their corresponding sensitivity are presented at the end of the baseline conditions **Section 6.10 – 6.14**. A full summary of sensitive receptors located on each link considered within the assessment is presented in **Appendix 6D**.

Magnitude of change

6.8.8 The scale of magnitude used and how this is determined for each assessment criteria considered within the assessment is outlined below.

Severance

6.8.9 The IEMA guidance¹² states that:

"severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery."

Furthermore:

"changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively".

- 6.8.10 However, the guidance acknowledges that the measurement and prediction of severance is extremely difficult. The assessment of severance pays full regard to specific local conditions, in particular the location of pedestrian routes to key local facilities and whether or not crossing facilities are provided.
- 6.8.11 *Volume 11, Section 3, Part 8, Chapter 6 of the DMRB¹⁵* provides further guidance on the aspect of New Severance within a community in terms of the 2-way Annual Average Daily Traffic flow (AADT) on a link. It states that new severance should be described in terms of “Slight”, “Moderate” or “Severe” and that these categories “... should be coupled with an estimate of the numbers of people affected, their location and the community facilities from which they are severed.”
- 6.8.12 The potential effects as set out in **Section 6.10** are based on an assessment which takes into account the guidance and thresholds. These thresholds have been adapted to the criteria used within this ES and are summarised in **Table 6.14**, while also being mindful of absolute flows (e.g. a doubling of flows on a link with very few flows is unlikely to lead to significant severance).

Table 6.2 Severance thresholds

Magnitude	Traffic Flow (AAWT) change
Very High	>90%
High	61-90%
Medium	31-60%
Low	11-30%
Very Low	<10%

Fear and intimidation

- 6.8.13 Pedestrians and cyclists may experience fear and intimidation as a result of vehicular movements. IEA guidance¹² notes that the impact of this criteria is dependent on the volume of traffic, the HGV composition, the width of footway and its proximity to the carriageway edge.
- 6.8.14 There are no commonly agreed thresholds for the magnitude of this criteria, with appraisal based on the judgement of the assessor. Fear and intimidation thresholds have therefore been interpreted with professional judgement to determine the significance of effects of the Proposed Development.
- 6.8.15 **Table 6.15** outlines how this guidance has been applied to determine fear and intimidation effects²¹.

Table 6.15 Fear and intimidation thresholds (applied)

Magnitude	Traffic flow over 18hr day (vehicle/ hour)	Total 18hr heavy goods vehicle flow
Very High	1,800	>3,000

²¹ IEA guidance also notes that average speeds should be used to assess fear and intimidation hazard. With reference to the average speeds over 18-hour days, this would be in excess of 20mph for the majority of links assessed and any assessment of levels of fear and intimidation based on this aspect would effectively be irrelevant. A judgement is therefore made in relation to average 18 hr traffic flows and total 18 hr HGV flows only.

Magnitude	Traffic flow over 18hr day (vehicle/ hour)	Total 18hr heavy goods vehicle flow
High	1,200-1,800	2,000-3,000
Medium	600-1,200	1,000-2,000
Low	300-600	500 – 1,000
Very Low	0-300	0-500

Pedestrian delay and amenity

- 6.8.16 Increased traffic flows can result in pedestrian delay for a particular walking journey where the ability to cross roads is affected. This, therefore, could affect an individual's desire to make a particular walking journey. Increases in the volume and speed or changes in the composition of traffic are most likely to result in pedestrian delay, with the level of severity dependent on the general level of pedestrian activity and the physical condition of crossing points. Guidelines for the calculation of pedestrian delay are identified in *DMRB Volume 11¹⁵, Section 3*.
- 6.8.17 It is important to note that qualitative aspects, such as the quality of the pedestrian and cycle environment and the trip generators served by these environments, also influence the propensity for individuals to walk and cycle. Sense of personal security and safety, gradient, permeability, legibility and maintenance of infrastructure aids can encourage and discouraging the use of non-car modes. These factors, in addition to the quantitative aspects of assessment such as changing traffic flows, are therefore an important consideration in this chapter for a number of the criteria.
- 6.8.18 The determination of what constitutes a material impact on pedestrian delay is generally left to the judgement of the assessor and knowledge of local factors and conditions. However, the IEA¹² guidelines suggest "a lower threshold of 10 seconds delay and an upper threshold of 40 seconds delay, for a link with no crossing facilities". It further advises that the lower threshold equates to a two-way flow of approximately 1,400 vehicles per hour on links with insufficient or no pedestrian facilities at desire lines and links subject to pedestrian footfall.
- 6.8.19 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, which is affected by traffic flow, traffic composition and footway width/separation from traffic. Fear and intimidation is also a factor which can impact amenity and should be considered within this definition. The IEA¹² guidance suggests a "tentative threshold for judging the significance of changes in pedestrian amenity of where traffic flow (or its lorry component) is halved or doubled".

Driver delay

- 6.8.20 Delay to drivers can be estimated through capacity assessments at key points on the local highway network. The addition of new development-generated traffic could result in an increase in the number of vehicles using key junctions. This may lead to additional delays depending on the existing operation, levels of background traffic and development-generated traffic.
- 6.8.21 Assessment of junction capacity and delay is undertaken through the use of standard practice analytical tools and junction analysis programmes, including in this instance Junctions 9 (Arcady Module) for priority roundabouts and LinSig (Version 3) for signal junctions. Changes in driver delay times have been calculated by comparing the differences between the 2026 future baseline 'without development' and 'with development' scenarios for AM and PM peak delay times at key junctions, which were calculated as part of the TA (**Appendix 6A**).

- 6.8.22 Driver delay is only likely to be an issue requiring consideration of mitigation where junctions are operating beyond capacity. **Table 6.16** shows the magnitude-scale applied to the category 'driver delay' at junctions for the purpose of this assessment.

Table 6.16 Driver delay thresholds

Magnitude	Definition
Very High	Average vehicle delay changes of more than 90 seconds as a result of the Proposed Development during the peak hour periods
High	Average vehicle delay changes are between 61 and 90 seconds as a result of the Proposed Development during the peak hour periods
Medium	Average vehicle delay changes are between 31 and 60 seconds as a result of the Proposed Development during the peak hour periods
Low	Average vehicle delay changes are between 21 and 30 seconds as a result of the Proposed Development during the peak hour periods
Very Low	Average vehicle delay changes are less than 20 seconds as a result of the Proposed Development during the peak hour periods

Accidents and road safety

- 6.8.23 The assessment of accident risk and highway safety is based upon existing accident rates and specific local circumstances to identify accident clusters. For example, should a particular link or junction be found to have a high existing accident rate, the addition of substantial traffic volumes generally would be expected to adversely affect highway safety due to increased opportunities for incidents to occur. Mitigation measures may therefore be required.
- 6.8.24 The IEMA guidelines¹² state that "*professional judgement will be needed to assess the implications of local circumstances, or factors, which may elevate or lessen risks of accidents, e.g. junction conflicts*".
- 6.8.25 For the purpose of this assessment, a review of accidents occurring over a 54 to 60-month period within the area surrounding Bristol Airport has been undertaken. This was completed in order to identify existing accident clusters, where 10 or more accidents occurred over the five-year period. Data from a 54-month period (01 January 2014 to 30 June 2018) was used to identify accident clusters within the NSC administrative area and data from a 60-month period (01 October 2013 to 30 September 2018) was used for the BCC administrative area as this was the most up-to-date data that was available at the time of assessment. The assessment of potential increases in accident risk due to the Proposed Development has focused on these pre-identified accident clusters.
- 6.8.26 Professional judgement has been used to determine potential effects in respect of accidents and safety based on the PIC data provided by NSC, giving consideration to local conditions such as pedestrian footfall, traffic speeds and flows.

Evaluation of significance

- 6.8.27 **Table 6.17** demonstrates how the significance of potential effects has typically been judged against the magnitude of change and the sensitivity of the receptor, this being moderated by professional judgement where necessary.

Table 6.17 Significance matrix

		Magnitude of change				
		Very high	High	Medium	Low	Very low
Sensitivity/importance/value	Very high	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)
	High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)
	Medium	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

6.9 Assessment of construction effects

- 6.9.1 Estimated construction traffic movements for each phase of construction have been provided by QuantumCLS construction consultancy and informed by BAL. These movements have been used to derive the total vehicle and HGV AAWT construction traffic flows, provided in **Appendix 6C**.
- 6.9.2 Total vehicle AAWT flows during construction are estimated to be 39 vehicles a day and HGV AAWT flows are estimated to be nine vehicles a day. It is anticipated that peak vehicle movements will occur in January 2020; during this period there may be movements of 138 vehicles a day where a number of elements are being constructed concurrently (such as the A38 highway improvement works).
- 6.9.3 Assuming that permission is granted for the Proposed Development, construction contracts will be subject to a competitive tendering exercise as and when components of the development are taken forward. As a result, details on contractors and the precise routing and number of delivery vehicles are yet to be confirmed.
- 6.9.4 The existing CEMPs for Bristol Airport only permit construction traffic to access the airport via the A38 with the exception of use of other routes by local suppliers and for minor projects and maintenance. In the event of an incident occurring on the A38 that obstructs access to Bristol Airport, diversions would be followed. It is anticipated that future contractors would adhere to the same procedures.
- 6.9.5 It is therefore anticipated that the main increase in traffic during the construction phase would occur on the A38, with more minor changes experienced on other surrounding links.
- 6.9.6 **Table 6.18** below presents the potential increases in traffic which could occur in a scenario with all construction traffic routed along each link of the A38 in 2018 and 2026, based on average weekday construction traffic flows.

Table 6.18 Potential increases in traffic during the construction phase when compared to 2026 traffic flows 'without development'.

Link	Name	% Change in All Traffic 18hr AAWT (2018 baseline)	% Change in HGV 18hr AAWT (2018 baseline)	% Change in All Traffic 18hr AAWT (2026 without development)	% Change in HGV 18hr AAWT (2026 without development)
2	A38 New Road	0.3%	1.4%	0.2%	1.2%
4	A38 (North of Dinghurst Road)	0.2%	0.9%	0.2%	0.8%
10	A38 Bridgwater Road (North)	0.3%	1.6%	0.3%	1.3%
12	A38 (North of West Lane)	0.2%	0.9%	0.1%	0.7%
16	A38 (South of Silver Zone)	0.2%	1.2%	0.2%	1.0%

- 6.9.7 **Table 6.18** shows that vehicle movements associated with construction traffic would not cause an increase of more than 5% in total vehicles or HGVs on any of the identified study links along the A38. As noted in **Section 6.3**, significant effects are not anticipated where traffic increases of <5% are experienced as such variance can occur on a daily basis. It is therefore considered that there are no significant effects in regard to severance, fear and intimidation and accidents and disasters during the construction phase.
- 6.9.8 The vehicle trip generation during the peak construction phase is substantially lower than the operational traffic predictions in 2026 and is therefore expected to have a lesser effect on driver delay than that considered in 2026 and does not justify detailed junction modelling.
- 6.9.9 Improvements to the highway network associated with the Proposed Development, such as the upgrading of the A38/Downside Road and A38/West Lane junction and widening of the A38 may result in a short term localised increase in delays between October 2019 and April 2020 when it is proposed that the improvements will be undertaken. However, this will be confirmed during detailed construction planning and the temporary nature of the works mean it is unlikely to have a significant effect.
- 6.9.10 Similarly, during these works there may be temporary disruption to pedestrian delay and amenity such as to users of nearby PRoW (LA2/37/10/XG2, LA2/37/10/X and LA19/77/70). As flows are not anticipated to increase by more than 5% there are unlikely to be any significant effects to delay, however there may be a temporary reduction in amenity in this area whilst improvements works are carried out but it is not anticipated that this would result in a significant effect.
- 6.9.11 It is considered that there are unlikely to be any significant effects on severance, fear and intimidation, pedestrian delay and amenity, driver delay and accidents and safety during construction. This is due to the small increases in vehicle movements associated with this phase, temporary nature of improvement works on the A38, Downside Road and West Lane and control of HGV movements through the implementation of measures outlined in the CEMP (**Appendix 2B**) such as controls on HGV routing to avoid smaller local roads where possible.

6.10 Assessment of operational severance effects

Baseline conditions

Current baseline

6.10.1 A general overview of baseline conditions in the vicinity of Bristol Airport is provided in **Section 6.4**. This section focuses on baseline conditions relating to severance on the following links identified for further assessment in **Section 6.6**:

- Link 2 – A38 New Road;
- Link 9 – A4174 Colliters Way (North);
- Link 10 - A38 Bridgwater Road (North);
- Link 12 - A38 (North of West Lane);
- Link 14 – West Lane; and
- Link 15 – Downside Road.

Link 2 – A38 New Road

6.10.2 This section of the A38 is flanked by agricultural land, woodland and two small residential areas. Most of the dwellings in these areas are located on the eastern side of the A38.

6.10.3 A narrow footpath is provided along the full length of this link. On the southern section of this link, the footpath is provided on the western side of the road before being discontinued near the junction with Rowberrow Lane where it is then provided on the eastern side of the carriageway. Footpaths are provided on both sides of New Road on the approach to the A38 New Road/A386 Dinghurst Road junction where the link passes through one of the residential areas. A formal signalised pedestrian crossing is provided at this junction.

Link 9 – A4174 Colliters Way (North)

6.10.4 This link is surrounded by open space on both sides along its length, including agricultural land and wooded areas. A footpath is provided along most of the eastern side of this link and it is separated from the carriageway for a large proportion of this. A footpath is also provided on the western side of this link at the Bridgwater Road/ Colliters Way junction, where there is a formal signalised pedestrian crossing.

Link 10 - A38 Bridgwater Road (North)

6.10.5 The residential areas of Highridge and Bedminster Down are situated to the east of this link. To the west of the link are large areas of green open space, The Pavilions commercial area, Elm Farm, South Bristol crematorium and residential dwellings.

6.10.6 A footpath is provided along the eastern side of the highway along the length of this link. Footpaths are provided along both sides of the highway between South Bristol Cemetery and Crematorium and the A3029/A38 junction. There are a number of formal pedestrian crossings along this link including signalised crossings near the Pavilions commercial area, at the junction with Bishopsworth Road and Bedminster Road.

Link 12 – A38 (North of West Lane)

6.10.7 This link is surrounded by agricultural land along most of its length, apart from where it passes through the village of Potters Hill where a number of residential receptors are located. There is a

footway that runs along the length of the carriageway on its eastern side; this is slightly set back from the carriageway and separated from it by a small strip of grass. There are no formal crossing points present along this link.

Link 14 – West Lane

- 6.10.8 West Lane provides connections to the A38 from the villages of Felton and Long Cross. The main centre of Felton is located on the northern side of this link, however, there are parts that extend to the south of this link along Felton Street, towards Felton Hill.
- 6.10.9 There is a footpath present along the northern side of the carriageway where the road connects Long Cross to Felton. As the road enters Felton, footpaths are provided on both side of the carriageway. No footpaths are provided between Felton and the A38 and no formal crossing points are provided along the length of this link.

Link 15 – Downside Road

- 6.10.10 Downside Road is located along the northern boundary of Bristol Airport in Lulsgate Bottom. An access point for emergency and operational vehicles to Bristol Airport is present along this link. This junction is next to the long stay car park and a hotel (Hampton by Hilton) however the signposted route is to the main exit inside Bristol Airport to the east and clear signage is provided noting that this access is not for customer use.
- 6.10.11 There are a number of residential dwellings along this link (approximately 40-50), mainly within Lulsgate Bottom and Downside, the majority of which are located along the northern side of the road. There are approximately nine dwellings on the southern side of the road in close proximity to the junction with the A38 (approximately 120m away), while further west there are two dwellings and a B&B (Tanda) located on the southern side of the road and along Cooks Bridle Path. The only formal crossing point located on this link is a signalised crossing at the A38 junction.
- 6.10.12 There is therefore a degree of severance already experienced along this route. However, there are footpaths present for most of the length of the carriageway where these dwellings are located.
- 6.10.13 Baseline traffic flows for the above links are presented in **Table 6.3 6.2**.

Predicted future baseline

- 6.10.14 At the time of writing, no known improvements are proposed to the above links in terms of pedestrian and crossing facilities. Therefore, these conditions are expected to remain unchanged by 2026.
- 6.10.15 There is a general trend of increasing traffic volume over time and it is anticipated that there will be increases in the volume of vehicles travelling on the above links due to predicted increases in housing and jobs provided within the local area. Predicted increases are presented in **Table 6.10** and incorporate additional traffic that is anticipated to occur as a result of Bristol Airport reaching the consented 10mppa capacity which is expected to occur in 2021.

Predicted effects and their significance

Link 2 – A38 New Road

- 6.10.16 This link is overall classed as **medium** sensitivity due to there being a narrow footpath present which may be used by pedestrians. There is a 5.5% increase in 18hr AAWT traffic flow between the future baseline 'without development' scenario and the 'with development' scenario which relates to a **very low** magnitude change. No change in HGVs are expected along this link.

- 6.10.17 It is therefore anticipated that there will be a **negligible** effect in respect of severance which is **not significant**.

Link 9 – A4174 Colliters Way (North)

- 6.10.18 This link is largely surrounded by open space, including agricultural land and is therefore classed as being of **very low** sensitivity. There is an 5.5% increase in 18hr AAWT traffic flow between the future baseline 'without development' scenario and the 'with development' scenario which relates to a **very low** magnitude change. A 1.5% increase in 18hr HGV AAWT is expected to occur which is a negligible magnitude change.
- 6.10.19 It is therefore anticipated that there will be a **negligible** effect in respect of severance which is **not significant**.

Link 10 – A38 Bridgwater Road (North)

- 6.10.20 Residential properties are located along this link which are classified as **low** sensitivity receptors. There is an 8.8% increase in 18hr AAWT traffic flow between the future baseline 'without development' scenario and the 'with development' scenario which relates to a **very low** magnitude change. No change in HGVs are expected along this link.
- 6.10.21 It is therefore anticipated that there will be a **negligible** effect in respect of severance which is **not significant**.

Link 12 – A38 (North of West Lane)

- 6.10.22 There are **low** sensitivity receptors located along this link including a number of residential properties, a B&B (Beechwood) and The Fox and Goose public house. There is an 9.6% increase in 18hr AAWT traffic flow between the future baseline 'without development' scenario and the 'with development' scenario which relates to a **very low** magnitude change. A 1.6% increase in 18hr HGV AAWT is expected to occur which is a negligible magnitude change.
- 6.10.23 It is therefore anticipated that there will be a **negligible** effect in respect of severance which is **not significant**.

Link 14 – West Lane

- 6.10.24 There are **low** and **very low** sensitivity receptors located along this link including Felton Village Hall, residential properties which front onto Weston Land and The George and Dragon public house. There is an 9.1% increase in 18hr AAWT traffic flow between the future baseline 'without development' scenario and the 'with development' scenario which relates to a **very low** magnitude change. No change in HGVs are expected along this link.
- 6.10.25 It is therefore anticipated that there will be a **negligible** effect in respect of severance which is **not significant**.

Link 15 – Downside Road

- 6.10.26 There are a number of receptors located along this link including residents and Tanda and Stoneleigh B&B which are **low** sensitivity receptors, there are also narrow footways which are only provided along one side of the carriageway which is classed as a **medium** sensitivity receptor. There is a 5.2% increase in 18hr AAWT traffic flow between the future baseline 'without development' scenario and the 'with development' scenario which relates to a **very low** magnitude change. No change in HGVs are expected to occur along this link.
- 6.10.27 It is therefore anticipated that there will be a **negligible** effect in respect of severance which is **not significant**.

6.11 Assessment of operational pedestrian delay and amenity effects

Baseline conditions

Current baseline

Link 2 – A38 New Road

- 6.11.1 This part of the A38 has a traffic flow of approximately 832 vehicles/hr. Footpaths are provided along this link which allow people to walk between the residential areas and provides connections onto Churchill. Footpaths are, however, not provided continuously along one side and formal pedestrian crossing facilities are not provided to cross where the footpath is discontinued near Rowberrow Lane.
- 6.11.2 There are approximately eight PRow which connect to this link, six of which are footpaths and two are bridleways (AX14/7/50 and AX14/18b/10). These are:
- AX14/17/10;
 - AX14/9/20;
 - AX14/18/10;
 - AX14/12/20;
 - AX14/19a/30;
 - AX25/63/10;
 - AX14/7/50; and
 - AX14/18b/10.
- 6.11.3 No NCR routes use or cross this link.

Link 9 – A4174 Colliters Way (North)

- 6.11.4 Colliters Way is part of the South Bristol link road and has traffic flows of approximately 1,311 vehicles/hr. A footpath is provided along the length of this link and there is a formal pedestrian crossing point at the Bridgwater Road/ Colliters Way junction.
- 6.11.5 Five PRow connect to this section of Colliters Way, all of which are footpaths. These are:
- LA12/12/40;
 - LA12/12/50;
 - LA12/12c/10;
 - LA12/12c/20; and
 - LA12/14/70.
- 6.11.6 No NCR routes use or cross this link.

Link 10 – A38 Bridgwater Road (North)

- 6.11.7 This section of the A38 has traffic flows of approximately 648 vehicles/hr. Footpaths are provided along either one or both sides of the highway which provide links and access to Bristol City centre.

As noted in **Section 6.10**, there are several formal pedestrian crossing points provided along this link, including signalised crossings.

6.11.8 Seven PRoW connect to this section of Bridgwater Road, all of which are footpaths. These are:

- BCC/219B/10;
- BCC/428/20;
- BCC/428/30;
- BCC/430/40;
- BCC/430/20;
- BCC/430/30; and
- BCC/435/10.

6.11.9 No NCR routes use or cross this link.

Link 12 – A38 (North of West Lane)

6.11.10 The A38 has traffic flows of approximately 1,319 vehicles/hr. As noted in **Section 6.10**, this link has a footpath running along its length which provides connections from Lulsgate Bottom to the surrounding area including Potters Hill and south west Bristol. There are no formal crossing points provided for pedestrians, nor are there formal cycle paths.

6.11.11 There are nine PRoW which connect to this stretch of the A38, eight of which are footpaths and one is a bridleway (LA3/30/20). These are:

- LA2/37/10/XG2;
- LA19/57/70;
- LA2/41/20;
- LA19/79/10;
- LA19/63/20;
- LA19/63/10;
- LA3/17/40;
- LA3/24/10; and
- LA3/30/20.

6.11.12 NCR 410 (Avon Cycleway) and 334 cross the A38 from east to west and north to south, respectively.

Link 14 – West Lane

6.11.13 West Lane has a traffic flow of 317 vehicles/hr. Footpaths are provided along most of its length, apart from the section between Felton and the A38 junction. There are no formal pedestrian crossing points along this link.

6.11.14 There are seven PRoW which stem from or cross West Lane, six of which are footpaths and one is a bridleway (LA19/1/10). These are:

- LA19/58/10;
- LA19/60/10;

- LA19/56/20;
- LA19/56/10;
- LA19/52/30;
- LA19/52/20; and
- LA19/1/10.

6.11.15 NCR 410 (Avon Cycleway) runs along the length of West Lane from the A38, before connecting to Old Hill to the south.

Link 15 – Downside Road

6.11.16 Downside Road also has relatively small traffic flows in comparison to the A38, with flows along this link being approximately 338 vehicles/hr. There are no formal pedestrian crossing points along this link.

6.11.17 There are no PRow which link to, or cross, Downside Road.

6.11.18 The NCR 410 (Avon Cycleway) runs from the A38 in the east, along this road to the west towards Chelvey.

Predicted future baseline

6.11.19 At the time of writing, there are no known improvements proposed to the above links in terms of pedestrian and cyclist facilities. Therefore, these conditions are expected to remain the same in 2026.

6.11.20 Changes in traffic flows are expected to occur by 2026 for reasons outlined in **Section 6.10**. The following increases in traffic flows are anticipated in 2026 in absence of the Proposed Development:

- Link 2 - A38 New Road = 164 vehicles/hr;
- Link 9 – A4174 Colliters Way (North) = 259 vehicles/hr;
- Link 10 - A38 Bridgwater Road (North) = 153 vehicles/hr;
- Link 12 – A38 (North of West Lane) = 324 vehicles/hr;
- Link 14 – West Lane = 76 vehicles/hr; and
- Link 15 – Downside Road = 66 vehicles/hr.

Predicted effects and their significance

6.11.21 As noted in **Section 6.8**, guidance¹² suggests that a two-way vehicle flow of 1,400/hr equates to a ten second delay on a road crossing with no formal crossing points to factor delay against flow. **Table 6.19** shows expected delays with and without the Proposed Development. This assessment is based on 2026 'without development' and 'with development' AAWT traffic flow as presented in **Table 6.10**, adjusted to hourly flows.

Table 6.19 Pedestrian delay

Link	2026 - without development pedestrian delay (seconds)	2026 - with development pedestrian delay (seconds)	Change (seconds)
Link 2 A38 New Road	7	7	0

Link	2026 - without development pedestrian delay (seconds)	2026 - with development pedestrian delay (seconds)	Change (seconds)
Link 9 A4174 Colliters Way (N)	11	12	1
Link 10 A38 Bridgwater Road (N)	6	6	0
Link 12 - A38 (North of West Lane)	12	13	1
Link 14 – West Lane	3	3	0
Link 15 – Downside Road	3	3	0

- 6.11.22 Along Link 12: A38 (North of West Lane) and Link 9: A4174 Colliters Way, an increase in delay of one second would be expected when crossing these roads as a result of the additional traffic added by the Proposed Development. Pedestrian delay is not expected to increase along any of the other links.
- 6.11.23 Link 9 forms part of the SBL road and it is anticipated that there will be an increase of 87 vehicles/hr along this link. The increase in pedestrian delay may have a negative effect on pedestrians crossing this route, such as between the PRow which connect to this link, however a formal crossing point is available at the Bridgwater Road/ Colliters Way junction.
- 6.11.24 An increase of 158 vehicles/hr is expected along Link 12 which encompasses part of the A38. This route is not a busy pedestrian route due to its rural location, however there are nine PRow which connect to this link and pedestrians may use Link 12 to move between these PRow. It is also a busy road which may deter cyclists from using it as there are other, quieter roads and national cycle routes that can be used to travel around the local area (refer to **Figure 6.8**).
- 6.11.25 The Avon Cycleway runs along West Lane and Downside Road, though the increase in hourly vehicle flows along these carriageways are anticipated to be very small (36 and 21 respectively). This increase may decrease the pleasantness of the journey experienced by cyclists along this route, however this is not expected to deter them from using the West Lane and Downside Road parts of the Avon Cycleway.
- 6.11.26 The proposed improvements may also have a beneficial effect on the amenity to pedestrians and cyclist through the provision of shared footway/cycleways along parts of the A38 and Downside Road and signalisation of the A38/West Lane junction which would allow for more controlled entry onto the A38 for cyclists.
- 6.11.27 New Road and Bridgwater Road (North) do not form part of any NCR, however, cyclists may still use these routes. Footpaths and crossing facilities are provided along the length of these routes which can be used by pedestrians to access nearby areas. However, these footpaths are sometimes in close proximity to the carriageway. Increases in hourly vehicle flows along New Road and Bridgwater Road (North) are expected to be small (54 and 71, respectively).
- 6.11.28 It is therefore considered that the magnitude of change in respect of pedestrian delay and amenity experienced along these links is **low**. As there are **medium** and **low** sensitive receptors located on these links, effects are anticipated to be **minor** at worst (where receptors are of medium sensitivity) and **not significant**.

6.12 Assessment of operational fear and intimidation

Baseline conditions

Current baseline

- 6.12.1 In addition to total vehicle traffic flows, HGV flows are used in the assessment of fear and intimidation. Hourly traffic flows and HGV flows are presented in **Table 6.20**.

Table 6.20 Baseline (2018) fear and intimidation hazard

Link	2018 All Traffic 18hr AAWT (vehicles/hour)	Fear and Intimidation Hazard	2018 HGV 18hr AAWT (total)	Fear and Intimidation Hazard
Link 2 A38 New Road	444	Low	642	Low
Link 9 A4174 Colliters Way (N)	1,311	High	1,080	Medium
Link 10 A38 Bridgwater Road (N)	648	Medium	580	Low
Link 12 - A38 (North of West Lane)	1,319	High	971	Low
Link 14 – West Lane	317	Low	75	Very low
Link 15 – Downside Road	338	Low	228	Very low

- 6.12.2 Link 14: West Lane and Link 15: Downside Road are considered to have low fear and intimidation hazards. Link 10: A38 Bridgwater Road (North) is considered to have a medium hazard and Link 12: A38 (North of West Lane) and Link 9: A4174 Colliters Way (North) are considered to have a high hazard due to the total number of vehicles.
- 6.12.3 Link 2: A38 New Road is considered to have medium hazards due to the number of HGVs travelling along this link, despite only being of low hazard in relation to total vehicle traffic flows.

Predicted future baseline

- 6.12.4 At the time of writing, no known improvements to the above links in terms of pedestrian and cyclist facilities are committed, nor are any changes to speed limits anticipated. As such these conditions are assumed to remain the same in 2026.
- 6.12.5 Changes in traffic flows are expected to occur by 2026, for reasons outlined in **Section 6.10**. These flows are presented in **Table 6.21**, which shows that there is no change in the hazard of fear and intimidation experienced along links 9, 10, 14 and 15. It is anticipated that there may be a change from a 'low' degree of hazard to a 'medium' degree of hazard on Link 2, which is associated with changes in total vehicle traffic flows. There may also be a change from a 'low' degree of hazard to a 'medium' degree of hazard associated with HGV flows, however total vehicle flows are classified as a 'high' degree of hazard in 2018 and 2026.

Table 6.3 2026 (without development) future baseline fear and intimidation hazard

Link	2026 (without development) All Traffic 18hr AAWT (vehicles/hour)	Fear and Intimidation Hazard	2026 (without development) HGV 18hr AAWT (total)	Fear and Intimidation Hazard
Link 2 - A38 New Road	996	Medium	768	Low
Link 9 - A4174 Colliters Way (North)	1,570	High	1,293	Medium
Link 10 - A38 Bridgwater Road (North)	801	Medium	718	Low
Link 12 - A38 (North of West Lane)	1,643	High	1,210	Medium
Link 14 – West Lane	393	Low	94	Very low
Link 15 – Downside Road	403	Low	273	Very low

Predicted effects and their significance

6.12.6 Modelled traffic flows for 2026 'with development' scenario and the associated fear and intimidation hazard are presented in **Table 6.22**.

Table 6.422 2026 (with development) fear and intimidation hazard

Link	2026 (with development) All Traffic 18hr AAWT (vehicles/hour)	Fear and Intimidation Hazard	2026 (with development) HGV 18hr AAWT (total)	Fear and Intimidation Hazard
Link 2 - A38 New Road	1,050	Medium	768	Low
Link 9 - A4174 Colliters Way (North)	1,656	High	1,313	Medium
Link 10 - A38 Bridgwater Road (North)	872	Medium	718	Low
Link 12 - A38 (North of West Lane)	1,801	Very High	1,229	Medium
Link 14 – West Lane	429	Low	94	Very low
Link 15 – Downside Road	424	Low	273	Very low

- 6.12.7 Fear and intimidation hazard associated with five of the six links has not changed as a result of the Proposed Development, although flows have increased.
- 6.12.8 It is anticipated that Link 12; A38 (North of West Lane) will experience an increase in hazard from high to very high as a result of increases in total vehicle movements associated with the Proposed Development. The 'without development' scenario flows are towards the upper end of the 'high' hazard classification at 1,643 and the additional flows of 153 movements related to the Proposed Development result in the total vehicle flows breaching the very high threshold by only one vehicle/hour.
- 6.12.9 Links 2, 9, 10, 14 and 15 do not experience a change in hazard as a result of the Proposed Development and therefore the magnitude change on these links is considered to be **very low**. Receptor sensitivity varies along these links from **very low** to **medium**. It is anticipated that effects will be **negligible** and therefore **not significant**.
- 6.12.10 Only Link 12: A38 (North of West Lane) experiences a change of one hazard classification, the magnitude of change is considered to be **medium**. As only **low** sensitivity receptors are located along Link 12: A38 (North of West Lane), effects are considered to be **minor** and **no significant effects** are likely to occur.

6.13 Assessment of operational driver delay effects

- 6.13.1 The TA (**Appendix 6A**) has assessed the impact that the Proposed Development may have on junction capacity at a number of junctions within the study area. Junctions which would receive a 5% or greater increase in vehicles in any of the three peak hours, AM (08:00-09:00), Inter Peak (13:00-14:00) and PM (17:00-18:00), were identified for further capacity modelling. These junctions are:
- Junction 1 A38 / Bristol Airport Northern Roundabout;
 - Junction 2 A38 / Bristol Airport Southern Roundabout;
 - Junction 3 Downside Road / Bristol Airport Service Access;
 - Junction 4a A38 / Downside Road;
 - Junction 4b A38 / West Lane;
 - Junction 5 A38 / Barrow Lane;
 - Junction 6 A38 / Barrow Street; and
 - Junction 7 A38 / A4174 South Bristol Link (SBL).

Current baseline

- 6.13.2 Current delays experienced at the eight junctions are outlined in **Table 6.23**.

Table 6.23 2018 baseline driver delay

Junction Number	Junction Name	Arm	2018 Baseline Delay (sec)		
			AM	Inter	PM
1	A38 / Northern Roundabout	A38 (North)	2.90	3.00	3.75

Junction Number	Junction Name	Arm	2018 Baseline Delay (sec)		
			AM	Inter	PM
		Enterprise Car Rental	6.02	6.52	8.68
		A38 (South)	5.41	3.76	5.26
		Bristol Airport	2.72	3.03	3.25
2	A38 / Southern Roundabout	A38 (North)	2.39	2.52	2.79
		A38 (South)	3.05	2.24	2.52
		Bristol Airport	4.28	3.76	4.23
3	Downside Way / Bristol Airport	Bristol Airport Left Turn	6.48	5.86	6.59
		Bristol Airport Right Turn	10.10	8.65	9.52
		Downside Way (West)	4.98	5.02	5.08
4a	A38/West Lane	West Lane Left Turn	16.30	12.88	57.10
		West Lane Right Turn	43.23	32.91	287.44
		A38 (South)	12.25	11.66	21.34
4b	A38/Downside Road	A38 (South)	18.40	13.00	47.40
		Downside Road	66.80	68.10	139.40
		A38 (North)	15.11	9.70	12.40
5	A38 / Barrow Lane	A38 Bridgewater Road (W)	2.00	1.60	1.80
		Barrow Lane	20.10	11.20	22.20
6	A38/Barrow Street	A38 Bridgewater Road (W)	23.60	15.00	24.50
		B3130 Barrow Street	22.10	24.90	20.40
		A38 Bridgewater Road (E)	19.10	9.40	17.10
7	SBL / A38	SBL (North) – Ahead & Left	21.50	22.00	24.80
		SBL (North) – Ahead	20.70	22.30	24.90
		SBL (North) – Circulatory Ahead	5.60	5.00	5.10

Junction Number	Junction Name	Arm	2018 Baseline Delay (sec)		
			AM	Inter	PM
		SBL (North) – Circulatory Right Ahead	5.90	5.40	5.30
		A38 (North) – Ahead + Left	31.80	26.00	31.60
		A38 (North) – Ahead	33.30	26.80	32.40
		A38 (North) – Circulatory Ahead	3.70	2.50	3.20
		A38 (North) – Circulatory Right Ahead	2.80	2.20	2.70
		A38 (North) – Circulatory Right	1.40	1.40	1.60
		SBL (South) – Left	21.00	23.40	25.20
		SBL (South) – Ahead	20.60	20.60	21.70
		SBL (South) – Circulatory Ahead	10.70	6.70	9.30
		SBL (South) – Circulatory Ahead	9.30	6.20	8.10
		SBL (South) – Circulatory Right	10.60	8.40	11.10
		A38 (South) – Left	12.50	10.30	10.00
		A38 (South) – Ahead	10.20	7.50	8.60
		A38 (South) – Circulatory Ahead	7.80	6.00	7.70
		A38 (South) – Circulatory Right Ahead	8.80	7.00	8.50
6.13.3	At present, the greatest delay is experienced on Junction 4a A38/West Lane during the PM peak. The longest delays during the AM and inter peak hours are experienced on Junction 4b A38/Downside Road. Delays are generally longer during the PM peak, than the AM and inter peak hour.				
6.13.4	The shortest delays during all three peaks are experienced on Junction 7 A38/ SBL A38 (North) – Circulatory Right. On this arm drivers experience delays of less than two seconds.				
Predicted future baseline					
6.13.5	At the time of writing, there are no known plans to improve any of the junctions that have been capacity tested by 2026.				

6.13.6 Forecast delays anticipated in 2026 in the absence of the Proposed Development are outlined in **Table 6.24**.

Table 6.24 2026 (without development) driver delay

Junction Number	Junction Name	Arm	2026 (without development) delay (seconds)		
			AM	Inter	PM
1	A38 / Northern Roundabout	A38 (North)	3.64	4.35	5.78
		Enterprise Car Rental	7.88	10.62	15.60
		A38 (South)	8.80	5.32	9.12
		Bristol Airport	3.20	4.63	4.51
2	A38 / Southern Roundabout	A38 (North)	2.53	2.92	3.23
		A38 (South)	3.59	2.43	2.77
		Bristol Airport	4.97	4.57	5.11
3	Downside Way / Bristol Airport	Bristol Airport Left Turn	6.70	6.09	6.96
		Bristol Airport Right Turn	10.86	9.16	10.20
		Downside Way (West)	4.98	5.02	5.12
4a	A38/West Lane	West Lane Left Turn	42.46	55.65	628.42
		West Lane Right Turn	238.38	1717.83	1804.55
		A38 (South)	16.62	20.01	46.62
4b	A38/Downside Road	A38 (South)	47.20	41.90	365.70
		Downside Road	111.20	111.40	328.70
		A38 (North)	26.50	19.60	65.10
5	A38 / Barrow Lane	A38 Bridgewater Road (W)	2.60	2.20	2.30
		Barrow Lane	113.00	42.20	83.30
6	A38/Barrow Street	A38 Bridgewater Road (W)	30.30	21.50	28.30

		B3130 Barrow Street	21.90	21.50	21.50
		A38 Bridgewater Road (E)	40.90	11.90	19.40
7	SBL / A38	SBL (North) – Ahead & Left	22.00	23.00	27.80
		SBL (North) – Ahead	20.30	23.30	27.70
		SBL (North) – Circulatory Ahead	6.00	5.90	5.70
		SBL (North) – Circulatory Right Ahead	6.30	6.70	6.10
		A38 (North) – Ahead + Left	35.10	28.60	33.00
		A38 (North) – Ahead	34.30	27.30	31.70
		A38 (North) – Circulatory Ahead	4.00	3.10	4.10
		A38 (North) – Circulatory Right Ahead	3.10	2.80	3.50
		A38 (North) – Circulatory Right	1.40	1.50	1.70
		SBL (South) – Left	22.00	27.00	28.60
		SBL (South) – Ahead	22.80	23.20	24.50
		SBL (South) – Circulatory Ahead	12.30	6.90	8.40
		SBL (South) – Circulatory Ahead	11.60	6.40	7.60
		SBL (South) – Circulatory Right	11.70	6.70	7.70
		A38 (South) – Left	15.70	11.70	10.60
		A38 (South) – Ahead	11.90	7.80	9.00
		A38 (South) – Circulatory Ahead	7.20	6.70	9.00
		A38 (South) – Circulatory Right Ahead	8.30	8.50	10.30

- 6.13.7 Delays are expected to increase at the majority of junctions due to future traffic growth associated with surrounding development, including additional trips associated with Bristol Airport reaching the consented 10mppa.
- 6.13.8 An increase in delays of 100% or greater are expected to occur at one or more peak periods at Junction 4a, 4b, 5 and 6. The greatest increase is anticipated at Junction 4a, particularly on the West Lane Left Turn (628.42 seconds) and West Lane Right Turn (1804.55 seconds) arms. This reflects the constrained nature of these junctions and their predicted peak hour operation above capacity in the 2026 “without development” scenario.
- 6.13.9 Although Junction 6 experiences increases in delays of greater than 100%, none of these increases equate to more than five seconds. Increases in delays experienced on Junctions 4a and 4b are mitigated through proposed junction improvements to be provided as part of the Proposed Development. Anticipated changes to delays experienced at these junctions as a result of the proposed improvement works are detailed in **Table 6.25**.
- 6.13.10 Decreases in delay are expected to occur at the following junctions:
- Junction 6:
 - ▶ B3130 Barrow Street;
 - Junction 7:
 - ▶ SBL (N) – Ahead;
 - ▶ A38 (N) – Ahead;
 - ▶ SBL (S) – Circulatory Ahead;
 - ▶ SBL (S) – Circulatory Right;
 - ▶ A38 (S) – Circulatory Ahead; and
 - ▶ A38 (S) – Circulatory Right Ahead.
- 6.13.11 The greatest decrease is anticipated to occur on SBL (S) – Circulatory Right (-30.6 seconds).

Predicted effects and their significance

- 6.13.12 As part of the Proposed Development, upgrades will be made to Junctions 1, 4a and 4b and there will be widening of the A38 between Junction 4a and 4b, as outlined in **Section 6.7**.
- 6.13.13 **Table 6.25** presents delays that would be expected at junctions in their existing state (status noted as ‘existing’) and once they have been upgraded as part of the Proposed Development (status noted as ‘proposed’). Values have been noted as ‘N/A’ where junctions have been re-designed such that new arms or lanes have been added and a direct comparison of driver delay times is not possible.

Table 6.25 2026 (with development) driver delay and change in delay (seconds) from 2026 (without development) scenario (in Table 6.22)

Status	Junction Number	Junction Name	Arm	2026 (with development) delay (seconds)			Change in delay (seconds) from 2026 without development		
				AM	Inter	PM	AM	Inter	PM
Existing	1	A38 / Northern Roundabout	A38 (North)	4.06	6.04	7.41	0.42	1.69	1.63
			Enterprise Car Rental	8.97	17.41	22.95	1.09	6.79	7.35
			A38 (South)	10.93	7.36	12.66	2.13	2.04	3.54
			Bristol Airport	3.41	7.07	5.49	0.21	2.44	0.98
Proposed	1	A38 / Northern Roundabout	A38 (North)	3.70	4.43	7.66	0.06	0.08	1.88
			Enterprise Car Rental	7.87	10.62	22.95	-0.01	0.00	7.35
			A38 (South)	8.80	5.44	12.70	0.00	0.12	3.58
			Bristol Airport	3.89	3.72	3.73	0.69	-0.91	-0.78
Existing	2	A38 / Southern Roundabout	A38 (North)	2.59	3.18	3.38	0.06	0.26	0.15
			A38 (South)	3.73	2.58	2.89	0.14	0.15	0.12
			Bristol Airport	5.14	5.04	5.45	0.17	0.47	0.34
Existing	3	Downside Way / Bristol Airport	Bristol Airport Left Turn	6.71	6.14	7.05	0.01	0.05	0.09
			Bristol Airport Right Turn	10.95	9.31	10.41	0.09	0.15	0.21

			Downside Way (West)	4.96	4.99	5.13	-0.02	-0.03	0.01
Existing	4a	A38/West Lane	West Lane Left Turn	121.48	178.43	1039.05	79.02	122.78	410.63
			West Lane Right Turn	4413.46	1794.21	3265.61	4175.08	76.38	1461.06
			A38 (South)	19.29	34.22	99.08	2.67	14.21	52.46
Proposed	4a	A38/West Lane	A38 (North) – Ahead	15.20	19.80	14.40	N/A	N/A	N/A
			A38 (North) – Left	15.20	19.80	14.40	N/A	N/A	N/A
			West Lane – Left	28.30	29.80	38.50	N/A	N/A	N/A
			A38 (South) – Ahead	2.40	2.60	2.70	N/A	N/A	N/A
			A38 (South) – Ahead & Right	6.70	7.00	5.60	N/A	N/A	N/A
Existing	4b	A38/Downside Road	A38 (South)	108.10	196.50	462.20	60.90	154.60	96.50
			Downside Road	170.30	267.80	470.00	59.10	156.40	141.30
			A38 (North)	33.10	80.80	173.10	6.60	61.20	108.00
Proposed	4b	A38/Downside Road	A38 (South) - Left & Ahead	11.60	9.80	10.30	N/A	N/A	N/A
			A38 (South) - Ahead	11.60	9.30	8.90	N/A	N/A	N/A
			Downside Road - Left	36.40	47.00	41.20	N/A	N/A	N/A
			Downside Road – Right	36.40	47.00	41.20	N/A	N/A	N/A

			A38 (North) – Ahead	5.70	3.30	3.70	N/A	N/A	N/A
			A38 (North) – Ahead	5.40	3.20	3.60	N/A	N/A	N/A
Existing	5		A38 Bridgewater Road (W)	2.70	2.80	2.60	0.10	0.60	0.30
			Barrow Lane	163.00	116.30	128.90	50.00	74.10	45.60
Existing	6		A38 Bridgewater Road (W)	36.30	33.10	39.50	6.00	11.60	11.20
			B3130 Barrow Street	20.50	18.20	19.20	-1.40	-3.30	-2.30
			A38 Bridgewater Road (E)	26.80	15.10	24.00	-14.10	3.20	4.60
Existing	7	SBL / A38	SBL (North) – Ahead & Left	23.60	24.00	29.20	1.60	1.00	1.40
			SBL (North) – Ahead	21.90	24.40	29.00	1.60	1.10	1.30
			SBL (North) – Circulatory Ahead	5.80	6.20	5.80	-0.20	0.30	0.10
			SBL (North) – Circulatory Right Ahead	6.10	6.70	6.20	-0.20	0.00	0.10
			A38 (North) – Ahead + Left	37.30	31.40	36.00	2.20	2.80	3.00
			A38 (North) – Ahead	34.30	27.30	31.70	0.00	0.00	0.00
			A38 (North) – Circulatory Ahead	3.90	3.10	4.10	-0.10	0.00	0.00
			A38 (North) – Circulatory Right Ahead	3.00	2.80	3.50	-0.10	0.00	0.00
			A38 (North) – Circulatory Right	1.40	1.60	1.70	0.00	0.10	0.00

SBL (South) – Left	22.00	27.00	28.60	0.00	0.00	0.00
SBL (South) – Ahead	22.80	23.60	24.70	0.00	0.40	0.20
SBL (South) – Circulatory Ahead	12.60	7.70	8.90	0.30	0.80	0.50
SBL (South) – Circulatory Ahead	12.00	7.50	8.30	0.40	1.10	0.70
SBL (South) – Circulatory Right	11.70	6.70	7.70	0.00	0.00	0.00
A38 (South) – Left	15.10	14.60	11.20	-0.60	2.90	0.60
A38 (South) – Ahead	11.40	7.70	9.30	-0.50	-0.10	0.30
A38 (South) – Circulatory Ahead	8.40	6.60	8.50	1.20	-0.10	-0.50
A38 (South) – Circulatory Right Ahead	9.50	8.70	10.70	1.20	0.20	0.40

- 6.13.14 Only Junctions 4a, 4b and 5 will experience changes in driver delay which are greater than a magnitude of **very low**. All other junctions will experience an increase or decrease in delay by less than 20 seconds at peak times, which equates to a very low magnitude change. Most receptors in proximity to these junctions are **very low** or **low** sensitivity (residential and open space) and so effects are largely negligible. Only Junction 6 will experience a **minor adverse** effect as there is a high sensitivity receptor (roads used by pedestrians with no footways) present on Barrow Street (Link 13) near this junction. This effect is considered to be **not significant**.
- 6.13.15 As the layout of Junctions 4a and 4b will be altered as a result of the Proposed Development, a direct comparison cannot be made between delays experienced on each of the arms of these junctions. The maximum delay experienced at junction 4a in the absence of the Proposed Development is 30 minutes on the West Lane Right Turn arm. In comparison, the longest delay predicted at this junction once altered as part of the Proposed Development is 39 seconds on the West Lane Left arm. This equates to a **very high** magnitude beneficial change at a junction which is in proximity to **very low** and **low** sensitivity receptors including Felton Village Hall. The effect significance at these junctions is therefore either beneficial **moderate/major** (depending on receptor sensitivity) and it is considered that the Proposed Development will result in a **significant beneficial effect** in respect of reduced driver delay.
- 6.13.16 The longest delay anticipated in absence of the Proposed Development on Junction 4b is approximately 6 minutes, on the A38 (South) arm. In comparison, the longest delay expected at this junction once it has been upgraded as part of the Proposed Development is 47 seconds on the Downside Road Left and Right arms. At greater than 90 seconds, the magnitude of change is **very high**. There are **low** sensitivity receptors present in close proximity to this junction, including residential properties, resulting in major effect significance. Therefore, the beneficial effect with respect to reduced driver delay is considered to be **significant (beneficial)**.
- 6.13.17 At Junction 5, it is anticipated that there will be a maximum increase in delay of 74 seconds which would occur on the Barrow Lane arm during the inter peak hour only. Increases in delay during all other hours of the day would be lower. This would equate to a **high** magnitude adverse change. There is a **low** sensitivity receptor in close proximity to this junction in the form of a residential property. However, the majority of the surrounding area is comprised of agricultural land which is of **very low** sensitivity. This could result in a **minor to moderate adverse** effect, however given that the area surrounding the junction is largely open space, it is considered that this effect would be **not significant**.

6.14 Assessment of operational accidents and road safety

- 6.14.1 As part of the TA (**Appendix 6A**), a PIC review has been conducted across study areas in NSC and BCC. This assessed the most recent five-year study period to determine whether there are any integral highway safety issues where increases in vehicular, pedestrian and cycle movements associated with the Proposed Development are anticipated.
- 6.14.2 The section below provides a summary of the assessment and main conclusions, full details of which are provided in the TA (**Appendix 6A**).

Baseline conditions

Current baseline: NSC study area

Collision

6.14.3 A summary of the annual rolling 54-month collision data (01 January 2014 to 30 June 2018) within the study area is provided within **Table 6.26**. The five rolling years are as follows;

- ▶ Year 1 - 01/01/2014 – 31/12/2014;
- ▶ Year 2 – 01/01/2015 – 31/12/2015;
- ▶ Year 3 - 01/01/2016 – 31/12/2016;
- ▶ Year 4 – 01/01/2017 – 31/12/2017; and
- ▶ Year 5 – 01/01/2018 – 30/06/2018.

6.14.4 Accidents are categorised as either fatal, serious or slight in this data set and during this 54-month period, there were 321 collisions resulting in five (2%) fatal accidents, 50 (15%) serious accidents and 266 (83%) slight accidents.

Table 6.26 Summary of collisions (01/01/2014 - 30/06/2018)

Collisions	Injury Severity	Year					Total
		1	2	3	4	5	
Total	Fatal	1	1	0	3	0	5
	Serious	10	10	8	19	3	50
	Slight	74	59	53	67	13	266
	Sub Total	85	70	61	89	16	321
Vehicles	Fatal	1	1	0	1	0	3
	Serious	7	7	4	15	2	35
	Slight	58	50	39	53	12	212
	Sub Total	66	58	43	69	14	250
Pedestrian	Fatal	0	0	0	2	0	2

	Serious	2	2	3	1	1	9
	Slight	6	2	8	4	0	20
	Sub Total	8	4	11	7	1	31
Cyclist	Fatal	0	0	0	0	0	0
	Serious	1	1	1	3	0	6
	Slight	10	7	6	10	1	34
	Sub Total	11	8	7	13	1	40

6.14.5 Over the entire 5-year period, 22% (71) of the recorded collisions involved a vulnerable road user (pedestrian or cyclist) resulting in two fatalities, 15 serious accident types and 54 slight accident types. The remaining collisions involved vehicles only. For the individual years, the proportion of collisions involving either cyclists or pedestrians are as follows:

- 2014: 22% (19);
- 2015: 17% (12);
- 2016: 30% (18);
- 2017: 22% (20); and
- 2018: 13% (2).

6.14.6 The greatest number of collisions involving vehicles only occurred in 2017 where 69 collisions (82% of all collisions) occurred. The year with the highest proportion of vehicle only collisions is 2018 where 14 (87% of all collision) occurred.

Casualties

6.14.7 A summary of the number of casualties across the 54-month period is provided in **Table 6.27**. During the study period, there were 448 casualties resulting in five (1%) fatal injuries, 53 (12%) serious injuries and 390 (87%) slight injuries.

6.14.8 Over the entire 5-year period, 16% (72) of casualties involved a pedestrian or cyclists, 7% (31) were pedestrians and 9% (31) cyclists. There was one fatality involving a vulnerable road user (pedestrian) and 14 serious casualties (nine pedestrians and five cyclists).

Table 6.27 Summary of casualties (01/01/2014 - 30/06/2018)

Collisions	Injury Severity	Year					Total
		1	2	3	4	5	

Total	Fatal	1	1	0	3	0	5
	Serious	10	10	8	22	3	53
	Slight	105	85	76	105	19	390
	Sub Total	116	96	84	130	22	448
Vehicles	Fatal	1	1	0	1	0	3
	Serious	7	7	4	19	2	39
	Slight	89	76	62	88	18	333
	Sub Total	97	84	66	108	20	375
Pedestrian	Fatal	0	0	0	2	0	2
	Serious	2	2	3	1	1	9
	Slight	6	2	8	5	0	21
	Sub Total	8	4	11	8	1	32
Cyclist	Fatal	0	0	0	0	0	0
	Serious	1	1	1	2	0	5
	Slight	10	7	6	12	1	36
	Sub Total	11	8	7	14	1	41

6.14.9 The TA (**Appendix 6A**) identified that there are nine junctions where 'clusters'²² of collisions have occurred. The junctions where clusters of collisions have occurred and the main contributing factors are presented in **Table 6.28**.

²² A minimum of five collisions at a junction has been used to define a cluster of collisions, though exceptions have been made for locations in which there is a concentration of serious/fatal injuries.

Table 6.58 NSC study area collision clusters

Junction	Contributing factors
Bristol Road/ High Street	Of the contributing factors related to the collisions 43% were recorded as Driver/Rider Error or Reaction. The remaining 57% of factors were mostly comprised of Road Environment (14%) and Injudicious Action (14%).
West Town Road/ Station road / Dark Lane	53% of the contributory factors attributed were recorded as Driver/Rider Error or Reaction. The remaining 47% of factors were mostly comprised of Injudicious Action (14%) and Road Environment (9%).
A38/Downside road/West Lane	78% of the contributory factors attributed were recorded as 'Driver/Rider Error or Reaction'. The remaining 22% of factors were mostly comprised of 'Impairment or Distraction' (11%) and 'Behaviour or Inexperience' (11%).
Barrow Lane/ Hobbs Lane	60% of the contributory factors attributed were recorded as Driver/Rider Error or Reaction. The remaining 40% of factors were mostly comprised of 'Road Environment' (10%), 'Impairment or Distraction' (10%) and 'Behaviour or Inexperience' (10%).
A38/Dundry Lane	64% of the contributory factors attributed were recorded as Driver/Rider Error or Reaction. The remaining 36% of factors were mostly comprised of Road Environment (27%) and Injudicious Action (10%).
Bristol Road / Langford Road	63% of the contributory factors attributed were recorded 'Impairment or Distraction'. The remaining 37% of factors were mostly comprised of 'Injudicious Action' (21%) and 'Behaviour or Inexperience' (11%).
Longwood Lane/B3128/Providence Lane	40% of the contributory factors attributed were 'Impairment or Distraction'. The remaining 60% of factors were mostly comprised of 'Road Environment' (20%) and 'Vision Affected by' (13%).
Station Road / Clevedon Road	36% of the contributory factors attributed were recorded 'Impairment or Distraction'. The remaining 64% of factors were mostly comprised of 'Road Environment' (21%) and 'Vision Affected by' (13%).
Smallway/B3169/Bristol Road	50% of the contributory factors attributed were Driver / Rider Error or Reaction The remaining 50% of factors were mostly comprised of Injudicious Action (19%) and Behaviour or Inexperience (13%).

Current baseline: BSC study area

Collision

- 6.14.10 A summary of the annual rolling 60-month collision data (01 October 2013 to 30 September 2018) within the BCC study area is provided within **Table 6.29**. The five rolling years are as follows:
- ▶ Year 1 - 01/10/2013 – 30/09/2014;
 - ▶ Year 2 – 01/10/2014 – 30/09/2015;
 - ▶ Year 3 - 01/10/2015 – 30/09/2016;
 - ▶ Year 4 – 01/10/2016 – 30/09/2017; and
 - ▶ Year 5 – 01/01/2017 – 30/09/2018.
- 6.14.11 During this period, there were 235 collisions resulting in three (1%) fatal accidents, 22 (9%) serious accidents and 210 (90%) slight accidents.

Table 6.29 Summary of Collisions (01/10/2013 – 30/09/2018)

Collisions	Injury Severity	Year					Total
		1	2	3	4	5	
Total	Fatal	1	0	0	1	1	3
	Serious	5	4	6	4	3	22
	Slight	49	48	36	41	36	210
	Sub Total	55	52	42	46	40	235
Vehicle	Fatal	1	0	0	0	0	1
	Serious	2	4	1	2	3	12
	Slight	36	32	22	28	21	139
	Sub Total	39	36	23	30	24	152
Pedestrian	Fatal	0	0	0	1	1	2
	Serious	1	0	3	1	0	5
	Slight	6	4	6	6	4	26
	Sub Total	7	4	9	8	5	33
Cyclist	Fatal	0	0	0	0	0	0
	Serious	2	0	2	1	0	5
	Slight	7	12	7	7	11	44
	Sub Total	9	12	9	8	11	49

6.14.12 Over the entire five-year period, 35% (82) of the recorded collisions involved a vulnerable road user (pedestrian or cyclist) resulting in two fatalities, 10 serious injuries and 70 slight injuries. The remaining collisions involved vehicles only. For the individual years, the proportion of collisions involving either cyclists or pedestrians are as follows;

- 2014: 19.5% (16);
- 2015: 19.5% (16);
- 2016: 22% (18);
- 2017: 19.5% (16); and
- 2018: 19.5% (16).

6.14.13 The highest number of vehicle only collisions occurred in year 1 during which 39 (71% of all collision) occurred. The year with the highest proportion of vehicle only collisions is year 2 where 36 (69% of all collision) occurred.

Casualties

6.14.14 A summary for the casualties across the 60-month period is provided in **Table 6.30**. During the 60-month period, between the 1 October 2013 to 30 September 2018, there were 299 casualties resulting in three (1%) fatal injuries, 22 (7%) serious injuries and 274 (92%) slight injuries.

6.14.15 Over the entire five-year period, 27% (81) of casualties involved a pedestrian or cyclists; 11% (32) were pedestrians and 16% (49) cyclists. There were two fatalities involving a vulnerable road user and 10 serious casualties.

Table 6.30 Summary of Casualties (01/10/2013 – 30/09/2018)

Collisions	Injury Severity	Year					Total
		1	2	3	4	5	
Total	Fatal	1	0	0	1	1	3
	Serious	5	4	6	4	3	22
	Slight	61	64	46	48	55	274
	Sub Total	67	68	52	53	59	299
Vehicle	Fatal	1	0	0	0	0	1
	Serious	2	4	1	2	3	12
	Slight	48	48	32	35	41	204
	Sub Total	51	52	33	37	44	217
Pedestrian	Fatal	0	0	0	1	1	2
	Serious	1	0	3	1	0	5
	Slight	6	4	6	6	3	25

	Sub Total	7	4	9	8	4	32
Cyclist	Fatal	0	0	0	0	0	0
	Serious	2	0	2	1	0	5
	Slight	7	12	7	7	11	44
	Sub Total	9	12	9	8	11	49

6.14.16 The TA (**Appendix 6A**) identified that there are eight junctions where clusters of collisions have occurred. These locations and contributing factors are presented in **Table 6.31**.

Table 6.31 BCC study area collision clusters

Junction	Contributing factors
Whitechurch Lane / Hareclive Road	30% of the contributory factors attributed were recorded as 'Driver / rider error or reaction'. The remaining 70% of factors were mostly comprised of 'Vision affected by' (20%), 'Pedestrian only' (20%) and 'Special codes' (20%).
Anton Bantock Way / Hareclive Road	40% of the contributory factors attributed were recorded as 'Pedestrian only'. The remaining 60% of factors were mostly comprised of 'Injudicious Action' (20%).
Hengrove Way / Hartcliffe Way / Whitechurch Lane	35% of the contributory factors attributed were recorded as 'Driver / rider error or reaction'. The remaining 65% of factors were mostly comprised of 'Injudicious Action' (17%) and 'Impairment or Distraction' (17%).
Bedminster Down Road / Bedminster Road	35% of the contributory factors attributed were recorded as 'Driver / rider error or reaction'. The remaining 75% of factors were mostly comprised of 'Injudicious action' (26%) and 'Behaviour or Inexperience' (17%).
Winterstoke Road / Luckwell Lane / Marsh Lane	53% of the contributory factors attributed were recorded as 'Driver / rider error or reaction'. The remaining 47% of factors were mostly comprised of 'Injudicious action' (18%).
Blackmoors Lane / Clanage Road	50% of the contributory factors attributed were recorded as 'Driver / rider error or reaction'. The remaining 50% of factors were mostly comprised of 'Injudicious action' (21%) and 'Pedestrian only' (14%).
Plimsoll – Swing Bridge	53% of the contributory factors attributed were recorded as 'Driver / rider error or reaction'. The remaining 47% of factors were mostly comprised of 'Road environment' (18%).
Hotwell Place / Pembroke Place	84% of the contributory factors attributed were recorded as 'Driver / rider error or reaction'. The remaining 16% of factors were mostly comprised of 'Vision affected by' (8%) and 'Special codes' (8%).

Predicted future baseline

6.14.17 Future traffic growth will cause roads to be busier and therefore could increase the probability of a collision occurring. The collision data (**Table 6.26**) shows that although there was an increase in the number of collisions within the NSC study area between year 2 (2015) and year 4 (2017), the number of collisions recorded during year 2 (2015) and year 3 (2016) were lower than year 1 (2014) figures. Figures for the first six-month period of 2018 would indicate that there is potentially a reduction in the number of collisions occurring within the study area. However, since this data does

not incorporate autumn and winter months, where adverse weather conditions and less daylight can adversely affect the road environment, it is not possible to say with confidence that the number of collisions on the road network is reducing.

- 6.14.18 Collision data from BCC (**Table 6.29**) shows that the number of collisions within the study area is generally decreasing year on year from a high of 55 collisions in year 1 (2013 – 2014) to 40 in year 5 (2017-2018). There was a slight increase in the number of collisions in year 4 (2016-2017) where four more accidents occurred than the previous year, however, accident rates were still lower than for years 1 and 2.

Predicted effects and their significance

- 6.14.19 The analysis of the collision records presented in the TA (**Appendix 6A**) has concluded that there are no specific concerns regarding the geometric design / road layout of the local highway network. There are no re-occurring patterns of the frequency or severity of collisions recorded and the data does not highlight any specific concerns to clustering of collisions or locations within the NSC or BCC study area.
- 6.14.20 In addition to this, highway improvements in this area associated with the Proposed Development, such as the signalisation of the A38/ West Lane junction, have the potential to reduce the number of collisions occurring at the A38/Downside road/West lane junction where a cluster of accidents was identified. As most accidents (78%) were noted as being due to 'Driver/ Rider Error or Reaction' and not due to the layout of the junction, this could result in a minor beneficial impact.
- 6.14.21 A summary of the results of the assessment of the Traffic and Transport effects is provided in **Table 6.32**.

Table 6.32 Summary of significance of effects

Receptor and summary of predicted effects		Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Construction					
Severance	Links 1 - 18	Very low - High	Negligible	Negligible (not significant)	It is not anticipated that links will experience more than a 5% change in total vehicle AAWT or HGV AAWT and therefore no significant effects are anticipated. A CEMP has been submitted as part of the application which outlines measures to reduce potential adverse impacts to the local highway network during the construction phase.
Pedestrian and Cyclist Delay and Amenity					
Fear and Intimidation					
Accidents and Road Safety					
Driver Delay	Links 12, 14 and 15	N/A	N/A	Not significant	There may be a temporary adverse effect associated with driver delay along the A38 and at the northern and southern Bristol Airport roundabouts whilst upgrades are being undertaken however it is not anticipated that this would be significant due to the localised and temporary nature of the works.
Operation					
Severance	Link 2 A38 New Road	Medium	Very low	Negligible (not significant)	The majority of the area through which these links pass is open space and agricultural land. Link 12, 14 and 15 also pass through the villages of Potters Hill, Felton and Lulsgate Bottom, respectively, where residential receptors are located. Increases in traffic expected along these as a result of the Proposed Development may result in an increase in the severance experienced within these villages as there are a lack of formal crossing points. However these increases in traffic are expected to
	Link 9 A4174 Colliters Way (North)	Very low	Very low	Negligible (not significant)	
	Link 10 A38 Bridgwater Road (North)	Low	Very low	Negligible (not significant)	
	Link 12 A38 (North of West Lane)	Low	Very low	Negligible (not significant)	
	Link 14 West Lane	Low	Very low	Negligible (not significant)	

Receptor and summary of predicted effects		Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
	Link 15 Downside Road	Medium	Very low	Negligible (not significant)	be relatively minor and therefore effects are likely to be negligible.
Pedestrian and Cyclist Delay and Amenity	Link 2 A38 New Road	Medium	Low	Minor adverse (not significant)	The lack of formal pedestrian and cycle facilities, such as footpaths, controlled crossing points and cycle lanes reflects the rural nature of the local area surrounding Bristol Airport. There are a number of footpaths which are present along these links (at least in part) and the NCR 410 runs along West Lane and Downside Road. It is anticipated that the increases in traffic flows will result in a very low change to pedestrian and cyclist delay and amenity, however this will mainly be related to the pleasantness of the journey, particularly by cyclists using the NCR 410 and will not be significant.
	Link 9 A4174 Colliters Way (North)	Very low	Low	Negligible (not significant)	
	Link 10 A38 Bridgwater Road (North)	Low	Low	Negligible (not significant)	
	Link 12 A38 (North of West Lane)	Low	Low	Negligible (not significant)	
	Link 14 West Lane	Low	Low	Negligible (not significant)	
	Link 15 Downside Road	Medium	Low	Minor adverse (not significant)	
Fear and Intimidation	Link 2 A38 New Road	Medium	No change	Negligible (not significant)	The Proposed Development is not expected to increase the level of fear and hazard experienced on five of the six links. On these links the same level of hazard is expected to occur in 2026 with or without the development. Only Link 12 is expected to see an increase in fear and intimidation hazard experienced which may change from 'high' to 'very high'. This is mainly due to flows being within the upper end of the 'high' hazard classification in absence of the Proposed Development, and the additional flows related to the Proposed Development resulting in the total vehicle flows falling within the 'very high' hazard by one vehicle an hour.
	Link 9 A4174 Colliters Way (North)	Very low	No change	Negligible (not significant)	
	Link 10 A38 Bridgwater Road (North)	Low	No change	Negligible (not significant)	
	Link 12 A38 (North of West Lane)	Low	Medium	Minor adverse (not significant)	
	Link 14 West Lane	Low	No change	Negligible (not significant)	
	Link 15 Downside Road	Medium	No change	Negligible (not significant)	
Driver Delay	Junction 1 A38 / Bristol Airport Northern Roundabout	Very Low and Low	Very low	Negligible (not significant)	Highway improvements and junction upgrades proposed as part of the Proposed Development will help reduce

Receptor and summary of predicted effects		Sensitivity/ importance/ value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
	Junction 2 A38 / Bristol Airport Southern Roundabout	Low	Very low	Negligible (not significant)	driver delay times at Junctions 4a and 4b which is likely to have significant beneficial effects. Increases in vehicle movements associated with the Proposed Development may cause a change in driver delay time of less than 20 seconds at junctions 1, 2, 3, 6 and 7 and therefore no significant effects are anticipated at these locations. There will be increases in delay of up to 74 seconds during the inter peak hour at Junction 5, however given the nature of the surrounding area and receptors it is not anticipated that this would result in significant effects.
	Junction 3 Downside Road / Bristol Airport Service Access	Low	Very low	Negligible (not significant)	
	Junction 4a A38 / Downside Road	Low	Very high	Moderate/major beneficial (significant beneficial)	
	Junction 4b A38 / West Lane	Low	Very high	Major beneficial (significant beneficial)	
	Junction 5 A38/Barrow Lane	Very Low and Low	High	Minor or moderate adverse (not significant)	
	Junction 6 A38 / Barrow Street	High	Very low	Minor adverse (not significant)	
	Junction 7 A38 / A4174 South Bristol Link	Low	Very low	Negligible (not significant)	
Accidents and Road Safety	N/A	N/A	N/A	N/A	No specific concerns were identified with regards to the geometric design / road layout of the local highway network. It is not anticipated that the Proposed Development will have a significant effect on accidents and road safety, however, there is potential for there to be a minor beneficial effect at the A38/Downside road/West Lane junction where a cluster of accidents was identified. This is due to improvements to be provided at this location as part of the proposal e.g. signalisation of the A38/ West Lane junction.

6.15 Consideration of additional mitigation

- 6.15.1 The assessment set out above has concluded that it will not be necessary to implement further mitigation, over and above the embedded mitigation measures outlined in **Section 6.7**, to support the 12mppa expansion. However, a Draft Workplace Travel Plan (**Appendix 6B**) has been prepared and submitted as part of the application and the implementation of an Airport Surface Access Strategy will be secured by condition. These documents outline Bristol Airport's strategy to reduce car trips and encourage the use of sustainable modes of transport by employees, passengers and visitors.

6.15.2 Conclusions of significance evaluation

- 6.15.3 Changes in traffic flows experienced on the highway network as a result of the Proposed Development are expected to be small, with less than 10% increases in the number of total vehicles and less than 2% increases in HGVs. The areas likely to experience the highest increase in traffic flows are located just to the north and east of the Bristol Airport, along the A38 and West Lane. These links have a number of sensitive receptors located along them including residential properties which are located in the small villages of Potters Hill, Lulsgate Bottom and Felton. Although increases in traffic flows will be experienced along these links, effects on severance and fear and intimidation are anticipated to be negligible and not significant. Effects on pedestrian delay and amenity are anticipated to be minor adverse and not significant which will largely be associated with the pleasantness of journeys, particularly by cyclists using the NCR 410.
- 6.15.4 Highway improvements and junction upgrades proposed as part of the Proposed Development will help reduce driver delay times at the A38 / Bristol Airport Northern Roundabout and the A38 / Downside Road and A38 / West Lane junctions. Delays are expected to decrease by over 90 seconds at peak times which is considered to be a 'very high' magnitude change and therefore there may be significant beneficial effects. Increases in vehicle movements associated with the Proposed Development may cause a change in driver delay time of less than 20 seconds at junctions 1, 2, 3, 6 and 7 and therefore no significant effects are anticipated at these locations. There will be an increase in delay of up to 74 seconds at Junction 5 during the inter-peak hour. However, given the nature of the surrounding area and receptors it is not anticipated that this would result in significant effects. Therefore, no overall significant effects are anticipated at the above locations.
- 6.15.5 No specific concerns regarding the geometric design or road layout of the local highway network in respect to accidents and safety have been identified. There is potential for there to be a minor beneficial effect at the A38/Downside road/West Lane junction where a cluster of accidents was identified. This is due to proposed improvements to be provided at this location as part of the Proposed Development (for example signalisation of the A38/ West Lane junction).
- 6.15.6 No significant effects are anticipated to occur during the construction phase due to the small traffic flows associated with this phase and the implementation of mitigation measures through the CEMP to help reduce potential adverse effects on the local highway network.

6.16 Implementation of environmental measures

- 6.16.1 **Table 6.32** describes the environmental measures embedded within the Proposed Development and the means by which they will be implemented, i.e. they will have been secured through the implementation of mitigation measures within the CEMP (**Appendix 2B**).

Table 6.6 Summary of environmental measures to be implemented – relating to Traffic and Transport

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
<i>A construction traffic management plan will be provided as part of the CEMP.</i>	Applicant and Principal Contractor	This will be secured by condition	Section 6.6
Upgrades to Junctions 1 (A38 / Bristol Airport Northern Roundabout), 4a (A38 / Downside Road) and 4b (A38 / West Lane) and widening of the A38 between Junction 4a and 4b	Applicant	This will be secured by condition	Section 6.13
A Draft Workplace Travel Plan (Appendix 6B) has been prepared and submitted as part of the application	Applicant	This will be secured by condition	Section 6.15
An Airport Surface Access Strategy (ASAS)	Applicant	This will be secured by condition	Section 6.15