Preliminary Environmental Information Report
Chapter 12: Traffic and Transport

September 2021

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12 Traffic and Transport

12.1. Introduction

12.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the findings of the Environmental Impact Assessment (EIA) work undertaken to date concerning the potential effects of the proposal to make best use of Gatwick's existing runways (referred to within this report as 'the Project') on traffic and transport.

12.1.2 This chapter sets out the assessment methodology and considers the potential traffic and transport effects of the Project during construction and operation. In particular, this PEIR chapter:

- sets out the existing and future environmental baseline conditions, established from desk studies, surveys and consultation to date;
- presents the potential environmental effects on traffic and transport arising from the Project, based on the information gathered and the analysis and assessments undertaken to date;
- identifies any assumptions and limitations encountered in compiling the environmental information; and
- highlights any necessary monitoring and/or mitigation measures that could prevent, minimise, reduce or offset the possible environmental effects identified in the EIA process.

12.1.3 This chapter covers the traffic and transport effects on people arising from the Project and should be read in conjunction with the details of the Project's impact on the transport network performance provided in the Preliminary Transport Assessment Report (PTAR), which is contained in Appendix 12.9.1. This chapter provides an assessment on severance, driver delay, pedestrian and cyclist delay and amenity, accidents and safety, hazardous loads, and effects on public transport amenity based on the approach and methodology set out in the Institute of Environmental Management and Assessment (IEMA) guidance (IEMA, 2004). The PTAR provides more detailed commentary on the current transport operation and the assessments of the Project's impact on the highway network and for specific modes such as rail, bus and coach, as well as active travel. Draft actions and targets for the Airport Surface Access Strategy (ASAS) have been included in this chapter. The effectiveness of these interventions for managing access to the airport and how mode share targets can be achieved is described more fully in the PTAR.

12.1.4 The PEIR will inform pre-application consultation. Following consultation, comments on the PEIR will be reviewed and taken into account in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate (PINS) for development consent. The ES will contain an updated assessment arising from any new analysis undertaken following submission of the PEIR and also taking into account any new data. A final Transport Assessment and draft ASAS and Travel Plan will also accompany the application for development consent.

12.2. Legislation and Policy

Legislation

12.2.1 This section identifies the legislation and policy context for traffic and transport. Legislation relevant to traffic and transport includes the Transport Act 2000, the Highways Act 1980, the Infrastructure Act 2015 and the Railways Acts 1993 and 2005.

12.2.2 The Transport Act 2000 contains *'measures to create a more integrated transport system'*. Specific measures include requirements to improve local passenger transport services, and reduce road congestion and pollution, e.g. local transport authorities should produce a Local Transport Plan (LTP) every five years and to keep that plan under review. These plans have been considered in the assessment of traffic and transport.

12.2.3 The Highways Act 1980 sets out the duties of the highway authorities and how the highway network will be managed and operated. Part V of the Highways Act 1980 sets out the legislation on Improvement of Highways and Part VA covers the Environmental Impact Assessment, which is relevant to this chapter. In addition, the Infrastructure Act 2015 defines the role of Highways England as a government-owned company responsible for ensuring improvements to the UK's strategic road network. Highways England is a statutory consultee as part of the application for development consent.

12.2.4 Privatisation of UK railways led to the Railways Act 1993 which governs licensing, access agreements to the railway for operators, access charges and their review and enforcement. The Railways Act 2005 largely amends the Railways Act 1993. The Act makes a number of changes to the regulatory framework, including a change to periodic reviews of access charges and transferring various responsibilities to the Office of Rail and Road (ORR). These Acts designate Network Rail as the owner of rail infrastructure in the UK. Network Rail is a statutory consultee as part of this application for development consent.

12.2.5 On 20 May 2021, the Williams-Shapps plan for rail was announced by Government. This White Paper sets out the Government's plan for "a revolution on the railways" in Great Britain in terms of replacing the franchising model, accelerating innovation and technological change, levelling-up the country and cleaner, greener rail travel. The plan envisages a new agency, Great British Railways, which will absorb Network Rail as well as parts of the Department for Transport's and ORR's rail functions. This section will be updated for the final ES to reflect any changes resulting from the White Paper.

Planning Policy Context

National Policy Statements[1]

12.2.6 The Airports National Policy Statement (NPS) (Department for Transport, 2018), although primarily provided in relation to a new runway at Heathrow Airport, remains a relevant consideration for other applications for airport infrastructure in London and the south east of England.

[1] In July 2021, Government published its plan to decarbonise UK transport to net zero by 2050 with a number of strategic priorities discussed, including accelerating modal shift to public and active transport, decarbonisation of road transport through transition to zero emission road vehicles, decarbonising goods delivery, making the UK a hub for green transport technology, promoting place-based strategies for emissions reduction as well as reducing the UK's global impact on carbon through initiatives such as Jet Zero to decarbonise the aviation sector. These priorities align with the Government's Ten Point Plan for a Green Industrial Revolution. Given that the policy is under development, this section of the PTAR will be updated for the final ES. However, Gatwick is committed to low-carbon growth and its Decade of Change strategy sets ambitious carbon reduction targets.

12.2.7 The NPS for National Networks (Department for Transport, 2015[2]) sets out the need for development of road, rail and strategic rail freight interchange projects on the national networks and the policy against which decisions on major road and rail projects will be made. This has been taken into account in relation to the highway improvements proposed as part of the Project.

12.2.8 Table 12.2.1 provides a summary of the relevant requirements of these NPSs and how these are addressed within the PEIR.

Table 12.2.1: Summary of NPS Information Relevant to this Chapter

Summary of NPS requirement	How and where considered in the PEIR
Airports NPS	
Para 5.9 – "The applicant must prepare an airport surface access strategy in conjunction with its Airport Transport Forum, in accordance with the guidance contained in the Aviation Policy Framework. The airport surface access strategy must reflect the needs of the scheme contained in the application for development consent, including any phasing over its development, implementation and operational stages, reflecting the changing number of passengers, freight operators and airport workers attributable to the number of air traffic movements. The strategy should reference the role of surface transport in relation to air quality and carbon. The airport surface access strategy must contain specific targets for maximising the proportion of journeys made to the airport by public transport, cycling or walking. The strategy should also contain actions, policies and defined performance indicators for delivering against targets, and should include a mechanism whereby the Airport Transport Forum can oversee implementation of the strategy and monitor progress against targets alongside the implementation and operation of the preferred scheme."	Draft actions and targets for the Airport Surface Access Strategy are included in the Preliminary Transport Assessment Report (Appendix 12.9.1). The final strategy in the application for development consent will be prepared in conjunction with Gatwick's Airport Transport Forum and in accordance with the Aviation Policy Framework guidance.
Para 5.10 – "The applicant should assess the implications of airport expansion on surface access network capacity using the WebTAG methodology [now TAG] stipulated in the Department for Transport guidance, or any successor to such methodology. The applicant should consult Highways England, Network Rail and highway and transport authorities, as appropriate, on the assessment and proposed mitigation measures. The assessment should distinguish between the construction and	Assessment methodology is in accordance with TAG guidance and consultation with authorities is ongoing (see Sections 12.3 and 12.4). Both construction and operational effects have been assessed in this chapter (see Section 12.9). Further information on network performance is included in the PTAR (Appendix 12.9.1).

[2] It is noted that the Transport Decarbonisation Plan published by Department for Transport (DfT) on 14 July 2021 announced DfT's intention to review the NPS for National Networks in due course once demand patterns post-pandemic become clearer. It is understood DfT intends to commence the review by the end of 2021 and complete it by Spring 2023. In the interim and whilst the review is undertaken, DfT has confirmed the NPS for National Networks remains relevant government policy and has full force and effect for the purposes of the Planning Act 2008.

Summary of NPS requirement	How and where considered in the PEIR
operational project stages for the development comprised in the application."	
Para 5.11 – "The applicant should also consult with Highways England, Network Rail and relevant highway and transport authorities, and transport operators, to understand the target completion dates of any third party or external schemes included in existing rail, road or other transport investment plans. It will need to assess the effects of the preferred scheme as influenced by such schemes and plans. Such consultation and assessment, both of third party schemes on which the preferred scheme depends, and others which interact with it, all of which may be subject to their own planning, funding and approval processes, must be understood in terms of implications of the timings for the applicant's own surface access proposals."	Consultation took place with authorities (see Section 12.3), and relevant cumulative schemes are included in the assessments contained in this chapter. Further information on the schemes is included in the PTAR (Appendix 12.9.1) and its Annex B.
Para 5.13 – "For schemes and related surface access proposals or other works impacting on the strategic road network, the applicant should have regard to Department for Transport Circular 02/2013, *The Strategic Road Network and the delivery of sustainable development* (or prevailing policy), and the National Networks NPS. This sets out the way in which the highway authority for the strategic road network will engage with communities and the development industry to deliver sustainable development and economic growth, whilst safeguarding the primary function and purpose of the network."	The design of the Project and this assessment gives regard to the Department for Transport Circular, the delivery of sustainable development and the National Networks NPS.
Para 5.14 – "The surface access systems and proposed airport infrastructure may have the potential to result in severance in some locations. Where appropriate, the applicant should seek to deliver improvements or mitigation measures that reduce community severance and improve accessibility."	Embedded mitigation measures to reduce community severance and improve accessibility are set out in Section 12.8 of this chapter.
Para 5.17 – "Any application for development consent and accompanying airport surface access strategy must include details of how the applicant will increase the proportion of journeys made to the airport by public transport, cycling and walking..."	See Section 12.8 and Preliminary Transport Assessment Report in Appendix 12.9.1 for further details on how sustainable transport will be encouraged. The targets in the NPS described for 2030 and 2040 relate specifically to the Heathrow Runway 3 project ("5.1 This chapter focuses on the potential impacts of the Heathrow Northwest Runway scheme"). Nevertheless, Gatwick Airport is targeting a 60% mode share by sustainable modes by 2030 for passengers and staff with the Project as described in Section 12.6 and within the PTAR (Appendix 12.9.1).

Summary of NPS requirement	How and where considered in the PEIR
Para 5.18 – "The applicant should commit to annual public reporting on performance against these specific targets. The airport surface access strategy should consider measures and incentives which could help to manage demand by car users travelling to and from the airport, as well as physical infrastructure interventions, having at all times due regard to the effect of its strategy on the surrounding area and transport networks. The strategy should also include an assessment of the feasibility of the measures proposed as well as the benefits and disbenefits related to those measures, including any implications for Highways England, Network Rail and affected relevant highway authorities and transport providers. These measures could be used to help achieve mode share targets and should be considered in conjunction with measures to mitigate air quality impacts as described in the Airports NPS."	Gatwick is proposing draft targets and actions for the ASAS, details of which have been included as part of this PEIR and will publicly reported annually against these targets. These targets will be prepared in conjunction with Gatwick's Airport Transport Forum and in accordance with the Aviation Policy Framework
NPS for National Networks	
Para 3.17 - "There is a direct role for the national road network to play in helping pedestrians and cyclists. The Government expects applicants to use reasonable endeavors to address the needs of cyclists and pedestrians in the design of new schemes. The Government also expects applicants to identify opportunities to invest in infrastructure in locations where the national road network severs communities and acts as a barrier to cycling and walking, by correcting historic problems, retrofitting the latest solutions and ensuring that it is easy and safe for cyclists to use junctions."	See Section 12.8 and active travel section in Appendix 12.9.1 for further details.
Para 3.20 - "The Government's strategy for improving accessibility for disabled people is set out in Transport for Everyone: an action plan to improve accessibility for all. In particular: ▪ The Government will continue to work to ensure that the bus and train fleets comply with modern access standards by 2020, and to improve rail station access for passengers with reduced mobility. The private car will continue to play an important role, providing disabled people with independence where other forms of transport are not accessible or available. ▪ The Government expects applicants to improve access, wherever possible, on and around the national networks by designing and delivering schemes that take account of the accessibility requirements of all those who use, or are	Gatwick aims to be the UK's most accessible airport, giving everybody an equal opportunity to fly. The station has step-free level access to all platforms via lifts and escalators. The Station Project will add five new lifts and eight escalators. There are dedicated drop-off points on forecourts for Blue Badge holders or passengers who have booked assistance at the airport. Gatwick also provides Blue Badge bays in short-stay, long-stay and for valet parking.

Summary of NPS requirement	How and where considered in the PEIR
affected by, national networks infrastructure, including disabled users."	
Para 3.22 - "Severance can be a problem in some locations. Where appropriate applicants should seek to deliver improvements that reduce community severance and improve accessibility."	Embedded mitigation measures to reduce community severance and improve accessibility are set out in Section 12.8 of this chapter.
Para 4.61 and 4.62 – "The applicant should undertake an objective assessment of the impact of the proposed development on safety including the impact of any mitigation measures. This should use the methodology outlined in the guidance from Department for Transport (WebTAG) and from the Highways Agency." "They should also put in place arrangements for undertaking the road safety audit process. Road safety audits are a mandatory requirement for all trunk road highway improvement schemes in the UK (including motorways)."	The assessment is being undertaken in line with TAG guidance and based on DMRB. Road Safety Audits will be undertaken for the highway improvements proposed as part of the Project.
Para 5.201 to 5.212 - This section is on Impacts on Transport Networks and references the applicant to have regard to policies in local plans, consulting with relevant authorities, support for other transport modes, assessing impacts and mitigation in EIA.	Assessment in this chapter is undertaken in accordance with guidance and policies in local plans (see Section 12.4). See Preliminary Transport Assessment Report in Appendix 12.9.1 for details.

National Planning Policy Framework

12.2.9 The National Planning Policy Framework (NPPF) (Ministry of Housing, Community and Local Government, 2021) sets out the planning policies for England. At the heart of the Framework is a presumption in favour of sustainable development.

12.2.10 The NPPF states the following.

'Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

a) the potential impacts of development on transport networks can be addressed;

b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;

c) opportunities to promote walking, cycling and public transport use are identified and pursued;

d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and

e) patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.' (para 104).

'In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

b) safe and suitable access to the site can be achieved for all users;

c) the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code 46; and

d) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.' (para 110).

'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' (para 111).

12.2.11 The National Planning Practice Guidance (NPPG) (Ministry of Housing, Communities and Local Government, 2019) supports the NPPF and provides guidance across a range of topic areas. This includes general guidance on 'Travel Plans, Transport Assessments and Statements' (2014). The guidance sets out the overarching principles of the documents, how they relate to each other and why they are important. The key principles of preparing the reports are provided in the guidance together with when they are required and what information they should include.

Other Relevant National Planning Policy

12.2.12 Other relevant national documents include the following.

- Road Investment Strategy 2: 2020-2025 (Department for Transport, 2020) – sets out the five year strategy for investment in and management of the strategic road network.
- The Strategic Road Network and the Delivery of Sustainable Development (Department for Transport, 2013a)
- South East Route Control Period 6 Delivery Plan, Network Rail, March 2019 – This includes reference to support for a 45% rail mode share target for Gatwick Airport.
- Strategic Business Plan 2019 – 2024 (Network Rail, 2018) – Sets out the business plan for Control Period 6 (CP6).
- Periodic Review 2018 (PR18) (Network Rail, 2018) – PR18 establishes outputs and funding for CP6 from 1 April 2019 to 31 March 2024.

Local Planning Policy

12.2.13 Gatwick Airport lies in the administrative area of Crawley Borough Council and adjacent to the boundaries of Mole Valley District Council to the north west, Reigate and Banstead Borough

Council to the north east and Horsham District Council to the south west. From Gatwick Airport, the administrative area of Tandridge District Council is located approximately 1.9 km to the east, Mid Sussex District Council approximately 2 km to the south east. Other local authorities are East Sussex (12 km southeast) and Kent (15 km east). The airport is located within West Sussex County Council and is adjacent to Surrey County Council to the north.

12.2.14 The relevant local planning policies applicable to traffic and transport based on the extent of the study area for this assessment are listed in Table 12.2.2, with further detail and other guidance documents provided in the PTAR contained in Appendix 12.9.1.

Table 12.2.2: Local Planning Policy

Administrative Area	Plan	Policy
Adopted Policy		
West Sussex	West Sussex Transport Plan 2011-2026	West Sussex's approach to transport includes four strategies which are: promoting economic growth; tackling climate change; providing access to services, employment and housing; and improving safety, security and health.
	West Sussex County Council Highway Infrastructure Policy and Strategy 2018	
	West Sussex Walking and Cycling Strategy 2016-2026	
Surrey	Surrey Local Transport Plan 2011-2026	The vision of the Surrey Local Transport Plan is to help people to meet their transport and travel needs effectively, reliably, safely and sustainably within Surrey; in order to promote economic vibrancy, protect and enhance the environment and improve the quality of life.
East Sussex	East Sussex Local Transport Plan 2011-2026	The high-level objectives are to improve economic competitiveness and growth; improve safety, health and security; tackle climate change; Improve accessibility and enhance social inclusion; and improve quality of life.
Kent	Kent Local Transport Plan 2016-2031	The ambition for Kent is to deliver safe and effective transport, ensuring that all Kent's communities and businesses benefit, the environment is enhanced and economic growth is supported.
Mid Sussex	Mid Sussex Infrastructure Delivery Plan 2016	This document supports the objectives outlined in the emerging District Plan 2014-2031 and provides detail on infrastructure needs to support new development.
	Mid Sussex District Plan 2014-2031	Policy DP21 Transport

Administrative Area	Plan	Policy
Crawley	Crawley Borough Local Plan 2015-2030	IN3 Development & Requirements for Sustainable Transport,
		IN4 Car & Cycle Parking Standards
		IN5 The Location & Provision of New Infrastructure
		GAT1 Development of the Airport with a Single Runway
		GAT3 Gatwick Airport Related Parking
Reigate and Banstead	Reigate and Banstead Local Plan: Core Strategy 2014	CS17 Travel Options & Accessibility
	Reigate and Banstead Local Plan: Development Management Plan 2018-2027 (2019)	TAP1 Access, Parking and Servicing
		TAP2 Airport Car Parking
		HOR09 Horley Strategic Business Park
Mole Valley	Core Strategy 2009	CS18 Transport Options & Accessibility
	Local Plan 2000	RUD28 Off Airport Carparking
		MOV2 The Movement Implications of New Development
		MOV5 Parking Standards
Horsham	Horsham District Planning Framework (excluding South Downs National Park) 2015	Policy 40 Sustainable Transport
		Policy 41 Parking
Tandridge	Core Strategy 2008	CSP12 Managing Travel Demand
	Tandridge Local Plan Part 2: Detailed Policies 2014-2029	DP5 Highway Safety & Design
Emerging Policy		
West Sussex	Draft West Sussex Transport Plan 2022 to 2036	The vision includes for the transport network to be on a pathway to net zero carbon by 2050 through mass electrification, reduced use of fossil-fuels and local living. The transport network will also be safer and more efficient overall with more walking, cycling and use of public or shared transport and less congestion on major routes that connect West Sussex towns with Gatwick Airport, London and nearby cities. Objective 13 is to minimise the impacts on the transport network of surface access to Gatwick Airport by passengers and employees and ensure transport network improvements take the needs of other users and communities that share these routes into account.

Administrative Area	Plan	Policy
Surrey	Draft Local Transport Plan 2022–2032	The draft local transport plan aims to significantly reduce transport carbon emissions to meet the net zero challenge and to support delivery of Surrey's other priority objectives of enhancing Surrey's economy and communities, as well as the health and quality of life of our residents.
Crawley	Draft Crawley Borough Local Plan 2021-2037	SD1 Presumption in Favour of Sustainable Development
		SD2 Enabling Healthy Lifestyles and Wellbeing
		ST1 Development and Requirements for Sustainable Transport
		ST2 Car and Cycle Parking Standards
		ST3 Improving Rail Stations
		ST4 Safeguarding of a Search Corridor for a Crawley Western Relief Road
		GAT1 Development of the Airport with a Single Runway
		GAT3 Gatwick Airport Related Parking
Tandridge	Our Local Plan 2033	TLP50 Sustainable Transport & Travel
		TLP51 Airport Related Parking
Mole Valley	Future Mole Valley 2018-2033	INF1 Promoting Sustainable Transport and Parking
Horsham	Draft Horsham District Local Plan 2019-2036	Strategic Policy 41 - Infrastructure Provision
		Strategic Policy 42 - Sustainable Transport
		Policy 43 - Parking
		Policy 44 - Gatwick Airport Safeguarded Land

12.3. Consultation and Engagement

12.3.1 In September 2019, Gatwick Airport Limited (GAL) submitted a Scoping Report to the Planning Inspectorate, which described the scope and methodology for the technical studies being undertaken to provide an assessment of any likely significant effects and, where necessary, to determine suitable mitigation measures for the construction and operational phases of the Project. It also described those topics or sub-topics which are proposed to be scoped out of the EIA process and provided justification as to why the Project would not have the potential to give rise to significant environmental effects in these areas.

12.3.2 Following consultation with the statutory bodies, the Planning Inspectorate (on behalf of the Secretary of State) provided a Scoping Opinion on the 14 October 2019.

12.3.3 Key issues raised during the scoping process specific to traffic and transport are listed in Table 12.3.1, together with details of how these issues have been addressed within the PEIR. See Appendix 12.3.1 for a more detailed summary of stakeholder consultation and responses.

Table 12.3.1: Summary of Scoping Responses

PINS Ref	Summary of comment	How/where addressed in PEIR
2.3.6	There is limited information in the Scoping Report relevant to the North and South terminal junction access improvements.	A description of the highway works is included in Chapter 5: Project Description. More details will be provided in the final ES if design development evolves in consultation with Highways England and local highway authorities.
3.3.18	Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should also address how any mitigation proposed is secured.	See Section 12.8 on the Mitigation and Enhancement Measures which are relied upon for the purposes of this assessment.
4.6.3	The ES should clearly present the periods over which data has been collected and where previous sources are being relied upon, justification should be provided to demonstrate the suitability of such data.	See paragraphs 12.4.20 to 12.4.24 on data collection and Section 12.6 on the justification of the data sources.
4.6.4	Any such assumptions which influence the definition of future baseline conditions (passenger and employee modal shares) should be clearly presented in the ES and be subject to sensitivity testing where applicable such that consideration is given to different mode share scenarios in assessing a worst case scenario. The Scoping Report makes no reference to the provision of travel plans associated with the Project (for example in relation to staff travel). The ES should explain the need for / absence of such plans in delivering mitigation measures in order to achieve the predicted and assessed modal shares.	See Section 12.5 on Assumptions and Limitations of the Assessment. Section 12.6 covers future baseline conditions. Section 12.8 covers Mitigation which includes developing an appropriate Travel Plan.
4.6.5	The ES should assess the impacts to the rail network taking into account the anticipated capacity and projected growth from increased passenger and employee movements (as well as nonairport user increases as a result of the Proposed Development). Cumulative impacts with planned and necessary	The rail capacity as well as the station modelling undertaken in Legion, both reported in this chapter (see 'Effects on Public Transport Amenity' section for each assessment year), assume a

PINS Ref	Summary of comment	How/where addressed in PEIR
	developments to achieve this anticipated growth should also be assessed in demonstrating the validity of capacity assumptions set out in the ES.	proportion of visitors (meeter-greeters, well-wishers) as well as commuter use of Gatwick Airport railway station and rail services. The strategic modelling of rail capacity has been developed using a number of sources and includes all journeys made by airport passengers, airport employees and all other users of Gatwick Airport railway station and is reported under each assessment year. Cumulative development will be considered in the final ES.
4.6.6	The Applicant should ensure that the relationship between the TA and the scope of the traffic and transport assessment is fully explained and justified within the ES.	See paragraphs 12.1.3 and 12.1.4. Further details on the scope of this chapter are provided in Table 12.4.1.
4.6.7	Diagram 7.6.1 splits airport-related highway demand into passenger and employee trips, but does not set out how trips by airport supplier goods delivery trips and visitors to the airport (people using the airport hotels without being air passengers or visitors to on-airport businesses) will be accounted for in the modelling.	See Section 12.5 on Assumptions and Limitations of the Assessment. Airport supplier, cargo and logistics, i.e. delivery trips, as well as non-airport users including visitors and commuters are included in the modelling.
4.6.8	It is clear that significant engagement is planned and ongoing with the relevant consultation bodies (particularly as part of the surface access topic working group). Agreements reached with consultation bodies on the Applicant's methodological approach to the assessment (as part of the topic working group) should be documented in the ES where relevant.	See Section 12.3.4 on Consultation and Engagement.
4.6.9	The assessment should demonstrate how the worst-case construction and operational assessment scenarios and assumptions are considered with regard to trip generation and modal splits. The construction and operational assessment should clearly set out how impacts associated with closures or delays on the M23, M25 or the A217 have been considered. In particular, the potential for increased traffic on the villages of Hookwood and Charlwood should be specifically considered given anticipated	See Section 12.5 on Assumptions and Limitations of the Assessment, including on construction and operational traffic. Further information on the strategic modelling work in contained in the PTAR (Appendix 12.9.1) and the work will be developed further for the Transport Assessment to be

PINS Ref	Summary of comment	How/where addressed in PEIR
	duration of the proposed construction works to the north and south terminal junctions and the impacts on these villages in the event of a closure(s) during operation.	submitted as part of the application for development consent.
4.6.10	Assumptions around the increased movements of freight during operation should be explained and ideally quantified.	The highway modelling used to inform this PEIR includes freight and logistics movements related to the Airport. These have been uplifted in line with the projected increase in freight tonnage through the Airport in the future baseline and with Project scenario. Further work will be undertaken for the final ES for a more detailed assessment of freight as part of the strategic transport modelling work.
4.6.11	The Inspectorate is unclear what is meant by the creation of an "integrated travel application for passengers and staff…facilitating Mobility-as-a-Service".	GAL envisage an integrated travel planning tool, either hosted on or directed via the Airport's website and accessible on a mobile device through an app. Using this app, passengers, customers and employees will be able to choose across a range of surface transport modes, enabling Mobility-as-a-Service, whereby a person can choose across a range of modes to access the airport weighing up next available service, frequency of service and cost in one integrated platform.
4.6.12	The ES should explain the relevant provisions for the Applicant to monitor surface access impacts. No further information is provided as to the metrics of such monitoring, how "success" will be determined and what remedial actions (if any) could be involved.	See Section 12.8 on the Mitigation and Enhancement Measures. The targets and metrics for success will be defined in the ASAS and Travel Plan prepared in conjunction with Gatwick's Airport Transport Forum and in accordance with the Aviation Policy Framework guidance.
4.6.13	The Scoping Report proposes that a Construction Traffic Management Strategy (CTMS), will be	See Section 12.5 on Assumptions and Limitations. Further work is

PINS Ref	Summary of comment	How/where addressed in PEIR
	implemented to deliver mitigation measures. Any assumptions made in this regard should be set out in the ES, which should reflect a worst case scenario in the absence of such commitments being guaranteed. In particular, the description of the Proposed Development in the ES should explain the extent to which existing infrastructure would allow for such deliveries by rail.	being undertaken by GAL's construction team and the assessment will be refined for the final ES once more details are known.
4.6.14	Paragraphs 5.3.14 to 5.3.16 of the Scoping Report explains that there is some uncertainty around the need for and location of a Construction Logistics Consolidation Centre. Where such a facility is required, volumes of trips between this compound and main construction locations should be presented. Where uncertainty exists, a worst case should be assumed with respect to additional traffic generation on the local and strategic highway networks. The Applicant should have regard to Transport for London's Construction and Logistics Plan (CLP) guidance in this respect.	See Section 12.5 on Assumptions and Limitations. GAL has had regard to Transport for London's Construction and Logistics Plan (CLP) guidance.

12.3.4 Key issues raised during consultation and engagement with interested parties specific to traffic and transport are listed in Table 12.3.2, together with details of how these issues have been addressed within the PEIR. Engagement with stakeholders is ongoing and details of further consultation will be presented within the ES.

Table 12.3.2: Summary of Consultation

Consultee	Date	Details	How/where addressed in PEIR
Department for Transport	23 April 2019	Meeting held to discuss master plan scenarios and modelling approach to assess the potential effects on the transport network.	N/A. Initial briefing session. No actions for PEIR.
Highways England	Various, early 2019	Various meetings held in early 2019 to discuss master plan scenarios and Highways England expectations around both modelling and testing of effects and potential mitigation on the highway network.	N/A. Initial briefing sessions. No actions for PEIR. Agreement on use of South East Regional Transport Model (SERTM) for future strategic modelling.
	01 October 2019	Meeting with Highways England to discuss approach for PEIR, potential surface access improvements options, strategic highway modelling.	Meeting to discuss modelling approach and potential improvements. Highways England set out its expectations around process, engagement,

Consultee	Date	Details	How/where addressed in PEIR
			considerations (including the need to model network impacts during highway construction) and how to interface the Gatwick and Highways England teams on design issues.
	26 November 2019	Meeting on governance and forward engagement, design progress, surface access modelling programme, PINS engagement and DCO programme.	N/A. Ongoing engagement with Highways England.
	07 January 2020	Meeting to discuss potential concepts for surface access improvements on the strategic road network.	Surface access improvements options have been considered and tested in the PEIR.
	13 February 2020	To discuss VISSIM modelling outputs in the context of different highway options for 2047 future baseline and 2047 with Northern Runway Project (NRP).	VISSIM modelling has been included in the PTAR.
	26 October 2020	A meeting with Highways England to confirm the recommencement of the Project after a pause because of the Covid-19 pandemic. This included a recap on where the work had got to in Spring 2020 and next steps.	N/A. Meeting confirming project restart.
	02 February 2021	Given a change in personnel on the Highways England team considering GAL's DCO application, a briefing on all aspects of the project including proposed surface access improvements, VISSIM modelling demonstrating the appropriateness of the surface access improvements, strategic transport modelling including highway modelling and a proposed engagement schedule with Highways England.	Surface access improvement options have been considered and tested in the PEIR. Strategic transport modelling, including highway modelling, forms the basis of the assessment of effects for highway users. VISSIM modelling has been included in the PTAR.
	13 April 2021	The purpose of this meeting was to provide new team members at Highways England with an overview of the highway network serving GAL and the design development of surface access improvements to support growth at the Airport with NRP.	

Consultee	Date	Details	How/where addressed in PEIR
	Various inc. 17 May, 27 May and 15 June 2021	Meetings to discuss project governance, Highways England engagement and milestones to DCO submission	Non-technical meetings to discuss collaborative engagement through to DCO submission.
	06 July 2021	Meeting held with Highways England to discuss the status of strategic modelling and to set out the strategy for engagement through to DCO submission.	Meeting confirming project restart and further modelling and strategy to inform DCO submission. No further actions for PIER.
West Sussex County Council	15 April 2019	Meeting held with West Sussex surface access and modelling leads on to discuss master plan scenarios, West Sussex's expectations, a potential modelling approach and study area, including access to the Crawley model network.	N/A. Initial briefing session. No actions for PEIR. Agreement on use of West Sussex's Crawley Model for future strategic modelling. Note engagement with other Local Authorities has also taken place as described later in this table.
Network Rail	13 February 2019	Meeting held with Network Rail to discuss master plan scenarios and potential impacts on the station, South Terminal and inter-terminal shuttle. Network Rail agreed to release the Legion model used for business case modelling of the station project for use by Gatwick in relation to the DCO.	Agreement on use of Network Rail's Legion model for station testing, which has informed crowding for PEIR.
	11 July 2019	Meeting to discuss and agree preliminary Legion modelling of the station.	Preliminary Legion model outputs are provided in Section 12.9 of this chapter.
	04 December 2019	Meeting to discuss use of rail to transport project-related construction materials and spoil.	N/A. However, any construction material by rail would mitigate the construction traffic impacts described in this chapter.
	10 December 2019	Meeting to discuss further Legion modelling of the station and to discuss route capacity enhancements.	Preliminary Legion model outputs are provided in Section 12.9 of this chapter.
Transport for London	16 April 2019	Meeting held with Transport for London to discuss master plan scenarios and the approach to modelling and testing effects, including access to the London Highway Assignment Model (LoHAM) model network.	N/A. Initial briefing session. No actions for PEIR. Agreement on use of TfL's LoHAM Model for future strategic modelling.

Consultee	Date	Details	How/where addressed in PEIR
	04 November 2019	Meeting to discuss expectations for assessment, potential modelling approach and study area, assumptions regarding rail access and onward travel across London.	N/A. More relevant to strategic modelling for the final ES.
	14 April 2021	Update on progress towards DCO submission, in particular the outline programme to consultation, progress and forthcoming outputs on surface transport modelling and transport assessment. Other subjects covered included the recently introduced Forecourt Charging at Gatwick and the Mayor's Financial Sustainability Plan with potential user charging concepts for London.	N/A. Further briefing and discussion.
Local Authorities	21 August 2019	Meeting with Mid Sussex Borough Council, West Sussex County Council, Mole Valley Borough Council, Crawley Borough Council, Surrey County Council, East Sussex County Council, Tandridge Borough Council, Reigate and Banstead Borough Council to describe approach for the Project, including PEIR.	N/A. Initial briefing session. No specific comments on the approach for traffic and transport assessment for PEIR. Actions related to A27 and cumulative development for strategic modelling which will be undertaken for the ES.
	04 February 2020	Meeting with Mid Sussex Borough Council, West Sussex County Council, Mole Valley Borough Council, Crawley Borough Council, Surrey County Council, East Sussex County Council, Kent County Council, Tandridge Borough Council, Reigate and Banstead Borough Council to describe approach for the Project, including an update on the assessment for PEIR.	The assessment for PEIR was presented and discussed including forecasting, the highway assessment, the public transport assessment including rail and station, construction, the surface access improvements options, the Airport Surface Access Strategy and initial mode share targets. Progress with the strategic transport modelling was also presented.
	27 July 2021	Meeting with Mid Sussex Borough Council, West Sussex County Council, Mole Valley Borough Council, Crawley Borough Council, Surrey County Council, East Sussex County Council,	An update on emerging findings from the assessment for PEIR including updated forecasts, draft actions and targets in the Airport Surface Access Strategy

Consultee	Date	Details	How/where addressed in PEIR
		Kent County Council, Tandridge Borough Council, Reigate and Banstead Borough Council to describe approach for the Project, including an update on the assessment for PEIR.	including mode share, the highway assessment and proposed highway mitigation, airfield and highway construction impacts, the public transport assessment including rail and railway station performance.
Highway Authorities	11 November 2019	Meeting held with Highways England, West Sussex and Surrey County Councils at Gatwick to discuss strategic modelling and the Model Specification Report (MSR). The meeting discussed components of the modelling including demand types, time periods, strategic model to VISSIM integration, committed highway schemes to be included in the modelling etc. This was the first of series of planned meetings with Highway Authorities on the transport modelling.	The methodology used for the assessment is presented in Section 12.4 with further information provided in Appendix 12.9.1.
	12 December 2019	Meeting held with Highways England, West Sussex and Surrey County Councils at Gatwick to discuss strategic modelling, including model validation, demand forecasting, future transport schemes and forecast scenarios.	As above. Ongoing work related to strategic modelling for the final ES and TA.
	25 February 2020	Meeting held with Highways England, West Sussex and Surrey County Councils at Gatwick to discuss strategic modelling technical notes issued by Arup on behalf of GAL.	As above. Ongoing work related to strategic modelling for the final ES and TA.
	07 July 2021	Meeting held with Surrey to discuss the status of strategic modelling and to set out the strategy for engagement through to DCO submission.	Meeting confirming project restart and further modelling and strategy to inform DCO submission. No further actions for PIER
	14 July 2021	Meeting held with West Sussex to discuss the status of strategic modelling and to set out the strategy for engagement through to DCO submission.	Meeting confirming project restart and further modelling and strategy to inform DCO submission. No further actions for PIER

Consultee	Date	Details	How/where addressed in PEIR
Planning Inspectorate (PINS)	15 November 2019	Meeting held with PINS to respond to comments provided on the Environmental Impact Assessment Scoping Report, including in relation to cumulative development which impacts upon the strategic transport modelling.	The methodology used for the assessment is presented in Section 12.4 with further information provided in Appendix 12.9.1.
	03 February 2021	Meeting held with PINS to restart DCO engagement on the Project after a short pause related to Covid. Discussion on NSIPs, Heathrow Runway 3 and in relation to cumulative development which will impact upon the next stage of strategic transport modelling.	Meeting confirming project restart and further modelling and strategy to inform DCO submission. No further actions for PIER

12.4. Assessment Methodology

Relevant Guidance

12.4.1 The assessment of the traffic and transport effects has been undertaken in accordance with the following guidance:

- IEMA (2004), Guidelines for Environmental Impact Assessment.
- Design Manual for Roads and Bridges (DMRB), in particular LA 101 Introduction to Environmental Assessment, LA 103 Scoping Projects for Environmental Assessment, LA 104 Environmental Assessment and Monitoring. The assessments for LA 112 Population and Human Heath are contained in Chapter 18: Agricultural Land Use and Recreation.
- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

Scope of the Assessment

12.4.2 The scope of this PEIR has been developed in consultation with relevant statutory and non-statutory consultees as detailed in Table 12.3.1 and Table 12.3.2.

12.4.3 Taking into account the scoping and consultation process, Table 12.4.1 summarises the issues considered as part of this assessment. No effects identified in the scoping and consultation process to date have been scoped out. However, DMRB guidance on driver stress and view from the road assessments have since been withdrawn. These were originally included in the scoping in order to comply with the published DMRB at the time of writing. On the basis that these elements of the DMRB have been withdrawn, driver stress and view from the road effects have now been excluded from this assessment.

Table 12.4.1: Issues Considered within the Assessment

Activity	Potential Effects	Receptor
Construction Phase (including Demolition): Traffic and Transport		
Construction and demolition activities	Traffic generation and % change for local highway network (including construction materials, cut/fill, staff)	Highway users (all modes)
	Severance – local highway network	Highway users (all modes)
	Driver delay – local highway network, including during construction of highway junctions	Highway users (all modes)
	Pedestrian and cyclist delay – local highway network, including during construction of highway junctions	Pedestrian and cycle modes
	Pedestrian and cyclist amenity – local highway network, including during construction of highway junctions	Pedestrian and cycle modes
	Accidents and safety	Highway users (all modes)
	Hazardous loads	Highway users (all modes)
	Effects on rail network and rail users, such as crowding	Rail users
	Effects on other public transport services and users (eg bus and coach, such as amenity)	Public transport users
Operational Phase: Traffic and Transport		
Use of airport, including upgraded highway junctions	Traffic generation and % change for local highway network (staff and passengers)	Highway users (all modes)
	Severance – local highway network	Highway users (all modes)
	Driver delay – local highway network	Highway users (all modes)
	Pedestrian and cyclist delay – local highway network	Pedestrian and cycle modes
	Pedestrian and cyclist amenity – local highway network	Pedestrian and cycle modes
	Accidents and safety	Highway users (all modes)
	Hazardous loads	Highway users (all modes)
	Effects on rail network and rail users, such as crowding	Rail users
	Effects on other public transport services and users (eg bus and coach, such as amenity)	Public transport users

12.4.4 This chapter has been prepared in accordance with the government guidance in the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as amended, which states that the emphasis should be on the “main” or “significant” environmental effects to which a development is likely to give rise. The Environmental Statement should be proportionate and not be any longer than is necessary to assess properly those effects. Where, for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered.

Study Area

Highway Network

12.4.5 Strategic modelling work has informed the extent of the study area. The modelling work has been undertaken in consultation with Highways England and the relevant highway authorities. Further discussion on the approach and methodology is provided in Appendix 12.9.1. The highway peak hours examined in this assessment are:

- AM Peak 1 (AM1) – 0700 to 0800;
- AM Peak 2 (AM2) – 0800 to 0900;
- Interpeak (IP) – average hour between 0900 and 1600; and
- PM Peak (PM) – average hour between 1600 and 1800, as 1600-1700 and 1700-1800 are very similar in terms of flows.

12.4.6 The choice of hours being assessed is subject to further discussion with highway authorities.

12.4.7 For the Initial Construction Phase (2024-2029), AM1 and PM peak periods are reported. This is because the estimated vehicle trip generation for airfield construction is 33 vehicles (HGVs and LGVs) arriving and departing per hour, and 150 construction worker vehicles arriving between 0700 and 0800 (AM1), and departing after the PM peak hour. Therefore, these two peak periods represent the most robust time periods for assessment of the network.

12.4.8 The approach to defining the study area for assessment of the environmental effects the traffic and transport is to firstly use Rules 1 and 2 defined in the IEMA (2004) guidance:

- Rule 1 – include highway links where traffic flows will increase by more than 30% (or the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%); and
- Rule 2 – include any other specifically sensitive areas where traffic flows have increased by 10% or more.

12.4.9 To focus on the extent to which significant Project-related effects are likely to arise and to exclude any potential effects of minor flow variations in the region wide strategic modelling outputs, the additional screening thresholds described below have been applied to each of the rules. These have been developed with reference to the assessment criteria and magnitude of impacts (see paragraphs 12.4.37 onwards).

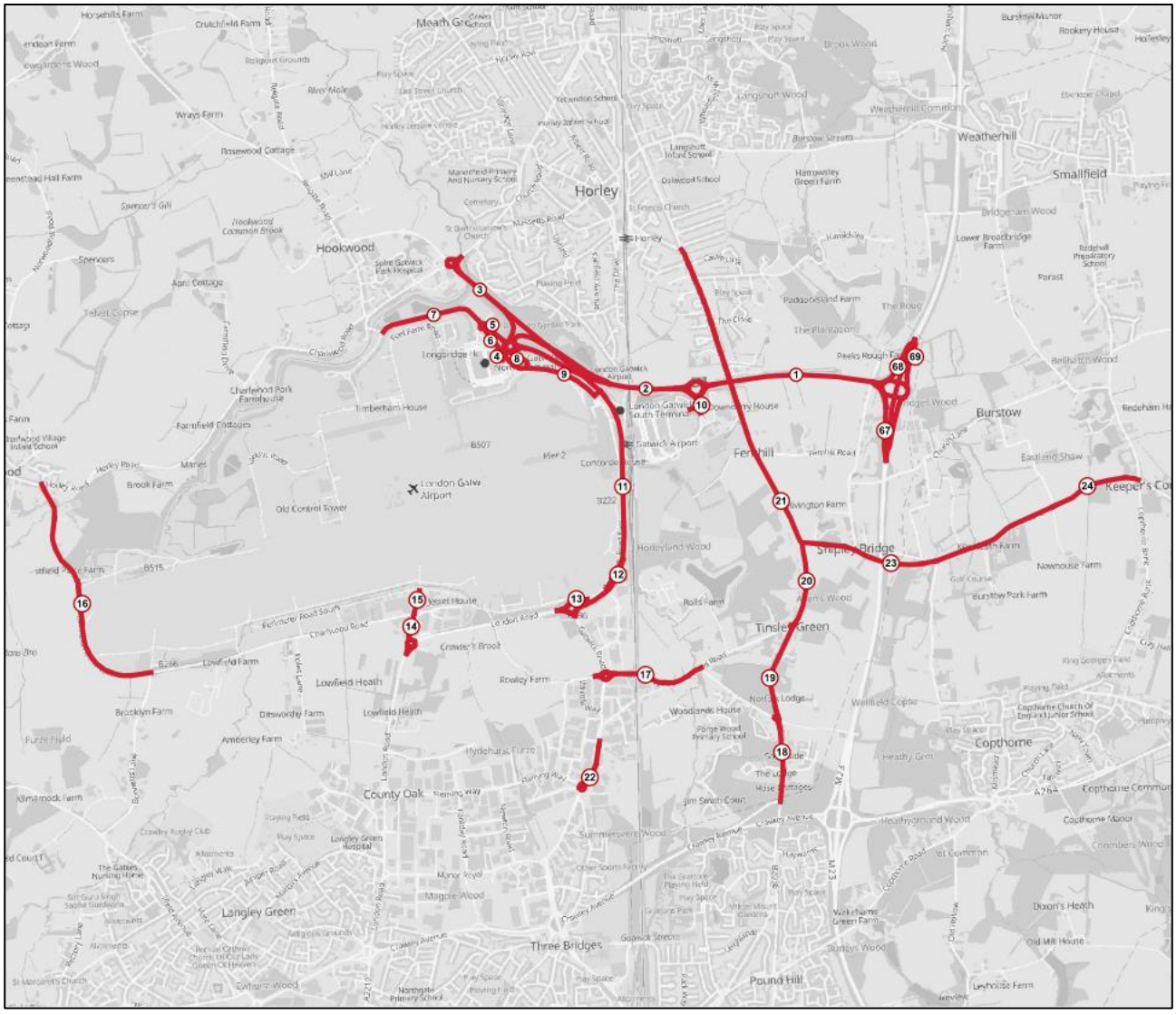
- Rule 1 – Where the change in total traffic is more than 30%, include links where the absolute difference is greater than two vehicles per minute and on links where the model is showing at least one vehicle in the future baseline (ie excluding routes with zero traffic). Where the change in HGVs is more than 30%, include links where the absolute difference is greater than one HGV every five minutes.
- Rule 2 – Where the change in total traffic is more than 10%, include links where the absolute difference is greater than two vehicles per minute, on links where the model shows at least one vehicle in future baseline (ie excluding routes with zero traffic) and where there are sensitive receptors along the link's frontage.

12.4.10 This chapter covers the traffic and transport effects on people arising from the Project. The thresholds adopted of two vehicles per minute and one HGV every five minutes are on two-way flows, and this level of change is not considered to have an impact on any of the assessment areas within this regard.

12.4.11 Figure 12.4.1 illustrates the distribution of traffic associated with Gatwick Airport. Appendix 12.9.2 provides a review of links within the strategic modelling area which were identified to meet the Rule 1 screening threshold as well as Rule 2 links with sensitive receptors to understand whether a significant effect is likely and therefore should be included in the study area. It should be noted that, irrespective of the significance of the effect, the PTAR includes discussion on highway performance across a wider area including within the Gatwick Diamond[3] as well as the M25, M23 and A27 corridors in terms of volume of traffic and volume over capacity at junctions.

12.4.12 Following the screening process, the resulting extent of the study area is shown in Diagram 12.4.1 for the Gatwick Airport area and Diagram 12.4.2 for other areas for assessment. Larger plans are included as Figures 12.4.2 and 12.4.3. The traffic flows for the links are provided in Appendix 12.9.2.

Diagram 12.4.1: Study Area links for assessment - Gatwick Airport area



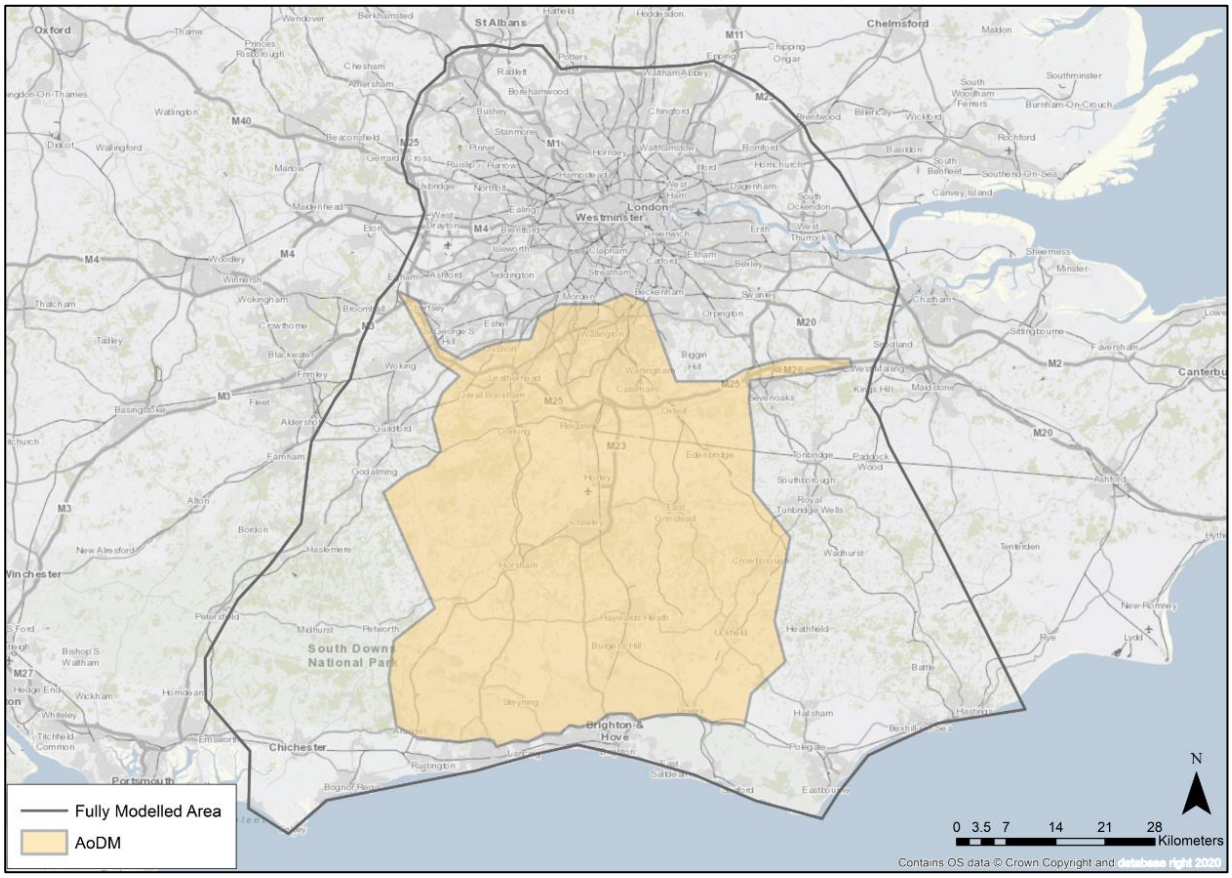
[3] The Gatwick Diamond is an economic area comprising seven local authorities (Crawley, Horsham, Mid Sussex, Tandridge, Reigate & Banstead, Mole Valley and Epsom & Ewell).

Diagram 12.4.2: Study Area links for assessment – other areas for assessment

12.4.13 The above diagram shows that links around Gatwick Airport meet the screening criteria and also some links in the Croydon area, Runnymede, Epsom and at the M25 J7 / M23 J8 junction. The Croydon area of the model will be reviewed and updated further for the ES. The location of Croydon in the Gatwick model means that some trips through this area are sensitive to small cost changes in route choice owing to different areas of fixed and variable speed coding in the model. This results in local flow changes and volume to capacity (V/C) changes at junctions. These changes are not related to the Project.

12.4.14 For the assessment of driver delay, the approach is to consider all junctions within the strategic highway assignment model coverage, as shown in Diagram 12.4.3, with a V/C of over 85% (see paragraph 12.4.42 on the assessment methodology).

Diagram 12.4.3: Highway Assignment Model Coverage and Area of Detailed Modelling (AoDM)



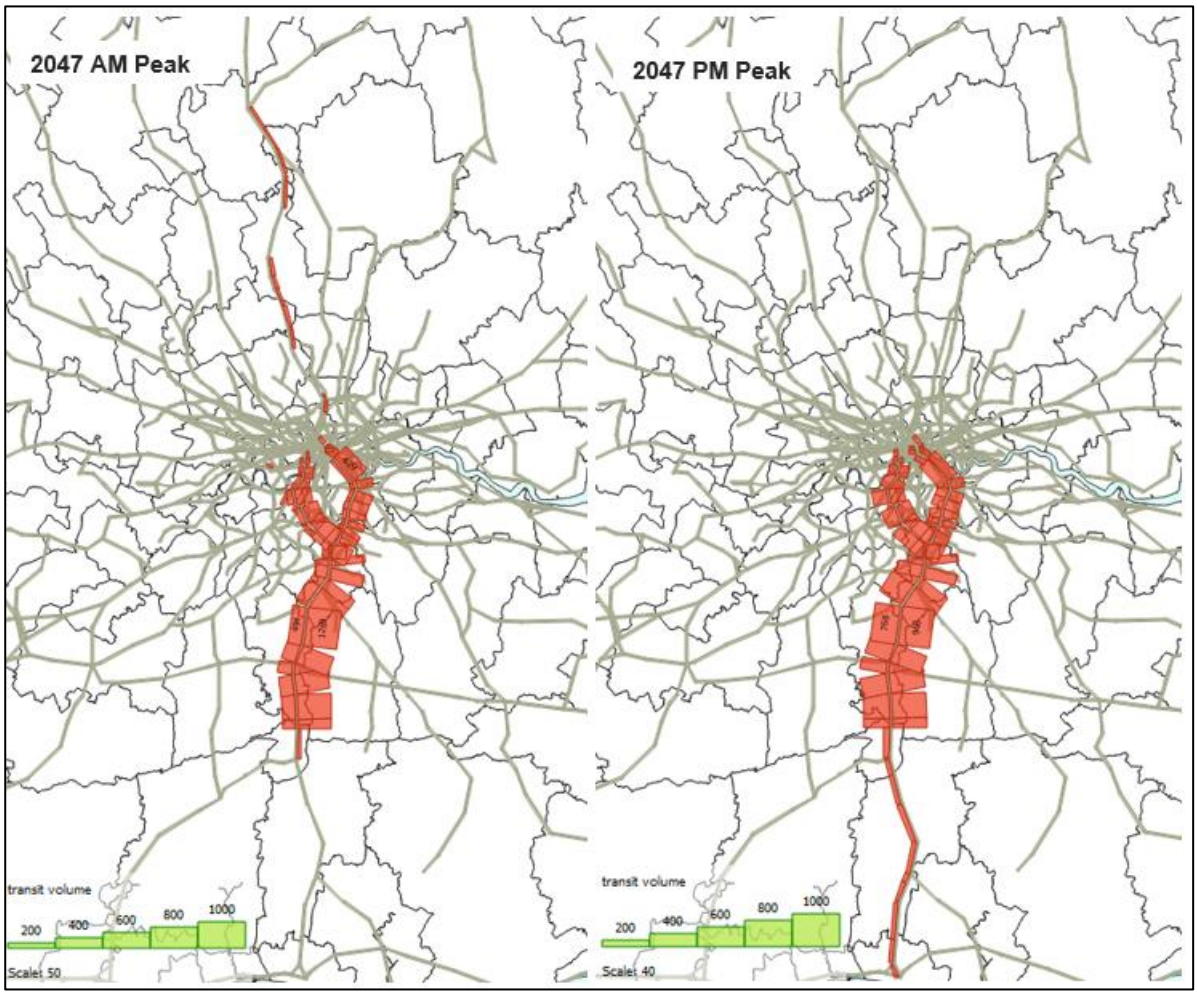
12.4.15 It should be noted that the model is deemed appropriate for assessment for the PEIR and associated impacts of the development at Gatwick Airport. However, detailed model statistics are being reviewed by stakeholders and the strategic transport model will go through a series of updates in terms of calibration and validation to feed into the final DCO submission.

Rail Network

12.4.16 The public transport study area for the PEIR is based on strategic modelling and the PLANET model for the rail network. The study area for public transport also includes the effects of growth on crowding in Gatwick Station.

12.4.17 Gatwick's primary area of effect on the rail network is on services which pass through Gatwick Airport railway station. Diagram 12.4.4 shows the net flow change in the 2047 AM and PM peak periods (0700-0900 and 1600-1800) between the future baseline and with the Project. The change in bandwidth indicates the growth with Project. These plots show that the largest potential change in demand will be on the Brighton Main Line, in particular north of Gatwick, and then on into London Victoria and London Bridge. Note, that London Underground, Docklands Light Railway, the Elizabeth Line and other cross-London rail connections are included in the model. However, the change in flows with Project is less than 200 passengers in two hours on these lines and so these are not shown in Diagram 12.4.4.

Diagram 12.4.4: 2047 flow change between future baseline and With Project - AM and PM peak periods (0700-0900 and 1600-1800)



12.4.18 The study area for rail is therefore proposed to focus on the highest line loadings, between Gatwick Airport and London. The hours of assessment are:

- AM Peak – two-hour period between 0700 and 0900
- PM Peak – two-hour period between 1600 and 1800

12.4.19 The existing rail models (PLANET South and Railplan) have a three hour AM peak 0700-1000, but Department for Transport cordon counts show that 0900-1000 is significantly quieter than 0700-0800 and 0800-0900. For this reason, a tighter two-hour period is preferred. The busiest single hour at London Bridge and Victoria is 0800-0900; these services pass through Gatwick between 0720 and 0820. The AM rail period for the rail model is 0700-0900, encompassing the peaks at both Gatwick and London.

Methodology for Baseline Studies

Desk Study

12.4.20 Desk studies have been undertaken to inform the baseline conditions and update GAL's assessment and modelling tools to test the likely effects of the Project. The desk studies and data sources include the following.

- WebTRIS data – Highways England have an extensive count database for the SRN available online, which measures the volume of traffic on the network and provides continuous outputs.
- Department for Transport manual classified counts (MCCs).
- Traffic Count Data – an extensive primary data collection exercise was undertaken in both 2016 and 2019 which has been supplemented by secondary data sources from the local authorities.
- CAA data – from Gatwick air passenger surveys 2014-2018 was used to provide the database of air passenger details.
- Employee Survey – behavioural survey data was obtained from the Gatwick Employee and Employment survey which GAL undertakes periodically, the data available for this work was collected in 2016.
- Trip Distribution Data - Citi Logik (CL) were commissioned in 2016 to provide travel demand data for an area within the south east of England. In the context of GAL, a broad specification to the data was included to ensure that temporal and geographic characteristics of travel through the area could be identified.
- OS Open Roads data set to inform network attributes such as link length and road type.
- Rail timetable information has been obtained from the Network Rail schedule database in CIF (Common Interface File) format. This provides the arrival and departure time at each station for each train service.
- Underground, Tramlink and Docklands Light Railway (DLR) timetables have been obtained from the Transport for London website.
- The national General Transit Feed Specification dataset, which includes published timetable/schedule data for all public transport services across the UK.
- ORR station entries and exits – ORR publishes annual estimates of the total numbers of passengers entering, exiting and interchanging at each UK rail station.
- West Sussex Cycle Journey Planner to establish existing national, regional and local cycle routes.

12.4.21 GAL already holds a number of models generated as part of the Airports Commission consideration of additional runway capacity in the UK.

- M25 Dartford Free Flow Crossing Model (SATURN) developed by Highways England and endorsed by the Department for Transport for that process.
- PLANET South model as provided by the Department for Transport, outputs of which were shared with Network Rail.

12.4.22 These models provide a reference for the current assessment with Project.

Site-Specific Surveys

12.4.23 Surveys of the site were also undertaken to inform the assessment. A summary of the surveys undertaken is provided in Table 12.4.2 and further details are included in the PTAR (Appendix 12.9.1). A number of these surveys were undertaken in 2016 in order to capture a representative data set, including mobile phone data capture, collected over a two month period and comprising upwards of 2.5 million devices and 170 million events per day for the busiest days giving a wealth of information to inform transport modelling. Given industrial action by Southern as well as rail disruption associated with works at London Bridge from late 2016 to 2018, construction of M23 Smart Motorway from 2018 to 2020 and now the Covid-19 pandemic, it has not been possible to update this base position with a more recent dataset. .

Table 12.4.2: Summary of Site-Specific Surveys

Survey	Methodology
Traffic counts (2016)	Following on from the Airports Commission process and in anticipation of future projects, Gatwick undertook an extensive data collection exercise in 2016 which included: ▪ automatic traffic counts; ▪ manual classified link and turning counts; and ▪ automatic number plate recognition (ANPR) counts.
INRIX (2016)	Journey time data collected which represents an estimated road speed at different times of the day based on real time GPS feeds.
Mobile phone-based survey (2016)	A comprehensive mobile phone-based survey of origin and destination movements in the area surrounding Gatwick Airport across an area equivalent to the Gatwick Diamond.
Employee survey (2016)	Gatwick Employer and Travel to Work Survey 2016 comprising data on number of employees, temporary or permanent, postcodes, shift patterns, mode of travel to work, travel preferences and influences.
Airport-related cargo and goods movement data (2019)	Data provided by Gatwick Airport. Currently being considered in the context of 2019 INRIX data.

12.4.24 In terms of Gatwick passenger data, three sources have been used to inform the assessment.

- Civil Aviation Authority data provides a national survey of departing passengers at each UK airport to understand passenger characteristics and trends. Access to this dataset has been secured through GAL.
- Profiler data - Survey of departing passengers to support further analysis on passenger trends and characteristics. This dataset which is collected by GAL is similar to the Civil Aviation Authority data; however, Profiler has a substantially higher response rate to the postcode question. This is important for developing air passenger matrices and more detail on parking location.
- A profile of arriving and departing passengers, by year, month, day and hour for 2016 to 2018 from passenger counts for each flight as collected by GAL.

12.4.25 All the data and surveys used are considered sufficiently up to date to inform PEIR in accordance with best practice and Department for Transport TAG guidance (2013b), noting that construction of M23 Smart Motorways and rail disruption means that data collection since late 2016 would have been affected. The final ES for the development consent application will use updated data where available and as appropriate.

Assessment Criteria and Assignment of Significance

12.4.26 The significance of an effect is determined by the sensitivity of a receptor and the magnitude of an impact. This section describes the criteria applied in this chapter to characterise the sensitivity of receptors and magnitude of potential impacts. The terms used to define magnitude and sensitivity are based on and have been adapted from those used in IEMA (2004) and DMRB (Highways England *et al*., 2020), which is described in further detail in Chapter 6: Approach to Environmental Assessment.

Receptor Sensitivity/Value

12.4.27 The receptors considered in the assessment are:

- pedestrians and cyclists using roadside footways or off-road cycle routes;
- bus and coach passengers;
- rail passengers; and
- car drivers and passengers, including taxis and private hire vehicles, servicing vehicles.

12.4.28 Effects on public rights of way (including their use by walkers, cyclists and equestrians) are considered within Chapter 18: Agricultural Land Use and Recreation.

12.4.29 The criteria to assess receptor sensitivity is shown in Table 12.4.3.

Table 12.4.3: Sensitivity Criteria

Sensitivity	Definition
Very High	Those receptors with greatest sensitivity due to site-specific characteristics which make them particularly sensitive to changes in traffic flows (eg community with high incidence of mobility impairment requiring to crossroads to access essential facilities).
High	Receptors of high sensitivity to traffic flows (eg schools, colleges, playgrounds, accident black spots, urban / residential roads without footways that are used by pedestrians).
Medium	Receptors of medium sensitivity to traffic flows (eg congested junctions, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways un-segregated cycle ways, community centres, parks, recreation facilities, retirement homes).
Low	Receptors with some sensitivity to traffic flows (eg places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision).
Negligible	Receptors with low sensitivity to traffic flows and those sufficiently distance from affected roads and junctions.

12.4.30 The links being assessed within the study area are shown in Diagram 12.4.1. Each link has been assessed for sensitivity (in terms of pedestrians and cyclists) and these are set out in Appendix 12.9.2. The sensitivities of other road users are considered separately as outlined below.

12.4.31 For pedestrian and cyclist sensitivity, there are roads within the study area which are not on desire lines (direct routes which pedestrians and cyclists prefer to take to reach their destination) and have no footway or dedicated cycle provision. The sensitivity of these roads is considered to be negligible. The sensitivity is considered to be low if there are footways and/or cycle provision, and medium if there are residential frontages or particularly sensitive receptors, eg a hospital. A table is provided in Appendix 12.9.2 which sets out the sensitivity considered for each link within the study area.

12.4.32 For car drivers and passengers, the sensitivity on roads is considered to be low if there is generally no congestion and is not considered to be particularly sensitive to changes in traffic. The sensitivity is considered to be medium if there is sometimes congestion or if the road is of strategic importance, and therefore more sensitive to changes in traffic. For the purposes of assessing driver delay, only junctions where the volume of traffic is over 85% of the capacity of the junction and are becoming congested (ie with a Volume to Capacity or V/C ratio of over 85%) are considered to focus on potential significant effects. Car drivers and passengers are considered to have medium sensitivity where V/C ratios are 85% or higher.

12.4.33 In terms of crowding on rail services, rail passengers on busy train services will be more sensitive to increases in demand. Rail services where seats are available to passengers are considered to have low sensitivity. Rail services where passenger demand exceeds the number of seats but is within standing capacity are considered to have medium sensitivity. Rail services where passenger demand exceeds standing capacity are considered to have high sensitivity.

12.4.34 For station crowding, higher crowding means a lower standard of passenger comfort and a reduction in crowding means improved passenger comfort. Paragraphs 12.4.53 to 12.4.56 sets out the Level of Service (LoS) methodology, which ranges from LoS A to F (see Diagram 12.4.5). LoS A represents free flow and LoS F a complete breakdown in circulation. LoS C is typically used for designing transport interchanges. For the purposes of this assessment, passengers experiencing LoS C or better are considered to have a low sensitivity to increases in crowding, those experiencing LoS D are considered to have medium sensitivity and those experiencing LoS E or F are considered to have high sensitivity.

Magnitude of Impact

12.4.35 The magnitude of impact has taken into account the impact duration which is defined as follows for the purposes of this assessment:

- short term: a period of months, up to one year;
- medium term: a period of more than one year, up to five years; and
- long term: a period of greater than five years.

12.4.36 The criteria used to assess the magnitude of impact, are described below in Table 12.4.4. For some assessment topics, the magnitude of impact is specially defined in the IEMA guidance (2004) and these are set out in the following sections for each impact.

Table 12.4.4: Impact Magnitude Criteria

Magnitude of Impact	Definition
High	Changes which are likely to be perceptible and which would significantly change conditions which would otherwise prevail to the extent that it would significantly affect travel behaviour.
Medium	Changes which are likely to be perceptible and which would materially change conditions which would otherwise prevail to the extent that it may affect travel behaviour to a measurable degree.
Low	Changes which are likely to be perceptible but not the extent that they would materially change conditions which would otherwise prevail.
Negligible	Changes which are just perceptible.
No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Severance

12.4.37 IEMA (2004) defines severance as the perceived divisions that can occur within a community when it becomes separated by a traffic route. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself.

12.4.38 The assessment thresholds are based on changes in traffic flows as set out in the IEMA guidelines (2004) as set out in Table 12.4.5. IEMA (2004) states that full regard should be given to specific local conditions, such as whether crossing facilities are provided. Peak hour two-way traffic flows have been used to assess severance.

Table 12.4.5: Magnitude of Impact for Severance

Magnitude of Impact - Severance	Changes in Traffic Flow
High	More than 90%
Medium	60% to 90%
Low	30% to 60%
Negligible	0% to 30%
No Change	No change in traffic flows

12.4.39 The DMRB (Highways England *et al*., 2020) defines community severance as the extent to which members of communities are able (or not able) to move around their community and access services / facilities. This DMRB assessment has been undertaken separately and is contained in Chapter 18: Agricultural Land Use and Recreation.

12.4.40 For the purposes of reporting, highway flows for links within the study area are contained in Appendix 12.9.2, with those which have a magnitude of impact of low, medium and high assessed within this chapter to focus on potential significant effects on people.

Driver Delay

12.4.41 The IEMA guidance (2004) on assessing driver delay requires the use of modelling packages. Driver delay can occur where the Project results in additional vehicular movements at junctions and along highway links. Increased pedestrian movements at crossing points could also have an impact on driver delay.

12.4.42 Detailed highway modelling assessment is contained in the PTAR. The IEMA guidance (2004) does not define the magnitude of impact for driver delay. For the purposes of this report, ratios expressing the total traffic volume with respect to its total available capacity (Volume to Capacity) has been used to assess the level of congestion. The approach to the magnitude of impact for driver delay is set out in Table 12.4.6. It is proposed that only junctions with a V/C of over 85% are considered in this assessment, to focus on potential significant effects.

Table 12.4.6: Magnitude of Impact for Driver Delay

Magnitude of Impact – Driver Delay	Volume to Capacity (V/C)			
	<85%	85 - 92%	92 - 99%	99% or more
<2% change in Congestion Indicator	Negligible	Negligible	Negligible	Negligible
2-5% change in Congestion Indicator	Negligible	Low	Low	Medium
Between 5-10% change in Congestion Indicator	Negligible	Low	Medium	High
>10% change in Congestion Indicator	Negligible	Medium	High	High

Pedestrian and Cyclist Delay

12.4.43 IEMA (2004) states that changes in volume, composition or speed of traffic may affect the ability of pedestrians to cross roads. The IEMA guidelines do not prescribe any quantitative criteria for the assessment of pedestrian delay. Instead, professional judgement has been used to determine the magnitude of pedestrian and cyclist delays, taking into account pedestrian and cycle routes and pedestrian crossing facilities.

Pedestrian and Cyclist Amenity

12.4.44 IEMA (2004) defines pedestrian amenity as the relative pleasantness of a journey. It is affected by traffic flow, traffic composition, and footway width/separation from traffic. The IEMA guidelines suggest that the threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow is doubled.

12.4.45 The perception of traffic can also affect fear and intimidation for pedestrians and cyclists. IEMA (2004) identifies the impact of fear and intimidation is dependent on the volume of traffic, the HGV composition, the proximity of traffic to people, or the level of protection caused by factors such as narrow pavement widths. There are no commonly agreed thresholds for fear and intimidation. Professional judgement has been used to determine the magnitude of impact on pedestrian and

cyclist amenity, taking into account the degree of hazard, the changes in traffic flows and also the provision of pedestrian and cyclist facilities.

Accidents and Safety

12.4.46 IEMA (2004) references the use of professional judgement to assess the accident and safety impacts. Implications of local circumstances, or factors which may elevate or lessen risks of accidents, such as junction conflicts, would be considered.

12.4.47 Changes in traffic flows and highway design could influence the risk of accidents, but embedded surface access improvements are proposed, and any design changes to the highway network will be subject to a Road Safety Audit. Therefore, professional judgement has been used to consider the risks in terms of accidents and safety, taking into account changes in traffic flows, existing accident clusters, and embedded design mitigation measures.

Hazardous Loads

12.4.48 IEMA (2004) recognises that some developments may involve the transportation of dangerous or hazardous loads (such as gases, inflammable liquids, toxic substances, or radioactive material) by road. The Project is not expected to generate hazardous loads but changes to highway design and temporary diversion routes during the construction period could affect the existing transportation of hazardous loads on the public highway. Any effects will be assessed as part of the ES and, for the purposes of the PEIR, it is assumed that temporary diversions will be safe and clearly signposted. The exact temporary routes are not known yet but will be assessed in the final ES.

Rail Network and Rail Users

12.4.49 No IEMA or DMRB guidance exists for the measurement of public transport amenity. For the purposes of this assessment, crowding assessments on rail services to and from Gatwick, and crowding at Gatwick Airport station have been used to indicate public transport amenity.

Rail Crowding

12.4.50 The EMME platform has been used for the public transport modelling for Gatwick. EMME is a well-established and reliable software model for public transport assignment, including modelling impacts of in-vehicle crowding on passenger route choice. PLANET South has been used for the assessment of rail effects. Further information is contained in the PTAR.

12.4.51 Line loading data, as well as information on seating and standing capacity by line, have been used to determine crowding. If all passengers have a seat, this is assumed to be a more comfortable journey with low levels of crowding. More passengers standing indicates a reduction in space and less comfortable journeys and higher crowding. The following train services have been assessed:

- North Downs Line (NDL)
- Gatwick Express (GX)
- Fast services to/from London Victoria
- Stopping services to/from London Victoria
- Fast services to/from London Bridge
- Stopping services to/from London Bridge

12.4.52 The approach to assessing rail crowding is firstly to assess the percentage increase in line loadings as the result of the Project at stations between Gatwick Airport and London. The seating capacity of the lines has then been reviewed. If number of passengers exceeds the number of seats, a further assessment is undertaken on the standing capacity in terms of percentage occupied. The assessment is undertaken for both inbound and outbound direction for the AM and PM peak periods. The peak periods are averaged over two hours (AM peak 0700-0900, PM peak 1600-1900), and the line loadings shown are on departure from each station during this period. Based on the two hour assessment period, the criteria considered in determining the magnitude of impact for rail crowding is shown in Table 12.4.7.

Table 12.4.7: Magnitude of Impact for Rail Crowding

Magnitude of Impact – Rail Crowding	Rail Crowding - Change in Occupied Standing Capacity
High	Over 30%
Medium	10% to 30%
Low	0 to 10%
Negligible	No change, or the number of seats exceeds the number of passengers, ie all passengers can be seated.
No Change	

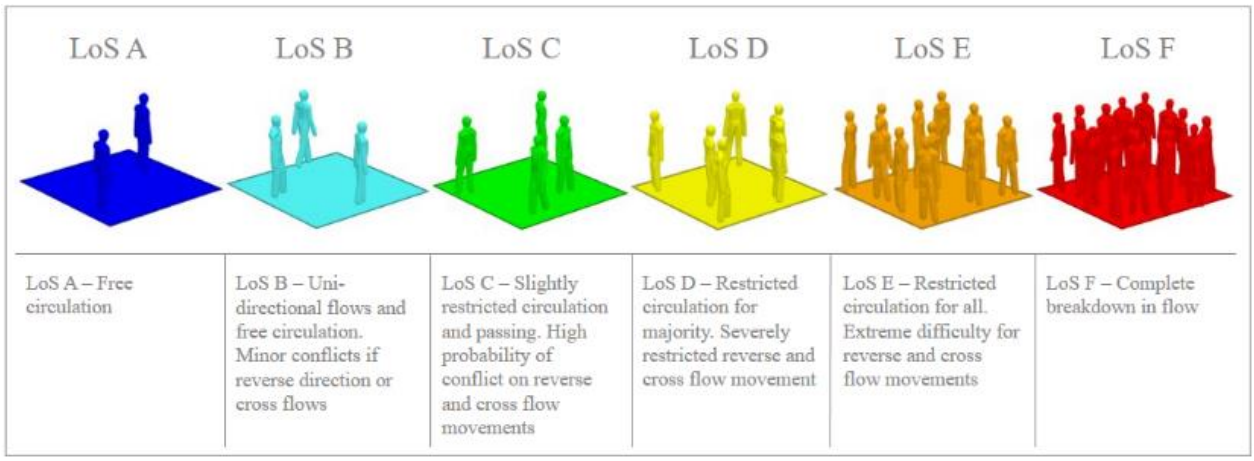
Railway Station Crowding

12.4.53 The assessment of crowding in Gatwick Airport railway station has been modelled in Legion using the calibrated and validated model developed by Network Rail for AM and PM peak periods (07:00-10:00 and 16:00-19:00). The model was developed as part of the Network Rail/Costain Gatwick Station Project and provided to GAL in March 2019. Details on trip generation and mode shares are contained in PTAR (Appendix 12.9.1).

12.4.54 In the station, higher crowding means a lower standard of passenger comfort and a reduction in crowding means improved passenger comfort. Crowding has been assessed in line with Station Capacity Planning Guidance (Network Rail, 2016). The assessment of crowding is based on the Fruin Level of Service criteria. Level of Service (LoS) is used to describe pedestrian movement, relating density of pedestrians and flow rates for walkways and circulation areas, stairs and in queues, with LoS A representing free flow and LoS F a complete breakdown in circulation.

12.4.55 LoS C is typically used for designing transport interchanges as it provides a balance between congestion, design and operations. Network Rail therefore typically recommends LoS C or better for the design of new stations and station enhancements. LoS D can be considered acceptable in peak conditions at existing stations for short durations or where flows are predominantly one-way.

Diagram 12.4.5: Levels of Service Ranges



12.4.56 Changes in station crowding level have been used to estimate the magnitude of impact of the Project. Where there is no change in Level of Service experienced between the baseline conditions and the 'with Project' scenarios, the impact is considered to be negligible. Changes in Level of Service by one category (ie a change from LoS C to LoS D) is defined as a low to medium impact. Changes in LoS by two categories (such as between LoS C and LoS E) are defined as a medium to high impact.

Table 12.4.8: Magnitude of Impact for Public Transport Amenity

Magnitude of Impact – Public Transport Amenity	Level of Service in the railway station
High	A change in two Levels of Service.
Medium	
Low	A change in one Level of Service.
Negligible	No change in Level of Service experienced in the station.
No Change	

Other Public Transport Services and Users

12.4.57 A bus and coach network model has been developed in EMME software and complements the rail modelling undertaken in PLANET South to create the overarching Gatwick public transport model.

12.4.58 The public transport model includes all bus and coach services used to access the airport by air passengers and employees. The information for bus/coach route coding has been obtained through discussions with operators, data from Gatwick and other publicly available data sources.

12.4.59 Given the adaptability of bus and coach provision, it is expected that operators will increase services to meet demand. For many local authority areas, the change in bus or coach trips is very small and would not require a change in bus or coach frequency. However, gradual increases in capacity could be expected to be required over time with a sustained increase in demand. Therefore it is not considered necessary to model crowding on bus and coach services explicitly within the modelling framework. The assessment will include service frequency as a measure of

public transport amenity. More information is contained in the PTAR. Table 12.4.9 illustrates the coaches per day assumed for each assessment year with and without Project.

Table 12.4.9: Coaches per Day

Terminus	2029		2032		2047	
	Future Baseline	With Project	Future Baseline	With Project	Future Baseline	With Project
Bognor Regis	2	2	2	3	2	3
Brighton	21	23	22	27	25	30
Bristol*	7	8	8	9	9	10
Cardiff*	9	10	10	12	11	13
Chatham[4]	0	11	0	11	0	11
Chingford	16	17	16	20	19	22
Derby/Nottingham*	12	13	12	15	14	17
Heathrow*	5	5	5	6	5	7
Northampton*	9	10	10	12	11	13
Norwich*	11	12	12	14	13	16
Oxford	27	28	27	33	31	37
Park Royal	12	13	12	15	14	16
Poole	11	11	11	13	12	15
Rayleigh	16	17	16	20	19	22
Southend	16	17	16	20	19	22
Swansea*	13	14	14	17	16	19
Victoria	61	65	62	76	71	85
Worthing	4	4	4	5	5	6
Wolverhampton*	8	9	8	10	9	11
LGW-LHR total	75	80	77	94	88	105

* indicates via Heathrow

[1] New Kent service proposed with Project (see 12.6.51 onwards)

Significance of Effect

12.4.60 The significance of the effect upon traffic and transport has been determined by taking into account the sensitivity of the receptor and the magnitude of the impact. The method employed for this assessment is presented in Table 12.4.10. Where a range of significance levels are presented, the final assessment for each effect has been based upon expert judgement.

12.4.61 In all cases, the evaluation of receptor sensitivity, impact magnitude, and significance of effect has been informed by professional judgement and is underpinned by narrative to explain the conclusions reached.

[4] New Kent service proposed with Project (see 12.6.51 onwards

12.4.62 For the purpose of this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 12.4.10: Assessment Matrix

Sensitivity	Magnitude of Impact				
	No change	Negligible	Low	Medium	High
Negligible	No change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No change	Minor	Minor or Moderate	Moderate or Major	Major or Substantial
Very High	No change	Minor	Moderate or Major	Major or Substantial	Substantial

12.4.63 A description of the significance levels is provided in the bullets below:

- Substantial: Only adverse effects are normally assigned this level of significance. These effects are generally, but not exclusively, associated with changes of international, national or regional importance that are likely to suffer a most damaging impact. However, a major change of local importance may also enter this category.
- Major: These beneficial or adverse effects are considered to be very important considerations .
- Moderate: These beneficial or adverse effects may be important . The cumulative effects of such factors may lead to an increase in the overall effect on a particular resource or receptor.
- Minor: These beneficial or adverse effects may be raised as local factors. They may be important in enhancing the subsequent design of the project.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

12.5. Assumptions and Limitations of the Assessment

12.5.1 This PEIR sets out the preliminary assessment findings. Further detailed work will be undertaken throughout the EIA process and presented within the ES, which will accompany the application for development consent. The assessment currently includes assumptions on the following which may be further refined throughout the EIA process:

- passenger forecasts, based on a scenario with no Heathrow third runway;
- mode shares and travel patterns of future users of the Project based on strategic modelling work;
- the distribution of trips on the network;
- committed developments; and
- TEMPRO growth to indicate background growth associated with cumulative schemes.

12.5.2 Strategic multi-modal modelling has been undertaken which informed mode shares and the resulting traffic flows and rail loadings used in this assessment. Further information on passenger forecasts, trip generation and mode shares are contained in the PTAR (Appendix 12.9.1).

12.5.3 This assessment uses passenger forecasts provided by ICF and assumes business-as-usual travel behaviour based on a 2016 baseline. The 2016 dataset has been extrapolated to 2018, for the purposes of understanding the likely effects from the Project for air quality and carbon where required. Given industrial action by Southern as well as rail disruption associated with works at London Bridge from late 2016 to 2018, construction of M23 Smart Motorways from 2018 to 2020 and now the Covid-19 pandemic, it has not been possible to update this base position with a more recent dataset (see paragraphs 12.4.23 and 12.6.1 to 12.6.4). It should be noted that the Project is assessed against future baseline years, rather than against 2016.

12.5.4 The assessment of traffic impacts includes consideration of the Project construction phases.

- Airfield Construction – The peak airport construction assessment is based on information provided by GAL's construction team for the core airfield works required to enable operation of the Project (opening in 2029). Airfield construction has been modelled using a future baseline 2029 highway network as a robust case of baseline traffic flows. Some residual activity related to build out will continue beyond 2029 but remaining activity is similar to business-as-usual levels, which include the everyday construction and maintenance works associated with normal airport operations. This is already accounted for in the traffic data used for the modelling and the assessment.
- Highway Construction - A separate assessment has been undertaken for the construction of the surface access improvements . The surface access improvements are required to be in place after the northern runway becomes operational and by 2032. This construction scenario has therefore been modelled using the 2029 with Project demand, reflecting operational demand growth associated with the northern runway, on a modified highway network, reflecting the construction of the Project surface access improvements works.

12.5.5 Further work will be undertaken by GAL's construction team on the detailed programme and improvement measures, which will inform the application for development consent.

12.5.6 At this stage further analysis is required to confirm the need for and location of a Construction Logistics Consolidation Centre. The Code of Construction Practice notes that a Consolidation Centre could be on an existing site or one that is permitted for such use already. As the details are yet to be confirmed, for the purposes of the assessments in this chapter, it is assumed that a Construction Logistics Consolidation Centre is not provided. This is a conservative assumption as the consolidation centre should reduce trips to and from the construction sites on airport. Should one be provided, this could be explored as further mitigation as part of the final ES if necessary.

12.5.7 The impact of growth on rail passenger flows through Gatwick Airport Railway Station uses Network Rail's simulation model built for the station upgrade project using Legion software. The station modelling undertaken in Legion includes all airport-related rail users and assumes a proportion of visitors (meeter-greeters, well-wishers) as well as commuter use of Gatwick Airport railway station.

12.5.8 The PEIR assessment uses the best information available at the time of writing. Where possible, a robust approach has been taken to minimise the risk of under reporting effects. Where assumptions have been made, these are stated where appropriate in the assessment.

12.6. Baseline Environment

Existing Baseline

12.6.1 The baseline assessment year for the PEIR is 2018, based on a 2016 calibrated and validated traffic model providing base flows which have been extrapolated to describe relevant 2018 conditions for the air quality and carbon assessments.

12.6.2 The Covid-19 pandemic had a very severe impact on the global aviation industry in 2020. Gatwick, along with all other UK airports, experienced a significant reduction in passenger traffic levels as a result of both Government-imposed restrictions on air travel and reduced passenger demand driven by low consumer confidence.

12.6.3 Passenger numbers at Gatwick decreased from over 46.6 million passengers per annum (mppa) in 2019 to 10.2 mppa in 2020. It is expected that Government travel restrictions will continue to have an impact on passenger demand and traffic levels throughout 2021, but that by the end of 2021 traffic levels will be starting to recover.

12.6.4 It is anticipated that demand at Gatwick will return to pre-Covid levels by the mid-2020s.

Mode Share and Travel Patterns

12.6.5 The passenger mode share information has been taken from Gatwick 2018 Airport Surface Access Strategy and are based 2017 Civil Aviation Authority data, while the latest staff mode share information has been taken from the 2016 Gatwick Employer and Travel to Work Survey which are not expected to have significantly changed for the 2018 baseline year. A more limited Staff Travel Survey was undertaken in 2019, providing information on attitudes to travel choices but without sufficient data to replace the mode share and distribution from 2016. The mode shares are shown in Table 12.6.1.

Table 12.6.1: Staff and Passenger Mode Shares

Mode	Passenger	Staff
Rail	39%	12%
Bus/Coach	6%	16%
Walk/Cycle	0%	3%
Car Driver	39%	52%
Car Share	0%	8%
Taxi	15%	0%
Car rental	1%	0%
Company	0%	6%
Other	0%	3%
Total	**100%**	**100%**

12.6.6 Table 12.6.1 shows that Gatwick achieved an annual average public transport mode share for passengers of over 45%, with 39% of passengers coming to the airport by rail and almost 6% by bus and coach in 2018. Around 55% of passengers access the airport by car-based modes, with almost 40% of passengers coming by private car, either as pick-up and drop-off trips to terminal forecourts or to park their car at the airport.

12.6.7 Ongoing CAA surveys to first quarter 2020 (prior to the impact of Covid-19) show a continuing improvement in public transport mode share year-on-year, up to 47.4% in 2019 and 47.8% in the 12 months to March 2020.

12.6.8 It should be noted that there is significant quarter-by-quarter variation in passenger mode share, which is an important consideration for the assessment. The assessment has been undertaken to test a busy summer day at the Airport which is when public transport mode share is lower owing to the higher proportion of UK outbound leisure passengers. Public transport mode share for the busiest summer months in 2019 was 43.4% as compared to the yearly average of 47.4%.

12.6.9 The staff travel survey in 2016 showed that the sustainable mode share for employees was 31% excluding car share and company travel (shared transport provided by individual airlines and other on-airport employers).

Highway Network

12.6.10 Gatwick Airport can be directly accessed from the national strategic road network via the M23 motorway, which runs north-south adjacent to the airport. Junction 9 of the M23 is the main access point with an onward link of motorway (M23 Spur) to Junction 9a at the airport's South Terminal roundabout. Highways England's M23 Smart Motorway project was completed in Summer 2020. This has added additional running lane capacity to the strategic network serving Gatwick at peak times.

12.6.11 The typical journey time from Gatwick Airport to the M25 via the M23 is less than 10 minutes. From the M25, there is access to the wider UK strategic road network.

12.6.12 The A23, which runs parallel to the M23, continues north beyond the M25 into London via Croydon and Brixton to the West End and the City. It connects south London and Croydon, through Redhill then Horley and Gatwick Airport, through Crawley and providing a connection to the south through Pease Pottage to Brighton.

12.6.13 South of Gatwick, the M23/A23 continues as a strategic highway corridor from London to Brighton on the South Coast. Brighton is approximately 30 to 45 minutes from the airport by road in the off-peak and peak periods respectively. The A23 connects with the A272 and A27 east - west routes, placing the whole of the South Coast between Southampton and Folkestone within approximately 1 hour and 20 minutes of the airport.

12.6.14 The M25 is busy and can be slow-moving and congested at peak times. Highways England is committed to improving conditions on the M25, through a variety of committed enhancements as well as the M25 South West Quadrant study, which is looking at ways to enhance capacity from Junctions 7 (for the M23) to 16 (for the M40) of M25. In addition, the proposed Lower Thames Crossing linking Essex and Kent will provide additional cross-river capacity east of London, relieving congestion on the M25 at the existing Dartford Crossing and improving accessibility to South Coast ports.

12.6.15 Surface transport facilities within the airport boundary are made up of on-airport roads, forecourts and car parks, including facilities for coaches, taxis and car rental companies. GAL has recently completed works to improve the North Terminal Forecourt and has introduced forecourt charging at both terminals. There are currently around 46,700 car parking spaces 'on airport', including staff parking, and a further 21,200 authorised spaces 'off-airport'.

Accident Data

12.6.16 Department for Transport STATS19 road safety data (January 2021) has been examined for entire study area for the latest available three, full years (2017 to 2019). Accidents which occur within 30 miles of the study area links and adjacent junctions are shown in Diagram 12.6.1, and a more detailed plan around the airport is shown in Diagram 12.6.2.

Diagram 12.6.1: Three Year Accident Data within 30 m of a Study Area Link

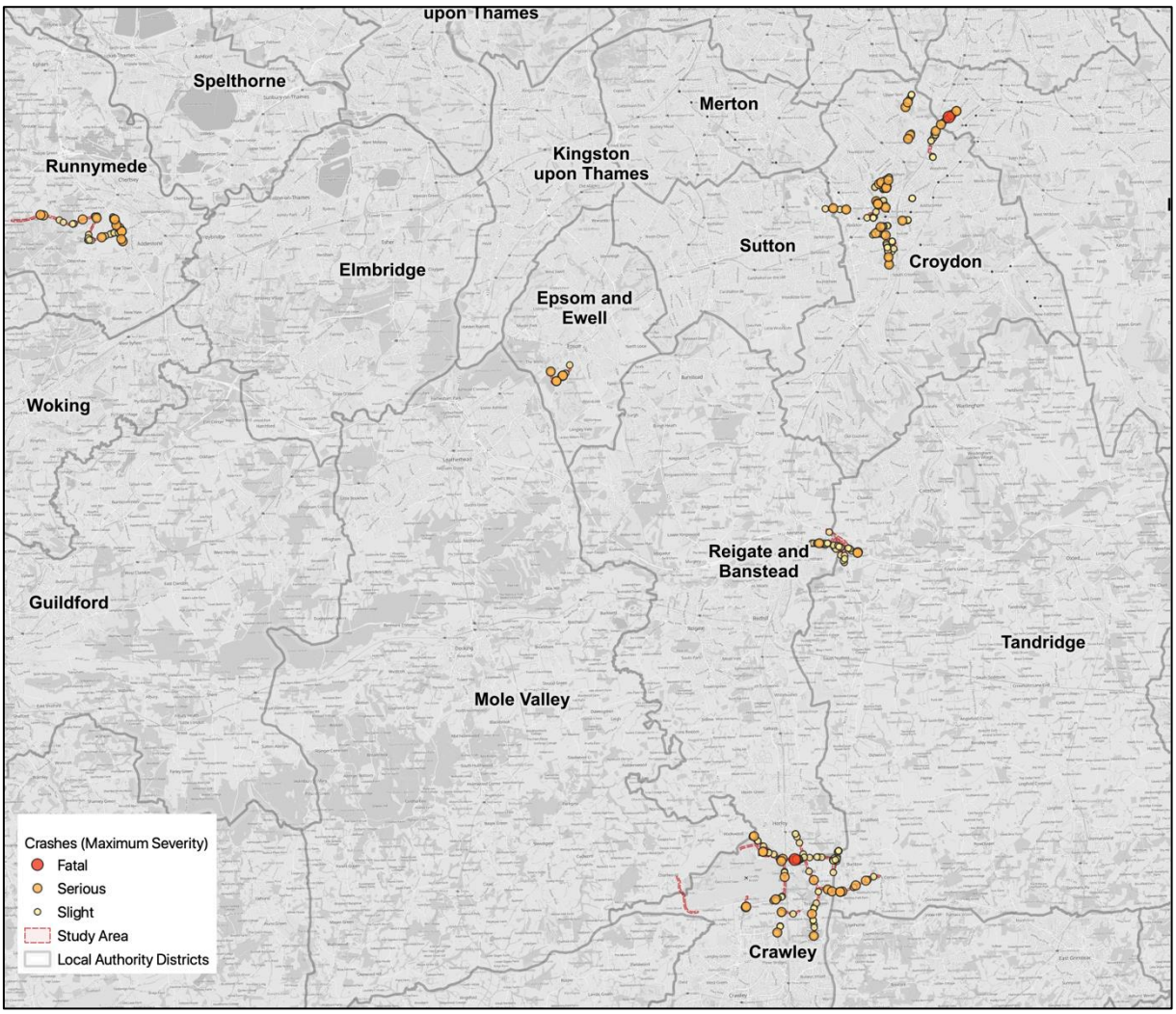
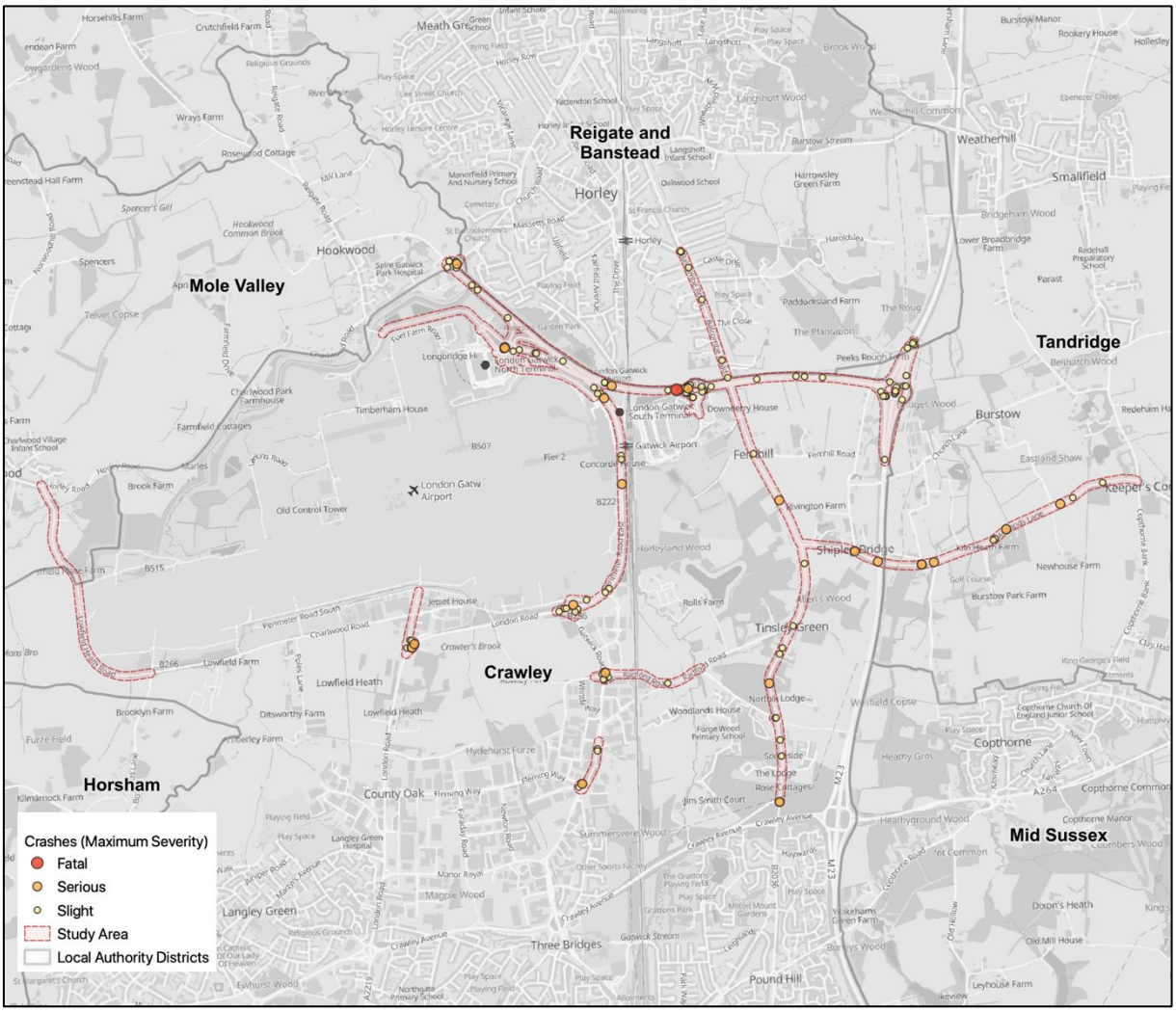


Diagram 12.6.2: Three Year Accident Data within Proximity of the Airport



12.6.17 A summary of the average annual number of accidents by casualty severity is shown in Table 12.6.2. The accidents have also been considered in terms of local authorities.

Table 12.6.2: Accident Data

Location	Average Annual Number of Accidents, 2017 to 2019 **(Highest Recorded Injury Severity)**			
	Fatal	**Serious**	**Slight**	**Total**
Total accidents within 30 miles of a study area link	**0.6**	**24**	**140**	**164**
Bromley	0.3	1	5	6
Crawley	0.3	5	31	36
Croydon	-	8	63	71
Epsom and Ewell	-	2	2	4
Mole Valley	-	-	2	2
Reigate and Banstead	-	1	13	14
Runnymede	-	4	20	24
Sutton	-	-	1	1
Tandridge	-	3	3	6

12.6.18 The above shows that on average, 164 accidents per year occurred within the study area over the three year period. Of these, 140 accidents resulted in slight injuries (85%), 24 resulted in serious injuries (15%) and less than one on average over three years resulted in a fatality.

12.6.19 The location of the accidents suggest that junctions tend to have a higher risk of accidents because of potential conflicts and sensitivity to human error. Further assessments on the causation of accidents will be undertaken for the final EIA.

Rail

12.6.20 Gatwick Airport station has regular, direct daily services from over 120 stations. Over 800 stations are accessible with one interchange. There are four train operators serving Gatwick.

- **Gatwick Express** provides a direct service to London Victoria, departing every 15 minutes in peak periods and taking around 30 minutes. Four trains per hour extend to Brighton at peak times, with two trains per hour to Brighton in off peak periods.
- **Southern** provides services across London and the south east, including London Victoria, Clapham Junction, Brighton, Southampton, Ore, Eastbourne, Littlehampton, Bognor Regis and Portsmouth, as well as many local stations.
- **Thameslink** connects Gatwick to Brighton, Horsham and Three Bridges, as well as central London through London Bridge, St. Pancras International and Farringdon, and north to Bedford, Cambridge and Peterborough. Thameslink also provides a direct train to Luton Airport Parkway.
- **Great Western** runs an hourly service between Gatwick Airport and Reading, via Redhill, Reigate and Guildford.

12.6.21 The peak rail frequencies are provided below.

Table 12.6.3: Rail Frequencies to Gatwick (2020)

Operator/Service	Route	Peak Frequency
Gatwick Express	Gatwick Airport non-stop to London Victoria and Brighton	4 trains per hour
Southern – Brighton-London mainline	Gatwick Airport to Victoria via East Croydon and Clapham Junction	6 trains per hour
Thameslink – via London Bridge	Gatwick Airport to Bedford, Cambridge and Peterborough, via London Bridge	12 trains per hour
Great Western Railway – North Downs Line	Reading to Gatwick Airport via Redhill	1 train per hour

12.6.22 Gatwick is part of London's Oyster and contactless fare payment network. From Gatwick Airport station, it is possible to travel directly to the City of London via the Thameslink route (with interchange to Docklands from London Bridge station currently and at Farringdon on the Elizabeth Line (Crossrail) from 2022) and to the West End via London's Victoria station. These services also directly connect the airport to key interchanges at Croydon, Clapham Junction and Brighton.

Diagram 12.6.3: 2022 Rail Connectivity Map

12.6.23 Gatwick Airport therefore enjoys a very high level of rail connectivity, with 22 trains to and from central London in the morning peak hour (12 via London Bridge and 10 to London Victoria, of which four are Gatwick Express services).

12.6.24 Train services can be busy in peak periods in the peak direction, into London in the morning and towards Brighton and down towards the south coast in the evening. Trains towards London become increasingly busy further north of Gatwick in the morning peak, whereas trains out of London towards Brighton and the south are already busy north of Gatwick in the evening. However, with completion of the Thameslink Programme[5], train services between Gatwick and London provide nearly 14,000 seats per direction per hour, with room for nearly 30,000 passengers (including standing passengers) per direction per hour overall.

Bus and Coach

12.6.25 Gatwick is served by frequent bus and coach services at both North and South Terminals. The operators include Metrobus, National Express, Megabus, Oxford Bus Company, and easyBus. On average there are approximately 450 daily arrivals and 500 daily departures, offering services to destinations throughout the UK. An extract of the Metrobus network map is included in Figure 12.6.1.

Coach Services

12.6.26 The airport is served by a range of coach services, which complement and provide choice alongside the rail network. Many operators have invested in high quality vehicles, customer service improvements and effective marketing which have contributed to more attractive coach services.

12.6.27 Prior to the Covid-19 pandemic, National Express provided a number of direct services to and from Gatwick and the most popular routes are summarised in Table 12.6.4. Scheduled journey times for some services vary, especially across peak periods. Several of the long distance services stop either at Heathrow's Central Bus Station or at Victoria Coach Station allowing for onward connections to a wider range of destinations. All services are expected to resume as passenger demand at the airport returns.

Table 12.6.4: Popular National Express Coach Services to Gatwick

Routes	Service	Daily Services	Fastest Journey Time
London (Victoria, Vauxhall, Belmont, Banstead) to Gatwick	A3	37	33 mins to Sutton 1hr 50 mins to Victoria
Brighton to Gatwick	025, 026, 028, 029, 201, 206, 747	23	45 mins
Heathrow to Gatwick	200, 201, 210, 230, 707, 727, 747	81	1 hr 5 mins
Southampton to Gatwick	206	19	2 hrs 30 mins
Bournemouth to Gatwick	206	24	3 hrs 20 mins

[5] Rolling stock procurement and engineering works are complete but timetable changes are ongoing, with the last of these in summer 2019.

Routes	Service	Daily Services	Fastest Journey Time
Bristol to Gatwick	200, 201	19	3 hrs 25 mins
Birmingham to Gatwick	210	23	4 hrs
Newport to Gatwick	201	20	4 hrs 10 mins
Cardiff to Gatwick	201	22	4 hrs 35 mins
Swansea to Gatwick	201	15	5 hrs 40 mins

12.6.28 Other coach services include the following.

- Megabus routes serve Gatwick Airport from London (EB1) and Bristol (M25).
- Oxford Bus Company operate the Airline service between Gatwick and Oxford.
- easyBus provides a non-stop shuttle service between Gatwick and London (Fulham Road and Park Royal).

Local Bus Services

12.6.29 The majority of local bus services are provided by Metrobus and are used by airport staff and air passengers, as well as rail passengers accessing Gatwick Airport station.

12.6.30 Metrobus provides three 'Fastway' bus routes, calling at stops with shelters and real-time information displays and using a combination of bus lanes and guided busways to achieve bus priority over general traffic:

- 10: Bewbush – Broadfield – Crawley – Gatwick Airport;
- 20: Broadfield – Three Bridges – Gatwick Airport – Crawley – Horley; and
- 100: Maidenbower – Three Bridges – Crawley – Gatwick Airport – Horley – Redhill.

12.6.31 Metrobus also provides conventional routes:

- 4 and 5: County Oak – Crawley – Wakeham Green;
- 22: Holbury St Mary – Docking – Crawley;
- 200: Horsham – Gatwick Airport;
- 400: East Grinstead – Gatwick Airport – Redhill – Caterham; and
- 460: Epsom – Redhill – Crawley.

12.6.32 Particular emphasis has been placed on improving early morning services to the airport every day of the week in order to enable shift work staff to travel by bus. Gatwick has worked with Metrobus over many years to support and subsidise an extensive 24-hour, local bus network.

12.6.33 Figure 12.6.1 shows an extract of the Metrobus map to illustrate the coverage of the bus network. The map shows that there is good local bus coverage in the local areas of Crawley and Horley, extending west to Horsham and north to Redhill, which is reflected in the staff mode shares in these areas.

12.6.34 All buses are low floor, wheelchair accessible vehicles. Metrobus has introduced a range of ticketing options through the use of smart ticketing in the form of a smart Key Card. Airport staff are entitled to the Gatwick Travelcard key card which enables them to buy discounted bus travel. Staff can top up their smartcard online or at local travel shops.

12.6.35 All local buses are fitted with GPS technology, so users can find out how far away their bus is from any bus stop on the network using the internet or their smart phone. Many bus stops are also fitted with screens providing this information, as well as the exit from Gatwick Airport railway station. QR codes and NFC tags at bus stops, compatible with smart phone readers, make it even easier for users to get this information. Buses are also fitted with the 'Next Stop' screens which are very useful for infrequent travellers.

12.6.36 Gatwick has recently improved the customer experience for bus and coach services at the airport through provision of a new waiting area at South Terminal for passengers and installation of new fully accessible lifts connecting South Terminal, the railway station and the A23 southbound bus stops.

Other Bus and Coach Services

12.6.37 In common with other large airports, Gatwick also has a wide range of staff buses/coaches, licensed car park and car hire shuttle buses, hotel and guest house shuttle buses.

12.6.38 There are multiple hotel bus routes which operate on circular routes calling at both terminals in one direction. All routes operate seven days per week and include journeys in the early morning and late evening, in order to match demand from departing and arriving passengers.

12.6.39 In 2018, there were nearly 30 guest houses or hotels that operate services on request. The vehicles used are cars or van-based minibuses.

12.6.40 There were also large numbers of bus movements associated with off airport car parks.

12.6.41 In 2018, there were over 17,000 charter coach movements a year, peaking at almost 200 arrivals a day at the airport, which are operated by a large number of companies from across the UK.

Walking and Cycling

12.6.42 Very few passengers walk or cycle to Gatwick Airport. Based on the 2016 staff survey, around 3.0% of staff travel to Gatwick was by walking or cycling. Given the extent of the catchment area for walking and cycling trips, the focus is on staff travel from nearby residential areas, including Horley and Crawley.

12.6.43 Footways are provided along some of the internal forecourt roads where pedestrian movements are considered to be appropriate. Zebra crossings are provided along primary desire lines and signage is also provided to direct passengers to the terminals. In addition, GAL has introduced campus-wide advisory walking routes and maps for use by both passengers and employees. This includes a designated route between North Terminal and South Terminal.

12.6.44 There is also access to the airport via Povey Cross Bridge which is convenient for staff living around Charlwood and Hookwood, and from the Balcombe Road for residential areas to the east of the airport.

12.6.45 There are designated off-road walking routes towards Crawley and Horley which minimise conflicts with vehicles. Figure 12.6.2 shows the key designated pedestrian routes along with a 2 km catchment to indicate the areas likely to attract walking trips.

12.6.46 The cycling catchment is expected to be larger and Figure 12.6.3 shows the key designated cycling routes together with a 5 km catchment to indicate the areas likely to attract cycling trips.

12.6.47 National Cycle Route 21 (NCR21) provides a continuous route between Crawley, Gatwick, Horley, Reigate and London. Route 20 continues south towards Brighton and Route 21 continues east towards Royal Tunbridge Wells before heading south towards Eastbourne.

12.6.48 Within the vicinity of Gatwick, NCR21 provides an A23 crossing in the form of a subway, located to the north of the South Terminal. It crosses the railway lines along a ramped subway to the north of Horley station and along St Mary's Drive to the north of Three Bridges station.

12.6.49 Cyclists and pedestrians using NCR21 currently have to navigate a number of underpasses and overbridges and, while some sections of the route provide adequate lighting and priority off-road space, other sections are not well signed and require users to switch to on-road facilities.

12.6.50 Signal controlled pedestrian crossings are located on all four arms of the Longbridge Roundabout. There is also a marked cycle lane on the A23 merge from North Terminal Roundabout, which becomes narrow and indistinct before terminating close to where the River Mole passes under the highway. From here it joins an overgrown unpaved track, which diverts away from the A23. There are no other pedestrian or cycle facilities along the A23 or M23 to the east.

Airport Surface Access Strategy and Travel Plan

12.6.51 Gatwick is committed to low-carbon growth and its Decade of Change (Gatwick Airport Limited, 2021) strategy sets ambitious carbon reduction targets. These inform headline mode share targets established when generating this assessment for PEIR.

12.6.52 Mode share targets have been tested through the strategic modelling process to understand the impact of 'pull' and 'push' measures that are required to deliver these targets. 'Pull' measures include committed and planned transport improvements such as M23 Smart Motorways or planned upgrades on the Brighton-London main line. 'Push' measures include increasing forecourt or parking charges.

12.6.53 The final strategy in the application for development consent will be prepared in conjunction with Gatwick's Airport Transport Forum and in accordance with the Aviation Policy Framework guidance.

12.6.54 Gatwick intends to put forward a robust strategy which enhances Gatwick as a regional transport hub through improvements to rail, bus, and sustainable transport with challenging but achievable mode share targets established towards a lower carbon future.

12.6.55 In alignment with the ASAS, the Travel Plan will focus on specific interventions related to staff travel in particular. The Travel Plan will seek to promote sustainable and healthier modes of transport for staff and reduce travel to work by single occupancy car.

Targets

12.6.56 The Project ASAS and Travel Plan will be developed to deliver the growth associated with the northern runway safely and sustainably.

12.6.57 Headline targets proposed and common to both the future baseline and with Project ASAS are as follows.

- Achieve 60% sustainable mode share (public transport and active travel) for airport passengers by 2030 under the scrutiny of the Transport Forum Steering Group.
- Demonstrate clear progress towards reaching a rail mode share aspiration of 50% by 2030.
- Achieve 60% of staff journeys to work by sustainable modes (public transport, active travel modes and group travel provided by individual employers for their staff, referred to as 'company transport') and including other low emission travel initiatives (car share and zero emission vehicles) by 2030.

Actions

12.6.58 To achieve these targets, Gatwick Airport will undertake the following.

- Support committed highway and rail schemes, due for delivery before 2025, which are necessary for background growth and provide sufficient capacity for airport growth.
- Support Network Rail in providing additional rail network capacity delivered through committed and planned schemes through CP6 and CP7, which provide for commuter growth in the South East, but which will also accommodate additional airport demand at the target mode share.
- Deliver the station improvement project to provide sufficient capacity.
- Work with coach and bus operators to provide an appropriate increase in service frequency as well as new route offers to accommodate future growth.

12.6.59 The above actions have been included as "pull" measures or interventions in the strategic modelling as per below. In line with TAG, only those interventions which are near certain or more than likely to occur have been included in the modelling, as described more fully in the PTAR in Appendix 12.9.1.

- Road – all committed highway schemes including M23 Smart Motorways.
- Rail – rail assumptions to 2029 and beyond in future baseline and with Project include:
  - Elizabeth Line (Crossrail);
  - Thameslink frequency (24 trains per hour (tph));
  - extra peak Southern services enabled by improvements in East Croydon area (CARS);
  - North Downs Line increase from 2 tph to 3 tph (increase from 1 tph to 2 tph at Gatwick) with 1 tph extended from Reading to Oxford in 2047 only;
  - LUL Northern Line Extension;
  - LUL/DLR frequency and capacity improvements; and
  - Gatwick Airport Station Project, doubling the size of the station concourse, adding five new lifts and eight escalators to improve passenger flow, and widening two platforms to reduce crowding.
- Bus and coach – bus and coach assumptions to 2029 and beyond in future baseline:
  - updates to coach frequencies in proportion to growth in air passengers.
- Further bus and coach enhancements with Project include:
  - new bus route hourly Uckfield to Gatwick via East Grinstead; and
  - new coach route two-hourly Chatham – Maidstone – Sevenoaks – Gatwick.

12.6.60 GAL is also considering the following.

- Increasing forecourt charging to reduce the proportion of “Kiss and Fly” trips (those incurring both drop off and pick up journeys). Note, free drop-off and pick-up will be provided in long-stay to ensure equitable access from those locations not well-served by public transport.
- Increasing parking charges to encourage use of more sustainable modes.

12.6.61 The above actions have been included as “push” measures in the strategic modelling as follows.

- Car ‘Kiss and Fly’ and parking – in 2029 the forecourt charge is assumed to rise to £9.50 (in 2021 money) and to £11.50 in 2032 and 2047. Charges for use of both GAL managed and off-site car parks are assumed to rise by 30% in real terms from 2016 Base to 2029 and by 40% to 2032 and 2047.

12.6.62 The above measures are included in the strategic modelling used to inform this EIA chapter as well as to provide traffic data for noise and air quality modelling. The measures lead to an increase in passenger public transport mode share from around 45% prior to the Covid-19 pandemic up to 54% and 56% between 2029 and 2047 for both the future baseline and with Project. Whilst not at the 60% target, this increase in public transport mode share for air passengers is significant and notable given the growth in passenger numbers in the future baseline and with the Project. The assessment shows that mitigating the effects of the Project can be achieved by the interventions tested and are not reliant on the ASAS targets being met. However, Gatwick aspires to a more sustainable, lower emission mode share so will continue to work towards these targets with stakeholders and consider additional interventions prior to the application for development consent and subject to model testing.

Future Baseline

12.6.63 These sections describe predicted future baseline scenarios, based on anticipated passenger growth in the absence of the Project. Chapter 4 sets out the future Airport context and the projects which are proposed or have already been consented and would proceed in the short term, in the absence of the Project. These include airport passenger throughput, freight demand, additional car parking and Gatwick Airport station improvements which are all included in the future baseline. Minor improvements (signalisation and local widening) to South and North Terminal Roundabouts form part of the demand input and network structure of the strategic modelling.

12.6.64 Background traffic is based on the latest TEMPRO growth factors with adjustments to consider cumulative development. In London, data from TfL was adopted to modify the assumptions in London for growth in travel demand. More information on growth rates are contained in the PTAR.

2024-2029

12.6.65 Peak airport construction impacts are expected between 2024 and 2029. For the purposes of this assessment, 2029 traffic flows have been used to test the robustness of the highway network to cope with the additional construction traffic associated with the Project. This is a robust case as 2029 has the highest background traffic flows in the period 2024 to 2029.

12.6.66 The committed rail upgrade works at Gatwick Airport station will be in place in this future baseline scenario. Works commenced in 2020 and completion is expected in September 2023. The works involve a larger concourse, five new lifts, eight new escalators, four new stairways and widening for two existing platforms to reduce overcrowding and improve accessibility. The works are

expected to reduce train delays caused by platform overcrowding and congestion, while also improving passenger experience by providing easier connections to other destinations.

12.6.67 Gatwick is looking to upgrade South and North Terminal roundabouts through local widening and signalisation. These improvements are identified in Gatwick's Capital Investment Programme and are scheduled to be in place by the mid-2020s.

12.6.68 As part of the CIP works, Gatwick has proposed improvements to walking and cycling. This includes a new pedestrian and cycle route between the Longbridge Roundabout and North Terminal by Staff Car Park Y including a new pedestrian and cycle bridge over the River Mole. Other pedestrian and cycle improvements are proposed at the North Terminal roundabout and along Perimeter Road North between North and South Terminal.

12.6.69 No other committed infrastructure changes within the study area are expected for public transport or highway network.

2029

12.6.70 The 2029 Gatwick passenger demand per annum is forecast to be 57.3 million. Trip generation associated with the 2029 future baseline is provided in the PTAR (Appendix 12.9.1).

12.6.71 There are internal improvements works proposed within Gatwick Airport which are expected to be in place by 2029. These include the opening of new multi-storey car parks at North Terminal (MSCP7) and South Terminal (MSCP4) and use of robotics technology within existing long stay parking areas. These improvements will result in approximately an additional 6,750 spaces.

12.6.72 A number of rail, bus and coach improvements are anticipated to 2029, as per Section 12.6.59.

Interim Assessment Year: 2032

12.6.73 The 2032 Gatwick passenger demand per annum is forecast to be 59.4 million. Trip generation associated with the 2032 future baseline is provided in the PTAR (Appendix 12.9.1). No additional changes are assumed by 2032.

Design Year: 2047

12.6.74 The North Downs Line has 1 tph extended from Reading to Oxford in 2047. No other committed changes within the study area are assumed for walking, cycling, public transport or highway network.

12.6.75 The 2047 Gatwick passenger demand per annum is forecast to be 67.2 million. Trip generation associated with the 2047 future baseline is provided in the PTAR (Appendix 12.9.1).

12.7. Key Project Parameters

12.7.1 The assessment has been based on the parameters identified within Chapter 5: Project Description.

12.7.2 Table 12.7.1 below identifies the key parameters relevant to this assessment. Where options exist, the maximum design scenario selected is the one having the potential to result in the greatest effect on an identified receptor or receptor group. Effects of greater adverse significance

are not predicted to arise should any other option identified in Chapter 5 be taken forward in the final design of the Project.

12.7.3 The traffic assessment has been used to inform the assessments contained in Chapter 13: Air Quality and Chapter 14: Noise and Vibration.

Table 12.7.1: Maximum Design Scenarios

Potential Impact	Maximum Design Scenario	Justification
Initial Construction Phase: 2024-2029		
Increase in construction traffic. Temporary traffic and pedestrian diversions. Rail improvements.	Peak construction traffic assessed on top of 2029 background traffic growth (highest background traffic between the period 2024-2029). Construction traffic assessed.	2029 is the latest possible year prior to opening of the Project.
First Full Year of Opening: 2029		
Increase in passenger numbers.	Passenger Air Transport Movements based on forecast data.	The increase in the number of passengers will increase trips on the transport network.
Interim Assessment Year: 2032		
Increase in passenger numbers.	Passenger Air Transport Movements based on forecast data.	The increase in the number of passengers will increase trips on the transport network.
Design Year: 2047		
Increase in passenger numbers. Highway embedded mitigation.	A conservative assessment year reflecting a requirement under DMRB to assess the effects of a project 15 years after it has been completed.	Airport passenger and staff numbers are highest in 2047 and background traffic has increased on the network. This assessment year therefore provides a robust assessment and has been tested both without and with the Project.

12.8. Mitigation and Enhancement Measures Adopted as Part of the Project

12.8.1 A number of measures have been designed into the Project to reduce the potential for impacts on traffic and transport. These are listed in Table 12.8.1.

Table 12.8.1: Mitigation and Enhancement Measures

Measures Adopted as Part of the Project	Justification
Mitigation	
Surface Access Improvements	Preliminary traffic modelling shows that the surface access improvements will be required for the Project by 2032. Highway schemes have been developed and these are considered to form part of the Project design. Details of the highway improvement schemes being considered are contained in Chapter 5: Project Description. The surface access improvements works include changes to the North and South Terminal roundabouts and involve grade separated solutions. The Longbridge Roundabout also requires modification. These works are in addition to those identified in the future baseline 2024-2029. Modelling for PEIR indicates that mitigation is not required at M23 Junction 9.
Road Safety Audit	Highway design changes will be subject to Road Safety Audits where risks will be identified and remediation measures incorporated into the design where appropriate.
Travel Plan (construction and operation)	A Travel Plan is expected to be implemented to meet policy requirements. In particular, specific measures would target staff travel and encourage more sustainable travel patterns. This will be prepared for the development consent application once additional modelling work to inform the final assessment has been completed, including strategic multi-modal modelling to test specific interventions and how these affect mode share. A Travel Plan will also be implemented for construction workers. An Outline Construction Workforce Travel Plan will be prepared for the final ES which accompanies the application for development consent.
Temporary diversion routes during construction	Temporary diversion routes for traffic and pedestrians would be required during highway construction to maintain safety and therefore considered as part of the Project.
Construction Traffic Management Plan	As part of the construction works, a traffic management strategy would be put in place to minimise any negative environmental and community impacts. This would include the following. Measures to ensure the transport of construction materials and waste is managed as sustainably as possible, noting the impacts of transporting this by road, including the potential use of rail via facilities close to the airport, where this is appropriate and feasible. Scheduling of construction material and logistics traffic movements that need to come by road to use roads and highways outside of peak periods and to use designated routes into construction sites on the airport which are suitable for this type of traffic.

Measures Adopted as Part of the Project	Justification
	Delivery Management Zones to consolidate materials onto the least number of vehicles and to hold vehicles away from sensitive areas until deliveries are required. Encouraging/incentivising the highest possible public transport use for the construction workforce. Timing shift patterns such that those workers who do need to come by road to use roads and highways outside of peak periods. The strategy would be prepared in accordance with Transport for London guidance as set out in the PINS scoping comments. An Outline Construction Traffic Management Plan for Materials and Workforce will be prepared for the final ES which accompanies the application for development consent.
Monitoring	
Travel Plan monitoring	Ongoing monitoring of travel patterns are expected to ensure the success of the Travel Plan. Annual reporting will be undertaken to assess the performance against targets, in accordance with Airport NPS.
Surface access monitoring	Developing and carrying out monitoring of pedestrian, cyclist and traffic levels by mode in order to be able to respond to changes in demand. GAL will also monitor those surface access impacts as required by Highways England, Network Rail and the Department for Transport to demonstrate the successful mitigation of the effects of the Project.

12.8.2 The above mitigation measures are considered to be embedded into the Project and therefore relied upon for the purposes of this assessment. The mitigation measures are expected to be secured through the DCO process.

12.9. Assessment of Effects

12.9.1 For each year of assessment, the Traffic and Transport effects have been assessed as a comparison between future baseline and future baseline with Project, in line with guidance.

Initial Construction Phase: 2024-2029

12.9.2 During this phase, only airfield construction traffic would be generated by the Project. The proposal is for all construction vehicles to travel to and from the airport from via M23 Junction 9, and no restrictions are proposed for construction workers. Construction traffic would be monitored to ensure compliance with proposed routes, unless disruption causes these to be unavailable and signed diversionary routes provided.

12.9.3 The busiest month for construction vehicle activity is December 2026. However, December is a lower month for traffic on the highway network around the Airport and therefore the assessment has also considered other months during the peak months of construction activity in 2026 and 2027. Typically, the summer months, with high Airport activity and background traffic, are the

busiest on the network. Accordingly, the modelling and assessment considers the highest summer month which occurs in August 2027. The estimated hourly construction vehicle trip generation is 33 vehicles (HGVs and LGVs) in and out an hour along the M23 Spur, and 150 construction worker vehicles arriving in the AM1 peak hour and departing after the PM peak hour through August 2027. The modelling has tested the summer peak level of construction activity in August 2027 on 2029 baseline airport and background traffic levels to provide a robust assessment of potential construction impacts. The difference in traffic flows between 2027 and 2029 will be small (a few percent higher) and accordingly within the daily variation in any given year. Further information is contained in the PTAR (Appendix 12.9.1).

Severance

12.9.4 The peak hour highway flows for each link within the study area are contained in Appendix 12.9.2. For the purposes of reporting, only those which have a magnitude of impact of low, medium and high adverse or beneficial are assessed to focus on potential significant effects.

12.9.5 The data shows that no link within the study area is expected to experience changes in traffic of over 30% as the result of the Project during the airfield construction phase. Therefore, the magnitude of impact is considered to be negligible. The sensitivity of the links within the study area range from low to high, and the overall effect on severance is considered to be **negligible adverse**.

Driver Delay

12.9.6 The embedded mitigation measures as set out in Table 12.8.1 in the form of the Construction Traffic Management Plan will aim to reduce impact on journey times, particularly during the peak hours. The following diagram shows the magnitude of impact for driver delay for junctions where the V/C is over 85%.

Diagram 12.9.1: 2029 Construction Driver Delay Magnitude of Impact (all assessment time periods)

12.9.7 The above shows that most junctions (over 1,000) have no significant or low magnitude of impact in terms of delay. Car driver and passenger sensitivity is considered to be medium for junctions where the V/C is over 85%. For the junctions with no significant delays, the driver delay effect is **negligible**. For those with a low magnitude of impact, the driver delay is **minor adverse**.

12.9.8 There are two junctions in the Croydon area which are shown to have a medium magnitude of impact (the model area in Croydon is highly sensitive and is identifying capacity issues not related to the Project which require refinement for the final ES, see paragraph 12.4.13). For these junctions, the driver delay effect is considered to be **moderate adverse**. Further information is contained in the modelling Annex to the PTAR (Appendix 12.9.1) on overall journey times to consider driver delays in more detail. Work will be undertaken to verify model findings as well as to identify mitigation measures if required for the development consent. Any significant effects on driver delay will be mitigated and it is expected that the residual effect will reduce to minor adverse.

Pedestrian and Cyclist Delay

12.9.9 The peak construction traffic is not expected to interact with the main pedestrian and cyclist routes, which tend to be off-road. The change in traffic along pedestrian routes is also negligible, as set out in paragraph 12.9.5 and flow data in Appendix 12.9.2. The magnitude of impact is considered to be negligible, the sensitivity of receptors along the highway routes range from

negligible to medium. The overall effect on pedestrian and cycle delays are therefore expected to be **negligible adverse**.

Pedestrian and Cyclist Amenity

12.9.10 The suggested threshold for a significant effect on pedestrian and cyclist amenity is when the traffic flows have doubled. No roads within the study area are expected to meet this threshold during the construction period.

12.9.11 The traffic composition can also affect pedestrian and cyclist amenity. The traffic flows in Appendix 12.9.2 show that whilst there are links with increases in HGVs, with the highest increase in the number of HGVs along the M23 Spur and the A23, there are very small changes to the overall traffic composition. The highest increase in the percentage of HGVs (number of HGVs divided by total vehicle number) is 3% for all peak periods on the A23 London Road, to the south of Longbridge Roundabout (Link ID: 004). The predicted increase is from 4% to 7% in the AM1 and AM2 periods, 6% to 9% in the IP and 2% to 5% in the PM peak. The magnitude of this impact can be considered to be low. The sensitivity of the A23 London Road is considered to be low. The effect on pedestrian and cyclist amenity on the A23 London Road is therefore considered to be **minor adverse.**

12.9.12 For all the other roads, the predicted increase in the percentage of HGVs varies between -2% and 2%. The magnitude of impact is considered to be negligible. The sensitivity of the receptors along these links are considered to be negligible to high. The effect on pedestrian and cyclist amenity on all other roads is considered to be **negligible adverse.**

Accidents and Safety

12.9.13 Changes in traffic flows and highway design could influence the risk of accidents. No links are expected to experience a traffic increase of over 30%. Roads in study area identified as construction routes in particular, will experience a change in traffic composition, with a slightly higher proportion of HGVs compared to total traffic. Suitable measures to minimise the impact of construction vehicles would form part of the Construction Traffic Management Plan.

12.9.14 The magnitude of impact for accidents and safety is considered to be low. The sensitivity of receptors in terms of pedestrians and cyclists along construction routes are considered to be negligible to low. The effect on accidents and safety on pedestrians and cyclist is considered **negligible** along the construction routes.

12.9.15 The sensitivity of receptors in terms of car drivers and passengers is considered to be low to medium for both construction scenarios. The effect on accidents and safety on car drivers and passengers is considered **negligible adverse** along the construction routes, and no change on all other roads.

Hazardous Loads

12.9.16 It is expected that there would be some temporary diversions in place during construction as part of the Project but no significant changes are expected to the strategic highway network.

12.9.17 The magnitude of impact and sensitivity of receptors for hazardous loads are both considered to be negligible. The effect on transporting or routeing of hazardous loads is considered to be **negligible adverse.**

Effects on Public Transport Amenity

12.9.18 Changes in passenger crowding during this phase compared to the future baseline would be associated with Project construction workforce who travel to site by rail.

12.9.19 The number of construction workers travelling by rail is expected to be low. They will be travelling to Gatwick in the morning peak and this has been examined in terms of capacity by direction. From the north, this is the counter network peak direction and capacity modelling shows there is plenty of seating capacity available in 2029, including with incremental growth in passengers. Capacity modelling shows the rail service from the south also has seating capacity available (see paragraphs 12.9.43 onwards). In addition, measures within the Travel Plan for construction workers could include staggered shift start and end times to reduce peak period pressure as well as provision of bus services to park and ride sites and to specific towns and cities where construction workers come from.

12.9.20 The magnitude of impact is considered to be negligible and the sensitivity of receptors in terms of rail capacity is also considered to be low. The effect on rail crowding is therefore considered **negligible adverse.**

Further Mitigation and Future Monitoring

12.9.21 The assessment shows that although there will be increases in traffic flows as the result of construction, most of the effects are not significant. However, due to the issues identified in the strategic model in the Croydon area (see paragraph 12.4.13), two junctions in Croydon have been identified to have a moderate adverse effect in terms of driver delay. These changes do not relate to the airfield construction activities at Gatwick. Work will be undertaken to verify model findings as well as to identify mitigation measures if required for the development consent application. Any significant effects on driver delay will be mitigated and it is expected that the residual effect will be minor adverse. No further mitigation has been identified at this stage.

12.9.22 Construction activities are expected to be monitored as part of the Construction Traffic Management Plan. No further monitoring measures are currently proposed.

Significance of Effects

12.9.23 Potential significant effect identified in the Croydon area for driver delay. Again, this does not relate to the airfield construction activities at Gatwick. Further work will be undertaken to verify model findings as well as to identify mitigation measures if required. No other significant effects have been identified for this assessment year. No further mitigation or monitoring has been identified; therefore, the significance of effects would remain as presented above.

First Full Year of Opening: 2029

12.9.24 The annual passenger demand for 2029 is expected to increase from 57.3 million in the 2029 future baseline to 61.3 million with the Project. Trip generation associated with 2029 with the Project is provided in the PTAR (Appendix 12.9.1). The first full year of opening is considered to be when the main airport construction work is completed and the northern runway is operational.

12.9.25 A number of rail, bus and coach improvements are anticipated to 2029, as per Section 12.6.59.

12.9.26 The measures described above and included in the strategic model lead to an increase in passenger public transport mode share from around 45% prior to the Covid-19 pandemic up to

54% and 56% between 2029 and 2047. Whilst not at the 60% target set for 2030, this increase in public transport mode share for air passengers is significant and notable given the growth in passenger numbers with the Project.

Severance

12.9.27 The peak hour highway flows for the first full year of opening are contained in Appendix 12.9.2. For the purposes of reporting, only the links which have a magnitude of impact of low, medium and high adverse or beneficial are assessed in this section to focus on potential significant effects. These links and associated flows are shown in Table 12.9.1 for the future baseline, Table 12.9.2 for future baseline with Project. The net change in traffic flows are shown in Table 12.9.3.

12.9.28 The below shows that within the whole study area, from all of the links analysed in Appendix 12.9.2 during the first full year of opening, only two locations will experience more than 30% increase in traffic in the first full year of opening. Perimeter Road East at Gatwick Road Roundabout (Link ID: 13) and both sections of Old Brighton Road (Link IDs: 14 and 15) which are to the south of the airport and provide access to airport-related uses. The increases are due to changes in car parking in the with Project scenario in 2029, which are accessed from the south of the airport.

12.9.29 Perimeter Road East is considered to have low sensitivity in terms of pedestrians and cyclists. It is expected to experience an increase of around 35% in the AM1 and AM2 periods (low impact), with a lower increase of 19% in the IP (negligible impact). In the PM peak, a traffic reduction of 36% (low beneficial impact) is expected. Overall, the effect of severance for Perimeter Road East is considered **negligible adverse.**

12.9.30 Old Brighton Road South is considered to have low sensitivity in terms of pedestrians and cyclists. It experiences the highest percentage increase on the northern section between Charlwood Road and Perimeter Road South of around 70% in the AM1, AM2 and IP assessment periods (medium impact), and 259% in the PM peak periods (high impact). The southern section between Lowfield Heath Roundabout and Charlwood Road experiences an increase of 66% in the PM assessment period (medium impact). The future baseline flows for Old Brighton Road South are relatively low, and the magnitude of impact can be considered to be high. The effect of severance for Old Brighton South is therefore considered **minor adverse.**

12.9.31 All other links will have an increase of less than 30% and therefore the magnitude of impact on severance is considered to be negligible. The sensitivity of the highway links for pedestrians and cyclists range from negligible to high and the overall effect of severance is considered to be **minor adverse**.

Table 12.9.1: First Full Year of Opening 2029 Traffic Flows – Future Baseline

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
13	Perimeter Road East	821	77	9%	813	118	15%	893	151	17%	802	56	7%
14	Old Brighton Road South (South)	739	31	4%	810	35	4%	606	24	4%	682	9	1%
15	Old Brighton Road South (North)	314	16	5%	294	18	6%	225	16	7%	286	13	5%

Table 12.9.2: First Full Year of Opening 2029 Traffic Flows – Future Baseline with Project

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
13	Perimeter Road East	1116	87	8%	1073	125	12%	1067	156	15%	510	59	12%
14	Old Brighton Road South (South)	844	31	4%	886	36	4%	697	24	3%	1134	9	1%
15	Old Brighton Road South (North)	526	12	2%	509	19	4%	373	23	6%	1026	15	1%

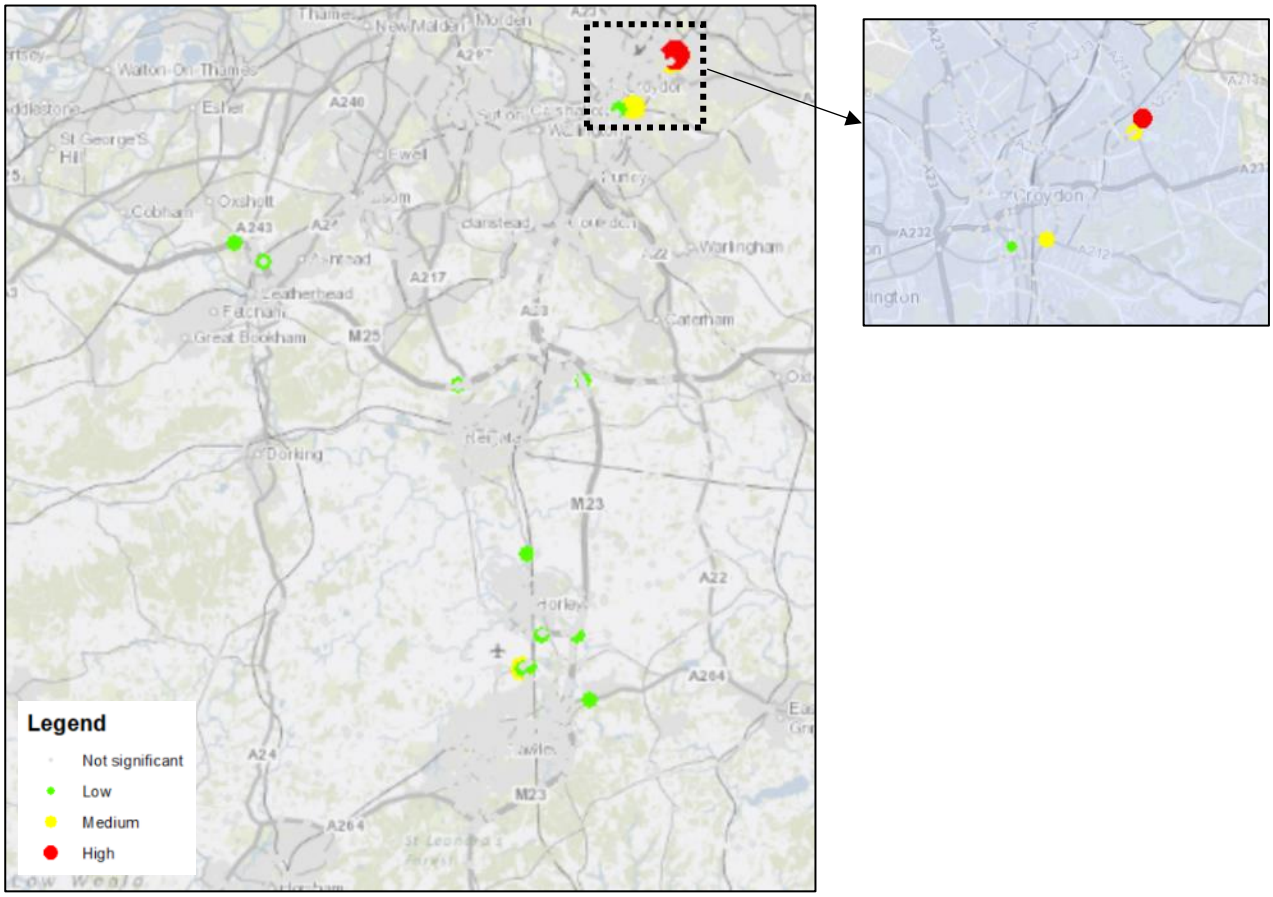
Table 12.9.3: First Full Year of Opening 2029 Traffic Flows – Net Change (Percentage Change in Brackets)

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
13	Perimeter Road East	295 (36%)	10 (13%)	-2% (-2%)	260 (32%)	7 (6%)	-3% (-3%)	174 (19%)	5 (3%)	-2% (-2%)	-292 (-36%)	3 (5%)	5% (5%)
14	Old Brighton Road South (South)	105 (14%)	0 (0%)	-1% (-1%)	76 (9%)	1 (3%)	0% (0%)	91 (15%)	0 (0%)	-1% (-1%)	452 (66%)	0 (0%)	-1% (-1%)
15	Old Brighton Road South (North)	212 (68%)	-4 (-25%)	-3% (-3%)	215 (73%)	1 (6%)	-2% (-2%)	148 (66%)	7 (44%)	-1% (-1%)	740 (259%)	2 (15%)	-3% (-3%)

Driver Delay

12.9.32 The following diagram shows the magnitude of impact for driver delay for junctions where the V/C is over 85%. The diagram shows driver delay for all time periods assessed and any overlaps in colours indicate different magnitudes of impact by time period. The highest magnitude of impact for each junction is considered.

Diagram 12.9.2: 2029 Driver Delay Magnitude of Impact (all assessment time periods)



12.9.33 The above shows that most junctions (over 1,000) have no significant or low magnitude of impact in terms of delay. Car driver and passenger sensitivity is considered to be medium for junctions where the V/C is over 85%. For the junctions with no significant delays, the driver delay effect is **negligible**. For those with a low magnitude of impact, the driver delay is **minor adverse**.

12.9.34 There are three junctions which are shown to have a medium magnitude of delay, one is located near Gatwick Airport and two are located in the Croydon area (as per paragraph 12.4.13 above, the model area in Croydon is highly sensitive and is identifying capacity issues not related to the Project which require refinement for the next stage). One junction is identified with a high magnitude of delay located in the Croydon area. For these junctions, the driver delay effect is considered to be **moderate adverse**. Further information is contained in the modelling annex to the PTAR on overall journey times to consider driver delays in more detail, and work will be undertaken to verify model findings as well as to identify mitigation measures if required for the development consent. Any significant effects on driver delay will be mitigated and it is expected that the residual effect will reduce to minor adverse.

Pedestrian and Cyclist Delay

12.9.35 The highest increase in traffic flows will be on Old Brighton Road South and Perimeter Road South. However, the traffic flows with Project of around 1,000 two-way flow per hour is not expected to lead to pedestrian or cyclist delay.

12.9.36 No significant changes to traffic flows on other links are expected and the magnitude of impact is considered to be negligible. The sensitivity of receptors along the highway routes range from negligible to high. The effect on pedestrian and cycle delays are expected to be **negligible adverse**.

Pedestrian and Cyclist Amenity

12.9.37 The threshold for an effect on pedestrian and cyclist amenity is when the traffic flows have doubled. Old Brighton Road South is expected to experience a doubling of traffic flows in the PM peak. This magnitude of impact can be considered to be medium, and with the sensitivity of the link for pedestrians and cyclists considered to be low, the effect of the Project on amenity along Old Brighton Road South can be considered to be **minor adverse** in the PM peak.

12.9.38 The traffic composition can also affect pedestrian and cyclist amenity. The highest increase in the percentage of HGVs (number of HGVs divided by total vehicle number) is 5% for the PM peak on Perimeter Road East. The predicted increase is from 7% to 12% and the magnitude of this impact can be considered to be low. The change in percentage HGV is largely due to the reduction in general traffic on this link in the PM peak with Project. The sensitivity of the Perimeter Road East is considered to be low and it is not considered to be a key pedestrian / cycle route. The effect of the Project on amenity along Perimeter Road East can be considered to be **negligible adverse** in the PM peak.

12.9.39 No other roads within study area will experience a doubling of traffic flows or noticeable changes to the traffic composition. The magnitude of impact is considered to be negligible and the sensitivity of receptors along the highway routes range from negligible to high. The overall effect on pedestrian and cyclist amenity is considered to be **negligible adverse**.

Accidents and Safety

12.9.40 The increases in the traffic flows are not expected to be significant and no changes to the highway layouts are proposed. The magnitude of impact is considered to be negligible. The sensitivity of receptors is negligible for high for pedestrians and cyclists, and low to medium for car drivers and passengers. The risk of accidents and safety for all road users is considered to be **negligible adverse**.

Hazardous Loads

12.9.41 No changes to traffic routes are proposed and therefore the effect on hazardous loads is considered to be **no change.**

Effects on Public Transport

12.9.42 To assess the effect of the Project on public transport, this section considers the impact on passenger crowding on rail services and in Gatwick Airport railway station. Public transport provision is as set out in 12.6.59.

Crowding on Rail Services

AM Peak (0700-0900)

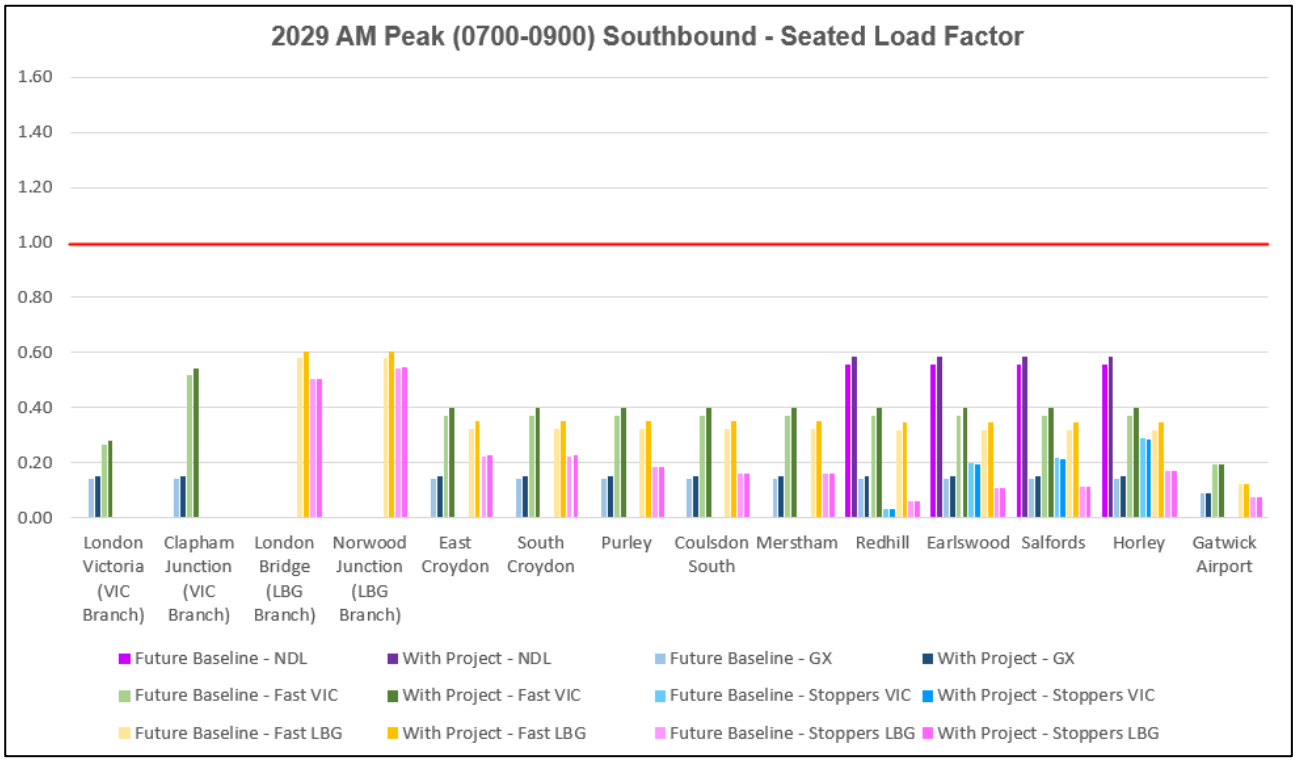
12.9.43 Crowding has been assessed based on line loading in both directions in the AM and PM peaks, and detailed data is contained in the PTAR (Appendix 12.9.1). In the AM peak, the highest increase in rail passengers is actually in the southbound direction, from London to Gatwick. This indicates that Gatwick growth means better use of contra-peak rail capacity and improves operational value for money. Table 12.9.4 provides a summary of the increase in line loading by station in the southbound direction.

12.9.44 The below table shows that on the rail services being assessed, the Project adds up to a total of around 550 passengers. Most of these passengers are expected on the fast train services from London Victoria and London Bridge. The increase in passengers represents an 8% increase in passengers on the fast services, and 9% on Gatwick Express. To assess the impact on crowding, Diagram 12.9.3 shows the seated load factor assessment.

Table 12.9.4: 2029 AM Southbound Line Loading Capacity Assessment

Station	2029 AM Peak Southbound (0700-0900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
London Victoria (VIC Branch)	-	53	65	-	-	-	**118**	-	9%	4%	-	-	-	**5%**
Clapham Junction (VIC Branch)	-	53	123	-	-	-	**176**	-	9%	4%	-	-	-	**5%**
London Bridge (LBG Branch)	-	-	-	-	239	13	**252**	-	-	-	-	4%	1%	**3%**
Norwood Junction (LBG Branch)	-	-	-	-	239	21	**260**	-	-	-	-	4%	1%	**3%**
East Croydon	-	53	176	-	293	5	**527**	-	9%	8%	-	8%	0%	**7%**
South Croydon	-	53	176	-	293	5	**527**	-	9%	8%	-	8%	0%	**7%**
Purley	-	53	176	-	293	5	**527**	-	9%	8%	-	8%	1%	**7%**
Coulsdon South	-	53	176	-	293	5	**527**	-	9%	8%	-	8%	1%	**7%**
Merstham	-	53	176	-	293	5	**527**	-	9%	8%	-	8%	1%	**7%**
Redhill	28	53	176	2	293	7	**559**	5%	9%	8%	5%	8%	2%	**8%**
Earlswood	28	53	176	-5	293	8	**553**	5%	9%	8%	-2%	8%	1%	**7%**
Salfords	28	53	176	-5	293	8	**553**	5%	9%	8%	-2%	8%	1%	**7%**
Horley	28	53	176	-5	293	8	**554**	5%	9%	8%	-1%	8%	1%	**7%**
Gatwick Airport	-	4	15	-	10	3	**33**	-	1%	1%	-	1%	1%	**1%**

Diagram 12.9.3: 2029 AM Southbound Seated Load Factor



12.9.45 The above diagram shows that the increase in passengers in the southbound direction will increase the seated load factor across all the lines assessed, but there is still seating available for passengers. The highest seated load factor is around 0.6, which means that four out of ten seats will be available.

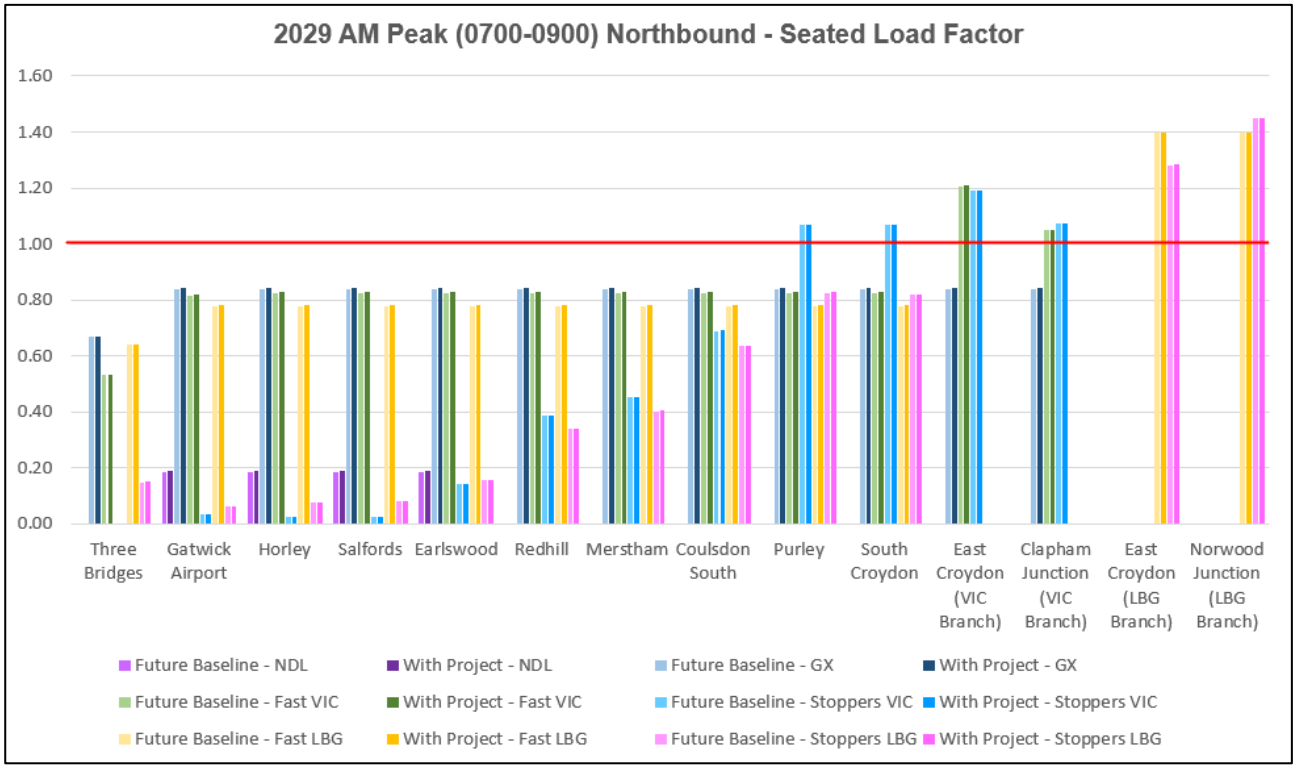
12.9.46 The line loading in the northbound direction has also been assessed. This is the peak rail network direction in the AM peak and Table 12.9.5 provides a summary of the increase in line loadings in this direction.

Table 12.9.5: 2029 AM Northbound Line Loading

Station	2029 AM Peak Northbound (0700-0900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Three Bridges	-	3	9	-	18	8	**39**	-	0%	0%	-	0%	1%	**0%**
Gatwick Airport	6	23	41	1	60	10	**141**	3%	1%	1%	1%	1%	2%	**2%**
Horley	6	23	40	1	60	10	**139**	3%	1%	1%	1%	1%	2%	**2%**
Salfords	6	23	40	0	60	10	**139**	3%	1%	1%	1%	1%	2%	**2%**
Earlswood	6	23	40	3	60	13	**146**	3%	1%	1%	1%	1%	1%	**2%**
Redhill	-	23	40	4	60	7	**134**	-	1%	1%	0%	1%	0%	**2%**
Merstham	-	23	40	4	60	6	**134**	-	1%	1%	0%	1%	0%	**2%**
Coulsdon South	-	23	40	4	60	5	**133**	-	1%	1%	0%	1%	0%	**2%**
Purley	-	23	40	4	60	5	**132**	-	1%	1%	0%	1%	0%	**1%**
South Croydon	-	23	40	4	60	5	**132**	-	1%	1%	0%	1%	0%	**1%**
East Croydon (VIC Branch)	-	23	22	3	-	-	**47**	-	1%	0%	0%	-	-	**1%**
Clapham Junction (VIC Branch)	-	23	5	-1	-	-	**27**	-	1%	0%	0%	-	-	**1%**
East Croydon (LBG Branch)	-	-	-	-	15	13	**28**	-	-	-	-	0%	0%	**0%**
Norwood Junction (LBG Branch)	-	-	-	-	15	14	**29**	-	-	-	-	0%	0%	**0%**

12.9.47 The above table shows that the Project adds around 140 passengers to rail services in this direction, which represents an overall increase of 2%. Diagram 12.9.4 shows the seated load factor assessment for the AM peak northbound direction services.

Diagram 12.9.4: 2029 AM Northbound Seated Load Factor



12.9.48 The above diagram shows that between Three Bridges and Coulsdon South, there is seating available for all passengers. However, north of Purley, there are some services where the seating capacity is exceeded owing to background commuter flows into London. For these stations, standing capacity has been assessed which is shown in Table 12.9.6.

12.9.49 The standing capacity assessment shows the percentage occupied based on the capacity of each service. On average over the two-hour AM peak period, the highest percentage of standing capacity occupied is around 35%, which occurs north of East Croydon on both the London Victoria and London Bridge branches of the network. Whilst services north of East Croydon are therefore busy, the Project will not materially change congestion in 2029, with the highest increase in standing capacity occupied by Gatwick passengers being 0.6% north of East Croydon on fast services into London Victoria.

Table 12.9.6: 2029 AM Northbound Standing Capacity Assessment

Station	2029 AM Peak Northbound (0700-0900) - Percentage of Standing Capacity Occupied													
	Future Baseline 2029							Future Baseline 2029 + Project (% change)						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Purley	-	0%	0%	12%	0%	0%	**1%**	-	0% (0.0%)	0% (0.0%)	12% (0.2%)	0% (0.0%)	0% (0.0%)	**1% (0.0%)**
South Croydon	-	0%	0%	12%	0%	0%	**1%**	-	0% (0.0%)	0% (0.0%)	12% (0.2%)	0% (0.0%)	0% (0.0%)	**1% (0.0%)**
East Croydon (VIC Branch)	-	0%	34%	32%	-	-	**5%**	-	0% (0.0%)	35% (0.6%)	32% (0.2%)	-	-	**5% (0.1%)**
Clapham Junction (VIC Branch)	-	0%	8%	13%	-	-	**1%**	-	0% (0.0%)	8% (0.1%)	13% (-0.1%)	-	-	**1% (0.0%)**
East Croydon (LBG Branch)	-	-	-	-	30%	17%	**18%**	-	-	-	-	30% (0.1%)	17% (0.1%)	**18% (0.1%)**
Norwood Junction (LBG Branch)	-	-	-	-	30%	27%	**21%**	-	-	-	-	30% (0.1%)	28% (0.1%)	**21% (0.1%)**

Table 12.9.7: 2029 PM Northbound Line Loading Capacity Assessment

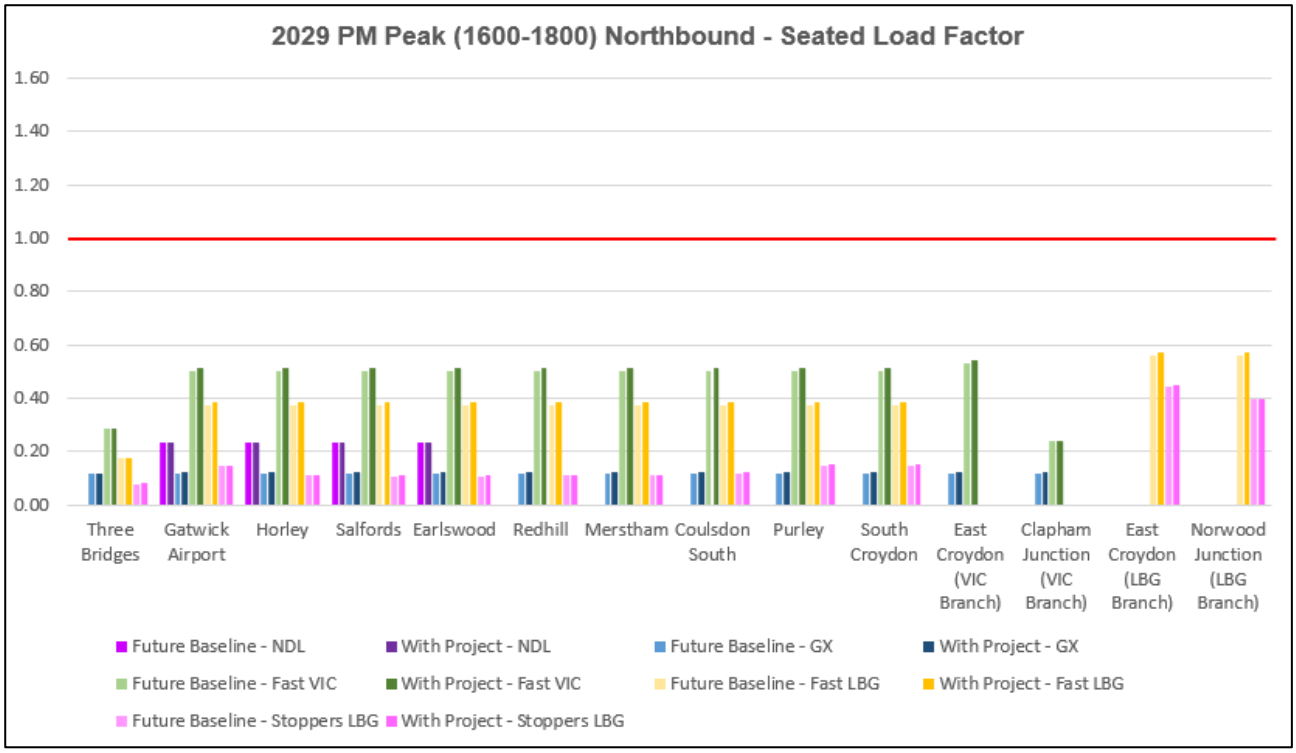
Station	2029 PM Peak Northbound (1600-1900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Three Bridges	-	4	15	-	11	6	**36**	-	1%	1%	-	1%	1%	**1%**
Gatwick Airport	5	21	82	-	77	14	**199**	2%	4%	2%	-	2%	1%	**2%**
Horley	5	21	82	-	77	13	**198**	2%	4%	2%	-	2%	1%	**2%**
Salfords	5	21	82	-	77	13	**198**	2%	4%	2%	-	2%	1%	**2%**
Earlswood	5	21	82	-	77	13	**198**	2%	4%	2%	-	2%	1%	**2%**
Redhill	-	21	82	-	77	8	**188**	-	4%	2%	-	2%	1%	**2%**
Merstham	-	21	82	-	77	8	**188**	-	4%	2%	-	2%	1%	**2%**
Coulsdon South	-	21	82	-	77	8	**188**	-	4%	2%	-	2%	1%	**2%**
Purley	-	21	82	-	77	8	**188**	-	4%	2%	-	2%	1%	**2%**
South Croydon	-	21	82	-	77	8	**188**	-	4%	2%	-	2%	1%	**2%**
East Croydon (VIC Branch)	-	21	61	-	-	-	**81**	-	4%	2%	-	-	-	**2%**
Clapham Junction (VIC Branch)	-	21	26	-	-	-	**46**	-	4%	1%	-	-	-	**2%**
East Croydon (LBG Branch)	-	-	-	-	74	21	**95**	-	-	-	-	2%	0%	**1%**
Norwood Junction (LBG Branch)	-	-	-	-	74	23	**97**	-	-	-	-	2%	1%	**1%**

PM Peak (1600-1900)

12.9.50 In the PM peak, the highest increase in rail passengers is in the northbound direction, from Gatwick to London. Table 12.9.4 provides a summary of the increase in line loading by station in the northbound direction, again demonstrating the operational value for money that Gatwick growth provides.

12.9.51 Table 12.9.7 shows that on the rail services being assessed, the Project adds up to around 200 passengers. Most of these passengers are expected on the fast train services to London Victoria and London Bridge. The increase in passengers represents an 2% increase in passengers on the fast services, and 4% on Gatwick Express. To assess the impact on crowding, Diagram 12.9.5 shows the seated load factor assessment.

Diagram 12.9.5: 2029 PM Northbound Seated Load Factor



12.9.52 The above diagram shows that the increase in passengers in the northbound direction will increase the seated load factor across all the lines assessed but there is still more seating available for passengers. The highest seated load factor is up to 0.6 which means that four out of ten seats are available.

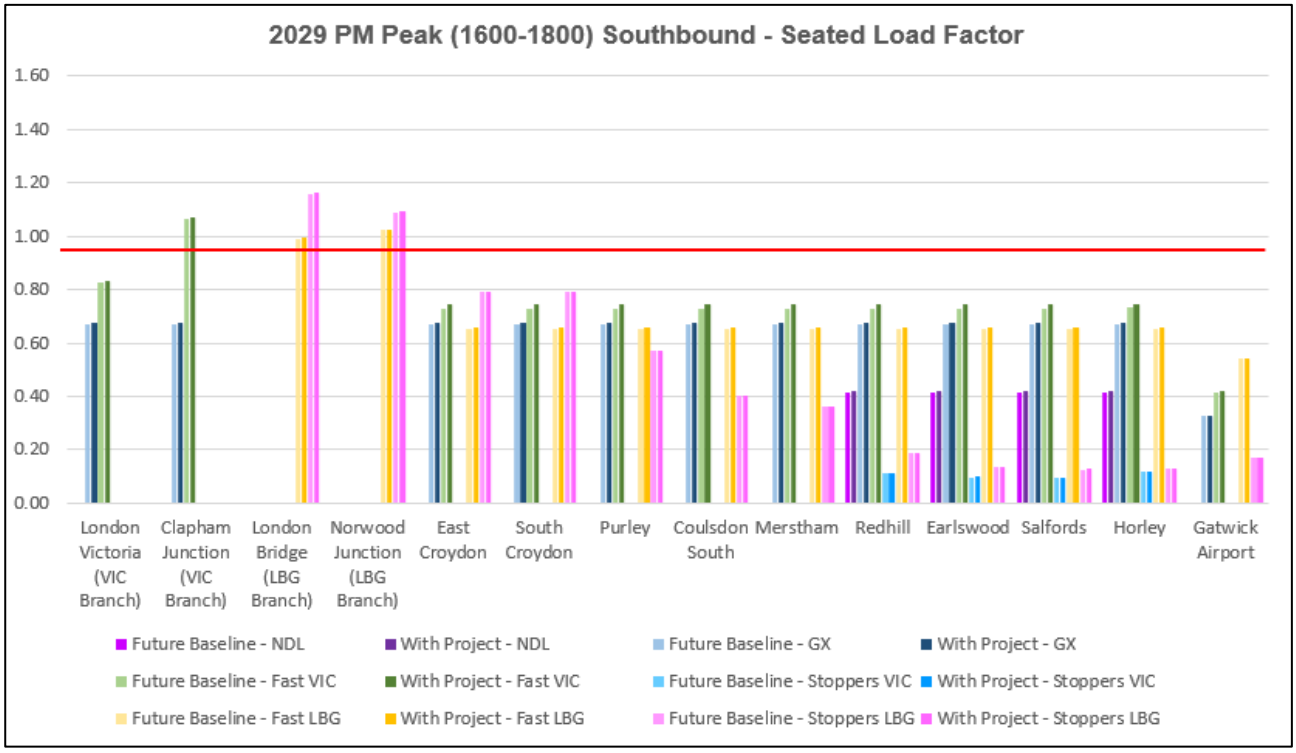
12.9.53 The line loading in the southbound direction has been examined. This is the peak rail network direction in the PM peak and Table 12.9.8 provides a summary of the increase in line loadings in this direction.

Table 12.9.8: 2029 PM Southbound Line Loading

Station	2029 PM Peak Southbound (1600-1900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
London Victoria (VIC Branch)	-	36	21	-	-	-	**57**	-	1%	0%	-	-	-	**1%**
Clapham Junction (VIC Branch)	-	36	33	-	-	-	**69**	-	1%	1%	-	-	-	**1%**
London Bridge (LBG Branch)	-	-	-	-	22	10	**32**	-	-	-	-	0%	0%	**0%**
Norwood Junction (LBG Branch)	-	-	-	-	25	14	**39**	-	-	-	-	0%	0%	**0%**
East Croydon	-	36	73	-	69	2	**180**	-	1%	2%	-	1%	0%	**1%**
South Croydon	-	36	73	-	69	2	**180**	-	1%	2%	-	1%	0%	**1%**
Purley	-	36	73	-	69	2	**180**	-	1%	2%	-	1%	0%	**1%**
Coulsdon South	-	36	73	-	69	2	**181**	-	1%	2%	-	1%	0%	**1%**
Merstham	-	36	73	-	69	3	**181**	-	1%	2%	-	1%	0%	**1%**
Redhill	6	36	73	1	69	6	**191**	1%	1%	2%	1%	1%	1%	**1%**
Earlswood	6	36	73	1	69	5	**191**	1%	1%	2%	1%	1%	1%	**1%**
Salfords	6	36	73	1	69	5	**191**	1%	1%	2%	1%	1%	1%	**1%**
Horley	6	36	73	1	69	6	**192**	1%	1%	2%	1%	1%	1%	**1%**
Gatwick Airport	-	2	1	-	6	2	**10**	-	0%	0%	-	0%	0%	**0%**

12.9.54 The above table shows that the Project adds around 190 passengers to rail services in this direction, which represents an overall increase of 1%. Diagram 12.9.6 shows the seated load factor assessment for the PM peak southbound direction services.

Diagram 12.9.6: 2029 PM Southbound Seated Load Factor



12.9.55 The above diagram shows that trains departing London in the PM peak are mostly occupied beyond their seated capacity. However, on arrival at Clapham Junction and East Croydon, sufficient passengers alight such that seats become available indicating spare seated capacity. For the stations where seating capacity is exceeded, standing capacity has been assessed and this is shown in Table 12.9.9.

Table 12.9.9: 2029 PM Southbound Standing Capacity Assessment

Station	2029 PM Peak Southbound (1600-1800) - Percentage of Standing Capacity Occupied													
	Future Baseline 2029							Future Baseline 2029 + Project (% change)						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Clapham Junction (VIC Branch)	-	0%	11%	-	-	-	1%	-	0% (0.0%)	12% (0.9%)	-	-	-	1% (0.1%)
London Bridge (LBG Branch)	-	-	-	-	0%	10%	3%	-	-	-	-	0% (0.0%)	10% (0.1%)	3% (0.0%)
Norwood Junction (LBG Branch)	-	-	-	-	2%	6%	2%	-	-	-	-	2% (0.2%)	6% (0.1%)	2% (0.1%)

12.9.56 On average over the two-hour PM peak period, the highest percentage of standing capacity occupied is 11% in the future baseline, which indicates that rail services are very busy but suggests that there is some spare standing capacity available. The Project will not materially change congestion in 2029, with the highest increase in standing capacity occupied being 0.9% on fast services out of London Victoria.

Summary on Rail Crowding

12.9.57 A summary of rail crowding by peak hour and direction is as follows:

- **AM Peak** – The highest increase in line loading as a result of the Project is up to 9%. This is on the southbound services, where there is sufficient number of spare seats for passengers. On the northbound services, there will be passengers standing on some services north of Purley. The highest percentage of standing capacity occupied on train services is around 35%, indicating busy trains into London. However, the Project only accounts for a 0.6% change in standing, with the remainder being as a result of high commuter flows into London. The overall magnitude of impact of the Project on rail capacity is therefore considered to be low.
- **PM Peak** - The highest increase in line loading as a result of the Project is up to 4%. This is on the contra-peak northbound services, where there is sufficient number of spare seats for passengers. On the southbound services, there will be passengers standing on some services out of London, with seats only becoming available at Clapham Junction and East Croydon. The highest percentage of standing capacity occupied on a service is 12%, with the Project accounting for a 0.9% change in standing. The overall magnitude of impact is therefore considered to be low.

12.9.58 The overall magnitude of impact is considered to be low and the sensitivity of receptors in terms of public transport capacity is considered to be low to medium. Any effects to changes in crowding levels for 2029 are therefore anticipated to be **negligible adverse** or **minor adverse**, which is not significant.

Crowding in Station

12.9.59 As part of the Station Project, Network Rail has tested station capacity to 2036, assuming growth at the Airport and in terms of background commuter and leisure traffic. The station crowding assessment has been completed for 2032 and 2047 and these results are reported below. When considering both the concourse and platforms in both the 2032 AM and PM peak hours, the magnitude of impact of the Project on crowding is considered to be negligible to low. As demand is higher in 2032 than 2029, this will also be true of this earlier opening year.

Further Mitigation and Future Monitoring

12.9.60 Four junctions have been identified to have moderate adverse effect in terms of driver delay. The junctions in Croydon are due to the issues identified in the strategic model in the Croydon area (see paragraph 12.4.13). Further information is contained in the modelling annex to the PTAR (Appendix 12.9.1) on overall journey times to consider driver delays in more detail. Work will be undertaken to verify model findings as well as to identify mitigation measures if required for the development consent application. Any significant effects on driver delay will be mitigated and it is expected that the residual effect will reduce to minor adverse. No further mitigation or additional monitoring is proposed other than that adopted as part of the Project (as set out in Section 12.8).

12.9.61 Travel Plan monitoring will be ongoing at Gatwick Airport to understand travel patterns and to implement measures to further encourage the use of sustainable modes of transport as part of the Airport Surface Access Strategy.

Significance of Effects

12.9.62 Potential significant effect has been identified for four junctions in terms of driver delay. Further work will be undertaken to verify model findings as well as to identify mitigation measures if required. No other mitigation or monitoring is required; and no other significant effects are identified.

Highway Construction Phase

12.9.63 The Project would include embedded highway improvement works providing grade separation of traffic movements at the North and South Terminal roundabouts and upgrading the Longbridge Roundabout. It is envisaged that highway works will occur after the works on the northern runway are complete and it is operational. The highway works have therefore been assessed assuming an increase in operational traffic associated with the northern runway in 2029.

12.9.64 Construction of the surface access improvements is expected to take place after the main airport construction activities are complete, but as soon as possible thereafter to allow for growth. Construction would be undertaken with the aim of minimising disruption both to airport traffic but also local background traffic.

- At both terminal roundabouts, it is intended that new link roads would be built in turn, to ensure that traffic can continue to flow through the junction whilst construction is underway. As each new link is completed and can be opened to traffic, sections of the existing junction or link roads can be closed, enabling construction to take place at those locations.
- Short duration temporary lane closures may be needed to allow construction activities to proceed safely. Occasional temporary full closures of carriageways or roads may be needed for certain critical activities and these would be timed to avoid the busiest times of the day or night, with appropriate alternate routes in place and signposted.
- Traffic flow around Longbridge Roundabout would be maintained and work would be scheduled to avoid the busiest times of the day or night. Night-working would be minimised but cannot be avoided altogether.
- Alongside construction workforce travel plans, further measures would be introduced for airport staff travel plans to lessen employee car movements during construction periods.

12.9.65 The following would be expected during highway construction.

- Temporary road diversions and lane closures.
- Temporary speed limits.
- Some overnight working.
- Traffic management measures.
- Occasional full closures of carriageways may be needed for certain critical activities and these would be timed to avoid the busiest times of the day or night, with appropriate alternate routes in place and signposted.
- Construction Traffic Management Plan and Staff Travel Plans would be implemented to reduce airport-related traffic from sensitive areas, especially in the peak periods, as far as possible.

Severance

12.9.66 The highway construction phase has been assessed for the AM1 and PM peak periods. The highway flows for these years are contained in Appendix 12.9.2. For the purposes of reporting, only the links which have a magnitude of impact of low, medium and high adverse or beneficial are assessed in this section to focus on potential significant effects. These links and associated flows are shown in Table 12.9.10 for the future baseline, Table 12.9.11 for future baseline with Project and Highway Construction. The net change in traffic flows are shown in Table 12.9.12.

Table 12.9.10: First Full Year of Opening 2029 Traffic Flows – Future Baseline with Project

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
8	Gatwick Way	439	33	8%	438	42	10%	395	40	10%	306	16	5%
13	Perimeter Road East	1116	87	8%	1073	125	12%	1067	156	15%	510	59	12%
14	Old Brighton Road South (South)	844	31	4%	886	36	4%	697	24	3%	1134	9	1%
15	Old Brighton Road South (North)	526	12	2%	509	19	4%	373	23	6%	1026	15	1%
67	M23 J9, northbound slip (South of junction)	1079	10	1%	907	15	2%	733	36	5%	750	16	2%

Table 12.9.11: First Full Year of Opening 2029 Traffic Flows – Future Baseline with Project and Highway Construction

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
8	Gatwick Way	458	33	7%	415	43	10%	439	42	10%	426	17	4%
13	Perimeter Road East	1066	79	7%	1023	122	12%	1029	155	15%	1025	61	6%
14	Old Brighton Road South (South)	759	30	4%	680	34	5%	664	28	4%	752	12	2%
15	Old Brighton Road South (North)	553	20	4%	537	23	4%	383	24	6%	483	14	3%
67	M23 J9, northbound slip (South of junction)	654	7	1%	601	11	2%	553	34	6%	616	16	3%

Table 12.9.12: First Full Year of Opening 2029 Traffic Flows – Net Change (Percentage Change in Brackets)

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
8	Gatwick Way	19 (4%)	0 (0%)	0% (0%)	-23 (-5%)	1 (2%)	1% (1%)	44 (11%)	2 (5%)	-1% (-1%)	120 (39%)	1 (6%)	-1% (-1%)
13	Perimeter Road East	-50 (-4%)	-8 (-9%)	0% (0%)	-50 (-5%)	-3 (-2%)	0% (0%)	-38 (-4%)	-1 (-1%)	0% (0%)	515 (101%)	2 (3%)	-6% (-6%)
14	Old Brighton Road South (South)	-85 (-10%)	-1 (-3%)	0% (0%)	-206 (-23%)	-2 (-6%)	1% (1%)	-33 (-5%)	4 (17%)	1% (1%)	-382 (-34%)	3 (33%)	1% (1%)
15	Old Brighton Road South (North)	27 (5%)	8 (67%)	1% (1%)	28 (6%)	4 (21%)	1% (1%)	10 (3%)	1 (4%)	0% (0%)	-543 (-53%)	-1 (-7%)	1% (1%)
67	M23 J9, northbound slip (South of junction)	-425 (-39%)	-3 (-30%)	0% (0%)	-306 (-34%)	-4 (-27%)	0% (0%)	-180 (-25%)	-2 (-6%)	1% (1%)	-134 (-18%)	0 (0%)	0% (0%)

12.9.67 The above shows that within the whole study area, only five links will experience a change of more than 30% in traffic during the highway construction phase. These are Gatwick Way (Link ID: 8), Perimeter Road East (Link ID: 13), both sections of Old Brighton Road (Link IDs: 14 and 15), and the M23 J9 northbound slip (Link ID:67).

12.9.68 Of these, both sections of Old Brighton Road South (low sensitivity) and the M23 J9 northbound slip (negligible sensitivity) are expected to experience a reduction in traffic flows. The magnitude of impact is considered to be low and the effect of severance on these links is minor beneficial.

12.9.69 Gatwick Way (low sensitivity) is expected to experience an increase of 39% in the PM peak which is a low magnitude of impact. The effect of severance on this link is **minor adverse**.

12.9.70 Perimeter Road East (low sensitivity) will experience a doubling of traffic in the PM peak, with negligible reduction in traffic flows for the other assessment time periods. The magnitude of impact in the PM peak is high and the effect of severance on this link is considered **minor adverse**.

12.9.71 All other links will have a change of traffic of less than 30% and therefore the magnitude of impact on severance is considered to be negligible. The sensitivity of the highway links for pedestrians and cyclists range from negligible to high and the overall effect of severance is considered to be **minor adverse**.

Driver Delay

12.9.72 The following diagram shows the magnitude of impact for driver delay for junctions where the V/C is over 85%. The diagram shows driver delay for all time periods assessed and any overlaps in colours indicate different magnitudes of impact by time period. The highest magnitude of impact for each junction is considered.

Diagram 12.9.7: Highway Construction Driver Delay Magnitude of Impact (all assessment time periods)

12.9.73 The above shows that most junctions (over 1,000) have no significant or low magnitude of impact in terms of delay. Car driver and passenger sensitivity is considered to be medium for junctions where the V/C is over 85%. For the junctions with no significant delays, the driver delay effect is **negligible**. For those with a low magnitude of impact, the driver delay is **minor adverse**.

12.9.74 There is one junction which is shown to have a medium magnitude of delay located near Gatwick Airport, and four junctions are identified with a high magnitude of delay which are located near Gatwick Airport and one in the Croydon area (as per paragraph 12.4.13 above, the Croydon results are not related to the Project but due to model convergence issues which requires review and adjustment in the next stage). For these junctions, the driver delay effect is considered to be **moderate adverse**. Further information is contained in the modelling annex to the PTAR (Appendix 12.9.1) on overall journey times to consider driver delays in more detail, and work will be undertaken to verify model findings as well as to identify mitigation measures if required for the development consent. Any significant effects on driver delay will be mitigated and it is expected that the residual effect will reduce to minor adverse.

Pedestrian and Cyclist Delay

12.9.75 Works to the Longbridge Roundabout would require temporary changes to pedestrian and cycle routes. These are expected to be in the form of temporary diversions and signal-controlled crossing points which could increase pedestrian and cyclist delays. However, it is expected that

the traffic management measures would minimise delays as far as possible and appropriate signage would be provided.

12.9.76 The magnitude of impact is considered to be low and the sensitivity of receptors at Longbridge Roundabout is low to medium. The effect on pedestrian and cycle delays at Longbridge Roundabout are therefore expected to be **minor adverse**.

12.9.77 There are limited pedestrian and cycle provision and movements at the other locations in the area of highway works (North Terminal and South Terminal roundabouts, Airport Way and London Road) and therefore pedestrian and cycle delay is not expected to be affected. For these links and the other roads within the study area which are not identified as construction routes, there will be **no change** to pedestrian and cyclist delay.

Pedestrian and Cyclist Amenity

12.9.78 The suggested threshold for a significant effect on pedestrian and cyclist amenity is when the traffic flows have doubled, as set out in paragraph 12.4.44. As set out in Table 12.9.12, only Perimeter Road East is expected to experience a doubling of flows in the PM peak. The magnitude of impact is considered to be medium and the sensitivity of this link is low. The effect on pedestrian and cyclist amenity on this link is considered to be **minor adverse**.

12.9.79 Amenity is also affected by traffic composition and footway width/separation from traffic. The traffic composition could change with more HGVs and temporary footways and crossing points at Longbridge Roundabout which may increase fear and intimidation for pedestrians and cyclists. The magnitude of impact is considered to be low for routes which would experience construction traffic and temporary traffic management measures. The sensitivity of receptors along the highway links range from negligible to medium. The overall effect on pedestrian and cyclist amenity is considered to be **minor adverse**.

Accidents and Safety

12.9.80 Changes in traffic flows and highway design could influence the risk of accidents. There would be temporary changes to the highway design during the highways' construction period but suitable signage and measures to minimise the impact would be implemented as part of the Construction Traffic Management Plan. The magnitude of impact for accidents and safety is considered to be low.

12.9.81 The sensitivity of receptors in terms of pedestrians and cyclists for the highway works area is considered to be low. The effect on accidents and safety on pedestrians and cyclist is considered **minor adverse** along the construction routes, and no change on all other roads.

12.9.82 The sensitivity of receptors in terms of car drivers for the highway works is considered to be medium. The effect on accidents and safety on car drivers is considered **minor adverse** along the construction routes, and no change on all other roads.

Hazardous Loads

12.9.83 The highway construction works are not expected to generate hazardous loads but changes to highway design and temporary diversion routes during the construction period could affect the existing transportation of hazardous loads on the public highway. Any effects will be assessed as part of the ES and, for the purposes of this chapter, it is assumed that temporary diversions would

be safe and clearly signposted. The proposed temporary routes are not known yet but will be assessed in the final ES.

Effects on Public Transport Amenity

12.9.84 Changes in passenger crowding during this phase would be primarily associated with the growth in passenger numbers and those of the highway construction workforce who travel to site by rail.

12.9.85 Capacity modelling shows there is plenty of seating capacity available in 2029, including with incremental growth in passengers (see paragraphs 12.9.43 onwards). This likely level of construction trips is not expected to have a measurable impact on rail crowding. Measures within the Travel Plan for construction workers could include staggered shift start and end times to reduce peak period pressure as well as provision of bus services to park and ride sites and to specific towns and cities where construction workers come from.

12.9.86 The magnitude of impact is considered to be negligible and the sensitivity of receptors in terms of public transport capacity is also considered to be low. Any effects to changes in crowding levels are therefore anticipated to be **negligible adverse**, and are not considered significant

Further Mitigation and Future Monitoring

12.9.87 Six junctions have been identified to have moderate adverse effect in terms of driver delay. The junctions in Croydon relate to model convergence which requires review and adjustment. These effects are not related to the Project (see paragraph 12.4.13). Further information is contained in the modelling annex to the PTAR (Appendix 12.9.1) on overall journey times to consider driver delays in more detail. Work will be undertaken to verify model findings as well as to identify any mitigation measures if required for the development consent application. It is expected that the residual effect will reduce to minor adverse. No further mitigation has been identified at this stage.

12.9.88 Construction activities are expected to be monitored as part of the Construction Traffic Management Plan. No further monitoring measures are currently proposed.

Significance of Effects

12.9.89 Potential significant effect identified for six junctions in terms of driver delay. Further work will be undertaken to verify model findings as well as to identify mitigation measures if required. No other significant effects have been identified for this assessment year. No further mitigation or monitoring has been identified; therefore, the significance of effects would remain as presented above.

Interim Assessment Year: 2032

12.9.90 The annual passenger demand for 2032 is expected to increase from 59.4 mppa in the future baseline scenario to 72.3 million with the Project. Trip generation associated with 2032 with the Project is provided in the PTAR (Appendix 12.9.1).

12.9.91 To deliver the growth in the with-Project scenario, surface access improvements are required. It is expected that highway works would begin after the opening year of the Project. While some highway works may continue into 2032, the assessment for this period has been undertaken assuming all highway works are completed, and the northern runway is fully operational. The scope of the surface access improvements will involve providing grade separation of traffic

movements at South Terminal and North Terminal roundabouts, and improvements at Longbridge Roundabout.

Severance

12.9.92 The peak hour highway flows for the interim assessment year are contained in Appendix 12.9.2. For the purposes of reporting, only the links which have a magnitude of impact of low, medium and high adverse or beneficial are assessed in this section to focus on potential significant effects. These links and associated flows are shown in Table 12.9.13 for the Future Baseline, Table 12.9.14 for future baseline with Project. The net change in traffic flows are shown in Table 12.9.15.

Table 12.9.13: Interim Assessment Year 2032 Traffic Flows – Future Baseline

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
2	A23 Airport Way	4600	164	4%	4328	184	4%	3874	246	6%	4397	114	3%
5	Longbridge Way	812	110	14%	831	98	12%	827	146	18%	940	60	6%
6	Northgate Road	611	77	13%	594	74	12%	613	148	24%	566	41	7%
8	Gatwick Way	467	32	7%	392	43	11%	407	39	10%	404	16	4%
9	Perimeter Road North, between NT and ST	1046	137	13%	1009	155	15%	987	199	20%	885	70	8%
13	Perimeter Road East	840	82	10%	820	121	15%	899	149	17%	810	58	7%
14	Old Brighton Road South (South)	757	31	4%	798	36	5%	644	24	4%	710	9	1%
15	Old Brighton Road South (North)	318	14	4%	304	19	6%	246	24	10%	299	14	5%
34	Waddon New Road, Croydon	164	33	20%	140	33	24%	65	31	48%	73	31	42%
35	Reeves Corner, Croydon	139	33	24%	120	32	27%	42	30	71%	40	30	75%
36-38	Church Street / Drummond Road, Croydon	607	45	7%	593	45	8%	299	38	13%	404	33	8%
39	London Road, Croydon ROAD	282	104	37%	246	104	42%	197	103	52%	109	101	93%

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
41	Poplar Walk (west), Croydon	50	50	100%	50	50	100%	241	52	22%	230	51	22%
42	Poplar Walk (east), Croydon	70	70	100%	70	70	100%	260	71	27%	249	70	28%
56	A213 Windmill Road	1014	15	1%	893	13	1%	608	31	5%	687	7	1%
67	M23 J9, northbound slip (South of junction)	1284	11	1%	1071	14	1%	784	34	4%	754	16	2%

Table 12.9.14: Interim Assessment Year 2032 – Future Baseline with Project

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs								
2	A23 Airport Way	5949	197	3%	5761	244	4%	4608	268	6%	5070	127	3%
5	Longbridge Way	1021	138	14%	829	115	14%	1134	248	22%	851	71	8%
6	Northgate Road	441	99	22%	382	88	23%	344	94	27%	202	49	24%
8	Gatwick Way	1167	128	11%	1017	136	13%	943	121	13%	659	54	8%
9	Perimeter Road North, between NT and ST	765	60	8%	676	84	12%	624	51	8%	483	30	6%
13	Perimeter Road East	1258	100	8%	1213	149	12%	1216	185	15%	667	72	11%
14	Old Brighton Road South (South)	929	33	4%	911	33	4%	694	26	4%	1112	9	1%
15	Old Brighton Road South (North)	594	16	3%	564	20	4%	405	25	6%	1059	16	2%
34	Waddon New Road, Croydon	161	33	20%	133	33	25%	64	31	48%	223	32	14%
35	Reeves Corner, Croydon	140	33	24%	113	32	28%	41	30	73%	199	32	16%
36-38	Church Street / Drummond Road, Croydon	627	46	7%	562	44	8%	303	38	13%	601	36	6%
39	London Road, Croydon ROAD	303	104	34%	225	104	46%	197	103	52%	234	102	44%

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs								
41	Poplar Walk (west), Croydon	50	50	100%	50	50	100%	246	52	21%	358	51	14%
42	Poplar Walk (east), Croydon	70	70	100%	70	70	100%	265	71	27%	377	70	19%
56	A213 Windmill Road	1002	14	1%	772	12	2%	606	32	5%	903	12	1%
67	M23 J9, northbound slip (South of junction)	1648	15	1%	1478	25	2%	975	41	4%	1009	19	2%

Table 12.9.15: Interim Assessment Year 2032 – Net Change (Percentage Change in Brackets)

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
2	A23 Airport Way	1349 (29%)	33 (20%)	0% (0%)	1433 (33%)	60 (33%)	0% (0%)	734 (19%)	22 (9%)	-1% (-1%)	673 (15%)	13 (11%)	0% (0%)
5	Longbridge Way	209 (26%)	28 (25%)	0% (0%)	-2 (0%)	17 (17%)	2% (2%)	307 (37%)	102 (70%)	4% (4%)	-89 (-9%)	11 (18%)	2% (2%)
6	Northgate Road	-170 (-28%)	22 (29%)	10% (10%)	-212 (-36%)	14 (19%)	11% (11%)	-269 (-44%)	-54 (-36%)	3% (3%)	-364 (-64%)	8 (20%)	17% (17%)
8	Gatwick Way	700 (150%)	96 (300%)	4% (4%)	625 (159%)	93 (216%)	2% (2%)	536 (132%)	82 (210%)	3% (3%)	255 (63%)	38 (238%)	4% (4%)
9	Perimeter Road North, between NT and ST	-281 (-27%)	-77 (-56%)	-5% (-5%)	-333 (-33%)	-71 (-46%)	-3% (-3%)	-363 (-37%)	-148 (-74%)	-12% (-12%)	-402 (-45%)	-40 (-57%)	-2% (-2%)
13	Perimeter Road East	418 (50%)	18 (22%)	-2% (-2%)	393 (48%)	28 (23%)	-2% (-2%)	317 (35%)	36 (24%)	-1% (-1%)	-143 (-18%)	14 (24%)	4% (4%)
14	Old Brighton Road South (South)	172 (23%)	2 (6%)	-1% (-1%)	113 (14%)	-3 (-8%)	-1% (-1%)	50 (8%)	2 (8%)	0% (0%)	402 (57%)	0 (0%)	0% (0%)
15	Old Brighton Road South (North)	276 (87%)	2 (14%)	-2% (-2%)	260 (86%)	1 (5%)	-3% (-3%)	159 (65%)	1 (4%)	-4% (-4%)	760 (254%)	2 (14%)	-3% (-3%)
34	Waddon New Road, Croydon	-3 (-2%)	0 (0%)	0% (0%)	-7 (-5%)	0 (0%)	1% (1%)	-1 (-2%)	0 (0%)	1% (1%)	150 (205%)	1 (3%)	-28% (-28%)
35	Reeves Corner, Croydon	1 (1%)	0 (0%)	0% (0%)	-7 (-6%)	0 (0%)	2% (2%)	-1 (-2%)	0 (0%)	2% (2%)	159 (398%)	2 (7%)	-59% (-59%)

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
36-38	Church Street / Drummond Road, Croydon	20 (3%)	1 (2%)	0% (0%)	-31 (-5%)	-1 (-2%)	0% (0%)	4 (1%)	0 (0%)	0% (0%)	197 (49%)	3 (9%)	-2% (-2%)
39	London Road, Croydon ROAD	21 (7%)	0 (0%)	-3% (-3%)	-21 (-9%)	0 (0%)	4% (4%)	0 (0%)	0 (0%)	0% (0%)	125 (115%)	1 (1%)	-49% (-49%)
41	Poplar Walk (west), Croydon	0 (0%)	0 (0%)	0% (0%)	0 (0%)	0 (0%)	0% (0%)	5 (2%)	0 (0%)	0% (0%)	128 (56%)	0 (0%)	-8% (-8%)
42	Poplar Walk (east), Croydon	0 (0%)	0 (0%)	0% (0%)	0 (0%)	0 (0%)	0% (0%)	5 (2%)	0 (0%)	-1% (-1%)	128 (51%)	0 (0%)	-10% (-10%)
56	A213 Windmill Road	-12 (-1%)	-1 (-7%)	0% (0%)	-121 (-14%)	-1 (-8%)	0% (0%)	-2 (0%)	1 (3%)	0% (0%)	216 (31%)	5 (71%)	0% (0%)
67	M23 J9, northbound slip (South of junction)	364 (28%)	4 (36%)	0% (0%)	407 (38%)	11 (79%)	0% (0%)	191 (24%)	7 (21%)	0% (0%)	255 (34%)	3 (19%)	0% (0%)

12.9.93 Table 12.9.15 shows a selection of links which will experience more than 30% in traffic flows for one or more peak periods. Some of these links are in Croydon (see paragraph 12.4.13 on the modelling of Croydon). These links have been considered against the magnitude of impact for severance based on IEMA, as set out in Table 12.4.5.

12.9.94 The following links are expected to have an increase of 30% to 60% (low impact):

- Link 2: A23 Airport Way (low sensitivity) in the AM2 period;
- Link 5: Longbridge Way (low sensitivity) in the IP period;
- Link 13: Perimeter Road East (low sensitivity in the AM1, AM2 and IP periods;
- Link 14: Old Brighton Road South, southern section (low sensitivity) in the PM period;
- Links 36-38: Church Street / Drummond Road, Croydon (medium sensitivity) in the PM period;
- Links 41-42: Poplar Walk Croydon (medium sensitivity) in the PM period;
- Link 56: A213 Windmill Road (high sensitivity due to nearby primary school and nursery) in the PM period; and
- Link 67: M23 J9 northbound slip (negligible sensitivity), in the AM2 and PM periods.

12.9.95 The above links would have a **minor adverse** severance effect.

12.9.96 The following link is expected to have an increase of 60% to 90% (medium impact).

- Link 15: Old Brighton Road South, northern section (low sensitivity) in the AM1, AM2 and IP periods.

12.9.97 The above link would have a **minor adverse** severance effect.

12.9.98 The following links are expected to have an increase of more than 90% (high impact):

- Link 8: Gatwick Way (low sensitivity) in the AM1, AM2, IP and PM periods;
- Link 15: Old Brighton Road South, northern section (low sensitivity) in the PM period;
- Link 34: Waddon New Road, Croydon (medium sensitivity) in the PM period;
- Link 35: Reeves Corner, Croydon (medium sensitivity) in the PM period; and
- Link 39: London Road, Croydon (medium sensitivity) in the PM period.

12.9.99 The above links with low sensitivity would have a severance effect of **minor adverse**, and those with medium sensitivity would have a severance effect of **moderate adverse**. It is worth noting that most of the links experience a high increase in traffic flows are in Croydon during the PM peak and this area will be further reviewed in the modelling work for the development consent application and the supporting ES.

12.9.100 In addition to the above, two links are expected to experience a reduction 30% to 60% (low beneficial impact).

- Link 6: Northgate Road (negligible sensitivity) in the AM2, IP and PM peak periods.
- Link 9: Perimeter Road North, between North Terminal (NT) and South Terminal (ST) (low sensitivity) in the AM2, IP and PM peak periods.

12.9.101 Northgate Road would have **negligible beneficial** and Perimeter Road North would have a **minor beneficial** severance effect.

12.9.102 All other changes in traffic flows are below 30% and the magnitude of impact is considered to be negligible. The sensitivity of the pedestrians and cyclists along the highway links range from negligible to medium.

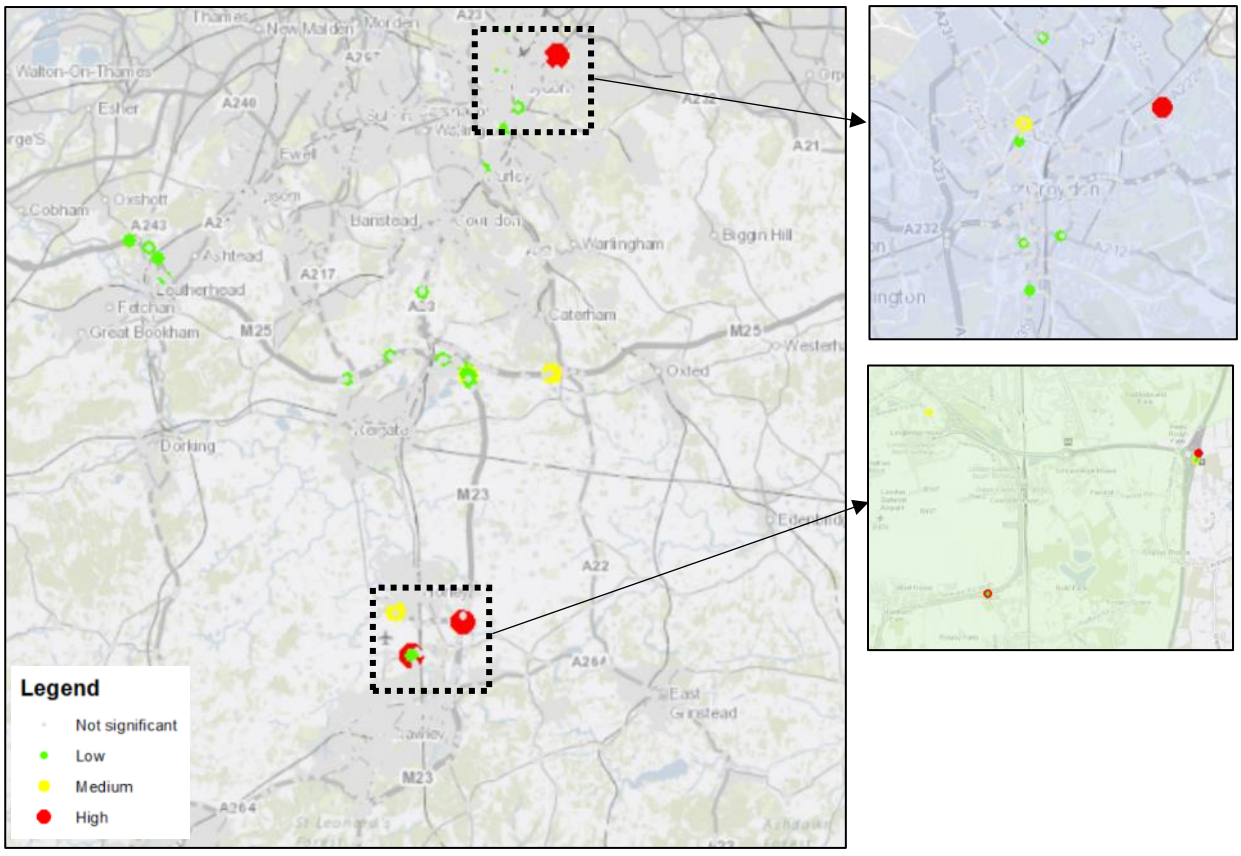
12.9.103 Overall, the effect of the Project on severance can be considered to be **minor adverse**, with some of the more sensitive links experiencing **moderate adverse** effects during at least one of the time periods modelled (AM1, AM2, IP or PM peak periods). The links with moderate adverse effects in the Croydon area relate to model convergence which requires review and adjustment (see paragraph 12.4.13). These effects are not related to the Project.

Driver Delay

12.9.104 The embedded surface access improvement measures in the future baseline 2032 with Project scenario aim to alleviate potential significant effects on driver delay as much as possible. Analysis indicates that around 75% Gatwick traffic uses the M23 Spur and accordingly this is where highway improvements have been proposed. Work is ongoing to optimise designs to improve traffic flow.

12.9.105 The following diagram shows the magnitude of impact for driver delay for junctions where the V/C is over 85%. The diagram shows driver delay for all time periods assessed and any overlaps in colours indicate different magnitudes of impact by time period. The highest magnitude of impact for each junction is considered.

Diagram 12.9.8: 2032 Driver Delay Magnitude of Impact (all assessment time periods)



12.9.106 The above shows that most junctions (over 1,000) have no significant or low magnitude of impact in terms of delay. Car driver and passenger sensitivity is considered to be medium for junctions where the V/C is over 85%. For the junctions with no significant delays, the driver delay effect is **negligible**. For those with a low magnitude of impact, the driver delay is **minor adverse**.

12.9.107 There are five junctions which are shown to have a medium magnitude of delay. Three junctions are identified with a high magnitude of delay, one is located in the Croydon area, and two are located near the airport at the A23 London Road / Gatwick Road roundabout and M23 J9. The highway network proximal to the Airport including M23 Junction 9 and the A23 has been analysed further using VISSIM modelling, as described in the PTAR (Appendix 12.9.1). VISSIM is more appropriate tool for assessing junction performance than a strategic highway model and allows for balancing of signal timings as potential mitigation.

12.9.108 For these junctions, the driver delay effect is considered to be **moderate adverse**. Further information is contained in the modelling annex to the PTAR (Appendix 12.9.1) on overall journey times to consider driver delays in more detail, and work will be undertaken to verify model findings as well as to identify mitigation measures (if required) for the DCO. Any significant effects on driver delay will be mitigated and it is expected that the residual effect will reduce to minor adverse.

Pedestrian and Cyclist Delay

12.9.109 The highway improvements proposed as part of the Project would change some pedestrian and cycle routes at the North Terminal, South Terminal and Longbridge Roundabout junctions. The works are expected to improve pedestrian and cycle accessibility and these movements would be separated from general traffic where practicable. Any proposed changes to the Longbridge Roundabout would retain pedestrian crossings on all arms. Within the terminal forecourts, the Zebra crossings would be retained. Existing off-road routes and National Cycle Route 21 underneath Airport Way near South Terminal would also be retained. In addition, pedestrian and cycling improvements have been identified as part of the Gatwick Airport's Capital Investment Plan, which includes new linkages. Further details are contained in the PTAR (Appendix 12.9.1).

12.9.110 The magnitude of impact for the highway improvement works is considered to be negligible to low, the sensitivity of receptors along these routes range from negligible to medium. The changes to pedestrian and cycle delay would be **negligible beneficial**, and the junctions with proposed highway improvements with the Project would have **minor beneficial** effects.

12.9.111 The increase in traffic flows can also affect pedestrian and cyclist delay. As set out in paragraph 12.9.98, the highest increases are in the Croydon area in the PM peak. There are existing crossing facilities along these routes and the magnitude of impact can be considered negligible to low. The sensitivity of receptors along these routes range from low to medium and the changes to pedestrian and cycle delay could be considered to be **minor adverse.**

Pedestrian and Cyclist Amenity

12.9.112 The threshold for an effect on pedestrian and cyclist amenity is when the traffic flows have doubled. As shown in Table 12.9.15, Old Brighton Road South (low sensitivity), Waddon New Road (low sensitivity), Reeves Corner (medium sensitivity) and London Road (medium sensitivity) will experience a doubling or more of traffic flows in the PM peak. The magnitude of impact on these links is considered to be medium. The sensitivity of these links' ranges from low to medium.

The effect of the Project on pedestrian and cyclist amenity is considered to be **minor adverse** for the links with low sensitivity, and **moderate adverse** for links with medium sensitivity**.** However, it should be noted that these links generally have low future baseline traffic flows and the links with medium sensitivity and therefore moderate adverse effects are in the Croydon area which are not related to the Project (see paragraph 12.4.13). Further modelling review of these links will be undertaken for the development consent application and the accompanying ES.

12.9.113 The traffic composition can also affect pedestrian and cyclist amenity. The traffic flows contained in Appendix 12.9.2 show that the highest increase in the percentage of HGVs (number of HGVs divided by total vehicle number) is on Northgate Road (Link ID: NT3), with around 10% in the AM1 and AM2 periods and 17% in the PM peak. The magnitude of this impact is considered to be low to medium. There are no pedestrian or cyclist facility along Northgate Road and the sensitivity is considered to be negligible. The effect of the Project on amenity along Northgate Road can be considered to be **negligible adverse**.

Accidents and Safety

12.9.114 The design of the proposed highway improvements would separate through traffic from the North Terminal and South Terminal roundabouts. This would reduce traffic flows through the junction and reduce the risks of conflict and this is considered to be beneficial. In addition, the embedded highway improvements also allow for road surface improvements to help improve skid resistance, whilst speed limits would be reviewed in order to assess the potential for further safety benefits. The magnitude of impact is considered to be negligible to low.

12.9.115 The sensitivity of receptors in terms of pedestrians and cyclists along the highway links range from negligible to medium. The effect of accidents and safety on pedestrians and cyclist is considered to be **minor beneficial** where highway improvements as part of the Project are proposed, and **negligible adverse** on all other roads.

12.9.116 The sensitivity of receptors in terms of car drivers and passengers ranges from low to medium. The effect of accidents and safety on car drivers and passengers is considered **minor beneficial** at the junctions where highway improvements are proposed, and **negligible adverse** for all other roads.

Hazardous Loads

12.9.117 The proposed changes to the highway network are expected to improve the safety of general traffic. The magnitude of impact is expected to be negligible and the sensitivity of receptors is considered to be negligible. The effect on hazardous loads is considered to be **negligible beneficial.**

Effects on Public Transport Amenity

12.9.118 To assess the effect of the Project on public transport amenity, this section considers the impact on passenger crowding on rail services and in Gatwick Airport railway station.

Crowding on Rail Services

AM Peak (0700-0900)

12.9.119 Crowding has been assessed based on line loading in both directions in the AM and PM peaks, and detailed data is contained in the PTAR (Appendix 12.9.1). In the AM peak, the highest

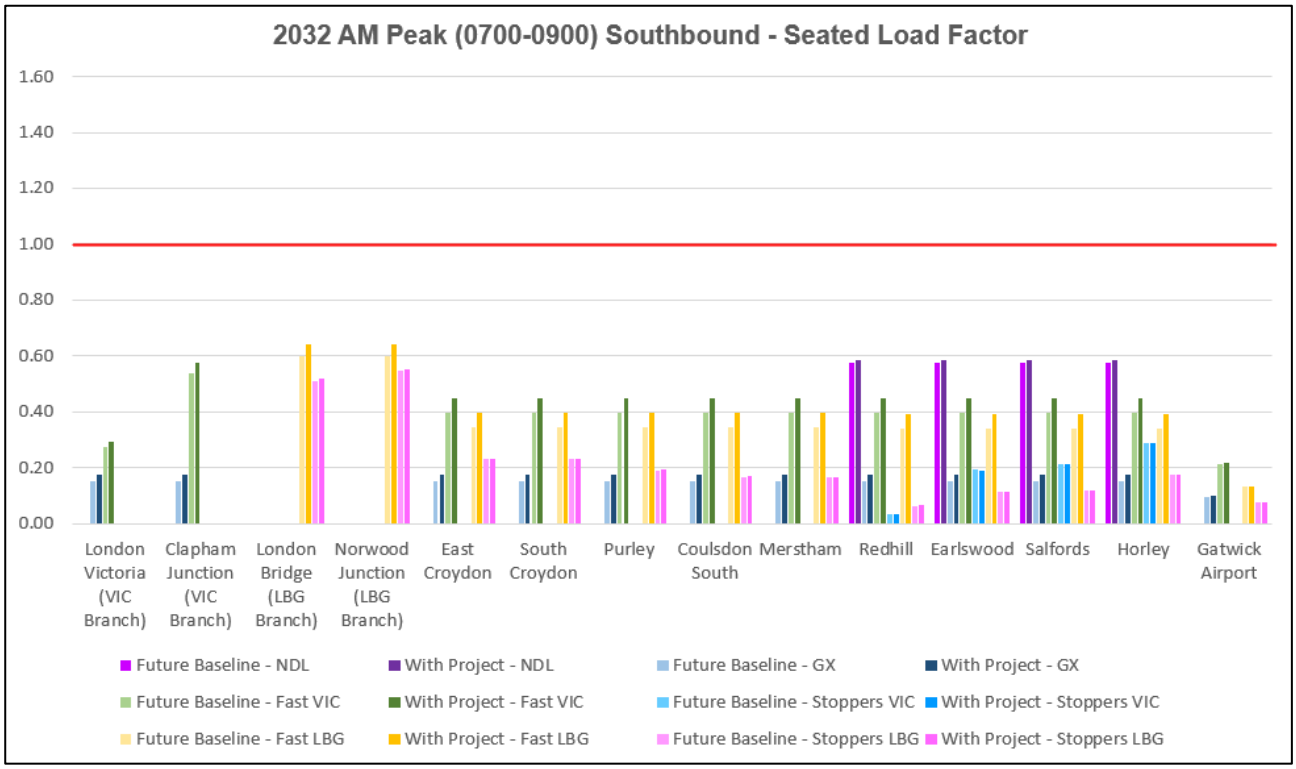
increase in rail passengers is actually in the southbound direction, from London to Gatwick. This indicates that Gatwick Airport growth means better use of contra-peak rail capacity and improves operational value for money. Table 12.9.16 provides a summary of the increase in line loading by station in the southbound direction.

12.9.120 The below table shows that on the rail services being assessed, the Project contributes a total of approx. 950 passengers. Most of these passengers are expected to use the fast train services from London Victoria and London Bridge. The increase in passengers represents a 13% to 14% increase in passengers on the fast services, and 14% on Gatwick Express. To assess the impact on crowding, Diagram 12.9.9 shows the seated load factor assessment.

Table 12.9.16: 2032 AM Southbound Line Loading Capacity Assessment

Station	2029 AM Peak Southbound (0700-0900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
London Victoria (VIC Branch)	-	89	114	-	-	-	203	-	14%	7%	-	-	-	9%
Clapham Junction (VIC Branch)	-	89	225	-	-	-	314	-	14%	7%	-	-	-	8%
London Bridge (LBG Branch)	-	-	-	-	441	44	485	-	-	-	-	7%	2%	5%
Norwood Junction (LBG Branch)	-	-	-	-	441	42	483	-	-	-	-	7%	2%	5%
East Croydon	-	89	306	-	533	17	945	-	14%	13%	-	14%	1%	12%
South Croydon	-	89	306	-	533	17	945	-	14%	13%	-	14%	1%	12%
Purley	-	89	306	-	533	15	943	-	14%	13%	-	14%	2%	12%
Coulsdon South	-	89	306	-	533	15	943	-	14%	13%	-	14%	2%	12%
Merstham	-	89	306	-	533	16	944	-	14%	13%	0%	14%	2%	13%
Redhill	8	89	306	2	530	10	945	1%	14%	13%	5%	14%	3%	12%
Earlswood	8	89	306	-3	530	7	937	1%	14%	13%	-2%	14%	1%	12%
Salfords	8	89	306	-3	530	7	937	1%	14%	13%	-1%	14%	1%	12%
Horley	8	89	306	-3	530	8	938	1%	14%	13%	-1%	14%	1%	11%
Gatwick Airport	-	10	29	-	27	8	73	-	3%	2%	-	2%	2%	2%

Diagram 12.9.9: 2032 AM Southbound Seated Load Factor



12.9.121 The above diagram shows that the increase in passengers in the southbound direction will increase the seated load factor across all the lines assessed, but there is still seating available for passengers. The highest seated load factor is up to around 0.7, which means that three out of ten seats will be available.

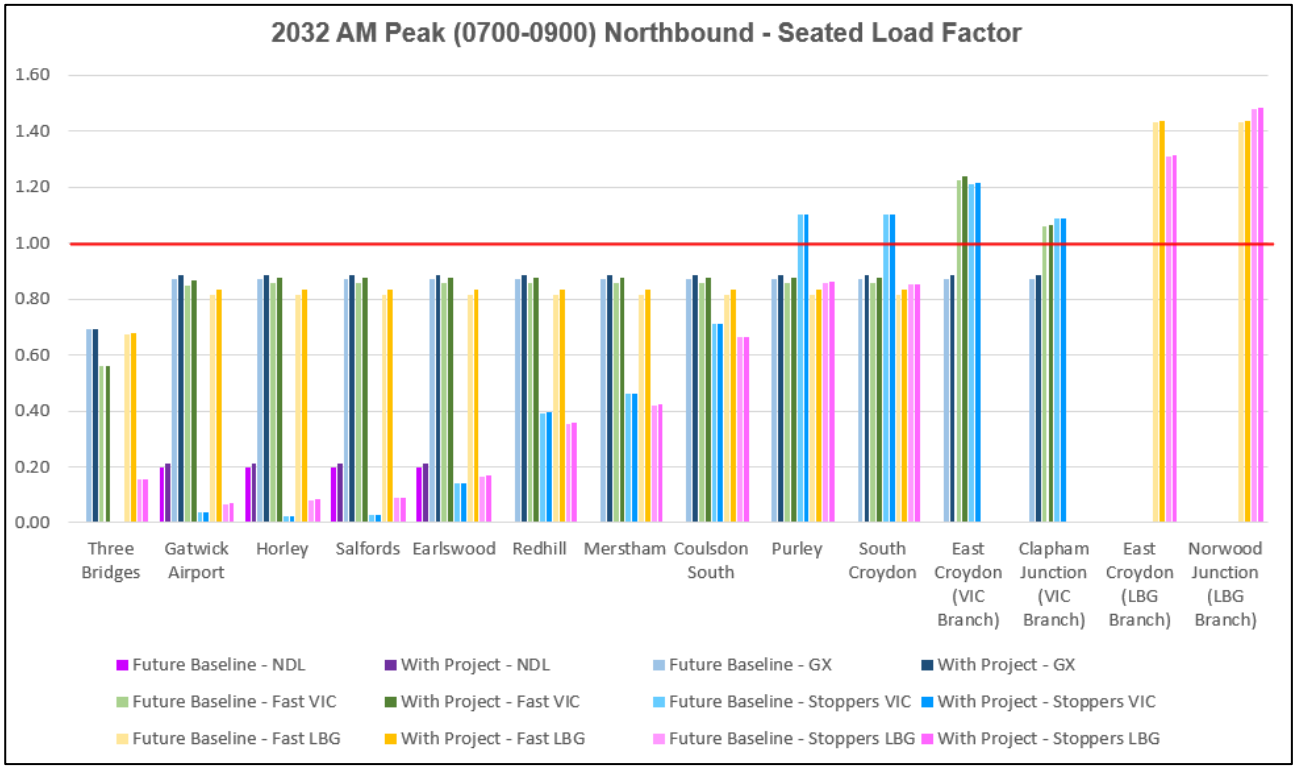
12.9.122 The line loading in the northbound direction has been assessed. This is the peak rail network direction in the AM peak and Table 12.9.17 provides a summary of the increase in line loadings in this direction.

Table 12.9.17: 2032 AM Northbound Line Loading

Station	AM Peak Northbound (0700-0900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Three Bridges	-	-15	3	-	46	-9	**25**	-	0%	0%	-	1%	-1%	**0%**
Gatwick Airport	14	66	119	1	188	26	**415**	7%	2%	2%	2%	2%	6%	**2%**
Horley	14	66	117	1	188	25	**412**	7%	2%	2%	1%	2%	5%	**2%**
Salfords	14	66	117	1	188	25	**412**	7%	2%	2%	1%	2%	4%	**2%**
Earlswood	14	66	117	8	188	24	**418**	7%	2%	2%	2%	2%	2%	**2%**
Redhill	-	66	117	10	188	14	**396**	-	2%	2%	1%	2%	1%	**2%**
Merstham	-	66	117	9	188	12	**393**	-	2%	2%	1%	2%	0%	**2%**
Coulsdon South	-	66	117	10	188	9	**391**	-	2%	2%	1%	2%	0%	**2%**
Purley	-	66	117	10	188	9	**391**	-	2%	2%	0%	2%	0%	**1%**
South Croydon	-	66	117	10	188	8	**390**	-	2%	2%	0%	2%	0%	**1%**
East Croydon (VIC Branch)	-	66	74	10	-	-	**151**	-	2%	1%	0%	-	-	**1%**
Clapham Junction (VIC Branch)	-	66	17	-1	-	-	**82**	-	2%	0%	0%	-	-	**1%**
East Croydon (LBG Branch)	-	-	-	-	77	10	**87**	-	-	-	-	0%	0%	**0%**
Norwood Junction (LBG Branch)	-	-	-	-	77	13	**90**	-	-	-	-	0%	0%	**0%**

12.9.123 The above table shows that the Project adds around 420 passengers to rail services in this direction, which represents an overall increase of 2%. Diagram 12.9.10 shows the seated load factor assessment for the AM peak northbound direction services.

Diagram 12.9.10: 2032 AM Northbound Seated Load Factor



12.9.124 The above diagram shows that between Three Bridges and Coulsdon South, there is seating available for all passengers. However, north of Purley, there are some services where the seating capacity is exceeded owing to background commuter flows into London. For these stations, standing capacity has been assessed which is shown in Table 12.9.18.

Table 12.9.18: 2032 AM Northbound Standing Capacity Assessment

Station	AM Peak Northbound (0700-0900) - Percentage of Standing Capacity Occupied													
	Future Baseline 2032							Future Baseline 2032 + Project (% change)						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Purley	-	0%	0%	17%	0%	0%	**1%**	-	0% (0.0%)	0% (0.0%)	17% (0.6%)	0% (0.0%)	0% (0.0%)	**1% (0.0%)**
South Croydon	-	0%	0%	17%	0%	0%	**1%**	-	0% (0.0%)	0% (0.0%)	17% (0.6%)	0% (0.0%)	0% (0.0%)	**1% (0.0%)**
East Croydon (VIC Branch)	-	0%	38%	35%	-	-	**6%**	-	0% (0.0%)	40% (2.0%)	36% (0.7%)	-	-	**6% (0.2%)**
Clapham Junction (VIC Branch)	-	0%	10%	15%	-	-	**2%**	-	0% (0.0%)	11% (0.4%)	15% (-0.1%)	-	-	**2% (0.0%)**
East Croydon (LBG Branch)	-	-	-	-	32%	19%	**19%**	-	-	-	-	32% (0.5%)	19% (0.1%)	**20% (0.2%)**
Norwood Junction (LBG Branch)	-	-	-	-	32%	29%	**22%**	-	-	-	-	32% (0.5%)	30% (0.1%)	**23% (0.3%)**

12.9.125 The standing capacity assessment shows the percentage occupied based on the capacity of each service. On average over the two-hour AM peak period, the highest percentage of standing capacity occupied is 40% on the fast service to London Victoria, which occurs north of East Croydon. Whilst services north of East Croydon are therefore busy, the Project will not significantly increase the percentage of standing capacity occupied when compared to the future baseline 2032 situation, with the highest increase being 2% on the same fast services into London Victoria.

PM Peak (1600-1900)

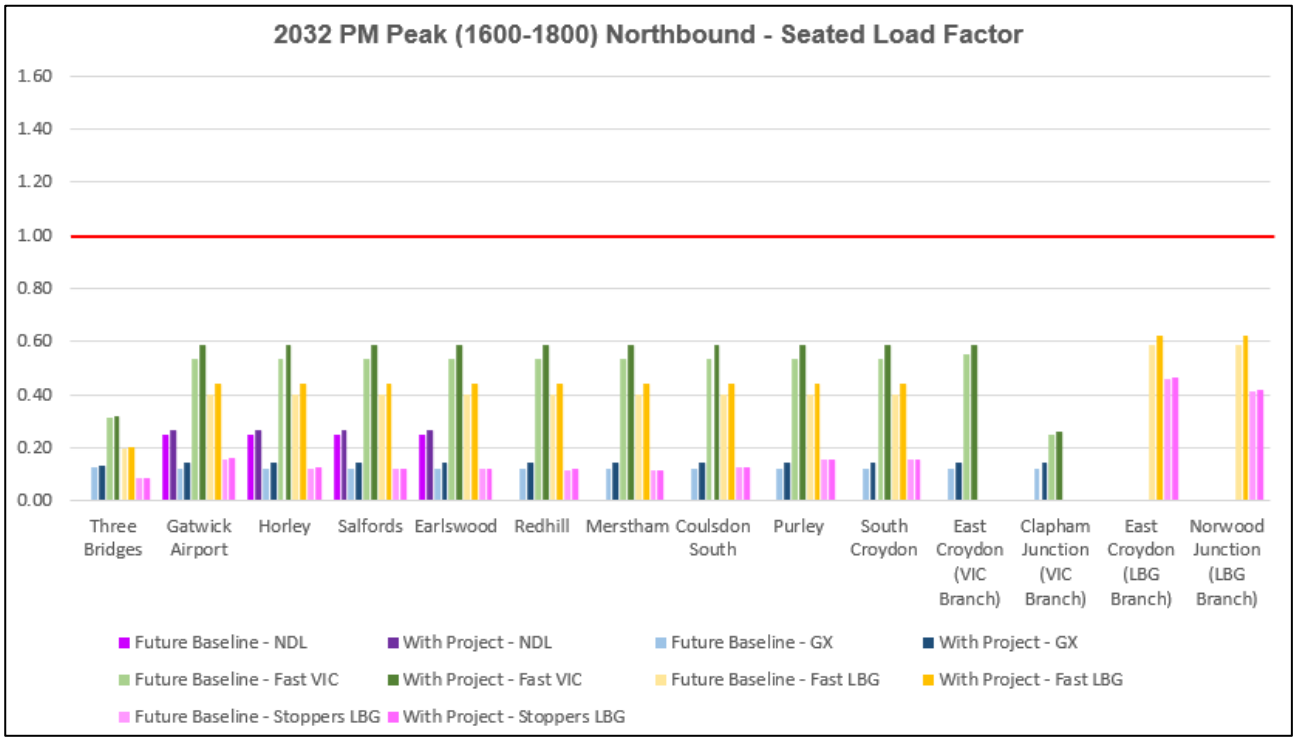
12.9.126 In the PM peak, there is an increase in rail passengers in the northbound direction, from Gatwick to London. Table 12.9.19 provides a summary of the increase in line loading by station in the off-peak northbound direction.

12.9.127 The below table shows that on the rail services being assessed, the Project contributes around 840 additional passengers. Most of these passengers are expected to use the fast train services to London Victoria and London Bridge. The increase in passengers represents a 9 to 10% increase in passengers on the fast services, and 16% on the Gatwick Express. To assess the impact on crowding, Diagram 12.9.11 shows the seated load factor assessment.

Table 12.9.19: 2032 PM Northbound Line Loading Capacity Assessment

Station	2032 PM Peak Northbound (1600-1900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Three Bridges	-	17	57	-	51	19	**144**	-	3%	2%	-	3%	2%	**3%**
Gatwick Airport	-	96	356	-	327	36	**831**	-	16%	9%	-	10%	2%	**8%**
Horley	16	96	356	-	327	35	**830**	6%	16%	9%	-	10%	3%	**9%**
Salfords	16	96	356	-	327	40	**835**	6%	16%	9%	-	10%	4%	**9%**
Earlswood	16	96	356	-	327	39	**834**	6%	16%	9%	-	10%	3%	**9%**
Redhill	-	96	356	-	327	23	**802**	-	16%	9%	-	10%	2%	**9%**
Merstham	-	96	356	-	327	22	**801**	-	16%	9%	-	10%	2%	**9%**
Coulsdon South	-	96	356	-	327	22	**801**	-	16%	9%	-	10%	2%	**9%**
Purley	-	96	356	-	327	24	**802**	-	16%	9%	-	10%	2%	**8%**
South Croydon	-	96	356	-	327	24	**802**	-	16%	9%	-	10%	2%	**8%**
East Croydon (VIC Branch)	-	96	257	-	-	-	**353**	-	16%	6%	-	-	-	**7%**
Clapham Junction (VIC Branch)	-	96	115	-	-	-	**211**	-	16%	6%	-	-	-	**9%**
East Croydon (LBG Branch)	-	-	-	-	307	85	**392**	-	-	-	-	6%	2%	**4%**
Norwood Junction (LBG Branch)	-	-	-	-	307	82	**389**	-	-	-	-	6%	2%	**4%**

Diagram 12.9.11: 2032 PM Northbound Seated Load Factor



12.9.128 The above diagram shows that the increase in passengers in the northbound direction will increase the seated load factor across all the lines assessed, but there is still seating available for passengers. The highest seated load factor is slightly over 0.6, which means that four out of ten seats will still be available.

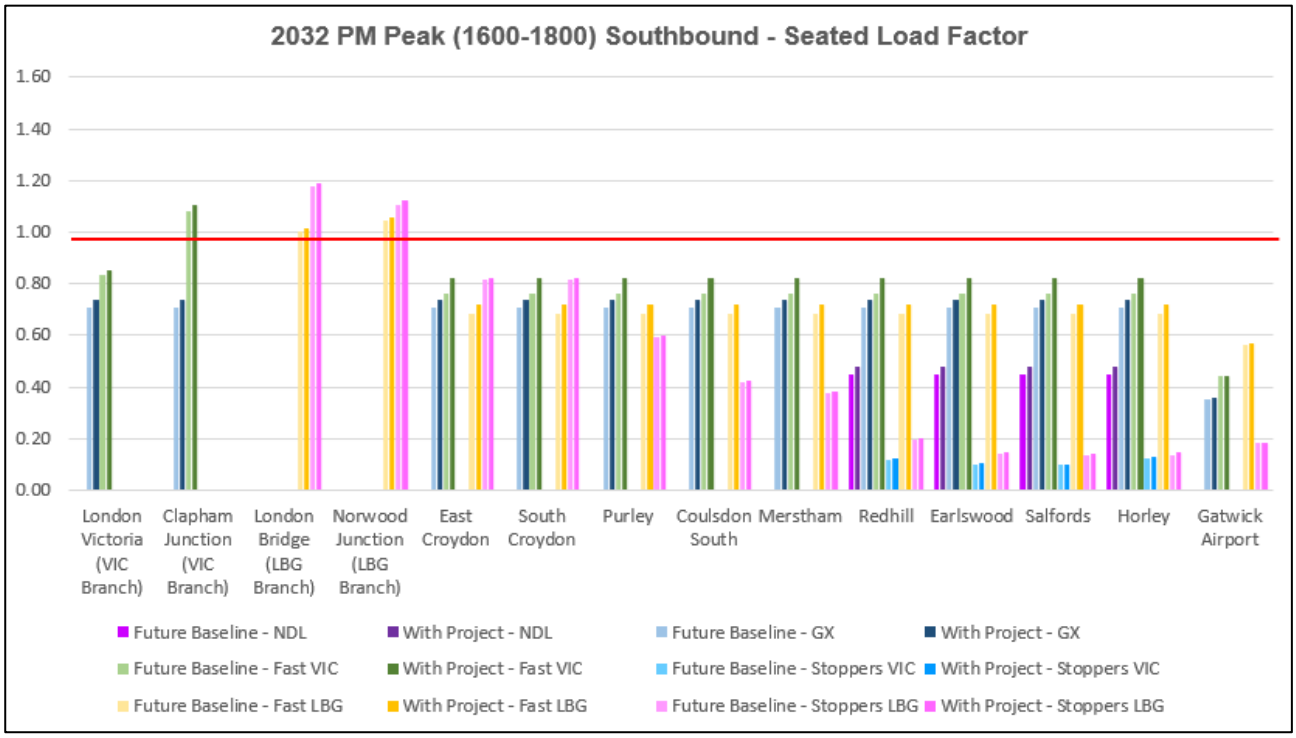
12.9.129 The line loading in the southbound direction has been examined. This is the peak rail network direction in the PM peak and Table 12.9.20 provides a summary of the increase in line loadings in this direction.

Table 12.9.20: 2032 PM Southbound Line Loading

Station	2032 PM Peak Southbound (1600-1900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
London Victoria (VIC Branch)	-	167	115	-	-	-	**282**	-	4%	2%	-	-	-	**3%**
Clapham Junction (VIC Branch)	-	167	152	-	-	-	**319**	-	4%	2%	-	-	-	**3%**
London Bridge (LBG Branch)	-	0	0	-	121	78	**200**	-	0%	0%	-	1%	1%	**1%**
Norwood Junction (LBG Branch)	-	0	0	-	140	84	**224**	-	0%	0%	-	1%	1%	**1%**
East Croydon	-	167	361	-	370	23	**921**	-	4%	8%	-	5%	0%	**5%**
South Croydon	-	167	361	-	370	23	**921**	-	4%	8%	-	5%	0%	**5%**
Purley	-	167	361	-	370	24	**922**	-	4%	8%	-	5%	1%	**5%**
Coulsdon South	-	167	361	-	370	24	**922**	-	4%	8%	-	5%	1%	**5%**
Merstham	-	167	361	-	370	26	**923**	-	4%	8%	-	5%	1%	**5%**
Redhill	30	167	361	5	370	42	**976**	7%	4%	8%	4%	5%	4%	**6%**
Earlswood	30	167	361	6	370	42	**976**	7%	4%	8%	5%	5%	5%	**6%**
Salfords	30	167	361	5	370	38	**971**	7%	4%	8%	5%	5%	5%	**6%**
Horley	30	167	362	6	370	39	**974**	7%	4%	8%	4%	5%	5%	**6%**
Gatwick Airport	-	9	-18	-	47	5	**44**	-	0%	-1%	-	1%	0%	**0%**

12.9.130 The above table shows that the Project adds around 980 passengers to rail services in this direction, which represents an overall increase of 6%, with 8% increase on the fast services from London Victoria. Diagram 12.9.12 shows the seated load factor assessment for the PM peak southbound direction services.

Diagram 12.9.12: 2032 PM Southbound Seated Load Factor



12.9.131 The above diagram shows that trains departing London in the PM peak are mostly occupied beyond their seated capacity. However, on arrival at Clapham Junction and East Croydon, sufficient passengers alight such that seats become available indicating spare capacity. For the stations where seating capacity is exceeded, standing capacity has been assessed and this is shown in Table 12.9.21.

Table 12.9.21: 2032 PM Southbound Standing Capacity Assessment

Station	PM Peak Southbound (1600-1800) - Percentage of Standing Capacity Occupied													
	Future Baseline 2032							Future Baseline 2032 + Project (% change)						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Clapham Junction (VIC Branch)	-	0%	13%	-	-	-	**1%**	-	0% (0.0%)	18% (4.2%)	-	-	-	**2% (0.5%)**
London Bridge (LBG Branch)	-	-	-	-	0%	11%	**3%**	-	-	-	-	1% (0.8%)	12% (0.8%)	**4% (0.6%)**
Norwood Junction (LBG Branch)	-	-	-	-	3%	7%	**3%**	-	-	-	-	4% (0.9%)	7% (0.9%)	**4% (0.7%)**

12.9.132 On average, over the two-hour PM peak period, the highest percentage of standing capacity is 18% on fast services out of Victoria with the Project. This indicates that rail services are very busy but suggests that there is some spare standing capacity available. The Project will not significantly increase the percentage of standing capacity occupied when compared to the future baseline 2032 situation, with the highest increase as a result of Gatwick passengers being 4.2% on these same fast Victoria services.

Summary on Rail Crowding

12.9.133 A summary of rail crowding by peak hour and direction is as follows:

- **AM Peak** – The highest increase in line loading as a result of the Project is up to 14%. This is on the southbound services, where there are sufficient spare seats for passengers. On the northbound services, there will be passengers standing on some services north of Purley. The highest percentage of standing capacity occupied on train services is around 40%, indicating busy trains into London. However, the Project only accounts for a 2% change in standing, with the remainder being as a result of high commuter flows into London. The overall magnitude of impact of the Project on rail capacity is therefore considered to be low.
- **PM Peak** - The highest increase in line loading as a result of the Project is up to 18%. This is on the contra-peak northbound services, where there are sufficient spare seats for passengers. On the southbound services, there will be passengers standing on some services out of London, with seats only becoming available at Clapham Junction and East Croydon. The highest percentage of standing capacity occupied on a service is 18%, with the Project accounting for a 4.2% change in standing. The overall magnitude of impact is therefore considered to be low.

12.9.134 The overall magnitude of impact is considered to be low and the sensitivity of receptors in terms of public transport capacity is considered to be low to medium. Any effects to changes in crowding levels for 2032 are therefore anticipated to be **minor adverse**, which is not significant.

Crowding in Station

12.9.135 The assessment has also considered crowding in the Gatwick railway station. As set out in paragraph 12.6.65, the assessment assumes that the capacity enhancements associated with the proposed station improvement will be complete before the assessment period.

12.9.136 Diagram 12.9.13 and Diagram 12.9.14 show the Level of Service performance for circulation at the concourse level of the station for the peak hour in the AM and PM peak modelled periods.

Diagram 12.9.13: 2032 Concourse LoS (AM Peak Hour, 08:00 – 09:00)

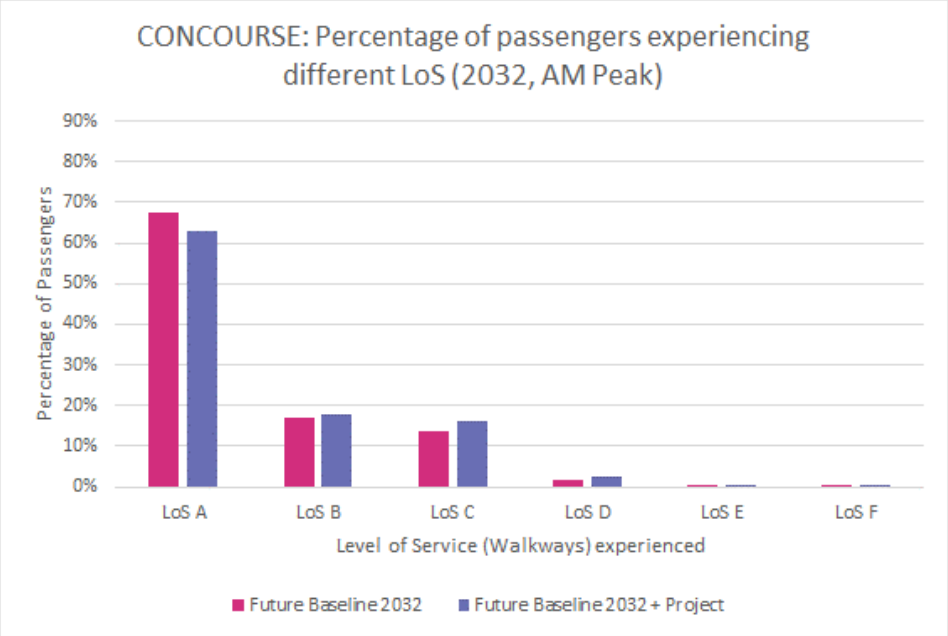
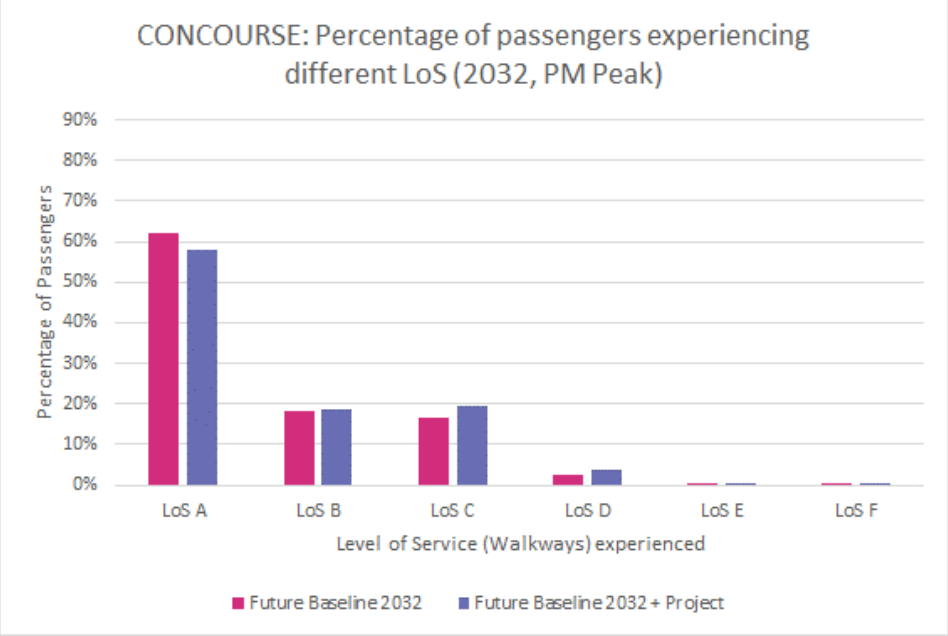


Diagram 12.9.14: 2032 Concourse LoS (PM Peak Hour, 17:00 to 18:00)



12.9.137 The percentage of passengers experiencing a different Level of Service varies but the assessment shows that station performance at concourse level would be predominantly LoS C or better. This represents a low passenger sensitivity to increases in crowding.

12.9.138 The Level of Service performance for queuing and waiting for the station platforms is shown in Diagram 12.9.15 and Diagram 12.9.16, excluding escalator elements. Level of Service is not typically applied to escalator elements as passengers either walk up these or stand at a spacing of their choosing.

Diagram 12.9.15: 2032 Platforms LoS (AM Peak Hour, 08:00 – 09:00)

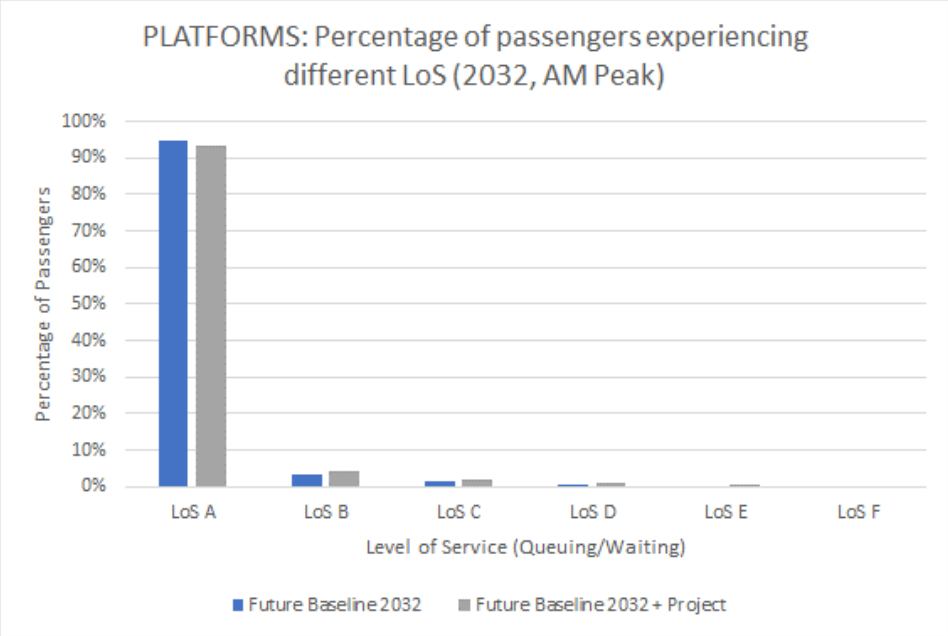
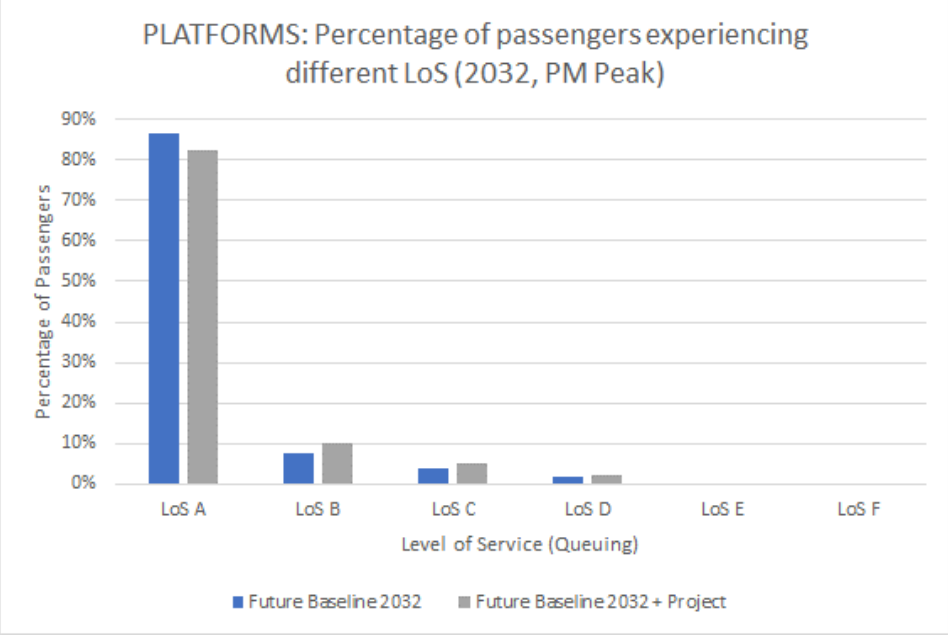


Diagram 12.9.16: 2032 Platforms LoS (PM Peak Hour, 17:00 to 18:00)



12.9.139 The percentage of passengers experiencing a different Level of Service ranges varies but the assessment shows that the station performance at platform level would generally be at LoS C or better, with a very small percentage of passengers experiencing LoS D in the peak hour. In fact, most passengers will experience LoS A for 80% (PM peak) to 90% (AM peak) of the time.

12.9.140 The AM peak period shows a very small percentage would experience a one level change to LoS E with the Project (less than 1%). The magnitude of impact on platform crowding can be considered to be negligible to low.

12.9.141 When considering the full assessment across the station, both the concourse and platforms and both peak hours, the magnitude of impact of the Project on crowding is considered to be negligible to low. The sensitivity of receptors is considered to be low given that most passengers experience LoS C or better. The overall effect on changes in crowding levels for the railway station with the Project are considered **negligible adverse**.

Bus and Coach

12.9.142 Given the adaptability of bus and coach provision, crowding on bus and coach services has not been assessed explicitly within this PEIR assessment. However, the final assessment for the ES to accompany the application for development consent will include more data on service frequency and quality as a measure of public transport amenity.

Further Mitigation and Future Monitoring

12.9.143 Eight junctions have been identified to experience a moderate adverse effect in terms of driver delay. The junctions in Croydon require further review and effects here are not related to the Project (see paragraph 12.4.13). Further information is contained in the modelling annex to the PTAR (Appendix 12.9.1) on overall journey times to consider driver delays in more detail. Work will be undertaken to verify model findings as well as to identify mitigation measures (if required) for the development consent application. No further mitigation or additional monitoring is proposed other than that adopted as part of the Project (as set out in Section 12.8).

Significance of Effects

12.9.144 Potential significant effects have been identified for eight junctions in terms of driver delay. Further work will be undertaken to verify model findings as well as to identify mitigation measures if required. No other significant effects have been identified for this assessment year. No further mitigation or monitoring is required; therefore, the significance of effects would remain as presented above.

Design Year: 2047

12.9.145 The annual passenger demand for 2047 is expected to increase from 67.2 mppa in the future baseline scenario to 80.2 million with the Project. Trip generation associated with 2047 with the Project is provided in the PTAR (Appendix 12.9.1).

Severance

12.9.146 The peak hour highway flows for the design year are contained in Appendix 12.9.2. For the purposes of reporting, only the links which have a magnitude of impact of low, medium and high adverse or beneficial are assessed in this section to focus on potential significant effects. These links and associated flows are shown in Table 12.9.22 for the future baseline, Table 12.9.23 for future baseline with Project. The net change in traffic flows are shown in Table 12.9.24.

Table 12.9.22: Design Year 2047 Traffic Flows – Future Baseline

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
2	A23 Airport Way	4717	173	4%	4355	217	5%	4042	276	7%	4649	128	3%
4	North Terminal Access	2677	34	1%	2626	63	2%	2441	59	2%	2307	30	1%
5	Longbridge Way	953	128	13%	875	118	13%	917	181	20%	1175	71	6%
6	Northgate Road	770	99	13%	673	89	13%	729	172	24%	722	48	7%
8	Gatwick Way	356	34	10%	339	44	13%	332	35	11%	538	16	3%
9	Perimeter Road North (between NT and ST)	1077	160	15%	1036	170	16%	955	218	23%	895	76	8%
13	Perimeter Road East	900	87	10%	860	125	15%	982	170	17%	472	63	13%
15	Old Brighton Road South (North)	334	21	6%	327	31	9%	272	25	9%	722	17	2%
25	Woodcote Side	506	10	2%	847	10	1%	155	9	6%	397	8	2%
26	Woodcote Green Road (east)	299	15	5%	627	15	2%	14	14	100%	199	14	7%
27	Woodcote Green Road (west)	482	20	4%	762	20	3%	333	20	6%	587	16	3%
32	Beddington Farm Road (west)	399	15	4%	285	12	4%	293	10	3%	370	11	3%
33	Beddington Farm Road (east)	391	7	2%	277	5	2%	286	3	1%	362	3	1%

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
67	M23 J9, Northbound slip (South of J9)	1320	12	1%	1124	20	2%	839	42	5%	817	18	2%
69	M23 J9, Southbound slip (North of J9)	2255	91	4%	2179	99	5%	1622	81	5%	1465	42	3%

Table 12.9.23: Design Year 2047 Traffic Flows – Future Baseline with Project

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
2	A23 Airport Way	6078	217	4%	5900	273	5%	5035	296	6%	5437	150	3%
4	North Terminal Access	3485	39	1%	3351	75	2%	2773	67	2%	2463	36	1%
5	Longbridge Way	1181	157	13%	953	132	14%	1289	278	22%	940	79	8%
6	Northgate Road	463	110	24%	396	97	24%	382	108	28%	221	54	24%
8	Gatwick Way	1069	142	13%	982	140	14%	983	134	14%	736	65	9%
9	Perimeter Road North (between NT and ST)	651	62	10%	632	80	13%	631	53	8%	543	37	7%

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
13	Perimeter Road East	1321	106	8%	1255	158	13%	1282	203	16%	758	80	11%
15	Old Brighton Road South (North)	617	23	4%	586	28	5%	447	27	6%	1052	17	2%
25	Woodcote Side	528	10	2%	1194	15	1%	156	9	6%	404	8	2%
26	Woodcote Green Road (east)	321	15	5%	972	20	2%	14	14	100%	207	14	7%
27	Woodcote Green Road (west)	501	21	4%	1116	25	2%	336	20	6%	599	16	3%
32	Beddington Farm Road (west)	435	15	3%	262	12	5%	304	10	3%	565	12	2%
33	Beddington Farm Road (east)	427	8	2%	254	5	2%	297	3	1%	557	5	1%
67	M23 J9, Northbound slip (South of J9)	1625	17	1%	1495	29	2%	1144	47	4%	1118	22	2%
69	M23 J9, Southbound slip (North of J9)	2702	108	4%	2634	121	5%	2127	94	4%	1857	55	3%

Table 12.9.24: Design Year 2047 Traffic Flows – Net Change (Percentage Change in Brackets)

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
2	A23 Airport Way	1361 (29%)	44 (25%)	0% (0%)	1545 (35%)	56 (26%)	0% (0%)	993 (25%)	20 (7%)	-1% (-1%)	788 (17%)	22 (17%)	0% (0%)
4	North Terminal Access	808 (30%)	5 (15%)	0% (0%)	725 (28%)	12 (19%)	0% (0%)	332 (14%)	8 (14%)	0% (0%)	156 (7%)	6 (20%)	0% (0%)
5	Longbridge Way	228 (24%)	29 (23%)	0% (0%)	78 (9%)	14 (12%)	0% (0%)	372 (41%)	97 (54%)	2% (2%)	-235 (-20%)	8 (11%)	2% (2%)
6	Northgate Road	-307 (-40%)	11 (11%)	11% (11%)	-277 (-41%)	8 (9%)	11% (11%)	-347 (-48%)	-64 (-37%)	5% (5%)	-501 (-69%)	6 (13%)	18% (18%)
8	Gatwick Way	713 (200%)	108 (318%)	4% (4%)	643 (190%)	96 (218%)	1% (1%)	651 (196%)	99 (283%)	3% (3%)	198 (37%)	49 (306%)	6% (6%)
9	Perimeter Road North (between NT and ST)	-426 (-40%)	-98 (-61%)	-5% (-5%)	-404 (-39%)	-90 (-53%)	-4% (-4%)	-324 (-34%)	-165 (-76%)	-14% (-14%)	-352 (-39%)	-39 (-51%)	-2% (-2%)
13	Perimeter Road East	421 (47%)	19 (22%)	-2% (-2%)	395 (46%)	33 (26%)	-2% (-2%)	300 (31%)	33 (19%)	-1% (-1%)	286 (61%)	17 (27%)	-3% (-3%)
15	Old Brighton Road South (North)	283 (85%)	2 (10%)	-3% (-3%)	259 (79%)	-3 (-10%)	-5% (-5%)	175 (64%)	2 (8%)	-3% (-3%)	330 (46%)	0 (0%)	-1% (-1%)
25	Woodcote Side	22 (4%)	0 (0%)	0% (0%)	347 (41%)	5 (50%)	0% (0%)	1 (1%)	0 (0%)	0% (0%)	7 (2%)	0 (0%)	0% (0%)
26	Woodcote Green Road (east)	22 (7%)	0 (0%)	0% (0%)	345 (55%)	5 (33%)	0% (0%)	0 (0%)	0 (0%)	0% (0%)	8 (4%)	0 (0%)	0% (0%)

ID	Road	AM1			AM2			IP			PM		
		All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV	All vehs	HGV	% HGV
27	Woodcote Green Road (west)	19 (4%)	1 (5%)	0% (0%)	354 (46%)	5 (25%)	0% (0%)	3 (1%)	0 (0%)	0% (0%)	12 (2%)	0 (0%)	0% (0%)
32	Beddington Farm Road (west)	36 (9%)	0 (0%)	0% (0%)	-23 (-8%)	0 (0%)	0% (0%)	11 (4%)	0 (0%)	0% (0%)	195 (53%)	1 (9%)	-1% (-1%)
33	Beddington Farm Road (east)	36 (9%)	1 (14%)	0% (0%)	-23 (-8%)	0 (0%)	0% (0%)	11 (4%)	0 (0%)	0% (0%)	195 (54%)	2 (67%)	0% (0%)
67	M23 J9, Northbound slip (South of J9)	305 (23%)	5 (42%)	0% (0%)	371 (33%)	9 (45%)	0% (0%)	305 (36%)	5 (12%)	-1% (-1%)	301 (37%)	4 (22%)	0% (0%)
69	M23 J9, Southbound slip (North of J9)	447 (20%)	17 (19%)	0% (0%)	455 (21%)	22 (22%)	0% (0%)	505 (31%)	13 (16%)	-1% (-1%)	392 (27%)	13 (31%)	0% (0%)

12.9.147 The above table shows a selection of links which will experience more than a 30% increase in traffic flows for one or more peak periods. The following links are expected to have an increase of 30% to 60% (low impact).

- Link 2: A23 Airport Way (negligible sensitivity) in the AM2 period.
- Link 4: North Terminal Access (low sensitivity) in the AM1 period.
- Link 5: Longbridge Way (low sensitivity) in the IP period.
- Link 8: Gatwick Way (low sensitivity) in the PM period.
- Link 15: Old Brighton Road South, northern section (low sensitivity) in the PM period
- Link 25: Woodcote Side (medium sensitivity) in the AM2 period.
- Links 26 to 27: Woodcote Green Road (medium sensitivity) in the AM2 period.
- Link 32-33: Beddington Farm Road (low sensitivity) in the PM period.
- Link 67: M23 J9, Northbound slip (South of J9), (negligible sensitivity) in the AM2, IP and PM periods.
- Link 69: M23 J9, Southbound slip (North of J9), (negligible sensitivity) in the IP period.

12.9.148 For the above links with negligible to low sensitivity, the severance effect is **negligible adverse**. For the links with medium sensitivity, the severance effect is **minor adverse.**

12.9.149 The following links are expected to have an increase of 60% to 90% (medium impact).

- Link 6: Northgate Road (negligible sensitivity) in the AM1 period.
- Link 13: Perimeter Road East (low sensitivity) in the PM period.
- Link 15: Old Brighton Road South, northern section (low sensitivity) in the AM1, AM2 and IP periods.

12.9.150 The above links would have a **minor adverse** severance effect.

12.9.151 The following link is expected to have an increase of more than 90% (high impact).

- Link 8: Gatwick Way (low sensitivity) in the AM1, AM2 and IP periods.

12.9.152 The above link would have a **minor adverse** severance effect. It should be noted that the links that experience the highest increase in traffic flows are associated with the airport access which are considered to have negligible to low pedestrian and cyclist sensitivity.

12.9.153 In addition to the above, two links are expected to experience a reduction 30% to 60% (low beneficial impact):

- Link 6: Northgate Road (negligible sensitivity) in the IP period; and
- Link 9: Perimeter Road North between the terminals (low sensitivity) in the IP period.

12.9.154 Northgate Road would have **negligible beneficial** effect in the IP period but a minor adverse effect in the AM1 period as set out above. Perimeter Road North would have a **minor beneficial** severance effect.

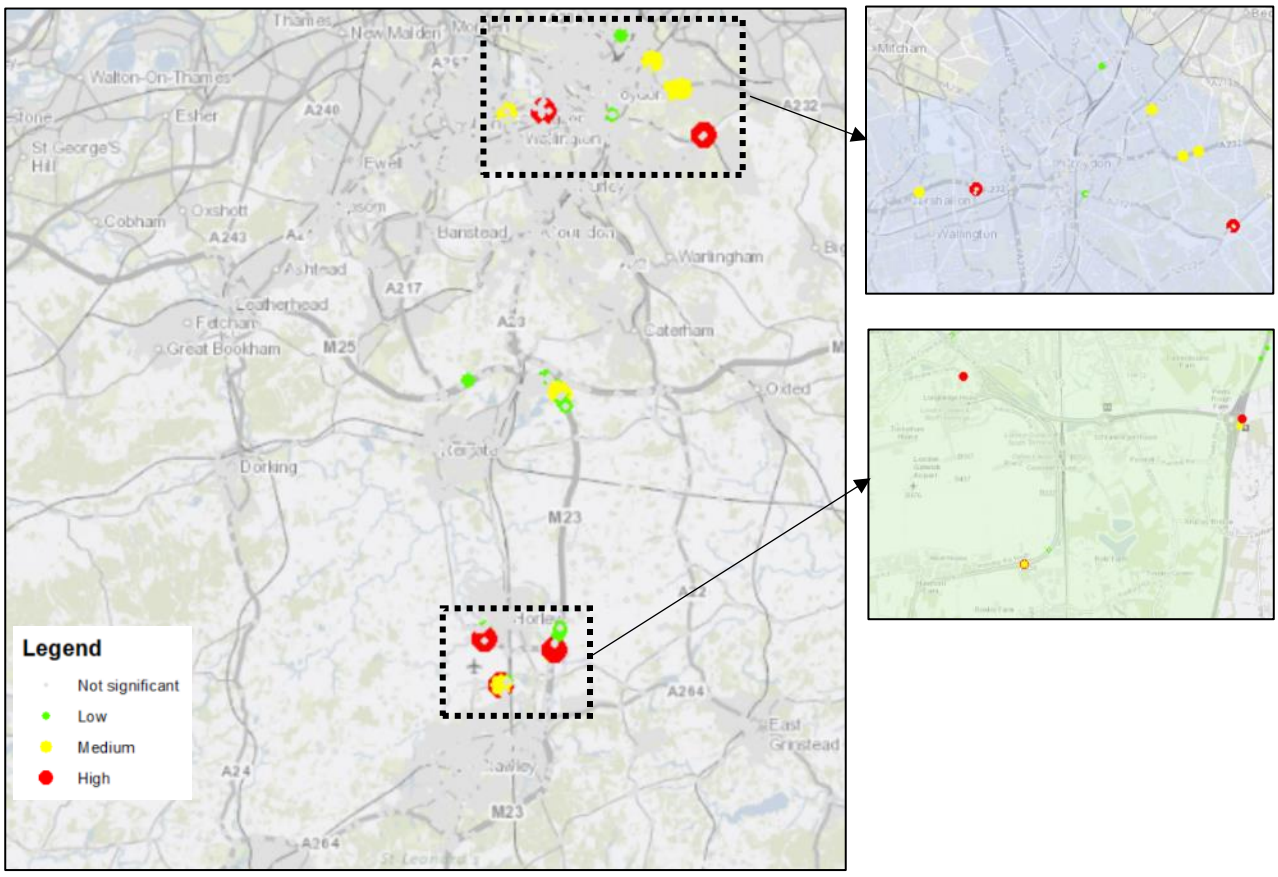
12.9.155 All other changes in traffic flows are below 30% and the magnitude of impact is considered to be negligible. The sensitivity of the pedestrians and cyclists along the highway links range from negligible to medium.

12.9.156 Overall, the effect of the Project on severance can be considered to be **minor adverse**.

Driver Delay

12.9.157 The following diagram shows the magnitude of impact for driver delay for junctions where the V/C is over 85%. The diagram shows driver delay for all time periods assessed and any overlaps in colours indicate different magnitudes of impact by time period. The highest magnitude of impact for each junction is considered.

Diagram 12.9.17: 2047 Driver Delay Magnitude of Impact (all assessment time periods)



12.9.158 The above shows that most junctions (over 1,000) have no significant or low magnitude of impact in terms of delay. Car driver and passenger sensitivity is considered to be medium for junctions where the V/C is over 85%. For the junctions with no significant delays, the driver delay effect is **negligible**. For those with a low magnitude of impact, the driver delay is **minor adverse**.

12.9.159 There are eight junctions which are shown to have a medium magnitude of delay. Five junctions are identified with a high magnitude of delay, two are located in the Croydon area[6] and three are located near the airport at the A23 London Road / Gatwick Road roundabout, M23 J9 and an internal junction along Perimeter Road North. For these junctions, the driver delay effect is considered to be **moderate adverse**. Further information is contained in the modelling annex to the PTAR (Appendix 12.9.1) on overall journey times to consider driver delays in more detail, and work will be undertaken to verify model findings as well as to identify mitigation measures (if

[6] Junctions in the Croydon area require review and adjustment in the next phase of modelling for ES (see paragraph 12.4.13)

required) for the development consent. Any significant effects on driver delay will be mitigated and it is expected that the residual effect will be **minor adverse**.

Pedestrian and Cyclist Delay

12.9.160 The highway improvements included as part of the Project would change some pedestrian and cycle routes at the North Terminal, South Terminal and Longbridge Roundabout junctions. The works are expected to improve pedestrian and cycle accessibility and these movements are separated from general traffic where practicable. The proposed changes to the Longbridge Roundabout would retain pedestrian crossings on all arms. Within the terminal forecourts, the pedestrian crossings would be retained. In addition, pedestrian and cycling improvements have been identified as part of the Gatwick Airport's Capital Investment Plan, which includes new linkages. Further details are contained in the PTAR (Appendix 12.9.1).

12.9.161 The magnitude of impact is considered to be negligible to low, the sensitivity of receptors along the highway routes range from negligible to medium. Overall, it is expected that the changes to pedestrian and cycle delay would be **negligible**, and the junctions with proposed highway improvements with the Project would have **minor beneficial** effects.

Pedestrian and Cyclist Amenity

12.9.162 The threshold for an effect on pedestrian and cyclist amenity is when the traffic flows have doubled. As shown in Table 12.9.24, Old Brighton Road South, Perimeter Road East, Longbridge Way, Northgate Road, Perimeter Road North and Gatwick Way are expected to experience a doubling or more in flows. The magnitude of impact of these links is considered to be medium. These are airport estate roads with negligible to low sensitivity in terms of pedestrians and cyclists. The effect of the Project on pedestrian and cyclist amenity can be considered to be **minor adverse**.

12.9.163 The traffic composition can also affect pedestrian and cyclist amenity. The traffic flows contained in Appendix 12.9.2 shows that the highest increase in the percentage of HGVs (number of HGVs divided by total vehicle number) are expected on the airport estate roads. The magnitude of this impact can be considered to be low to medium. The sensitivity along these roads is considered to be negligible to low. The effect of the Project on amenity is considered to be **minor adverse**.

Accidents and Safety

12.9.164 The design of the highway improvements would separate through-traffic from the North Terminal and South Terminal roundabouts. This would reduce traffic flows through the junction and reduce the risks of conflict and this is considered to be beneficial. The magnitude of impact is considered to be negligible to low.

12.9.165 The sensitivity of receptors in terms of pedestrians and cyclists along the highway links range from negligible to medium. The effect of accidents and safety on pedestrians and cyclist is considered to be **minor beneficial** where highway improvements as part of the Project are proposed, and **negligible to minor adverse** on all other roads.

12.9.166 The sensitivity of receptors in terms of car drivers and passengers ranges from low to medium. The effect of accidents and safety on car drivers and passengers is considered to be **minor beneficial** at the junctions where highway improvements are proposed, and **negligible** for all other roads.

Hazardous Loads

12.9.167 The proposed changes to the highway network are expected to improve the safety of general traffic. The magnitude of impact is expected to be negligible and the sensitivity of receptors is considered to be negligible. The effect on hazardous loads is considered to be **negligible beneficial.**

Effects on Public Transport Amenity

12.9.168 To assess the effect of the Project on public transport amenity, this section considers the impact on passenger crowding on rail services and in Gatwick Airport railway station.

Crowding on Rail Services

AM Peak (0700-0900)

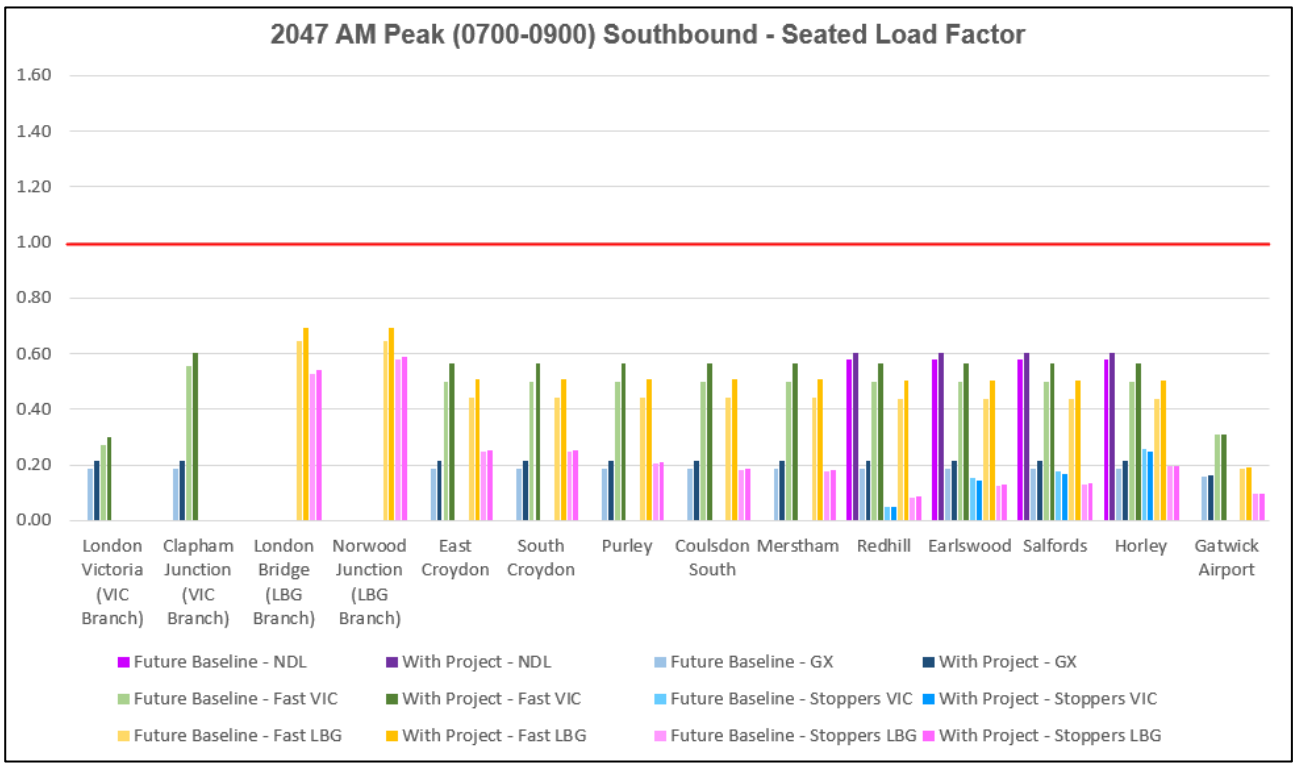
12.9.169 Crowding has been assessed based on line loading in both directions in the AM and PM peaks, and detailed data is contained in the PTAR. In the AM peak, the highest increase in rail passengers is actually in the southbound direction, from London to Gatwick. This indicates that Gatwick growth means better use of contra-peak rail capacity. Table 12.9.25 provides a summary of the increase in line loading by station in the southbound direction.

Table 12.9.25: 2047 AM Southbound Line Loading Capacity Assessment

Station	2047 AM Peak Southbound (0700-0900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
London Victoria (VIC Branch)	-	129	162	-	-	-	**291**	-	16%	10%	-	-	-	**12%**
Clapham Junction (VIC Branch)	-	129	276	-	-	-	**405**	-	16%	8%	-	-	-	**10%**
London Bridge (LBG Branch)	-	-	-	-	523	59	**582**	-	-	-	-	7%	2%	**6%**
Norwood Junction (LBG Branch)	-	-	-	-	523	48	**571**	-	-	-	-	7%	2%	**6%**
East Croydon	-	129	378	-	718	18	**1243**	-	16%	13%	-	15%	1%	**13%**
South Croydon	-	129	378	-	718	18	**1243**	-	16%	13%	-	15%	1%	**13%**
Purley	-	129	378	-	718	16	**1241**	-	16%	13%	-	15%	2%	**13%**
Coulsdon South	-	129	378	-	718	17	**1242**	-	16%	13%	-	15%	2%	**13%**
Merstham	-	129	378	-	718	17	**1243**	-	16%	13%	-	15%	2%	**13%**
Redhill	22	129	378	3	717	18	**1268**	4%	16%	13%	6%	15%	4%	**13%**
Earlswood	22	129	378	-11	717	12	**1247**	4%	16%	13%	-6%	15%	2%	**13%**
Salfords	22	129	378	-11	717	12	**1247**	4%	16%	13%	-6%	15%	2%	**13%**
Horley	22	129	378	-11	717	11	**1246**	4%	16%	13%	-4%	15%	1%	**12%**
Gatwick Airport	-	24	22	-	30	10	**85**	-	3%	1%	-	1%	2%	**2%**

12.9.170 The above table shows that on the rail services being assessed, the Project contributes an additional 1,270 passengers approx. Most of these passengers are expected to use the fast train services from London Victoria and London Bridge. The increase in passengers represents a 13% to 15% increase in passengers on the fast services, and 16% on Gatwick Express. To assess the impact on crowding, Diagram 12.9.18 shows the seated load factor assessment.

Diagram 12.9.18: 2047 AM Southbound Seated Load Factor



12.9.171 The above diagram shows that the increase in passengers in the southbound direction will increase the seated load factor across all the lines assessed, but there is still seating available for passengers. The highest seated load factor is up to around 0.7, which means that three out of ten seats will be available.

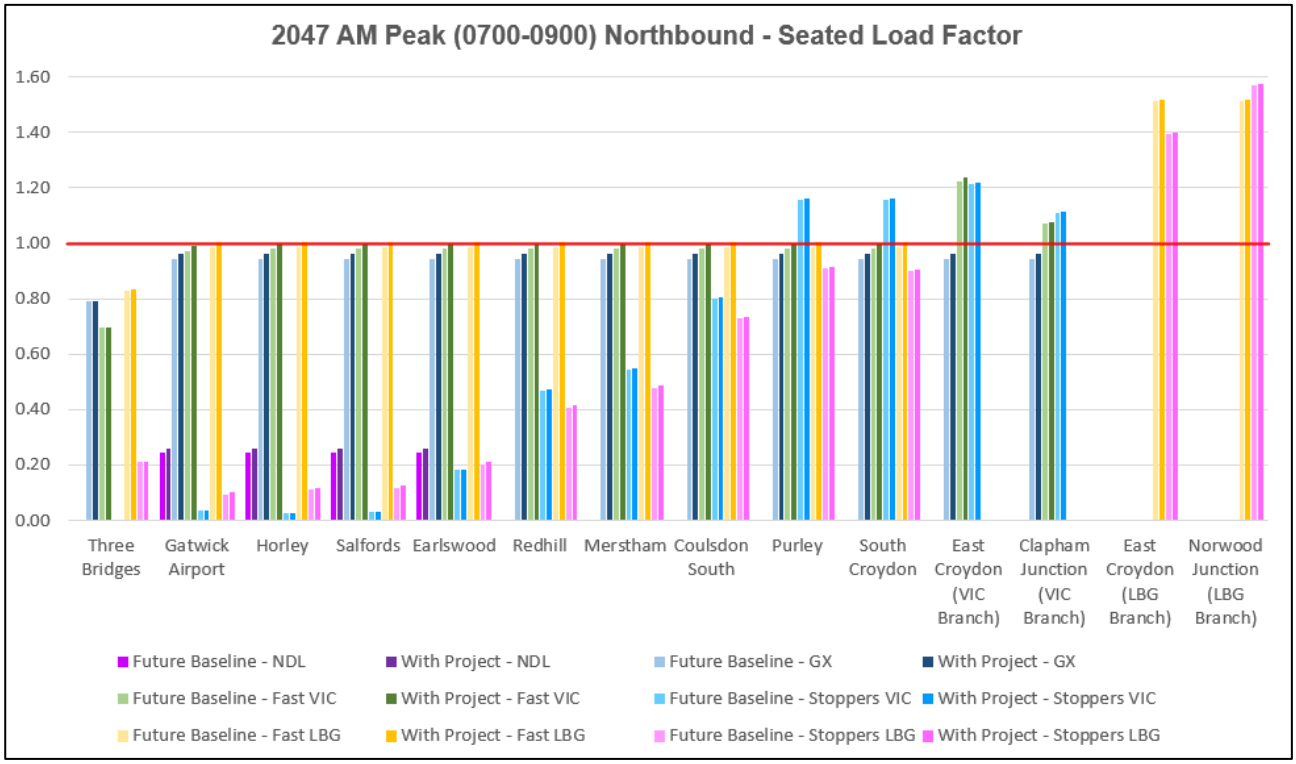
12.9.172 The line loading in the northbound direction has been assessed. This is the peak rail network direction in the AM peak and Table 12.9.26 provides a summary of the increase in line loadings in this direction.

Table 12.9.26: 2047 AM Northbound Line Loading

Station	AM Peak Northbound (0700-0900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Three Bridges	-	-6	2	-	40	10	**47**	-	0%	0%	-	0%	1%	**0%**
Gatwick Airport	17	70	147	1	215	44	**493**	7%	2%	2%	1%	2%	7%	**2%**
Horley	17	70	145	1	215	45	**493**	7%	2%	2%	2%	2%	6%	**2%**
Salfords	17	70	145	2	215	45	**493**	7%	2%	2%	2%	2%	6%	**2%**
Earlswood	17	70	145	12	215	55	**514**	7%	2%	2%	2%	2%	4%	**2%**
Redhill	-	70	145	16	215	40	**486**	-	2%	2%	1%	2%	1%	**2%**
Merstham	-	70	145	16	215	39	**484**	-	2%	2%	1%	2%	1%	**2%**
Coulsdon South	-	70	145	16	215	37	**483**	-	2%	2%	1%	2%	1%	**2%**
Purley	-	70	145	16	215	36	**481**	-	2%	2%	0%	2%	1%	**1%**
South Croydon	-	70	145	16	215	35	**480**	-	2%	2%	0%	2%	1%	**1%**
East Croydon (VIC Branch)	-	70	101	14	-	-	**185**	-	2%	1%	0%	-	-	**1%**
Clapham Junction (VIC Branch)	-	70	21	7	-	-	**99**	-	2%	0%	0%	-	-	**1%**
East Croydon (LBG Branch)	-	-	-	-	88	22	**110**	-	-	-	-	1%	0%	**0%**
Norwood Junction (LBG Branch)	-	-	-	-	88	26	**115**	-	-	-	-	1%	0%	**0%**

12.9.173 The above table shows that the Project adds up to 520 passengers to rail services in this direction, which represents an overall increase of 2%. Diagram 12.9.19 shows the seated load factor assessment for the AM peak northbound direction services.

Diagram 12.9.19: 2047 AM Northbound Seated Load Factor



12.9.174 The above diagram shows that between Three Bridges and Coulsdon South, the seating capacity is reached but seats are available for all passengers. Seating capacity is exceeded north of Purley, owing to background commuter flows into London, and standing capacity has therefore been assessed as shown in Table 12.9.27.

Table 12.9.27: 2047 AM Northbound Standing Capacity Assessment

Station	AM Peak Northbound (0700-0900) - Percentage of Standing Capacity Occupied													
	Future Baseline 2047							Future Baseline 2047 + Project (% change)						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Purley	-	0%	0%	26%	0%	0%	**1%**	-	0% (0.0%)	0% (0.0%)	27% (0.8%)	0% (0.3%)	0% (0.0%)	**2% (0.2%)**
South Croydon	-	0%	0%	26%	0%	0%	**1%**	-	0% (0.0%)	0% (0.0%)	27% (0.8%)	0% (0.3%)	0% (0.0%)	**2% (0.2%)**
East Croydon (VIC Branch)	-	0%	37%	36%	-	-	**7%**	-	0% (0.0%)	39% (2.2%)	37% (0.7%)	-	-	**7% (0.3%)**
Clapham Junction (VIC Branch)	-	0%	12%	19%	-	-	**2%**	-	0% (0.0%)	12% (0.5%)	19% (0.4%)	-	-	**3% (0.1%)**
East Croydon (LBG Branch)	-	-	-	-	39%	24%	**23%**	-	-	-	-	40% (0.6%)	25% (0.2%)	**24% (0.3%)**
Norwood Junction (LBG Branch)	-	-	-	-	39%	35%	**26%**	-	-	-	-	40% (0.6%)	35% (0.2%)	**27% (0.3%)**

12.9.175 On average over the two-hour AM peak period, the highest percentage of standing capacity occupied is 39% and 40% on the fast services to London Victoria and London Bridge, which occurs north of East Croydon. Whilst services north of East Croydon are therefore busy, the Project will not significantly increase the percentage of standing capacity occupied when compared the future baseline 2047 situation, with the highest increase being 2.2% on the fast services into London Bridge.

PM Peak (1600-1900)

12.9.176 In the PM peak, there is an increase in rail passengers in the northbound direction, from Gatwick to London.

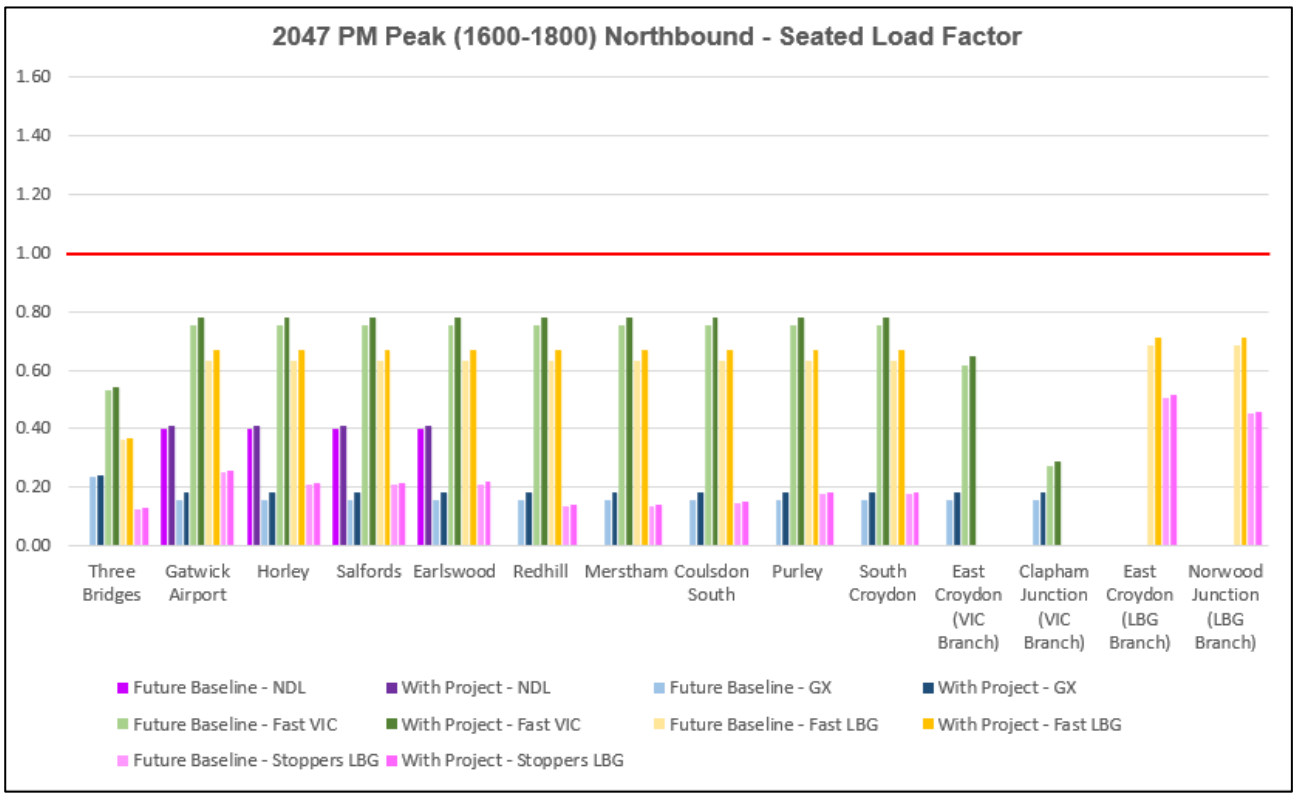
12.9.177 Table 12.9.28 provides a summary of the increase in line loading by station in the off-peak northbound direction, again demonstrating the operational value for money that Gatwick growth provides.

Table 12.9.28: 2047 PM Northbound Line Loading Capacity Assessment

Station	2047 PM Peak Northbound (1600-1900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Three Bridges	-	23	72	-	49	26	**170**	-	2%	2%	-	2%	2%	**2%**
Gatwick Airport	11	130	224	-	329	77	**770**	3%	17%	4%	-	6%	3%	**5%**
Horley	11	130	224	-	329	77	**770**	3%	17%	4%	-	6%	4%	**5%**
Salfords	11	130	224	-	329	79	**773**	3%	17%	4%	-	6%	4%	**5%**
Earlswood	11	130	224	-	329	80	**774**	3%	17%	4%	-	6%	4%	**5%**
Redhill	-	130	224	-	329	57	**740**	-	17%	4%	-	6%	4%	**6%**
Merstham	-	130	224	-	329	56	**739**	-	17%	4%	-	6%	4%	**6%**
Coulsdon South	-	130	224	-	329	54	**737**	-	17%	4%	-	6%	4%	**6%**
Purley	-	130	224	-	329	53	**736**	-	17%	4%	-	6%	3%	**5%**
South Croydon	-	130	224	-	329	53	**736**	-	17%	4%	-	6%	3%	**5%**
East Croydon (VIC Branch)	-	130	216	-	-	-	**345**	-	17%	5%	-	-	-	**6%**
Clapham Junction (VIC Branch)	-	130	90	-	-	-	**220**	-	17%	4%	-	-	-	**8%**
East Croydon (LBG Branch)	-	-	-	-	230	90	**320**	-	-	-	-	4%	2%	**3%**
Norwood Junction (LBG Branch)	-	-	-	-	230	89	**319**	-	-	-	-	4%	2%	**3%**

12.9.178 The above table shows that on the rail services being assessed, the Project contributes an additional 770 passengers approx. Most of these passengers are expected to use the fast train services to London Victoria and London Bridge. The increase in passengers represents a 4% to 6% increase in passengers on the fast services, and 17% on the Gatwick Express. To assess the impact on crowding, Diagram 12.9.20 shows the seated load factor assessment.

Diagram 12.9.20: 2047 PM Northbound Seated Load Factor



12.9.179 The above diagram shows that the increase in passengers in the northbound direction will increase the seated load factor across all the lines assessed, although there is still seating available for passengers. The highest seated load factor is up to 0.8, which means that two out of ten seats will still be available.

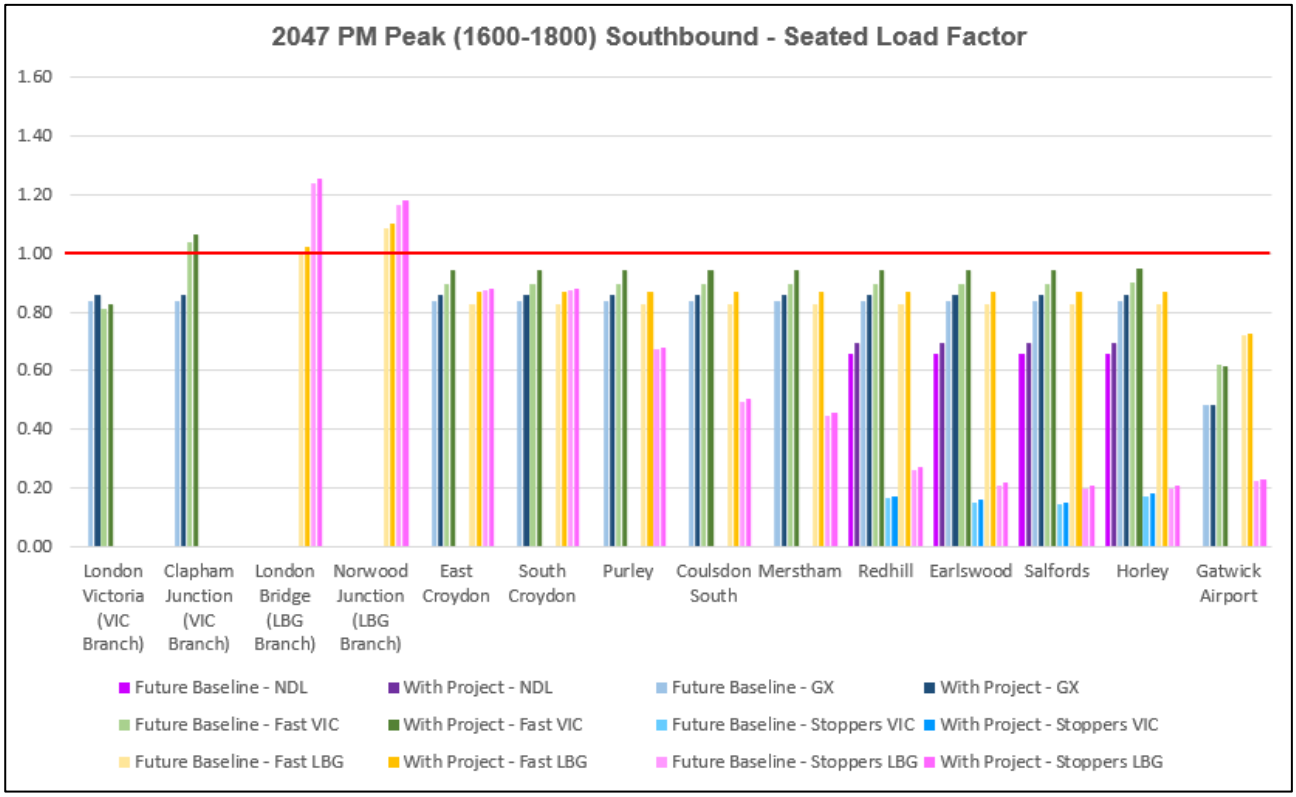
12.9.180 The line loading in the southbound direction has been examined. This is the peak rail network direction in the PM peak and Table 12.9.29 provides a summary of the increase in line loadings in this direction.

Table 12.9.29: 2047 PM Southbound Line Loading

Station	2047 PM Peak Southbound (1600-1900)													
	Change in Line Loading on Departure							Percentage Change						
	NDL	GX	Fast VIC	Stoppers	Fast LBG	Stoppers	Total	NDL	GX	Fast VIC	Stoppers	Fast LBG	Stoppers	Total
London Victoria (VIC Branch)	-	124	107	-	-	-	**231**	-	3%	2%	-	-	-	**2%**
Clapham Junction (VIC Branch)	-	124	181	-	-	-	**305**	-	3%	2%	-	-	-	**2%**
London Bridge (LBG Branch)	-	-	-	-	150	90	**240**	-	0%	0%	-	1%	1%	**1%**
Norwood Junction (LBG Branch)	-	-	-	-	172	93	**264**	-	0%	0%	-	2%	1%	**1%**
East Croydon	-	124	365	-	435	32	**956**	-	3%	5%	-	5%	1%	**4%**
South Croydon	-	124	365	-	435	32	**956**	-	3%	5%	-	5%	1%	**4%**
Purley	-	124	365	-	435	34	**958**	-	3%	5%	-	5%	1%	**4%**
Coulsdon South	-	124	365	-	435	36	**960**	-	3%	5%	-	5%	1%	**4%**
Merstham	-	124	365	-	435	37	**961**	-	3%	5%	-	5%	1%	**4%**
Redhill	37	124	365	7	435	62	**1029**	5%	3%	5%	4%	5%	4%	**5%**
Earlswood	37	124	365	7	435	61	**1028**	5%	3%	5%	4%	5%	5%	**5%**
Salfords	37	124	365	7	435	59	**1026**	5%	3%	5%	4%	5%	5%	**5%**
Horley	37	124	365	7	435	59	**1027**	5%	3%	5%	4%	5%	5%	**5%**
Gatwick Airport	-	-4	-45	-	52	19	**22**	-	0%	-1%	-	1%	1%	**0%**

12.9.181 The above table shows that the Project adds around 1030 passengers to rail services in this direction, which represents an overall increase of 5%. Diagram 12.9.21 shows the seated load factor assessment for the PM peak southbound direction services.

Diagram 12.9.21: 2047 PM Southbound Seated Load Factor



12.9.182 The above diagram shows that trains departing London Bridge in the PM peak are mostly occupied beyond their seated capacity. However, on arrival at East Croydon, sufficient passengers alight such that seats become available indicating spare capacity. For the lines serving stations where seating capacity is exceeded, standing capacity has been assessed and this is shown in Table 12.9.30.

Table 12.9.30: 2047 PM Southbound Standing Capacity Assessment

Station	AM Peak Northbound (0700-0900) - Percentage of Standing Capacity Occupied													
	Future Baseline 2047							Future Baseline 2047 + Project (% change)						
	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total	NDL	GX	Fast VIC	Stoppers VIC	Fast LBG	Stoppers LBG	Total
Clapham Junction (VIC Branch)	-	0%	7%	-	-	-	**1%**	-	0% (0.0%)	11% (4.0%)	-	-	-	**1% (0.5%)**
London Bridge (LBG Branch)	-	-	-	-	1%	15%	**4%**	-	-	-	-	2% (1.0%)	16% (0.9%)	**5% (0.7%)**
Norwood Junction (LBG Branch)	-	-	-	-	6%	10%	**5%**	-	-	-	-	7% (1.1%)	11% (1.0%)	**6% (0.8%)**

12.9.183 On average, over the two-hour PM peak period, the highest percentage of standing capacity occupied in the with Project scenario is 16% in the future baseline on fast services out of London Bridge, which indicates that rail services are very busy but suggests that there is some spare standing capacity available. The Project will not significantly increase the percentage of standing capacity occupied when compared to the future baseline 2047 situation, with the highest increase in standing capacity occupied as a result of Gatwick passengers being 4.0% on fast services out of London Victoria.

Summary on Rail Crowding

12.9.184 A summary of rail crowding by peak hour and direction is as follows :

- **AM Peak** – The highest increase in line loading as a result of the Project is up to 16%. This is on the southbound services, where there is sufficient number of spare seats for passengers. On the northbound services, there will be passengers standing on some services north of Purley. The highest percentage of standing capacity occupied on train services is around 40%, indicating busy trains into London. However, the Project only accounts for a 2.2% change in standing, with the remainder being as a result of high commuter flows into London. The overall magnitude of impact of the Project on rail capacity is therefore considered to be low.
- **PM Peak** - The highest increase in line loading as a result of the Project is up to 17%. This is on the contra-peak northbound services, where there is sufficient number of spare seats for passengers. On the southbound services, there will be passengers standing on some services out of London, with seats only becoming available at Clapham Junction and East Croydon. The highest percentage of standing capacity occupied on a service is 18%, with the Project accounting for a 4% change in standing. The overall magnitude of impact is therefore considered to be low.

12.9.185 It should be noted that the Project does not assess committed improvements proposed by the rail industry as mitigation of its effects, instead these improvements are applied in the future baseline, against which the Project is being assessed. Moreover, the last Control Period considered for improvements is CP7 (which is to 2029) so the modelling currently assumes no further improvements between 2029 and 2047, which is considered a conservative assumption. The overall magnitude of impact is considered to be low and the sensitivity of receptors in terms of public transport capacity is considered to be low to medium. Any effects to changes in crowding levels for 2047 are therefore anticipated to be **minor adverse**, which is not significant.

Crowding in Station

12.9.186 The assessment has also considered crowding in the Gatwick railway station. As set out in paragraph 12.6.65, the assessment assumes that the capacity enhancements associated with the Station improvement will be complete by the start of the assessment period.

12.9.187 Diagram 12.9.22 and Diagram 12.9.23 show the Level of Service performance for circulation at the concourse level of the station for the peak hour in the AM and PM peak modelled periods.

Diagram 12.9.22: 2047 Concourse LoS (AM Peak Hour, 08:00 – 09:00)

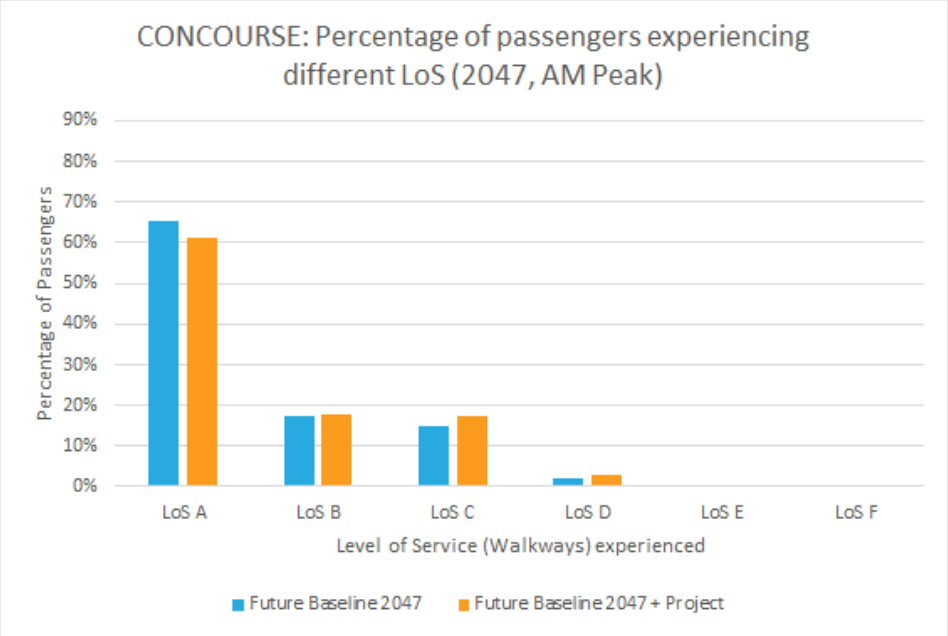
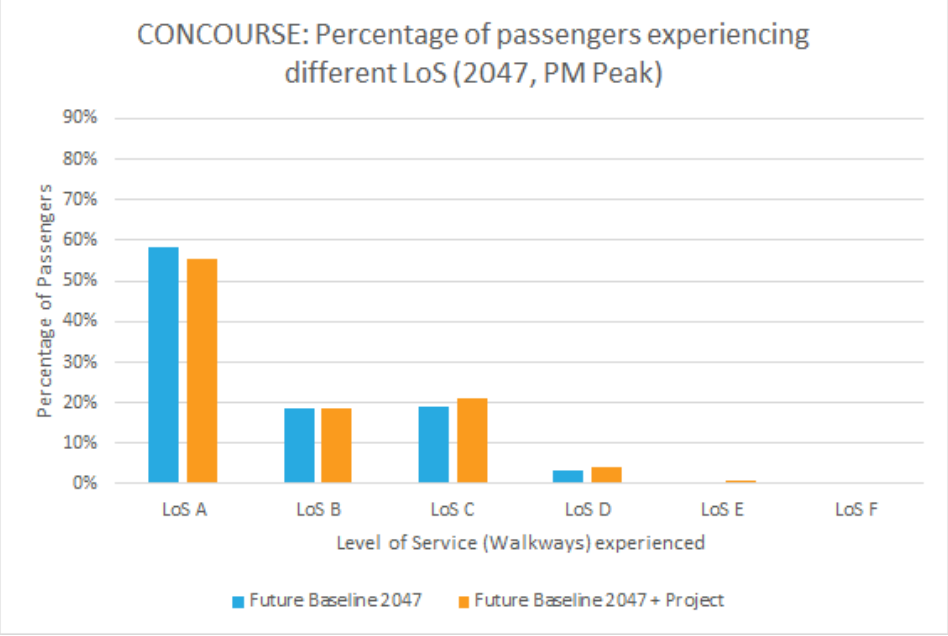


Diagram 12.9.23: 2047 Concourse LoS (PM Peak Hour, 17:00 – 18:00)



12.9.188 The percentage of passengers experiencing different Levels of Service varies but the assessment shows that station performance at concourse level is expected to be LoS C or better. This represents a low passenger sensitivity to increases in crowding.

12.9.189 The PM peak period shows a very small percentage of passengers (1%) would experience a one level change to LoS E with the Project. This is expected to be the worst case and this magnitude of impact is considered as low**.**

12.9.190 The Level of Service performance for queuing and wating for the station platforms is shown in Diagram 12.9.24 and Diagram 12.9.25, excluding escalator elements.

Diagram 12.9.24: 2047 Platforms LoS (AM Peak Hour, 08:00 – 09:00)

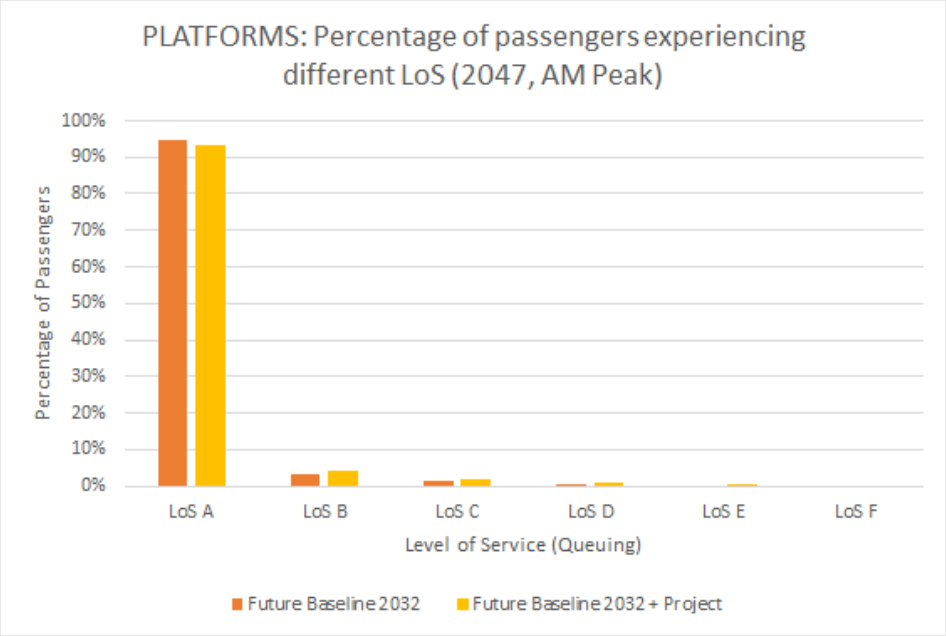
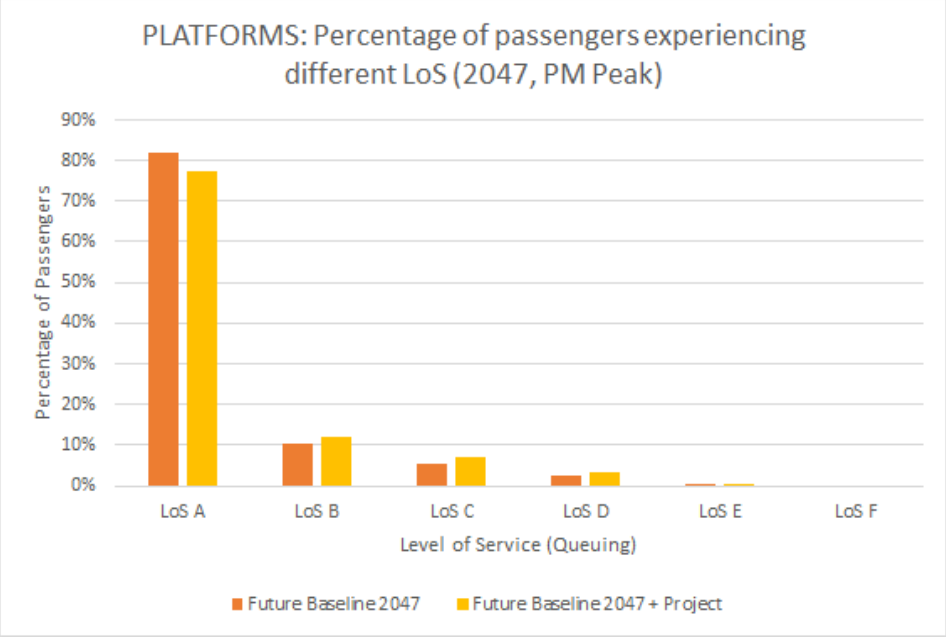


Diagram 12.9.25: 2047 Platforms LoS (PM Peak Hour, 17:00 – 18:00)



12.9.191 The percentage of passengers experiencing different Level of Service ranges varies but the assessment shows that the station performance at platform level would generally be LoS C or better, with a small percentage of passengers experiencing LoS D and E in the peak hour. In fact, most passengers will experience LoS A for 75% (PM peak) to 90% (AM peak) of the time.

12.9.192 Therefore, when considering the full assessment across the station, both the concourse and platforms, and both peak hours, the magnitude of impact of the Project on crowding is considered to be negligible to low. The sensitivity of receptors is considered to be low given that most passengers experience LoS C or better. The overall effect on changes in crowding levels for the railway station with the Project are considered **negligible adverse**.

Bus and Coach

12.9.193 Given the adaptability of bus and coach provision, crowding on bus and coach services has not been assessed explicitly within this PEIR assessment. However, the final assessment for the ES to accompany the application for development consent will include service frequency and quality as a measure of public transport amenity

Further Mitigation and Future Monitoring

12.9.194 There are 13 junctions which have been identified to have moderate adverse effect in terms of driver delay. The junctions in Croydon relate to model convergence which requires review and further adjustment (see paragraph 12.4.13). Further information is contained in the modelling annex to the PTAR (Appendix 12.9.1) on overall journey times to consider driver delays in more detail. Work will be undertaken to verify model findings as well as to identify mitigation measures if required for the development consent application. No further mitigation or additional monitoring is proposed other than that adopted as part of the Project (as set out in Section 12.8).

Significance of Effects

12.9.195 Potential significant effect has been identified for 13 junctions in terms of driver delay. Further work will be undertaken to verify model findings as well as to identify mitigation measures if required. No other significant effects have been identified for this assessment year. No further mitigation or monitoring is required; therefore, the significance of effects would remain as presented above.

12.10. Potential Changes to the Assessment as a Result of Climate Change

12.10.1 Climate change is not considered to have a direct impact on the traffic and transport topics assessed. However, changing travel behaviour in response to climate change concerns is expected to result in a long-term shift to more sustainable modes of travel, lower emission vehicles and advances in technology which in turn will support improved telecommuting and flexible working. This may reduce the scale of background traffic flows and travel demand during peak hours.

12.10.2 A reduction in vehicle emissions and traffic volumes would result in an improvement for some of the elements of this assessment, such as pedestrian and cyclist amenity and driver delay. A greater demand for public transport could affect capacity and crowding on buses and rail services but it is expected that the frequencies of these services would increase with long-term demand.

12.11. Cumulative Effects

12.11.1 In line with The Planning Inspectorate in Advice Note Seventeen (Planning Inspectorate, 2019), the cumulative traffic and transport effects are inherently included in the future baseline scenarios as per the PTAR in Appendix 12.9.1 and the full list of cumulative development in Annex B. Development assumptions have been confirmed with Local Authorities. Strategic highway

modelling reported for PEIR includes background traffic growth based on the latest TEMPRO growth factors with adjustments to consider cumulative development. Future year networks have been updated in consultation with Highways England and Local Authorities to reflect the committed schemes for which funding has been secured. The estimates of rail and station crowding for PEIR also include for background traffic growth in line with Network Rail projections.

12.11.2 Modelling assumes growth at Heathrow with two runways from Heathrow's future baseline as published during its DCO consultation owing to the uncertainty around when Heathrow's third runway (R3) will come forward. If Heathrow R3 was to come forward, traffic levels at Gatwick would likely decline in the period immediately following the opening of R3. However, by 2047, there would be little difference between demand at Gatwick with or without Heathrow R3 and accordingly this scenario would be unchanged irrespective of developments at Heathrow.

12.11.3 The Heathrow R3 surface access narrative is predicated on "no more traffic", which is to say that total car traffic to the Airport is to be maintained at existing levels, albeit with variation in passenger and employee travel and therefore the distribution and timing of trips. Despite local variations, given the overall strategy of no more traffic at Heathrow, it is not envisaged that there would be a material impact on the performance of the highway network should both proposals come forward. In terms of public transport, the network and catchments serving the two airports are different and therefore the cumulative effects of Gatwick and Heathrow are unlikely to be significantly different to those described in this chapter. GAL will, however, keep this under review and as it progresses its work and prepares its final documents, including the formal Environmental Statement in support of development consent.

12.11.4 These assessments are considered to be comprehensive and within the defined assessment parameters at this stage for the purposes of PEIR based on the information available. Therefore, in keeping with the Planning Inspectorate Advice Note Seventeen, no additional cumulative assessment is considered to be required.

12.11.5 The assessment will be kept under review in the event that any new other existing development and/or approved development is identified that has potential to exceed the background growth assumptions and the model would be updated for the ES, as required.

12.12. Inter-Related Effects

12.12.1 The traffic and transport effects are not expected to have any inter-relationships with topics which have not already been considered.

12.12.2 There will be inter-related effects between forecast traffic flows and Air Quality (Chapter 13) and Noise and Vibration (Chapter 14). The highway improvement works that form part of the Project are also expected to have inter-related effects with Landscape and Visual Resources (Chapter 8). Effects on public rights of way are considered as part of Chapter 18: Agricultural Land Use and Recreation.

12.13. Summary

12.13.1 This chapter has set out the preliminary assessment of the environmental effects of the Project on severance, driver delay, pedestrian and cyclist delay and amenity, accidents and safety, hazardous loads, and public transport services and users. The assessment has been undertaken in accordance with IEMA (2004) and DMRB (Highways England *et al*., 2020) guidance and

professional judgement has been used for qualitative assessment where appropriate. This assessment for PEIR uses the best information available at the time of writing and it will be comprehensively updated for the final ES including outputs from strategic modelling. The final ES will accompany the application for development consent.

12.13.2 For the purposes of this assessment, the receptors are considered to be pedestrians, cyclists, bus and coach passengers, rail passengers, and car drivers and their passengers.

12.13.3 As part of the design development, embedded mitigation forms part of the Project, particularly with reference to the proposed highway improvements.

12.13.4 The assessment shows that given the existing high traffic flows on the highway network, the Project is not expected to generate substantial traffic flows beyond the local highways. However, owing to redistribution effects and modelling convergence, the strategic modelling work shows that there could be some increases in traffic flows in areas such as Croydon during certain times of day which are not as a result of the Project, particular during the interim assessment year 2032. This will be further investigated in the modelling work for the final development consent order.

12.13.5 Within the vicinity of the airport, there are segregated pedestrian and cycle routes which reduce the sensitivities of the highway links. The proposed highway improvements would also help reduce conflicts and risk of accidents.

12.13.6 Based on the methodology, assessment criteria and assignment of significance set out in this chapter, generally there are no significant effects which have been identified. However, it is recognised that a number of links will need further consideration in terms of increases in traffic flows and further mitigation may be required.

Table 12.13.1: Summary of Effects

Receptor	Receptor Sensitivity	Description of Impact	Short/medium/long term/permanent	Magnitude of Impact	Significance of Effect	Significant/not significant	Notes
Initial Construction Phase: 2024-2029							
Pedestrians and cyclists	Negligible to Medium	Severance	Medium term	Negligible	Negligible Adverse	Not Significant	
		Pedestrian and cycle delay	Medium term	Negligible	Negligible Adverse	Not Significant	
		Pedestrian and cycle amenity	Medium term	Low for A23 London Road, Negligible for all other roads	Minor Adverse for A23 London Road, Negligible Adverse for all other roads	Not Significant	
		Accident and Safety	Medium term	Low	Negligible Adverse	Not Significant	
Public transport users	Low	Public transport amenity	Medium term	Negligible	Negligible Adverse	Not Significant	
Car drivers and passengers	Low to Medium	Driver delay	Medium term	No Change to Medium	Moderate Adverse for two Croydon junctions, up to Minor Adverse for all other junctions.	Not Significant / Significant for two junctions	Further work and mitigation measures will be considered, and the residual effect is expected to reduce to not significant.

Receptor	Receptor Sensitivity	Description of Impact	Short/medium/long term/permanent	Magnitude of Impact	Significance of Effect	Significant/not significant	Notes
		Accidents and safety	Medium term	Low	Negligible Adverse	Not Significant	
		Hazardous loads	Medium term	Negligible	Negligible Adverse	Not Significant	
First Full Year of Opening: 2029							
Pedestrians and cyclists	Negligible to Medium	Severance	Medium term	Medium to High for Old Brighton Road South. Low for Perimeter Road East. Negligible for all other roads	Minor Adverse	Not Significant	
		Pedestrian and cycle delay	Medium term	Negligible	Negligible Adverse	Not Significant	
		Pedestrian and cycle amenity	Medium term	Medium for Old Brighton Road South. Negligible for all other roads	Minor Adverse for Old Brighton Road South, Negligible Adverse for all other roads.	Not Significant	
		Accident and Safety	Medium term	Negligible	Negligible Adverse	Not Significant	
Public transport users	Low	Public transport amenity	Medium term	Low	Minor Adverse	Not Significant	

Receptor	Receptor Sensitivity	Description of Impact	Short/medium/long term/permanent	Magnitude of Impact	Significance of Effect	Significant/not significant	Notes
Car drivers and passengers	Low to Medium	Driver delay	Medium term	No Change to Medium	Moderate Adverse for four junctions, up to Minor Adverse for all other junctions.	Not Significant / Significant for four junctions	Further work and mitigation measures will be considered, and the residual effect is expected to reduce to not significant.
		Accidents and safety	Medium term	Negligible	Negligible Adverse	Not Significant	
		Hazardous loads	Medium term	No Change	No Change	Not Significant	
Interim Assessment Year: 2032							
Pedestrians and cyclists	Negligible to Medium	Severance	Long term	Low to High	Moderate Adverse for three links in Croydon, up to Minor Adverse on all other roads. Minor beneficial for Perimeter Road North.	Not Significant / Significant for three links in Croydon.	Further work and mitigation measures will be considered, and the residual effect is expected to reduce to not significant.
		Pedestrian and cycle delay	Long term	Negligible to Low	Minor Adverse for Croydon links, Negligible to Minor	Not Significant	

Receptor	Receptor Sensitivity	Description of Impact	Short/medium/long term/permanent	Magnitude of Impact	Significance of Effect	Significant/not significant	Notes
					Beneficial for all other roads.		
		Pedestrian and cycle amenity	Long term	Negligible to Medium	Moderate Adverse for two Croydon links, Minor Adverse for all other roads.	Not Significant	Further work and mitigation measures will be considered, and the residual effect is expected to be not significant
		Accident and Safety	Long term	Negligible to Medium	Minor Beneficial where highway improvements are part of the Project, Negligible Adverse for all other roads.	Not Significant	
Public transport users	Low	Public transport amenity	Long term	Negligible to Low	Minor Adverse	Not Significant	
Car drivers and passengers	Negligible to Medium	Driver delay	Long term	No Change to Medium	Moderate Adverse for eight junctions, up to Minor Adverse for all other junctions.	Not Significant / Significant for eight junctions	Further work and mitigation measures will be considered, and the residual effect is expected to

Receptor	Receptor Sensitivity	Description of Impact	Short/medium/long term/permanent	Magnitude of Impact	Significance of Effect	Significant/not significant	Notes
							reduce to not significant.
		Accidents and safety	Long term	Low to Medium	Minor Beneficial at junctions where highway improvements are part of the Project, Negligible Adverse for all other roads	Not Significant	
		Hazardous loads	Long term	Negligible	Negligible Beneficial	Not Significant	
Design Year: 2047							
Pedestrians and cyclists	Negligible to Medium	Severance	Permanent	Low to High	Minor Adverse	Not Significant	
		Pedestrian and cycle delay	Permanent	Negligible to Low	Minor Beneficial where highway improvements are part of the Project, Negligible adverse for all other roads.	Not Significant	
		Pedestrian and cycle amenity	Permanent	Negligible to Low	Minor Beneficial where highway improvements are part of the Project,	Not Significant	

Receptor	Receptor Sensitivity	Description of Impact	Short/medium/long term/permanent	Magnitude of Impact	Significance of Effect	Significant/not significant	Notes
					Negligible Adverse for all other roads.		
		Accident and Safety	Permanent	Negligible to Low	Negligible to Minor Adverse / Beneficial	Not Significant	
Public transport users	Low	Public transport amenity	Permanent	Negligible to Low	Minor Adverse	Not Significant	
Car drivers and passengers	Low to Medium	Driver delay	Permanent	No Change to Medium	Moderate Adverse for 13 junctions, up to Minor Adverse for all other junctions.	Not Significant / Significant for 13 junctions	Further work and mitigation measures will be considered, and the residual effect is expected reduce to not significant.
		Accidents and safety	Permanent	Negligible to Low	Minor Beneficial at junctions where highway improvements are part of the Project, Negligible Adverse for all other roads	Not Significant	
		Hazardous loads	Permanent	Negligible	Negligible Beneficial	Not Significant	

Next Steps

12.13.7 The assessment undertaken for the PEIR is based on the best information available at this time. There will be further detailed work to produce the final ES chapter and Transport Assessment for the application for development consent. Ongoing consultation is also expected with highways authorities and other stakeholders on the Project and the expected transport impacts.

12.14. References

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Railways Act 1993

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12.15. Glossary

Table 12.15.1: Glossary of Terms

Term	Description
AADT	Annual Average Daily Traffic
ANPR	Automatic Number Plate Recognition
AQMA	Air Quality Management Area
ASAS	Airport Surface Access Strategy
CIF	Common interface file
CL	Citi Logik
CP5	Control Period 5
CP6	Control Period 6 (2019-2024)
CP7	Control Period 7 (2024-2029)
DfT	Department for Transport
DLR	Docklands Light Railway
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
GAL	Gatwick Airport Limited
HGV	Heavy Goods Vehicle

Term	Description
IEMA	Institute of Environmental Management and Assessment
IP	Interpeak
LBG	London Bridge
LoS	Level of Service
LTP	Local Transport Plan
MCC	Manual Classified Counts
NCR	National Cycle Route
NDL	North Downs Line
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
ORR	Office of Rail and Road
PEIR	Preliminary Environmental Information Report
PGC	Passenger Guidance Capacity
PINS	Planning Inspectorate
PR	Periodic Review
PTAR	Preliminary Transport Assessment Report
RIS	Road Investment Strategy
SERTM	South East Regional Transport Model
SRN	Strategic Road Network
TfL	Transport for London
tph	Trains per hour
V/C	Volume to Capacity
vehs	Vehicles
VIC	London Victoria