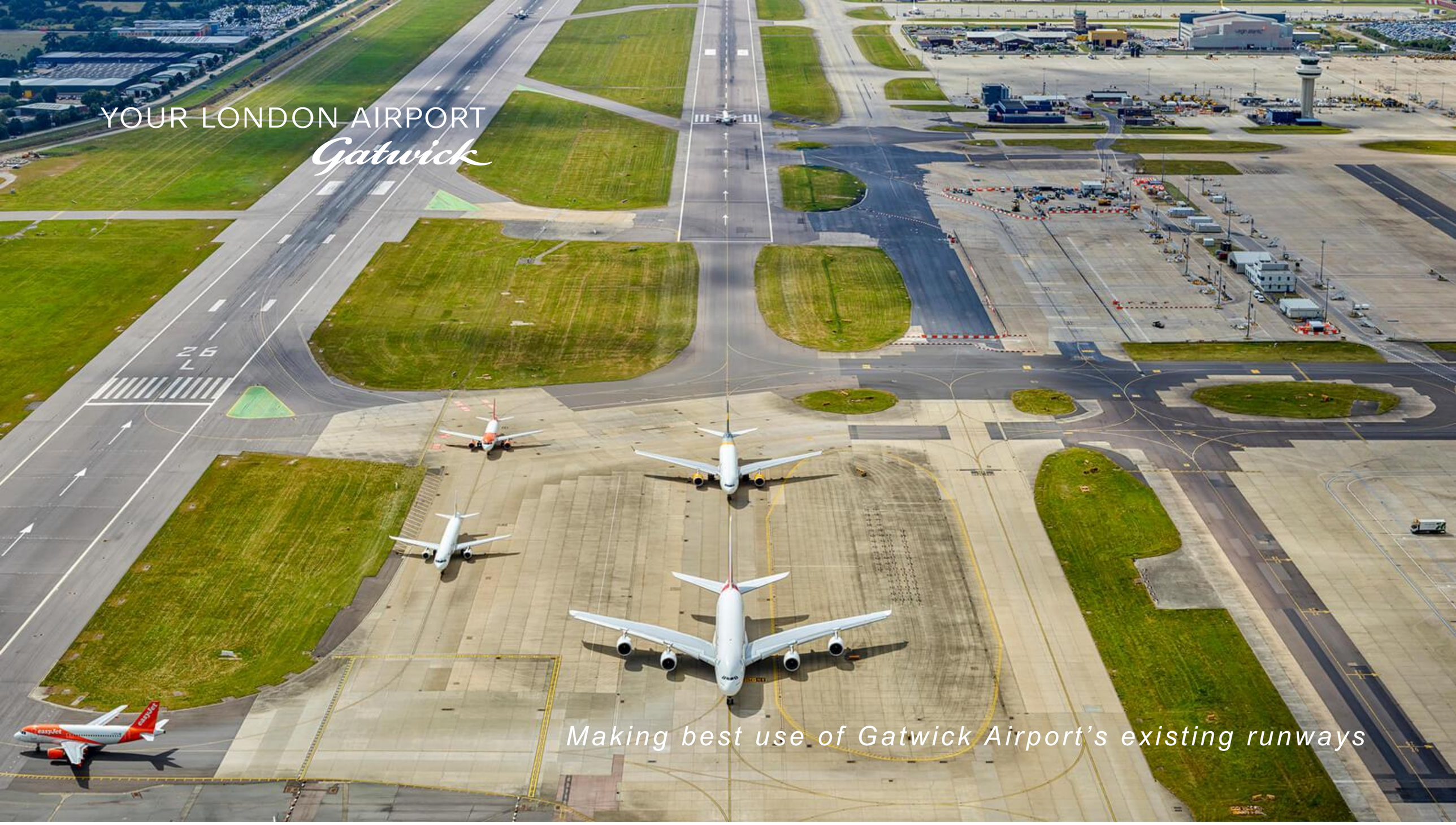

Preliminary Environmental Information Report
Appendix 12.9.1: Preliminary Transport Assessment Report (PTAR)

September 2021

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1 Introduction

1.1 General

1.1.1 This document forms Appendix 12.9.1 of the Preliminary Environmental Information Report (PEIR) prepared on behalf of Gatwick Airport Limited (GAL). The PEIR presents the preliminary findings of the Environmental Impact Assessment (EIA) process for the proposal to make best use of Gatwick Airport's existing runways (referred to within this report as 'the Project'). The Project proposes alterations to the existing northern runway which, together with the lifting of the current restrictions on its use, would enable dual runway operations. The Project includes the development of a range of infrastructure and facilities which, with the alterations to the northern runway, would enable the airport passenger and aircraft operations to increase. Further details regarding the components of the Project can be found in the Chapter 5: Project Description.

1.1.2 This document provides the Preliminary Transport Assessment Report (PTAR) for the Project.

1.2 Purpose of Assessment

1.2.1 In line with planning guidance, this PTAR sets out the transport network, its operation and performance and potential transport impacts of the proposed project. It includes an assessment of impacts, and how those impacts will be mitigated to promote sustainable development. A draft Airport Surface Access Strategy (ASAS) and Travel Plan will be included in the final Transport Assessment (TA). Draft actions and targets which could be considered to deliver an effective ASAS and Travel Plan are described in Section 7. Interventions that have been tested in the strategic transport modelling to support meeting these draft targets are also identified specifically in this section.

1.3 Overview of the Project

1.3.1 Gatwick Airport is currently served by a single main runway. The airport also has a further runway, which is located north of the main runway and is only available for use when the main runway is closed. This runway is known as the 'northern runway' or the 'standby runway'. A planning condition, together with a planning agreement, has historically prevented this runway from being used at the same time as the main runway. This agreement expired in August 2019 but the planning condition remains in place.

1.3.2 The Project proposes to make alterations to the northern runway, including repositioning its centreline to the north by 12 metres which, along with the lifting of the planning condition restricting its use, would enable dual runway operations in accordance with international standards.

1.3.3 It is anticipated that by 2047 these improvements could increase airport capacity up to 80.2 million passengers per annum (mppa), compared to a maximum potential capacity based on existing facilities of 67.2 mppa within the same timescale. This represents an increase of approximately 13 mppa.

1.3.4 Further details of the key components of the Project are provided in Section 2 of this report.

1.4 Scope of Assessment

1.4.1 A TA will be submitted as part of the Development Consent Order (DCO) application for the Project and will set out the potential transport impacts of development and how those impacts will be mitigated to promote sustainable development.

1.4.2 This document is the PTAR for the PEIR which will become the TA for the application for development consent as the modelling analysis and design proposals are further refined.

1.5 Document Structure

1.5.1 The structure of the documents is as follows:

- Section 2 describes the Project.
- Section 3 explains the policy context for the Project, whilst Section 4 sets out the assessment methodology required to test the effects of the Project in that policy context. The strategic transport modelling which underpins the assessment is described in Annex B.
- Existing conditions are described in Section 5 though more detail is provided in the sections pertaining to each mode of transport (Section 8 to Section 13).
- The demand forecasts for the Future Baseline and Project scenarios are presented in Section 6.
- The ASAS, mode share modelling and proposed highway mitigation are described in Section 7.
- The assessment of effects pertaining to each mode is described as follows:
  - Section 8 Rail.
  - Section 9 Bus and Coach.
  - Section 10 Strategic Highways: including proposed highway mitigation. A more detailed concept design report describing the highway mitigation is provided in Annex C.
  - Section 11 Local Highway and Road Network, including Terminal Forecourts.
  - Section 12 Walking and Cycling.
  - Section 13 Railway Station and Inter-Terminal Shuttle.
- The effects of construction of the Project are considered in Section 13.6.3.
- Freight, Cargo and Logistics movements are discussed in Section 15.
- Section 16 and Annex A include GIS mapping related to catchment areas and Quality of Life.
- Resilience and reliability of transport networks is be presented in Section 17, with impacts of future transport trends in Section 18.
- Conclusions are presented in the final section, Section 19.

2 The Project

2.1 Site Description

2.1.1 The airport is located between the towns of Horley to the north and Crawley to the south. The London to Brighton railway line, also knowns as the Brighton Main Line, and the A23 are adjacent to South Terminal, and the M23 motorway runs north to south further to the east of the Airport. Gatwick Airport's location is shown in Diagram 2.1.1.

2.1.2 A site overview is provided in Diagram 2.1.2. Gatwick Airport is served by a single runway. The airport also has a further runway, which is located north of the main runway and is only available for use when the main runway is unavailable, ie owing to planned maintenance or an unplanned closure.

2.1.3 Gatwick has two passenger terminals, North Terminal which opened in 1988, and South Terminal which opened in 1958. North Terminal currently accommodates more than half of Gatwick's annual passenger traffic, processing 24.5 mppa in 2017/18, while South Terminal processed 21.2 mppa.

2.1.4 The train station adjacent to South Terminal (owned by Network Rail) provides access to a wide range of rail services. These include the Gatwick Express service to London Victoria as well the Southern and Thameslink networks.

Diagram 2.1.1: Gatwick Airport – Location

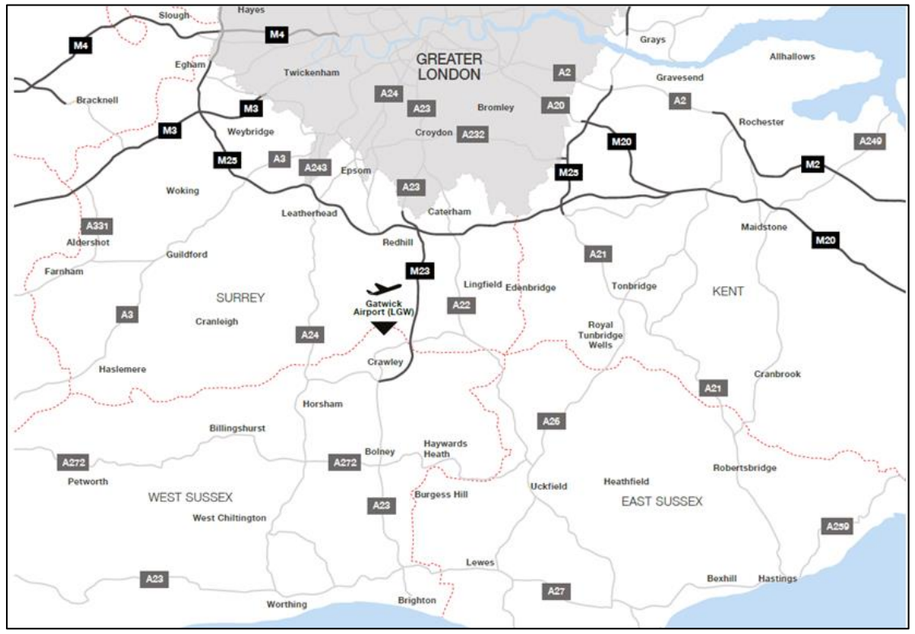


Diagram 2.1.2: Gatwick Airport – Site Overview

2.2 Site Access

2.2.1 Gatwick is an airport and a transport hub, where a range of transport modes connect. It acts as both a destination and an interchange for passengers.

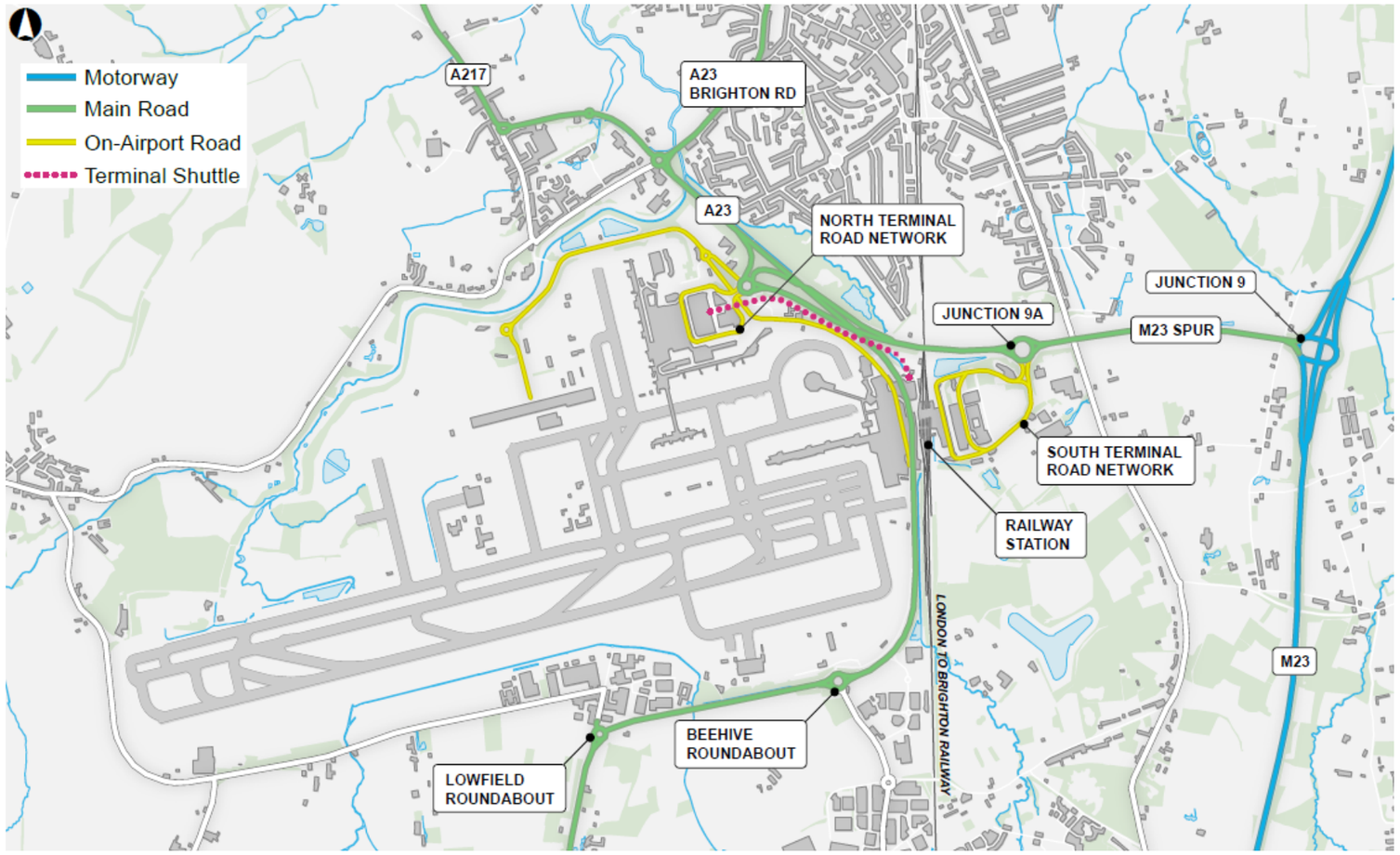
2.2.2 The Airport can be accessed by rail and road, as shown in Diagram 2.2.1:

- The Airport has a seven platform railway station adjacent to the South Terminal located on the Brighton Main Line, connecting London to Brighton.
- The 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 standard dual carriageway to Junction 9a at the airport's South Terminal roundabout. The M23 connects to the M25 around London and the A23 towards Brighton and the South Coast.

2.2.3 North and South Terminals offer bus and coach access and are connected via an inter-terminal shuttle system.

2.2.4 Gatwick is the only London Airport to have 24 hour rail, bus and express coach access. The Airport is also accessible by walking and cycling, with routes into the Airport from Povey Cross, Horley and Crawley. National Cycle Network Route 21 (NCN21) provides a continuous route between Crawley, Gatwick, Horley, Reigate and London.

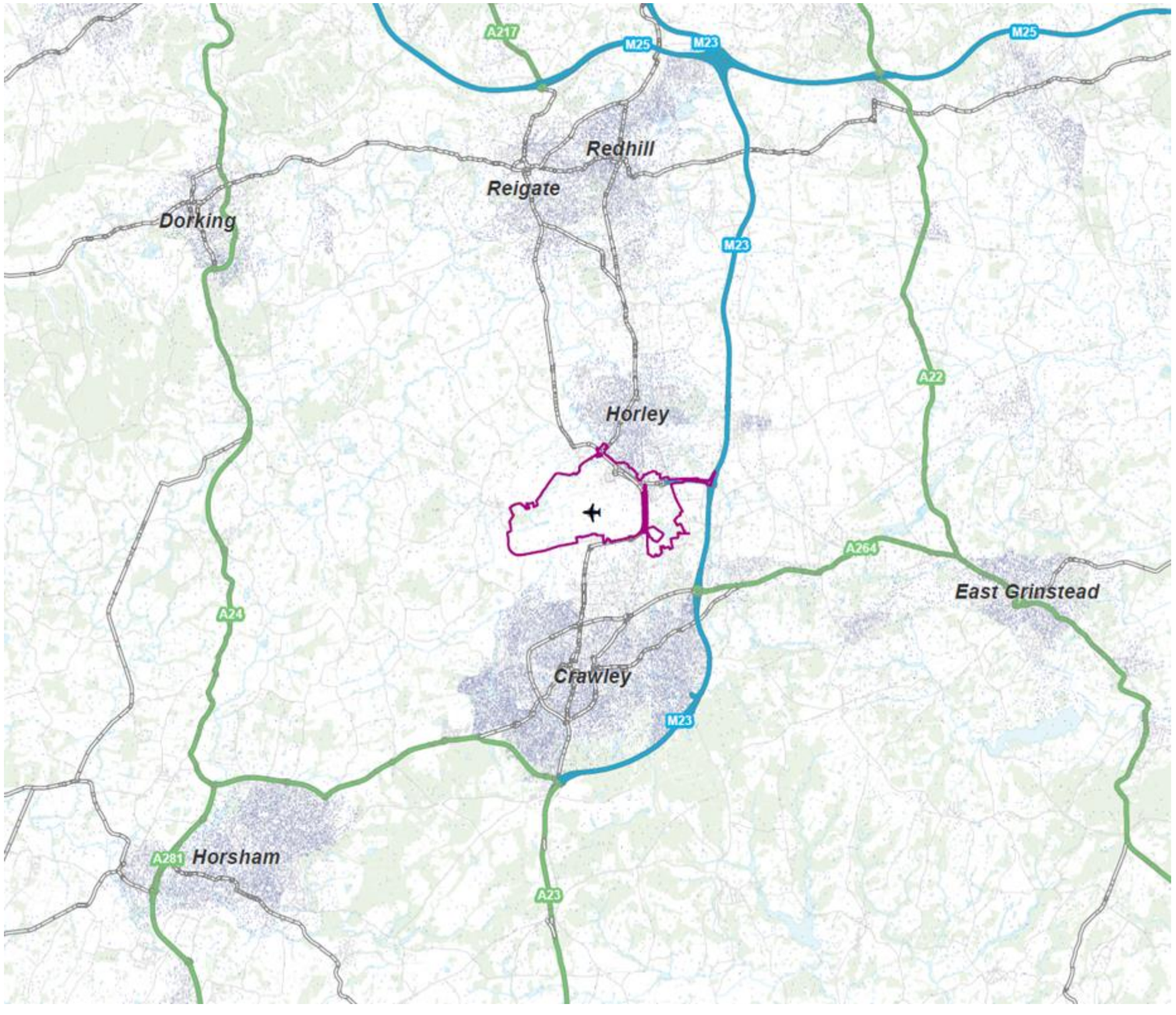
Diagram 2.2.1: Gatwick Airport – Transport Overview



2.3 Surrounding Communities

2.3.1 Gatwick Airport is located within the town of Crawley, West Sussex, along the border with the county of Surrey. The nearest towns are Crawley itself, with its town centre situated approximately 5 miles to the south of the airport, and the town of Horley, located immediately to the north. As shown in Diagram 2.3.1, Gatwick is also located near several other populous towns in West Sussex and Surrey, notably Horsham to the southwest, Dorking to the northwest, Redhill and Reigate to the north as well as East Grinstead to the east.

Diagram 2.3.1: Gatwick Airport -- Surrounding Communities



2.4 Project Description

2.4.1 The Project comprises alterations to the existing northern runway which, along with lifting the current restrictions on its routine use, will enable dual runway operations.

2.4.2 The Project includes the development of infrastructure and facilities to allow increased airport passenger and aircraft operations and to allow Gatwick Airport to make best use of its existing runways. There will be enhancements to the taxiway system and parking stands to accommodate an increase in aircraft movements. Other elements of the Project will enable the increased airfield capacity to be realised so that passengers can access the airport efficiently, with good levels of customer service, and so that environmental effects are mitigated.

2.4.3 In order to accommodate the proposed increase in passenger numbers, the following surface access improvements form part of the embedded mitigation of the Project, as shown in Diagram 2.4.1:

- South Terminal: new junction, providing full grade separation;
- North Terminal: new junction layout including some grade-separation, improving traffic flow and removing westbound traffic between Airport Way and the A23 from using the North Terminal roundabout;
- enhancement of the eastbound M23 Gatwick Spur as part of the South Terminal roundabout improvements, should these not be completed in advance of the airport expansion; and
- improvements to Longbridge roundabout where the A23 meets the A217.

2.4.4 Improvements to Gatwick Railway Station were the subject of a separate consenting process, with consent granted in March 2019 for a series of improvements to almost double the size of the station concourse, provide additional lifts and escalators and improve access to the platforms. The enhancement to the railway station will improve passenger experience and provide capacity for further growth in the numbers of rail passengers and overall public transport mode share. These improvements commenced in 2020 and will be in place prior to operation of the Project. Studies have been undertaken to explore the need for further improvement to the rail station, but taking into account the improvements that are planned, it is not currently envisaged that any further improvements will be required to the rail station platforms or concourse to accommodate the peak flows generated by the Project.

2.4.5 The Inter-Terminal Transit System (ITTS) provides a dedicated, elevated people mover system connecting North Terminal and South Terminal. Modelling has determined the scale of intervention necessary to adequately cater for demand, noting that some improvements can be made within the existing operation, eg increasing shuttle frequency.

2.4.6 It is anticipated that, by 2047, these improvements could increase Gatwick's passenger throughput to approximately 80.2 million passengers per annum (mppa), compared to a maximum potential passenger throughput based on existing facilities (with proposed/consented projects) of 67.2 mppa. This represents an anticipated increase in capacity of 13 mppa (see EIA Chapter 4: Existing Site and Operation for further details).

Diagram 2.4.1: Surface access works with the Project

3 Policy and Planning Context

3.1.1 The key legislation and policy documents relevant to traffic and transport and considered within the assessment process are described in this section.

3.2 National

3.2.1 The key national policy statements and frameworks considered are as follows[1]:

- **Airports NPS** (Department for Transport, 2018) - Primarily in relation to a new runway at Heathrow Airport but relevant for other applications for airport infrastructure in London and the south east of England, specifically "making best use of existing runways".
- **National Policy Statement (NPS) for National Networks**[2] (Department for Transport, 2015) - sets out the need for development of road, rail and strategic rail freight interchange projects on the national networks and the policy context against which decisions on major road and rail projects will be made.
- **National Planning Policy Framework (NPPF)** (Ministry of Housing, Communities and Local Government, 2021) - sets out the planning policies for England.

3.2.2 A summary of the key national policies is set out in Table 3.2.1.

[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 and DCO submission. However, Gatwick is committed to low-carbon growth and its Decade of Change strategy sets ambitious carbon reduction targets. These inform headline mode share targets established when generating this assessment for PEIR and as documented in this PTAR.

[2] It is noted that the Transport Decarbonisation Plan announces the Department for Transport's (DfT's) intention to review the NPS in due course once demand patterns post-pandemic become clearer. It is understood DfT intend 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 have confirmed the NPS for National Networks remains relevant government policy and has full force and effect for the purposes of the Planning Act 2008. To the extent that any emerging policy statement affects the assessment carried out in this PTAR, it will be updated as necessary in the environmental statement submitted with the DCO application.

Table 3.2.1: Summary of key national policies

Ref	Description
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.
Para 5.10	The applicant should assess the implications of airport expansion on surface access network capacity using the WebTAG methodology 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 operational project stages for the development comprised in the application.
Para 5.11	The applicant should also consult to understand the target completion dates of any third party or external schemes included in existing rail, road or other transport investment plans.
Para 5.13	The applicant should have regard to Department for Transport (Department for Transport) Circular 02/2013, The Strategic Road Network and the delivery of sustainable development (or prevailing policy), and the National Networks NPS.
Para 5.14	Where appropriate, the applicant should seek to deliver improvements or mitigation measures that reduce community severance and improve accessibility.
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 (with specific targets set for Heathrow in relation to its third runway proposal).
Para 5.18	The applicant should commit to annual public reporting on performance against these specific targets.
NPS for National Networks	
Para 3.14	The Government expects applicants to use reasonable endeavours to address the needs of cyclists and pedestrians in the design of new schemes.
Para 3.20	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 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.
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. They should also put in place arrangements for undertaking the road safety audit process.
Para 5.201-5.212	This section discusses Impacts on Transport Networks and requires the applicant to give regard for policies in local plans, consulting with relevant authorities, support for other transport modes, assessing impacts and mitigation in EIA.
NPPF	
Para 10	At the heart of the Framework is a presumption in favour of sustainable development.
Para 104	Transport issues should be considered from the earliest stages of plan-making and development proposals, so that potential impacts can be address and opportunities are realised.
Para 110	In assessing applications for sites that may be allocated for development in plans, or specific applications for development,, it should be ensured that appropriate opportunities to promote sustainable transport modes can be taken up, safe and suitable access to the site can be achieved for all users, and any significant impacts from the development on the transport network can be cost effectively mitigated to an acceptable degree.
Para 111	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.

3.2.3 Other national guidance which has been considered in developing this PTAR includes:

- 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, including 'Travel Plans, Transport Assessments and Statements'
- 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, 2013)
- South East Route Control Period 6[3] 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); and
- Periodic Review 2018 (PR18) (Office of Rail and Road, 2018) – PR18 will establish outputs and funding for Control Period 6 (CP6) from 1 April 2019 to 31 March 2024.

3.3 Regional and Local

3.3.1 Gatwick Airport lies within 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. The administrative area of Tandridge District Council is located approximately 1.9 km to the east of Gatwick Airport, while Mid Sussex District Council lies approximately 2 km to the south east. Other local authorities are . East Sussex (12km southeast) and Kent (15km east). Gatwick Airport is located in West Sussex and immediately adjacent to the bordering county of Surrey.

3.4

The relevant local planning policies applicable to Traffic and Transport based on the extent of the study area for this assessment are summarised in Table 3.5.1 and explained further in the paragraphs below.

3.5 Other Related Plans and Policies

3.5.1 Other plans and strategies have also been considered and these include:

- Draft West Sussex Transport Plan 2022 to 2036 (West Sussex County Council, 2021)
- West Sussex Transport Plan 2011-2026 (LTP3) (West Sussex County Council, 2011)
- West Sussex Walking and Cycling Strategy 2016-2026 (West Sussex County Council, 2016)
- West Sussex County Council Highway Infrastructure Policy and Strategy 2018 (West Sussex County Council, 2018)
- Mid Sussex Infrastructure Delivery Plan 2016 (Mid Sussex District Council, 2016)
- Draft Surrey Local Transport Plan 2022–2032 (LTP4) (Surrey County Council, 2021)
- Surrey Local Transport Plan 2011-2026 (LTP3) (Surrey County Council, 2018)
- East Sussex Local Transport Plan 2011-2026 (East Sussex County Council, 2011)
- Kent Local Transport Plan 2016-2031 (Kent County Council, 2017)

3.5.2 The following guidance has been considered:

- Design Manual for Roads and Bridges (DMRB) Standards for Highways
- WebTAG (Transport Analysis Guidance) (Department for Transport, 2019)
- Station Capacity Planning Guidance (Network Rail, 2016)
- Local highway authority standards, where relevant if these differ from DMRB

3.5.3 Additional studies and strategies which have also been reviewed as part of this PTAR report:

- West Sussex Infrastructure Studies (AECOM, 2016)
- West Sussex Guidance on Parking at New Developments (West Sussex County Council, 2020)
- West Sussex Transport Assessment Methodology (West Sussex Couny Council, 2007)
- West Sussex Cycling Design Guide (West Sussex County Council, 2019)
- Emerging Crawley's Local Cycling and Walking Infrastructure Plan, consultation draft (Crawley Borough Council, 2020)Horsham District Council, Draft Infrastructure Delivery Plan (Horsham District Council, 2020)
- The London Plan 2021 (Greater London Authority, 2021)
- The Mayor's Transport Strategy 2018 (Greater London Authority, 2018)
- South East Route - Sussex Area Route Study Final (Network Rail, 2015)
- Strategic Economic Plan (2018-2030) (Coast to Capital, 2018)
- Transport Strategy (being developed) (Transport for the South East, 2019)
- Manual for Streets (Department for Transport, 2007)
- Manual for Streets 2 (Chartered Institute of Highways and Transportation, 2010)

[3] Control Periods are 5 year periods used by Network Rail to specify planning and investment in railway infrastructure. Control Period 5 runs from 2014 to 2019, Control Period 6 from 2019 to 2024, and so on.

Table 3.5.1: Summary of key regional and local policies

Policy	Description
Crawley 2030: Crawley Borough Local Plan 2030	
IN3 Development and Requirements for Sustainable Transport	Supports guiding development toward existing sustainable travel networks and requires satisfactory mitigations for unacceptable cumulative impacts on the networks. For major projects, requires preparation of a Transport Assessment.
IN4 Car and Cycle Parking Standards	Calls for developments within the Borough to include sufficient car and cycle parking per relevant planning obligations and agreements. Standards for non-residential developments to be based on particular requirements of the development.
IN5 The Location and Provision of New Infrastructure	States support for infrastructure improvements where these are required to support development within the Borough. Major facilities should be located in locations with high levels of multi-modal accessibility.
IN6 Improving Rail Stations	Improvements to Gatwick Station should support its function as an airport related interchange as well as enhancing the broader functions as a multi-modal interchange for rail, coach, and bus users.
GAT1 Development of the Airport with a Single Runway	Support development that contributes safe and efficient operations within the existing airport boundary, provided satisfactory mitigations are in place for surface access and other environmental impacts. Currently, the Council supports development of the airport in its existing configuration as a two-terminal, single runway facility with growth up to 45 mppa.
GAT3 Gatwick Airport Related Parking	Policy calls for new or replacement airport parking to be based on demonstrated need and to be sited within the existing airport boundary. This policy is guided by a desire to limit spill over of parking facilities into local communities and need to maintain high mode-share targets for sustainable transport to the airport.
Draft Crawley Borough Local Plan 2021 – 2037 (January 2021) – Consultation closed at the end of June 2021.	
SD1 Presumption in Favour of Sustainable Development	When considering development proposals the council will take a positive approach to approving development which is sustainable. Strategic objectives are provided and development will be supported where it meets the objectives.
SD2 Enabling Healthy Lifestyles and Wellbeing	New development must be designed to achieve healthy, inclusive and safe places, which enable and support healthy lifestyles and address health and wellbeing needs in Crawley, as identified in the Crawley Joint Strategic Needs Assessment.
ST1 Development and Requirements for Sustainable Transport	Development should be located and designed so as to encourage travel via the walking and cycling network and public transport routes, while reducing dependency on travel by private motor vehicle. Developments should meet the access needs they generate and not cause an unacceptable impact in terms of increased traffic congestion or highway safety. Developments will be considered acceptable in highways terms unless there would be an unacceptable impact on highway safety, or the cumulative impact on the transport network is severe and cannot be satisfactorily mitigated. Developments that generate a significant amount of movements should be supported by a Transport Statement / Assessment.
ST2 Car and Cycle Parking Standards	Development will be permitted where the proposals provide the appropriate amount and type of car and cycle parking (including electric vehicle charging infrastructure) to meet its needs when it is assessed against the borough council's car and cycle parking standards.
ST3 Improving Rail Stations	Any improvements or developments at Gatwick Station should support its function as an airport-related interchange and provide opportunities for broadening the function of the station as an interchange for surface travellers using rail, coach, Fastway and other buses consistently with the safe and efficient operation of the airport.
ST4 Safeguarding of a Search Corridor for a Crawley Western Relief Road	The Local Plan Map identifies a Search Corridor for a Crawley Western Link Road linking the A264 with the A23. This Search Corridor will be safeguarded from development which would be incompatible with the future delivery of a full Crawley Western Link Road.
GAT1 Development of the Airport with a Single Runway	The council will support the development of facilities which contribute to the sustainable growth of Gatwick Airport as a single runway, two terminal airport provided that the proposed use is appropriate within the airport boundary and contributes to the safe, secure and efficient operation of the airport, the impacts of the operation of the airport on the environment are minimised, adequate supporting infrastructure (particularly for surface access) can be put in place, and benefits to Crawley's local economy and community are maximised.
GAT3 Gatwick Airport Related Parking	The provision of additional or replacement airport-related parking will only be permitted where i) it is located within the airport boundary; and ii) it is justified by a demonstrable need in the context of proposals for achieving a sustainable approach to surface transport access to the airport.

Policy	Description
Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014)	
Policy CS17 Travel Options and Accessibility	States broad council commitment to working with relevant parties to manage travel demand, improve network efficiency for all road users, and facilitate sustainable transport choices.
Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2019)	
TAP1 Access, Parking and Servicing,	Sets forth highway design, multi-modal access, and car and cycle parking requirements for proposals within the Borough, as well as stating preference for proposals to promote safe, sustainable travel and incorporate travel demand measures. Requires a Transport Assessment as appropriate.
TAP2 Airport Car Parking	Precludes permission for airport related parking, including additional or replacement parking, within the district.
HOR09 Horley Strategic Business Park	The site is allocated for a strategic business park of predominantly offices, with a complementary range of commercial, retail and leisure facilities and at least 5 ha of new high quality public open space. It should be demonstrated through a Transport Assessment that there will be no severe residual impact on the local and strategic road network. Development will be subject to requirements / considerations, including a new dedicated, direct access onto the strategic road network (M23 spur), a secondary access to the site from Balcombe Road for use by emergency services, public transport and other sustainable transport modes, measures and improvements to manage the impact of additional traffic on surrounding local roads, and improvements to pedestrian / cycle routes. In the Examination in Public, it was concluded that access to the business park would range from “a new access to the existing roundabout through to a grade-separated junction, depending on the level of development traffic”.
Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009)	
CS18 Transport Options and Accessibility	States council preference for development with high levels of multi-modal accessibility on the existing network, and for schemes that include improvements for cyclists, pedestrians, and public transport users. Requires submission of Travel Plans to accompany major developments, to be implemented under an s106 agreement.
Mole Valley Local Plan 2000 (Mole Valley District Council, 2000)	
RUD28 Off Airport Car parking	Precludes permission for airport related parking, including additional or replacement parking, within the district.
MOV2 The Movement Implications of New Development	Proposals for development within the District should demonstrate compatibility with existing transport infrastructure and environmental character. As appropriate developers should provide for schemes and initiatives to provide adequate capacity for the development and provide provisions for all road users.
MOV5 Parking Standards	States that current car parking standards are applied as maximums for developments within the district and should be examined in regard to the site's accessibility by other modes and opportunities to contribute to improved public transport networks.
Draft Future Mole Valley 2018-2033	
INF1 Promoting Sustainable Transport and Parking	New development will be required to contribute to the delivery of an integrated, accessible and safe transport network, and maximise the use of sustainable transport modes; including walking, cycling and public transport. Where practical, taking account of the scale and nature of the development, the policy sets out requirements for proposals. New development will be required to provide and contribute towards suitable access, transport infrastructure and services that are necessary to make the development acceptable, including the mitigation of its otherwise adverse material impacts. Development of new off-airport car parking facilities or extensions to existing sites related to Gatwick Airport will not be supported unless a specific need can be demonstrated, and all realistic alternatives have been examined.
Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015)	
Policy 40 Sustainable Transport	Encourages and supports development proposals seeking to manage travel demand by promoting and improving sustainable transport options.
Policy 41 Parking	Calls for adequate parking, including for cars, bicycles, and motorcycles, to be provided within new developments generally. Precludes permission for airport-related parking within the district, unless no feasible alternative is available to meet a demonstrated need.

Policy	Description
Draft Horsham District Local Plan 2019-2036 (Horsham District Council, 2020)	
Strategic Policy 41 - Infrastructure Provision	The release of land for development will be dependent on there being sufficient capacity in the existing local infrastructure to meet the additional requirements arising from new development, or suitable necessary mitigation arrangement for the improvement of the infrastructure, services and community facilities caused by the development being provided. Where there is a need for extra capacity, this will need to be provided in time to serve the development or the relevant phase of the development, in order to ensure that the environment and amenities of existing or new local residents is not adversely affected. To ensure required standards are met, arrangements for new or improved infrastructure provision will be secured by Planning Obligations/Community Infrastructure Levy, or in some cases contributions attached to a planning permission, so that the appropriate improvement can be completed prior to occupation of the development, or the relevant phase of the development.
Strategic Policy 42 - Sustainable Transport	There is a commitment to developing an integrated community connected by a sustainable transport system. In order to manage the anticipated growth in demand for travel, development proposals which promote an improved and integrated transport network, with a re-balancing in favour of non-car modes as a means of access to jobs, homes, services and facilities, will be encouraged and supported.
Policy 43 - Parking	Adequate parking and facilities must be provided within developments to meet the needs of anticipated users. Consideration should be given to the needs of cycle parking, motorcycle parking, and vehicles for the mobility impaired. Adequate parking and plug-in charging facilities must be provided to cater for the anticipated increased use of electric, hybrid or other low emission vehicles. Planning permission will not be granted for off-airport parking facilities related to Gatwick Airport unless a need can be demonstrated and no other realistic alternatives is available.
Policy 44 - Gatwick Airport Safeguarded Land	Land identified on the Local Plan Policies Map will be safeguarded from development which would be incompatible with expansion of the airport to accommodate the construction of an additional wide spaced runway (if required by national policy) together with a commensurate increase in facilities that contribute to the safe and efficient operation of the expanded airport. Minor development within this area, such as changes of use and small scale building works, such as residential extensions, will normally be acceptable. Where appropriate, planning permission may be granted on a temporary basis. The airport operator will be consulted on all planning applications within the safeguarded area.
Tandridge District Core Strategy 2008 (Tandridge District Council, 2008)	
Policy CSP12 Managing Travel Demand	Developments to provide transport infrastructure improvements as appropriate, inclusive of all road users. Improvements to key corridors are supported, including the M23/A23 corridor.
Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014)	
Policy DP5 Highway Safety and Design;	In addition to adherence to relevant highway design guidance, requires developments to avoid creating unnecessary traffic flow impediments or roadway hazards, ensure safe and suitable access to all road users, to maintain existing active travel networks, and to fund, as appropriate, mitigation measures for significant impacts. Calls for a Transport Assessment for developments generating significant amounts of traffic.
Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019)	
Policies TLP50 Sustainable Transport and Travel	Calls for proposals to demonstrate broad conformity with the vision and objectives in the Surrey Local Transport plan, especially as regards active travel and air quality, and seeks to guide development to appropriate locations with a range of transport options. Requires preparation of a Transport Assessment and Travel Plan, as appropriate, to ensure appropriate mitigation measures for adverse impacts to traffic and the environment. Sets forth objectives to promote and enhance public transport, electric vehicle infrastructure, and active travel networks.
TLP51 Airport Related Parking	Precludes permission for airport related parking, including additional or replacement parking, within the district.
Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018)	
Policy DP21 Transport	Requires developments within the District to support West Sussex Transport Plan (2011-2026) objectives, which promote ensuring provision of high quality, resilient, safe and healthy, and sustainable transport network and outlines evaluation criteria for support. Transport Assessment along with Travel Plans are required as appropriate for developments generating significant amounts of movement.

Policy	Description
Saved policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004)	
T4 New Development	Calls for new development to adhere to sustainability requirements through siting in built up areas near existing public transport provision, seeking to limit new private car trips, and providing convenient and safe cycling and pedestrian infrastructure.
T5 Parking Standards	Proposals should adhere to latest parking standards for the district, and not provide parking in excess of guidance.

4 Assessment Methodology

4.1.1 This section describes the methodology, including modelling approach and assumptions used, to assess the impact or the effects of additional passengers, staff and cargo forecast for Gatwick Airport on the surface transport network.

4.1.2 The methodology and the inputs described have been discussed with key stakeholders in a series of meetings held through 2019-2021 and dialogue is ongoing.

4.1.3 In particular, strategic modelling has been developed with input from key stakeholders including DfT, Highways England and Local Authorities including West Sussex and Surrey County Councils through a series of technical workshops and reviewing of specific modelling technical notes when the base model was being developed (2019 to early 2020). These workshops are being restarted as of July 2021 to finalise the base and forecast year models to inform the application for development consent.

4.2 Stakeholder Consultations

4.2.1 Stakeholder engagement meetings and workshops are documented in Table 4.2.1.

Table 4.2.1: Ongoing Stakeholder Engagement

Consultee	Date	Details
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.
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.
	01 October 2019	Meeting to discuss modelling findings and potential mitigation. Highways England set out its expectations around process, engagement, 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 to discuss updates and evolution of proposed mitigation, including model assessment years, an alternative arrangement for North Terminal Roundabout, consideration of how to build highway works offline to reduce the traffic impacts of construction, as well as potential changes to posted speed limits.
	26 October 2020	Meeting with Highways England to confirm the recommencement of the Project after a pause because of the Covid pandemic. This included a recap on where the work had got to in Spring 2020 and next steps.
	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 highway mitigation, VISSIM modelling demonstrating the appropriateness of the highway mitigation, strategic transport modelling including highway modelling and a proposed engagement schedule with Highways England.
	13 April 2021	Meeting to provide new team members at Highways England with an overview of the highway network serving GAL and the design development of highway mitigation to support growth at the Airport with NRP.
	17 May, 27 May, 15 June 2021	Meetings between GAL, Highways England and Arup on a programme of engagement through to DCO submission in summer 2022.
West Sussex County Council	15 April 2019	Meeting held with West Sussex surface access and modelling leads to discuss Master Plan scenarios, West Sussex's expectations, a potential modelling approach and study area, including access to the Crawley model network, which has since be provided to GAL.
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.
	11 July 2019	Meeting to discuss and agree preliminary Legion modelling of the station, as presented in Section 12.
	04 December 2019	Meeting to discuss use of rail to transport project-related construction materials and spoil.
	10 December 2019	Meeting to discuss further Legion modelling of the station and to discuss route capacity enhancements.
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) network, which has since been provided to GAL.
	04 November 2019	Meeting to discuss expectations for assessment, potential modelling approach and study area, assumptions regarding rail access and onward travel across London.
	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.
Local Authority Topic Working Group	21 August 2019	Meeting held with various Local Authorities (LAs) as the start of ongoing engagement with LAs, following the official announcement by GAL of its intention to submit a DCO application.
	04 February 2020	The assessment for the PEIR was presented and discussed including forecasting, the highway assessment, the public transport assessment including rail and station, construction, the highway mitigation options, the Airport Surface Access Strategy and initial mode share targets. Progress with the strategic transport modelling was also presented.
	27 July 2021	Meeting held with various Local Authorities (LAs) to provide an update on emerging findings from the assessment for PEIR including updated forecasts, draft actions and targets in the Airport Surface Access Strategy 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.

Consultee	Date	Details
	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.
	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.
	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.
	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.
	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.
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.
	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.

4.3 Modelling Approach

4.3.1 For the purpose of the assessment, GAL has developed a bespoke suite of inter-related strategic modelling tools. The development and structure of these modelling tools has been shared with Department for Transport, Highways England, Network Rail and the Local Authorities as statutory consultees prior to consultation.

4.3.2 An overall model architecture has been developed. Diagram 4.3.1 shows the proposed overall modelling structure that the Gatwick Strategic Model will follow. This aligns with the approach in WebTAG (Unit M1.1) (Department for Transport, 2014). It comprises three core model components.

- The demand model – capable of reflecting changes in the distribution and mode of non-airport demand and the mode of travel for airport demand (passengers, employees, freight and logistics movements).
- Assignment models – capable of establishing the likely routes taken by airport and non-airport demand and producing costs for the demand model.
- Simulation models – used for the detailed operational assessment of key pieces of infrastructure at and adjacent to the Airport, including the impacts of proposed mitigation.

Demand Model

4.3.3 A variable demand model has been developed to identify the background (non-Gatwick) trips. Alongside this sits a specific demand model for Gatwick Airport trips for two main reasons:

- more model detail is required – more modes (eg taxi), different segmentation (eg UK/overseas) and additional time periods customised to the specific circumstances of Gatwick Airport; and
- there are different choices and sensitivities – eg air passengers have no flexibility to change destination as they have to get to the airport. They also have different values with regard to journey time compared to general background trips.

4.3.4 Therefore, the development of the airport mode choice model has enabled the assessment of the relevant access/egress modes taken across the day for both passengers and employees. The mode choice model includes assumptions for the availability and performance of both the highway and public transport networks as the model is integrated with both the public transport (rail, bus and coach) and highway (car (kiss and fly, park and fly), taxi, Light Goods Vehicles (LGV) and Heavy Goods Vehicles (HGVs)) models.

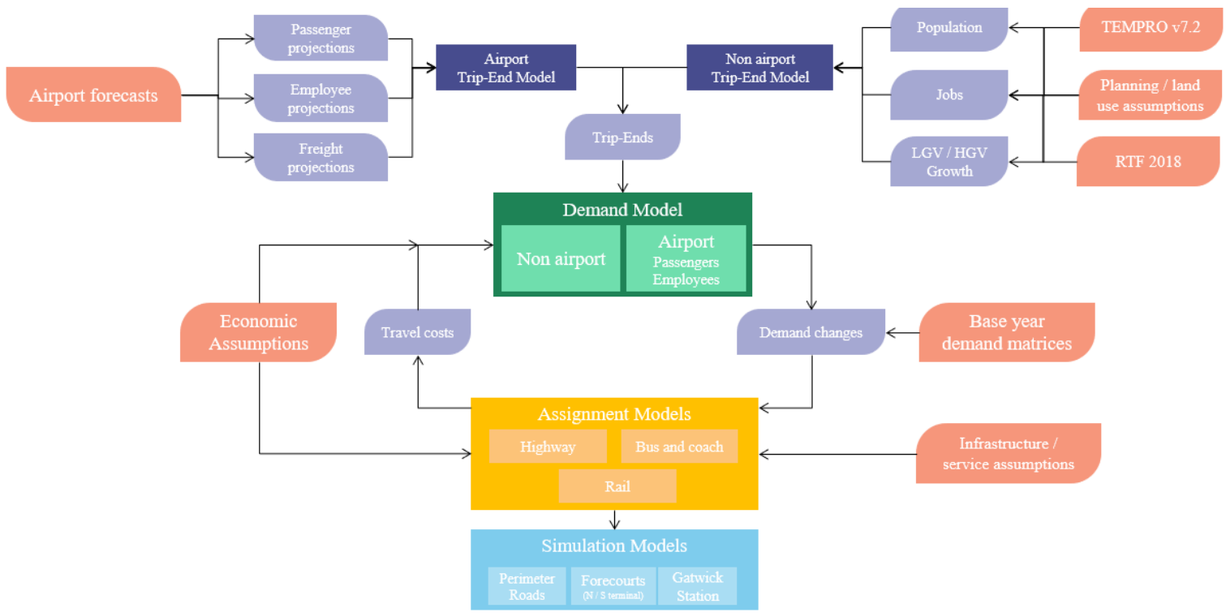
Public Transport

4.3.5 The public transport assignment model has used the PLANET South model as a basis for rail assignment and a new EMME model has been developed for bus/coach travel to create a bespoke Gatwick public transport model.

4.3.6 Department for Transport's strategic rail model is called PLANET. PLANET is split into four geographic regions (North, Midlands, South and National) with the PLANET South Model covering London and the South East as well as the South West, East of England and the Midlands. It is an AM peak model covering the south of England. It is focussed on national rail (TOCs) but London Underground, DLR and Croydon Tramlink services are also included to provide London access and cross London connectivity for rail trips. The Department for Transport supports the use of PLANET South as the base model for development of the Gatwick model.

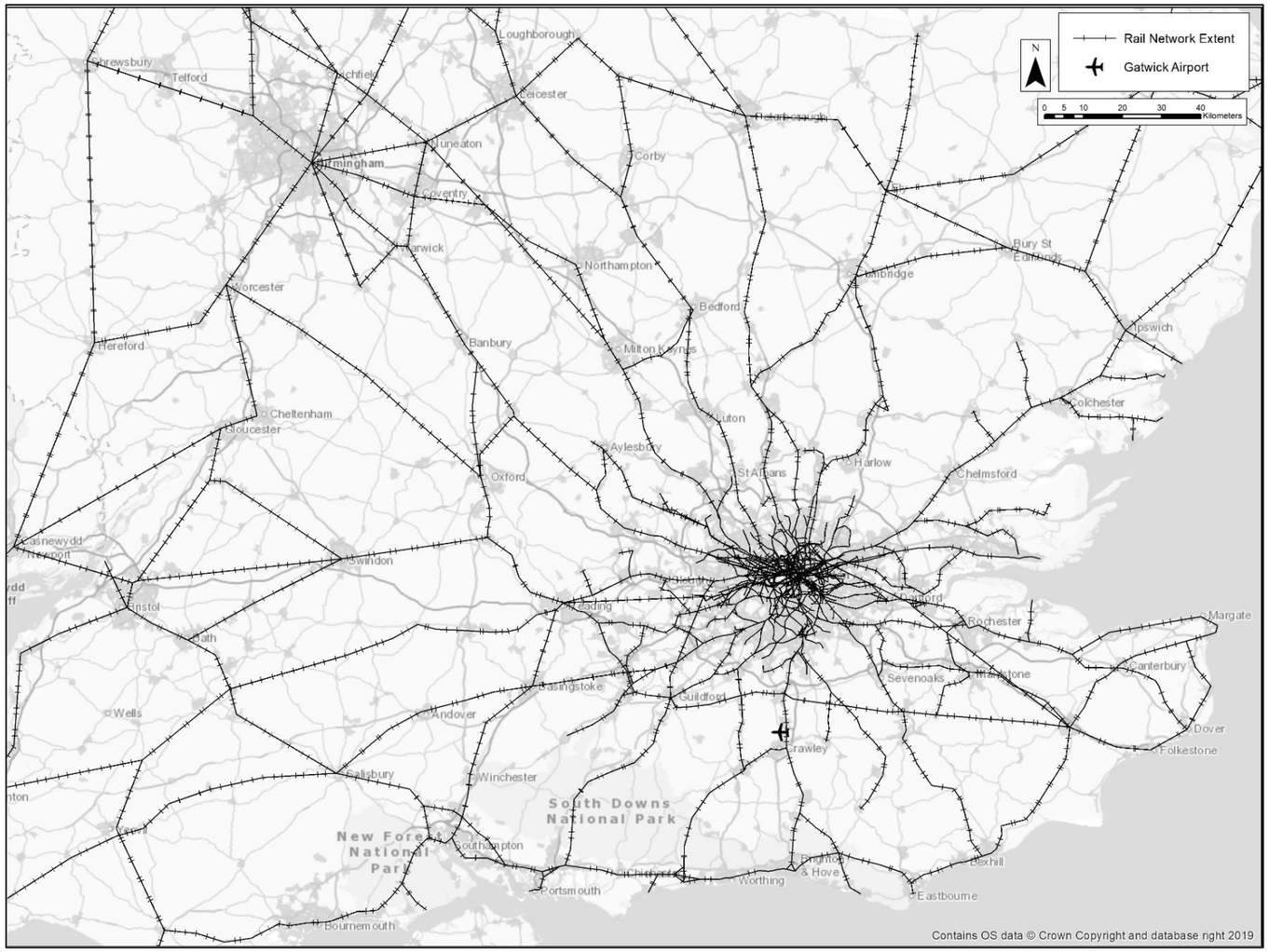
4.3.7 PLANET South was used for determining the study area for public transport and the assessment of rail effects such as capacity and crowding with and without the Project. The affected rail network in PLANET South showed that the minimum extent of rail network coverage should be from the Sussex coast to central London plus the North Downs Line between Gatwick and Reading (see Section 7). Moreover, given that travel to Gatwick for many passengers, requires cross-London travel, full coverage of PLANET South to locations north of London such as Stevenage, Peterborough and Cambridge have also been included. A plan showing the PLANET South model area is shown in Diagram 4.3.2.

Diagram 4.3.1: Proposed Model Architecture



4.3.8 Meanwhile, the bus/coach model includes all bus services that operate to, from or within the Crawley, Horley and Gatwick area. In addition to all the coach services operated by Megabus and National Express nationwide, plus other coach operators operating services at Gatwick Airport. The bus/coach model has been developed as a standard public transport frequency-based assignment tool using the inbuilt modules of the EMME software and applying a standard generalised journey time function with weight on the components of time as recommended in TAG.

Diagram 4.3.2: Proposed Rail and Public Transport Assignment Model



Highways (Strategic)

4.3.9 The Gatwick strategic highway model uses SATURN, which is the software used for strategic highway modelling by all the source highway models. Gatwick's model has been developed using Highways England's South East Regional Transport Model (SERTM). SERTM is the basis for generating a sub-regional highway assignment model that can be used to test strategic network effects specifically related to Gatwick Airport as well as providing input into any environmental analysis for noise and air quality.

4.3.10 SERTM was developed as one of five strategic models by Highways England and focuses on London and the South East. In terms of its coverage, it includes the entire south east of England, from The Wash and Oxford to Southampton. It includes detailed simulation of all motorways and 'A' roads, plus all 'B' roads and any 'C' roads that play a material role in allowing traffic to access the Strategic Road Network (SRN). The model includes in less detail the rest of UK (south west, Midlands, north, Wales and Scotland) and all motorways and 'A' roads, and all important 'B' roads that could affect the long distance routing of traffic in the South East.

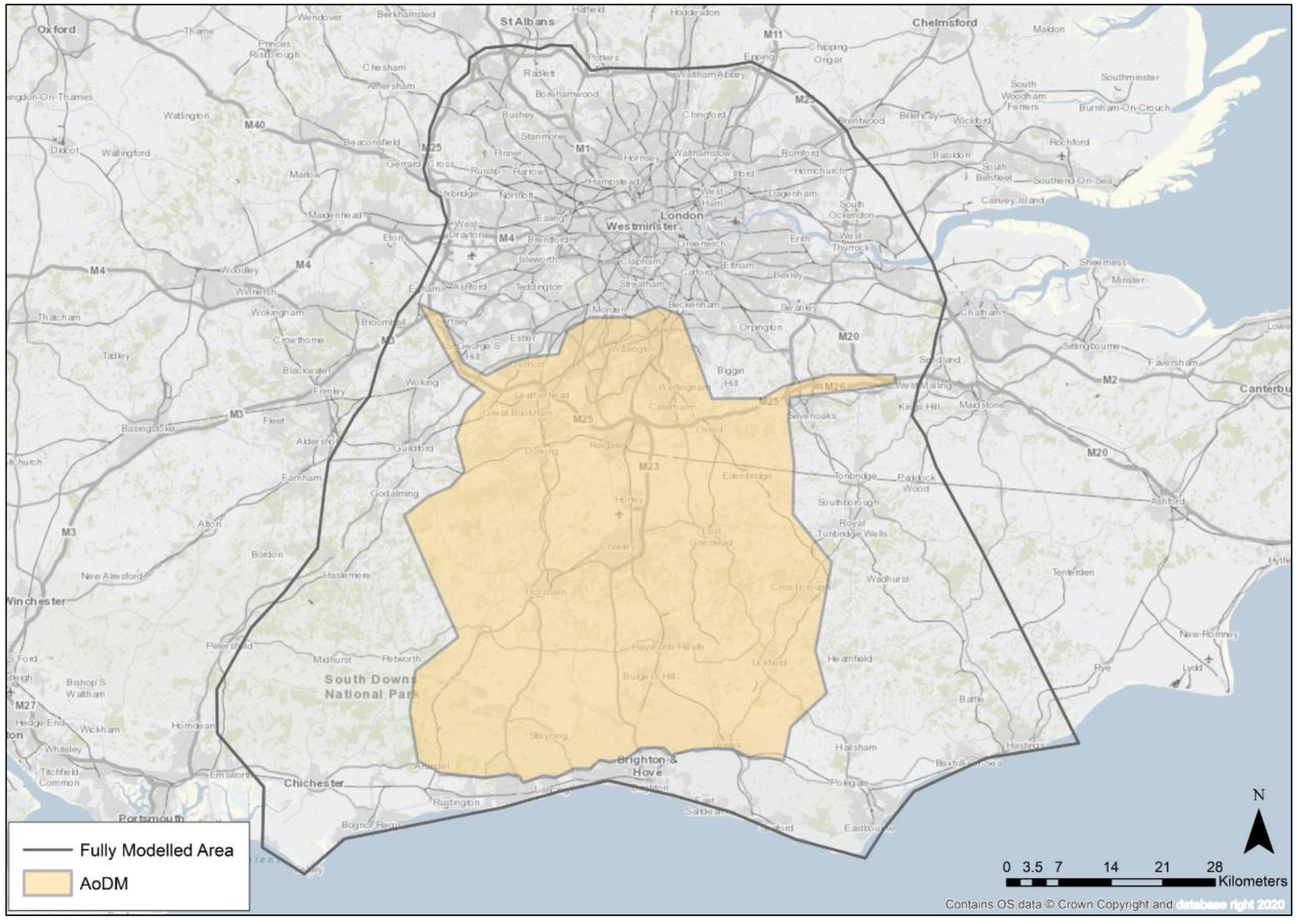
4.3.11 The Gatwick Highway Model has refined SERTM locally to add additional network detail and zoning. This update has made use of West Sussex's Crawley Local Transport Model (CLTM) and Transport for London's London Highway Assignment Model (LoHAM) for network coding in Crawley, Horley and the area of South London.

4.3.12 SERTM has been used for determining the study area for the highway network in addition to the extents being informed by previous experience and understanding of Gatwick's transport effects from modelling work to support various expansion proposals put forward by Gatwick Airport since 2013. Model coverage has been shared with key stakeholders.

4.3.13 The coverage of the highway assignment model is shown in Diagram 4.3.3 in which the more detailed simulation area is shown in yellow, with the fully modelled simulation area defined by a black outline. The simulation area includes the A27 between Chichester and Hastings which has been included in the modelling following discussions with West Sussex County Council. It should be noted that, while the whole of London is shown as simulation area, other than for an area in South London, the network is represented as fixed speeds which is the methodology adopted in SERTM. The area shown outside the fully modelled area is termed as "buffer network" which provides the key feeder links to the simulation area. Note this buffer area has been expanded when compared to SERTM to include links to Gatwick passenger origins and destinations.

4.3.14 The strategic highways model developed in SATURN is the primary highway assessment tool used for the PEIR, informing demand on links and through junctions as well as variation in speeds to be fed into more detailed junction modelling using VISSIM as well as into air quality and noise models.

Diagram 4.3.3: Highway Assignment Model Coverage



Highways (Local)

4.3.15 Local to Gatwick, Gatwick has developed three VISSIM traffic simulation models, comprising the detailed models of the North and South Terminal forecourts and a model of the wider network known as the Corridor Model.

4.3.16 The Corridor Model includes south Horley from the junction at Massetts Road and A23 Brighton Road, down through Longbridge Roundabout, east through North and South Terminal Roundabouts, along the M23 Spur to Junction 9 of the M23. The model also extends down the A23 London Road into North Crawley, including roads connecting to the Manor Royal estate.

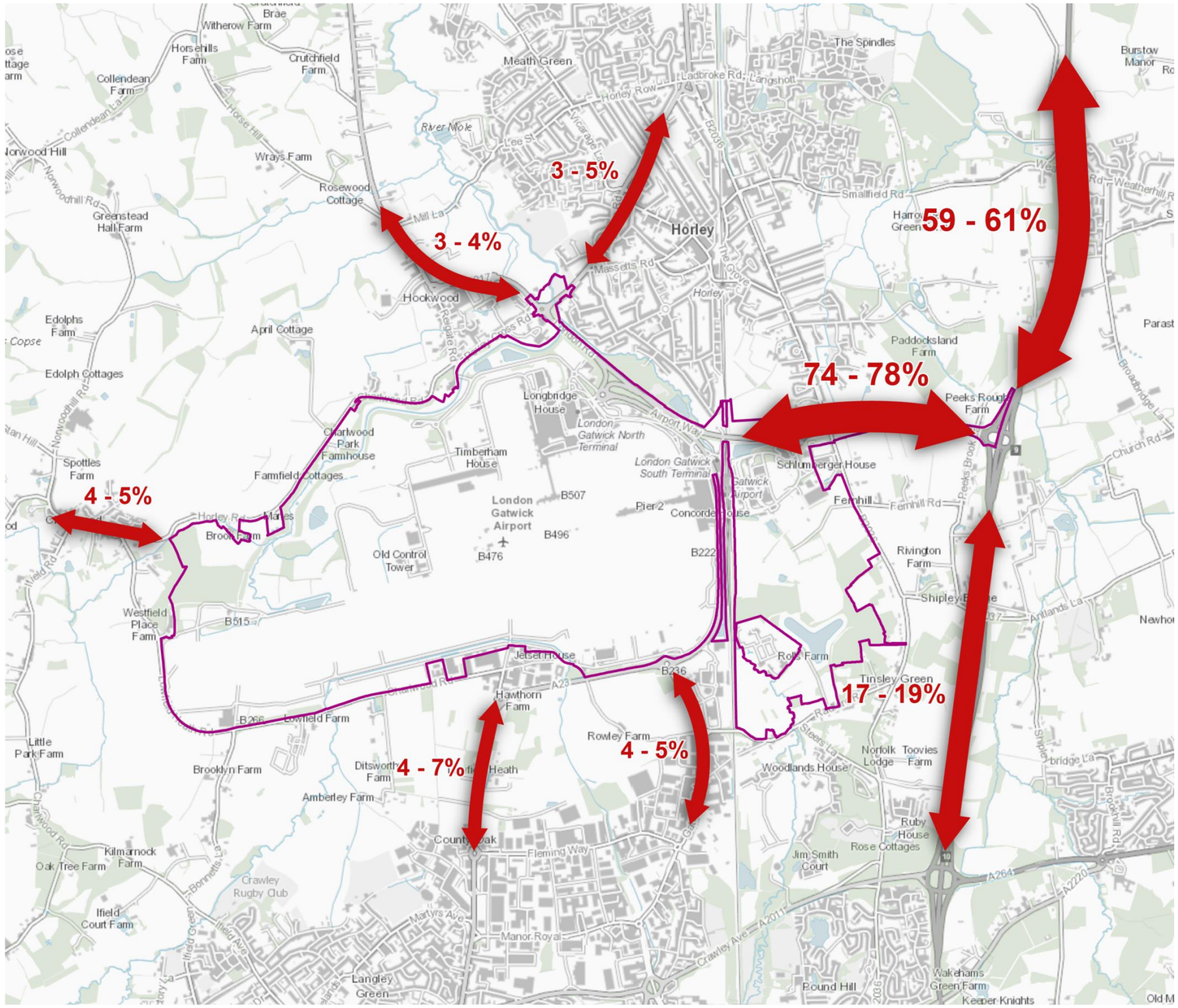
4.3.17 In 2016, the Corridor Model was recalibrated based on an extensive data collection exercise. Calibration of the 2016 Corridor Model shows that the model satisfies WebTAG requirements, with 90% calibration over the 24 hour simulation for turning counts and with 87% to 100% validation in terms of known journey times by route within one minute or a 15% variance.

4.3.18 Given this high degree of calibration and validation, the rebased 2016 Corridor Model is considered a robust base to test highway junction performance and congestion effects of growth at the Airport both in the baseline and with Project. VISSIM is a more appropriate tool for this detailed assessment than a strategic highway model, though demand in the VISSIM models is informed by the strategic highway model.

4.3.19 As per Diagram 4.3.4, model data shows that almost 80% of airport-related traffic is expected to use the M23 Spur in peak periods. Most of this traffic comes from the M23 to the north, ie most traffic comes from the M25 and London. Around 20% of road trips to Gatwick Airport are from the south, also via the M23. The remaining airport-related road trips are distributed in smaller proportions across the more local highway network to the north, west and south of the airport.

4.3.20 The VISSIM Corridor Model is therefore an appropriate tool for the assessment of traffic and congestion around the Airport as it includes the main east-west corridor, including the M23 Spur, A23 London Road and Airport Way, between and including M23 Junction 9 and Longbridge Roundabout.

Diagram 4.3.4: Proportion of Gatwick Traffic on the Highway Network, 2047



Station and Inter-Terminal Shuttle

4.3.21 In order to test the effects of future passenger growth on the railway station, South Terminal departures and the inter-terminal shuttle system, Gatwick is using the Legion model developed, validated and calibrated by Network Rail for the committed Station Project (see Section 13.1) to test the effects of future growth on passenger densities and crowding.

4.4 Assessment Scenarios

4.4.1 Modelling will consider the following assessment years to test and analyse the peak construction phase and the operation of the Airport without and with the Project

- The baseline year is 2016, which matches the base year of the modelling tools being used and reflects an extensive data collection exercise undertaken by GAL in that year, 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. The 2016 dataset has been extrapolated to describe relevant 2018 conditions for the air quality and carbon assessments, where required. Given industrial action by Southern Rail 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 the Covid-19 pandemic, it has not been possible to update this base position with a more recent dataset. It should be noted that the Project is assessed against Future Baseline years, rather than against 2016 data.
- The baseline scenario is used to describe existing transport infrastructure and the performance of the transport network prior to expansion. In order to provide comparison with other environmental modelling workstreams a 2018 forecast was provided from the model to support these assessments. This is particularly pertinent to the Environmental Impact Assessment (EIA).
- 2029 First Full Year of Operation: The first year of operation after opening of the northern runway is anticipated to be 2029, accordingly this would be the first operational year modelled and tested.
- 2032 Interim Assessment Year: An interim assessment year, 2032, will be tested which is when all slots on the northern runway are likely to have been filled and the highway mitigation is expected to be in place. This horizon has been tested both without and with the Project.

- 2047 Ultimate Year: Reflecting a requirement under the Design Manual for Road and Bridges Vol. 5, Sec. 1 (TD37/93) (Highways England, 1995) to assess the effects of a project 15 years after it has been completed. Airport passenger and staff numbers are also higher in 2047 than 2032 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.
- Construction Traffic Scenarios:
  - Understanding the impact of peak construction vehicle traffic on the highway network. An airfield construction scenario has been tested, with peak construction activity in 2026/27. The construction trips have been added to 2029 baseline traffic levels. This is conservative but reasonable as traffic flows in 2029 will be a few percent higher than in 2026/27, albeit within the daily variation in any given year.
  - Understanding the impact of constructing highway mitigation, including grade-separation, on the network and the potential reassignment of traffic this may cause as drivers seek alternative routes. This has been tested for 2029 and assuming the Project is operational. The test therefore includes increased operational airport traffic as a result of the northern runway.

4.4.2 The central case for the assessment is based on Heathrow's third runway not coming forward (as described in more detail in Section 5.10.4).

4.4.3 In terms of cumulative demand impacts, further discussion is provided in Section 6.5.

5 Current Transport Network, Operations and Performance

5.1 Existing Travel Demand

5.1.1 The main sources of data for travel demand are:

- The Civil Aviation Authority (CAA) – for passenger data; and
- Gatwick Employee surveys and travel to work surveys.

5.1.2 The CAA undertakes regular independent surveys of the air passengers using Gatwick and this is a primary source of information about the patterns of travel by air passengers.

5.1.3 Gatwick carries out employee surveys and travel to work surveys for airport employees every five years. The most recent staff survey was carried out in 2016.

Passengers

5.1.4 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.

5.1.5 Passenger numbers at Gatwick decreased from over 46 million passengers per annum (mppa) in FY2018/19 to 10.2 mppa in FY2019/20. 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.

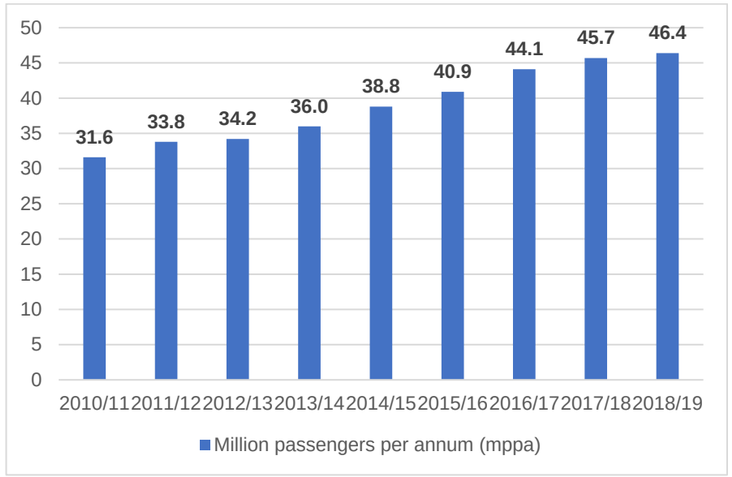
5.1.6 Prior to the Covid-19 pandemic, Gatwick Airport handled over 45 mppa in FY2017/18 and over 46 mppa in FY2018/19, as shown in Diagram 5.1.1. In FY2017/18, Gatwick was the seventh busiest airport in Europe, with the twelfth largest long-haul network, serving 200 destinations including over 60 long-haul routes. Mirroring this growth in long-haul passenger flights, cargo volumes were also growing.

5.1.7 Prior to the Covid-19 pandemic, Gatwick has been Europe's busiest point-to-point airport, with less than 10% of passengers transferring between flights. This high proportion of originating and terminating passengers places significant emphasis on surface access capacity.

5.1.8 In FY2017/18, 92% of all Gatwick passengers used the airport for an international flight, with 73% of passengers travelling on short haul international flights to European business centres.

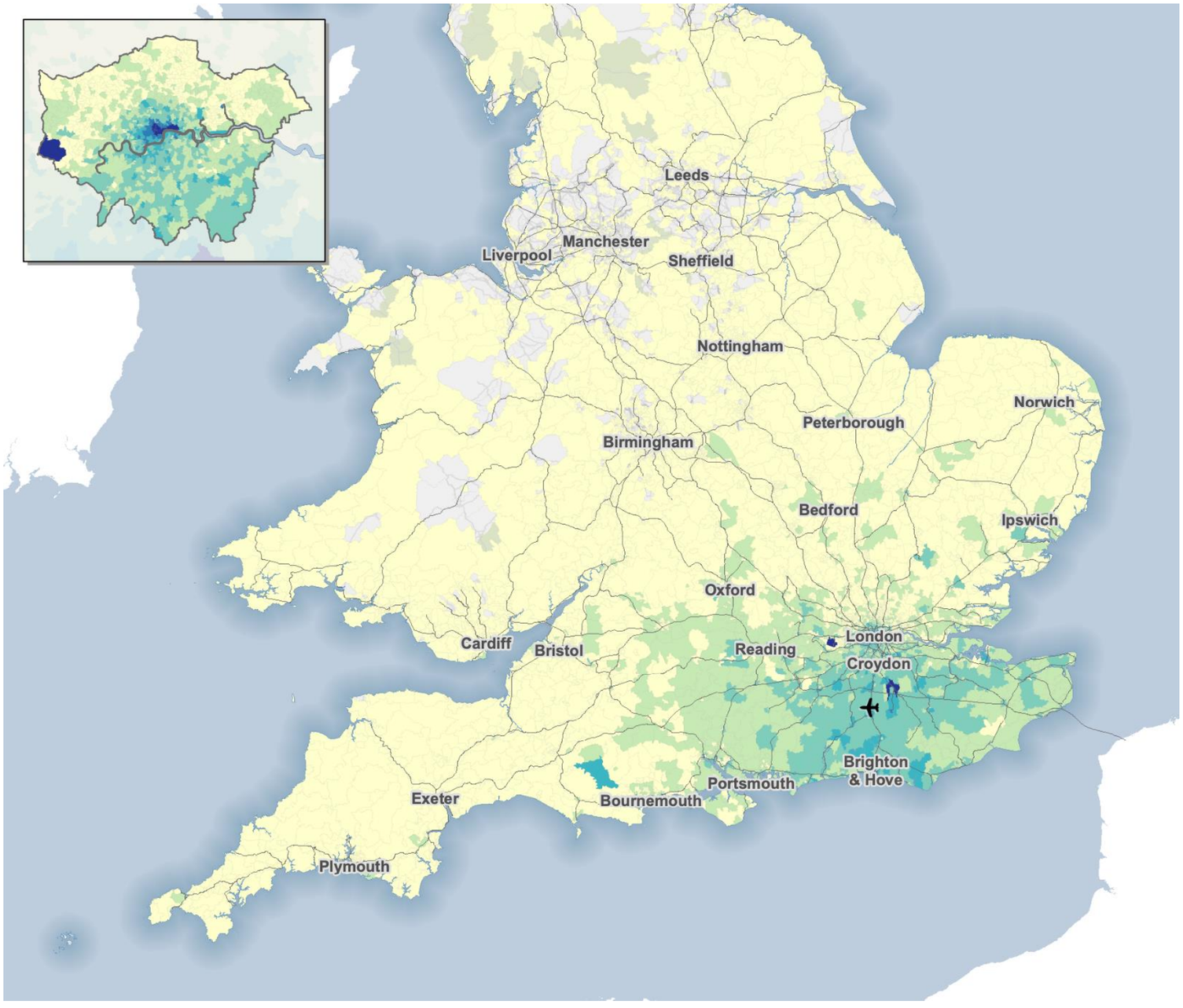
5.1.9 CAA passenger data has been analysed by mode for non-transfer passengers, which illustrates the distribution of passenger origins. Diagram 5.1.2 provides an illustration of the summary analysis, showing data for all surface access modes from the 2017 CAA passenger survey.

Diagram 5.1.1: Gatwick Passengers to FY2018/19 (million passengers per annum, or mppa)



5.1.10 Gatwick's proximity to London and extensive surface access links to the wider South East (and beyond) give it a wide catchment area. Recent CAA passenger survey data shows a total of 81% of Gatwick's originating and terminating passengers (i.e. excluding transfer passengers) travelling from/to destinations in London or the South East. Greater London is the largest source market (42%), but nearby counties Kent, Surrey and East and West Sussex account for a further 27%. Of the 19% of passengers travelling to/from destinations outside the South East, the majority travel to/from the East or the South of England.

Diagram 5.1.2: CAA Catchment Analysis for Gatwick Passengers (Average Day, June 2016)



Staff

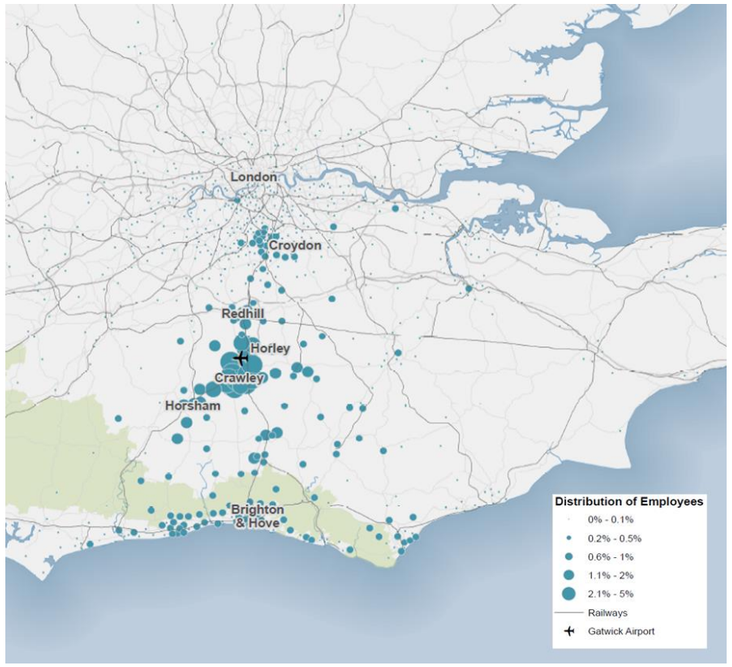
5.1.11 In 2016, nearly 24,000 people worked at Gatwick Airport. To better understand the commute patterns of airport staff, GAL routinely undertakes a travel-to-work survey, typically every 4 years. The most recent survey was taken in 2016 and received upwards of 5,300 responses (Gatwick Airport Ltd, 2016), building on the 2008 and 2012 surveys and showing a trend towards more sustainable modes, despite significant rail disruption at that time. It is unclear when the next staff survey will be undertaken owing to the impact of Covid-19. 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.

5.1.12 The 2016 survey showed that many of Gatwick's staff live within a short distance of the airport. Approximately 11% of staff travelled 3 miles or fewer to work and an additional 36% travelled between 4 and 10 miles. Overall, half of staff began their journey within 15 miles of the Airport.

5.1.13 Analysis of 2016 survey data shows that 63% of staff lived in East and West Sussex, about half of whom lived in Crawley, with significant numbers in the Horsham area also. An additional 19% of employees lived in Surrey, largely concentrated in Horley and Redhill. Significant clusters of employees also lived along the Brighton Mainline in Croydon and Brighton and Hove. The distribution of Gatwick employee home locations is shown in Diagram 5.1.3.

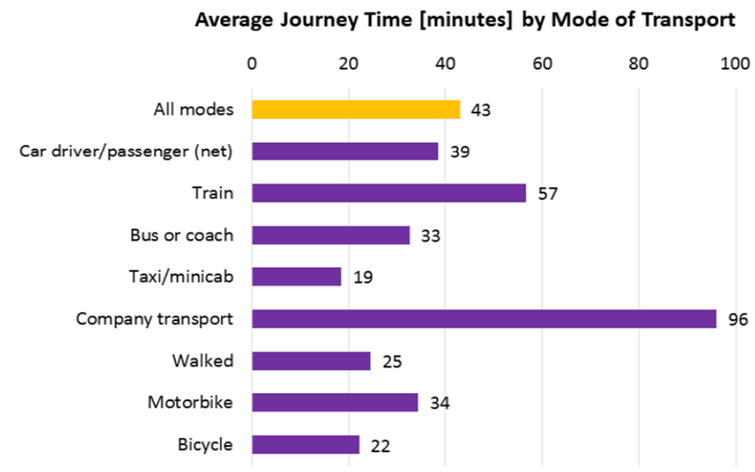
5.1.14 Staff journeys vary by mode of travel but the typical journey time is 43 minutes, as shown in Diagram 5.1.4. However, as noted above, many employees live in close proximity to the airport and thus tend to have much shorter journey times. Half of all employees' journey to work has been surveyed at 30 minutes or less; 24% have journey times between 11 and 20 minutes; and 9% have a journey of 10 or fewer minutes.

Diagram 5.1.3: Distribution of Home Location for Gatwick Employees



Source: Arup analysis of 2016 Gatwick Employer and Travel to Work Survey data

Diagram 5.1.4: Journey Time to Work for Gatwick Employees



Source: 2016 Gatwick Employer and Travel to Work Survey

5.2 Mode Share

Passengers

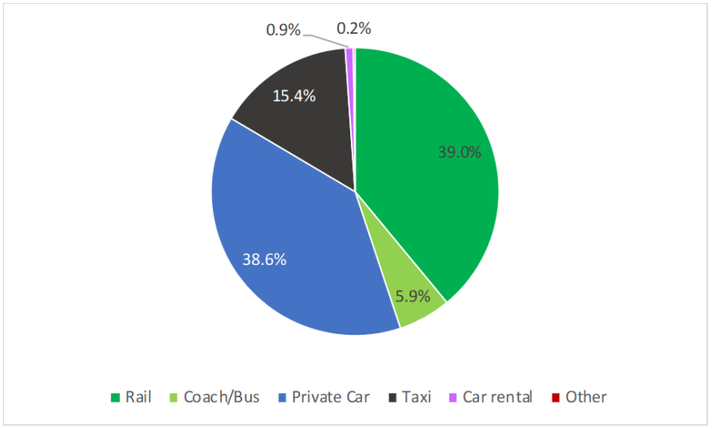
5.2.1 In 2012, Gatwick Airport set itself a target of achieving a 45% public transport mode share as the airport continued to grow beyond 40 million passengers per annum.

5.2.2 As set out in the Master Plan (Gatwick Airport Ltd, 2019), Gatwick achieved a public transport mode share for passengers of 45% in 2017, with 39% of passengers coming to the Airport by rail and almost 6% by bus and coach. Around 55% of passengers accessed 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. The 2017 passenger mode share at the Airport is shown in Diagram 5.2.1

5.2.3 Ongoing CAA surveys to first quarter 2020 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, as per Diagram 5.2.12.

5.2.4 Diagram 5.2.23 shows quarter-by-quarter passenger mode share data, as provided by CAA, is an important consideration for the assessment and this PTAR. This shows that public transport mode share is highest in the autumn and winter, October through to March, owing to the passenger mix in those months. However, the assessment of the future impact with Project has been undertaken to test a busy summer day at the Airport which is when public transport mode share is at its lowest owing to the higher proportion of UK outbound leisure passengers. Accordingly, when considering outputs of any mode share modelling, it is important to understand that the average annual mode share will be higher than the summer mode share, as discussed further in Section 7.

Diagram 5.2.1: Mode Share data for Gatwick Passengers



Source: 2017 CAA Data

Diagram 5.2.2: Mode Share data for Gatwick Passengers to Q1 2020

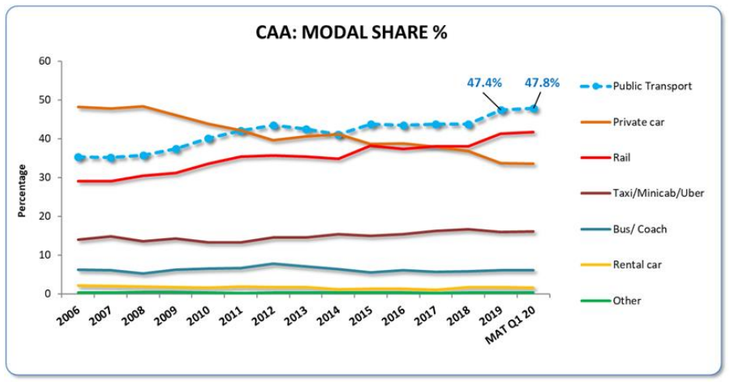


Diagram 5.2.3: Mode Share data for Gatwick Passengers by Quarter

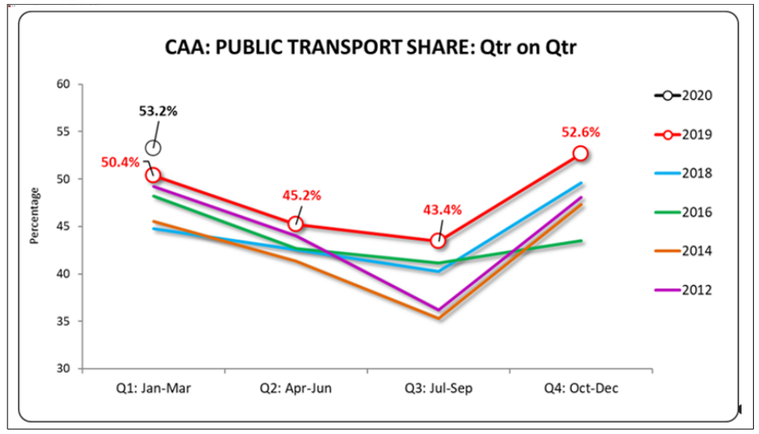
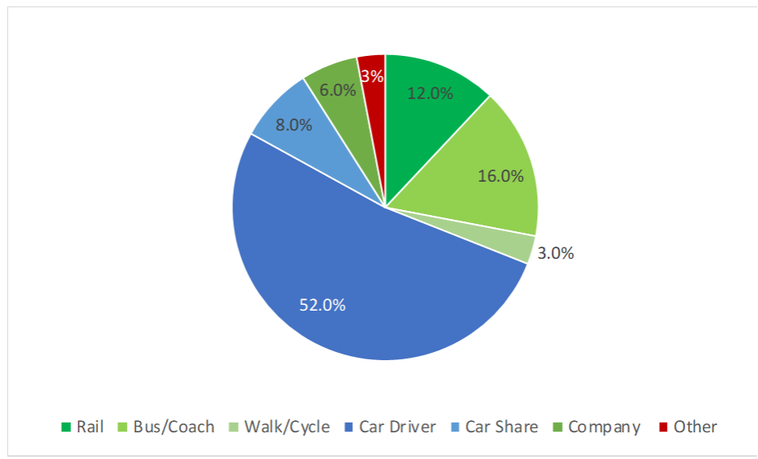


Diagram 5.2.4: Mode Share data for Gatwick Employees



Source: 2016 Gatwick Employer and Travel to Work Survey

Staff

5.2.5 In the 2016, the staff travel survey showed that the sustainable mode share for employees was 31% excluding car share (39% with), as per Diagram 5.2.4.

5.2.6 Owing to changes in shift patterns, corresponding to a busier early morning schedule of flights, and a higher proportion of aircrew that rotate between more than one London airport, there have been challenges around how staff get to work by public transport. GAL has worked with the local operator Metrobus to make more bus services available 24 hours a day, serving the Crawley and Horley areas where a significant proportion of staff live. Staff receive discounts on both bus and rail journeys with local operators. Recent rail timetable changes will also support a higher rail mode share by staff.

5.3 Rail

5.3.1 Gatwick Airport station has regular, direct daily services from over 120 stations. Over 800 stations are accessible with one interchange.

5.3.2 There are four service brands provided by two 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. Two trains per hour extend to Brighton at peak times.
- **Southern** provides services across London and the South-East, including London Victoria, London Bridge, Clapham Junction, Brighton, Southampton, Eastbourne and Portsmouth, as well as many local stations.
- **Thameslink** connects Gatwick to the south coast at Brighton, central London through London Bridge, St. Pancras International and Farringdon, and north to Bedford. Thameslink also provides a direct train to Luton Airport Parkway.
- **Great Western Railway** runs an hourly service between Gatwick Airport and Reading, via Redhill, Reigate and Guildford.

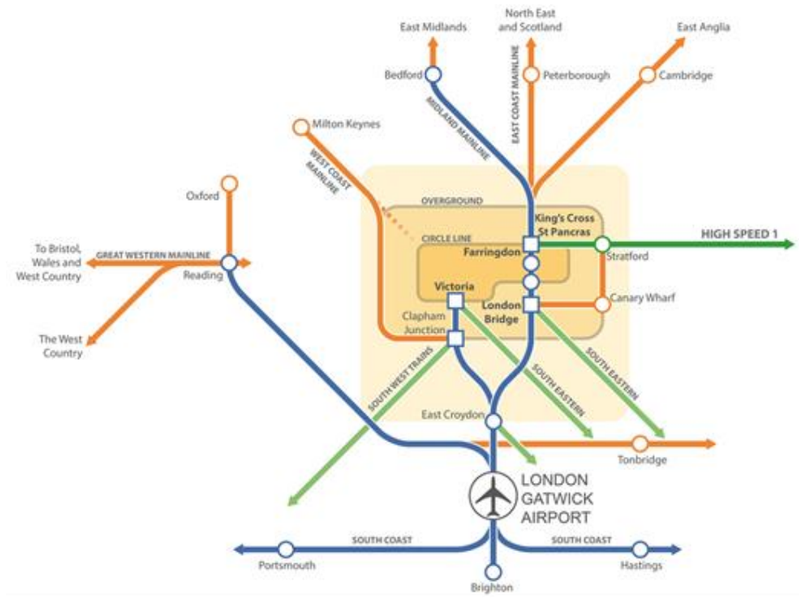
5.3.3 Peak rail frequencies are provided in Table 5.3.1

5.3.4 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 from 2021) 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.

5.3.5 Gatwick Airport therefore enjoys a very high level of rail connectivity, with 20 trains to and from central London in the morning peak hour (10 to London Bridge and 10 to London Victoria, of which four are Gatwick Express services).

5.3.6 Train services can be busy in peak periods in the peak direction, into London in the morning and towards Brighton and the South Coast in the evening. However, with completion of the Thameslink Programme in 2019, train services between Gatwick and London now provide nearly 14,000 seats per direction per hour, with room for nearly 30,000 passengers (including standing passengers) per direction per hour overall.

Diagram 5.3.1: Current Rail Network to Gatwick



Source: Network Rail / GAL

Table 5.3.1: Rail frequencies via Gatwick

Operator/Service	Route	Peak Frequency
Gatwick Express	Gatwick Airport non-stop to London Victoria	4 trains per hour
Southern – Brighton Main Line	Gatwick Airport to Victoria via East Croydon and Clapham Junction	6 trains per hour
Southern – via London Bridge	Horsham and Gatwick Airport to London Bridge	1 trains per hour
Thameslink –via London Bridge	Brighton to Bedford via London Bridge	8 trains per hour
First Great Western – North Downs Line	Reading to Gatwick Airport via Redhill	1 train per hour

5.3.7 Opened in 1958, the current station is capacity constrained despite a number of upgrades, including a £53 million

improvement programme in 2014, which provided an additional platform (Platform 7) and improved circulation for passengers. Accordingly, proposals exist to increase the size of the station concourse, improve vertical circulation and widen two of the seven platforms as per the Department for Transport upgrade announcement in July 2019. Construction of elements of the new station is currently underway, despite the Covid pandemic.

5.4 Bus and Coach

5.4.1 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, prior to Covid, there were approximately 450 to 500 daily arrivals and departures respectively, offering services to destinations throughout the UK.

5.4.2 Bus and coach mode share for passengers was around 6% in 2017/18, whereas these modes account for 16% of staff travel.

5.5 Active Travel

5.5.1 There are very few passengers who walk or cycle to Gatwick Airport. However, based on the 2016 staff survey, around 3% of staff travel to Gatwick by walking or cycling. Given the extent of the catchment area for walking and cycling trips, the focus of active travel is on staff from nearby residential areas, including Horley and Crawley.

5.5.2 National Cycle Network Route 21 (NCN21) provides a continuous route between Crawley, Gatwick, Horley, Reigate and London, splitting towards Greenwich on Route 21 and Wandsworth on Route 20. To the south of Crawley, Route 20 continues south towards Brighton and Route 21 continues east towards Royal Tunbridge Well before heading south towards Eastbourne.

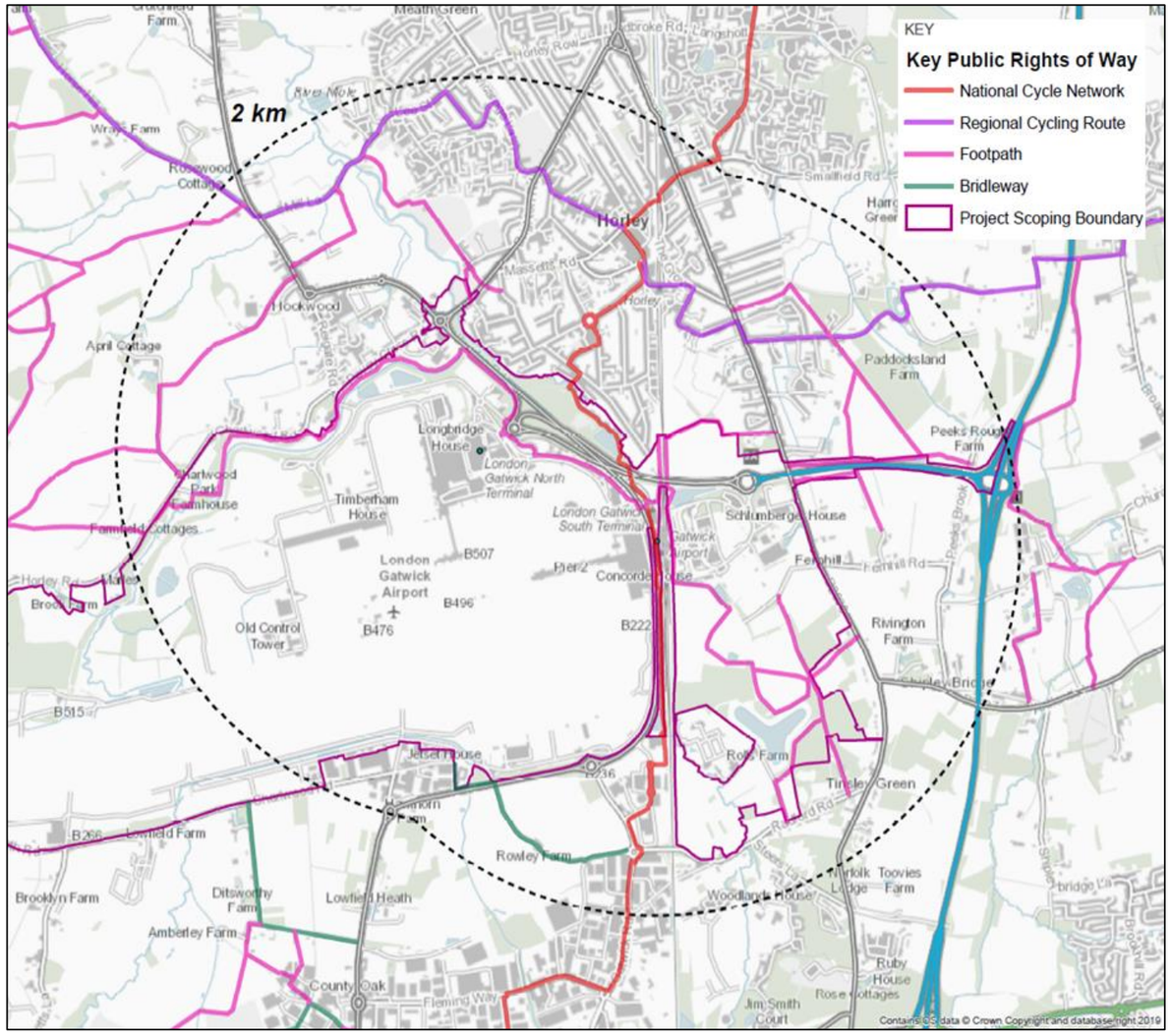
5.5.3 Within the vicinity of Gatwick, NCN21 crosses the A23 in the form of a subway, located to the north of the South Terminal. It crosses the railway lines along a ramped subway to the north of Horley station and along St Mary's Drive to the north of Three Bridges station.

5.5.4 On the wider highway network, there is a cycle track and shared pedestrian / cycle space on the A23 between the North Terminal and the Longbridge Roundabout. Signal controlled pedestrian crossings are located on all four arms of the Longbridge Roundabout. There are no other pedestrian or cycle facilities along the A23 or M23 to the east.

5.5.5 Gatwick provides pathways along internal access and forecourt roads, where pedestrian movements are considered to be appropriate. Zebra crossings are provided at appropriate locations and signage is also provided to direct passengers to the terminals.

5.5.6 Diagram 5.5.1 indicates the key designated pedestrian and cycle routes. Further details are included in Section 0.

Diagram 5.5.1: Key Active Travel Routes



Source: Analysis of West Sussex and Surrey online maps and OpenStreetMap Data

5.7 Highways

5.7.1 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 to Junction 9a at the airport's South Terminal roundabout.

5.7.2 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.

5.7.3 The A23, which runs parallel to the M23, continues north beyond the M25 into London via Croydon and Brixton to the heart of 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.

5.7.4 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.

5.7.5 Highways England's M23 Smart Motorway project opened in 2020 and adds additional running lane capacity to the strategic network serving Gatwick at peak times. In addition, GAL has allocated funding in its Capital Investment Programme to improve South and North Terminal roundabouts to cater for predicted growth over the next decade and beyond.

5.7.6 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) – 16 (for the M40) of M25.

5.8 Forecourts and Car Parks

5.8.1 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. In 2021, GAL introduced forecourt charging at both terminals and this is enforced by Automatic Number Plate Recognition. Free drop-off is provided in long-stay car parks for those who do not wish to pay. The forecourt charges are £5 for 10 minutes, and £1 for each additional minute, up to 20 minutes. The maximum charge is £25 and the maximum length of stay is 30 minutes. People picking up passengers are signed to do so from the short stay car parks as it often takes more time to collect passengers.

Diagram 5.8.1: Northway in Operation

5.8.3 There are currently approximately 46,700 car parking spaces 'on airport', including staff parking, and a further 21,196 authorised spaces 'off-airport'.

5.9 Freight and Cargo

5.9.1 In 2019 Gatwick handled 150,000 tonnes of cargo, an increase on the previous year, driven by additional long-haul services.

5.9.2 The Gatwick Cargo Centre comprises 12 self-contained units with landside and airside access, located west of North Terminal and accessed via Perimeter Road North and Cargo Road.

5.9.3 In the mid-2000s, Gatwick handled over 300,000 tonnes of cargo from the same facility. As such, there is spare capacity within the current facility for future growth.

5.10 Road Safety

5.10.1 DfT STATS19 road safety data (January 2021) has been examined for the latest available five years (2017 to 2019). The extent of the accident data reviewed is the study area identified as part of the EIA. Accidents which occur within 30m of the study area links are shown in Diagram 5.10.1, and a more detailed plan around the airport is shown in Diagram 5.10.2.

5.10.2 A summary of the average annual number of accidents by casualty severity is shown in Table 5.10.1. The accidents have also been considered in terms of local authorities.

Table 5.10.1: Accident Data

	Average Annual Number of Accidents, 2017 to 2019 (Highest Recorded Injury Severity)			
Location	**Fatal**	**Serious**	**Slight**	**Total**
Total accidents within 30m 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

Diagram 5.10.1: 3-year accident data within 30m of a EIA study area link

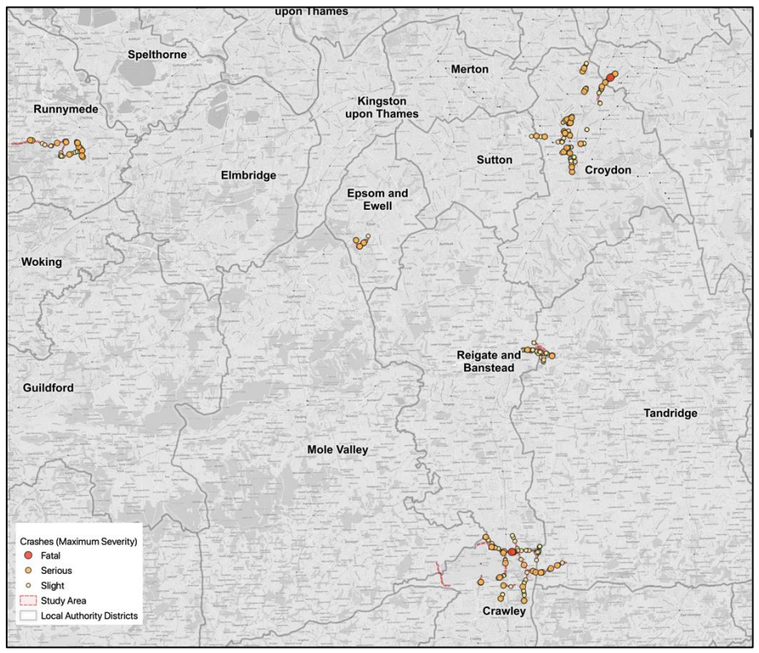
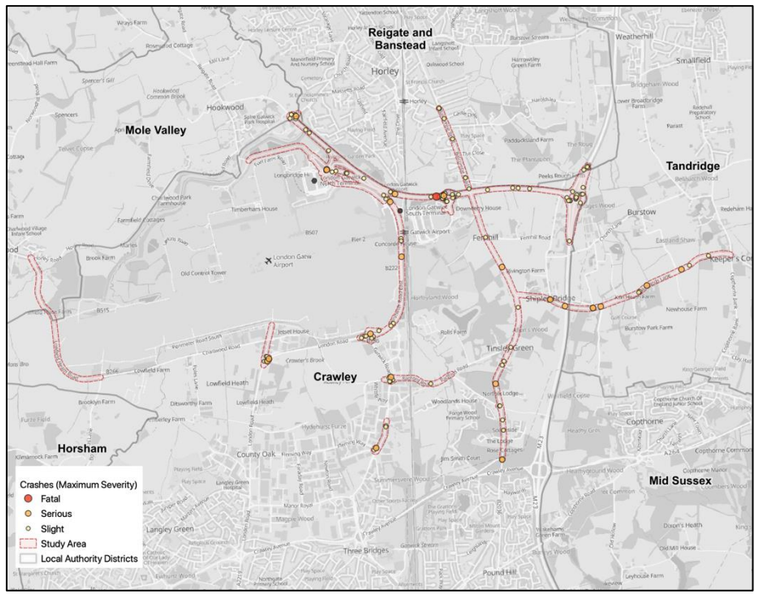


Diagram 5.10.2: 3-year accident data within proximity of the airport



5.10.3 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 accident, when average over three years, resulted in a fatality.

5.10.4 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 Transport Assessment to support the development consent order.

6 Demand Forecasts – Future Baseline and Project Scenarios

6.1 Context

6.1.1 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. Passenger numbers at Gatwick decreased from over 46 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.

6.1.2 In the medium-term, through to the mid-2020s, it is expected that overall demand for air travel will recover to previous levels as consumer behaviours return, driven by factors such as global and UK economic growth, disposable income, consumer confidence and the relative cost of air travel. While the immediate outlook therefore remains challenging, there is confidence that passenger and airline demand will return to previous levels over the course of the next few years and then continue to grow thereafter.

6.1.3 In addition to recovery from Covid-19, another important factor that will affect the level of air traffic at Gatwick in the future is whether Runway 3 (R3) is brought forward at Heathrow.

6.1.4 Given various legal challenges as well as the Covid-19 pandemic, Heathrow Airport Holdings Ltd (HAHL) – the owner and operator of Heathrow Airport and the promotors of R3 – has stopped the work it had been doing to seek development consent for its R3 project. There is therefore significant

uncertainty surrounding when, or indeed, if a third runway will now be developed at Heathrow Airport.

6.1.5 Given this uncertainty, the forecasts prepared by GAL for the baseline and with Project scenarios for this PTAR therefore adopt a 'No Heathrow R3' assumption. This approach provides a conservative assessment from a traffic and transport perspective. If Heathrow R3 was to come forward, traffic levels at Gatwick would likely decline in the period immediately following the opening of R3, meaning that the impacts of the Project, such as traffic and therefore associated noise and emissions would be lower in the 2032 assessment year. By not including Heathrow R3, the 2032 assessment is therefore more conservative. 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.

6.1.6 GAL will, however, keep this under review as it progresses its work and prepares the TA in support of the application for development consent, particularly in view of any updated timelines put forward by Heathrow.

6.1.7 The central assessment cases for the Project are therefore as follows.

- Gatwick future baseline with no Heathrow R3.
- Gatwick Northern Runway or "with Project", which assumes the northern runway opens in 2029 and Heathrow R3 does not come forward.

Assessment Years

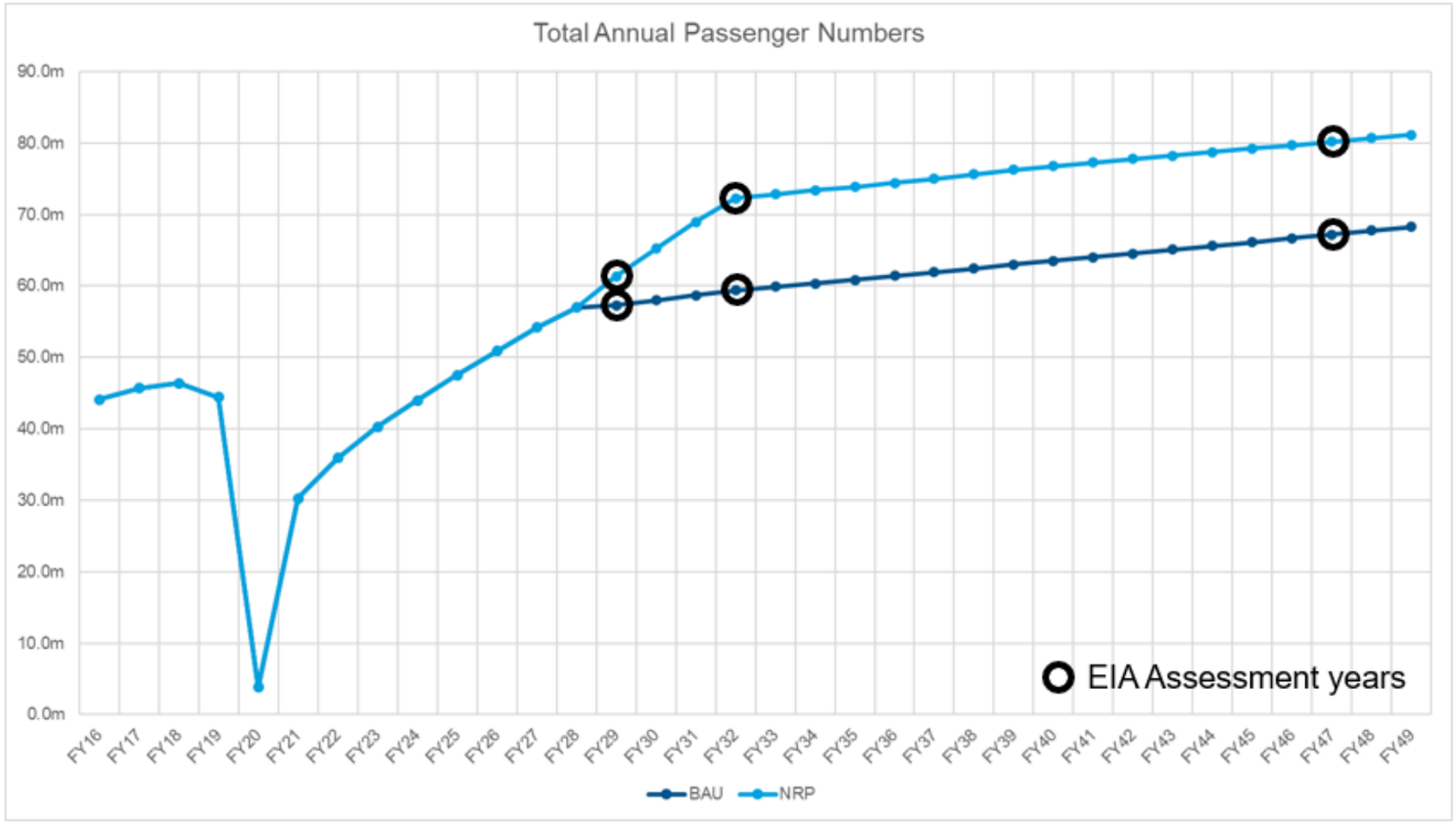
6.1.8 In respect of each of these two cases, forecasts have been prepared for three primary assessment years – 2029, 2032 and 2047:

- 2029: represents the first full year of opening of the Project (and therefore the first year when effects arising from its operation would occur).
- 2032: an interim assessment year, by which time highway mitigation is expected to have been completed, all peak slots on both runways are full and which therefore represents a year in which environmental effects are likely to be higher than 2029.
- 2047: reflects a requirement under the Design Manual for Road and Bridges Vol. 5, Sec. 1 (TD37/93) (Highways England, 1995) to assess the effects of a highway project 15 years after it has been completed. Airport passenger and staff numbers are also higher in 2047 than 2032 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.

Annual Demand

6.1.9 Annual demand for these assessment years is shown in Diagram 6.1.1 and described more fully in the Forecast Databook in Appendix 4.3.1. Between 2024 and 2025, demand at the Airport is forecast to return to pre-Covid-19 levels and, by 2029, annual demand is estimated to be 57.3mppa in the future baseline. Opening of the Northern Runway generates additional traffic, with airlines taking advantage of the released slots, such that 2029 demand with the Project is 4 mppa higher than the future baseline at 61.3 mppa at the end of 2029. With the Project, there then follows a three year period of rapid growth to 2032, by which time demand at the Airport has grown to 72.3 mppa with the Northern Runway as compared to 59.4 mppa in the future baseline. Demand then levels off in line with future baseline and grows incrementally with all peak slots filled and with any growth coming from higher load factors or larger aircraft. It is anticipated that by 2047, the Project could increase airport capacity up to 80.2 mppa, compared to a maximum potential capacity based on existing facilities of 67.2 mppa within the same timescale. This represents an increase of approximately 13 mppa.

Diagram 6.1.1: Annual demand for Future Baseline and with Project Scenarios (No Heathrow R3)



Daily Demand

6.1.10 The daily profile of airside demand in terms of two-way passengers (arrivals and departures) is shown in Diagram 6.1.2

6.1.11 The future baseline growth scenario to 2032 is around 30% higher across the day when compared to 2016. By 2047 demand is around 40% higher than in 2016. Demand in the Project scenario is 70% higher across the day when compared to 2016.

6.1.12 To generate landside demand, modelling assumes a 'lead' time before departure - which is referenced to surveyed arrival at check-in profiles, with passengers arriving closer to departure time for short-haul flights and over a longer period for long-haul flights - as well as a 'lag' time after flight arrival - referenced to survey data of passengers exiting through terminal processes before taking landside modes.

6.1.13 When considering the landside profiles in Diagram 6.1.3, both scenarios create overlaps with background traffic peaks so the potential effect on congestion is greater at these times of the day, specifically 07:00 to 09:00 and 16:00 to 18:00. High inter-peak demand may also affect resilience and network recovery.

6.1.14 Accordingly GAL has developed a bespoke suite of inter-related strategic modelling tools to test the impact and the effects of this growth on the transport network as well as to inform environmental workstreams, as described in Section 4.3.

Diagram 6.1.2: Airside demand for 2018, Baseline and with Project

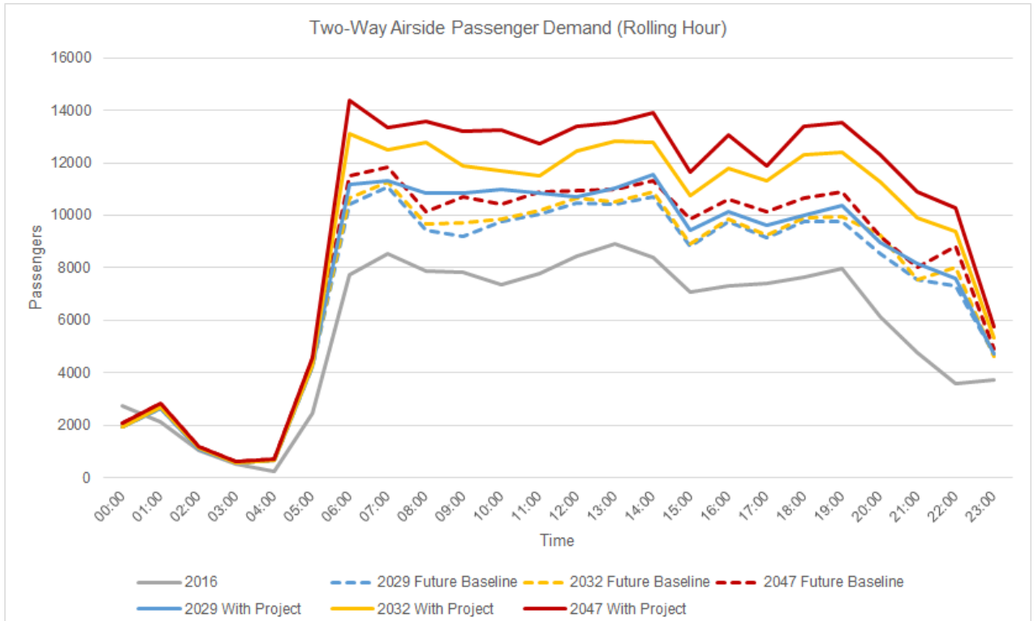
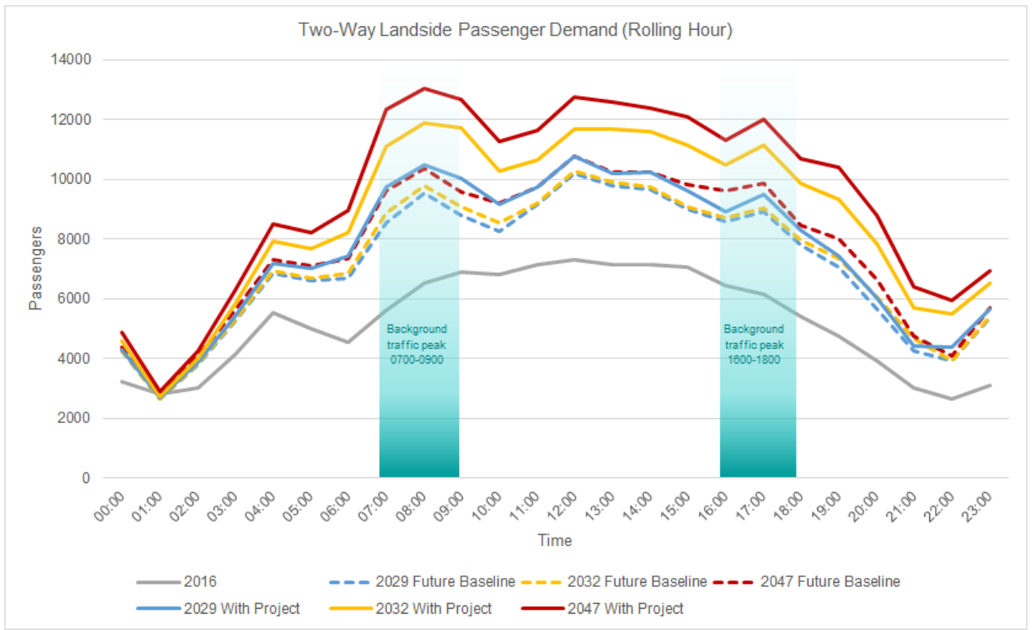


Diagram 6.1.3: Landside demand for 2018, Future Baseline and Project Scenarios



6.2 Employee Forecasts

6.2.1 Travel for staff working at the airport is an important consideration for this PTAR. The performance of transport networks will need to take account of forecast increases in the number of employees, their distribution and their working hours.

6.2.2 The Gatwick Airport Employment survey (Gatwick Airport Ltd, 2016) shows that approximately 23,800 people were employed on-airport.

6.2.3 Total on-airport employees is forecast to rise both in the Future Baseline and assuming the Project, as shown in Table 6.2.1.

Table 6.2.1: Gatwick employee forecasts (on-airport employee only)

	Future Baseline without Project	With Project
2016	23,807	-
2029	27,609	28,596
2032	28,074	31,247
2047	29,721	32,822

6.2.4 The forecasts indicate that on-airport employees will increase progressively and will reach approximately 29,700 by 2047 for the future baseline scenario and approximately 32,800 by 2047 for the Project scenario, a difference of 3,100 employees.

6.2.5 The majority of airport staff work in 4-day shift patterns, with a range of start times from before 0500 to after 1000. As an employment site, this spreads the impact of the journey to work beyond the traditional commuter peak more commonly associated with office, retail and some service sector employment. Therefore, only a proportion of trips for additional employment at Gatwick will have an impact on peak traffic flows.

6.2.6 Gatwick commissioned a study into employment growth and housing supply as per the Assessment of Population and Housing Effects in Appendix 16.6.2. This indicates that there will be sufficient housing in the local area into the future to accommodate Gatwick's growth as well as growth generated by other employers.

6.2.7 Accordingly, the transport modelling assumes that the distribution of new employment will be comparable to existing employment.

6.3 Cargo and Goods Traffic

6.3.1 In 2019, Gatwick handled 150,000 tonnes of cargo. Gatwick's cargo volumes are forecast to grow to just over 290,000 tonnes by 2047 in the future baseline and just under 350,000 tonnes in the Project scenario.

6.3.2 Forecast growth in cargo volumes is driven by an increasing proportion and volume of flights to long haul markets where cargo volumes are typically strong. To serve these markets the forecasts anticipate a greater proportion of wide-body aircraft with cargo capacities in line with or greater than today's fleet.

6.3.3 It should be noted that Gatwick handled more than 300,000 tonnes of cargo in the mid-2000s and accordingly appropriate levels of handling capacity are already available at the Gatwick Cargo Centre.

6.3.4 Cargo and logistics movements are described further in Section 15. Cargo and logistics movements are included in the strategic transport model.

6.4 Background Demand

6.4.1 The level of background growth in the modelling undertaken for the PEIR has been estimated using TEMPRO, the Trip End Model Presentation Program, developed by the Department for Transport. TEMPRO v7.2 has been used to provide demand forecasts through to 2051 and is based on published Local Plan data where it exists and then extrapolated.

6.4.2 These forecasts are appropriate at district level but require adjustment to deal with local uncertainty or specific projects. This is covered further in the detailed strategic modelling appendix.

6.5 Cumulative Development

6.5.1 The estimates of rail and station crowding as reported in this PTAR (Sections 7 and 13) include for background traffic growth in line with Network Rail projections.

6.5.2 Highway modelling reported in Section 11 includes background traffic growth from TEMPRO through to 2047 and based on published Local Plan data.

6.5.3 This PTAR is based on strategic transport modelling which includes a comprehensive set of cumulative development assumptions related to specific developments that have been identified as of relevance to the Project.

6.5.4 A core set of assumptions have been developed for the strategic model scenarios through an uncertainty log which includes inputs from the local authorities regarding their development and infrastructure plans/proposals, as described in in the detailed strategic modelling appendix.

6.5.5 Modelling assumes growth at Heathrow with two runways from Heathrow's Future Baseline as published during its DCO consultation on its third runway or R3.

6.5.6 This approach provides a conservative assessment from a traffic and transport perspective. If Heathrow R3 was to come forward, traffic levels at Gatwick would likely decline in the period immediately following the opening of R3, meaning that the impacts of the Project, such as traffic and therefore associated noise and emissions would be lower in the 2032 assessment year. By not including Heathrow R3, the 2032 assessment is therefore more conservative. 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.

6.5.7 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 PTAR. 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 the development consent application.

7 Airport Surface Access Strategy, Mode Share and Mitigation

7.1.1 Gatwick is committed to low-carbon growth and its Decade of Change strategy (Gatwick Airport Limited, 2021) sets ambitious carbon reduction targets. These inform headline mode share targets established when generating this assessment for PEIR and as documented in this PTAR. These targets are common to both the baseline and the with Project ASAS.

7.1.2 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 tested include increasing forecourt and parking charges.

7.1.3 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.

7.1.4 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.

7.1.5 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.

7.2 Targets

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

7.2.2 Headline targets proposed in this PTAR and common to both the future baseline and with Project ASAS are as follows.

- Achieve 60% sustainable travel (active travel and public transport) mode share 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 for those travelling by car (car share and zero emission vehicles) by 2030.

- Achieve a year on year increase in bus use by staff and passengers, and demonstrate measurable value for money from Passenger Transport Levy funding.
- In proportion with the sustainable mode share targets set above, to deliver:
  - A reduction in air passenger “Kiss and Fly” car journeys.
  - A reduction in single occupancy car journeys by staff and an increase staff car journeys by registered car share users.
  - A reduction in staff car parking spaces in line with a shift to more sustainable modes.

7.2.3 At this stage, these ASAS targets have informed the actions (described in Section 7.3) and the modelled interventions (as set out in Section 7.4) used in the assessment. 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 high sustainable, low emission mode share so will continue to work towards these targets with stakeholders prior to the application for development consent and subject to model testing.

7.3 Actions

7.3.1 To achieve these targets, it is proposed that Gatwick Airport will:

- 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.

7.4 Modelled interventions

7.4.1 The above actions have been included as “pull” measures or interventions strategic modelling for the future baseline and with Project 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. These interventions underpin the assessment results described in this PTAR.

- Road – all committed highway schemes including M23 Smart Motorways.
- Rail – rail assumptions to 2029 and beyond in future baseline and with Project include:
- Crossrail
- Thameslink frequency (24 tph)
- Extra peak Southern services enabled by improvements in East Croydon area (CARS)
- North Downs Line increase from 2 trains per hr (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
- 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 and with Project include:
- 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.
- New coach route two-hourly Chatham – Maidstone – Sevenoaks – Gatwick
- Active travel – at this stage and to be conservative, no walking and cycling improvements have been included in any of the modelling and therefore these improvements would provide a benefit over and above the findings in this PTAR.

7.4.2 Iterative testing of these “pull” measures has indicated that there will still be a shortfall in the sustainable travel mode share being targeted and accordingly Gatwick is also considering:

- 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.

7.4.3 The above actions have been included as “push” measures in the strategic modelling for the future baseline and with Project as follows:

- Car ‘Kiss and Fly’ and parking – 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.

7.5 ASAS outcomes for PEIR

7.5.1 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.

7.5.2 The annual average represents a public transport mode share of 48% to 50% on the busy summer day, owing to the seasonal variation described in Section 5.2, comprising 42% to 43% rail and 6% to 7% bus and coach.

7.5.3 Rail mode share on the busy summer day is shown by the model to be around 43% indicating that the annual average will be higher and likely to be closer to an annual average of 50% rail mode share in line with the ASAS target.

7.5.4 Additional routes and higher frequencies will be explored for bus and coach prior to the application for development consent.

7.5.5 In terms of employees, the strategic model shows that a sustainable transport mode share of 47% is achievable and this would indicate that further measures are required; in particular these could include incentives around EV uptake as well as restrictions on staff parking.

7.5.6 In response to Gatwick’s Decade of Change (Gatwick Airport Limited, 2021), the Project will consider additional interventions to further improve sustainable mode share as per Section 7.7. However, this assessment shows that mitigating the effects of the Project are not reliant on these additional measures or conditional on the ASAS targets being met.

7.6 Trip Generation

7.6.1 Table 7.6.1 below shows airside passenger demand for the future baseline and with Project scenarios as compared to 2016. In the future baseline, passenger growth to 2032 is 30% higher across the day when compared to 2016. By 2047 passenger demand is around 40% higher than in 2016. Passenger demand in the Project scenario is 70% higher across the day when compared to 2016.

Passengers

Table 7.6.1: Airside passenger two-way demand

Time Period	Total Passengers - Future Baseline				Total Passengers - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	16,420	20,518	20,939	21,975	16,420	22,129	25,260	26,934
IP (0900-1600)	55,875	69,429	70,728	75,109	55,875	75,403	83,828	91,593
PM (1600-1800)	14,751	18,919	19,107	20,763	14,751	19,785	23,098	24,960
OP1 (1800-0000)	33,830	47,694	49,289	52,516	33,830	49,859	60,619	66,180
OP2 (0000-0400)	6,483	6,320	6,370	6,732	6,483	6,305	6,373	6,731
OP3 (0400-0700)	10,424	15,381	15,623	16,760	10,424	16,088	18,089	19,659
24hr	**137,782**	**178,262**	**182,056**	**193,855**	**137,782**	**189,569**	**217,265**	**236,056**

7.6.2 To generate landside demand, modelling assumes a 'lead' time before departure - which is referenced to surveyed arrival at check-in profiles, with passengers arriving closer to departure time for short-haul flights and over a longer period for long-haul flights - as well as a 'lag' time after flight arrival - referenced to survey data of passengers exiting through terminal processes before taking landside modes. Landside demand is shown in Table 7.6.2. Demand is lower than for the airside as transfer passengers are excluded from the landside table. Also, some passengers departing on flights between midnight and 01:00 arrive the day before the simulated day and some passengers arriving on flights between 23:00 and midnight reaching the landside after midnight on the simulated day and are therefore not modelled.

Table 7.6.2: Landside passenger two-way demand

Time Period	Total Passengers - Future Baseline				Total Passengers - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	12,160	18,081	18,651	19,967	12,160	20,220	22,972	25,389
IP (0900-1600)	49,548	64,812	65,823	69,532	49,548	69,763	78,748	85,377
PM (1600-1800)	12,611	17,506	17,737	19,498	12,611	18,385	21,620	23,302
OP1 (1800-0000)	22,917	34,081	35,424	37,731	22,917	36,224	44,782	49,142
OP2 (0000-0400)	13,215	15,950	16,118	16,889	13,215	16,269	17,187	18,333
OP3 (0400-0700)	15,098	20,172	20,481	21,755	15,098	21,644	23,859	25,717
24hr	125,549	170,602	174,233	185,372	125,549	182,505	209,169	227,260

7.6.3 These demands have been input into the model and have been assigned to different modes by the strategic transport model based on the “push” and “pull” measures described above as well as origin and destination, time and cost parameters which influence which modes are available to passengers and which modes passengers will choose to take.

7.6.4 By 2047, rail mode share on the busy summer day is shown by the model to increase to around 43% and bus and coach at 6% to 7%, as per Table 7.6.3 and Table 7.6.4. There is variation across the day with rail mode share up to 53% on average in the PM peak period on the busy summer day. As one would expect rail mode share is lower – 24% to 25% - late at night and early in the morning when there are limited services and connections are more difficult. Bus and coach mode share is more stable at between 6% and 7% across the day.

7.6.5 When taking data for the busy summer day, it is estimated from the modelling that the annual average will be a higher public transport mode share of around 54% and 56% between 2029 and 2047%, owing to the seasonal variation described in Section 5.2.

Table 7.6.3: Landside passenger two-way rail demand and mode share

Time Period	Rail Passengers - Future Baseline				Rail Passengers - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	3,564	7,033	7,484	8,213	3,564	7,871	9,111	10,310
IP (0900-1600)	18,819	30,249	31,311	32,792	18,819	32,464	37,358	40,151
PM (1600-1800)	5,505	9,113	9,388	10,339	5,505	9,530	11,395	12,332
OP1 (1800-0000)	9,061	16,439	17,386	18,366	9,061	17,392	21,991	23,954
OP2 (0000-0400)	2,858	4,045	4,174	4,280	2,858	4,085	4,375	4,566
OP3 (0400-0700)	2,674	4,849	5,052	5,219	2,674	5,211	5,856	6,151
24hr	**42,481**	**71,727**	**74,797**	**79,210**	**42,481**	**76,553**	**90,086**	**97,464**

Time Period	Rail Mode Share - Future Baseline				Rail Mode Share - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	29%	39%	40%	41%	29%	39%	40%	41%
IP (0900-1600)	38%	47%	48%	47%	38%	47%	47%	47%
PM (1600-1800)	44%	52%	53%	53%	44%	52%	53%	53%
OP1 (1800-0000)	40%	48%	49%	49%	40%	48%	49%	49%
OP2 (0000-0400)	22%	25%	26%	25%	22%	25%	25%	25%
OP3 (0400-0700)	18%	24%	25%	24%	18%	24%	25%	24%
24hr	**34%**	**42%**	**43%**	**43%**	**34%**	**42%**	**43%**	**43%**

Table 7.6.4: Landside passenger two-way bus/coach demand and mode share

Time Period	Bus/Coach Passengers - Future Baseline				Bus/Coach Passengers - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	701	1,164	1,253	1,375	701	1,427	1,718	1,923
IP (0900-1600)	2,695	3,846	4,035	4,326	2,695	4,458	5,391	5,857
PM (1600-1800)	671	984	1,023	1,134	671	1,112	1,386	1,487
OP1 (1800-0000)	1,173	1,861	1,986	2,128	1,173	2,102	2,766	3,022
OP2 (0000-0400)	702	1,013	1,062	1,125	702	1,108	1,270	1,351
OP3 (0400-0700)	831	1,287	1,358	1,445	831	1,471	1,745	1,859
24hr	**6,772**	**10,155**	**10,717**	**11,534**	**6,772**	**11,678**	**14,275**	**15,500**
Time Period	**Bus/Coach Mode Share - Future Baseline**				**Bus/Coach Mode Share - with Project**			
	2016	**2029 BAU**	**2032 BAU**	**2047 BAU**	**2016**	**2029 NRP**	**2032 NRP**	**2047 NRP**
AM (0700-0900)	6%	6%	7%	7%	6%	7%	7%	8%
IP (0900-1600)	5%	6%	6%	6%	5%	6%	7%	7%
PM (1600-1800)	5%	6%	6%	6%	5%	6%	6%	6%
OP1 (1800-0000)	5%	5%	6%	6%	5%	6%	6%	6%
OP2 (0000-0400)	5%	6%	7%	7%	5%	7%	7%	7%
OP3 (0400-0700)	6%	6%	7%	7%	6%	7%	7%	7%
24hr	**5%**	**6%**	**6%**	**6%**	**5%**	**6%**	**7%**	**7%**

7.6.6 By 2047, highway mode share (taxis, kiss and fly, car parking) on the busy summer day is shown by the model to reduce to around 50% of demand, as per Table 7.6.5, with higher mode share at times of the day when public transport options are more limited.

Table 7.6.5: Landside passenger two-way highway demand and mode share

Time Period	Highway Passengers - Future Baseline				Highway Passengers - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	7,895	9,884	9,914	10,379	7,895	10,922	12,143	13,156
IP (0900-1600)	28,035	30,718	30,476	32,415	28,035	32,841	35,999	39,369
PM (1600-1800)	6,435	7,408	7,325	8,024	6,435	7,743	8,839	9,483
OP1 (1800-0000)	12,684	15,781	16,052	17,237	12,684	16,730	20,026	22,166
OP2 (0000-0400)	9,654	10,892	10,881	11,483	9,654	11,076	11,542	12,415
OP3 (0400-0700)	11,593	14,036	14,070	15,090	11,593	14,962	16,259	17,707
24hr	**76,296**	**88,719**	**88,719**	**94,629**	**76,296**	**94,274**	**104,808**	**114,296**
Time Period	**Highway Mode Share - Future Baseline**				**Highway Mode Share - with Project**			
	2016	**2029 BAU**	**2032 BAU**	**2047 BAU**	**2016**	**2029 NRP**	**2032 NRP**	**2047 NRP**
AM (0700-0900)	65%	55%	53%	52%	65%	54%	53%	52%
IP (0900-1600)	57%	47%	46%	47%	57%	47%	46%	46%
PM (1600-1800)	51%	42%	41%	41%	51%	42%	41%	41%
OP1 (1800-0000)	55%	46%	45%	46%	55%	46%	45%	45%
OP2 (0000-0400)	73%	68%	68%	68%	73%	68%	67%	68%
OP3 (0400-0700)	77%	70%	69%	69%	77%	69%	68%	69%
24hr	**61%**	**52%**	**51%**	**51%**	**61%**	**52%**	**50%**	**50%**

Employees

7.6.7 Total employee trip generation is shown in Table 7.6.6. Note, these are two-way trips associated with those employees who are travelling to and from the Airport on any given day, not the total number of people employed at the Airport.

Table 7.6.6: Landside employee two-way demand

Time Period	Total Employees - Future Baseline				Total Employees - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	3,871	4,467	4,540	4,840	3,871	4,617	5,022	5,274
IP (0900-1600)	7,937	9,212	9,366	9,957	7,937	9,540	10,428	10,951
PM (1600-1800)	3,383	3,866	3,924	4,186	3,383	3,989	4,321	4,522
OP1 (1800-0000)	5,532	6,458	6,572	6,985	5,532	6,696	7,338	7,724

Time Period	Total Employees - Future Baseline				Total Employees - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
OP2 (0000-0400)	1,565	1,836	1,867	1,980	1,565	1,904	2,089	2,201
OP3 (0400-0700)	5,071	5,845	5,938	6,277	5,071	6,052	6,601	6,916
24hr	**27,359**	**31,683**	**32,207**	**34,226**	**27,359**	**32,798**	**35,798**	**37,588**

7.6.8 Modelling shows an employee mode share by sustainable modes of 36% by 2047 and up to 43% including car share, comprising 15% rail, 17% bus and coach and 4% active travel.

Table 7.6.7: Landside employee two-way rail demand and mode share

Time Period	Rail Employees - Future Baseline				Rail Employees - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	554	734	762	896	554	760	812	942
IP (0900-1600)	986	1,245	1,276	1,425	986	1,287	1,392	1,535
PM (1600-1800)	512	662	688	799	512	680	734	840
OP1 (1800-0000)	656	839	867	965	656	870	941	1,045
OP2 (0000-0400)	183	223	222	244	183	231	247	265
OP3 (0400-0700)	610	761	788	862	610	786	848	931
24hr	**3,501**	**4,464**	**4,604**	**5,191**	**3,501**	**4,612**	**4,973**	**5,558**
Time Period	**Rail Employee Mode Share - Future Baseline**				**Rail Employees Mode Share - with Project**			
	2016	**2029 BAU**	**2032 BAU**	**2047 BAU**	**2016**	**2029 NRP**	**2032 NRP**	**2047 NRP**
AM (0700-0900)	14%	16%	17%	19%	14%	16%	16%	18%
IP (0900-1600)	12%	14%	14%	14%	12%	13%	13%	14%
PM (1600-1800)	15%	17%	18%	19%	15%	17%	17%	19%
OP1 (1800-0000)	12%	13%	13%	14%	12%	13%	13%	14%
OP2 (0000-0400)	12%	12%	12%	12%	12%	12%	12%	12%
OP3 (0400-0700)	12%	13%	13%	14%	12%	13%	13%	13%
24hr	**13%**	**14%**	**14%**	**15%**	**13%**	**14%**	**14%**	**15%**

Table 7.6.8: Landside employee two-way bus/coach demand and mode share

Time Period	Bus/Coach Employees - Future Baseline				Bus/Coach Employees – with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	575	706	702	794	575	740	771	832
IP (0900-1600)	1,259	1,532	1,553	1,702	1,259	1,597	1,743	1,874
PM (1600-1800)	487	590	591	659	487	610	653	700
OP1 (1800-0000)	895	1,090	1,101	1,211	895	1,141	1,233	1,325
OP2 (0000-0400)	255	315	319	353	255	330	361	392
OP3 (0400-0700)	816	990	999	1,091	816	1,031	1,119	1,198
24hr	**4,285**	**5,223**	**5,266**	**5,811**	**4,285**	**5,447**	**5,881**	**6,321**
Time Period	**Bus/Coach Employee Mode Share - Future Baseline**				**Bus/Coach Employees Mode Share - with Project**			
	2016	**2029 BAU**	**2032 BAU**	**2047 BAU**	**2016**	**2029 NRP**	**2032 NRP**	**2047 NRP**
AM (0700-0900)	15%	16%	15%	16%	15%	16%	15%	16%
IP (0900-1600)	16%	17%	17%	17%	16%	17%	17%	17%
PM (1600-1800)	14%	15%	15%	16%	14%	15%	15%	15%
OP1 (1800-0000)	16%	17%	17%	17%	16%	17%	17%	17%
OP2 (0000-0400)	16%	17%	17%	18%	16%	17%	17%	18%
OP3 (0400-0700)	16%	17%	17%	17%	16%	17%	17%	17%
24hr	**16%**	**16%**	**16%**	**17%**	**16%**	**17%**	**16%**	**17%**

Table 7.6.9: Landside employee two-way active travel demand and mode share

Time Period	Active Travel Employees - Future Baseline				Active Travel Employees - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	205	240	238	260	205	248	255	266
IP (0900-1600)	310	352	355	373	310	364	388	400
PM (1600-1800)	201	231	231	250	201	237	248	258
OP1 (1800-0000)	193	221	222	234	193	230	243	250
OP2 (0000-0400)	52	60	61	64	52	63	67	69
OP3 (0400-0700)	183	209	210	219	183	216	230	237
24hr	**1,144**	**1,312**	**1,315**	**1,399**	**1,144**	**1,358**	**1,431**	**1,481**
Time Period	**Active Employee Mode Share - Future Baseline**				**Active Employees Mode Share - with Project**			
	2016	**2029 BAU**	**2032 BAU**	**2047 BAU**	**2016**	**2029 NRP**	**2032 NRP**	**2047 NRP**
AM (0700-0900)	5%	5%	5%	5%	5%	5%	5%	5%
IP (0900-1600)	4%	4%	4%	4%	4%	4%	4%	4%
PM (1600-1800)	6%	6%	6%	6%	6%	6%	6%	6%
OP1 (1800-0000)	3%	3%	3%	3%	3%	3%	3%	3%
OP2 (0000-0400)	3%	3%	3%	3%	3%	3%	3%	3%
OP3 (0400-0700)	4%	4%	4%	3%	4%	4%	3%	3%
24hr	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**

7.6.9 Modelling shows an employee mode share by highway modes of 64% by 2047. Note, this mode share comprises solo car drivers (which is the least sustainable), car sharing as well as company transport (eg airline minibuses). These modal splits will be separated out for the final TA.

Table 7.6.10: Landside employee two-way highway demand and mode share

Time Period	Highway Employees - Future Baseline				Highway Employees - with Project			
	2016	2029 BAU	2032 BAU	2047 BAU	2016	2029 NRP	2032 NRP	2047 NRP
AM (0700-0900)	2,538	2,787	2,838	2,890	2,538	2,870	3,184	3,233
IP (0900-1600)	5,382	6,083	6,182	6,457	5,382	6,293	6,904	7,141
PM (1600-1800)	2,183	2,382	2,413	2,478	2,183	2,462	2,685	2,724
OP1 (1800-0000)	3,789	4,309	4,382	4,575	3,789	4,456	4,921	5,104
OP2 (0000-0400)	1,075	1,238	1,265	1,320	1,075	1,280	1,414	1,475
OP3 (0400-0700)	3,463	3,886	3,941	4,106	3,463	4,018	4,404	4,550
24hr	**18,429**	**20,684**	**21,022**	**21,826**	**18,429**	**21,380**	**23,513**	**24,228**
Time Period	**Highway Employee Mode Share - Future Baseline**				**Highway Employees Mode Share - with Project**			
	2016	**2029 BAU**	**2032 BAU**	**2047 BAU**	**2016**	**2029 NRP**	**2032 NRP**	**2047 NRP**
AM (0700-0900)	66%	62%	63%	60%	66%	62%	63%	61%
IP (0900-1600)	68%	66%	66%	65%	68%	66%	66%	65%
PM (1600-1800)	65%	62%	62%	59%	65%	62%	62%	60%
OP1 (1800-0000)	68%	67%	67%	65%	68%	67%	67%	66%
OP2 (0000-0400)	69%	67%	68%	67%	69%	67%	68%	67%
OP3 (0400-0700)	68%	66%	66%	65%	68%	66%	67%	66%
24hr	**67%**	**65%**	**65%**	**64%**	**67%**	**65%**	**66%**	**64%**

7.7 Further actions and interventions to DCO

7.7.1 The assessment of the Project's impacts on the transport network have been undertaken on the basis of the above modelled interventions and the following further actions, which go beyond what is necessary to mitigate the Project's impact on the network, will be considered for DCO with the aim of improving the sustainable mode share further in line with ASAS targets:

- Upgrade the shuttle system to deliver appropriate capacity and passenger experience into the future.
- Support improved accessibility and connectivity for public transport, including rail, express coach, and local bus to make public transport the favoured choice for access for passengers and staff. This would include developing a Mobility-as-a-Service platform for the Airport.
- Further work with coach and bus operators to provide an appropriate increase in service frequency as well as new route offers to accommodate future growth.
- Support bus and rail operators to ensure early morning (04:00-07:00), late evening and weekend services are available to cater for staff shift patterns.

- Work with bus and rail operators to adopt the Gatwick Staff Travel Discount and to potentially create a Gatwick Staff Travel Card Area (combined across bus and rail) incorporating a specific catchment or series of post codes.
- Alongside the above to reduce car parking for staff, reflecting the same catchment area or postcodes.
- Complete a further review of options to manage forecourt access and passenger car parking, which could include increasing charges still further in real terms.
- Develop plans for a new Gatwick Cycle Hub in consultation with local stakeholders and partners.
- Develop a programme of monitoring against targets.

7.7.2 Car travel to Gatwick Airport will continue to be important and the ASAS and Travel Plan will need consider measures which improve car journeys to reduce emissions and the impact of congestion whilst also making these journeys more sustainable. These include:

- Provide a significant increase in capacity along the M23 Spur to ensure Airport traffic is accommodated on the strategic road network and to achieve speeds and delays at levels similar to today.
- Provide better travel conditions on through routes for non-airport users and, where possible, to separate airport traffic from non-airport traffic to add capacity and resilience as well as to improve safety.
- Develop a strategy to support more journeys to the Airport by Electric Vehicles or Zero Emission Vehicles, such as providing or supporting provision of EV charging on site or in the vicinity of the Airport.

7.8 Proposed Mitigation

7.8.1 Notwithstanding the increase in sustainable mode share demonstrated by the modelling, it has also shown that highway works are required as part of Project, to both the South Terminal and North Terminal roundabouts, and at Longbridge roundabout. These works are embedded mitigation with the Project, to improve capacity and mitigate against significant effects.

7.8.2 The final designs and details of the improvement works will be subject to further road traffic assessment and detailed engagement with highway authorities, including Highways England.

South Terminal Junction Improvements

7.8.3 The South Terminal roundabout (also known as the Welcome Roundabout) is the sole entry point into the South Terminal area and for local airport-related roads, including the terminal forecourt, long stay car parks and commercial premises. It is served by the M23 Gatwick Spur to the east (leading from the M23 Junction 9) and Airport Way from the west (leading from North Terminal roundabout). The majority of Gatwick traffic accesses the airport from the M23 and traffic for both the North Terminal and South Terminal passes through this roundabout.

7.8.4 The M23 Gatwick Spur has recently undergone an upgrade as part of the Highways England M23 Smart Motorway Project, completed in 2020. The hard shoulder of the westbound carriageway has become a permanent running lane, providing a total of three lanes approaching the airport. Further local improvements, involving signalisation and minor widening of entries/exits, are proposed in the absence of the Project.

7.8.5 In order to cater for additional road traffic demand associated with the Project, a significant improvement scheme will be required at the South Terminal roundabout. Details of the highway design are being developed and for the purpose of the PEIR, it is assumed that grade separation of the roundabout is required. The highway scheme being considered for the South Terminal roundabout for the PEIR involves the following.

- A new flyover taking through traffic from the M23 Gatwick Spur to Airport Way over the top of the existing roundabout to remove this traffic from the roundabout.
- The flyover will likely be around 8 metres above the existing ground level allowing for Highways England's safety and design standards.
- To deliver the grade separated solution, slip roads are required and these can be provided on public highway land to the north and GAL land to the south of the existing roundabout.
- Bridging structures are needed for the flyover at the roundabout. The existing structures either side of South Terminal roundabout (where the M23 Gatwick Spur crosses B2036 Balcombe Road, and where Airport Way crosses the Brighton-London main line railway) may require widening and strengthening or replacement.

North Terminal Junction Improvements

7.8.6 The North Terminal roundabout is the entry point to the North Terminal and local access roads, including the north and east perimeter roads. The existing layout consists of a circular five-arm at-grade roundabout to the north east of the North Terminal, to the south west of the A23. There is currently no direct entry to the roundabout southbound from Horley and no direct exit from the roundabout on to the A23 southbound towards Crawley.

7.8.7 Local improvements are proposed in the absence of the Project, including some widening and signalling to provide additional capacity in the future baseline.

7.8.8 In order to cater for additional road traffic demand associated with the Project, together with traffic growth that is expected to arise as a result of background growth and other developments, it is assumed that a significant improvement scheme will be required at North Terminal roundabout. As for the South Terminal junction improvements, any improvement scheme will be subject to detailed assessment work and discussion with Highways England and the local highway authorities.

7.8.9 For the purposes of the PEIR, the highway scheme being considered for the North Terminal roundabout involves the following.

- An elevated flyover to carry traffic between Airport Way (from South Terminal and the M23) and the A23 towards Horley. This removes through traffic from the roundabout.
- The elevated links are likely to be approximately 8 metres above the roundabout to provide the required clearances as stipulated by Highways England's safety and design standards.
- The grade separation solution would include additional slip roads, in particular to provide connections between Airport Way, the A23 London Road and access to the airport. Not all movements are currently catered for at North Terminal Roundabout (eg from the airport to the A23 southbound) and the aim is to include as many movements as practicable in order to improve the flow of traffic.
- The configuration of roads beneath the flyover will mean providing specific signal controlled routings which allow traffic to move directly between Airport Way, A23, Longbridge Way and the terminal forecourt.

Longbridge Roundabout

7.8.10 The existing Longbridge roundabout is where the A23 London Road meets Povey Cross Road, A217 and A23 Brighton Road. There is a dedicated left turn slip from Brighton Road to London Road. Signal controlled pedestrian crossings are provided on all four arms.

7.8.11 Preliminary modelling work shows that that the existing Longbridge roundabout would require works to improve capacity with the Project and to provide better integration with improvements at the North Terminal roundabout.

The proposed solution is to substantially improve the roundabout and provide full width running lanes throughout the junction, replacing the sub-standard narrow lanes that currently exist. These lanes create a capacity restriction due to goods vehicles needing to straddle two lanes for certain manoeuvres. The new roundabout would have a slightly larger inscribed diameter and would extend further west and north to accommodate wider circulating lanes, improved pedestrian crossing facilities and extra capacity on exit and entry lanes, particularly for the A23 arm to and from Horley.

8 Assessment of Transport Effects: Rail

8.1 Introduction

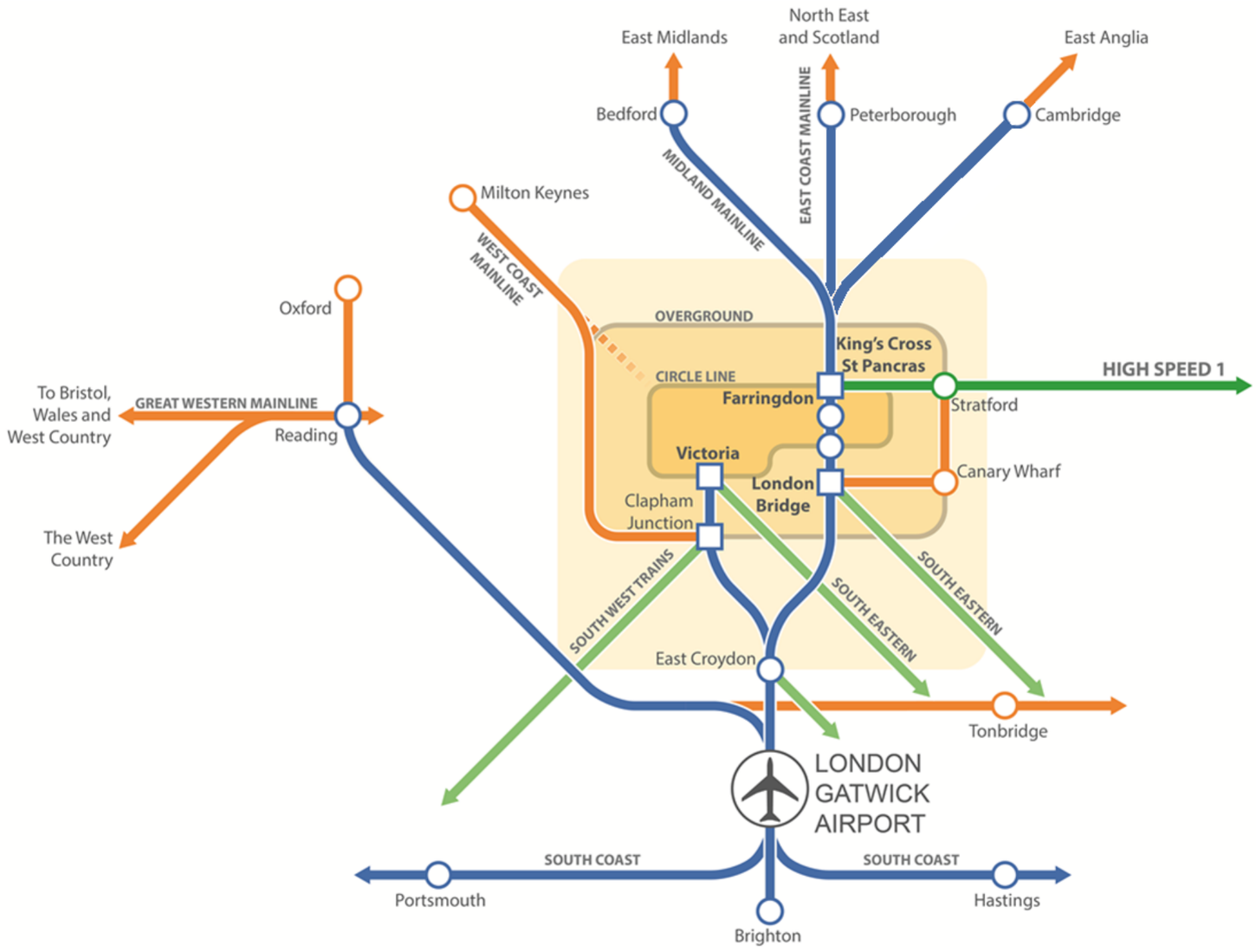
8.1.1 Gatwick is the UK's best connected airport by rail, as per Diagram 8.1.1. It has regular, direct daily services from over 120 stations, across the South Coast from Southampton to Hastings, west to Reading and as far north as Bedford, Cambridge and Peterborough, as shown by the blue lines.

8.1.2 A network of over 800 UK stations is accessible with just one interchange (as shown by the orange lines) and Gatwick is connected to High Speed 1 trains to Europe from St Pancras International. In addition to these stopping services, the Airport has a dedicated four trains per hour, Gatwick Express service to London Victoria.

8.1.3 Being situated on the Brighton-London main line, with a dedicated station integrated with the South Terminal, is an important asset and helps Gatwick Airport to achieve a high rail mode share for air passengers. Prior to the Covid-19 pandemic rail has attracted approximately 39% of all air passengers (2017 CAA passenger data) and approximately 12% of all airport employees (2016 staff travel survey)

8.1.4 As of May 2019, there were 8 tph via Thameslink to and from Gatwick to Bedford, Cambridge and Peterborough, a Southern service into London Bridge (1 tph), in addition to Southern services to and from London Victoria (8 tph) and Gatwick Express (4 tph). There is also a single direct service (1 tph) on the North Downs Line to Reading, for a total of 20 tph in each direction from Gatwick Airport in the peak.

Diagram 8.1.1: Current Rail Network to Gatwick



Source: GAL

8.2 Approach and Methodology

Committed and Planned Enhancements

Thameslink Programme

8.2.1 The Thameslink Programme has delivered additional rail capacity in Sussex and Kent, as well as improved cross London connectivity, particularly through direct rail services to Cambridge and Peterborough, as per Diagram 8.2.1. Most Thameslink services on the Brighton-London main line are operated using 12-car trains, which have provided additional capacity for people accessing the Airport. In addition, customers to Gatwick have enjoyed an increased frequency of connections with recent timetable changes.

8.2.2 The assessment presented in this section includes these capacity enhancements in Control Period 5 (CP)[4] for 2029 and beyond.

Digital Railway

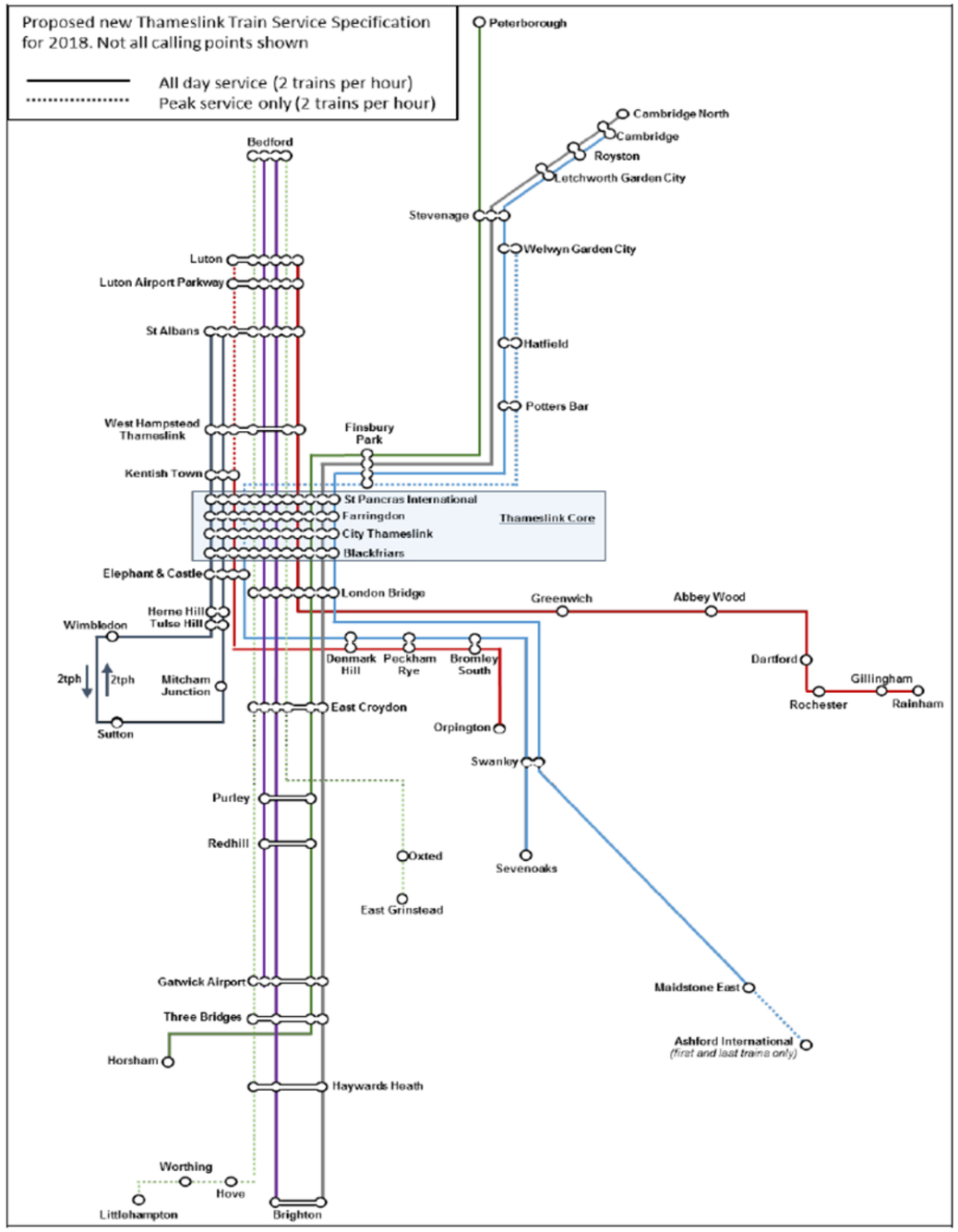
8.2.3 Network Rail's Digital Railway programme is delivering technological improvements to traffic management on the Brighton-London main line. A new Traffic Management System installed as part of the Thameslink Programme is able to:

- take full control of train regulation through the core cross London route via Blackfriars, Farringdon and St Pancras International (as described below);
- assist train regulation on the most intensively used parts of the Brighton-London main line, where the system can highlight issues of late train running and advise the signaller of a solution (which they can accept or reject); and
- assist regulation on other parts of the network, again suggesting solutions to the signaller but not being fully integrated with their control panel.

8.2.4 The system automates some traffic regulation and provides improved real-time information to signallers so they have time to take more oversight and strategic decisions across the network. It is understood that train drivers can also receive real-time advice to drive to a modified train service plan.

[4] Control Periods are 5 year periods used by Network Rail to specify planning and investment in railway infrastructure. Control Period 5 runs from 2014 to 2019, Control Period 6 from 2019 to 2024, and so on.

Diagram 8.2.1: Thameslink service patterns from 2018



Source: GTR 2018 Timetable Consultation, 15 September 2016

Diagram 8.2.2: Brighton Mainline Upgrade proposals

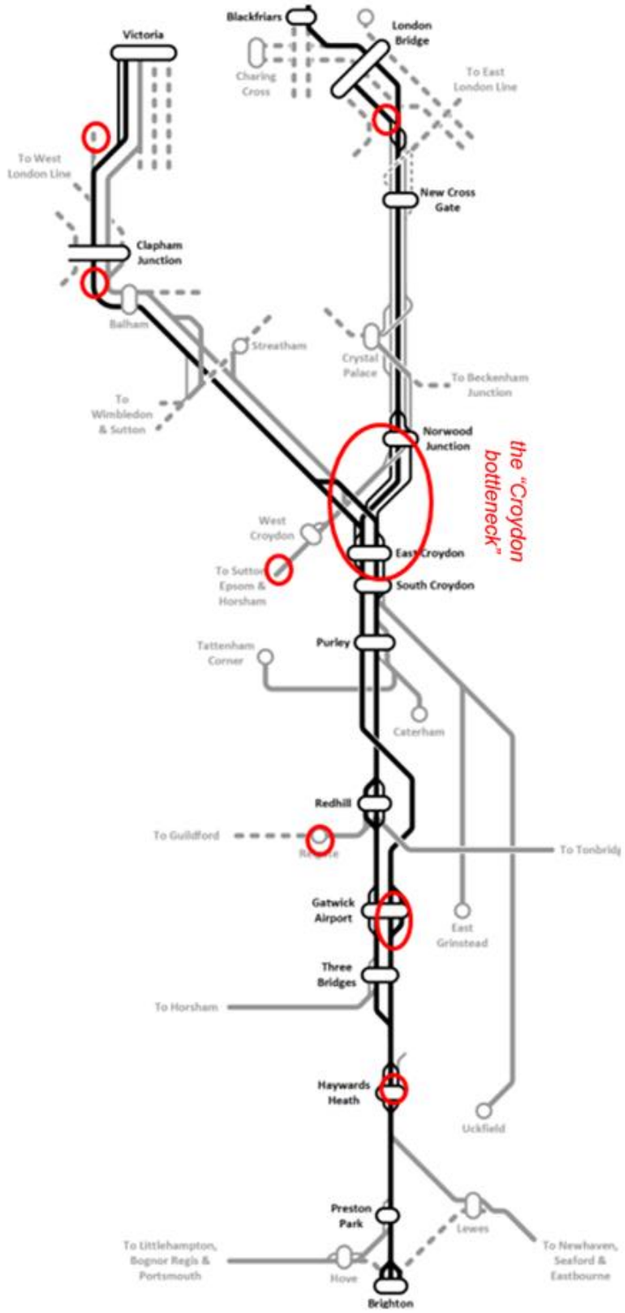
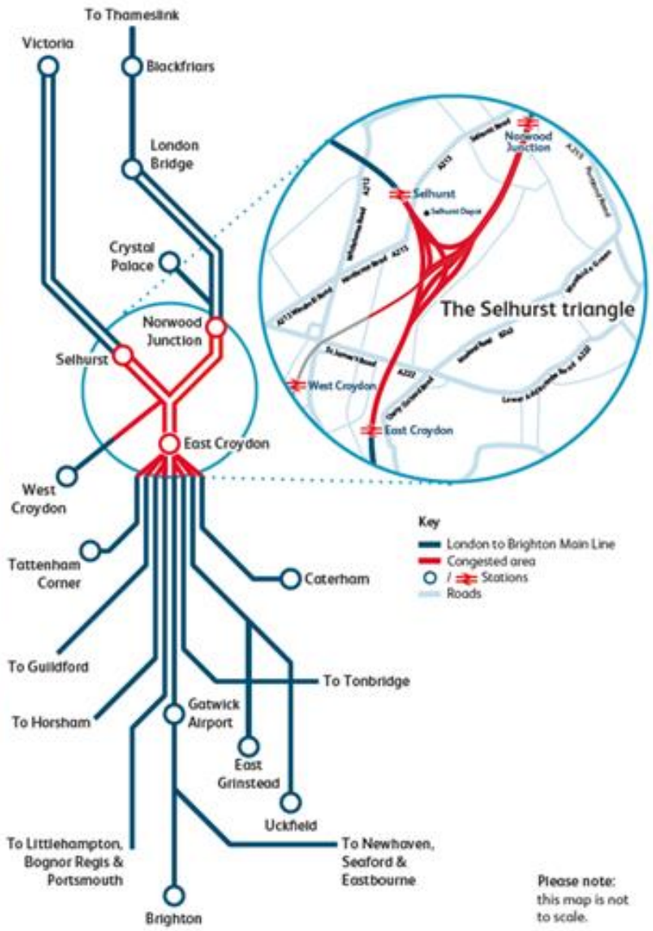


Diagram 8.2.3: Location of Croydon Area Remodelling Scheme (CARS)



Please note: this map is not to scale.

8.2.5 The cross London Thameslink route via Farringdon has been fitted with an automatic train operation system whereby Traffic Management algorithms automatically update the signalling to regulate the service optimally. These Digital Railway improvements are vital to maintain and improve punctuality under a more intensive and complicated train service delivered by the Thameslink Programme.

Brighton-London Main Line Upgrade (Croydon / Windmill Bridge)

8.2.6 The Brighton-London main line is one of the busiest commuter lines in the country with peak crowding on a range of services. The planned investments in capacity described above are intended to address the current gap and provide for growth. However, Network Rail is already developing a programme of measures to enhance the railway line for implementation in CP6 and CP7. These include the Croydon Area Remodelling Scheme (CARS), as per Diagram 8.2.2 and Diagram 8.2.3.

8.2.7 CARS is the most significant scheme to transform Brighton-London main line capacity and the largest and most complex part of Network Rail's long-term route upgrade proposals. It would remove the operationally most challenging bottleneck on Britain's railway at East Croydon station and the layout of the important Windmill Bridge Junction where the Thameslink route to London Bridge and the route to Victoria Station diverge.

8.2.8 Network Rail's analysis shows that removing this constraint could deliver four additional trains per hour in the peak direction via Gatwick as well as improving punctuality.

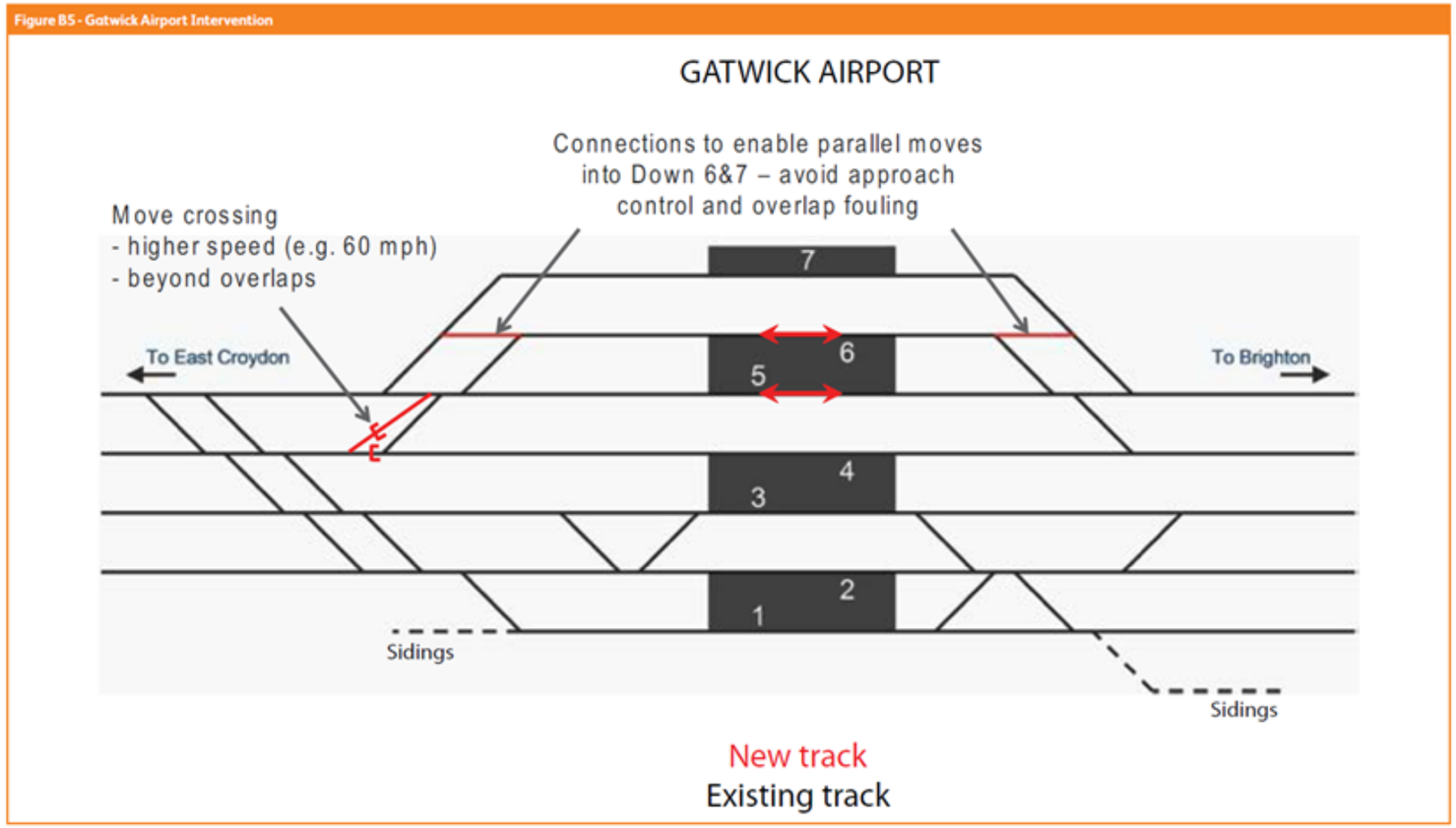
8.2.9 This additional capacity could remove the need to split and join trains from the South Coast, reducing journey times, and enable more trains to operate to Reigate; both are current connectivity gaps for the Airport. If this was supported by changes to the railway track layout at Gatwick Airport station, this could enable more trains to call at the Airport also.

8.2.10 CARS comprises major works at Norwood Junction, Selhurst triangle, two additional platforms at East Croydon station and between these locations and would include new grade-separation of track (fly-overs and dive-unders), more tracks and better signalling, resulting in improved reliability and enhanced capacity.

8.2.11 Network Rail is continuing design work and has carried out two consultations, the latest on its proposals in summer 2020, in line the Transport and Works Act process. The South East Route Control Period 6 Delivery Plan (Network Rail, 2019) identifies that the scheme will *"remove known bottle necks in the Croydon area in CP7 and increase capacity on the main line routes between London and Brighton",* ie the scheme is planned to come forward between 2024 and 2029. Accordingly the CARS is included in the future baseline for the strategic modelling.

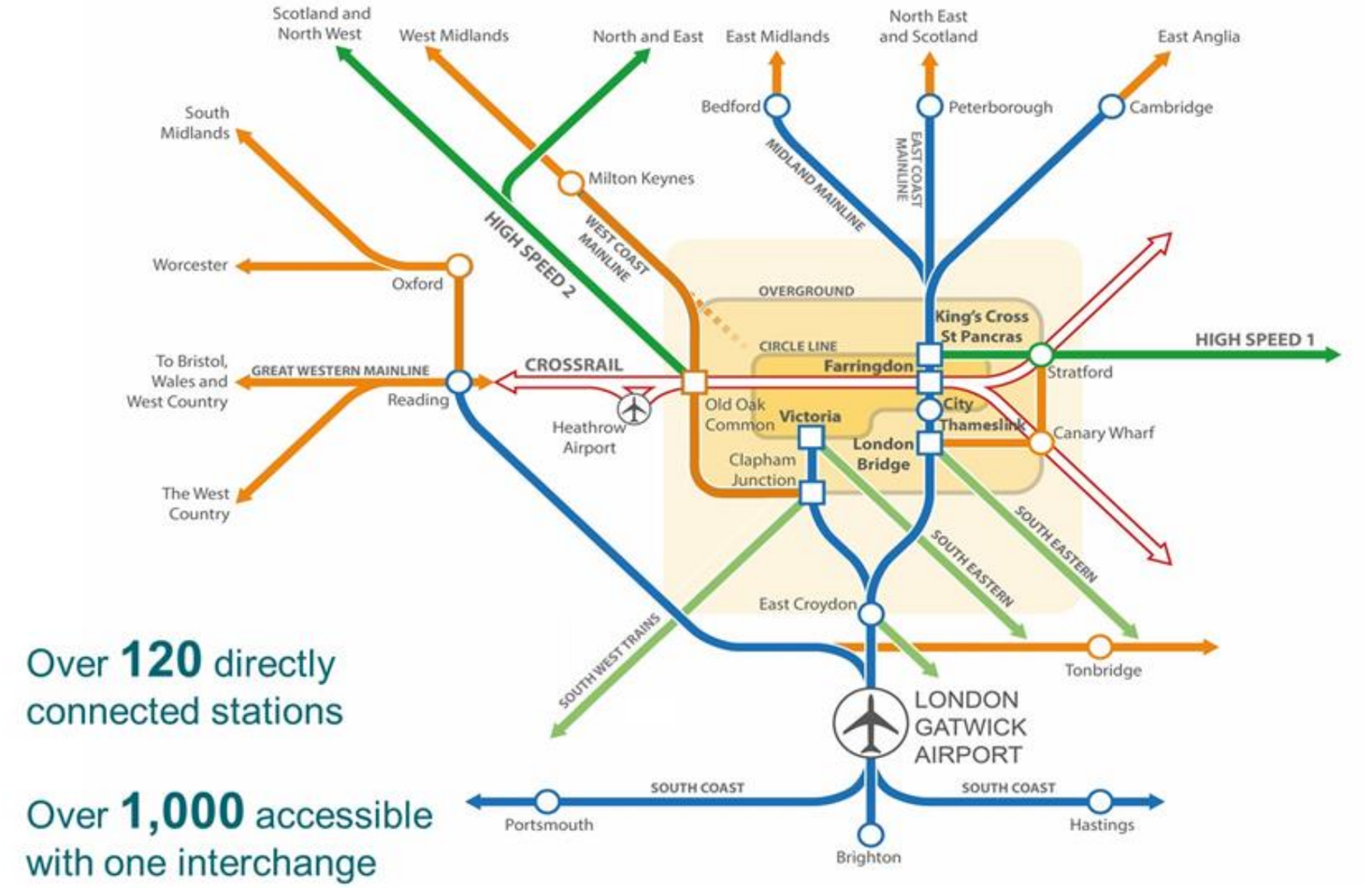
8.2.12 In addition to CARS, the accompanying changes to the track layout at Gatwick Airport are shown in Diagram 8.2.4 which support the delivery of this additional capacity.

Diagram 8.2.4: Proposed Gatwick Airport Station track layout enhancements



Source: Network Rail South East Area Route Study (September 2015)

Diagram 8.2.5: Future Rail network to Gatwick including the Thameslink Programme and Crossrail



Source: GAL

8.2.13 At this stage, it is envisaged that the full package of Brighton-London main line upgrades, most notably CARS, could deliver four tph in the peak direction and this assumption has been included in the initial assessment described in this section.

Redhill and the North Downs Line

8.2.14 The planned work to bring into use a new platform at Redhill will provide additional capacity to turn trains from the North Downs Line and run through to Gatwick. Great Western Railway (GWR) are planning to operate a second direct train per hour to Gatwick as a result, with potential for a third service extended to Oxford later in the assessment period. This will enable a connection to East West Rail in the future. GWR introduced a three tph service between Reading and Redhill in September 2020, in anticipation of extending the additional services to Gatwick Airport in the next phase. As such, service improvements on the North Downs Line have been included in the modelling.

Gatwick Airport Station

8.2.15 Gatwick Airport station currently acts as an interchange, primarily for passengers connecting to air services via the terminals but also for staff, commuters and local residents. The railway station, located adjacent to South Terminal, handled around 20 million airport passengers per annum prior to the Covid-19 pandemic.

8.2.16 The current station is congested at peak times and accordingly the Department for Transport announced £150 million investment in the Station Project in July 2019, which will include 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. This project is under construction.

8.2.17 These enhancements will make travelling to Gatwick Airport by rail more attractive into the future and should help grow the Airport's strong rail mode share. The performance of the station under the Project scenarios is described in Section 13.

Future Network Connectivity

8.2.18 In terms of wider connectivity, it will be possible to travel directly to the City of London via the Thameslink route with interchange to Docklands from London Bridge station now and at Farringdon on Crossrail from 2022. These services also directly connect the airport to Croydon. The connection to the East Coast Main Line provides direct services through Hertfordshire to Cambridge and Peterborough for air passengers. Cross-platform connections on to trains to Yorkshire, the North East and Scotland on the Virgin

Trains East Coast franchise are possible at both Stevenage and Peterborough.

8.2.19 Improvements to the connection from Gatwick to Reading (particularly the provision of more and faster direct trains) via Redhill, Reigate and Guildford is important for unlocking this corridor. The North Downs Line upgrade will also enable Gatwick to link with one or two connections to Oxford, the Midlands and, in the future, the East West Rail connection to Milton Keynes and Bedford.

8.2.20 In the future, Crossrail 2 may provide connectivity benefits between Surrey and Hertfordshire through Central London, in particular through Clapham Junction which provides connectivity to Gatwick Airport. In addition, Gatwick Airport will be connected to HS2 Phase 1 at Old Oak Common from the West London Line via interchange at Clapham Junction. However, these schemes have not been included in the modelling.

8.2.21 Future rail connectivity is shown in Diagram 8.2.5.

Earlier Train Services

8.2.22 Earlier morning trains on all routes to Gatwick Airport station would help match services to staff shift patterns at Gatwick. This intervention has been discussed with Network Rail though no specific service has been confirmed at this time and so this is not included in the modelling.

8.2.23 This intervention does not require additional capital expenditure but may require additional operational expenditure for additional traincrew. Subject to a detailed diagramming exercise, existing units could start operation earlier.

8.2.24 These earlier services provide better connectivity both for employees on early shifts as well as air passengers catching the first departing flights of the day. Track signalling upgrades could allow services to continue to run in parallel with overnight maintenance, which might otherwise restrict the ability to operate earlier services.

8.3 Comparison of Baseline and With Project Performance

Modellling approach

8.3.1 The EMME platform has been used for the public transport modelling for Gatwick. EMME is a well-established and reliable software for public transport assignment, including modelling impacts of in-vehicle crowding on passenger route choice. Both DfT and TfL have their primary rail models in EMME software (Railplan and Planet South respectively) and its strengths and limitations are well understood.

8.3.2 PLANET South has been used for the assessment of rail effects. The model extents include rail lines from the Sussex coast to central London, plus the North Downs Line between Gatwick and Reading. Moreover, given that travel to Gatwick for many passengers, requires cross-London travel, full coverage of PLANET South to locations north of London such as Stevenage, Peterborough and Cambridge have also been included. The Department for Transport supports the use of PLANET South for this study (as part of the overall assessment methodology set out in Section 1).

Study Area

8.3.3 As might be expected, Gatwick's primary effect on the rail network is on services which pass through Gatwick Airport railway station. The plots in Diagram 8.3.1 shows a comparison between flows in the 2047 AM and PM peak periods (0700-0900 and 1600-1800) in the future baseline and with the Project, with the change in bandwidth indicating 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, which is intuitive and confirmed by catchment analysis of CAA data for passengers and staff travel survey data for employees.

8.3.4 Diagram 8.3.2 shows rail catchments for air passengers to Gatwick. It can be seen that the largest number of trips to and from Gatwick by passengers by rail is along the Brighton-London main line, with catchments through Horsham, along the South Coast and also running west from Redhill/Reigate through to Reading on the North Downs Line.

8.3.5 A similar distribution is also shown for employees in Diagram 8.3.3 though specific catchments stand out as having higher concentrations of Gatwick employees, including Croydon, Redhill and Reigate, Crawley, Horsham, Haywards Heath, Brighton and towns along the South Coast.

8.3.6 The rail services which have been assessed are:

- 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

Modelled rail improvements to 2029

8.3.7 Modelled rail improvements to 2029 and beyond in future baseline and with Project include:

- Crossrail
- Thameslink frequency (24 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
- 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

8.3.8 These enhancements lead to an improvement in rail mode share to between 42% and 43% for air passengers and between 14% and 15% for employees in future years 2029, 2032 and 2047.

Assessment Criteria

8.3.9 Crowding is an important measure of rail effects. Line loading data, as well as information on seating and standing capacity by line, have been used to determine crowding. More passengers standing indicate a reduction in space and less comfortable journeys.

Diagram 8.3.1: 2047 net flow change between Future Baseline and With Project

Diagram 8.3.2: Gatwick Airport passenger catchments for rail

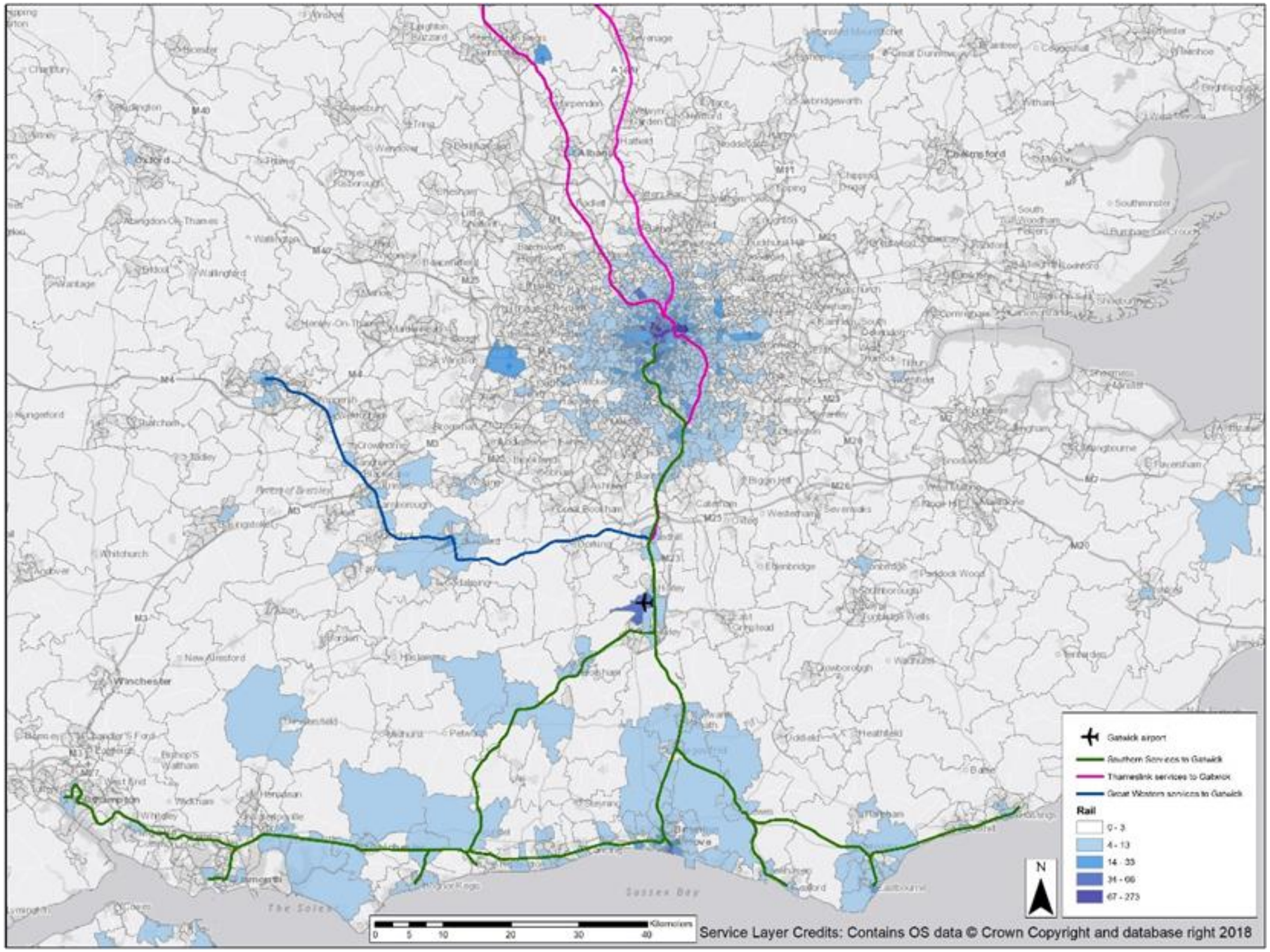
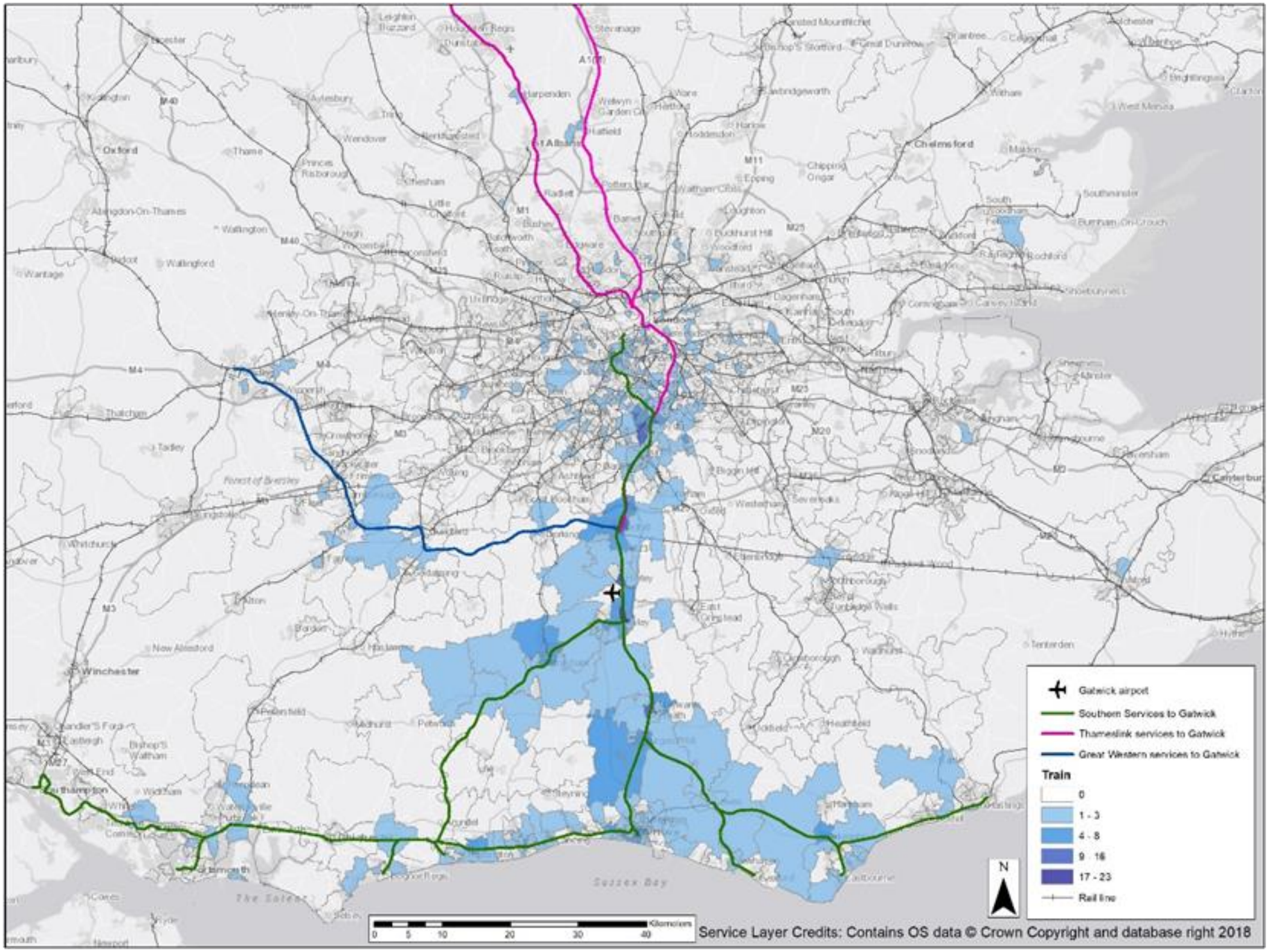


Diagram 8.3.3: Gatwick Airport employee catchments for rail



8.3.10 The scope of the rail crowding assessment includes the following:

- Line loading assessment
- Seated load factor assessment
- Standing capacity

Comparison of Future Baseline and with Project Scenarios

8.3.11 Table 8.3.1 shows airport rail passenger demand by year for the future baseline and with Project. By 2047, the Project accounts for over 2,000 more passengers using the rail network from Gatwick Airport railway station, from approximately 10,000 passengers to 12,000 passengers in the AM peak two hours (0700-0900) and from approximately 13,000 passengers to 15,000 in the PM peak two hours (1600-1800).

Table 8.3.1: Passenger Demand at Gatwick

Scenario	AM Peak (0700-0900)			
	Northbound		Southbound	
	Alighters	Boarders	Alighters	Boarders
2029 Future Baseline	858	3,413	3,764	416
2029 Project	938	3,603	4,288	445
2029 net increase	**80**	**190**	**524**	**30**
2032 Future Baseline	908	3,594	4,008	436
2032 Project	1,037	4,133	4,991	493
2032 net increase	**129**	**539**	**984**	**57**
2047 Future Baseline	1,020	4,117	4,536	471
2047 Project	1,187	4,751	5,763	534
2047 net increase	**168**	**635**	**1,227**	**63**
Scenario	**PM Peak (1600-1800)**			
	Northbound		**Southbound**	
	Alighters	**Boarders**	**Alighters**	**Boarders**
2029 Future Baseline	595	4,203	5,343	742
2029 Project	617	4,384	5,545	768
2029 net increase	**22**	**181**	**201**	**26**
2032 Future Baseline	610	4,383	5,560	764
2032 Project	716	5,175	6,589	870
2032 net increase	**107**	**792**	**1,030**	**105**
2047 Future Baseline	661	5,168	6,176	907
2047 Project	775	5,892	7,257	999
2047 net increase	**114**	**724**	**1,081**	**92**

AM Peak

Line Loading Assessment (AM Peak)

8.3.12 Crowding has been assessed based on line loading in both directions in the AM peak (0700-0900).

8.3.13 Table 8.3.2 shows the northbound line loading and Table 8.3.3: Passenger line loading on departure – AM Southbound (07:00 – 09:00) shows the southbound line loading, and the net change in line loading as the result of the Project is set out in Table 8.3.4.

8.3.14 In the AM peak, the highest increase in rail passengers is in the counter peak southbound direction, from London to Gatwick. This demonstrates that Gatwick growth means better use of contra-peak rail capacity.

8.3.15 The analysis shows that most passengers are expected on the fast train services from London Victoria and London Bridge and the changes in line loadings by assessment years are summarised below.

8.3.16 In 2029, the Project adds around 140 passengers to rail services in the northbound direction, which represents an overall increase of 2%. In the southbound off-peak direction, the Project adds up to a total of around 550 passengers. The increase in passengers represents an 8% increase in passengers on the fast services, and 9% on Gatwick Express.

8.3.17 In 2032, the Project adds around 420 passengers to rail services in the northbound direction, which represents an overall increase of 2%. In the southbound off-peak direction, the Project adds up to a total of around 950 passengers. This increase in passengers represents an 13% to 14% increase in passengers on the fast services, and 14% on Gatwick Express.

In 2047, the Project adds around 770 passengers to rail services in the northbound direction. The increase in passengers represents a 4% to 6% increase in passengers on the fast services owing to the high volume of commuters already travelling into London, and 17% on Gatwick Express which is to be expected as this is the dedicated Airport rail service. In the southbound off-peak direction, the Project adds up to a total of around 1,270 passengers. The increase in passengers represents an 13% to 15% increase in passengers on the fast services, and 16% on Gatwick Express.

Table 8.3.2: Passenger line loading on departure – AM Northbound (07:00 – 09:00)

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)													
							Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
2029 AM BAU	NDL	NB	4	1,040	1,276	2,316	0	192	192	192	192	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,728	2,960	7,688	3,169	3,975	3,975	3,975	3,975	3,975	3,975	3,975	3,975	3,975	3,975	3,975	0	0
	Fast VIC	NB	10	6,318	3,770	10,088	3,371	5,143	5,196	5,196	5,196	5,196	5,196	5,196	5,196	5,196	7,609	6,632	0	0
	Stoppers VIC	NB	4	2,672	1,596	4,268	0	96	64	72	381	1,032	1,207	1,842	2,857	2,857	3,182	2,873	0	0
	Fast LBG	NB	17	10,964	14,727	25,691	7,006	8,503	8,503	8,503	8,503	8,503	8,503	8,503	8,503	8,503	0	0	15,327	15,327
	Stoppers LBG	NB	10	6,710	10,924	17,634	1,000	422	502	551	1,045	2,286	2,706	4,263	5,545	5,498	0	0	8,603	9,711
	Total		**53**	**32,432**	**35,253**	**67,685**	**14,546**	**18,331**	**18,431**	**18,489**	**19,292**	**20,992**	**21,586**	**23,779**	**26,076**	**26,029**	**14,766**	**13,479**	**23,930**	**25,038**
2029 AM NRP	NDL	NB	4	1,040	1,276	2,316	0	198	198	198	198	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,728	2,960	7,688	3,172	3,998	3,998	3,998	3,998	3,998	3,998	3,998	3,998	3,998	3,998	3,998	0	0
	Fast VIC	NB	10	6,318	3,770	10,088	3,380	5,184	5,236	5,236	5,236	5,236	5,236	5,236	5,236	5,236	7,631	6,637	0	0
	Stoppers VIC	NB	4	2,672	1,596	4,268	0	97	64	73	384	1,037	1,211	1,846	2,861	2,861	3,185	2,872	0	0
	Fast LBG	NB	17	10,964	14,727	25,691	7,025	8,563	8,563	8,563	8,563	8,563	8,563	8,563	8,563	8,563	0	0	15,342	15,342
	Stoppers LBG	NB	10	6,710	10,924	17,634	1,008	432	512	560	1,058	2,293	2,712	4,268	5,550	5,503	0	0	8,616	9,725
	Total		**53**	**32,432**	**35,253**	**67,685**	**14,585**	**18,472**	**18,571**	**18,628**	**19,437**	**21,126**	**21,720**	**23,911**	**26,208**	**26,161**	**14,813**	**13,506**	**23,957**	**25,067**
2032 AM BAU	NDL	NB	4	1,040	1,276	2,316	0	204	204	204	204	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,728	2,960	7,688	3,276	4,110	4,110	4,110	4,110	4,110	4,110	4,110	4,110	4,110	4,110	4,110	0	0
	Fast VIC	NB	10	6,318	3,770	10,088	3,526	5,352	5,408	5,408	5,408	5,408	5,408	5,408	5,408	5,408	7,734	6,698	0	0
	Stoppers VIC	NB	4	2,672	1,596	4,268	0	98	64	73	374	1,049	1,229	1,893	2,938	2,938	3,236	2,911	0	0
	Fast LBG	NB	17	10,964	14,727	25,691	7,365	8,941	8,941	8,941	8,941	8,941	8,941	8,941	8,941	8,941	0	0	15,672	15,672
	Stoppers LBG	NB	10	6,710	10,924	17,634	1,043	450	535	586	1,108	2,383	2,817	4,445	5,763	5,714	0	0	8,792	9,932
	Total		**53**	**32,432**	**35,253**	**67,685**	**15,210**	**19,155**	**19,263**	**19,323**	**20,145**	**21,891**	**22,505**	**24,797**	**27,159**	**27,111**	**15,080**	**13,719**	**24,465**	**25,604**
2032 AM NRP	NDL	NB	4	1,040	1,276	2,316	0	218	218	218	218	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,728	2,960	7,688	3,260	4,176	4,176	4,176	4,176	4,176	4,176	4,176	4,176	4,176	4,176	4,176	0	0
	Fast VIC	NB	10	6,318	3,770	10,088	3,529	5,471	5,526	5,526	5,526	5,526	5,526	5,526	5,526	5,526	7,808	6,715	0	0
	Stoppers VIC	NB	4	2,672	1,596	4,268	0	99	65	74	382	1,059	1,238	1,903	2,947	2,947	3,246	2,910	0	0
	Fast LBG	NB	17	10,964	14,727	25,691	7,411	9,129	9,129	9,129	9,129	9,129	9,129	9,129	9,129	9,129	0	0	15,749	15,749
	Stoppers LBG	NB	10	6,710	10,924	17,634	1,034	477	561	611	1,132	2,397	2,829	4,455	5,772	5,722	0	0	8,802	9,945
	Total		**53**	**32,432**	**35,253**	**67,685**	**15,235**	**19,570**	**19,675**	**19,735**	**20,563**	**22,287**	**22,899**	**25,188**	**27,550**	**27,500**	**15,231**	**13,801**	**24,552**	**25,695**
2047 AM BAU	NDL	NB	4	1,040	1,276	2,316	0	255	255	255	255	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,728	2,960	7,688	3,747	4,468	4,468	4,468	4,468	4,468	4,468	4,468	4,468	4,468	4,468	4,468	0	0

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)													
							Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
	Fast VIC	NB	12	7,849	4,684	12,533	5,447	7,614	7,704	7,704	7,704	7,704	7,704	7,704	7,704	7,704	9,596	8,404	0	0
	Stoppers VIC	NB	5	3,319	1,983	5,302	0	121	83	97	600	1,558	1,802	2,651	3,838	3,838	4,032	3,688	0	0
	Fast LBG	NB	18	11,661	15,104	26,765	9,667	11,487	11,487	11,487	11,487	11,487	11,487	11,487	11,487	11,487	0	0	17,622	17,622
	Stoppers LBG	NB	10	6,710	10,924	17,634	1,416	629	739	799	1,353	2,740	3,217	4,893	6,092	6,031	0	0	9,367	10,533
	Total		**57**	**35,308**	**36,930**	**72,238**	**20,277**	**24,573**	**24,735**	**24,809**	**25,867**	**27,957**	**28,678**	**31,202**	**33,589**	**33,528**	**18,095**	**16,559**	**26,989**	**28,155**
2047 AM NRP	NDL	NB	4	1,040	1,276	2,316	0	272	272	272	272	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,728	2,960	7,688	3,741	4,538	4,538	4,538	4,538	4,538	4,538	4,538	4,538	4,538	4,538	4,538	0	0
	Fast VIC	NB	12	7,849	4,684	12,533	5,449	7,761	7,849	7,849	7,849	7,849	7,849	7,849	7,849	7,849	9,697	8,425	0	0
	Stoppers VIC	NB	5	3,319	1,983	5,302	0	122	84	99	613	1,574	1,818	2,667	3,854	3,854	4,045	3,695	0	0
	Fast LBG	NB	18	11,661	15,104	26,765	9,708	11,701	11,701	11,701	11,701	11,701	11,701	11,701	11,701	11,701	0	0	17,710	17,710
	Stoppers LBG	NB	10	6,710	10,924	17,634	1,426	673	784	844	1,408	2,781	3,256	4,930	6,129	6,066	0	0	9,389	10,559
	Total		**57**	**35,308**	**36,930**	**72,238**	**20,324**	**25,066**	**25,228**	**25,302**	**26,380**	**28,443**	**29,162**	**31,684**	**34,070**	**34,008**	**18,280**	**16,658**	**27,099**	**28,269**

Table 8.3.3: Passenger line loading on departure – AM Southbound (07:00 – 09:00)

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)													
							London Victoria (VIC Branch)	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)	East Croydon	South Croydon	Purley	Coulsdon South	Merstham	Redhill	Earlswood	Salfords	Horley	Gatwick Airport
2029 AM BAU	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	579	579	579	579	0
	GX	SB	8	4,276	2,676	6,952	602	602	0	0	602	602	602	602	602	602	602	602	602	376
	Fast VIC	SB	11	5,835	3,478	9,313	1,557	3,038	0	0	2,148	2,148	2,148	2,148	2,148	2,148	2,148	2,148	2,148	1,129
	Stoppers VIC	SB	2	1,144	638	1,782	0	0	0	0	0	0	0	0	0	37	226	248	331	0
	Fast LBG	SB	16	10,903	17,751	28,654	0	0	6,355	6,355	3,522	3,522	3,522	3,522	3,522	3,472	3,472	3,472	3,472	1,338
	Stoppers LBG	SB	8	5,032	8,193	13,225	0	0	2,526	2,728	1,130	1,130	923	807	799	306	541	567	849	370
	Total		**49**	**28,231**	**34,012**	**62,242**	**2,159**	**3,640**	**8,880**	**9,083**	**7,402**	**7,402**	**7,196**	**7,080**	**7,072**	**7,145**	**7,569**	**7,617**	**7,982**	**3,213**
2029 AM NRP	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	608	608	608	608	0
	GX	SB	8	4,276	2,676	6,952	655	655	0	0	655	655	655	655	655	655	655	655	655	380
	Fast VIC	SB	11	5,835	3,478	9,313	1,621	3,160	0	0	2,324	2,324	2,324	2,324	2,324	2,324	2,324	2,324	2,324	1,144

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)													
							London Victoria (VIC Branch)	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)	East Croydon	South Croydon	Purley	Coulsdon South	Merstham	Redhill	Earlswood	Salfords	Horley	Gatwick Airport
	Stoppers VIC	SB	2	1,144	638	1,782	0	0	0	0	0	0	0	0	0	39	221	243	326	0
	Fast LBG	SB	16	10,903	17,751	28,654	0	0	6,594	6,594	3,816	3,816	3,816	3,816	3,816	3,765	3,765	3,765	3,765	1,348
	Stoppers LBG	SB	8	5,032	8,193	13,225	0	0	2,539	2,749	1,135	1,135	927	812	805	313	549	575	857	373
	Total		**49**	**28,231**	**34,012**	**62,242**	**2,277**	**3,816**	**9,132**	**9,343**	**7,930**	**7,930**	**7,722**	**7,607**	**7,600**	**7,704**	**8,122**	**8,170**	**8,535**	**3,246**
2032 AM BAU	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	600	600	600	600	0
	GX	SB	8	4,276	2,676	6,952	649	649	0	0	649	649	649	649	649	649	649	649	649	410
	Fast VIC	SB	11	5,835	3,478	9,313	1,583	3,125	0	0	2,303	2,303	2,303	2,303	2,303	2,303	2,303	2,303	2,303	1,226
	Stoppers VIC	SB	2	1,144	638	1,782	0	0	0	0	0	0	0	0	0	38	221	244	330	0
	Fast LBG	SB	16	10,903	17,751	28,654	0	0	6,550	6,550	3,766	3,766	3,766	3,766	3,766	3,713	3,713	3,713	3,713	1,426
	Stoppers LBG	SB	8	5,032	8,193	13,225	0	0	2,555	2,743	1,158	1,158	947	830	820	317	564	591	882	384
	Total		**49**	**28,231**	**34,012**	**62,242**	**2,232**	**3,775**	**9,105**	**9,293**	**7,876**	**7,876**	**7,665**	**7,548**	**7,538**	**7,620**	**8,050**	**8,101**	**8,477**	**3,446**
2032 AM NRP	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	608	608	608	608	0
	GX	SB	8	4,276	2,676	6,952	738	738	0	0	738	738	738	738	738	738	738	738	738	420
	Fast VIC	SB	11	5,835	3,478	9,313	1,697	3,350	0	0	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609	1,255
	Stoppers VIC	SB	2	1,144	638	1,782	0	0	0	0	0	0	0	0	0	40	218	241	327	0
	Fast LBG	SB	16	10,903	17,751	28,654	0	0	6,991	6,991	4,299	4,299	4,299	4,299	4,299	4,243	4,243	4,243	4,243	1,453
	Stoppers LBG	SB	8	5,032	8,193	13,225	0	0	2,599	2,785	1,175	1,175	962	846	836	326	571	598	889	391
	Total		**49**	**28,231**	**34,012**	**62,242**	**2,436**	**4,089**	**9,590**	**9,776**	**8,820**	**8,820**	**8,608**	**8,492**	**8,482**	**8,565**	**8,988**	**9,038**	**9,415**	**3,519**
2047 AM BAU	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	603	603	603	603	0
	GX	SB	8	4,276	2,676	6,952	795	795	0	0	795	795	795	795	795	795	795	795	795	679
	Fast VIC	SB	11	5,835	3,478	9,313	1,584	3,253	0	0	2,916	2,916	2,916	2,916	2,916	2,916	2,916	2,916	2,916	1,792
	Stoppers VIC	SB	2	1,144	638	1,782	0	0	0	0	0	0	0	0	0	54	175	202	296	0
	Fast LBG	SB	16	10,903	17,751	28,654	0	0	7,049	7,049	4,823	4,823	4,823	4,823	4,823	4,763	4,763	4,763	4,763	2,029
	Stoppers LBG	SB	8	5,032	8,193	13,225	0	0	2,654	2,910	1,253	1,253	1,030	912	892	410	630	662	981	476
	Total		**49**	**28,231**	**34,012**	**62,242**	**2,379**	**4,048**	**9,703**	**9,959**	**9,787**	**9,787**	**9,564**	**9,446**	**9,426**	**9,542**	**9,883**	**9,941**	**10,355**	**4,976**
2047 AM NRP	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	625	625	625	625	0
	GX	SB	8	4,276	2,676	6,952	924	924	0	0	924	924	924	924	924	924	924	924	924	702
	Fast VIC	SB	11	5,835	3,478	9,313	1,746	3,529	0	0	3,294	3,294	3,294	3,294	3,294	3,294	3,294	3,294	3,294	1,814

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)													
							London Victoria (VIC Branch)	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)	East Croydon	South Croydon	Purley	Coulsdon South	Merstham	Redhill	Earlswood	Salfords	Horley	Gatwick Airport
	Stoppers VIC	SB	2	1,144	638	1,782	0	0	0	0	0	0	0	0	0	58	164	191	285	0
	Fast LBG	SB	16	10,903	17,751	28,654	0	0	7,572	7,572	5,541	5,541	5,541	5,541	5,541	5,481	5,481	5,481	5,481	2,059
	Stoppers LBG	SB	8	5,032	8,193	13,225	0	0	2,713	2,959	1,271	1,271	1,046	929	910	428	642	674	992	486
	Total		**49**	**28,231**	**34,012**	**62,242**	**2,670**	**4,453**	**10,284**	**10,530**	**11,030**	**11,030**	**10,805**	**10,688**	**10,669**	**10,809**	**11,130**	**11,188**	**11,601**	**5,061**

Table 8.3.4: Change in line loading – AM peak (07:00 – 09:00)

Year of Assessment	Groups	Direction	Change in Line Loading (% change)														
			Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
2029	NDL	NB	-	6 (3%)	6 (3%)	6 (3%)	6 (3%)	-	-	-	-	-	-	-	-	-
	GX	NB	3 (0%)	23 (1%)	23 (1%)	23 (1%)	23 (1%)	23 (1%)	23 (1%)	23 (1%)	23 (1%)	23 (1%)	23 (1%)	23 (1%)	-	-
	Fast VIC	NB	9 (0%)	41 (1%)	40 (1%)	40 (1%)	40 (1%)	40 (1%)	40 (1%)	40 (1%)	40 (1%)	40 (1%)	22 (0%)	5 (0%)	-	-
	Stoppers VIC	NB	-	1 (1%)	1 (1%)	-	3 (1%)	4 (0%)	4 (0%)	4 (0%)	4 (0%)	4 (0%)	3 (0%)	-1 (0%)	-	-
	Fast LBG	NB	18 (0%)	60 (1%)	60 (1%)	60 (1%)	60 (1%)	60 (1%)	60 (1%)	60 (1%)	60 (1%)	60 (1%)	-	-	15 (0%)	15 (0%)
	Stoppers LBG	NB	8 (1%)	10 (2%)	10 (2%)	10 (2%)	13 (1%)	7 (0%)	6 (0%)	5 (0%)	5 (0%)	5 (0%)	-	-	13 (0%)	14 (0%)
	Total		**39 (0%)**	**141 (1%)**	**139 (1%)**	**139 (1%)**	**146 (1%)**	**134 (1%)**	**134 (1%)**	**133 (1%)**	**132 (1%)**	**132 (1%)**	**47 (0%)**	**27 (0%)**	**28 (0%)**	**29 (0%)**
2032	NDL	NB	-	14 (7%)	14 (7%)	14 (7%)	14 (7%)	-	-	-	-	-	-	-	-	-
	GX	NB	-15 (0%)	66 (2%)	66 (2%)	66 (2%)	66 (2%)	66 (2%)	66 (2%)	66 (2%)	66 (2%)	66 (2%)	66 (2%)	66 (2%)	-	-
	Fast VIC	NB	3 (0%)	119 (2%)	117 (2%)	117 (2%)	117 (2%)	117 (2%)	117 (2%)	117 (2%)	117 (2%)	117 (2%)	74 (1%)	17 (0%)	-	-
	Stoppers VIC	NB	-	1 (2%)	1 (1%)	1 (1%)	8 (2%)	10 (1%)	9 (1%)	10 (1%)	10 (0%)	10 (0%)	10 (0%)	-1 (0%)	-	-
	Fast LBG	NB	46 (1%)	188 (2%)	188 (2%)	188 (2%)	188 (2%)	188 (2%)	188 (2%)	188 (2%)	188 (2%)	188 (2%)	-	-	77 (0%)	77 (0%)
	Stoppers LBG	NB	-9 (-1%)	26 (6%)	25 (5%)	25 (4%)	24 (2%)	14 (1%)	12 (0%)	9 (0%)	9 (0%)	8 (0%)	-	-	10 (0%)	13 (0%)
	Total		**25 (0%)**	**415 (2%)**	**412 (2%)**	**412 (2%)**	**418 (2%)**	**396 (2%)**	**393 (2%)**	**391 (2%)**	**391 (1%)**	**390 (1%)**	**151 (1%)**	**82 (1%)**	**87 (0%)**	**90 (0%)**
2047	NDL	NB	-	17 (7%)	17 (7%)	17 (7%)	17 (7%)	-	-	-	-	-	-	-	-	-

Year of Assessment	Groups	Direction	Change in Line Loading (% change)													
			Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
	GX	NB	-6 (0%)	70 (2%)	70 (2%)	70 (2%)	70 (2%)	70 (2%)	70 (2%)	70 (2%)	70 (2%)	70 (2%)	70 (2%)	70 (2%)	-	-
	Fast VIC	NB	2 (0%)	147 (2%)	145 (2%)	145 (2%)	145 (2%)	145 (2%)	145 (2%)	145 (2%)	145 (2%)	145 (2%)	101 (1%)	21 (0%)	-	-
	Stoppers VIC	NB	-	1 (1%)	1 (2%)	2 (2%)	12 (2%)	16 (1%)	16 (1%)	16 (1%)	16 (0%)	16 (0%)	14 (0%)	7 (0%)	-	-
	Fast LBG	NB	40 (0%)	215 (2%)	215 (2%)	215 (2%)	215 (2%)	215 (2%)	215 (2%)	215 (2%)	215 (2%)	215 (2%)	-	-	88 (1%)	88 (1%)
	Stoppers LBG	NB	10 (1%)	44 (7%)	45 (6%)	45 (6%)	55 (4%)	40 (1%)	39 (1%)	37 (1%)	36 (1%)	35 (1%)	-	-	22 (0%)	26 (0%)
	Total		**47 (0%)**	**493 (2%)**	**493 (2%)**	**493 (2%)**	**514 (2%)**	**486 (2%)**	**484 (2%)**	**483 (2%)**	**481 (1%)**	**480 (1%)**	**185 (1%)**	**99 (1%)**	**110 (0%)**	**115 (0%)**
Year of Assessment	**Groups**	**Direction**	**London Victoria (VIC Branch)**	**Clapham Junction (VIC Branch)**	**London Bridge (LBG Branch)**	**Norwood Junction (LBG Branch)**	**East Croydon**	**South Croydon**	**Purley**	**Coulsdon South**	**Merstham**	**Redhill**	**Earlswood**	**Salfords**	**Horley**	**Gatwick Airport**
2029	NDL	SB	-	-	-	-	-	-	-	-	-	28 (5%)	28 (5%)	28 (5%)	28 (5%)	-
	GX	SB	53 (9%)	53 (9%)	-	-	53 (9%)	53 (9%)	53 (9%)	53 (9%)	53 (9%)	53 (9%)	53 (9%)	53 (9%)	53 (9%)	4 (1%)
	Fast VIC	SB	65 (4%)	123 (4%)	-	-	176 (8%)	176 (8%)	176 (8%)	176 (8%)	176 (8%)	176 (8%)	176 (8%)	176 (8%)	176 (8%)	15 (1%)
	Stoppers VIC	SB	-	-	-	-	-	-	-	-	-	2 (5%)	-5 (-2%)	-5 (-2%)	-5 (-1%)	-
	Fast LBG	SB	-	-	239 (4%)	239 (4%)	293 (8%)	293 (8%)	293 (8%)	293 (8%)	293 (8%)	293 (8%)	293 (8%)	293 (8%)	293 (8%)	10 (1%)
	Stoppers LBG	SB	-	-	13 (1%)	21 (1%)	5 (0%)	5 (0%)	5 (1%)	5 (1%)	5 (1%)	7 (2%)	8 (1%)	8 (1%)	8 (1%)	3 (1%)
	Total		**118 (5%)**	**176 (5%)**	**252 (3%)**	**260 (3%)**	**527 (7%)**	**527 (7%)**	**527 (7%)**	**527 (7%)**	**527 (7%)**	**559 (8%)**	**553 (7%)**	**553 (7%)**	**554 (7%)**	**33 (1%)**
2032	NDL	SB	-	-	-	-	-	-	-	-	-	8 (1%)	8 (1%)	8 (1%)	8 (1%)	-
	GX	SB	89 (14%)	89 (14%)	-	-	89 (14%)	89 (14%)	89 (14%)	89 (14%)	89 (14%)	89 (14%)	89 (14%)	89 (14%)	89 (14%)	10 (3%)
	Fast VIC	SB	114 (7%)	225 (7%)	-	-	306 (13%)	306 (13%)	306 (13%)	306 (13%)	306 (13%)	306 (13%)	306 (13%)	306 (13%)	306 (13%)	29 (2%)
	Stoppers VIC	SB	-	-	-	-	-	-	-	-	-	2 (5%)	-3 (-2%)	-3 (-1%)	-3 (-1%)	-
	Fast LBG	SB	-	-	441 (7%)	441 (7%)	533 (14%)	533 (14%)	533 (14%)	533 (14%)	533 (14%)	530 (14%)	530 (14%)	530 (14%)	530 (14%)	27 (2%)
	Stoppers LBG	SB	-	-	44 (2%)	42 (2%)	17 (1%)	17 (1%)	15 (2%)	15 (2%)	16 (2%)	10 (3%)	7 (1%)	7 (1%)	8 (1%)	8 (2%)
	Total		**203 (9%)**	**314 (8%)**	**485 (5%)**	**483 (5%)**	**945 (12%)**	**945 (12%)**	**943 (12%)**	**943 (12%)**	**944 (13%)**	**945 (12%)**	**937 (12%)**	**937 (12%)**	**938 (11%)**	**73 (2%)**
2047	NDL	SB	-	-	-	-	-	-	-	-	-	22 (4%)	22 (4%)	22 (4%)	22 (4%)	-
	GX	SB	129 (16%)	129 (16%)	-	-	129 (16%)	129 (16%)	129 (16%)	129 (16%)	129 (16%)	129 (16%)	129 (16%)	129 (16%)	129 (16%)	24 (3%)
	Fast VIC	SB	162 (10%)	276 (8%)	-	-	378 (13%)	378 (13%)	378 (13%)	378 (13%)	378 (13%)	378 (13%)	378 (13%)	378 (13%)	378 (13%)	22 (1%)
	Stoppers VIC	SB	-	-	-	-	-	-	-	-	-	3 (6%)	-11 (-6%)	-11 (-6%)	-11 (-4%)	-
	Fast LBG	SB	-	-	523 (7%)	523 (7%)	718 (15%)	718 (15%)	718 (15%)	718 (15%)	718 (15%)	717 (15%)	717 (15%)	717 (15%)	717 (15%)	30 (1%)

Year of Assessment	Groups	Direction	Change in Line Loading (% change)													
			Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
	Stoppers LBG	SB	-	-	59 (2%)	48 (2%)	18 (1%)	18 (1%)	16 (2%)	17 (2%)	17 (2%)	18 (4%)	12 (2%)	12 (2%)	11 (1%)	10 (2%)
	Total		**291 (12%)**	**405 (10%)**	**582 (6%)**	**571 (6%)**	**1243 (13%)**	**1243 (13%)**	**1241 (13%)**	**1242 (13%)**	**1243 (13%)**	**1268 (13%)**	**1247 (13%)**	**1247 (13%)**	**1246 (12%)**	**85 (2%)**

Seated Loading Factor Assessment (AM peak)

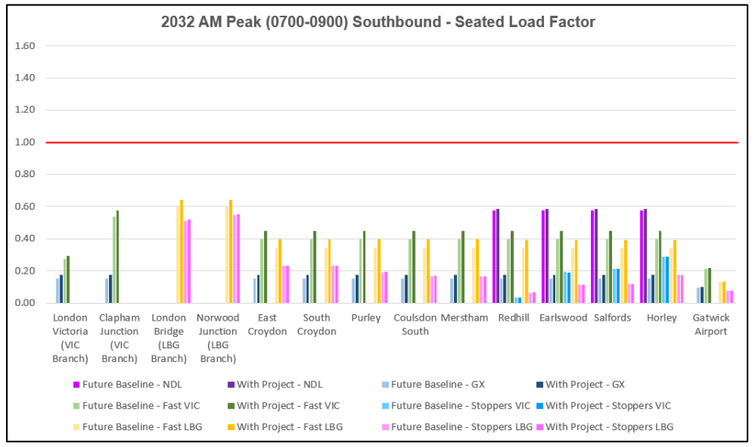
8.3.18 A seated load factor assessment for the AM peak has been undertaken for both the northbound and southbound direction services, as shown in Diagram 8.3.4.

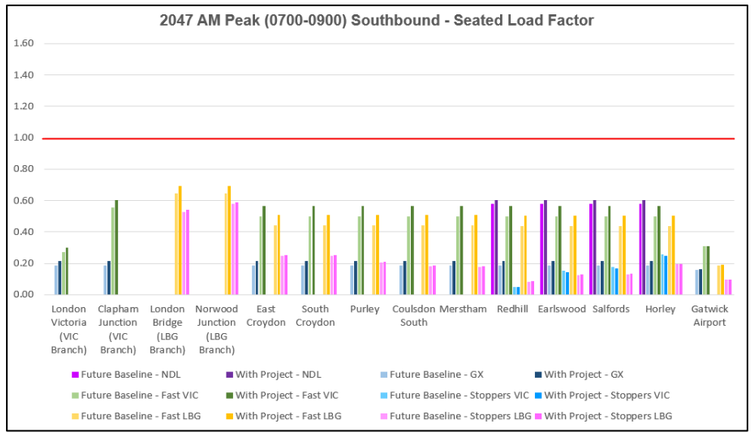
8.3.19 The highest increase in rail passengers is in the southbound direction, but there is still sufficient seating available for all passengers for all assessment years.

- 2029 - The highest seated load factor is around 0.6, which means that six out of ten seats are occupied and four will be available.
- 2032 and 2047 - The highest seated load factor is up to around 0.7, which means that seven seats out of ten seats are occupied and three will be available.

8.3.20 In the northbound direction, between Three Bridges and Coulsdon South, there is seating available for all passengers for all assessment years. 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 in the next section.

Diagram 8.3.4: Seated Load Factor – AM Peak





Standing Assessment (AM peak)

8.3.21 This assessment shows the percentage of standing capacity occupied for each service type. The AM peak assessment for the northbound services where the seating capacity is exceeded is shown in Table 8.3.5.

8.3.22 In 2029, 2032 and 2047, the highest percentage of standing capacity occupied is around 35% to 40%, which occurs north of East Croydon on both the London Victoria and London Bridge branches of the network, which is predominantly as a result of background commuter growth (1-2% maximum change in standing capacity occupied as a result of the Project). Whilst services north of East Croydon are therefore busy, the Project will not materially increase congestion, with the highest increase in standing capacity occupied by Gatwick passengers being 0.6% (2029) to 2.2% (2047) north of East Croydon on fast services into London Victoria.

8.3.23 Seating capacity is only exceeded on fast services to Victoria, stopping services to Victoria and fast services to London Bridge. The seating and standing capacities are illustrated in Diagram 8.3.5 below (after Table 8.3.5).

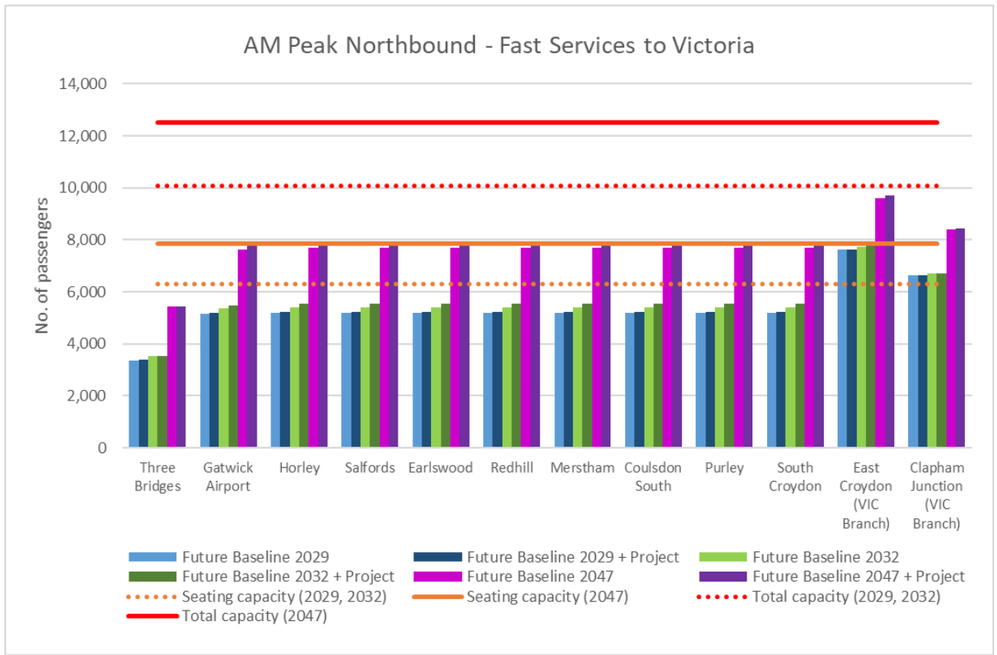
Table 8.3.5: Standing Assessment – Percentage of Standing Capacity Occupied – AM Peak (07:00 – 09:00) Northbound

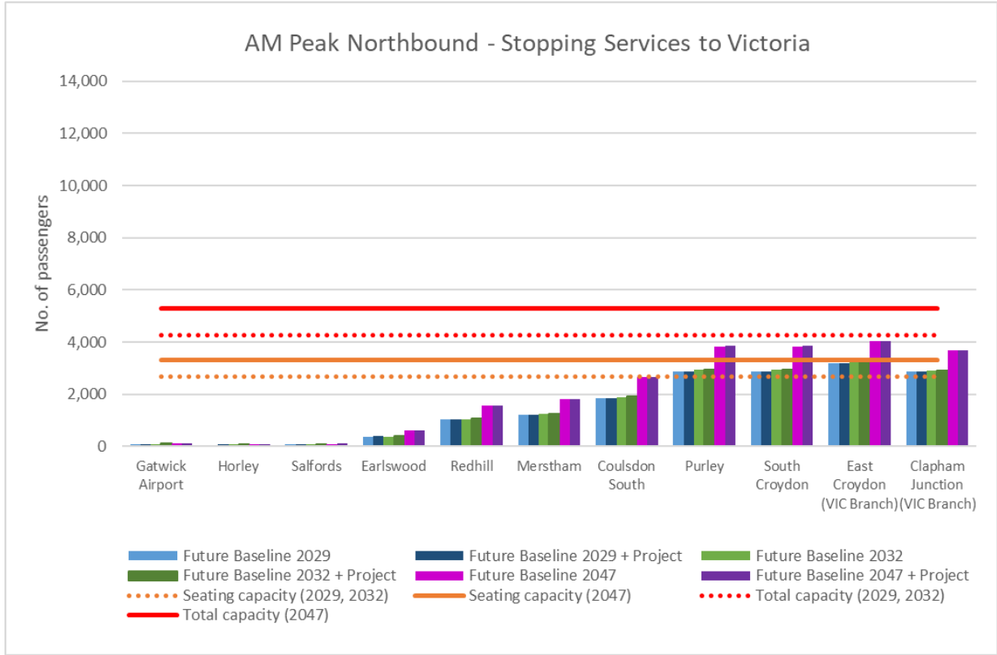
Assessment Year	Groups	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
2029 Future Baseline	NDL	-	-	-	-	-	-
	GX	0%	0%	0%	0%	-	-
	Fast VIC	0%	0%	34%	8%	-	-
	Stoppers VIC	12%	12%	32%	13%	-	-
	Fast LBG	0%	0%	-	-	30%	30%
	Stoppers LBG	0%	0%	-	-	17%	27%
	Total	**1%**	**1%**	**5%**	**1%**	**18%**	**21%**
2029 Project (% change)	NDL	-	-	-	-	-	-
	GX	0% (0%)	0% (0%)	0% (0%)	0% (0%)	-	-
	Fast VIC	0% (0%)	0% (0%)	35% (1%)	8% (0%)	-	-
	Stoppers VIC	12% (0%)	12% (0%)	32% (0%)	13% (0%)	-	-
	Fast LBG	0% (0%)	0% (0%)	-	-	30% (0%)	30% (0%)
	Stoppers LBG	0% (0%)	0% (0%)	-	-	17% (0%)	28% (0%)
	Total	**1% (0%)**	**1% (0%)**	**5% (0%)**	**1% (0%)**	**18% (0%)**	**21% (0%)**
2032 Future Baseline	NDL	-	-	-	-	-	-
	GX	0%	0%	0%	0%	-	-
	Fast VIC	0%	0%	38%	10%	-	-
	Stoppers VIC	17%	17%	35%	15%	-	-
	Fast LBG	0%	0%	-	-	32%	32%
	Stoppers LBG	0%	0%	-	-	19%	29%
	Total	**1%**	**1%**	**6%**	**2%**	**19%**	**22%**
2032 Project (% change)	NDL	-	-	-	-	-	-
	GX	0% (0%)	0% (0%)	0% (0%)	0% (0%)	-	-
	Fast VIC	0% (0%)	0% (0%)	40% (2%)	11% (0%)	-	-
	Stoppers VIC	17% (1%)	17% (1%)	36% (1%)	15% (0%)	-	-
	Fast LBG	0% (0%)	0% (0%)	-	-	32% (1%)	32% (1%)
	Stoppers LBG	0% (0%)	0% (0%)	-	-	19% (0%)	30% (0%)
	Total	**1% (0%)**	**1% (0%)**	**6% (0%)**	**2% (0%)**	**20% (0%)**	**23% (0%)**
2047 Future Baseline	NDL	-	-	-	-	-	-
	GX	0%	0%	0%	0%	-	-
	Fast VIC	0%	0%	37%	12%	-	-
	Stoppers VIC	26%	26%	36%	19%	-	-
	Fast LBG	0%	0%	-	-	39%	39%
	Stoppers LBG	0%	0%	-	-	24%	35%
	Total	**1%**	**1%**	**7%**	**2%**	**23%**	**26%**
2047 Project (% change)	NDL	-	-	-	-	-	-
	GX	0% (0%)	0% (0%)	0% (0%)	0% (0%)	-	-
	Fast VIC	0% (0%)	0% (0%)	39% (2%)	12% (0%)	-	-
	Stoppers VIC	27% (1%)	27% (1%)	37% (1%)	19% (0%)	-	-

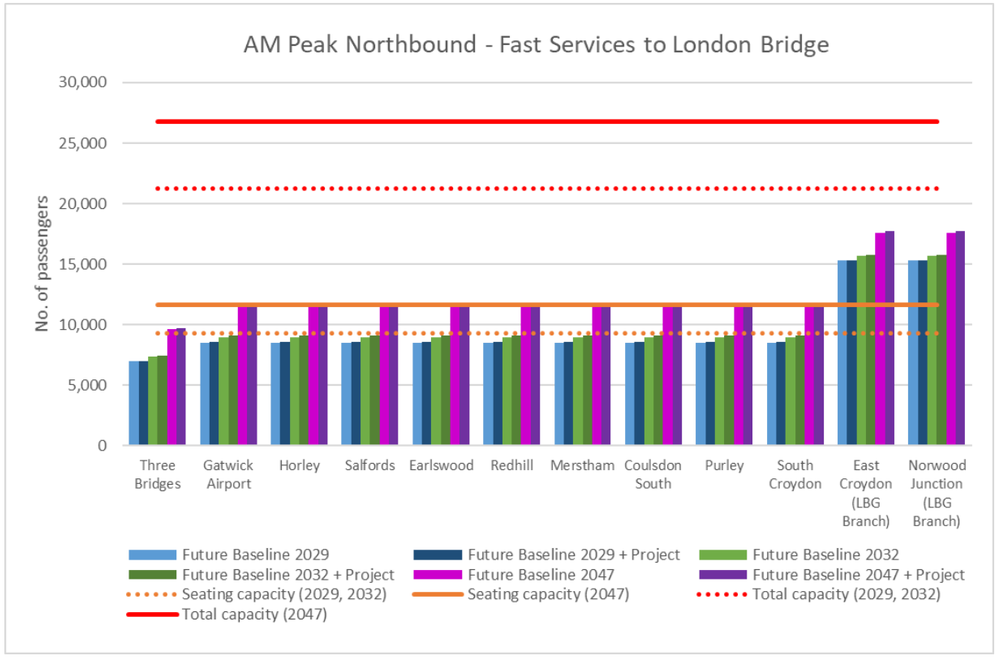
Assessment Year	Groups	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
	Fast LBG	0% (0%)	0% (0%)	-	-	40% (1%)	40% (1%)
	Stoppers LBG	0% (0%)	0% (0%)	-	-	25% (0%)	35% (0%)
	Total	**2% (0%)**	**2% (0%)**	**7% (0%)**	**3% (0%)**	**24% (0%)**	**27% (0%)**

Note: Fast LBG has 0.3% standing from Gatwick to South Croydon in 2047. This is minimal and not included in the above table.

Diagram 8.3.5: Occupied Seating and Standing Capacity – AM Peak (07:00 – 09:00) Northbound







PM Peak

Line Loading Assessment (PM Peak)

8.3.24 Crowding has been assessed based online loading in both directions in the PM peak (1600-1800). Table 8.3.6 shows the northbound line loading, Table 8.3.7 shows the southbound line loading, and the net change in line loading as the result of the Project is set out in Table 8.3.8.

8.3.25 The analysis shows that most passengers are expected on the fast train services from London Victoria and London Bridge and the changes in line loadings by assessment years are summarised below.

8.3.26 In 2029, the Project adds around 200 passengers to rail services in the northbound off-peak direction, which represents a 2% increase in passengers on the fast services, and 4% on Gatwick Express. In the southbound direction, the Project adds up to a total of around 190 passengers, which represents an overall increase of 1%.

8.3.27 In 2032, the Project adds around 840 passengers to rail services in the northbound off-peak direction. This increase in passengers represents a 9 to 10% increase in passengers on the fast services, and 16% on Gatwick Express. In the southbound direction, the Project adds up to a total of around 980 passengers. This represents an overall increase of 6%, with an 8% increase on the fast services from London Victoria.

8.3.28 In 2047, the Project adds around 770 passengers to rail services in the northbound off-peak direction. The increase in passengers represents a 4% to 6% increase in passengers on the fast services, and 17% on Gatwick Express which is dedicated airport service. In the southbound direction, the Project adds up to a total of around 1,030 passengers, which represents an overall increase of 5%.

Table 8.3.6: Passenger line loading on departure – PM Northbound (16:00 – 18:00)

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)													
							Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
2029 PM BAU	NDL	NB	4	1,040	1,276	2,316	0	242	242	242	242	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,952	3,104	8,056	572	579	579	579	579	579	579	579	579	579	579	579	0	0
	Fast VIC	NB	13	7,535	4,494	12,029	2,145	3,770	3,770	3,770	3,770	3,770	3,770	3,770	3,770	3,770	4,011	1,807	0	0
	Stoppers VIC	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fast LBG	NB	13	8,387	13,655	22,042	1,461	3,149	3,149	3,149	3,149	3,149	3,149	3,149	3,149	3,149	0	0	4,724	4,724
	Stoppers LBG	NB	15	9,466	15,422	24,888	758	1,373	1,045	1,022	1,028	1,051	1,042	1,144	1,418	1,418	0	0	4,222	3,757
	Total		**53**	**31,380**	**37,951**	**69,331**	**4,936**	**9,112**	**8,785**	**8,762**	**8,767**	**8,548**	**8,539**	**8,642**	**8,915**	**8,915**	**4,590**	**2,386**	**8,945**	**8,481**
2029 PM NRP	NDL	NB	4	1,040	1,276	2,316	0	247	247	247	247	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,952	3,104	8,056	576	600	600	600	600	600	600	600	600	600	600	600	0	0
	Fast VIC	NB	13	7,535	4,494	12,029	2,159	3,851	3,851	3,851	3,851	3,851	3,851	3,851	3,851	3,851	4,071	1,832	0	0
	Stoppers VIC	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fast LBG	NB	13	8,387	13,655	22,042	1,473	3,226	3,226	3,226	3,226	3,226	3,226	3,226	3,226	3,226	0	0	4,798	4,798
	Stoppers LBG	NB	15	9,466	15,422	24,888	764	1,387	1,059	1,036	1,041	1,059	1,050	1,152	1,426	1,426	0	0	4,242	3,780
	Total		**53**	**31,380**	**37,951**	**69,331**	**4,972**	**9,311**	**8,982**	**8,960**	**8,965**	**8,736**	**8,727**	**8,829**	**9,103**	**9,103**	**4,671**	**2,432**	**9,040**	**8,578**
2032 PM BAU	NDL	NB	4	1,040	1,276	2,316	0	261	261	261	261	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,952	3,104	8,056	639	609	609	609	609	609	609	609	609	609	609	609	0	0
	Fast VIC	NB	13	7,535	4,494	12,029	2,349	4,047	4,047	4,047	4,047	4,047	4,047	4,047	4,047	4,047	4,156	1,867	0	0
	Stoppers VIC	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fast LBG	NB	13	8,387	13,655	22,042	1,628	3,381	3,381	3,381	3,381	3,381	3,381	3,381	3,381	3,381	0	0	4,911	4,911
	Stoppers LBG	NB	15	9,466	15,422	24,888	811	1,484	1,148	1,125	1,132	1,097	1,090	1,192	1,469	1,469	0	0	4,336	3,883
	Total		**53**	**31,380**	**37,951**	**69,331**	**5,426**	**9,782**	**9,446**	**9,423**	**9,430**	**9,133**	**9,127**	**9,228**	**9,506**	**9,506**	**4,765**	**2,476**	**9,246**	**8,793**
2032 PM NRP	NDL	NB	4	1,040	1,276	2,316	0	278	278	278	278	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,952	3,104	8,056	656	705	705	705	705	705	705	705	705	705	705	705	0	0
	Fast VIC	NB	13	7,535	4,494	12,029	2,405	4,402	4,402	4,402	4,402	4,402	4,402	4,402	4,402	4,402	4,413	1,982	0	0
	Stoppers VIC	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fast LBG	NB	13	8,387	13,655	22,042	1,679	3,708	3,708	3,708	3,708	3,708	3,708	3,708	3,708	3,708	0	0	5,217	5,217

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)												
							Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
	Stoppers LBG	NB	15	9,466	15,422	24,888	829	1,520	1,182	1,165	1,171	1,120	1,112	1,214	1,493	1,493	0	0	4,420	3,965
	Total		**53**	**31,380**	**37,951**	**69,331**	**5,570**	**10,613**	**10,275**	**10,258**	**10,264**	**9,935**	**9,928**	**10,029**	**10,308**	**10,308**	**5,118**	**2,687**	**9,638**	**9,182**
2047 PM BAU	NDL	NB	4	1,040	1,276	2,316	0	416	416	416	416	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,952	3,104	8,056	1,167	779	779	779	779	779	779	779	779	779	779	779	0	0
	Fast VIC	NB	13	7,535	4,494	12,029	4,010	5,663	5,663	5,663	5,663	5,663	5,663	5,663	5,663	5,663	4,652	2,071	0	0
	Stoppers VIC	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fast LBG	NB	13	8,387	13,655	22,042	3,020	5,282	5,282	5,282	5,282	5,282	5,282	5,282	5,282	5,282	0	0	5,724	5,724
	Stoppers LBG	NB	15	9,466	15,422	24,888	1,179	2,362	1,975	1,960	1,980	1,290	1,294	1,395	1,687	1,687	0	0	4,791	4,260
	Total		**53**	**31,380**	**37,951**	**69,331**	**9,376**	**14,501**	**14,114**	**14,099**	**14,119**	**13,014**	**13,018**	**13,119**	**13,411**	**13,411**	**5,431**	**2,850**	**10,515**	**9,984**
2047 PM NRP	NDL	NB	4	1,040	1,276	2,316	0	426	426	426	426	0	0	0	0	0	0	0	0	0
	GX	NB	8	4,952	3,104	8,056	1,191	909	909	909	909	909	909	909	909	909	909	909	0	0
	Fast VIC	NB	13	7,535	4,494	12,029	4,082	5,887	5,887	5,887	5,887	5,887	5,887	5,887	5,887	5,887	4,867	2,161	0	0
	Stoppers VIC	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fast LBG	NB	13	8,387	13,655	22,042	3,069	5,611	5,611	5,611	5,611	5,611	5,611	5,611	5,611	5,611	0	0	5,954	5,954
	Stoppers LBG	NB	15	9,466	15,422	24,888	1,205	2,439	2,052	2,039	2,060	1,347	1,351	1,449	1,740	1,740	0	0	4,881	4,349
	Total		**53**	**31,380**	**37,951**	**69,331**	**9,546**	**15,271**	**14,884**	**14,872**	**14,893**	**13,753**	**13,757**	**13,856**	**14,147**	**14,147**	**5,776**	**3,070**	**10,835**	**10,303**

Table 8.3.7: Passenger line loading on departure – PM Southbound (16:00 – 18:00)

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)												
							London Victoria (VIC Branch)	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)	East Croydon	South Croydon	Purley	Coulsdon South	Merstham	Redhill	Earlswood	Salfords	Horley	Gatwick Airport
2029 PM BAU	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	431	431	431	431	0
	GX	SB	9	5,400	3,384	8,784	3,605	3,605	0	0	3,605	3,605	3,605	3,605	3,605	3,605	3,605	3,605	3,605	1,770
	Fast VIC	SB	10	6,077	3,623	9,700	5,029	6,473	0	0	4,440	4,440	4,440	4,440	4,440	4,440	4,440	4,440	4,446	2,534

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)													
							London Victoria (VIC Branch)	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)	East Croydon	South Croydon	Purley	Coulsdon South	Merstham	Redhill	Earlswood	Salfords	Horley	Gatwick Airport
	Stoppers VIC	SB	2	1,074	590	1,664	0	0	0	0	0	0	0	0	0	121	104	99	128	0
	Fast LBG	SB	15	10,072	14,894	24,966	0	0	9,984	10,317	6,557	6,557	6,557	6,557	6,557	6,557	6,557	6,557	6,557	5,435
	Stoppers LBG	SB	10	5,968	9,735	15,704	0	0	6,924	6,508	4,714	4,714	3,396	2,391	2,153	1,102	792	754	767	1,014
	Total		**50**	**29,631**	**33,502**	**63,134**	**8,634**	**10,078**	**16,908**	**16,824**	**19,317**	**19,317**	**17,999**	**16,994**	**16,756**	**16,258**	**15,930**	**15,887**	**15,935**	**10,754**
2029 PM NRP	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	438	438	438	438	0
	GX	SB	9	5,400	3,384	8,784	3,641	3,641	0	0	3,641	3,641	3,641	3,641	3,641	3,641	3,641	3,641	3,641	1,772
	Fast VIC	SB	10	6,077	3,623	9,700	5,050	6,506	0	0	4,513	4,513	4,513	4,513	4,513	4,513	4,513	4,513	4,519	2,535
	Stoppers VIC	SB	2	1,074	590	1,664	0	0	0	0	0	0	0	0	0	122	105	100	129	0
	Fast LBG	SB	15	10,072	14,894	24,966	0	0	10,007	10,342	6,626	6,626	6,626	6,626	6,626	6,626	6,626	6,626	6,626	5,441
	Stoppers LBG	SB	10	5,968	9,735	15,704	0	0	6,934	6,522	4,716	4,716	3,398	2,393	2,156	1,108	797	759	773	1,016
	Total		**50**	**29,631**	**33,502**	**63,134**	**8,691**	**10,148**	**16,940**	**16,863**	**19,497**	**19,497**	**18,179**	**17,174**	**16,937**	**16,449**	**16,121**	**16,078**	**16,127**	**10,764**
2032 PM BAU	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	465	465	465	465	0
	GX	SB	9	5,400	3,384	8,784	3,808	3,808	0	0	3,808	3,808	3,808	3,808	3,808	3,808	3,808	3,808	3,808	1,910
	Fast VIC	SB	10	6,077	3,623	9,700	5,074	6,560	0	0	4,637	4,637	4,637	4,637	4,637	4,637	4,637	4,637	4,642	2,693
	Stoppers VIC	SB	2	1,074	590	1,664	0	0	0	0	0	0	0	0	0	127	110	104	133	0
	Fast LBG	SB	15	10,072	14,894	24,966	0	0	10,123	10,503	6,864	6,864	6,864	6,864	6,864	6,864	6,864	6,864	6,864	5,667
	Stoppers LBG	SB	10	5,968	9,735	15,704	0	0	7,011	6,609	4,887	4,887	3,550	2,501	2,254	1,171	853	812	823	1,079
	Total		**50**	**29,631**	**33,502**	**63,134**	**8,882**	**10,368**	**17,135**	**17,112**	**20,196**	**20,196**	**18,860**	**17,811**	**17,563**	**17,072**	**16,736**	**16,690**	**16,735**	**11,350**
2032 PM NRP	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	495	495	495	495	0
	GX	SB	9	5,400	3,384	8,784	3,975	3,975	0	0	3,975	3,975	3,975	3,975	3,975	3,975	3,975	3,975	3,975	1,919
	Fast VIC	SB	10	6,077	3,623	9,700	5,189	6,712	0	0	4,999	4,999	4,999	4,999	4,999	4,999	4,999	4,999	5,004	2,675
	Stoppers VIC	SB	2	1,074	590	1,664	0	0	0	0	0	0	0	0	0	132	115	109	139	0
	Fast LBG	SB	15	10,072	14,894	24,966	0	0	10,245	10,643	7,234	7,234	7,234	7,234	7,234	7,234	7,234	7,234	7,234	5,714
	Stoppers LBG	SB	10	5,968	9,735	15,704	0	0	7,090	6,693	4,910	4,910	3,574	2,526	2,279	1,213	895	850	862	1,085
	Total		**50**	**29,631**	**33,502**	**63,134**	**9,163**	**10,687**	**17,334**	**17,336**	**21,118**	**21,118**	**19,782**	**18,733**	**18,487**	**18,047**	**17,712**	**17,661**	**17,709**	**11,394**
2047 PM BAU	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	686	686	686	686	0
	GX	SB	9	5,400	3,384	8,784	4,515	4,515	0	0	4,515	4,515	4,515	4,515	4,515	4,515	4,515	4,515	4,515	2,603
	Fast VIC	SB	13	7,646	4,558	12,204	6,199	7,945	0	0	6,864	6,864	6,864	6,864	6,864	6,864	6,864	6,864	6,869	4,743

Scenario	Groups	Direction	No of Services (2hr)	Seating Capacity	Standing Capacity	Total Capacity	Load on Departure (2hr)													
							London Victoria (VIC Branch)	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)	East Croydon	South Croydon	Purley	Coulsdon South	Merstham	Redhill	Earlswood	Salfords	Horley	Gatwick Airport
	Stoppers VIC	SB	2	1,074	590	1,664	0	0	0	0	0	0	0	0	0	176	163	155	185	0
	Fast LBG	SB	15	10,448	15,118	25,567	0	0	10,535	11,325	8,635	8,635	8,635	8,635	8,635	8,635	8,635	8,635	8,635	7,516
	Stoppers LBG	SB	10	5,968	9,735	15,704	0	0	7,399	6,953	5,204	5,204	4,032	2,958	2,677	1,571	1,234	1,175	1,182	1,338
	Total		**53**	**31,576**	**34,662**	**66,238**	**10,714**	**12,459**	**17,934**	**18,278**	**25,218**	**25,218**	**24,047**	**22,972**	**22,691**	**22,448**	**22,098**	**22,031**	**22,073**	**16,199**
2047 PM NRP	NDL	SB	4	1,040	1,276	2,316	0	0	0	0	0	0	0	0	0	723	723	723	723	0
	GX	SB	9	5,400	3,384	8,784	4,639	4,639	0	0	4,639	4,639	4,639	4,639	4,639	4,639	4,639	4,639	4,639	2,598
	Fast VIC	SB	13	7,646	4,558	12,204	6,306	8,125	0	0	7,229	7,229	7,229	7,229	7,229	7,229	7,229	7,229	7,235	4,699
	Stoppers VIC	SB	2	1,074	590	1,664	0	0	0	0	0	0	0	0	0	183	170	161	193	0
	Fast LBG	SB	15	10,448	15,118	25,567	0	0	10,685	11,497	9,070	9,070	9,070	9,070	9,070	9,070	9,070	9,070	9,070	7,568
	Stoppers LBG	SB	10	5,968	9,735	15,704	0	0	7,489	7,045	5,235	5,235	4,066	2,994	2,714	1,633	1,295	1,234	1,241	1,356
	Total		**53**	**31,576**	**34,662**	**66,238**	**10,945**	**12,764**	**18,174**	**18,542**	**26,174**	**26,174**	**25,004**	**23,932**	**23,652**	**23,477**	**23,126**	**23,057**	**23,100**	**16,221**

Table 8.3.8: Change in line loading – PM peak (16:00 – 18:00)

Year of Assessment	Groups	Direction	Change in Line Loading (% change)												
			Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
2029	NDL	NB	-	5 (2%)	5 (2%)	5 (2%)	5 (2%)	-	-	-	-	-	-	-	-	-
	GX	NB	4 (1%)	21 (4%)	21 (4%)	21 (4%)	21 (4%)	21 (4%)	21 (4%)	21 (4%)	21 (4%)	21 (4%)	21 (4%)	21 (4%)	-	-
	Fast VIC	NB	15 (1%)	82 (2%)	82 (2%)	82 (2%)	82 (2%)	82 (2%)	82 (2%)	82 (2%)	82 (2%)	82 (2%)	61 (2%)	26 (1%)	-	-
	Stoppers VIC	NB	-	0 (0%)	0 (0%)	-	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	-	-
	Fast LBG	NB	11 (1%)	77 (2%)	77 (2%)	77 (2%)	77 (2%)	77 (2%)	77 (2%)	77 (2%)	77 (2%)	77 (2%)	-	-	74 (2%)	74 (2%)
	Stoppers LBG	NB	6 (1%)	14 (1%)	13 (1%)	13 (1%)	13 (1%)	8 (1%)	8 (1%)	8 (1%)	8 (1%)	8 (1%)	-	-	21 (0%)	23 (1%)
	Total		**36 (1%)**	**199 (2%)**	**198 (2%)**	**198 (2%)**	**198 (2%)**	**188 (2%)**	**188 (2%)**	**188 (2%)**	**188 (2%)**	**188 (2%)**	**81 (2%)**	**46 (2%)**	**95 (1%)**	**97 (1%)**
2032	NDL	NB	-	16 (6%)	16 (6%)	16 (6%)	16 (6%)	-	-	-	-	-	-	-	-	-
	GX	NB	17 (3%)	96 (16%)	96 (16%)	96 (16%)	96 (16%)	96 (16%)	96 (16%)	96 (16%)	96 (16%)	96 (16%)	96 (16%)	96 (16%)	-	-
	Fast VIC	NB	57 (2%)	356 (9%)	356 (9%)	356 (9%)	356 (9%)	356 (9%)	356 (9%)	356 (9%)	356 (9%)	356 (9%)	257 (6%)	115 (6%)	-	-

Year of Assessment	Groups	Direction	Change in Line Loading (% change)													
			Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
	Stoppers VIC	NB	-	0 (0%)	0 (0%)	-	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	-	-
	Fast LBG	NB	51 (3%)	327 (10%)	327 (10%)	327 (10%)	327 (10%)	327 (10%)	327 (10%)	327 (10%)	327 (10%)	327 (10%)	-	-	307 (6%)	307 (6%)
	Stoppers LBG	NB	19 (2%)	36 (2%)	35 (3%)	40 (4%)	39 (3%)	23 (2%)	22 (2%)	22 (2%)	24 (2%)	24 (2%)	-	-	85 (2%)	82 (2%)
	Total		**144 (3%)**	**831 (8%)**	**830 (9%)**	**835 (9%)**	**834 (9%)**	**802 (9%)**	**801 (9%)**	**801 (9%)**	**802 (8%)**	**802 (8%)**	**353 (7%)**	**211 (9%)**	**392 (4%)**	**389 (4%)**
2047	NDL	NB	-	11 (3%)	11 (3%)	11 (3%)	11 (3%)	-	-	-	-	-	-	-	-	-
	GX	NB	23 (2%)	130 (17%)	130 (17%)	130 (17%)	130 (17%)	130 (17%)	130 (17%)	130 (17%)	130 (17%)	130 (17%)	130 (17%)	130 (17%)	-	-
	Fast VIC	NB	72 (2%)	224 (4%)	224 (4%)	224 (4%)	224 (4%)	224 (4%)	224 (4%)	224 (4%)	224 (4%)	224 (4%)	216 (5%)	90 (4%)	-	-
	Stoppers VIC	NB	-	0 (0%)	0 (0%)	-	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	-	-
	Fast LBG	NB	49 (2%)	329 (6%)	329 (6%)	329 (6%)	329 (6%)	329 (6%)	329 (6%)	329 (6%)	329 (6%)	329 (6%)	-	-	230 (4%)	230 (4%)
	Stoppers LBG	NB	26 (2%)	77 (3%)	77 (4%)	79 (4%)	80 (4%)	57 (4%)	56 (4%)	54 (4%)	53 (3%)	53 (3%)	-	-	90 (2%)	89 (2%)
	Total		170 (2%)	770 (5%)	770 (5%)	773 (5%)	774 (5%)	740 (6%)	739 (6%)	737 (6%)	736 (5%)	736 (5%)	345 (6%)	220 (8%)	320 (3%)	319 (3%)

Year of Assessment	Groups	Direction	London Victoria (VIC Branch)	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)	East Croydon	South Croydon	Purley	Coulsdon South	Merstham	Redhill	Earlswood	Salfords	Horley	Gatwick Airport
2029	NDL	SB	-	-	-	-	-	-	-	-	-	6 (1%)	6 (1%)	6 (1%)	6 (1%)	-
	GX	SB	36 (1%)	36 (1%)	-	-	36 (1%)	36 (1%)	36 (1%)	36 (1%)	36 (1%)	36 (1%)	36 (1%)	36 (1%)	36 (1%)	2 (0%)
	Fast VIC	SB	21 (0%)	33 (1%)	-	-	73 (2%)	73 (2%)	73 (2%)	73 (2%)	73 (2%)	73 (2%)	73 (2%)	73 (2%)	73 (2%)	1 (0%)
	Stoppers VIC	SB	-	-	-	-	-	-	-	-	-	1 (1%)	1 (1%)	1 (1%)	1 (1%)	-
	Fast LBG	SB	-	-	22 (0%)	25 (0%)	69 (1%)	69 (1%)	69 (1%)	69 (1%)	69 (1%)	69 (1%)	69 (1%)	69 (1%)	69 (1%)	6 (0%)
	Stoppers LBG	SB	-	-	10 (0%)	14 (0%)	2 (0%)	2 (0%)	2 (0%)	2 (0%)	3 (0%)	6 (1%)	5 (1%)	5 (1%)	6 (1%)	2 (0%)
	Total		**57 (1%)**	**69 (1%)**	**32 (0%)**	**39 (0%)**	**180 (1%)**	**180 (1%)**	**180 (1%)**	**181 (1%)**	**181 (1%)**	**191 (1%)**	**191 (1%)**	**191 (1%)**	**192 (1%)**	**10 (0%)**
2032	NDL	SB	-	-	-	-	-	-	-	-	-	30 (7%)	30 (7%)	30 (7%)	30 (7%)	-
	GX	SB	167 (4%)	167 (4%)	-	-	167 (4%)	167 (4%)	167 (4%)	167 (4%)	167 (4%)	167 (4%)	167 (4%)	167 (4%)	167 (4%)	9 (0%)
	Fast VIC	SB	115 (2%)	152 (2%)	-	-	361 (8%)	361 (8%)	361 (8%)	361 (8%)	361 (8%)	361 (8%)	361 (8%)	361 (8%)	362 (8%)	-18 (-1%)
	Stoppers VIC	SB	-	-	-	-	-	-	-	-	-	5 (4%)	6 (5%)	5 (5%)	6 (4%)	-
	Fast LBG	SB	-	-	121 (1%)	140 (1%)	370 (5%)	370 (5%)	370 (5%)	370 (5%)	370 (5%)	370 (5%)	370 (5%)	370 (5%)	370 (5%)	47 (1%)
	Stoppers LBG	SB	-	-	78 (1%)	84 (1%)	23 (0%)	23 (0%)	24 (1%)	24 (1%)	26 (1%)	42 (4%)	42 (5%)	38 (5%)	39 (5%)	5 (0%)
	Total		**282 (3%)**	**319 (3%)**	**200 (1%)**	**224 (1%)**	**921 (5%)**	**921 (5%)**	**922 (5%)**	**922 (5%)**	**923 (5%)**	**976 (6%)**	**976 (6%)**	**971 (6%)**	**974 (6%)**	**44 (0%)**
2047	NDL	SB	-	-	-	-	-	-	-	-	-	37 (5%)	37 (5%)	37 (5%)	37 (5%)	-
	GX	SB	124 (3%)	124 (3%)	-	-	124 (3%)	124 (3%)	124 (3%)	124 (3%)	124 (3%)	124 (3%)	124 (3%)	124 (3%)	124 (3%)	-4 (0%)
	Fast VIC	SB	107 (2%)	181 (2%)	-	-	365 (5%)	365 (5%)	365 (5%)	365 (5%)	365 (5%)	365 (5%)	365 (5%)	365 (5%)	365 (5%)	-45 (-1%)
	Stoppers VIC	SB	-	-	-	-	-	-	-	-	-	7 (4%)	7 (4%)	7 (4%)	7 (4%)	-
	Fast LBG	SB	-	-	150 (1%)	172 (2%)	435 (5%)	435 (5%)	435 (5%)	435 (5%)	435 (5%)	435 (5%)	435 (5%)	435 (5%)	435 (5%)	52 (1%)

Year of Assessment	Groups	Direction	Change in Line Loading (% change)													
			Three Bridges	Gatwick Airport	Horley	Salfords	Earlswood	Redhill	Merstham	Coulsdon South	Purley	South Croydon	East Croydon (VIC Branch)	Clapham Junction (VIC Branch)	East Croydon (LBG Branch)	Norwood Junction (LBG Branch)
	Stoppers LBG	SB	-	-	90 (1%)	93 (1%)	32 (1%)	32 (1%)	34 (1%)	36 (1%)	37 (1%)	62 (4%)	61 (5%)	59 (5%)	59 (5%)	19 (1%)
	Total		**231 (2%)**	**305 (2%)**	**240 (1%)**	**264 (1%)**	**956 (4%)**	**956 (4%)**	**958 (4%)**	**960 (4%)**	**961 (4%)**	**1029 (5%)**	**1028 (5%)**	**1026 (5%)**	**1027 (5%)**	**22 (0%)**

Seated Loading Factor Assessment (PM peak)

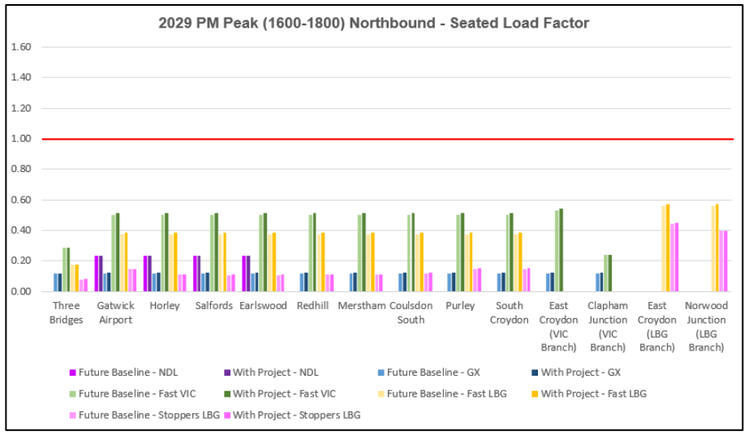
8.3.29 Seated load factor assessment for the PM peak has been undertaken for both the northbound and southbound direction services, as shown in Diagram 8.3.4.

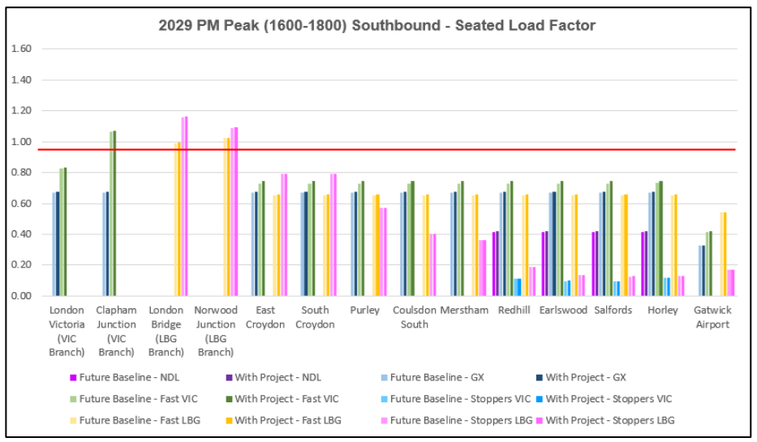
8.3.30 There is sufficient seating available for passengers for the assessment years in the northbound off-peak direction:

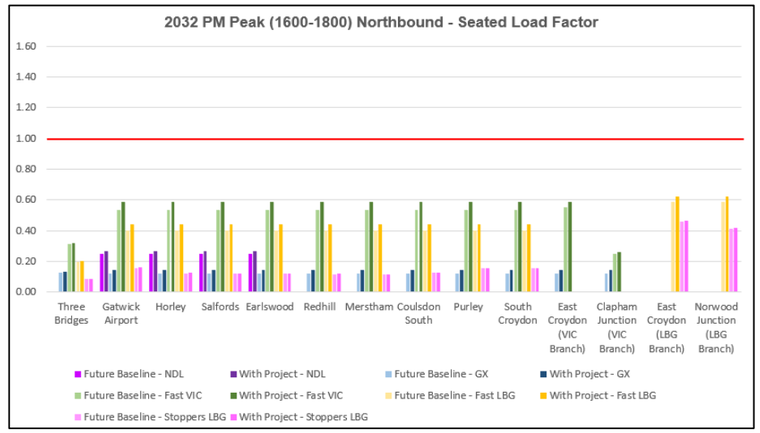
- 2029 and 2032 - The highest seated load factor is around 0.6, which means that six out of ten seats are occupied and four will be available .
- 2047 - The highest seated load factor is up to around 0.8, which means that eight out of ten seats are occupied and two will be available .

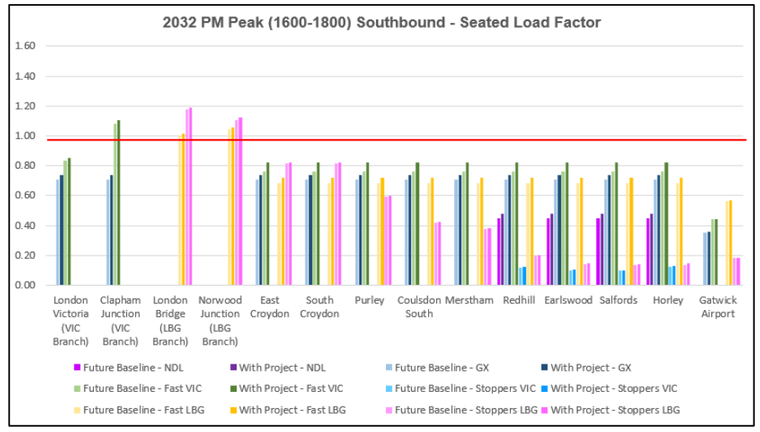
8.3.31 In the southbound direction, trains departing London in the PM peak are mostly full beyond their seated capacity. However, on arrival at Clapham Junction and East Croydon, sufficient passengers alight such that seats become available indicating spare capacity. For services into stations where seating capacity is exceeded, standing capacity has been assessed in the next section.

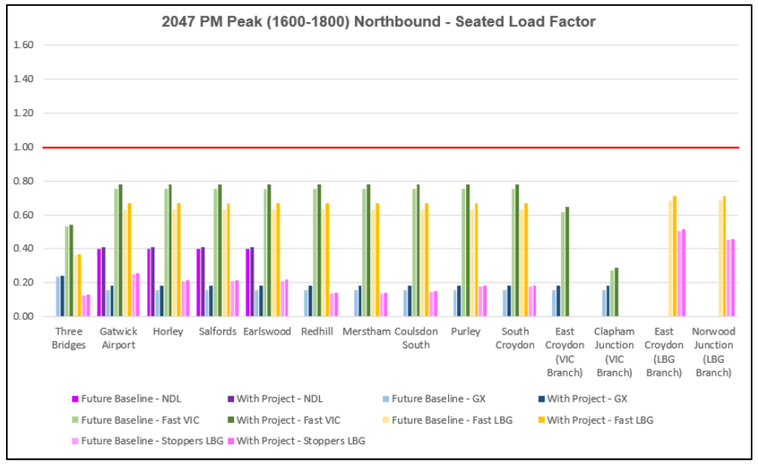
Diagram 8.3.6: Seated Load Factor – PM Peak

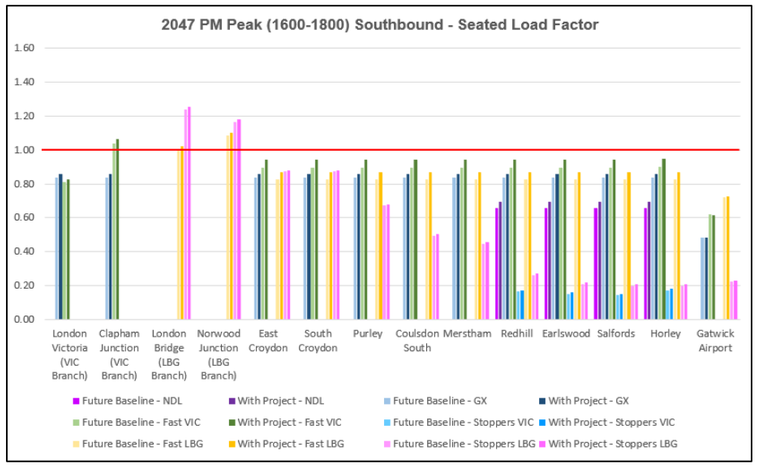












Standing Assessment (PM peak)

8.3.32 This assessment shows the percentage of standing capacity occupied for each service type. The PM peak assessment for the southbound services where the seating capacity is exceeded is shown in Table 8.3.9.

8.3.33 In 2029, 2032 and 2047, the highest percentage of standing capacity occupied is 12% to 18%, which indicates that rail services are busy out of London but suggests that there is some spare standing capacity available. The Project will not significantly materially increase congestion, with the highest increase in standing capacity occupied by Gatwick passengers being 1% (2029) to 4% (2047) on fast services departing London Victoria.

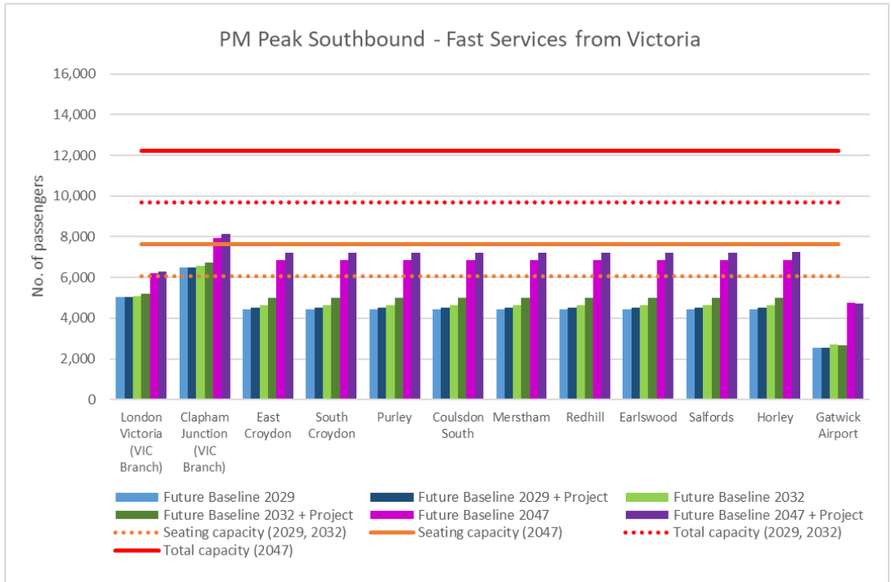
8.3.34 Seating capacity is only exceeded on fast services from Victoria, stopping services and fast services from London Bridge. The seating and standing capacities are illustrated in Diagram 8.3.7 below (after Table 8.3.9).

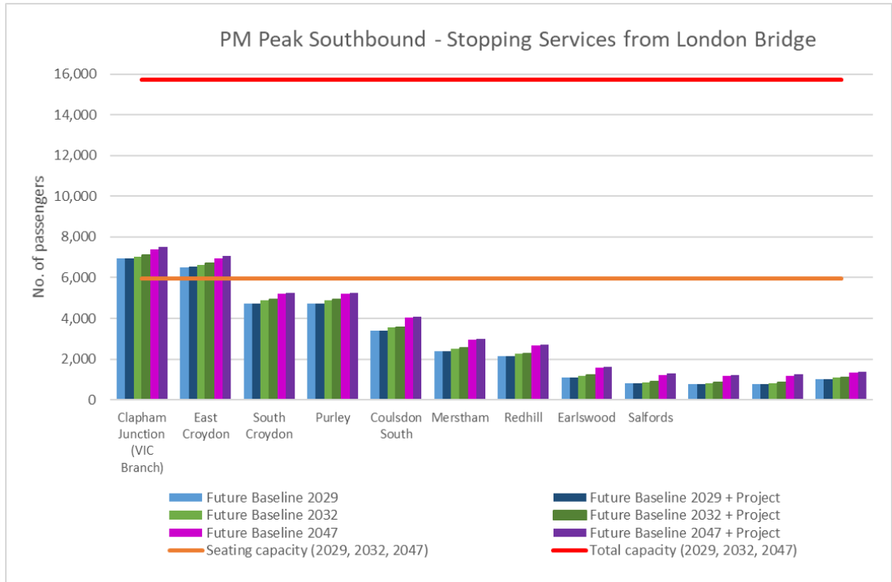
Table 8.3.9: Standing Assessment – Percentage of Standing Capacity Occupied – PM Peak (16:00 – 18:00) Southbound

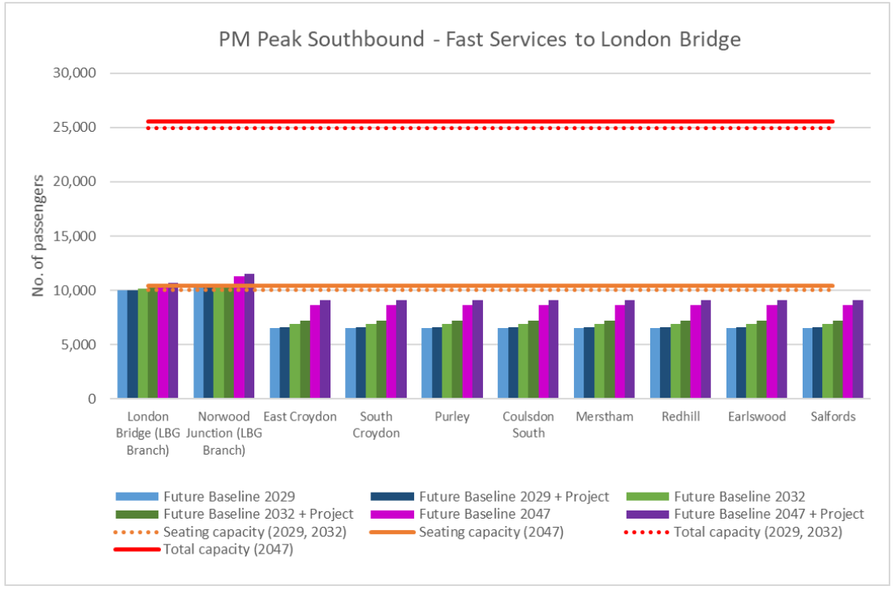
Assessment Year	Groups	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)
2029 Future Baseline	NDL	-	-	-
	GX	0%	-	-
	Fast VIC	11%	-	-
	Stoppers VIC	-	-	-
	Fast LBG	-	0%	2%
	Stoppers LBG	-	10%	6%
	Total	**1%**	**3%**	**2%**
2029 Project (% change)	NDL	-	-	-
	GX	0% (0%)	-	-
	Fast VIC	12% (1%)	-	-
	Stoppers VIC	-	-	-
	Fast LBG	-	0% (0%)	2% (0%)
	Stoppers LBG	-	10% (0%)	6% (0%)
	Total	**1% (0%)**	**3% (0%)**	**2% (0%)**
2032 Future Baseline	NDL	-	-	-
	GX	0%	-	-
	Fast VIC	13%	-	-
	Stoppers VIC	-	-	-
	Fast LBG	-	0%	3%
	Stoppers LBG	-	11%	7%
	Total	**1%**	**3%**	**3%**
2032 Project (% change)	NDL	-	-	-
	GX	0% (0%)	-	-
	Fast VIC	18% (4%)	-	-
	Stoppers VIC	-	-	-
	Fast LBG	-	1% (1%)	4% (1%)
	Stoppers LBG	-	12% (1%)	7% (1%)
	Total	**2% (0%)**	**4% (1%)**	**4% (1%)**
2047 Future Baseline	NDL	-	-	-
	GX	0%	-	-
	Fast VIC	7%	-	-
	Stoppers VIC	-	-	-
	Fast LBG	-	1%	6%
	Stoppers LBG	-	15%	10%
	Total	**1%**	**4%**	**5%**
	NDL	-	-	-

Assessment Year	Groups	Clapham Junction (VIC Branch)	London Bridge (LBG Branch)	Norwood Junction (LBG Branch)
2047 Project (% change)	GX	0% (0%)	-	-
	Fast VIC	11% (4%)	-	-
	Stoppers VIC	0% (0%)	-	-
	Fast LBG	-	2% (1%)	7% (1%)
	Stoppers LBG	-	16% (1%)	11% (1%)
	Total	**1% (1%)**	**5% (1%)**	**6% (1%)**

Diagram 8.3.7: Occupied Seating and Standing Capacity – PM Peak (16:00 – 18:00) Southbound







Summary of Assessment

8.3.35 The Project will increase the number of rail passengers but based on the line loading, seated loading factor and standing capacity assessments, no significant crowding on rail services is expected as a result of the Northern Runway.

8.3.36 The highest increases in line loading as a result of the Project are in the contra-peak direction services during the AM and PM peak periods, where there is sufficient number of spare seats to accommodate the increase in the number of passengers.

8.3.37 The network peak directions are northbound in the AM peak and southbound in the PM peak. In the AM peak, there will be passengers standing on some services north of Purley. The highest percentage of standing capacity occupied with Project on train services is around 40%, indicating busy trains into London. However, the Project only accounts for a very small change in standing (around 2%), with the remainder being as a result of high commuter flows into London.

8.3.38 In the PM peak, there will be passengers standing on some services southbound 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 4% change in standing.

8.3.39 Whilst the Project will add extra passengers to peak direction services that have standing, the greater increases in demand as a result of the Project, are contra peak.

8.3.40 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.

8.3.41 Overall, the Project is not expected to significantly increase rail crowding, and the growth in passengers makes better use of contra-peak rail capacity and improves operational value for money.

8.4 Potential Mitigation

8.4.1 The rail crowding assessment indicates that no additional mitigation is required because of the Project, other than that already proposed by the rail industry.

9 Assessment of Transport Effects: Bus and Coach

9.1 Introduction

9.1.1 Prior to the Covid-19 pandemic, Gatwick was served by frequent bus and coach services at both North and South Terminals. These are all expected to resume as demand returns to the airport, and the following sections describe the full services that were previously operating. The operators included Metrobus, National Express, Megabus, Oxford Bus Company, and Easybus. On average there were approximately 450 to 500 daily arrivals and departures respectively, offering services to destinations throughout the UK.

9.1.2 Bus and coach mode share for passengers was around 6% pre-pandemic, whereas these modes accounted for 16% of staff travel.

Coach services

9.1.3 Prior to the Covid-19 pandemic, the airport has been served by a range of coach services, which both complement and compete with the rail network. These coach services are expected to

resume as demand returns to the airport, with the following sections describing the full services that were previously operating. Many operators have invested in high-quality vehicles, customer service improvements and effective marketing which have contributed to more attractive coach services.

9.1.4 National Express provide a number of direct services to and from Gatwick and the most popular routes are summarised in Table 9.1.1.

Table 9.1.1: Popular National Express coach services to Gatwick

Routes	Service	Daily Services	Fastest Journey Time
London (Victoria, Vauxhall, Belmont, Banstead) to Gatwick	A3	37	30 mins
Heathrow to Gatwick	200, 201, 210, 230, 707, 727, 747	81	1 hr 5 mins
Bristol to Gatwick	200, 201	19	3 hrs 25 mins
Southampton to Gatwick	206	19	2 hrs 30 mins
Bournemouth to Gatwick	206	24	3 hrs 20 mins
Birmingham to Gatwick	210	23	4 hrs
Cardiff to Gatwick	201	22	4 hrs 35 mins
Brighton to Gatwick	025, 026, 028, 029, 201, 206, 747	23	45 mins
Newport to Gatwick	201	20	4 hrs 10 mins
Swansea to Gatwick	201	15	5 hrs 40 mins

9.1.5 Other coach services include:

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

Local bus services

9.1.6 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.

9.1.7 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
- 100: Maidenbower – Three Bridges – Crawley – Gatwick Airport – Horley – Redhill

9.1.8 Metrobus also provides conventional routes:

- 3 Crawley - Three Bridges - Gatwick Airport
- 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
- 420/460: Sutton/Epsom – Redhill - Crawley

9.1.9 There is also the Southdown PSV service operating one route: 422 Reigate – Gatwick Airport – Crawley.

9.1.10 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.

9.1.11 Gatwick has worked with Metrobus to develop an extensive, 24 hour, local bus network.

9.1.12 Diagram 9.1.1 shows the Metrobus services frequencies and Diagram 9.1.2 provides a bandwidth plot of frequencies within the vicinity of Gatwick and which have been used to inform the modelling. Diagram 9.1.1 shows that South Terminal generally has more frequent Metrobuses, with up to 30 buses in the peak hour. There is good local bus coverage in the local areas of Crawley and Horley, and north towards Redhill, which is reflected in the staff mode shares in these areas.

9.1.13 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 that is not available to members of the public. Staff can top up their smartcard online or at local travel shops and, since its introduction, it has been very successful.

9.1.14 All local buses are fitted with GPS technology so users can find out how far away their bus is in real time, 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 first time travellers.

Diagram 9.1.1: Metrobus services frequencies

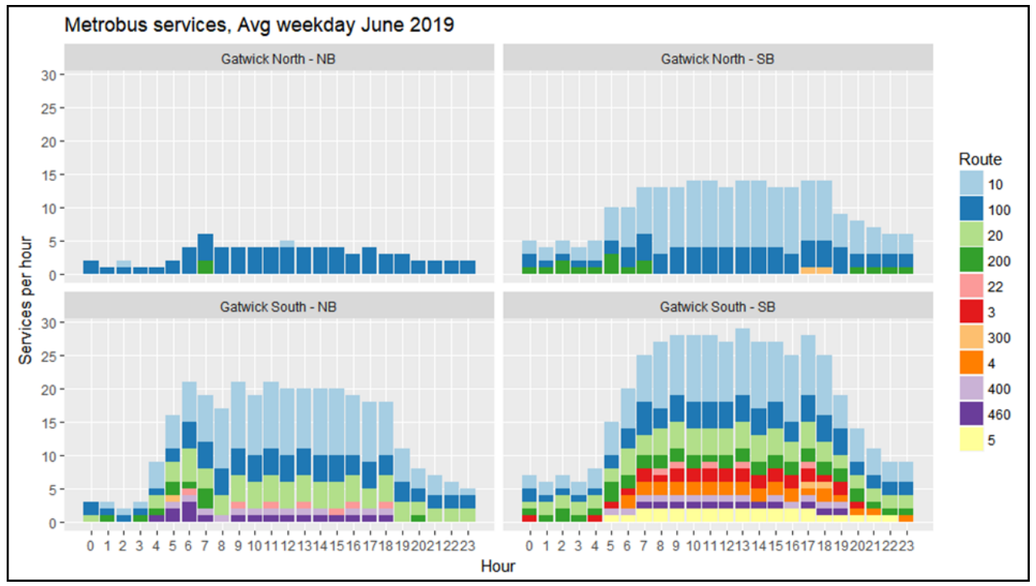


Diagram 9.1.2: Bandwidth plot of Metrobus frequencies

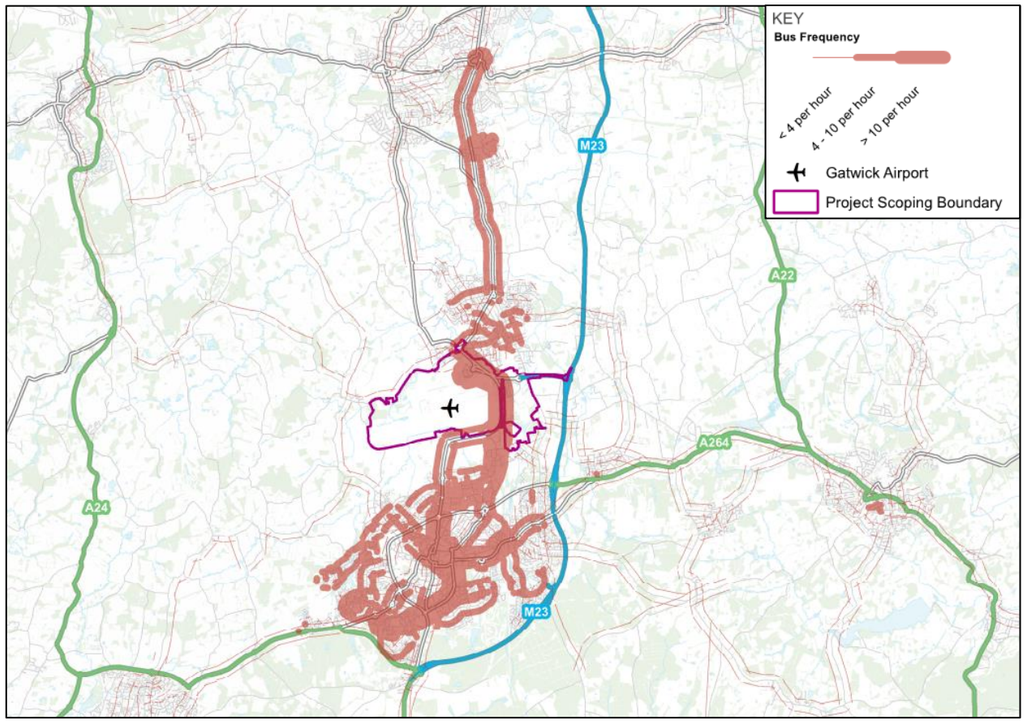
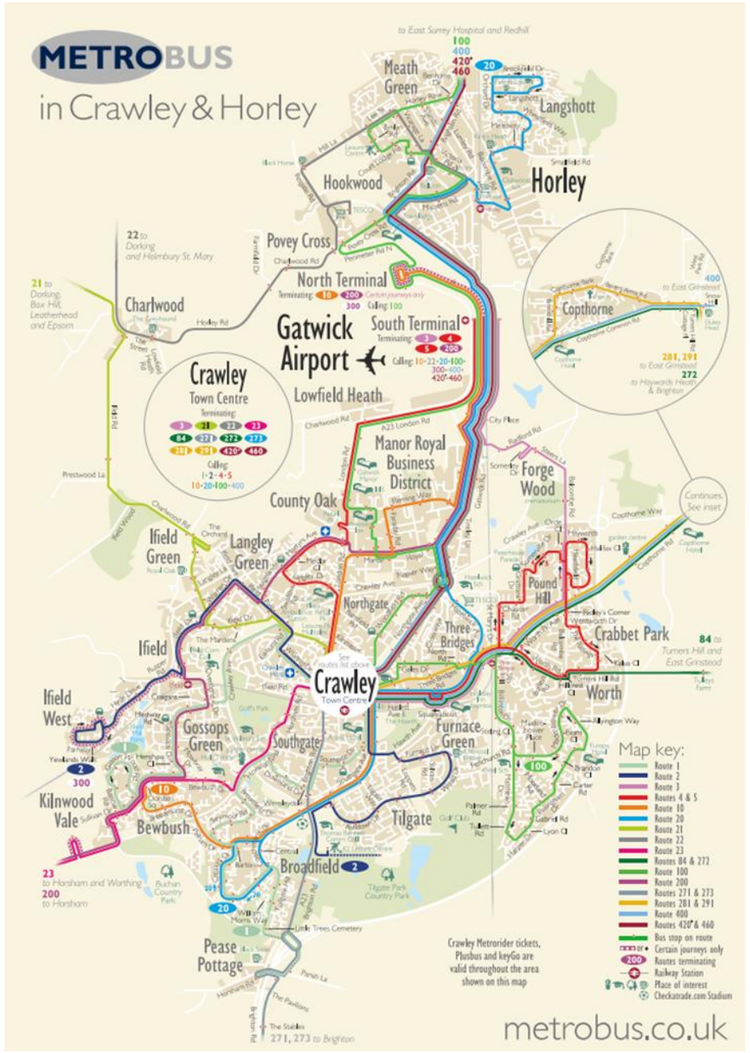


Diagram 9.1.3: Metrobus Local Service in Crawley and Horley (Summer 2019)



9.1.15 Gatwick has recently improved the customer experience for bus and coach services at the airport through provision of a new waiting area at the South Terminal for passengers. Gatwick is also developing a proposal to increase the capacity of bus and coach facilities on Furlong Way at the North Terminal and has improved pedestrian access between the South Terminal and local bus stops located on the A23.

Other Bus and Coach Services

9.1.16 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.

9.1.17 Prior to the Covid-19 pandemic, there were ten hotel bus routes which operated on circular routes calling at both terminals in one direction. All routes operated seven days per week and included journeys in the early morning and late evening, in order to match demand from departing and arriving passengers.

9.1.18 There were also nearly 30 guest houses or hotels that operated services on request. The vehicles used range from cars to van-based buses.

9.1.19 There are also large numbers of bus movements associated with off airport car parks.

9.1.20 Charter coach movements peaked at almost 200 arrivals a day at the airport and were operated by a large number of companies from across the UK.

9.1.21 All of the above are expected to resume as demand returns to the airport.

9.2 Comparison of Future Baseline and With Project Performance

Modelling approach

9.2.1 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.

9.2.2 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.

9.2.3 The bus/coach model has been developed as a standard public transport frequency-based assignment tool using the inbuilt modules of the EMME software and applying a standard generalised journey time function with weight on the components of time as recommended in TAG.

Study Area

Coaches

9.2.4 Coach services to/from Gatwick Airport are operated by National Express, Megabus, Oxford Airline and easyBus and include destinations such as Brighton, London, Heathrow Airport, South Wales, the South West, Hampshire and the West Midlands.

9.2.5 Coach is mostly relevant to air passengers though some local coach services (eg from Brighton and London) may fulfil a limited commuter role.

9.2.6 Analysis of CAA data shows significant airport passenger use of coach to access Gatwick from Brighton, Bournemouth, Southampton, Bristol, Oxford, London, Heathrow (transfers), as shown in Diagram 9.2.1.

Diagram 9.2.1: Gatwick Airport passenger catchments for coach (and bus)

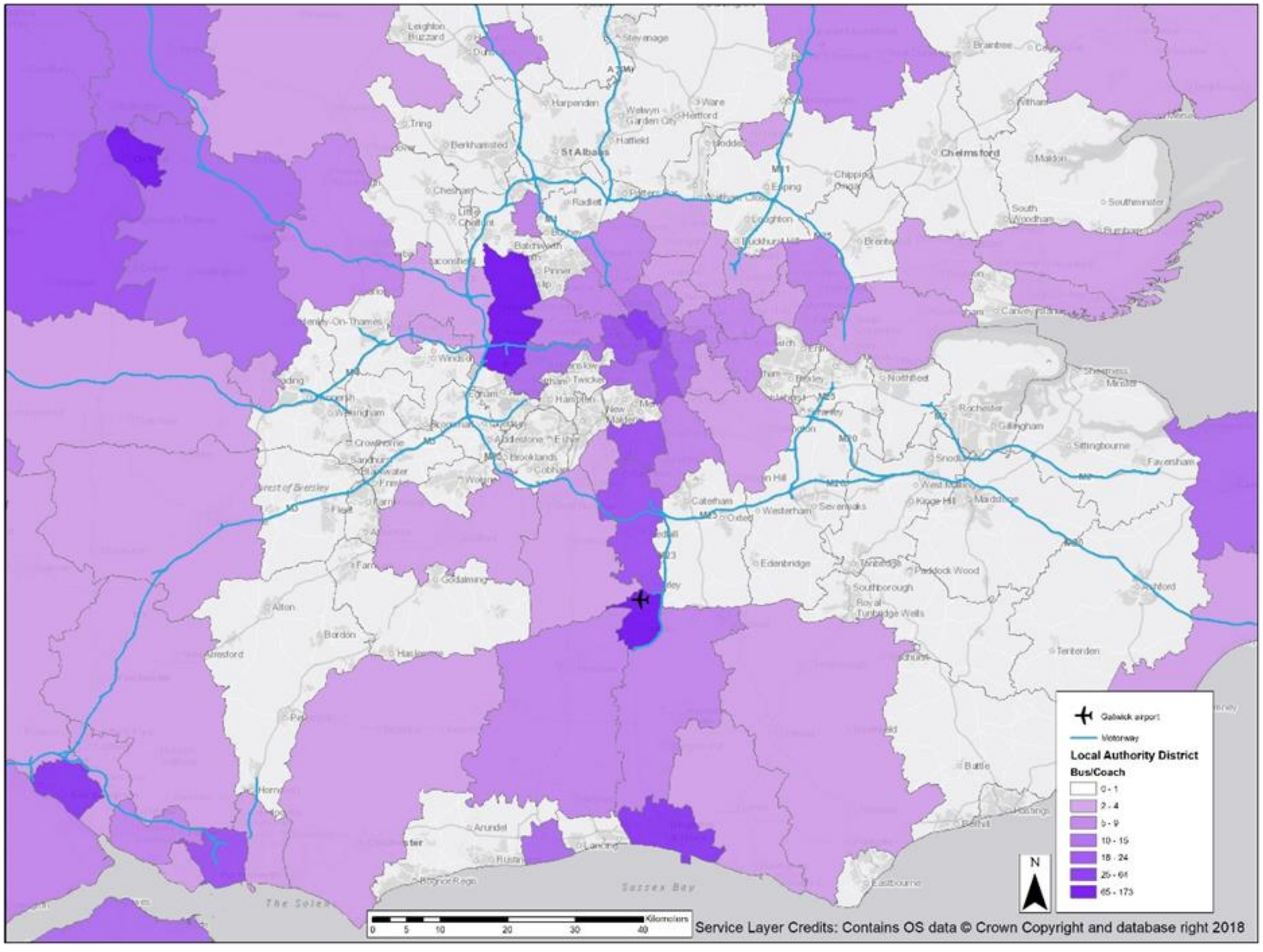
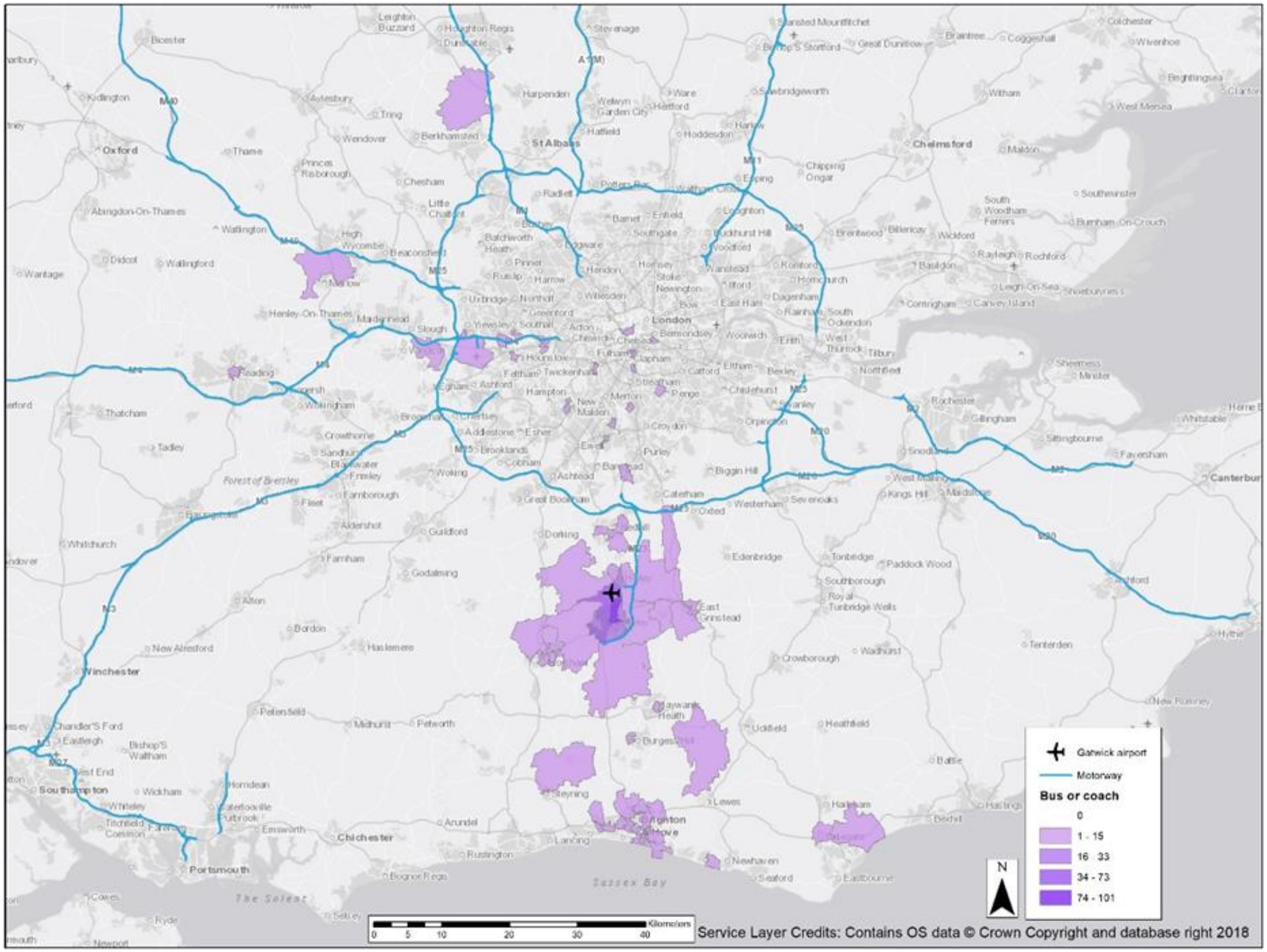


Diagram 9.2.2: Gatwick Airport employee catchments for bus (and coach)



9.2.7 Some Gatwick Airport passengers living in Horley and Crawley use local bus services to access the Airport.

9.2.8 The public transport model includes all airport coaches plus the England-wide National Express and Megabus networks. This ensures that there is a reasonable representation not just by direct coach to Gatwick but also those requiring an interchange, e.g. from Margate to Gatwick, requiring interchange in London.

Bus Services

9.2.9 Bus services are used predominantly by Gatwick Airport employees and those air passengers living locally. For airport employees, the existing catchment of bus users is shown in Diagram 9.2.2

9.2.10 Diagram 9.2.2 shows that most Gatwick employees who use bus/coach live in Crawley and Horley, with smaller clusters in surrounding towns and villages and the suburbs of Brighton.

9.2.11 The model includes all local bus routes that serve Gatwick Airport, Horley and Crawley, including journeys that require interchange at Crawley bus station.

Modelled bus and coach improvements

9.2.12 Modelled bus and coach improvements to 2029 and beyond in the future baseline and with Project include:

- Updates to coach frequencies in proportion to growth in air passengers.

9.2.13 Further bus and coach enhancements with Project include:

- New bus route hourly Uckfield to Gatwick via East Grinstead.
- New coach route two-hourly Chatham - Maidstone - Sevenoaks - Gatwick.

9.2.14 The new bus and coach routes were explored and put forward as part of Gatwick's Bus and Coach Strategy.

9.2.15 These enhancements lead to an improvement in bus and coach mode share to between 6% and 7% for air passengers and between 16% and 17% for employees in future years 2029, 2032 and 2047.

Assessment Criteria

9.2.16 Given the adaptability of bus and coach provision, crowding on bus and coach services has not been tested explicitly within the modelling framework as operators tend to respond to sustained increases in demand by increasing the number of services. As such, the assessment includes service frequency and quality as a measure of public transport amenity.

Comparison of Future Baseline and with Project Scenarios

9.2.17 With the improvements described above, demand on bus and coach services increases from approximately 4,500 passengers in 2018 across the busiest local areas to almost double at 8,700 daily passengers with the Project in 2047, as per Table 9.2.1.

9.2.18 Within this overall growth, there are significant increases in employee travel on local bus services in Crawley, an increase of almost 800 passengers on a high base of over 1,900 passengers, albeit with bus share remaining largely constant across Local Authority areas.

9.2.19 On coach services, London is by far the largest market for air passengers and demand on coach services to/from London increases by 1,500 daily passengers between 2018 and 2047 with Project, albeit with London's share of coach trips remaining at 5% throughout the assessment period, as per Table 9.2.2. Gains in share are shown by the model for Brighton and Hove and Hampshire, reflecting the strong existing catchments in these two locations, as per Diagram 9.2.1. Kent also shows strong growth in passenger numbers and share, reflecting the success of the new service from Chatham, Maidstone and Sevenoaks.

Table 9.2.1: Daily bus trips by Local Authority/Daily coach trips by region

		Bus/Coach trips						
		2018	2029 Future Baseline	2029 With Project	2032 Future Baseline	2032 With Project	2047 Future Baseline	2047 With Project
Local Bus	Crawley	1969	2329	2423	2372	2599	2536	2750
	Mole Valley	7	10	11	10	12	11	12
	Reigate and Banstead	174	215	226	221	247	236	263
	Tandridge	12	16	18	17	21	20	24
	Mid Sussex	46	58	62	60	69	64	74
	Horsham	72	86	91	88	99	93	104
Coach	Brighton and Hove	210	378	425	404	551	490	651
	Rest of West Sussex	37	63	70	67	91	77	104
	Rest of Surrey	16	25	27	26	33	28	35
	East Sussex	54	88	98	94	120	104	132
	Kent	73	124	376	131	442	139	470
	London	1089	1719	1894	1807	2331	1941	2527
	Hampshire	220	383	431	411	557	453	612
	Ox, Bucks, Berks	468	681	744	708	889	763	973
	TOTAL	**4446**	**6174**	**6896**	**6415**	**8063**	**6955**	**8732**

Table 9.2.2: Daily bus share by Local Authority/Daily coach share by region

		Bus/Coach share						
		2018	2029 Future Baseline	2029 With Project	2032 Future Baseline	2032 With Project	2047 Future Baseline	2047 With Project
Local Bus	Crawley	36%	36%	36%	36%	35%	36%	35%
	Mole Valley	1%	1%	1%	1%	1%	1%	1%
	Reigate and Banstead	8%	8%	8%	8%	8%	8%	8%
	Tandridge	2%	2%	2%	2%	2%	2%	2%
	Mid Sussex	2%	2%	2%	2%	2%	2%	2%
	Horsham	4%	4%	4%	4%	4%	4%	4%
Coach	Brighton and Hove	8%	11%	11%	11%	13%	13%	14%
	Rest of West Sussex	2%	2%	2%	2%	3%	3%	3%
	Rest of Surrey	0%	1%	1%	1%	1%	1%	1%
	East Sussex	2%	3%	3%	3%	3%	3%	3%
	Kent	1%	2%	5%	2%	5%	2%	5%
	London	4%	5%	5%	5%	5%	5%	5%
	Hampshire	5%	7%	7%	7%	8%	8%	9%
	Ox, Bucks, Berks	12%	15%	15%	15%	16%	15%	16%

9.3 Potential Mitigation

9.3.1 The bus and coach assessment indicates that additional peak period services, or network changes including consideration of new or revised routes, provides for increased patronage by both employees on local bus services and air passengers on coaches. Additional services would not be required or expected in all locations, with many experiencing very small changes in patronage. Increased service frequencies provide improved amenity for non-airport users also, benefitting both local communities and businesses by improving connectivity.

10 Assessment of Transport Effects: Strategic Highways

10.1 Introduction

10.1.1 Whilst Gatwick is committed to securing a higher surface access mode share by sustainable modes, highway access will remain critical for future access for passengers, staff, and freight, including those arriving by local bus and express coach.

10.1.2 In FY2017/18, 55% of all Gatwick passenger demand accessed the airport by car, either as a driver, car passenger or by taxi. Car journeys are split between those that park at the airport (short stay or long stay, using on or off airport parking and also including “meet and greet” or valet parking) and those that are dropped off or picked up (“kiss and fly” and taxi journeys). This proportion is gradually decreasing in favour of higher public transport access mode share.

10.1.3 This section covers modelling of the strategic highway network between London and Brighton including the M23 and M25. Proposed capacity enhancements and embedded mitigation with Project along the M23 Spur is described in Section 10.2 below.

10.2 Approach and Methodology

10.2.1 The strategic highway model has used SATURN software. It has been developed using Highways England's South East Regional Transport Model (SERTM) as the basis for generating a sub-regional highway assignment model that has been used to test strategic network effects as well as providing input into environmental analysis for noise and air quality.

10.2.2 SERTM has been used as the basis of the highway assignment model and refined locally to add additional network detail and zoning. The model uses network details from West Sussex's Crawley Local Transport Model (CLTM) and Transport for London's London Highway Assignment Model (LoHAM) for Crawley and the area of South London.

Current Network

10.2.3 Gatwick benefits from direct access to the national Strategic Road Network (SRN) 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 standard dual carriageway to Junction 9a, immediately adjacent to the entrance of South Terminal. The off-peak journey time from Gatwick Airport to the M25 via the M23 is around 10 minutes. From the M25, there is access to the wider UK strategic road network.

10.2.4 The A23, which runs parallel to the M23, continues north beyond the M25 into London via Croydon and Brixton to the heart of the West End and the City. Croydon is between 30 and 40 minutes from the airport by road in the off-peak and peak periods respectively.

10.2.5 South of Gatwick, the M23/A23 continues as a strategic highway corridor from London to Brighton on the South Coast. Brighton is between 30 and 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 1 hour and 20 minutes of the airport.

10.2.6 The A23 runs north-south parallel to the M23 from South London (and Croydon), through Redhill then Horley and Gatwick Airport. It then bypasses Crawley and provides a connection to the south through Pease Pottage to Brighton.

10.2.7 The A264 connects Horsham to the south-west with Gatwick via a combination of potential routes including the A23, A2011 or M23 depending on the route chosen. To the east the A264 also connects Gatwick to East Grinstead via the A22.

10.2.8 Whilst Gatwick is committed to encouraging more employees to travel to work by modes other than sole occupancy private car, road access will remain an important consideration in planning the airport's growth in the future.

10.2.9 Gatwick Airport has recently benefitted from a number of road improvements, as listed in Table 10.2.1.

Future Network

10.2.10 There are a number of schemes currently under development within the study area. Highways England maintain a pipeline of schemes under their Road Investment Programme (RIP) which includes schemes identified for progression under the Department for Transport's Road Investment Strategy (RIS) 1 covering the period 2015 to 2020 and Road Investment Strategy 2 (RIS2) covering 2020 to 2025. In addition, a number of local schemes are also planned that deliver improvements to junction capacity / traffic flow supporting development or safety enhancements. Table 10.2.1 shows the major highway schemes which have been included in the SATURN model. The schemes have been cross-checked with Highways England, information provided by LA/consultancies and available public information. The major Road Investment Strategy (RIS) schemes are captured as well as other strategic schemes in the study area. A full list of highway schemes in the model can be found in Annex B.

Diagram 10.2.1: Highway network serving Gatwick Airport

Diagram 10.2.2: Main strategic highway access to Gatwick – M23 Junction 9 (before Smart Motorways)

Diagram 10.2.3: Local highway and road network

Table 10.2.1: Major highway schemes included in the model

Scheme Name	Scheme Promoter	Opening Year
M23 Junctions 8-10: Smart Motorways	Highways England	Spring 2020
M23 Junction 9, north bound slip road - Carriageway widening	Crawley	Before 2026 (assumed)
M23 Junction 10 - Junction improvements, Signal, carriageway widening	Crawley	Before 2026 (assumed)
M25 Junction 10-16 Smart Motorway	Highways England	2023
M25 J8 Improvement Scheme	Highways England	Dec-2020
M25 South West Quadrant	Highways England	2023
Lower Thames Crossing - new link	Highways England	Before 2029 (assumed)
A2 Bean & Ebbsfleet Junction Improvement Scheme	Highways England	2022-2023
A27 East of Lewes	Highways England	Jan-2022
A22 Corridor - M25 Junction 6 improvements	Tandridge	Before 2029 (assumed)
Burgess Hill Northern Arc Land - Highways (A2300), bridges	West Sussex	Before 2029 (assumed)
Radford Road approach to Gatwick Road	Crawley	Before 2026 (assumed)

Source: Schemes confirmed with Highways England and Local Authorities

Model Forecasting Approach

10.2.11 Traffic modelling has been undertaken using a SATURN highway assignment model developed for Gatwick Airport using SERTM, CLTM and LoHAM and known as the GHOST model (Gatwick's Holistic Overview of Strategic Transport).

10.2.12 As described in Section 5.10.4, the base year model is 2016. Forecast years have been developed for Gatwick for the years 2029, 2032 and 2047 for a Future Baseline (without Project) and with Project scenario. Airport demand has been taken from the air passenger and employee forecasts, in accordance with all other modelling. Background traffic is based on the latest TEMPRO (v.7.2) growth factors which have been adjusted to align with cumulative developments in the scheme area in line with TAG guidelines.

10.2.13 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.

10.2.14 The base model updates include overlaying passenger and employee demand for the Airport using the geographical distributions from CAA passenger data and Gatwick employee survey data, which has then overlaid onto background trips in the model. Model flows have then been validated against observed traffic counts including checks on the model around Gatwick Airport to show how modelled flow validates against observed traffic flow.

10.2.15 The forecast year model has been developed with airport passenger and employee forecasts to generate future year demand scenarios out to 2047.

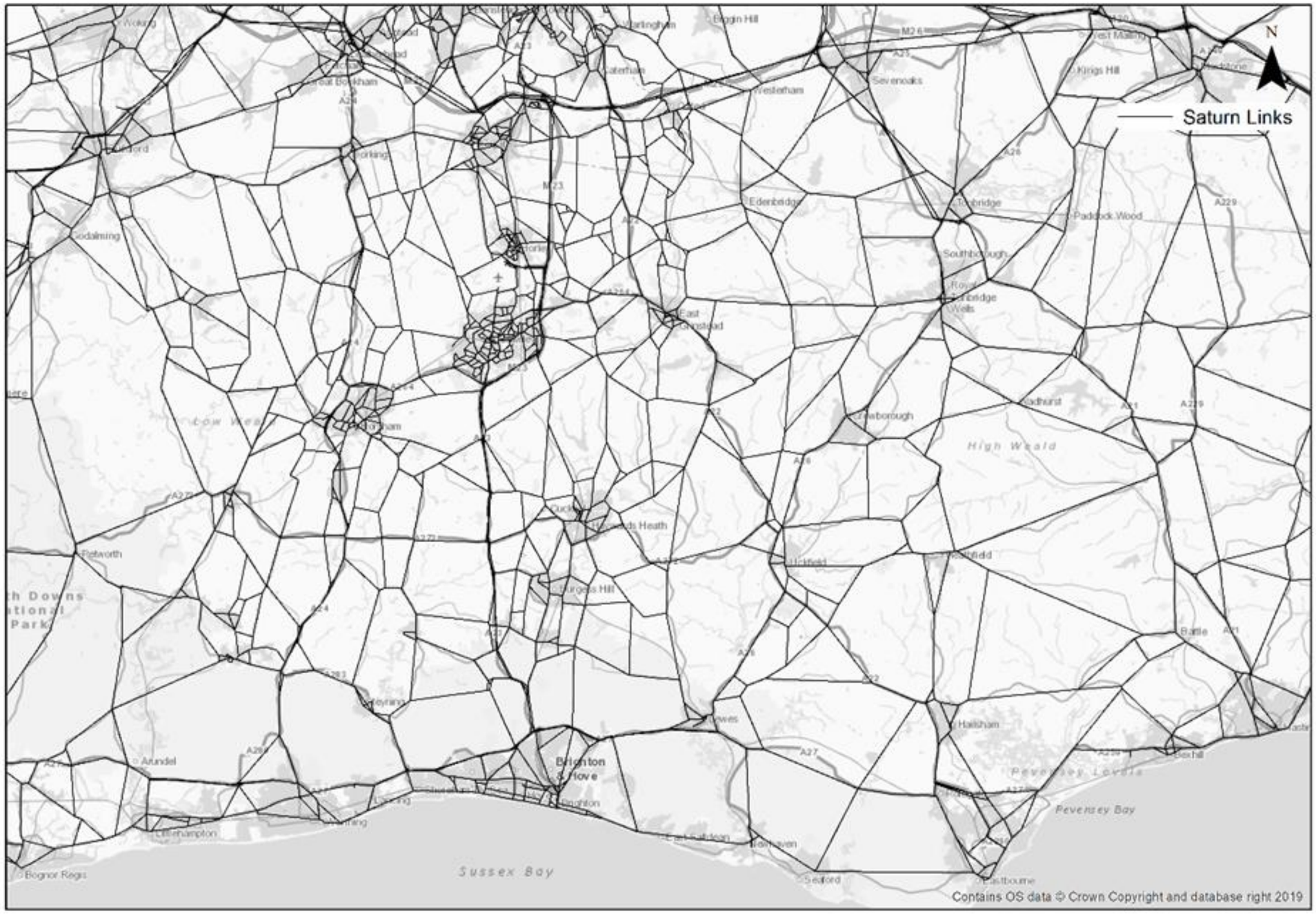
10.2.16 For the purpose of this study, the approach has been to model the road network during specific time periods when traffic levels and sensitivity to mode choice will vary.

10.2.17 The time periods modelled in the highway model are:

- AM Peak Hour 1 – representing the peak in flows on the SRN network between 07:00-08:00;
- AM Peak Hour 2 – representing the peak in flows on the SRN network between 08:00 - 09:00;
- IP Average Hour – representing an average hour flow between 09:00 - 16:00; and
- PM Average Hour – representing an average hour flow between 16:00 - 18:00.

10.2.18 The strategic transport modelling which underpins the assessment is described in detail in Annex B.

Diagram 10.2.4: Model network coverage in the vicinity of the Airport



10.3 Comparison of Future Baseline and Project Scenarios

Changes in Demand

10.3.1 Modelled traffic volumes extracted for the four modelled time periods are combined and expanded to represent Average Annual Daily Traffic (AADT) volumes. These averages represent (Monday-Sunday) traffic volumes at 24-hour levels.

10.3.2 Comparisons across the three assessment years considering the difference between the future baseline and with Project scenario have been carried for all modelled links. The purpose of this analysis is to demonstrate the characteristics of changes in traffic volume, henceforth denoted as AADT and distinguishes which corridors are affected, and the nature in which the highway model responds in the with Project scenario.

10.3.3 The assessment across all years shows a similar pattern and therefore the comparison between the 2047 baseline and with Project scenario is shown in Diagram 10.3.1.

10.3.4 The modelling shows that the key corridor affected by the development of the airport is the M23 in both directions with changes over 2,500 AADT.

10.3.5 Additionally the M25 east and west of junction 7 shows tidal changes on links approaching the airport between 1,000 and 2,500 AADT.

10.3.6 The diagram shows the other key corridors for access to the South-West via the A264 and A24 and across to East Grinstead on the A264 and A22.

10.3.7 When looking at the specific peak period distribution from SATURN in closer proximity to the Airport, as per Diagram 10.3.2, this shows that almost 80% of airport traffic comes via the M23 and then accesses the Airport via the M23 Spur between Junction 9 and 9a.

10.3.8 Previous analysis indicates minimal change in this distribution between expansion projects supporting the conclusion that increased capacity on the M23 in the future will remove traffic from other local roads that have less capacity (such as the A23 and A217).

10.3.9 Given the above concentration of flows on highways and junctions in close proximity to the Airport, an additional assessment of junction capacity has been undertaken in VISSIM as described in Section 11 of this PTAR.

Diagram 10.3.1: 2047 AADT – Change with Project as compared to Future Baseline

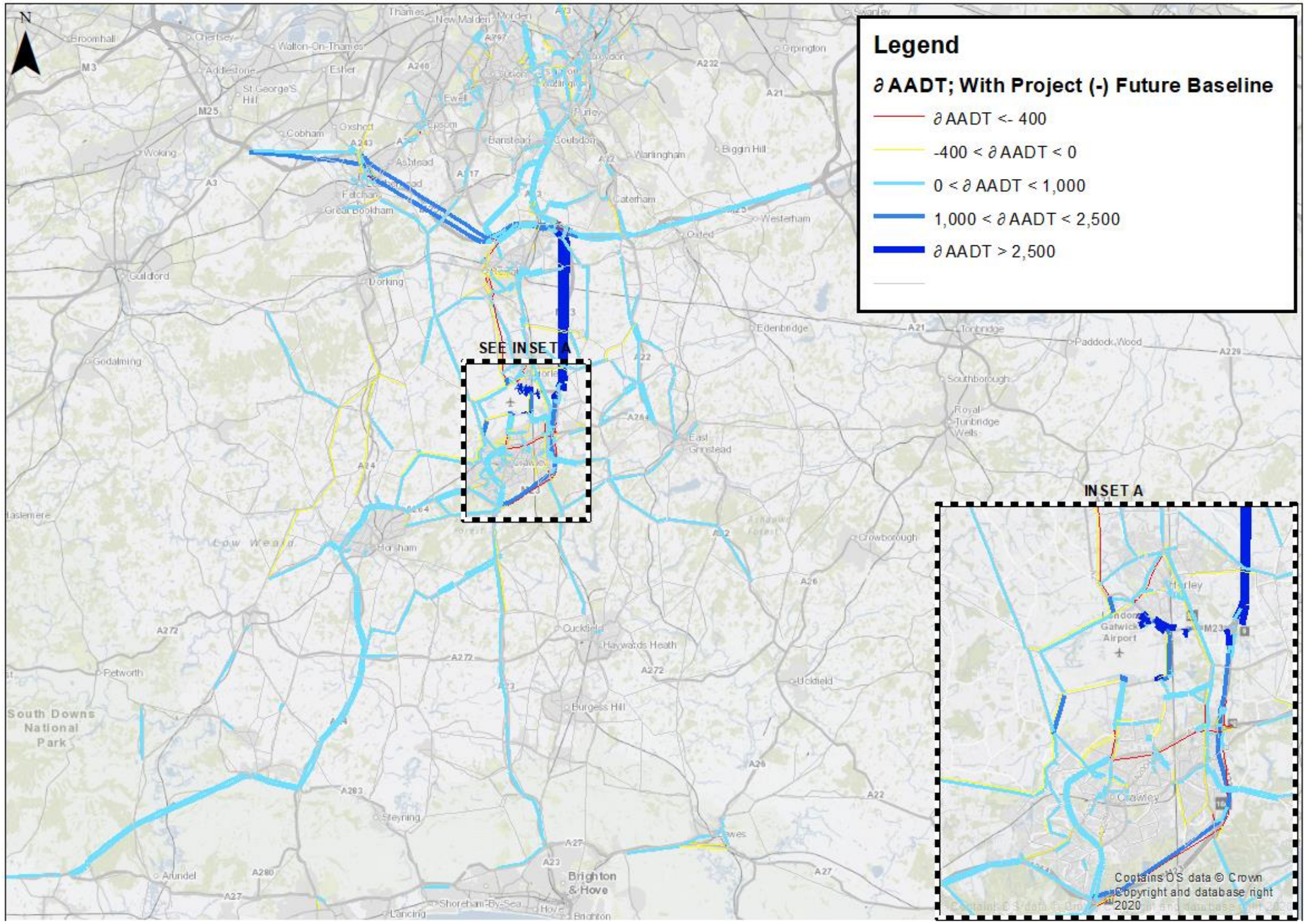
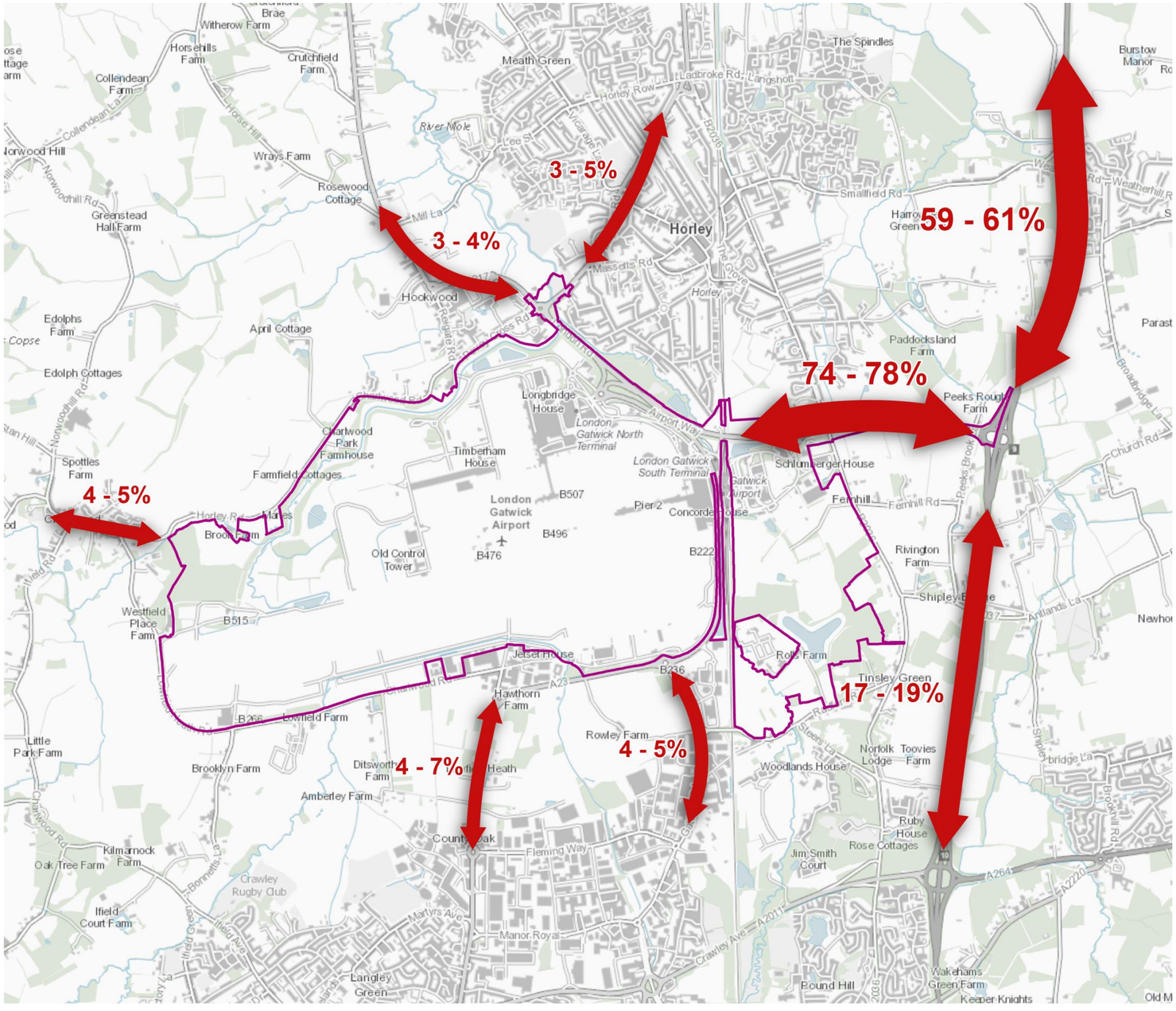


Diagram 10.3.2: Proportion of Gatwick Traffic on the Strategic Road Network, 2047



10.4 Effects of Project on Wider Area

10.4.1 The following section details the performance of the highway model in relation to the future baseline and with Project respectively. This covers the three assessment years of 2029, 2032 and 2047.

10.4.2 The performance of the highway model is assessed by considering the changes in network operation for each assessment year between the future baseline and with Project scenarios. The assessment considers five performance areas presented in Diagram 10.4.1 and consists of:

- Strategic Road Network (SRN): M25 (J5 to J10), M23, A23 & A27 (Lewes to Arundel);
- Performance Area A: Gatwick Airport, Crawley and Horley;
- Performance Area B: M25 to A272;
- Performance Area C: Inter-London; and
- Performance Area D: A272 – A27

10.4.3 The following network characteristics have been analysed:

- **Journey Times** – expressed as end-to-end travel times on key routes across the area of detailed modelling. These include the Strategic Route Network (SRN), routes in the vicinity of Gatwick Airport, the periphery of Crawley and other key distributor roads. The routes analysed capture trips to/from Gatwick Airport as well as other key strategic movements on the network. These are presented for SRN, Performance Areas A, B and D.
- ***Volume to Capacity (V/C)*** – ratios expressing the total traffic volume using a highway or road link with respect to its total available capacity. This is a common metric used to estimate the potential level of congestion. A volume to capacity or V/C ratio of 50% would mean low levels of busyness as demand is only 50% of the capacity of the junction. Conversely a V/C ratio of 105% would indicate demand being 105% of junction capacity and therefore over capacity, with congestion and queuing. Modelled values are presented to show the worst performing links (i.e. the maximum across all time periods). V/C is segmented in to three key operational categories presented in Table 10.4.1 and is considered for SRN & Performance Areas A-D.
- ***Magnitude of Impact (Links / Nodes)*** – changes between link and node V/C metrics between the future baseline and with Project scenarios are categorised into Low, Medium and High and presented for Performance Areas A-D. The categories are based on a combination of changes in V/C referred to as congestion indicators as well as the V/C standard in the with Project scenario. For example, an instance of V/C changing by greater than 10% with a corresponding V/C of less than 85% in the with Project scenario is deemed 'Not Significant' as the junction is below 85% of its capacity. However if the V/C is 92-99% in this context, a greater than 10% change would be classified as 'High' as the change takes the junction over capacity. An overview of the parameters considered as part of categorising this magnitude of impact is presented in Table 10.4.2.

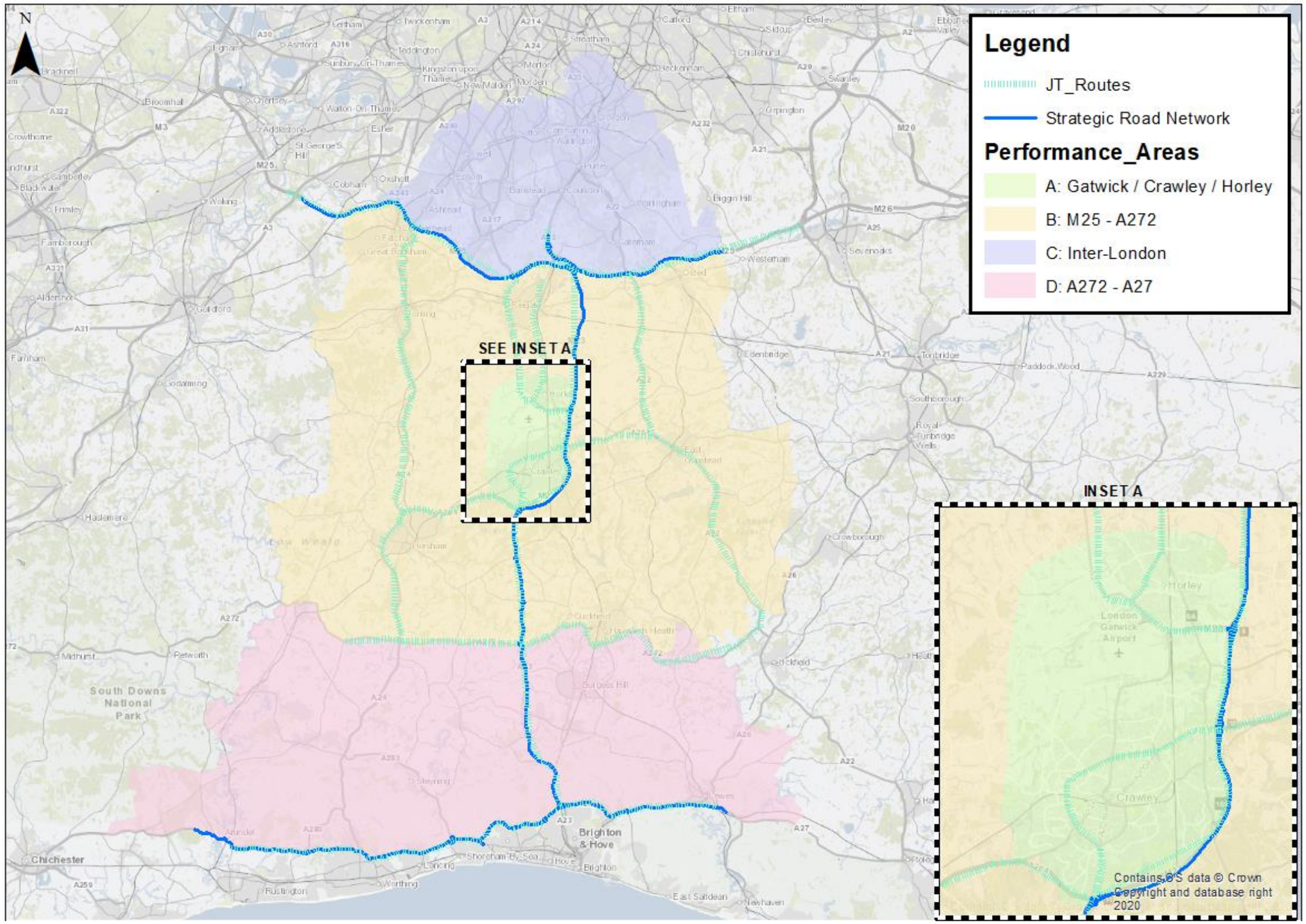
Table 10.4.1: Volume over Capacity Definition

Category	V/C Definition
-	V/C < 50%
Green	50% < V/C < 85%
Amber	85% < V/C < 99%
Red	V\C > 100%

Table 10.4.2: Magnitude of Impacts Grid

Criteria		Magnitude of impacts			
		Not significant	**Minor**	**Moderate**	**Major**
		<85%	**85 - 92%**	**92 - 99%**	**99% or more**
<2% change in Congestion Indicator	Very Low	Not significant	Not significant	Not significant	Not significant
2-5% change in Congestion Indicator	Low	Not significant	Low	Low	Medium
Between 5-10% change in Congestion Indicator	Medium	Not significant	Low	Medium	High
>10% change in Congestion Indicator	High	Not significant	Medium	High	High

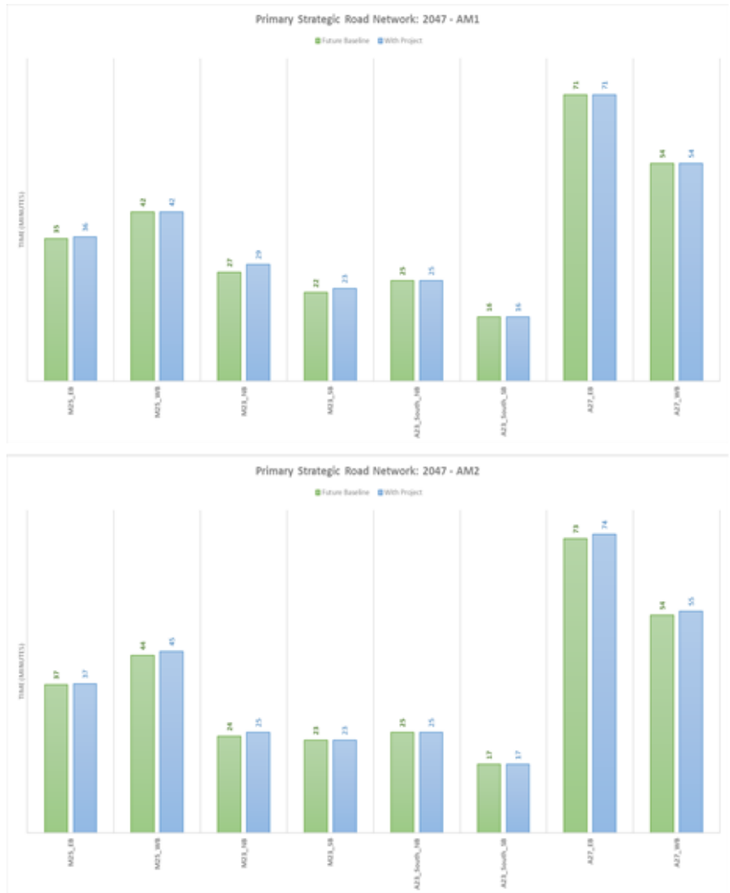
Diagram 10.4.1 : Highway Model Performance Area



Strategic Road Network

10.4.4 There are no notable changes in journey times with respect to the SRN between the future baseline and with Project scenarios, including the mitigation described in Section 10.2, with differences of circa 1 minute shown on the M25 and A27 eastbound and westbound in the AM1 time period for 2032 and 2047, as per Diagram 10.4.2.

Diagram 10.4.2 Highway Journey Times - Primary SRN, 2047



Additionally, the modelling suggests that there are no occurrences of SRN links that have had a change in magnitude of impact between the future baseline and with Project scenario across all assessment years.

Performance Area A

10.4.5 Within performance area A the following journey time routes covering the local road network were analysed:

- A23 from Longbridge Roundabout to A23 (south of M25, near Merstham), northbound and southbound; and
- A217 from M23 Spur via A217 to M25 J8, northbound and southbound.

10.4.6 In 2032 the A217 route showed a slight improvement in end to end journey time in the PM peak of circa 2 minutes while there were minimum other notable changes across the time periods.

10.4.7 In terms of operational performance there are some changes in the magnitude of impact between the future baseline and with Project scenario across all assessment years.

10.4.8 The magnitude of impact analysis for 2029 and 2047 is shown in Diagram 10.4.1 and Diagram 10.4.2 respectively. 2032 shows comparable or improved conditions when compared to 2029 owing to the provision of highway mitigation.

10.4.9 The only junction in 2029 which shows a medium impact relates to Gatwick Road roundabout for both the PM period. This change is predominantly driven by increase in the volume of trips heading to the Gatwick long-stay car park zone to the north and turning right from the south into the eastern arm of the roundabout.

10.4.10 Additionally, the low impact identified at South Terminal roundabout in 2029 is mitigated by 2032 when the embedded highway mitigation proposed with Project has been built.

10.4.11 In 2032, the M23 offslip at Junction 9 for access towards the airport changes from low to medium in terms of V/C. By 2047 this becomes a potential high impact classification at M23 Junction 9, related to the interaction between traffic from the southbound off-slip and traffic on the circulatory. The circulatory itself shows a medium impact. While the junction is operating at capacity, no blocking back on the slip-road occurs. These issues are analysed further using VISSIM modelling, as described in Section 11. VISSIM is more appropriate tool for assessing junction performance than a strategic highway model and allows for balancing of signal timings as potential mitigation.

10.4.12 A high impact occurrence is also shown in 2047 for Airport roads west of the North Terminal at Longbridge Way roundabout and this has also been assessed in the VISSIM model.

Diagram 10.4.1: Magnitude of Impacts: Performance Area A, 2029 Nodes

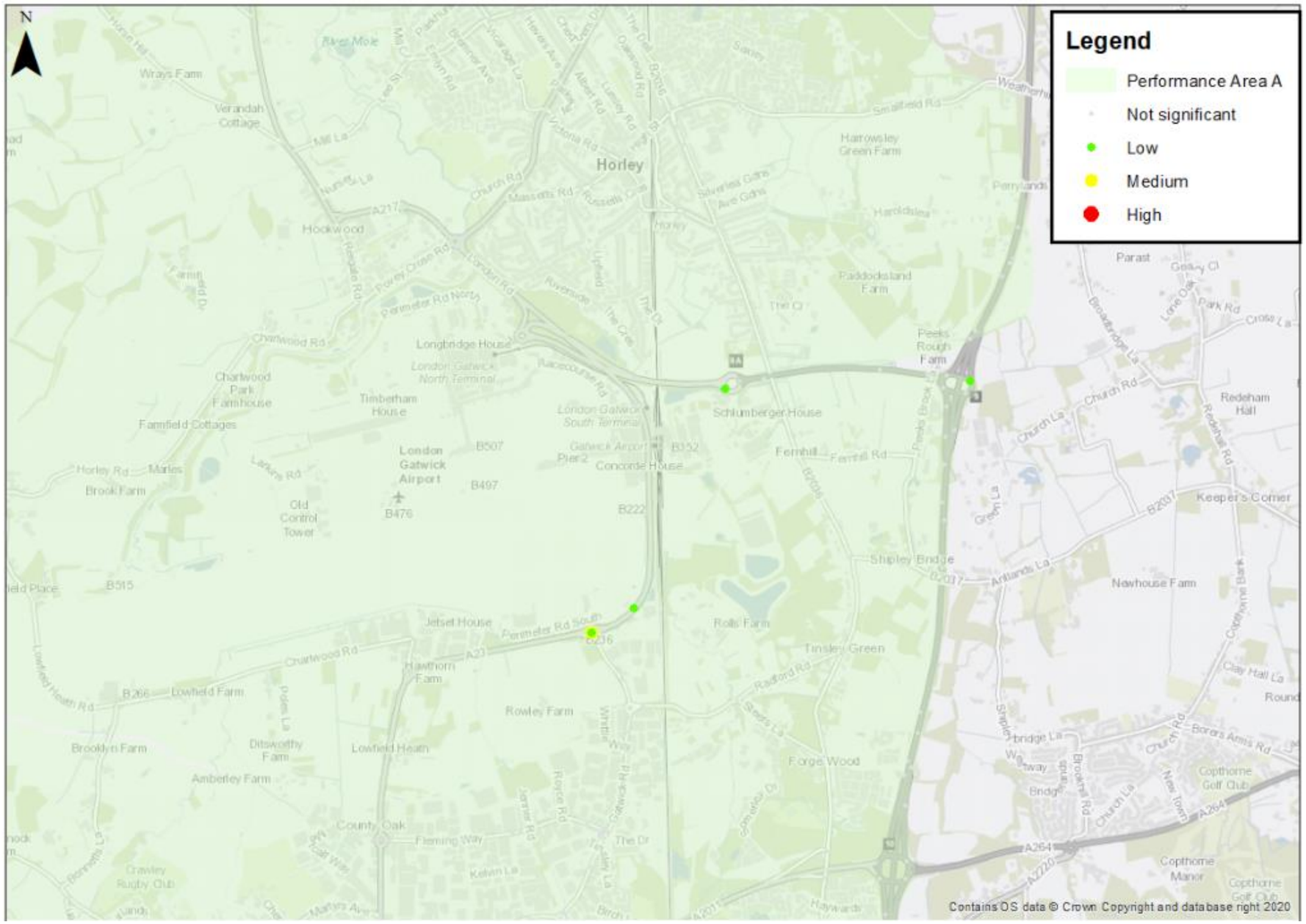
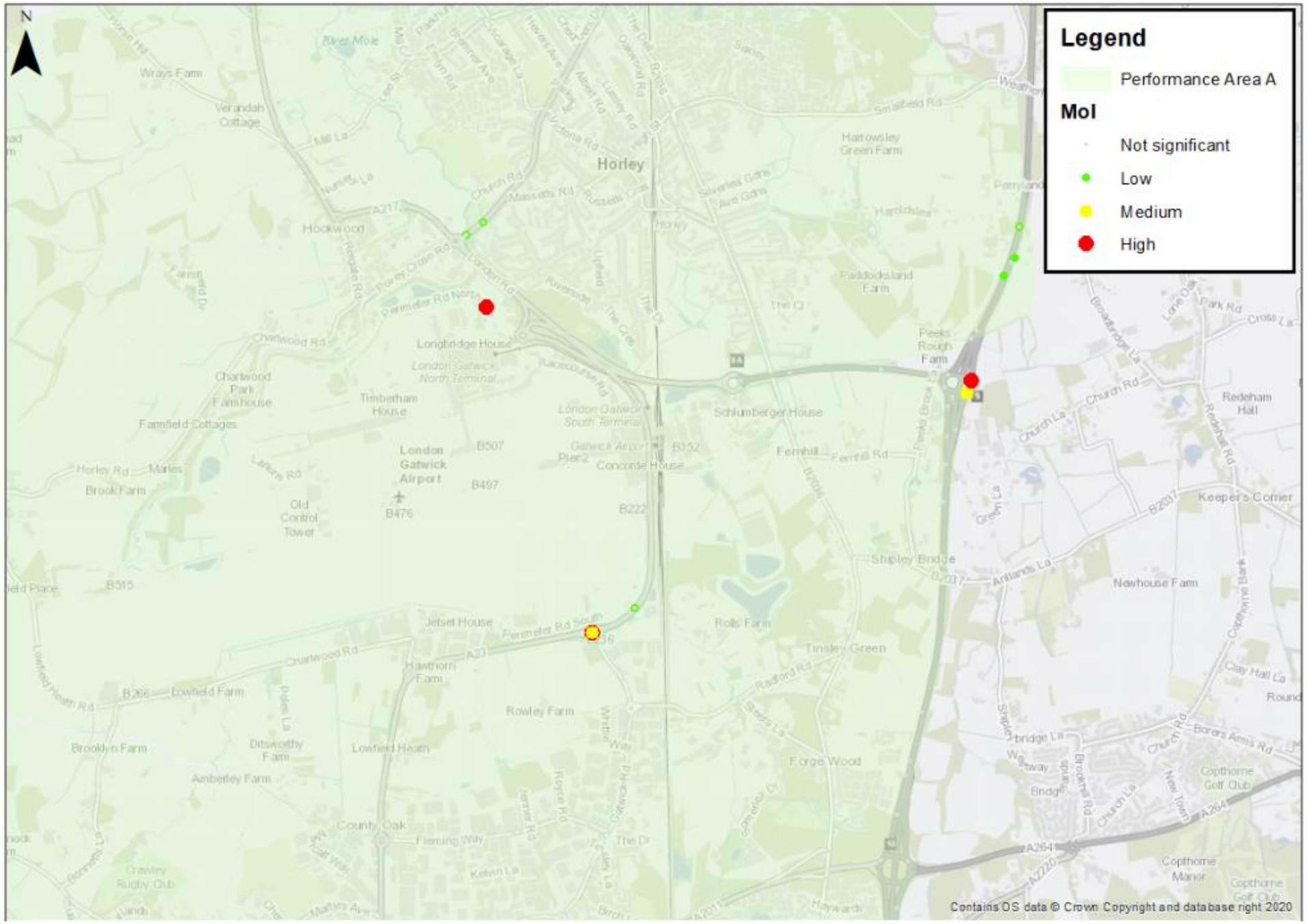


Diagram 10.4.2: Magnitude of Impacts: Performance Area A, 2047 Nodes



Performance Area B

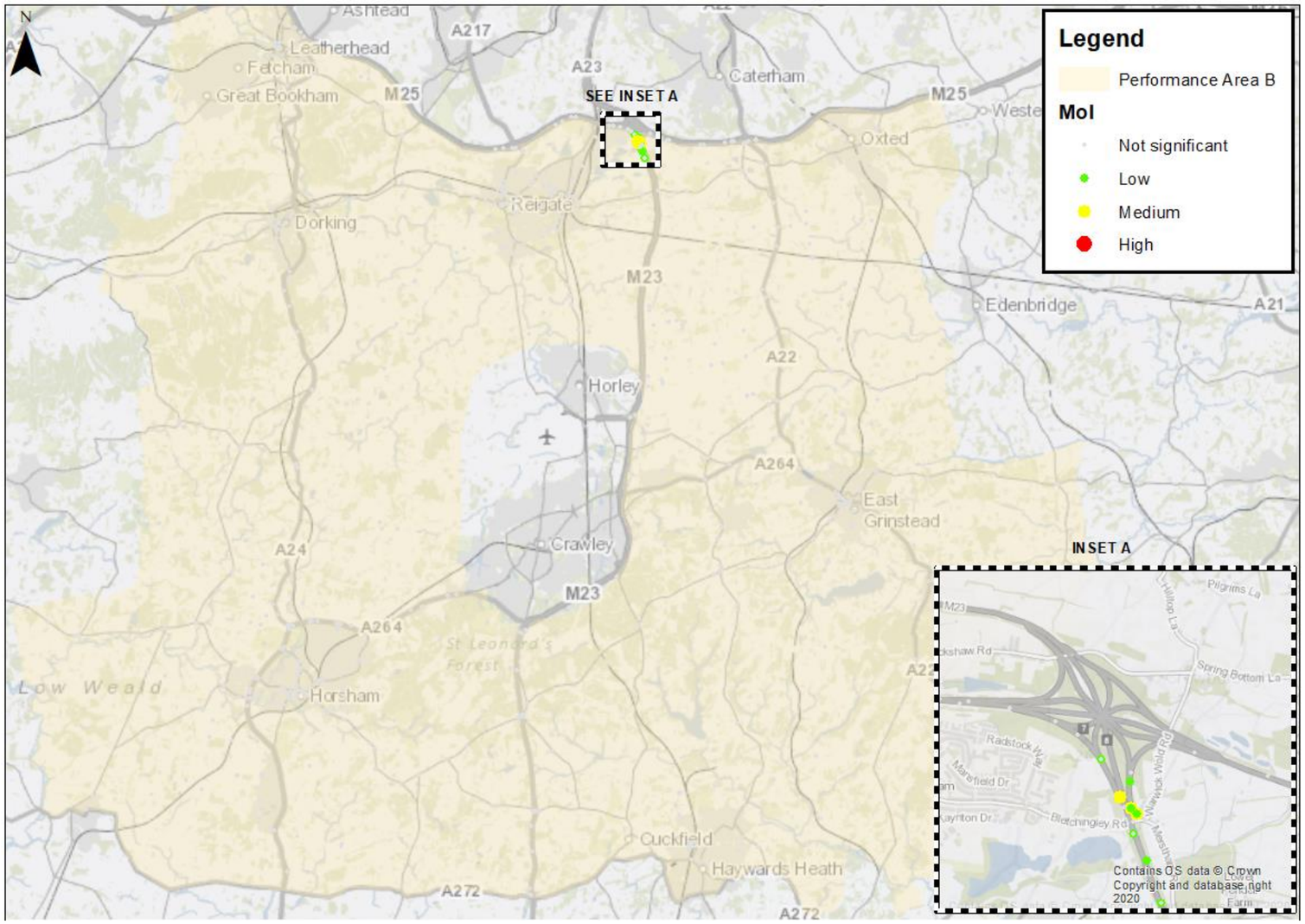
10.4.13 Modelled journey times extracted for the routes in performance area B are:

- A22 [1] from M25 J6 to East Grinstead, southbound and northbound;
- A22 [2] from East Grinstead to Maresfield, southbound and northbound;
- A2011 from M23 J11 to East Grinstead via Crawley, eastbound and westbound;
- A24 [1] from near M25 J9 (Leatherhead) to north Horsham, southbound and northbound;
- A24 [2] from north Horsham to A272/A24 near West Grinstead, southbound and westbound; and
- A264 from north Horsham to M23 J11, eastbound and westbound.

10.4.14 Journey time analysis demonstrates that no routes are notably impacted between the future baseline and with Project in 2029, 2032 and 2047. There are no instances of journey times exceeding changes greater than one minute. The modelled journey times suggest that, although these corridors carry more traffic with Project, there are no significant impacts in end-to-end journey times as a result of these additional vehicles.

10.4.15 In terms of impacts on congestion, the modelling shows that, in 2047, there are no high impact instances and a maximum of two medium impact instances across the modelled periods. These are shown in Diagram 10.4.3 and relate to the M25 westbound near M25 Junction 7 and the M25 southbound off-slip on to the M23 southbound for the AM1 and AM2 period. Here the V/C increases from 99% to 101% in the with Project scenario. The M25 southbound off-slip has a V/C of 87% which increases to 94% in the with Project scenario. Although flagged as a medium impact, overall the junction still operates at a similar level of V/C.

Diagram 10.4.3: Magnitude of Impacts: Performance Area B, 2047 Nodes



Performance Area C

10.4.16 Modelling undertaken to date has identified that this area of the network is particularly sensitive (as a result of high volumes of inner London traffic as well as areas of variable speed in the model, as opposed to with Project impacts) and the modelling assumptions (e.g. network definition / scale / coding of speeds) will be further reviewed during future workstreams in preparation for the DCO.

Performance Area D

10.4.17 Performance Area D shows no noticeable change in journey times on the A272 and no change in impact between the baseline and with Project scenarios.

10.4.18 No junctions within the area are classified as showing a low, medium or high change in impact in any of the assessed time periods or future years.

10.5 Potential Mitigation

10.5.1 Overall, strategic highway modelling shows that demand with Project and a northern runway can be accommodated on the main strategic highway routes currently used by airport traffic. Two high impact exceedances are shown closer to the Airport and these have been tested further using VISSIM modelling which is more appropriate tool for microsimulation of junction performance and are shown to perform within capacity (please see Section 11). The modelling 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 highway model will go through a series of updates in terms calibration and validation to feed into the final DCO submission.

10.5.2 The M23 Smart Motorways scheme widens the motorway to effectively 4 lanes in each direction at peak times between Junctions 8 and 10, providing significant additional capacity.

10.5.3 This scheme also widens the M23 Junction 9 to 9a link in the westbound direction and Gatwick is proposing a third eastbound lane as part of embedded mitigation with the Project.

10.5.4 Ongoing journey time variability on the M25 Southwest Quadrant is an issue which has been recognised by Highways England in their Stage 3 report for the M25 South West Quadrant (SWQ). The M25 is of strategic importance to the country and Highways England is promoting a package of measures to resolve congestion issues.

10.5.5 In addition, a number of committed schemes have been identified on the A27 to improve reliability along the corridor.

10.5.6 Given the above, GAL is not proposing any additional mitigation for the SRN, with the exception of the embedded Project mitigation on the M23 Spur between Junction 9 and Longbridge Roundabout, and schemes already envisaged by the highway authorities, as described in Section 10.2.

11 Assessment of Transport Effects: Local Highway and Road Network

11.1 Introduction

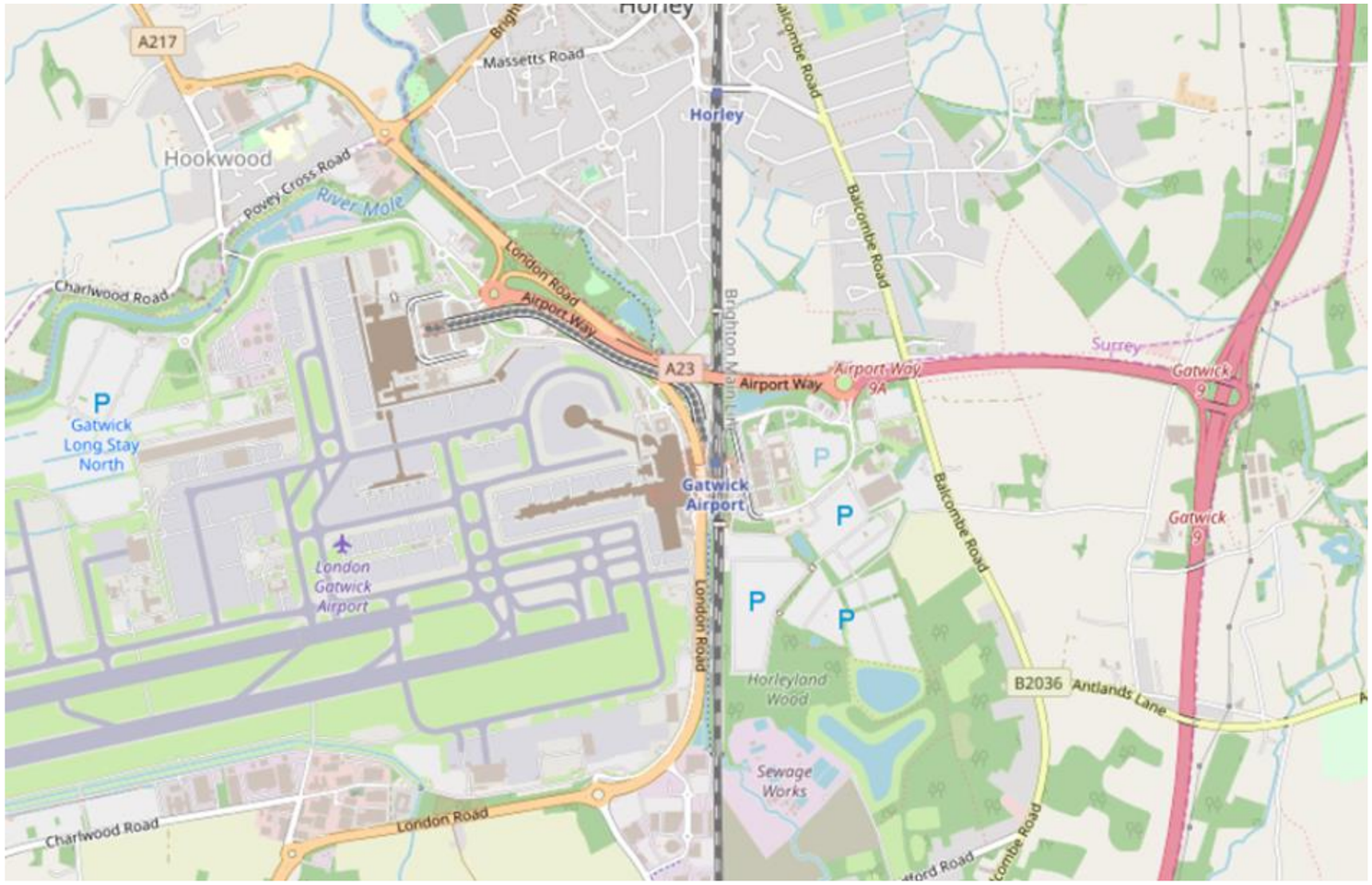
11.1.1 The signed route for access from the motorway to the Airport is via the M23 Spur between Junction 9 and 9a, with direct access to both South Terminal and North Terminal. This is the preferred ‘gateway’ for access to Gatwick by road and is consistent with the current wayfinding strategy. The corridor between M23 Junction 9 and Longbridge Roundabout, including South and North Terminal Roundabouts, is therefore fundamental to the successful operation of the Airport.

11.1.2 The A23 represents an important north-south strategic route as well as providing local access. It has an important local role connecting Crawley to the south to Horley to the north of Gatwick. Crawley is the largest nearby town and its centre lies approximately 4 km south of Gatwick’s South Terminal.

11.1.3 Some traffic from south of the Airport can access the airport via Junction 10 of the M23 as an alternative route. Currently, this is not as attractive to passengers as this is a longer route in distance and time. However, some delivery and logistics movements related to the Airport may still access the Airport from the south.

11.1.4 Diagram 11.1.1 shows the road network in the area around Gatwick including connection to the M23 motorway.

Diagram 11.1.1: Highway network in the vicinity of the Airport including the M23 spur



Source: Open Street Map

11.2 Approach and Methodology

VISSIM Models

11.2.1 For the PEIR, the strategic highways model developed in SATURN is the primary highway assessment tool, informing demand on links and through junctions as well as variation in speeds to be fed into more detailed junction modelling using VISSIM.

11.2.2 Gatwick has three VISSIM traffic simulation models which can be used to test detailed highway junction performance. These comprise the following.

- A 24 hour Corridor model to test flows, congestion and mitigation on the highway network around Gatwick Airport.
- Two 24 hour Terminal Forecourt models, one for the South Terminal and one for the North Terminal, including detailed pick-up and drop-off behaviour and dwell, car parking etc. to test how the forecourts perform.

11.2.3 The Corridor model has been used to test highway junction performance and congestion effects of growth at the Airport both in the Baseline and with Project.

Corridor Model

11.2.4 The Corridor Model includes south Horley from the junction at Massetts Road and A23 Brighton Road, down through Longbridge Roundabout, east through North and South Terminal Roundabouts, along the M23 Spur to Junction 9 of the M23. The model also extends down the A23 London Road into North Crawley, including roads connecting to the Manor Royal estate, as per Diagram 11.2.1.

11.2.5 In 2016, the Corridor Model was recalibrated based on an extensive data collection exercise and is considered a robust base to take forward and uplift for future analysis of impacts related to future growth at Gatwick. For the purposes of the PEIR and for consultation, the Corridor Model is being used to test highway link and junction performance around the Airport to confirm the findings of the strategic highway modelling which is the primary highway assessment tool.

Highway Network

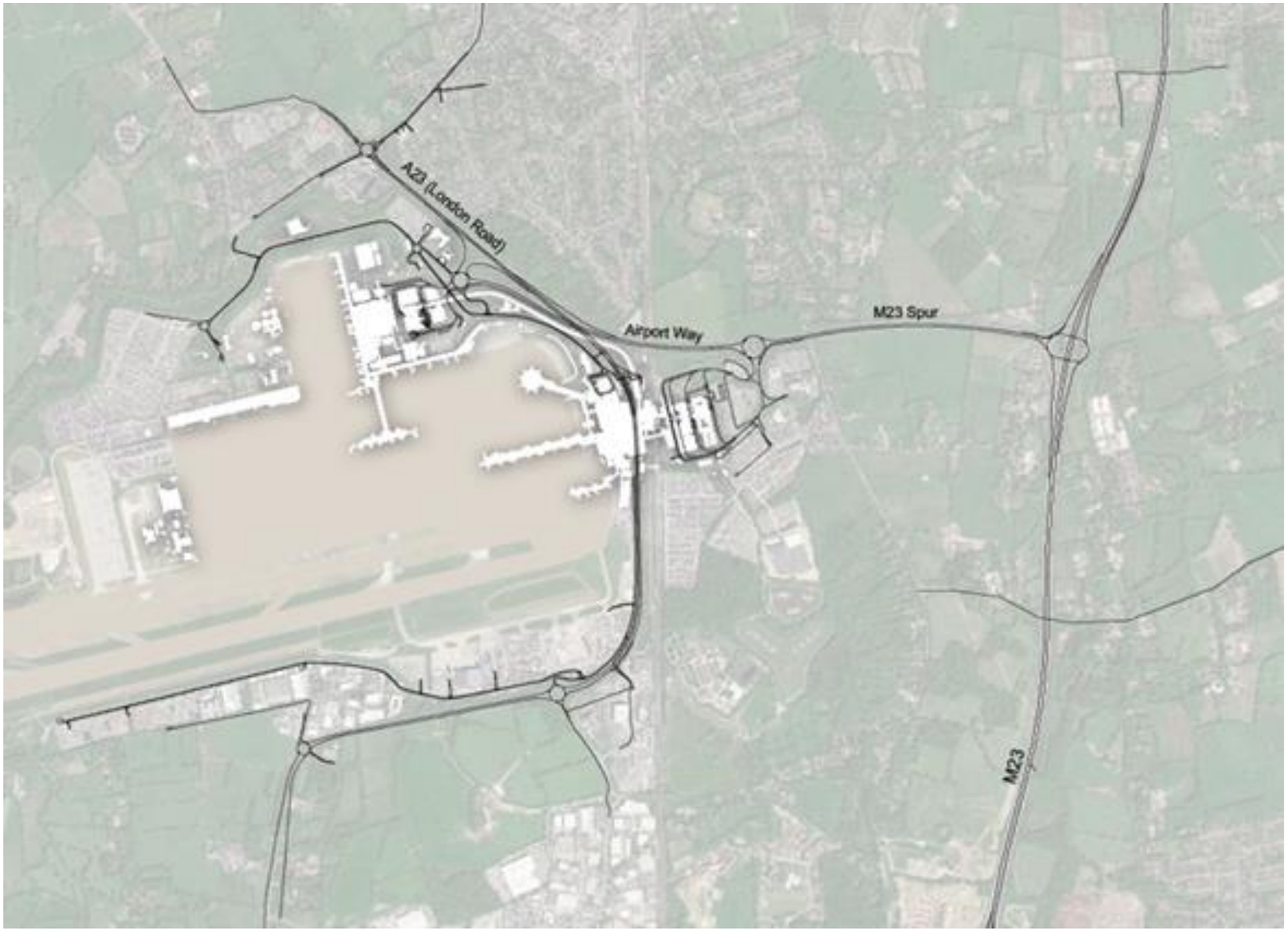
11.2.6 The following highway network improvements are included in the VISSIM model.

Highway England Smart Motorways

11.2.7 The Highways England Smart Motorways scheme forms part of its wider strategic highway investment programme.

11.2.8 The programme involves the delivery of £15bn of investment in England's motorways and major A roads. Key initiatives include conversion of the hard shoulder to be used for additional traffic capacity, along with technology enabled methods for monitoring congestion, changing speed limits, activating warning signs and closing lanes.

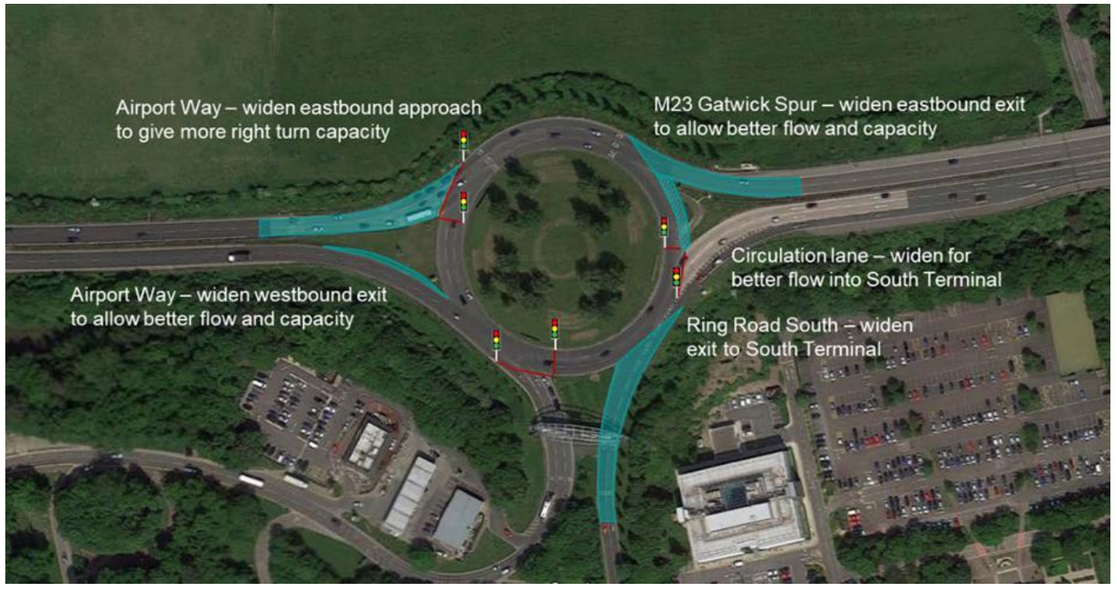
Diagram 11.2.1: VISSIM Corridor Model Extents



11.2.9 The 11 mile section along the M23, between Junctions 8 to 10, was completed in 2020 and includes the following features which are relevant and have been included in the future baseline VISSIM model.

- Conversion of the hard shoulder on the M23 to a permanent running lane, increasing it from three to four lanes in each direction.
- All on and off ramps, from the M23 to J9, being widened to allow two separate lanes connecting into the mainline. The current configuration has a single lane off and on the mainline widening to two lanes by Junction 9.
- The traffic signals on Junction 9, at the intersection with the M23 northbound off ramp, will be removed. A new bypass lane provides a free-flowing left turn movement towards Gatwick Airport.
- Additional capacity on the M23 spur by increasing it to three lanes in the westbound direction between Junction 9 and South Terminal Roundabout.

Diagram 11.2.2: CIP improvement works to South Terminal Roundabout



Capital Investment Plan (CIP) Improvements

11.2.10 Modelling of Capital Investment Plan (CIP) demand to between 53 and 55 million passengers per annum through the Airport shows the need for signalisation and local widening at both terminal roundabouts to cater for short-term increases in Airport and background demand. These works form the basis of a separate project currently being discussed between Gatwick Airport and Highways England which will be implemented in the mid-2020s.

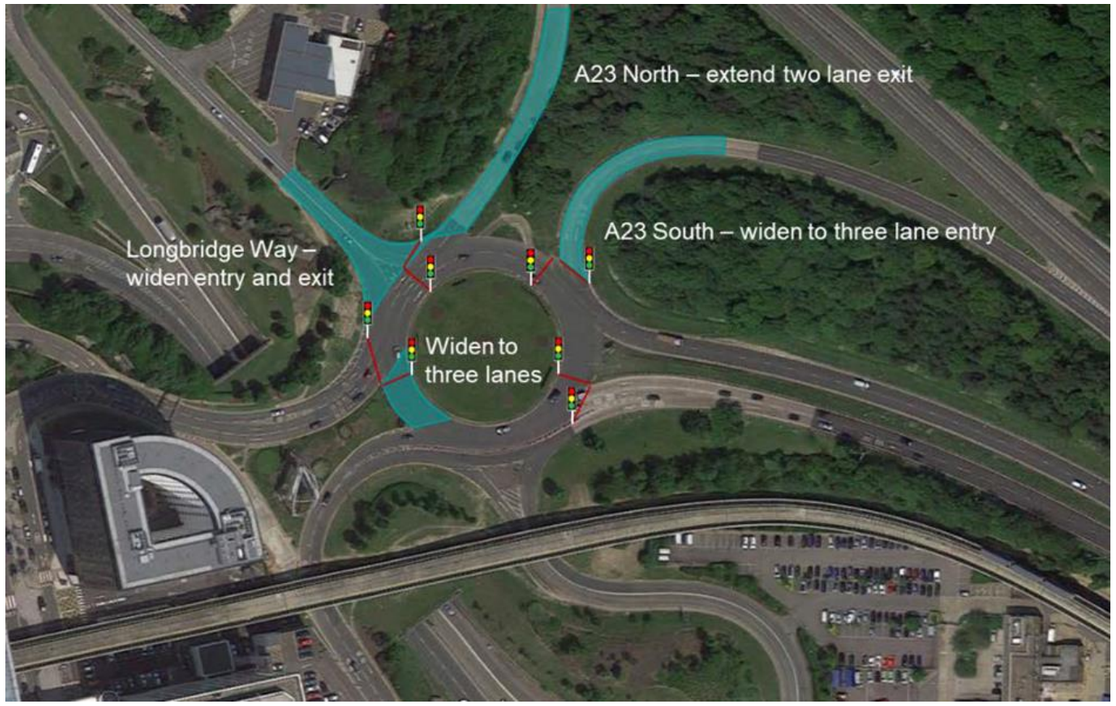
11.2.11 Proposed highway improvements include local widening on the junction entry/exit lanes for both the North Terminal and South Terminal roundabouts, together with signalisation of the roundabouts and provision of enhanced signage as shown in Diagram 11.2.2 and Diagram 11.2.3.

11.2.12 These improvements are included in the VISSIM assessment from 2029 onwards.

11.2.13 In addition, the CIP modelling shows that without improvements to the South Terminal roundabout, this junction acts as a ‘throttle’ during busy periods, limiting eastbound traffic flows heading out to the M23.

11.2.14 The CIP improvements release additional traffic through the junction though two lanes eastbound towards Junction 9 still provide appropriate capacity to accommodate this demand. However, grade-separation with Project, releases this ‘throttle’ and accordingly three lanes in the eastbound direction between South Terminal Roundabout and Junction 9 are recommended, mirroring the Smart Motorways enhancements on the westbound carriageway. Three lanes eastbound along the Spur have therefore been included in the VISSIM model for all future testing with Project.

Diagram 11.2.3: CIP improvement works to North Terminal Roundabout



Car Parking Strategy

11.2.15 A number of new car parks are proposed for implementation in the Future Baseline. These include the following:

- New multi-storey car parking capacity (MSCP4 and MSCP7) with 4,250 spaces; and
- Use of robotics technology within existing long stay parking areas, resulting in an additional 2,000 to 2,500 spaces.

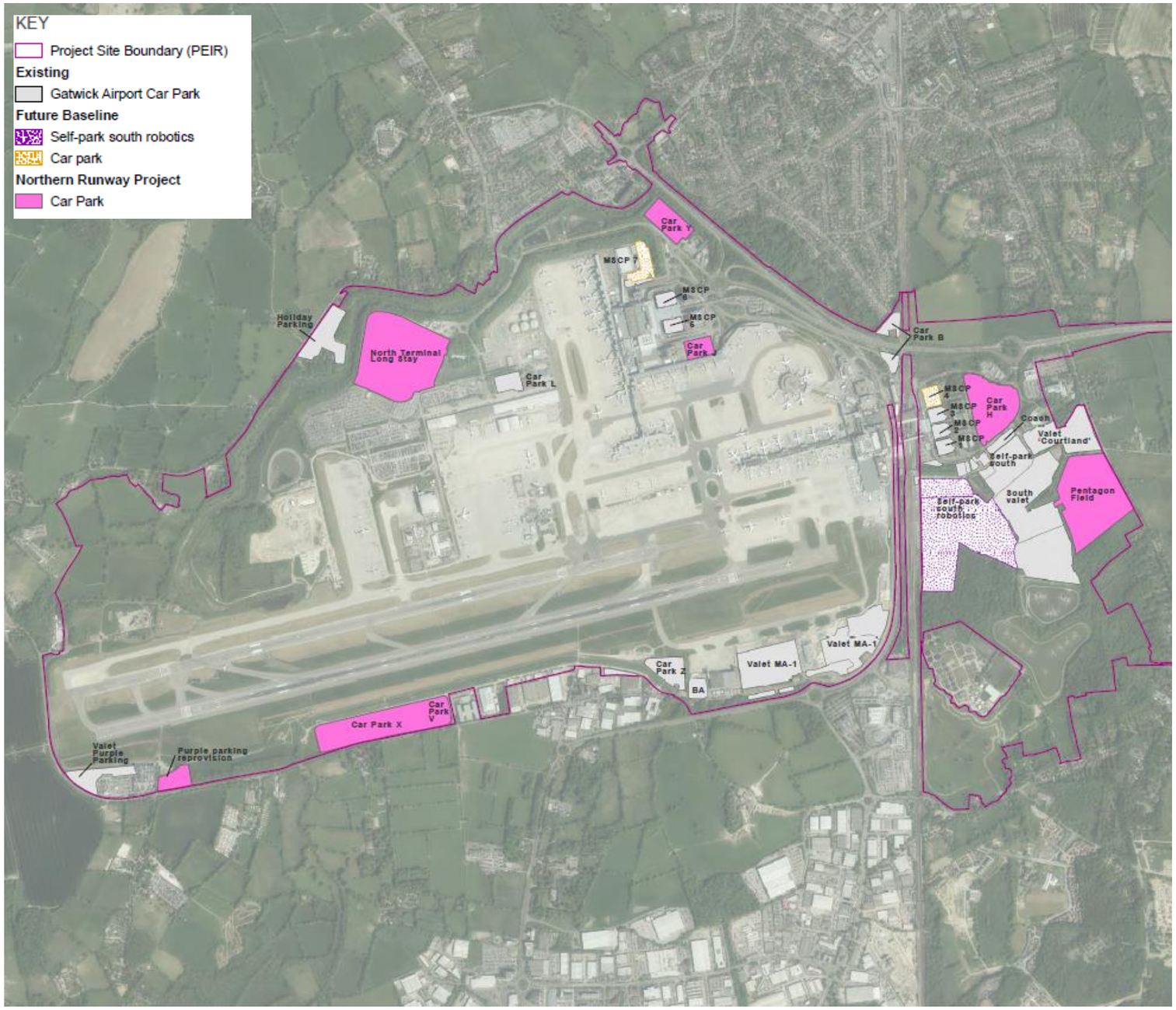
11.2.16 This will take future car parking provision on airport up to approximately 53,450 spaces in the absence of the Project.

11.2.17 New car parking will be required on site in order to meet additional parking demand generated by the proposed increase in passengers with Project, and to replace existing parking spaces that may be lost owing to development associated with the Project. Gatwick's plans also take into account an anticipated reduction in the number of spaces currently provided in unauthorised car parking sites away from the airport, in line with GAT3 requirements. 3,300 spaces are to reduce off airport parking from 6,300 to 3,000 spaces. The overall net increase in car parking spaces by 2047 with the Project could be approximately 18,500 spaces.

11.2.18 The location of car parks in the Future Baseline and Project scenarios are shown in Diagram 10.2.4. These car parks and the mix of passenger and staff parking in the GAL car parking strategy is included in the modelling.

11.2.19 It should be noted that the amount of car parking shown is the potential maximum to provide confidence that Gatwick has enough space to accommodate its parking needs. However, the aim of the Project ASAS will be to maximise sustainable modes and accordingly it may be that not all of this potential space for car parking is used.

Diagram 11.2.4: GAL Car Parking Strategy with Project



11.3 Comparison of Future Baseline and Project Scenarios

Highway Capacity

No Mitigation, 2032

11.3.1 Initial testing shows that Future Baseline can be accommodated on at-grade network assuming the CIP improvements to 2032. As per Diagram 11.3.1, the 2032 Future Baseline average speed plot shows that the majority of the network continues to operate well, with the exception of queueing on the approaches to Longbridge Roundabout.

11.3.2 The average speed plots show that the PM peak has very similar operation to the AM peak, as per Diagram 11.3.2 with some additional slow moving traffic at the merge eastbound from A23 London onto Airport Way.

11.3.3 Introducing changes in passenger growth with Project in 2032, the average speed plots show more congested conditions than in 2032 with demand related to the Northern Runway but without the mitigation proposed as part of the Project (Diagram 11.3.3 and Diagram 11.3.4). In particular long queues form at South Terminal roundabout, effecting egress from the terminal and which block back to adjacent junctions including M23 J9, which in turn effects slip road operation.

11.3.4 Given the congestion shown by the model with the 2032 Future Baseline network with Project demand, equivalent to 72.3 mppa, Gatwick has made the decision that mitigation will be required on the highway network to support additional growth with Project, out to 80.2 mppa by 2047, otherwise there will be potential for delays on the network.

11.3.5 Gatwick Airport has therefore explored the potential mitigation required to deliver appropriate capacity at both terminal roundabouts, including grade-separation, as well as Longbridge roundabout with this being provided prior to 2032. The scope and scale of the highway mitigation is described in Section 10.

Diagram 11.3.1: 2032 Future Baseline – Average Speeds, AM Peak

Diagram 11.3.2: 2032 Future Baseline – Average Speeds, PM Peak

Diagram 11.3.3: 2032 Future Baseline Network with Project Demand – Average Speeds, AM Peak

Diagram 11.3.4: 2032 Future Baseline Network with Project Demand – Average Speeds, PM Peak

With Mitigation, 2032 and 2047

11.3.6 This section provides VISSIM average speed plots for a mitigated network with Project growth. These plots show the current option for embedded highway improvements which involves a grade-separated South terminal roundabout; a signalised junction at the North Terminal beneath a flyover which takes through traffic over the junction; and an enhanced and enlarged roundabout at Longbridge.

11.3.7 The embedded highway mitigation measures in 2032 with Project reduce the congestion impacts of higher demand, as shown for the AM peak period in Diagram 11.3.5.

11.3.8 The model shows the network is accommodating the proposed growth, with no significant queuing in any location. High volumes of traffic in some areas result in the slowing of vehicles speeds in and around the North Terminal junction and Longbridge roundabout but this is predominantly as a result of vehicles waiting for the next green phase at traffic signals. The M23 southbound off-slip is busy but the modelling shows free flow traffic on the mainline.

11.3.9 The average speed plot for the PM peak is shown in Diagram 1.1.6 for 2032 with Project and show very similar operation to the morning peak period but with improved performance at M23 J9. The embedded highway mitigation measures as part of the Project mean that the network is shown by the modelling to be operating within capacity in 2032.

11.3.10 By 2047, the network would be busier in peak periods as a result of Project growth.

11.3.11 The average speed plot for the AM peak is shown in Diagram 1.1.7 for 2047 with Project. The embedded highway mitigation measures with Project aim to reduce congestion as much as possible. However, the increase in passenger demand with Project as well as increased background traffic to 2047 shows that vehicle speeds will reduce, with longer queues on the approaches to some junctions. However, the network continues to maintain an acceptable level of performance without queuing back into adjacent junctions.

11.3.12 In the PM peak, shown in Diagram 1.1.8, results are very similar to the AM peak but with improved performance at M23J9 due to the lower southbound off slip flows.

Conclusions

11.3.13 With Project and background traffic growth to 2047, VISSIM modelling shows some localised areas where the network is busy even with the proposed mitigation. However, some slower moving traffic and congestion is to be expected given that the modelling is to a 2047 horizon and indicates that the network has been sized appropriately. This operation is broadly in line with that predicted to occur in the 2032 Future Baseline, with improvements at the operation in some locations such as Longbridge Roundabout. As such the proposed mitigation is sufficient to provide for the expected growth but does not over-provide network capacity

11.3.14 As required and in conjunction with highway authorities, the highway designs will be adjusted in line with VISSIM modelling to provide further improvements by DCO submission.

Diagram 11.3.5: 2032 with Project – Average Speeds, AM Peak

Diagram 1.1.6: 2032 with Project – Average Speeds, PM Peak