Diagram 1.1.7: 2047 with Project – Average Speeds, AM Peak

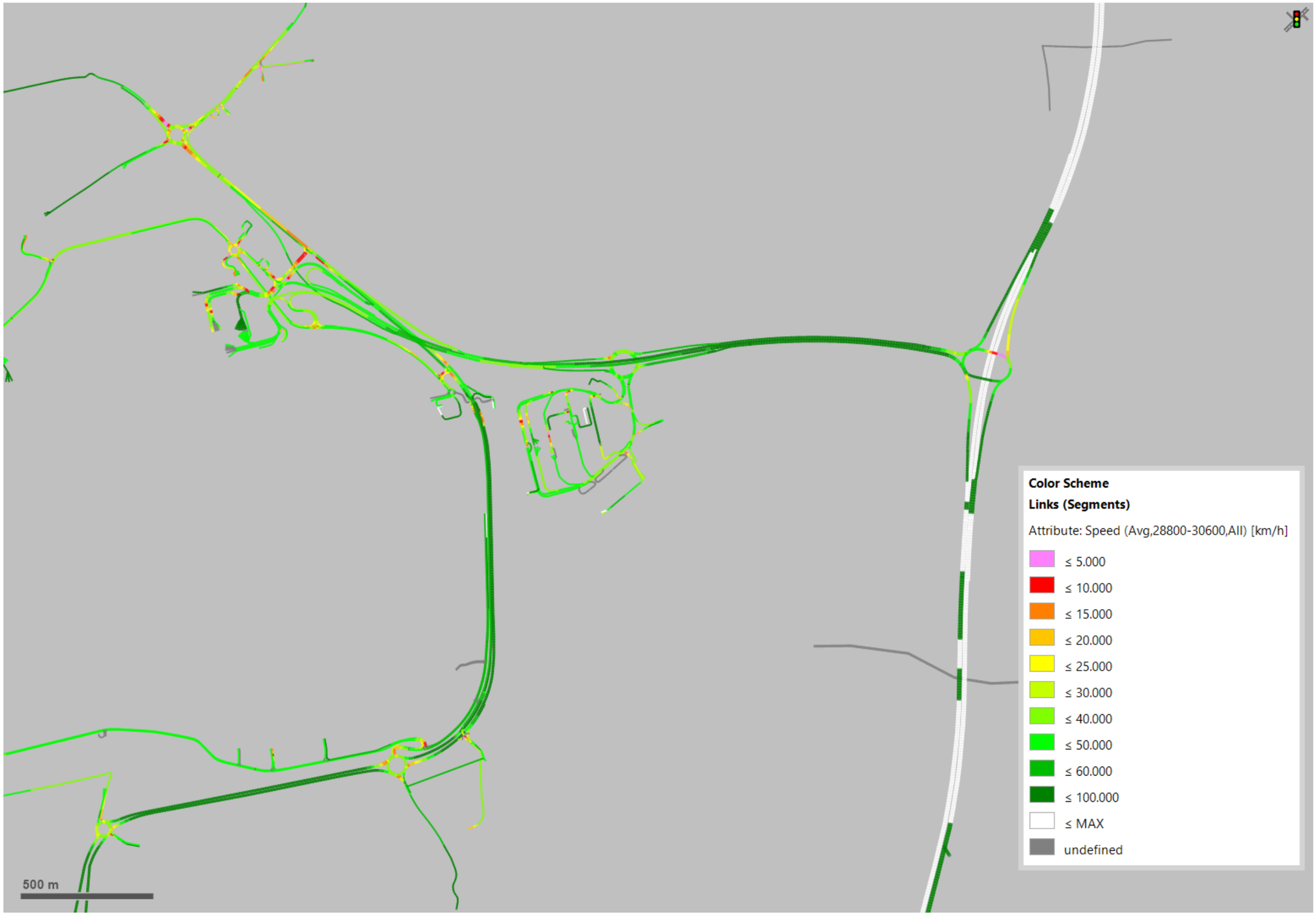
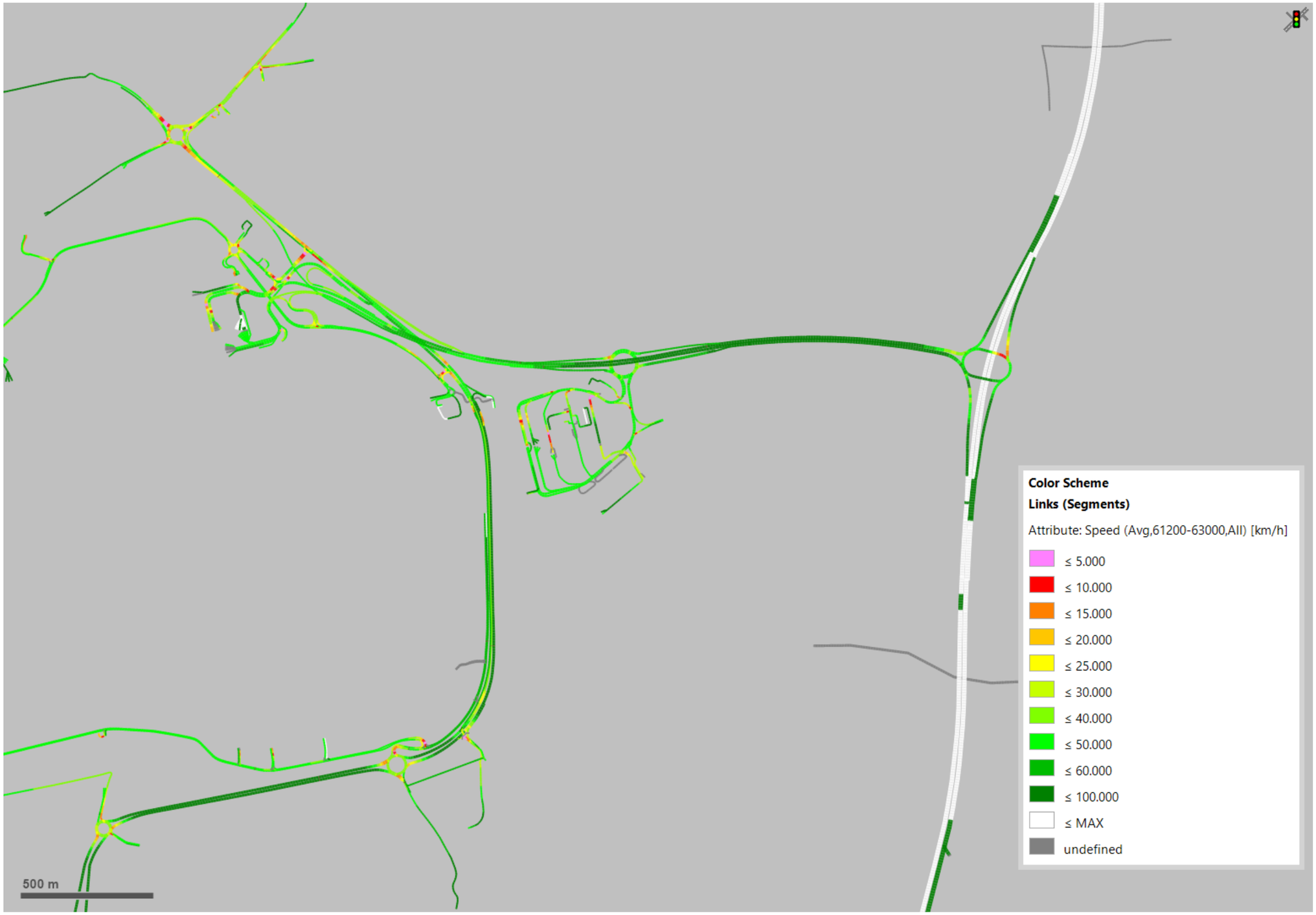


Diagram 1.1.8: 2047 with Project – Average Speeds, PM Peak



11.4 Forecourt Operations

11.4.1 Gatwick's Forecourt Design Technical Standard (2012) set out the user hierarchy that forecourts should aim to achieve, in order to be able to prioritise transport modes. This hierarchy is shown in Diagram 11.4.1 and reflects Gatwick's prioritisation of the most sustainable vehicle modes.

Diagram 11.4.1: User hierarchy in Gatwick's Forecourt Design Technical Standard (2012)

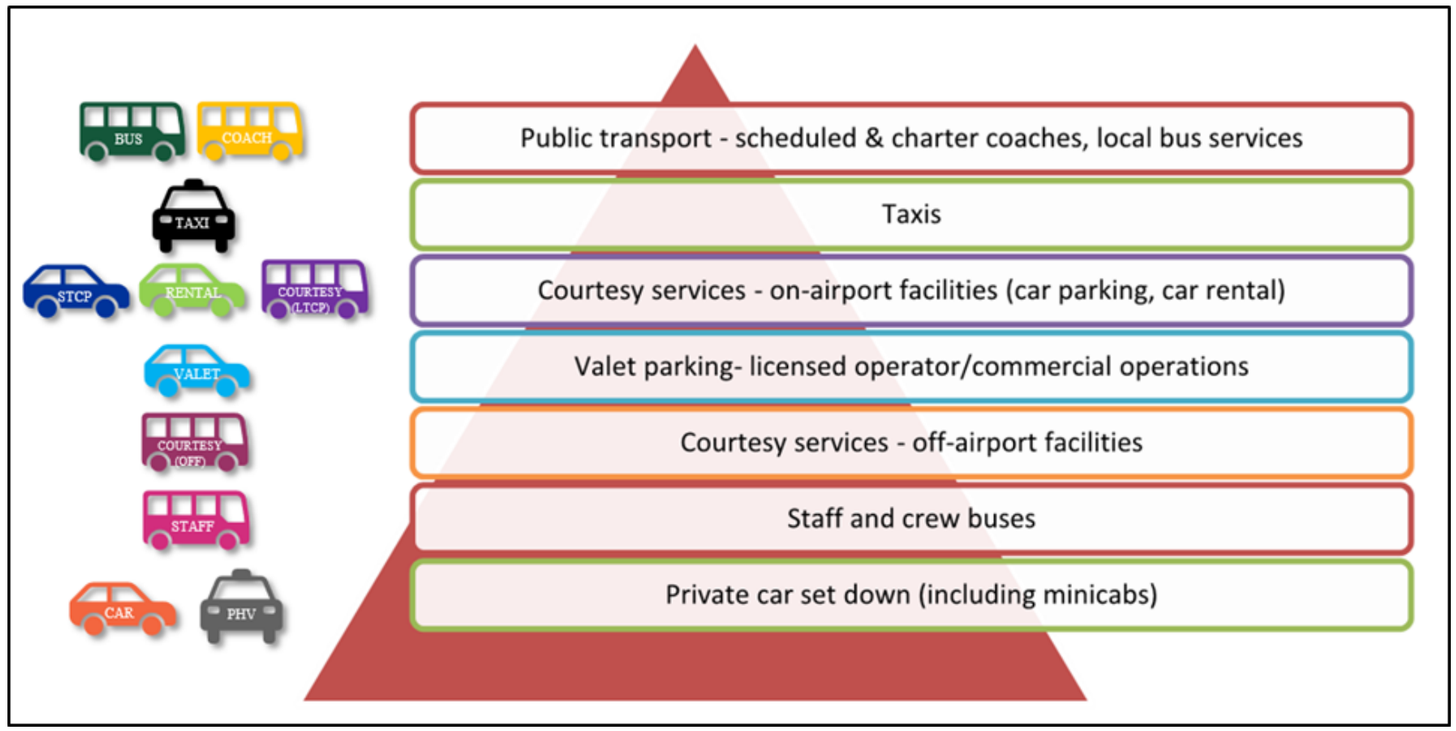
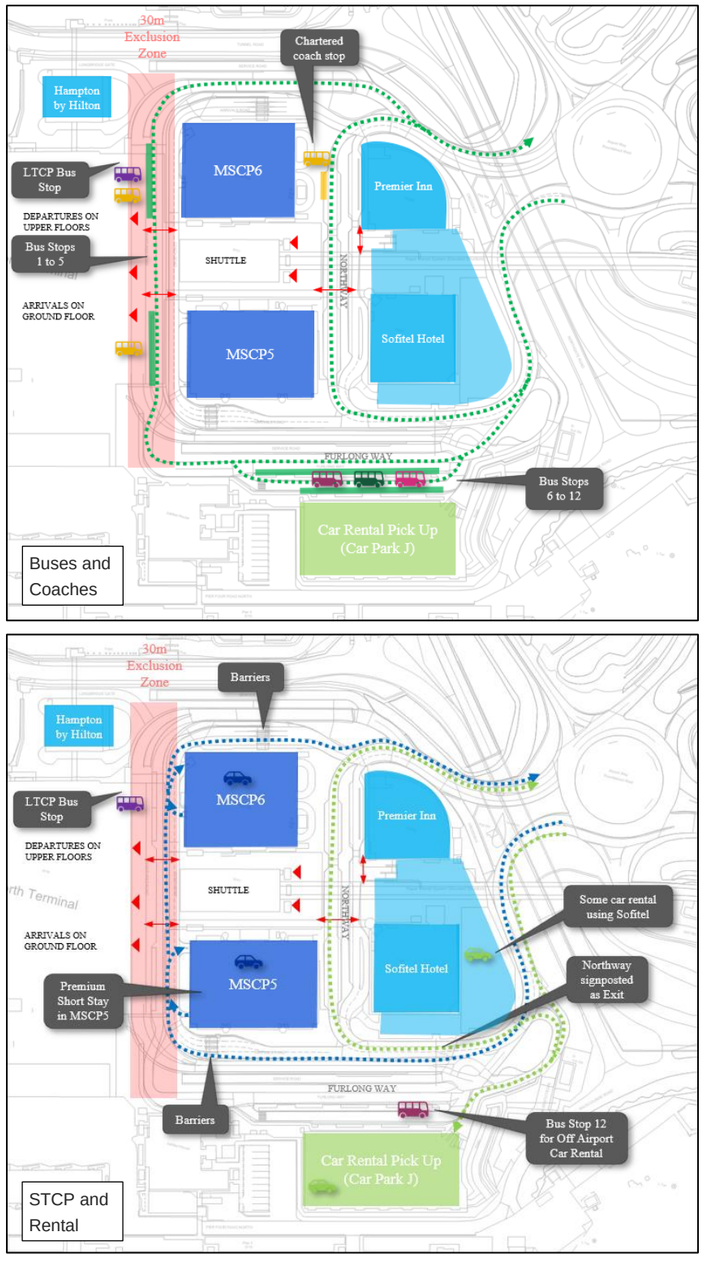


Diagram 11.4.2: Existing North Terminal Movements



Current Forecourt Operation

North Terminal

11.4.2 The North Terminal forecourt is accessed off the Airport Way / London Road roundabout. The extent of the forecourt includes two multi-storey car parks (MSCP5 and MSCP6), three hotels and an area for car rental. There is a bus station on Furlong Way to the south and there are additional bus stops by the terminal entrance. Drop-off activity currently takes place on Northway, located between the car parks and hotels. Northway is also used by the hotels.

11.4.3 In March 2021, Gatwick introduced forecourt charging at North Terminal and this is enforced by Automatic Number Plate Recognition along Northway. Car rental vehicles have been whitelisted and can use Northway without being charged. Free drop-off is provided in North Terminal long-stay for those who do not wish to pay.

11.4.4 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.

11.4.5 People picking up passengers are signed to do so from the short stay car parks as it often takes more time to collect passengers.

11.4.6 Prior to Covid-19, Northway was heavily used, and it was observed that vehicles sometimes do not pull up parallel to the kerb or double park, which holds up traffic or creates unsafe overtaking movements. Vehicles tend to use the southern end more than the northern end of the Forecourt, potentially owing to visibility issues and uncertainty of getting a parking space beyond the shuttle bridge structure.

11.4.7 The upper Forecourt has restricted access for VIP drop off only.

11.4.8 Diagram 11.4.2 illustrates the existing vehicle movements in the North Terminal forecourt.

South Terminal

11.4.9 The South Terminal forecourt is accessed off the M23 / Airport Way roundabout. The extent of the forecourt includes three multi-storey car parks MSCP1 – 3), Hilton hotel and an area for car rental. There is a separate coach park on the approach to the forecourt. Bus stops are located by the terminal entrance, drop-

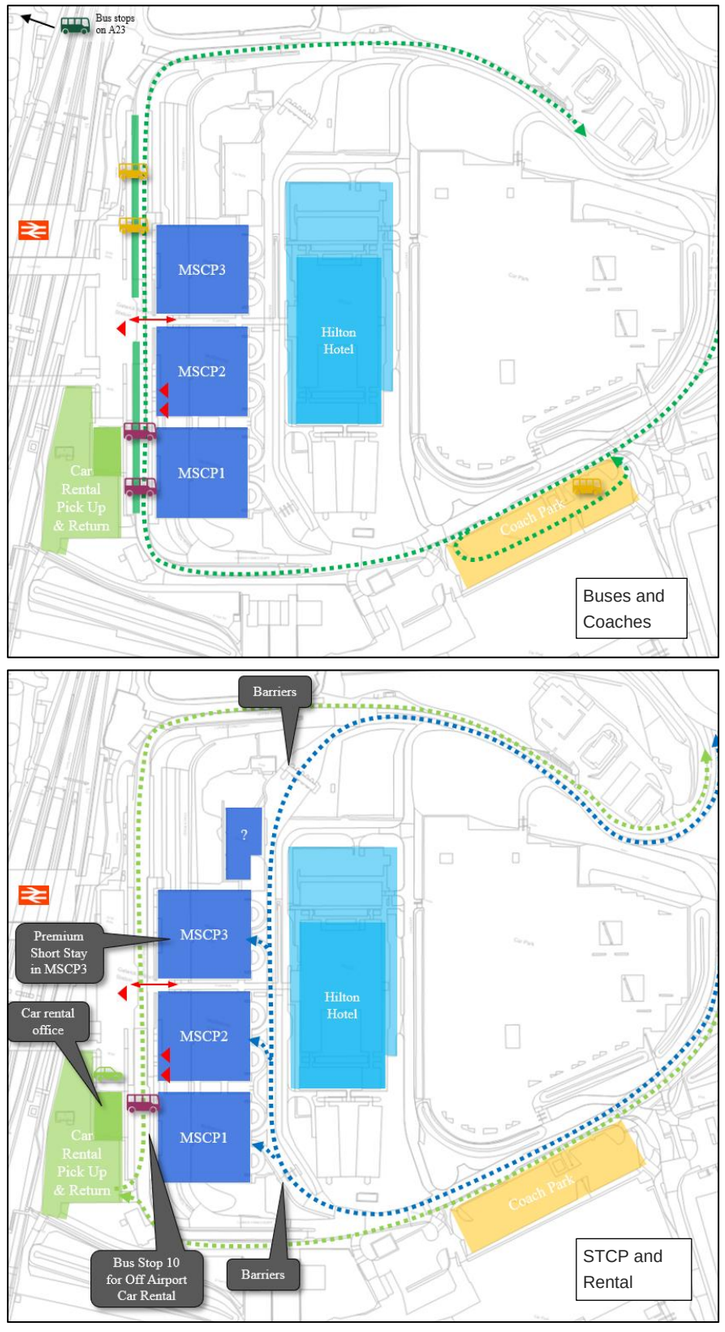
off activity takes place on Coach Road. Access to the multi-storey car parks is from Westway.

11.4.10 Forecourt charging was introduced at South Terminal in April 2021, with the same charges as at North Terminal. Prior to the Covid-19 pandemic, it was observed that queuing occurs at the primary drop-off kerb during busier times, with vehicles prioritising spaces near to the forecourt entry point. The secondary drop-off area is often underutilised which is a feature of drivers having to make a decision about which lane to be in before being able to see the kerbside occupancy. Steps have been taken to improve signage as part of the forecourt charging works. Free drop-off is provided in South Terminal long-stay for those who do not wish to pay.

11.4.11 The upper Forecourt has restricted access for long stay car park buses, approved taxis, premium valet and electric car rental only.

11.4.12 Diagram 11.4.3 illustrates the existing vehicles movements in the South Terminal forecourt.

Diagram 11.4.3: Existing South Terminal Movements



Estimated Future Forecourt Requirements

11.4.13 Initial estimates have been undertaken for drop off / pick up demand using landside passenger forecasts and existing departure mode shares with some amendments to reflect rail targets.

11.4.14 Whilst the North Terminal handles more than half of Gatwick Airport demand now and into the future, the terminal forecourt itself is around half the size of the South Terminal and accordingly static analysis indicates the potential for capacity constraints into the future both for the future baseline and the Project scenarios.

11.4.15 Analysis for the South Terminal indicates that the forecourt is sufficiently sized to accommodate future growth, subject to appropriate utilisation of the full capacity of the forecourt. This will require signage and operational management strategies to make full use of the available space.

11.4.16 The demand for the North Terminal forecourt with the northern runway in operation under the Project scenarios for 2032 and 2047 is shown in Table 11.4.1 below.

Table 11.4.1: North Terminal Forecast drop off / pick up (2032 and 2047 with Project)

	Drop Off / Pick Up Activity	Peak hourly pick up + drop off demand	No. of Spaces Required	
			2 minute dwell time	5 minute dwell time
2032 with Project	**Overall Peak**	**1,424**	**47 (315m)**	**119 (797m)**
	- Arrivals	405	13	34
	- Departures	996	33	83
	Peak Departures	1,086	36	91
2047 with Project	**Overall Peak**	**1,575**	**53 (355m)**	**131 (878m)**
	- Arrivals	464	15	39
	- Departures	1,026	34	86
	Peak Departures	1,157	39	96

Proposed Future Forecourt Strategy

North Terminal

11.4.17 The existing drop off facility on Northway is not expected to be able to accommodate the forecast level of passenger growth for drop-off and pick-up.

11.4.18 The strategy envisages moving drop-off from Northway into the short-stay Multi-Storey Car Parks (MSCPs) which is where pick-up is currently handled.

11.4.19 Accordingly, there is an opportunity to reconfigure the North Terminal forecourt to provide more capacity for drop off and also to increase priority for buses.

11.4.20 The proposed strategy at North Terminal also opens up the potential option for Northway to be repurposed as the primary bus station, which would be more visible and have more direct pedestrian access from the terminal building than Furlong Way.

11.4.21 Car rental is proposed to be relocated and consolidated to the South Terminal and a new multi-storey car park is proposed to the south of Furlong Way.

11.4.22 Diagram 11.4.4 below illustrates the proposed vehicle movements in the North Terminal forecourt.

South Terminal

11.4.23 The South Terminal forecourt generally has more capacity than the North Terminal and it is not expected that significant changes are required. Additional highway infrastructure is proposed to create the same charging regime as at North Terminal. The use of MSCP3 for pick up / drop off could also be expanded.

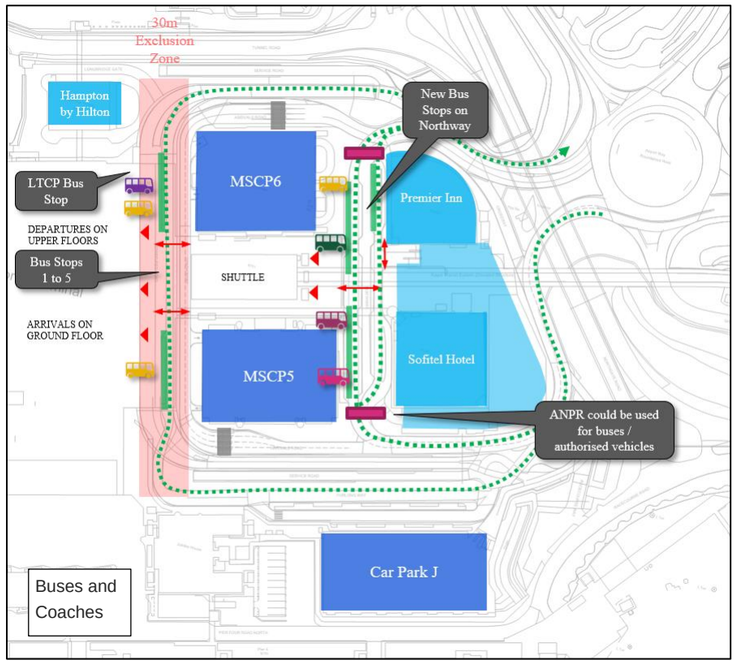
11.4.24 Diagram 11.4.5 below illustrates the proposed vehicles movements in the South Terminal forecourt.

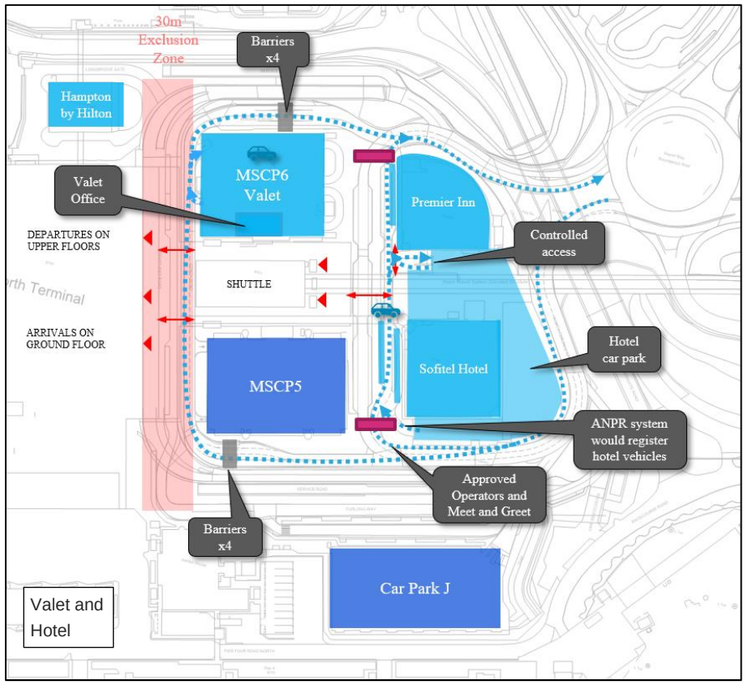
11.4.25 The demand for the South Terminal forecourt with the northern runway in operation under the Project scenarios for 2032 and 2047 is shown in Table 11.4.2.

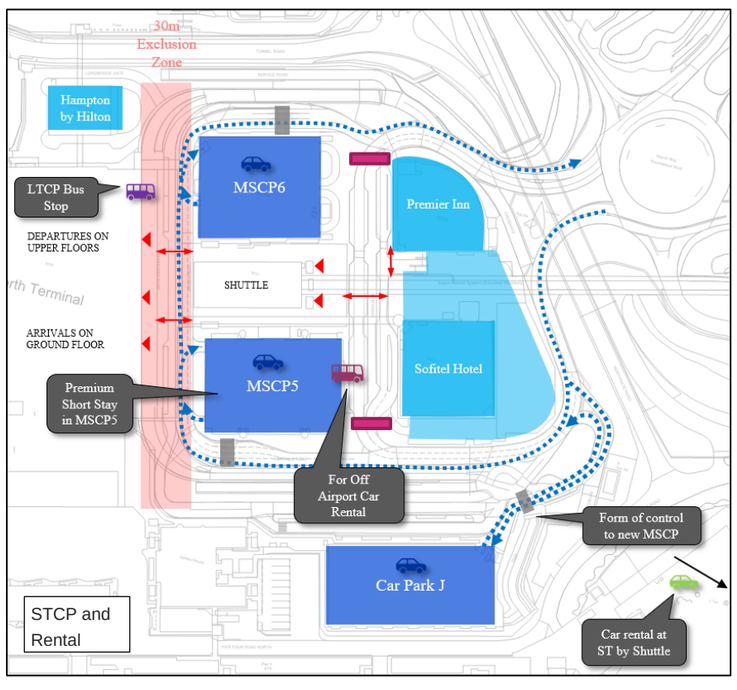
Table 11.4.2: South Terminal Forecast drop off / pick up (2032 and 2047 with Project)

	Drop Off / Pick Up Activity	Peak hourly pick up + drop off demand	No. of Spaces Required	
			2 minute dwell time	5 minute dwell time
2032 with Project	**Overall Peak**	**1,424**	**47 (315m)**	**119 (797m)**
	- Arrivals	405	13	34
	- Departures	996	33	83
	Peak Departures	1,086	36	91
2047 with Project	**Overall Peak**	**1,575**	**53 (355m)**	**131 (878m)**
	- Arrivals	464	15	39
	- Departures	1,026	34	86
	Peak Departures	1,157	39	96

Diagram 11.4.4: Proposed North Terminal Movements







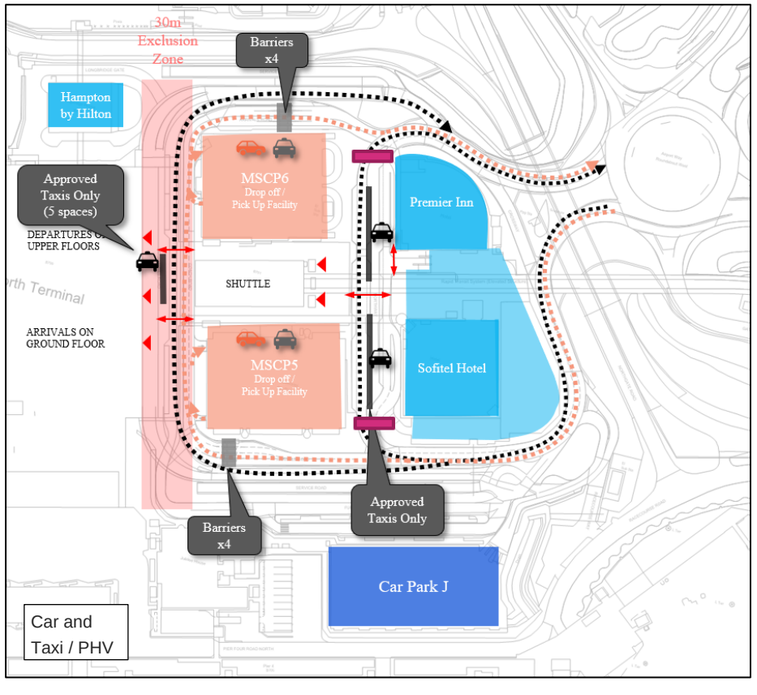
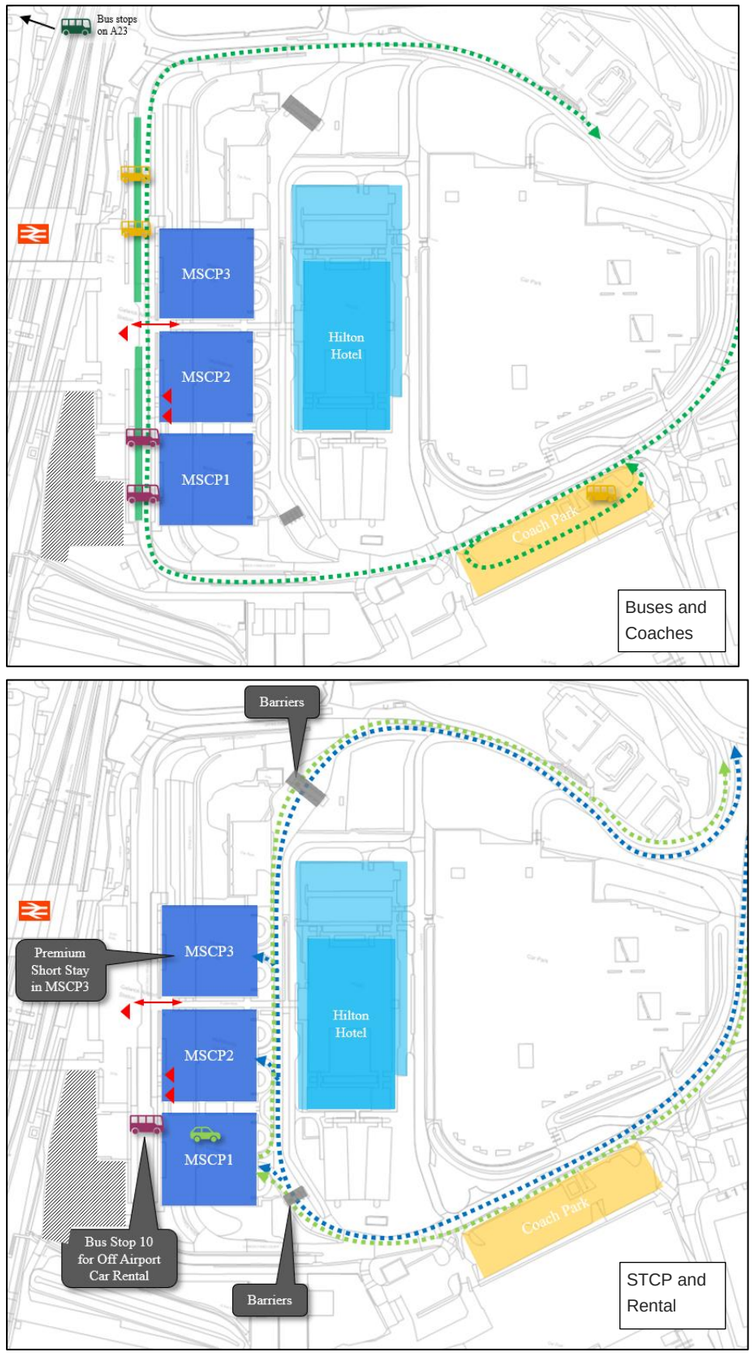
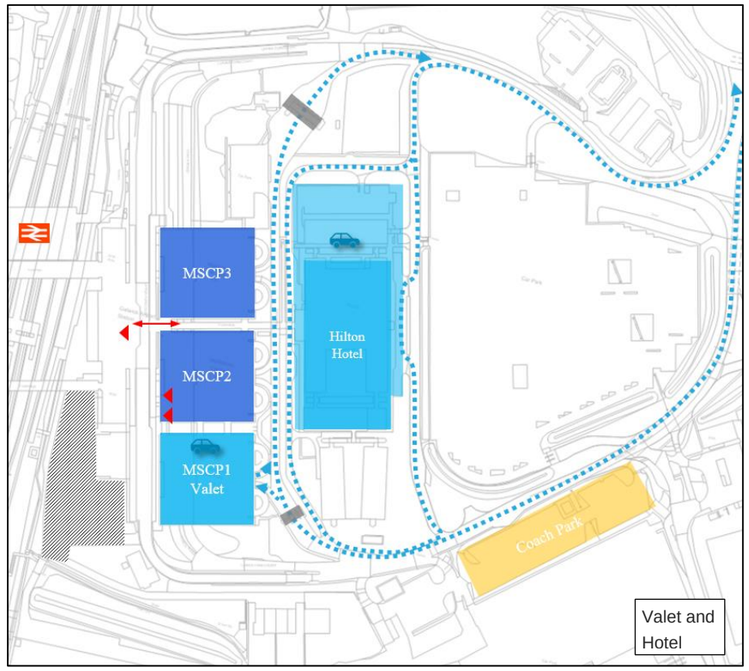
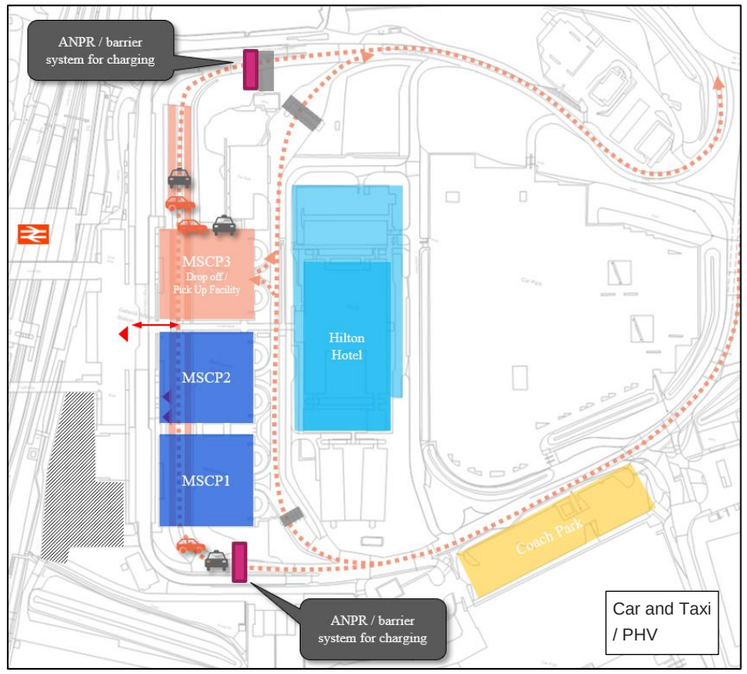


Diagram 11.4.5: Proposed South Terminal Movements







12 Active Travel: Walking and Cycling

12.1 Introduction

12.1.1 Although less than 0.5% of air passengers travel to the airport on foot or by bicycle, these modes are important for employee travel. 3% of staff at the airport regularly walk or cycle to work. These are supported under the Travel Plan with a number of initiatives for staff to consider sustainable modes as well as supporting infrastructure including cycle parking at a number of locations.

12.2 Approach and Methodology

12.2.1 The attractiveness of walking and cycling to work is influenced by several factors, including distance, safety, the quality of available routes, and the level of amenities and incentives provided on-site (such as showers and lockers).

12.2.2 The latest available employee survey data from GAL has been analysed to map trip-end patterns to better understand the home locations of employees currently using active travel. GIS methods provide the basis for understanding the catchment area for walking and cycling. A qualitative assessment of routes has been undertaken to assess opportunities for increasing walking and cycling mode shares and improving the active travel experience for employees, based on site visits and visual inspection.

12.3 Current Active Travel Patterns at Gatwick

12.3.1 As of the latest GAL survey, approximately 3% of employees walk or cycle to work (about 1% and 2% respectively) on an average day. It is estimated that the average travel time for walk-to-work trips is approximately 25 minutes, or about a 2.5 km walk at an average walking speed. The average travel time for cycling is 22 minutes, which at an average speed of 19 km/hr (or 12 mph) indicates a primary catchment of approximately 6km to 8km. This implies that walking trips are primarily generated from the immediate vicinity surrounding the airport, while cycling trips occur from locations slightly further afield.

12.3.2 Geographic analysis of the employee survey data supports these insights. Data mapped in Diagram 12.3.1 and Diagram 12.3.2 shows walking and cycling trips into Gatwick by staff, assuming 13,000 staff on site on a typical work day.

12.3.3 Approximately 115 employees walk to work at Gatwick, the vast majority of whom – over 70% – live in Horley. While some employees walk from areas in Crawley and towns in Mole Valley to the west of Gatwick, such as Charlwood, most residential areas fall outside the catchment area for walking, especially considering the limited number of entry points into the airport and the busyness of highways around the Airport.

12.3.4 Cycling has a wider catchment area. Of the 216 employees cycling to work, just under half come from Horley and surrounding communities. An additional 32% come in from Crawley, which reflects the fact that while most people find the walk from Crawley too far, it is within a 30-minute cycle of the airport. Small numbers of employees at Gatwick cycle from further areas, such as Horsham, communities in Mid-Sussex and from the north.

12.3.5 Although the overall mode shares for active travel are low when considering all airport employees, they are substantial in the areas immediately surrounding the airport and present a significant opportunity. In central Horley, more than one third of employees walk or cycle to work; in Greenfields to the northwest, this figure is over 20%, and in north-east Horley, it is 15%. In sections of Mole Valley including Hookwood and Charlwood lying just west of airport, walking and cycling mode share is almost 15%, and in areas of Crawley immediately south of Gatwick, over 8% walk and cycle.

Diagram 12.3.1: Home locations of employees walking to work

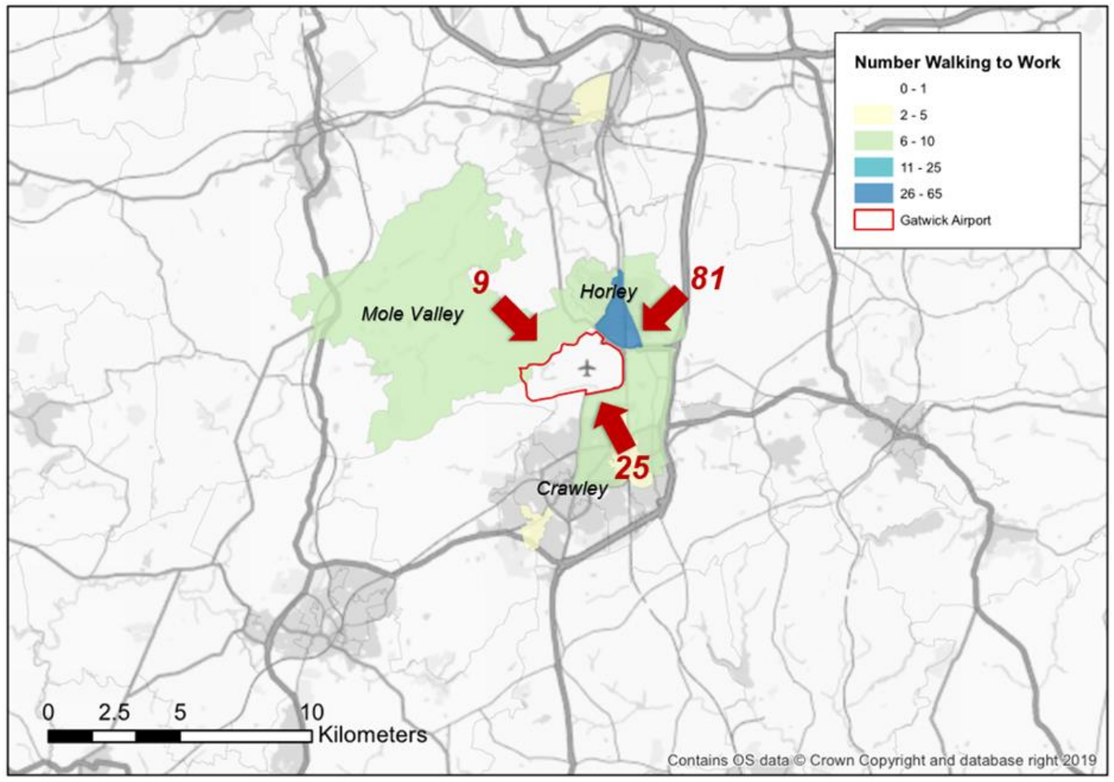
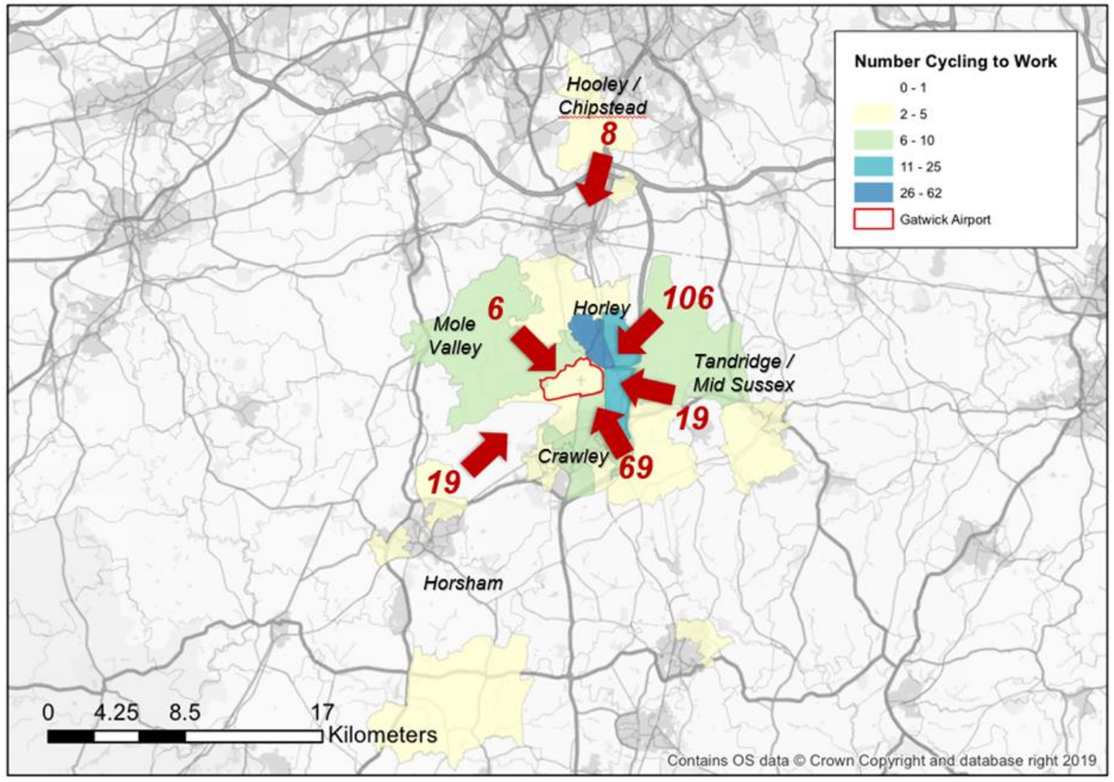


Diagram 12.3.2: Home locations of employees cycling to work



12.4 Active travel infrastructure

Key Routes

12.4.1 Gatwick is connected with its surrounding communities by a network of local streets and highways, as well as National Cycle Network Route 21 (NCN21) which runs north and south to the west of the railway line. Additionally, the areas around the airport are connected by a variety of public footpaths and bridleways, including the Sussex Border Path, mostly providing connectivity through wooded areas and farmland. The network of key links for pedestrians and cyclists is shown in Diagram 12.4.1.

12.4.2 NCN21 provides the key active travel link into the airport, with a mixture of on-road and off-road cycle facilities that result in a disjointed north/south link. A signage strategy has been implemented to direct cyclists and pedestrians along underpasses and overbridges. While some sections of the route provide adequate lighting and priority off-road space, other sections are less well signed and require users to switch to on-road facilities.

12.4.3 Diagram 12.4.2 shows a wider view of cycling routes within 5 km of the airport. This illustrates the connection to Gatwick via local routes into the centre of Crawley. It also shows the Surrey Cycleway through Horley. These routes are primarily on-street but provide connections with the north-south NCN21.

Diagram 12.4.1: Active travel network around Gatwick Airport

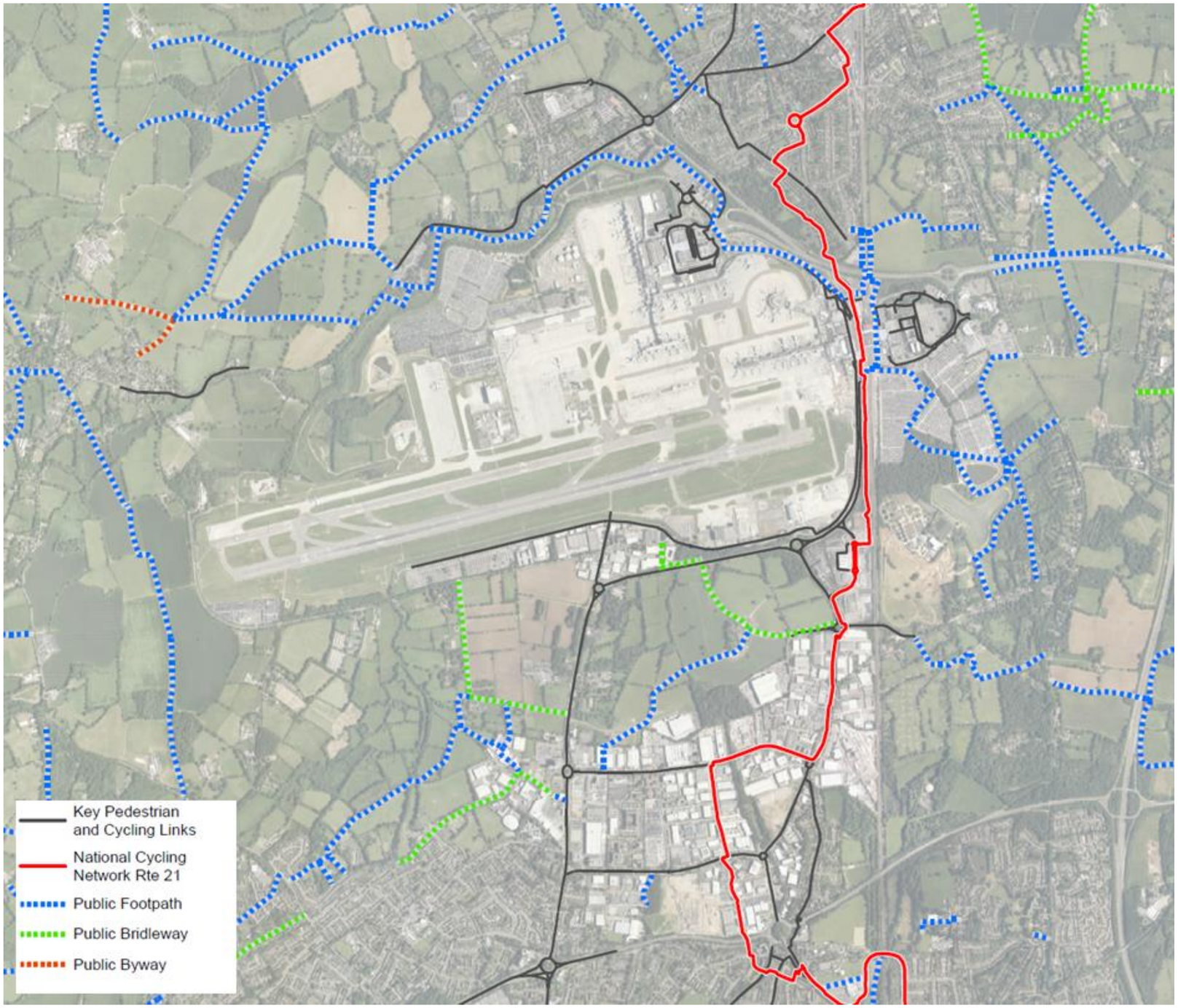
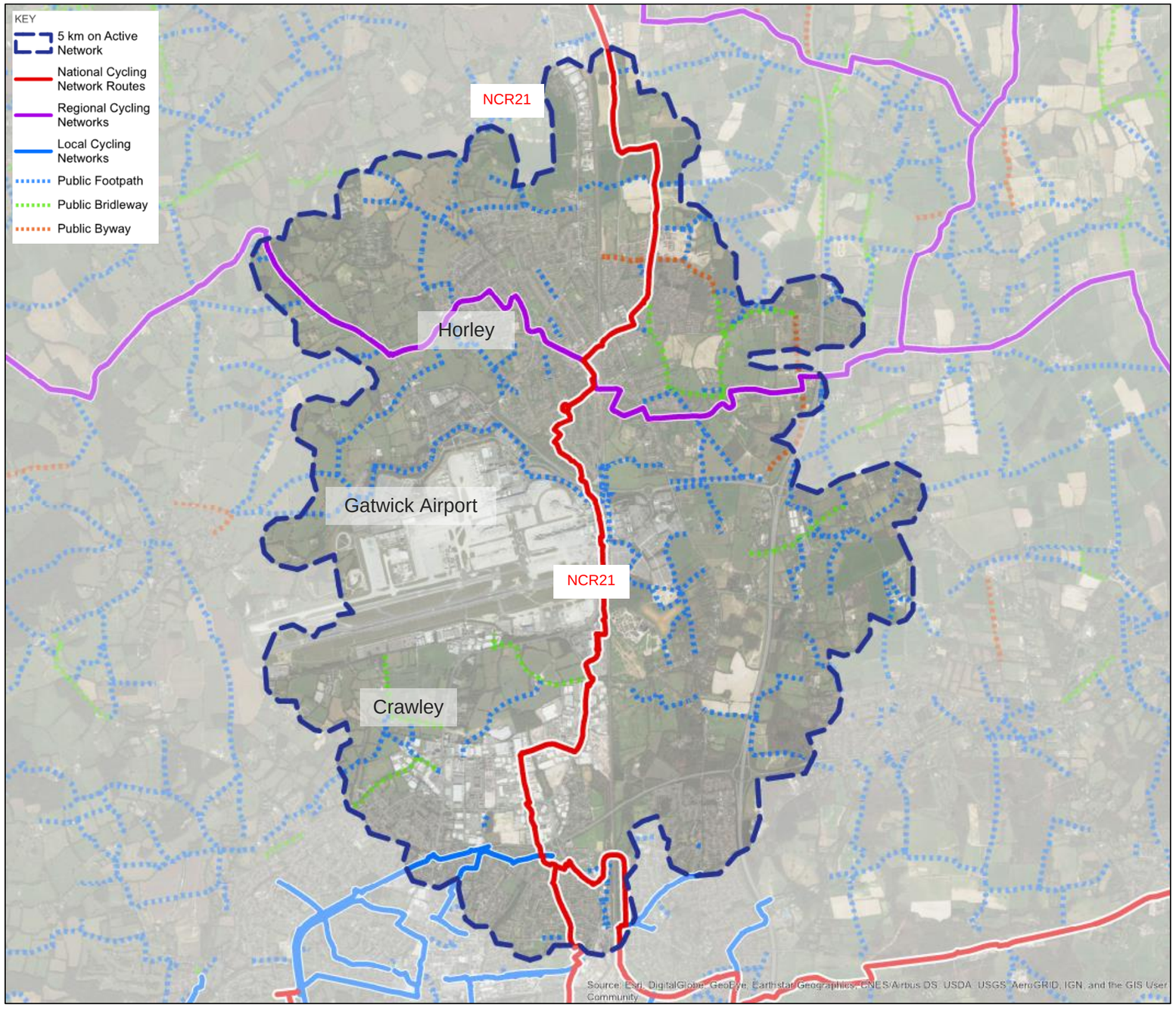


Diagram 12.4.2: Wider cycling network within 5km Gatwick Airport



Source: Open Street Map Data

Airport Access for Walking and Cycling

12.4.4 When considering the walking catchment of Horley, and the cycling catchments of Horley and Crawley, the primary access point to the airport is via the underpass beneath Airport Way by South Terminal. The routes available into this underpass are shown in Diagram 12.4.3.

12.4.5 To the north, there are two options to travel beneath Airport Way towards Horley. The route through Riverside Garden Park is paved and lit and connects directly onto Riverside Road in Horley. It is considered that this route should be promoted as the main walking and cycling route to Horley. To the south, the route directs cyclists onto NCN21 towards Crawley.

12.4.6 From Longbridge Roundabout, there is a public footpath from Povey Cross Road and runs along the A23 London Road towards the North Terminal.

12.4.7 Once on the Airport, the primary route for circulation is via the footpath along Perimeter Road North, which connects the two terminals. There are footways, dropped kerbs, dedicated crossing points within the forecourts.

Diagram 12.4.3: Access Route from NCN 21 and North to South Terminal Area

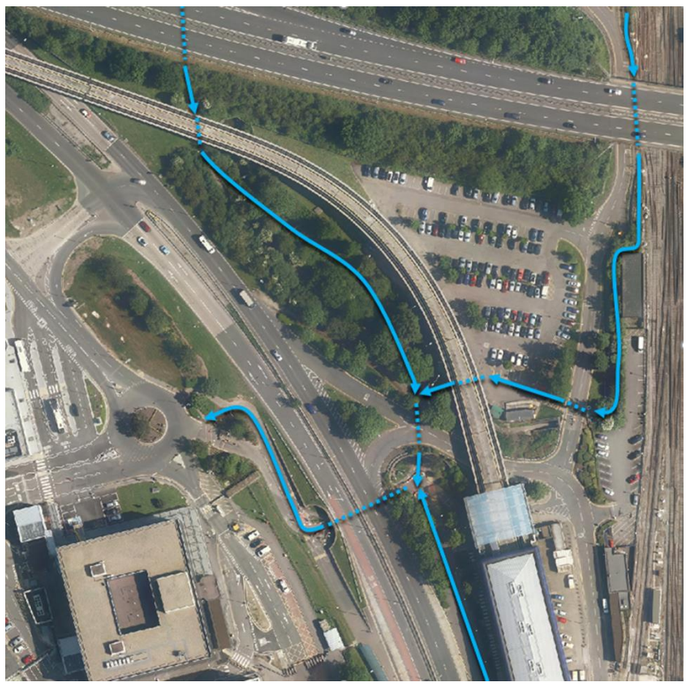
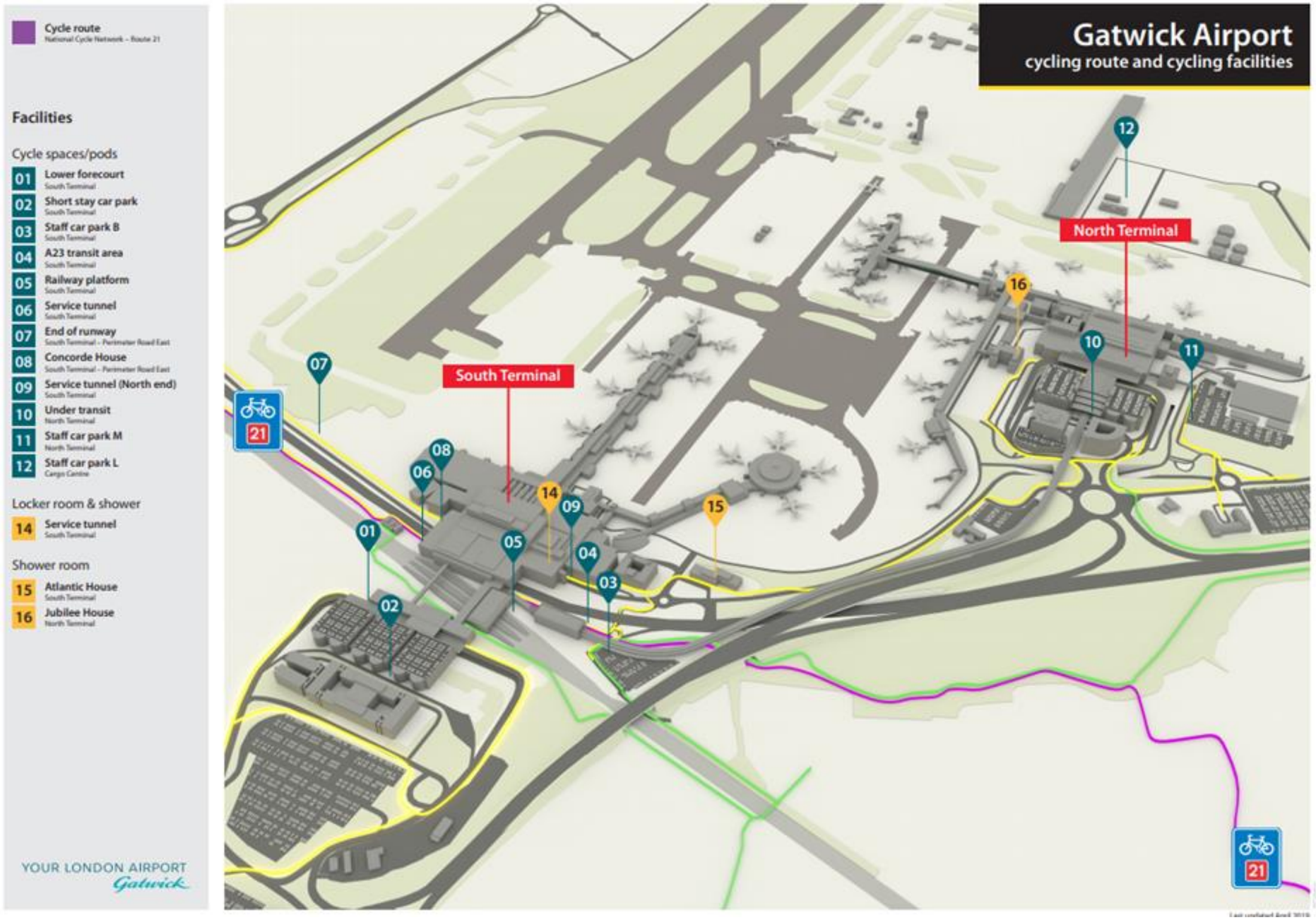


Diagram 12.4.4: Gatwick cycling facilities



Source: https://www.gatwickairport.com/globalassets/to-and-from/airport-cycle-routes-and-facilities.pdf

Bicycle Parking and Amenities

12.4.8 Currently, Gatwick provides upwards of 300 cycle parking spaces for airport staff and the general public. Cycle parking is available in several of the staff car parks, including car parks B, M and L. Much of the parking is clustered in the vicinity of the NCN 21 cycle route.

12.4.9 A locker and shower room is available to staff at the South Terminal, with another shower room at Atlantic House. Jubilee House provides the shower facility at the North Terminal.

Improvements to Walking and Cycling

12.4.10 GAL is exploring options to improve walking and cycling and have submitted proposals to improve linkages alongside the CIP improvements proposed for highways (see Section 11.2.10). The proposals include:

- new footways and pedestrian and cycle bridge over the River Mole to provide a more direct link between Longbridge Roundabout and the North Terminal;
- Provision of signal-controlled pedestrian crossings at the North Terminal roundabout;
- Shared cycle footway along Perimeter Road North; and
- Improved connection to NCN21 at the South Terminal.

12.4.11 The proposals are shown in Diagram 12.4.5 to Diagram 12.4.7.

12.4.12 There is a network of walking and cycling routes to Gatwick and it is proposed that the key routes shown in Diagram 12.4.8 should be promoted as the main access to the airport. These routes are considered to be more direct and of higher quality, suitable for staff and local residents, compared to the alternative public rights of way routes which may be more suitable for leisure users and ramblers, such as the Sussex Border Path.

12.4.13 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.

Diagram 12.4.5: Proposed Longbridge walking and cycling improvements

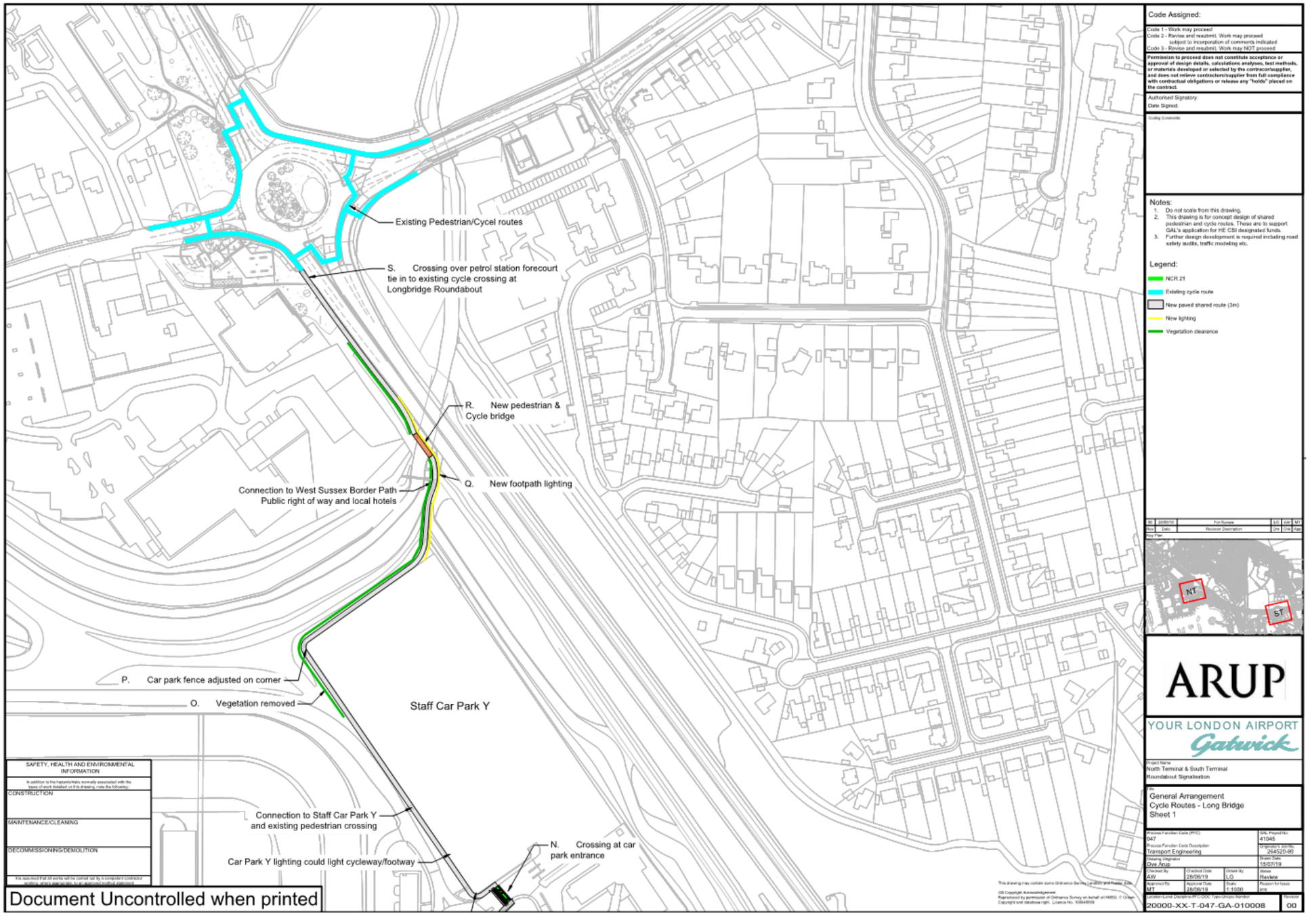


Diagram 12.4.6: Proposed North Terminal walking and cycling improvements

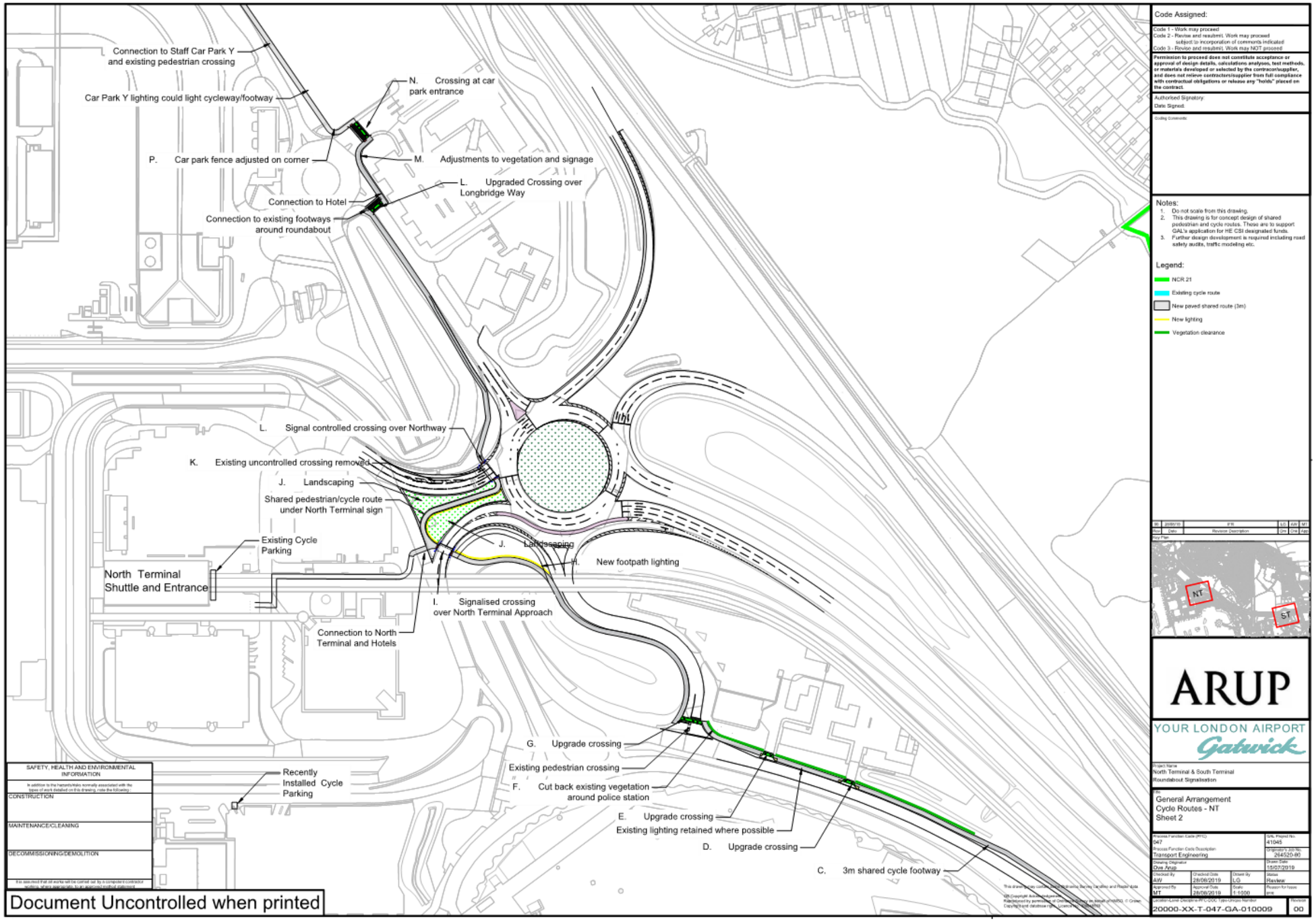


Diagram 12.4.7: Proposed South Terminal walking and cycling improvements

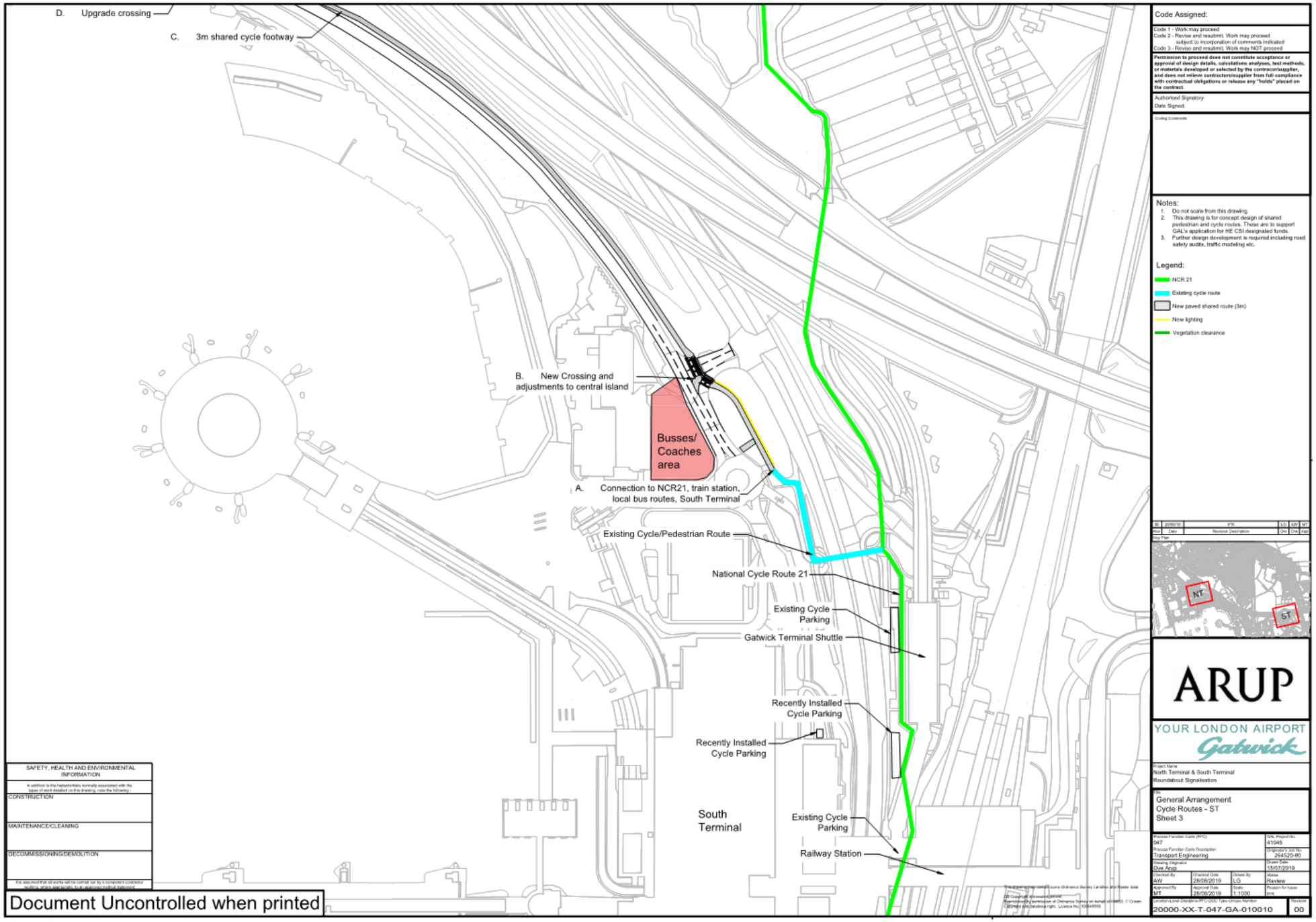
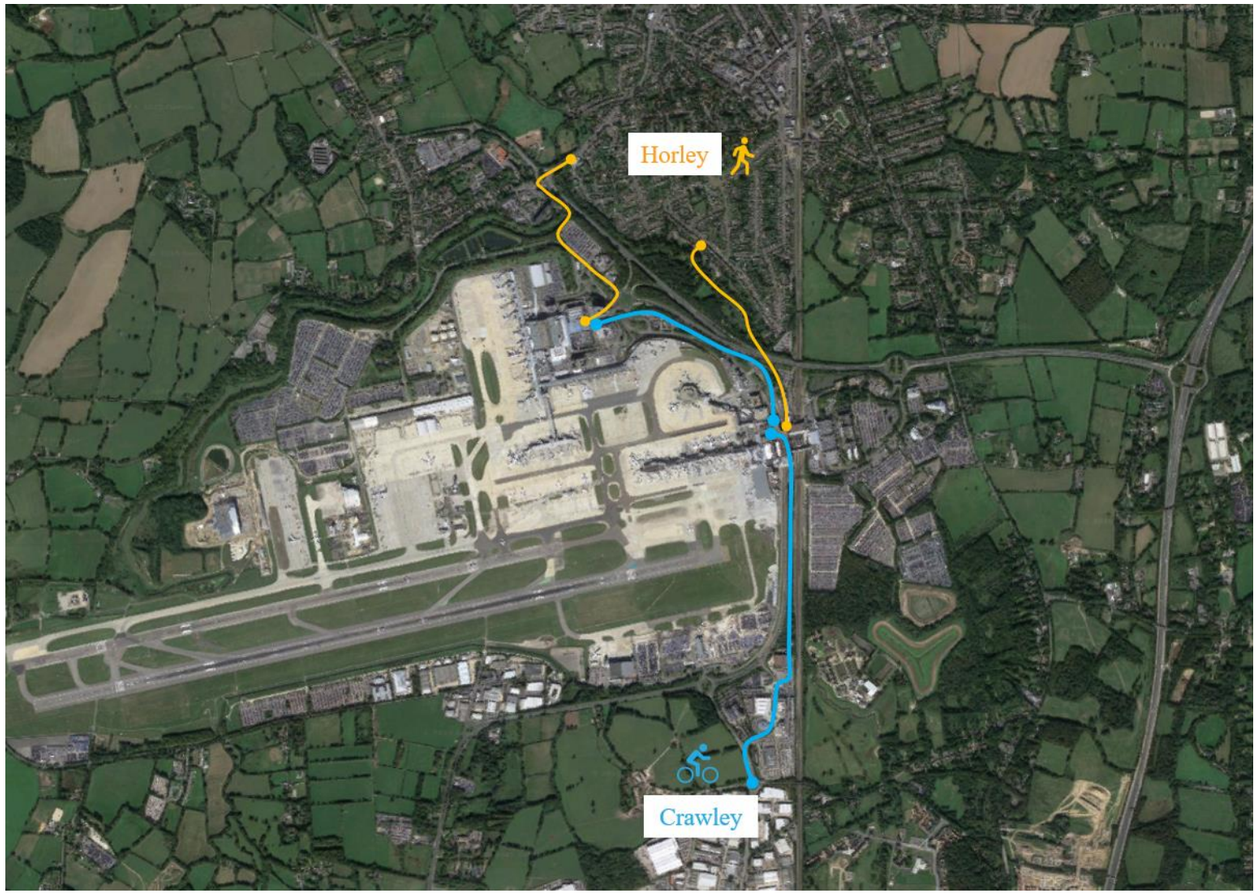


Diagram 12.4.8: Proposed promoted walking and cycling routes



12.5 Opportunities to Increase Active Travel

12.5.1 In 2016, 11% of Gatwick employees travelled 3 miles or fewer to work by car. Many of these employees who drive are within a comfortable distance to walk or cycle instead. Analysis of previous survey data for 2012 shows that 1 in 10 staff could have chosen to walk or cycle rather than drive.

12.5.2 The ASAS accompanying the DCO application will further develop Gatwick's strategic plan for walking and cycling. Strategies that will be explored and will include the following.

- **Increased and improved amenities:** Gatwick already provides locker and shower facilities to employees choosing to walk or cycle to work as well as cycle parking. Increasing the quantity or improving the quality of these facilities, as well as optimising their location, will further incentivise active travel amongst employees.
- **Improved routes on the airport:** Identifying and improving 'gaps' in infrastructure provision which may include provision of additional cycleways, footways, and improved crossings, as described above and as shown in Diagram 12.4.5 to Diagram 12.4.7. As appropriate, these routes should be separated from vehicular traffic.
- **Improved connections:** Some employees may find travelling to and from NCN21 or other key parts of the existing active travel network difficult or unsafe. Strategic investment in the wider network in Horley and Crawley could improve employee access and willingness to walk or cycle and Gatwick will work with Local Authorities to identify measures to improve these journeys.
- **Improved permeability:** As discussed above, the primary access point into the airport is the underpass under the A23 and into South Terminal. Additional, secure entrances and routes may need to be considered, such as the proposed route from Horley via Longbridge Roundabout, around car park Y and into the North Terminal and then along Perimeter Road to the South Terminal.
- **Improved wayfinding:** In some areas on the airport, it may be possible to enhance the sense of connectivity for users by improving or introducing new wayfinding signage. Gatwick has already begun this process along Perimeter Road North.

13 Railway Station and Inter-Terminal Shuttle Assessment

13.1 Gatwick Airport Railway Station

13.1.1 Opened in 1958, the current station is located adjacent to South Terminal with direct access from the terminal to the station concourse. Diagram 13.1.1 shows the original 1958 design, with the railway station integrated with the terminal and in close proximity to the forecourt area for private vehicle, taxi and bus access from the A23 – in essence, as an integrated transport hub.

13.1.2 In 2014, the station underwent a £53 million improvement programme, with opening of an additional platform (Platform 7) and improved circulation for passengers. However, despite this improvement, the current station is constrained with issues identified during the assessment work for the Airports Commission identifying the following issues.

- The current concourse is constrained in size as well as shape leading to a shortfall of capacity at peak times and associated congestion. Crowding occurs in front of ticket barriers with passengers waiting in this area to view information screens. Queuing also occurs at ticket machines and windows.
- The station has ticket barriers installed in late 2011. Barriers are not evenly used, particularly on the overbridge where a secondary set of barriers is less frequently used by passengers and is located in a separate corridor.
- There is insufficient safeguarded space, also known as run-off, at the top of escalator and stair elements.
- Some stairs do not meet the minimum Network Rail width requirement, having less than an obstacle-free width of 1.6 metres.
- On the platforms, passengers often congregate at the base of stairs and escalators. This leads to inefficient use of platforms and capacity issues when boarding and alighting trains. With 12-car trains operating through the station, it is important that passengers are spread along the full length of the train to ease boarding and alighting, both at Gatwick and the London stations.
- There are structural, mechanical and staff accommodation facilities located on platforms which reduce platform area and visibility.

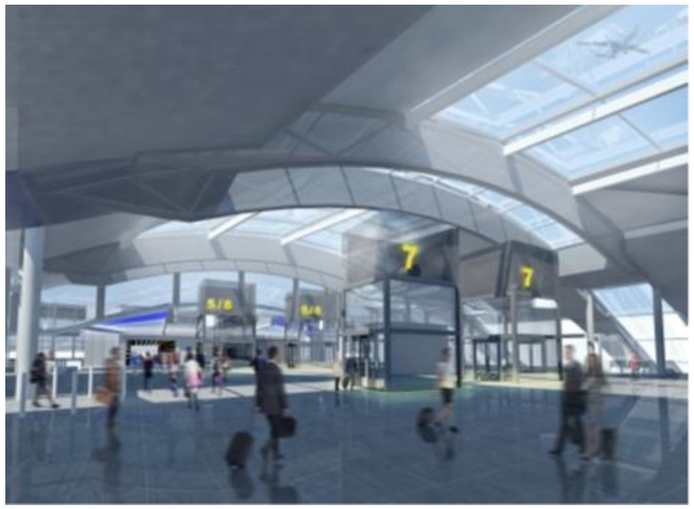
Diagram 13.1.1: Gatwick Station in 1958

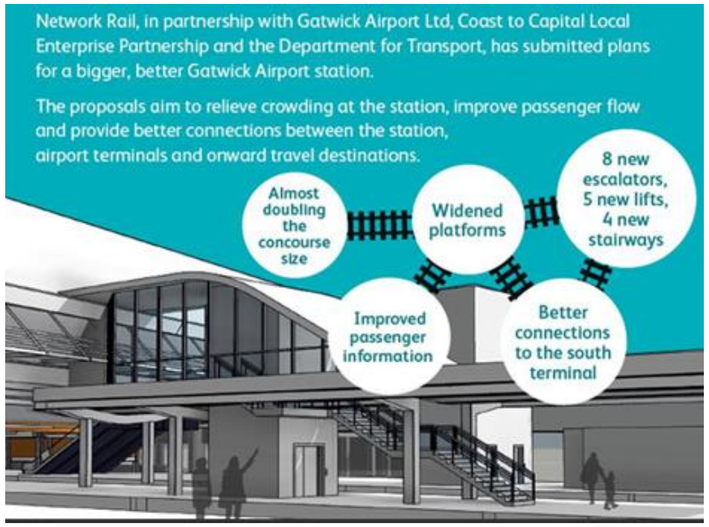
13.1.3 These constraints have been reaffirmed by consultation responses on Gatwick's 2018 Master Plan, which include 13 stakeholder comments on the need to improve the railway station, eg the Sussex Community Rail Partnership Limited which stated that *'upgrading work to improve the station is essential to reduce current ticket hall and platform congestion'*.

13.1.4 As such, Gatwick has been working with the Department for Transport, Network Rail and other stakeholders to develop an appropriate design to improve passenger experience in the station, as part of the Station Project.

13.1.5 In July 2019, the Department for Transport announced £150 million investment in the Station Project, 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.

Diagram 13.1.2: Station Project Enhancements





13.1.6 The Station Project is currently under construction, despite the Covid pandemic, and should be complete by 2022. It is therefore the reference design for all future assessment work on the station.

13.2 Inter-Terminal Shuttle

13.2.1 Located in close proximity to the railway station is the Inter-Terminal Shuttle which takes passengers arriving by rail to or from the North Terminal. The shuttle operates as two trains of three Innovia APM 100 cars as manufactured by Bombardier. These two trains each operate on their own track, with a peak headway of 6 minutes, which means that passengers never wait more than 3 minutes for a train at peak times.

Diagram 13.2.1: Gatwick Inter-Terminal Shuttle System

13.2.2 There is a shuttle station at each end of the system, with a single central boarding platform between the two tracks and two alighting platforms, on the outside of each track. This means that boarding and alighting flows can be kept separate which reduces congestion and dwell times.

13.2.3 The system was upgraded in 2010 and has an average design life of 25 years, meaning another upgrade is likely to be required prior to the end of the assessment period. Modelling reported here has assumed the current shuttle configuration and service frequency, though future improvements have been identified (see Section 13.5.21).

13.3 Legion Model

Model History

13.3.1 Network Rail provided GAL with the 2036 Legion model developed as part of the Gatwick Station Project and used to demonstrate the performance of the station under AM and PM peak demand conditions. The model was provided on 19 March 2019.

Model Extents

13.3.2 The model of station as provided by Network Rail includes the existing concourse, the new concourse and all seven platforms, as shown in Diagram 13.3.1.

13.3.3 The model provided by Network Rail has been built on the following assumptions.

- An ungated station solution, ie with no gateline, which is the preferred operation at Gatwick Airport into the future (though the station project design does allow for the inclusion of ticket gates).
- The existing concourse is primarily the entry concourse to the station from the airport, with the main Customer Information Screens and ticket retail accommodated in the reconfigured concourse.
- The concourse provides the main exit route from all platforms to both the Airport and the South Terminal forecourt area and interchange with bus and coach services. It also provides a new entry route to the station from the South Terminal forecourt, which is new and which will benefit commuters who park at Gatwick Airport and use the station for journeys into London and elsewhere on the rail network. Customer Information Screens will also be provided on this concourse.
- The station will continue to operate broadly as per current passenger flows, with boarding passengers encouraged to wait on the platforms as far as possible (to safeguard train dwell times).
- The passenger composition (the number of passengers with luggage and restricted mobility) passing through the station is based on NR's passenger survey carried out at the station in May 2014.

13.3.4 Arup has taken Network Rail's validated and calibrated Legion model and extended it to include the inter-terminal shuttle operation. Diagram 13.3.2 shows the South Terminal station but the model now also includes the North Terminal station which is configured in the same way, with a central boarding platform and alighting platforms on the outside.

13.3.5 The shuttle operation has been calibrated to video and CCTV footage, in particular for loading of boarding platforms and maximum loading of the shuttle itself

Diagram 13.3.1: Legion Model of Gatwick Airport Rail Station

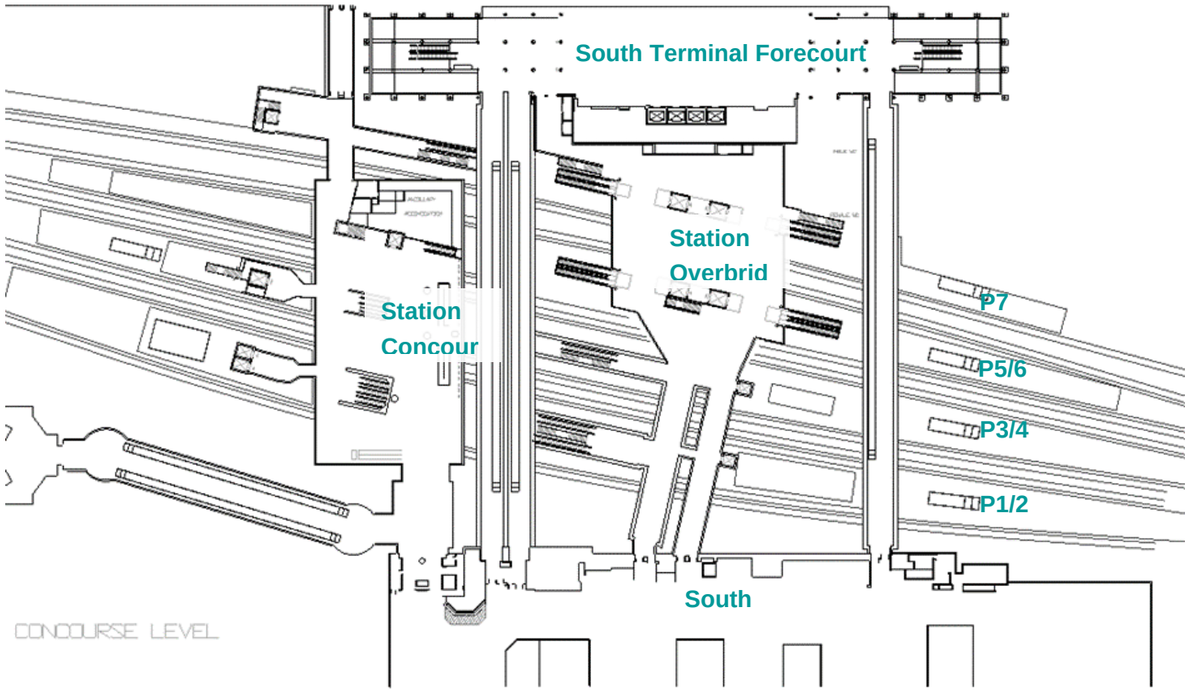
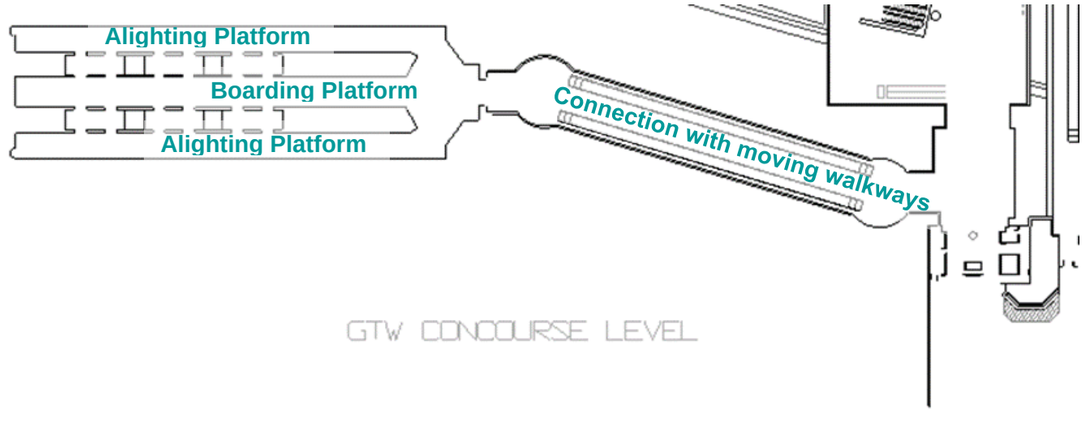


Diagram 13.3.2: Legion Model of Inter-Terminal Shuttle Extension (South Terminal)



Demand

13.3.6 Testing of Gatwick Airport Station and the shuttle has been undertaken for four future demand scenarios; future baseline 2032 and 2047, as well as for 2032 and 2047 with the Project. Both the AM and PM 2-hour peak have been modelled.

13.3.7 Demand into and out of the station taken from the strategic rail model for the specific peak hours modelled.

13.3.8 Entity groups include passengers arriving at or departing from Gatwick Airport and using rail, passengers using the South Terminal Forecourt and commuters using Gatwick Airport railway station. Interchange movements are also included and have been calculated as 7.3% of the total station entry and exit journeys, based on the 2015/16 Office of Road and Rail (ORR) Station Footfall figures. Table 13.3.1 shows the total modelled demand across a 2-hour AM and PM peak in line with the strategic modelling, as compared to demand in the 2036 Network Rail model. These demand numbers include rail passengers as well as people using South Terminal forecourt and parts of the South Terminal.

13.3.9 Demand in the 2032 and 2047 models as compared to the 2036 Network Rail model is provided in Table 13.3.1 It can be seen that demand in the 2032 and 2047 models with Project is higher than the previous 2036 demand test used for the Station Project, even by 2032. The PM peak has therefore been assessed in the EIA and PTAR.

Passenger Types and Luggage

13.3.10 The passenger composition is based on Network Rail's passenger survey carried out in May 2014, and divides passengers across three types: no luggage, medium luggage and large luggage.

Train Timetable

13.3.11 Diagram 13.3.3 and Diagram 13.3.4 show the frequency of train services per platform in the AM and PM peak period. Platforms 4 and 7 have the most train arrivals and departures.

Station Operation

13.3.12 Vertical circulation in Gatwick Airport railway station and replicated in the 2036 Legion model provided by Network Rail is shown in Diagram 13.3.5. There are nine up and eight down escalators, eight bi-directional stairs and one one-way stair to/from the platforms.

Table 13.3.1: Demand modelled across 2-hour AM and PM peak

Total Demand	Future Baseline 2032	Project 2032	NR 2036	Future Baseline 2047	Project 2047
AM 2 hours (0700-0900)	15,851	18,891	21,937	17,673	21,557
PM 2 hours (1600-1800)	19,539	23,296	22,353	22,025	25,728

Table 13.3.2: Passenger types used in model

Type	No Luggage	Medium Luggage	Large Luggage
Alighters	54%	36%	10%
Boarders	51%	36%	13%
Meeters	100%	0%	0%
Interchange	90%	10%	0%
Staff	100%	0%	0%

Diagram 13.3.3: AM train departures per platform

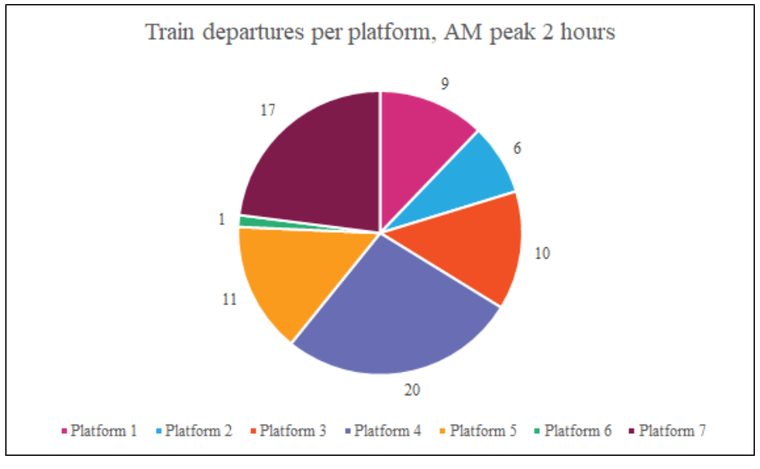


Diagram 13.3.4: PM train departures per platform

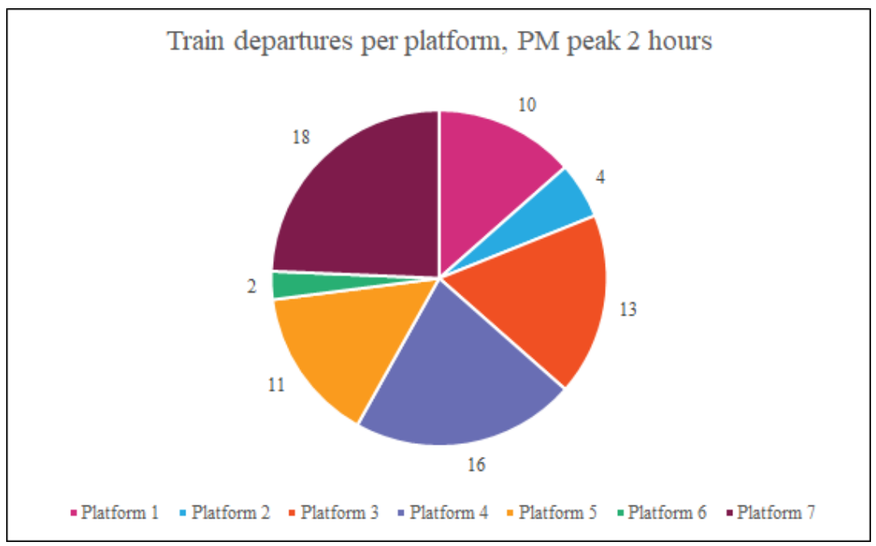
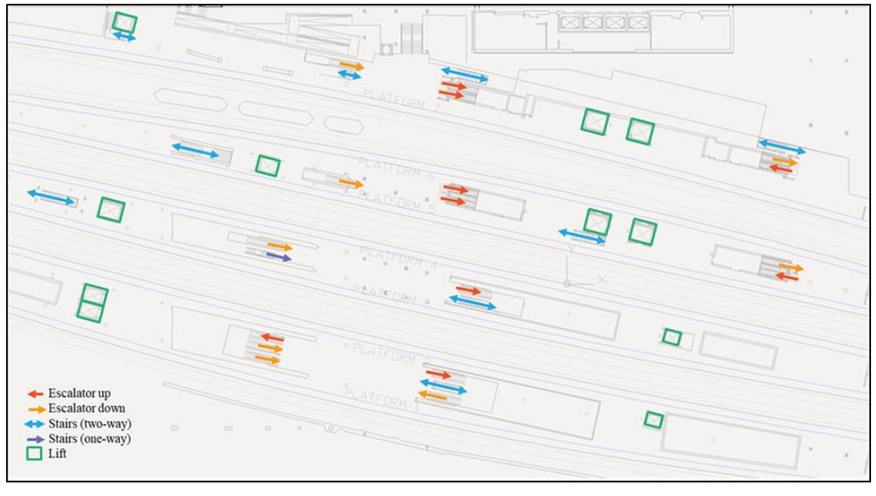


Diagram 13.3.5: Platform Vertical Circulation



13.3.13 Assumptions related to vertical circulation elements include the following.

- Escalator capacity flow rate at 54 passengers per minute.
- Lift capacity at 35% of the plated capacity.
- Lift cycle times of 110 seconds per cycle.

13.3.14 The above flow rates were confirmed during a site survey on 31 July 2019. Train arrivals on all platforms between 16:00 and

17:30 were observed and escalator flow rates recorded. For escalators with a continuous demand over 1 minute, flow rates observed were between 52 and 57 people per minute.

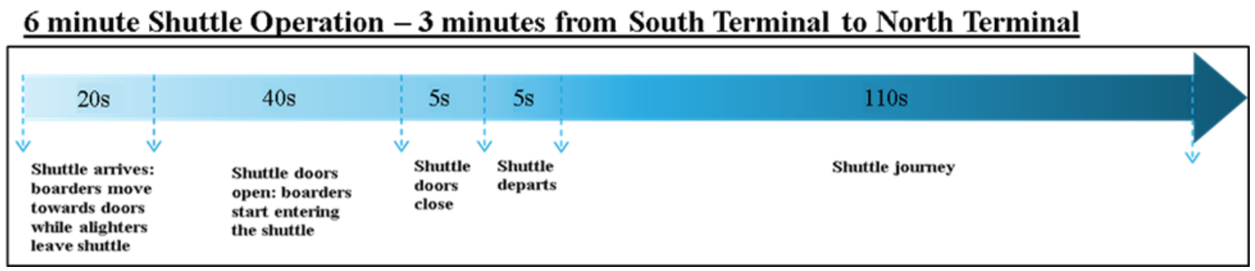
13.3.15 The following maximum flow rates for stairs have been used from Network Rail's Station Capacity Planning Guidance (Network Rail, 2016).

- Stairs (one-way): 35 passengers/minute/metre.
- Stairway (two-way): 28 passengers/minute/metre.

Shuttle Operation

13.3.16 The shuttle connections between the North and South Terminals have been added to the Network Rail model. Diagram 13.3.6 shows the pattern of service to achieve a 6-minute shuttle headway. Timings are based on data received from GAL and a site survey.

Diagram 13.3.6: 6-minute shuttle operation times



13.4 Assessment Criteria

Levels of Service

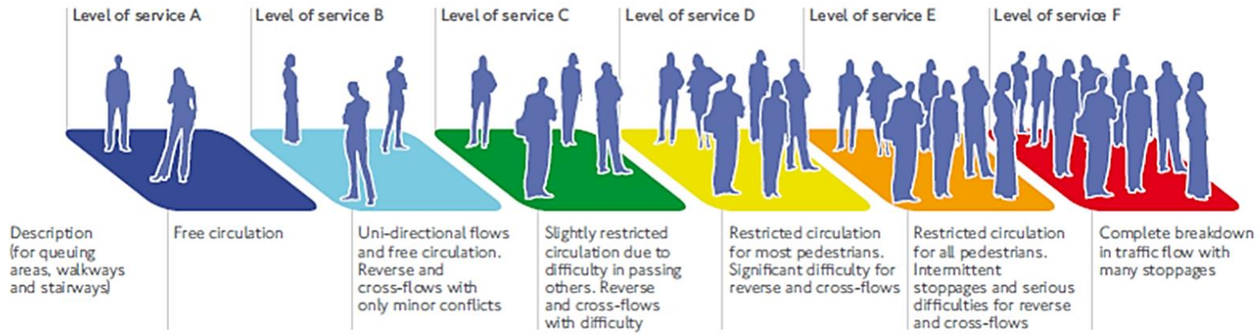
13.4.1 The analysis has been undertaken against Network Rail's Station Capacity Planning Guidance (November 2016). The assessment of crowding is based on Fruin Level of Service (LoS) criteria.

13.4.2 In the 1970s and 1980s, John Fruin pioneered pedestrian planning analysis and the development of LoS criteria for pedestrians – previously Level of Service metrics had only been used to describe vehicular traffic flow by highways agencies (Fruin, 1987).

13.4.3 LoS is used to describe pedestrian movement, relating density of pedestrians and flow rates for walkways and circulation areas, stairs and in queues, with LoS A representing free flow and LoS F a complete breakdown in circulation.

13.4.4 LoS C is typically used for designing transport interchanges as it provides a balance between congestion, design and operations. Network Rail therefore typically recommends LoS C or better for the design of new stations and station enhancements.

Diagram 13.4.1: Levels of Service ranges



13.4.5 It is important to note that Fruin differentiates between LoS for walkways – areas where a pedestrian would expect free movement – and queues/waiting areas – where pedestrians tolerate higher densities and still consider their environment comfortable. The difference between flow rates and area requirements for walkways and queues at each LoS range are very different, as shown in Table 13.4.1.

13.4.6 Platforms are considered as a queuing/waiting environment and Network Rail guidance states that these should perform at LoS B/C or 0.93 m^2 per person. Similarly, concourse waiting areas should perform at LoS B for queuing/waiting behaviour at 1.0 m^2 per person.

13.4.7 This is an important consideration when reviewing any Legion outputs shown in this report. The typical approach is to show a Fruin walkways map such that the overall station performance can be considered. This mapping is likely showing areas of queuing as LoS D or E for walkways – ie less than 1.0 m^2 per person. However, if these locations are where a queue should occur, such as at the top or bottom of an escalator, at gatelines or for boarding on a platform, the queuing density is more appropriate.

Table 13.4.1: Fruin Level of Service criteria for Walkways and Queues

Level of Service	Fruin Walkways		Fruin Queues
	Flow (people per m of circulation width)	Area per Person (m2)	Area per Person (m2)
A	23 or less	3.3 or more	1.2 or more
B	23 to 33	2.3 to 3.3	0.9 to 1.2
C	33 to 49	1.4 to 2.3	0.7 to 0.9
D	49 to 66	0.9 to 1.4	0.3 to 0.7
E	66 to 82	0.5 to 0.9	0.2 to 0.3
F	82 and over	0.5 or less	0.2 or less

13.5 Comparison of Baseline and Project

2032 Future Baseline

13.5.1 Diagram 13.5.1 and Diagram 13.5.2 show LoS for the peak 15 minutes in the 2032 future baseline for the concourse and for the platform level in terms of Fruin Walkways.

13.5.2 From Diagram 13.5.1, it can be seen that the station concourse level performs at an appropriate Level of Service in the 2032 future baseline, with predominantly LoS A to LoS C shown by modelling. Higher densities are shown on escalator elements which reflects people bunching on escalator treads which is typical and expected.

13.5.3 From Diagram 13.5.2, it can be seen that platforms performs at an appropriate Level of Service in the 2032 future baseline, with predominantly LoS C or better shown by the modelling. Higher densities are shown on some narrower sections of platform as well as at the base of escalator elements, in particular on Platforms 3 and 7, which reflects that these are waiting or queuing environments. As described in section 13.4, these higher densities are typical and expected at such locations.

Diagram 13.5.1: Concourse LoS, Fruin Walkways – 2032 Future Baseline PM Peak (17:45 – 18:00)

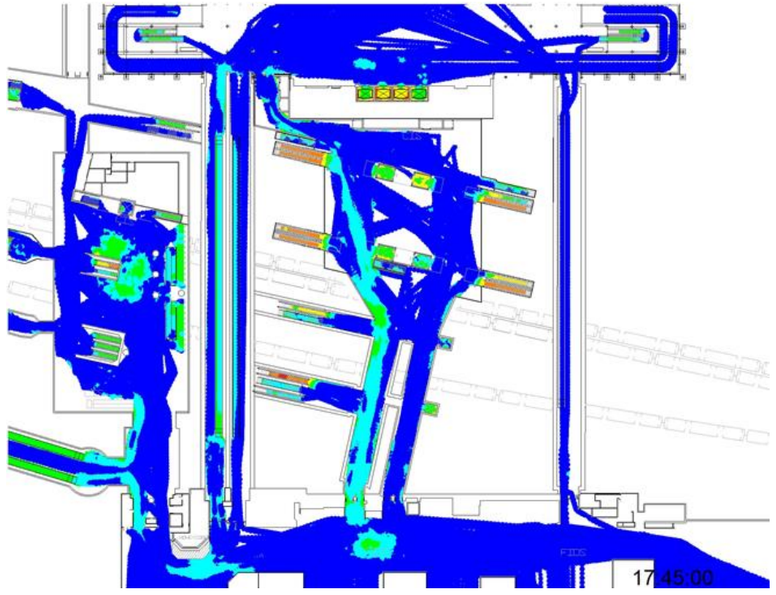
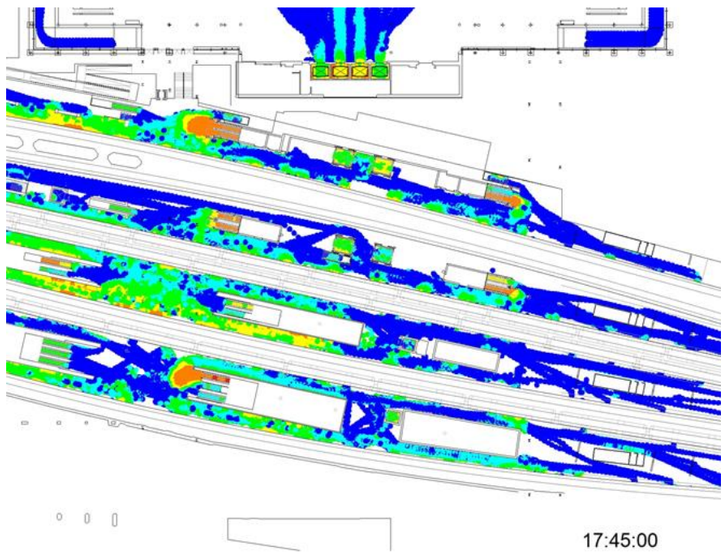


Diagram 13.5.2: Platform LoS, Fruin Walkways – 2032 Future Baseline PM Peak (17:45 – 18:00)



2047 Future Baseline

13.5.4 Diagram 13.5.3 and Diagram 13.5.4 show LoS for the peak 15 minutes in the 2047 future baseline for the concourse and for the platform level in terms of Fruin Walkways.

13.5.5 From Diagram 13.5.3, it can be seen that the station concourse level performs at a comparable Level of Service to the 2032 future baseline, with predominantly LoS A to LoS C shown by modelling.

13.5.6 From Diagram 13.5.4, it can be seen that platforms also perform at a comparable Level of Service to the 2032 Future Baseline, with predominantly LoS C or better shown by the modelling. However, higher densities are shown on some narrower sections of platform, most notably on Platforms 3 and 7, as well as at the base of escalator elements, in particular on Platforms 2 and 7. However, these are queuing or platform waiting environments, where people expect higher densities as described in 13.4.

Diagram 13.5.3: Concourse LoS, Fruin Walkways – 2047 Future Baseline PM Peak (17:45 – 18:00)

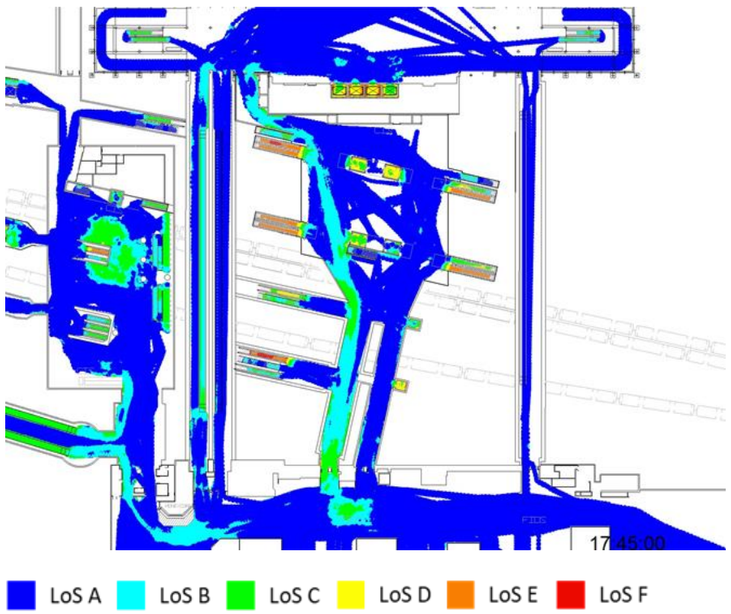
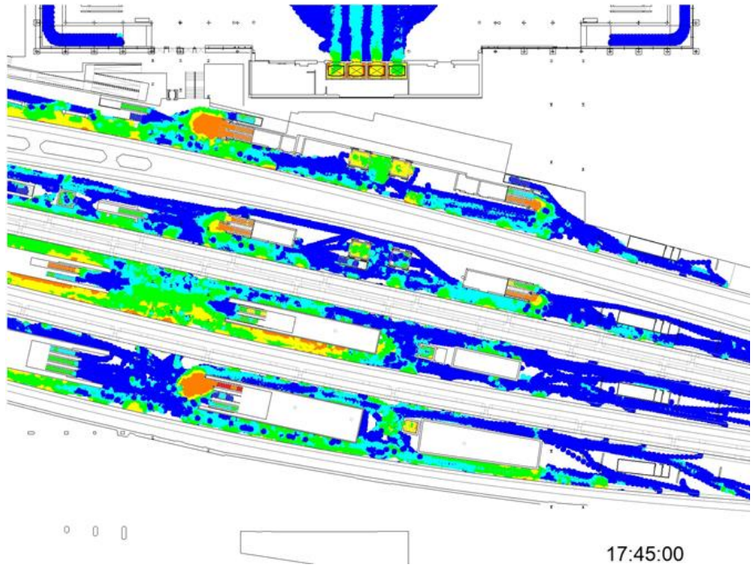


Diagram 13.5.4: Platform LoS, Fruin Walkways – 2047 Future Baseline PM Peak (17:45 – 18:00)



2032 with Project

13.5.7 Diagram 13.5.5 and Diagram 13.5.6 show LoS for the peak 15 minutes in 2032 with Project for the concourse and for the platform level in terms of Fruin Walkways.

13.5.8 From Diagram 13.5.5, it can be seen that the station concourse level performs at a comparable Level of Service to the 2032 future baseline, with predominantly LoS A to LoS C shown by modelling.

13.5.9 From Diagram 13.5.6, it can be seen that platforms also perform at a comparable Level of Service to the 2032 future baseline, with predominantly LoS C or better shown by the modelling. However, higher densities are shown on some narrower sections of platform, most notably on Platforms 1, 3 and 7, as well as at the base of escalator elements, in particular on Platforms 2 and 7. However, these are queuing or platform waiting environments, where people tolerate higher densities as described in section 13.4.

13.5.10 Level of Service for platforms based on Fruin Queuing are presented in paragraph 13.5.20 onwards.

Diagram 13.5.5: Concourse LoS, Fruin Walkways – 2032 with Project PM Peak (17:45 – 18:00)

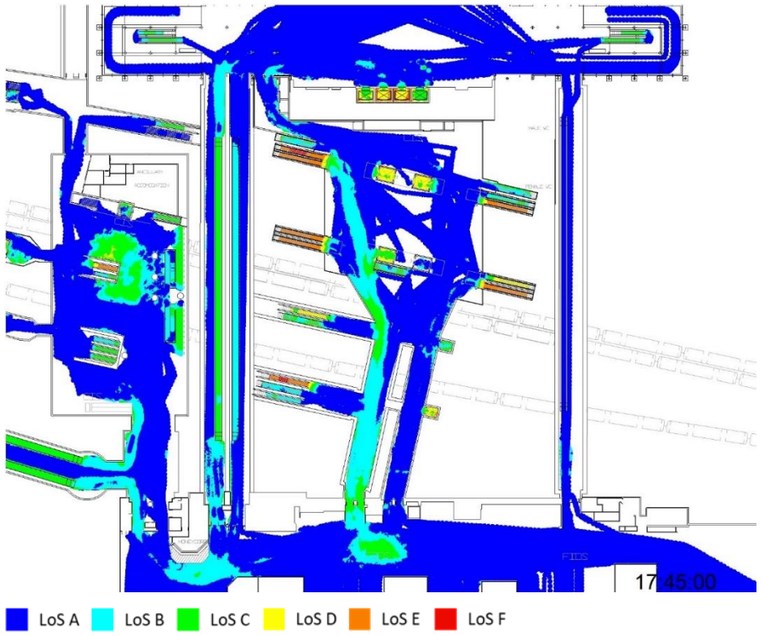


Diagram 13.5.6: Platform LoS, Fruin Walkways – 2032 with Project PM Peak (17:45 – 18:00)

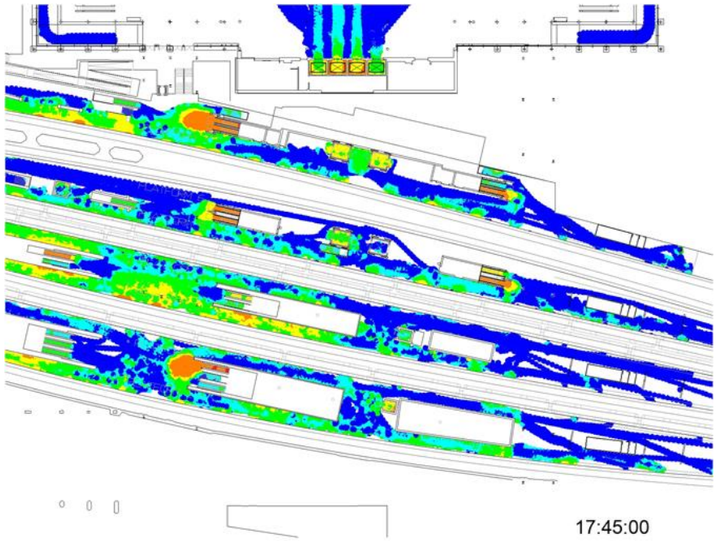


Diagram 13.5.7 and Diagram 13.5.8 show LoS for the peak 15 minutes in 2047 with the Project for the concourse and for the platform level in terms of Fruin Walkways.

13.5.12 When compared to Diagram 13.5.3, it can be seen that the station concourse level performs at a comparable Level of Service to the 2047 future baseline, with predominantly LoS A to LoS C shown by modelling.

13.5.13 When compared to Diagram 13.5.4, it can be seen that platforms also perform at a comparable Level of Service to the 2047 future baseline, with predominantly LoS C or better shown by the modelling. However, higher densities are shown on some narrower sections of platform, most notably on Platforms 1, 3 and 7, as well as at the base of escalator elements, in particular on Platforms 2 and 7. However, these are queuing or platform waiting environments, where people tolerate higher densities as described in 13.4.

13.5.14 Level of Service for platforms based on Fruin Queuing are presented in paragraph 13.5.20 onwards.

Diagram 13.5.7: Concourse LoS, Fruin Walkways – 2047 with Project PM Peak (17:45 – 18:00)

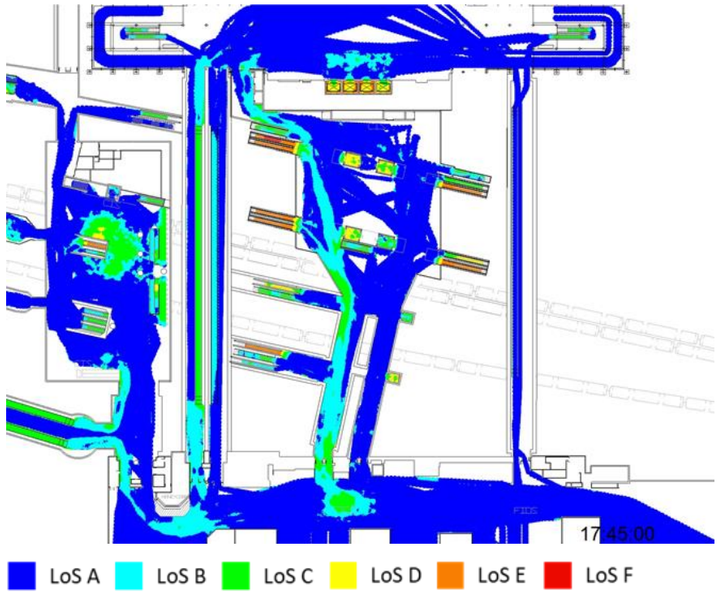
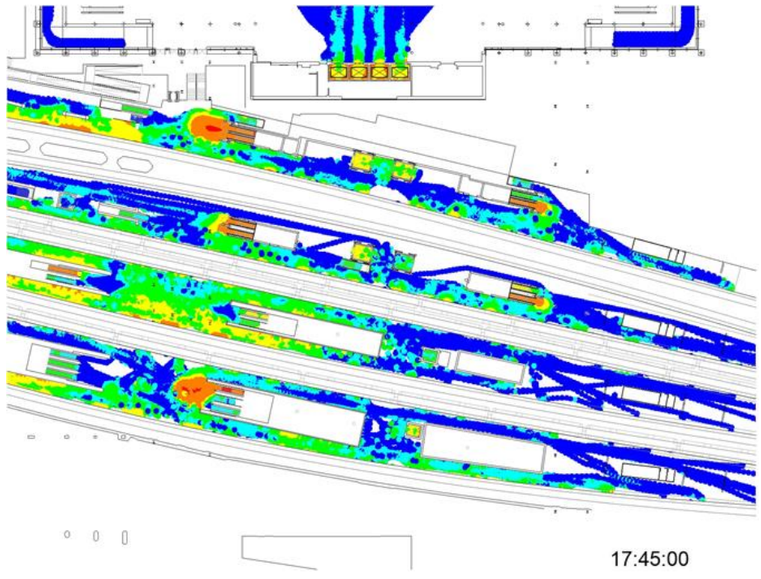


Diagram 13.5.8: Platform LoS, Fruin Walkways – 2047 with Project PM Peak (17:45 – 18:00)



2047 with Project

Summary of Performance

Level of Service

13.5.15 The Level of Service performance across all scenarios for the existing and new concourses is shown in Diagram 13.5.9 and Table 12.5.1, excluding escalator elements.

13.5.16 The percentage of passengers experiencing different Level of Service ranges varies between scenarios however all future years show station performance at concourse level being predominantly LoS C or better (95% to 97% of passengers experience LoS C or better depending on scenario). This indicates that there is no material difference in performance between the baseline and with Project scenarios and that performance is acceptable and appropriate.

13.5.17 The Level of Service performance across all scenarios for the station platforms is shown in Diagram 13.5.10 and Table 12.5.2, excluding escalator queuing areas and escalator elements, using a Walkways comparison i.e. as if the platforms were circulation environments.

13.5.18 All future years show station performance at platform level at predominantly LoS C or better (70% to 81% of passengers experience LoS C or better depending on scenario). However, the proportion of passengers experiencing more congested conditions at LoS D also increases into the future and with Project, with 30% of passengers experiencing higher densities by 2047.

13.5.19 However, it should be noted that platforms are considered more of a queuing environment than a typical walking environment as platforms typically have a mix of passengers waiting and standing still (essentially queuing) or walking at slower speeds to either move along or exit from the platform. To reflect this type of environment, Network Rail recommends using Fruin Queuing Level of Service for platforms, which represents a lower overall space requirement per passenger. The guidance states that platforms should perform at Queueing LoS B/C or 0.93 m^2 per person or better.

13.5.20 The Level of Service performance across all scenarios for the station platforms is shown in Diagram 13.5.11 and Table 13.5.3 using Fruin Queuing Level of Service criteria, excluding escalator-related elements. This shows performance at predominantly LoS B or better in terms of Fruin Queuing (90% to 94% of passengers depending on scenario), so acceptable conditions.

Diagram 13.5.9: Concourse LoS, Fruin Walkways – All Scenarios, PM Peak (17:45 – 18:00)

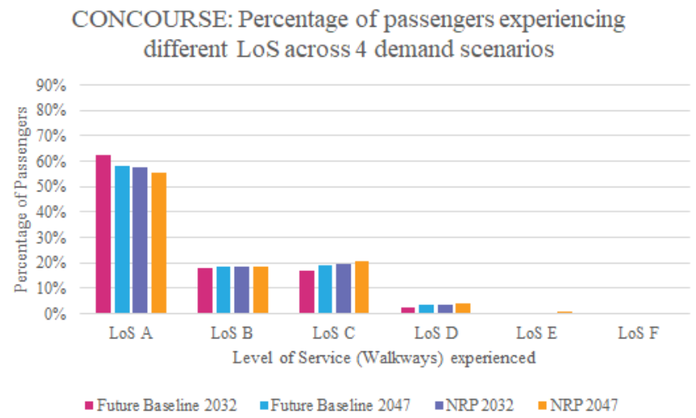


Table 13.5.1: Concourse LoS, Fruin Walkways – All Scenarios, PM Peak (17:45 – 18:00)

	PM Level of Service Walkways			
	Future Baseline 2032	**FUTURE Baseline 2047**	**Project 2032**	**Project 2047**
LoS A	62%	58%	58%	55%
LoS B	18%	19%	19%	19%
LoS C	17%	19%	19%	21%
LoS D	3%	3%	4%	4%
LoS E	0%	0%	1%	1%
LoS F	0%	0%	0%	0%

Diagram 13.5.10: Platforms LoS, Fruin Walkways – All Scenarios, PM Peak (17:45 – 18:00)

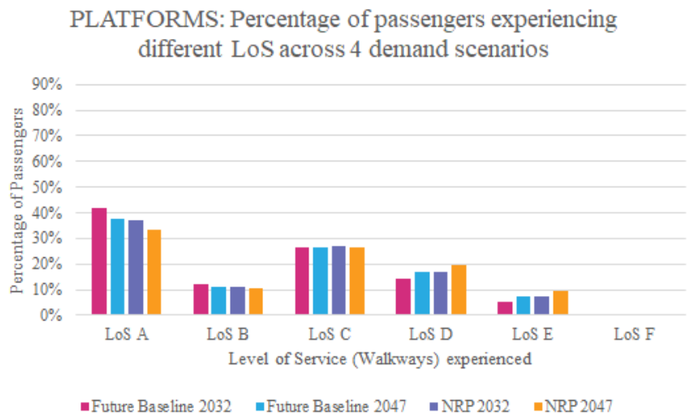


Table 13.5.2: Platform LoS, Fruin Walkways – All Scenarios, PM Peak (17:45 – 18:00)

	PM Level of Service Walkways			
	Future Baseline 2032	**Future Baseline 2047**	**Project 2032**	**Project 2047**
LoS A	42%	37%	37%	33%
LoS B	12%	11%	11%	11%
LoS C	26%	26%	27%	26%
LoS D	14%	17%	17%	19%
LoS E	5%	7%	7%	10%
LoS F	0%	0%	0%	1%

Diagram 13.5.11: Platforms LoS, Fruin Queuing – All Scenarios, PM Peak (17:45 – 18:00)

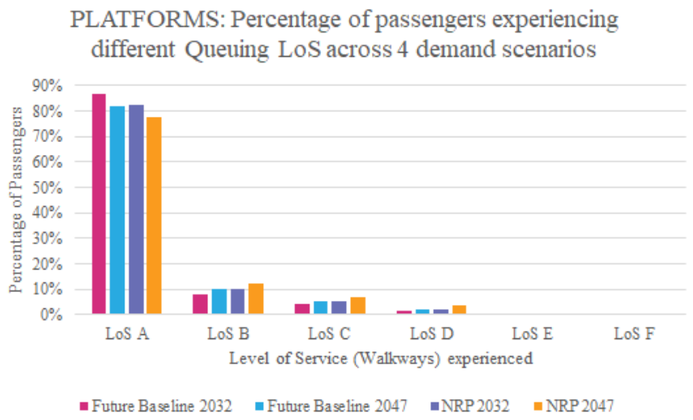


Table 13.5.3: Platform LoS, Fruin Queuing – All Scenarios, PM Peak (17:45 – 18:00)

	PM Level of Service Queuing			
	Future Baseline 2032	**Future Baseline 2047**	**Project 2032**	**Project 2047**
LoS A	87%	82%	82%	77%
LoS B	8%	10%	10%	12%
LoS C	4%	6%	5%	7%
LoS D	2%	2%	2%	3%
LoS E	0%	0%	0%	0%
LoS F	0%	0%	0%	0%

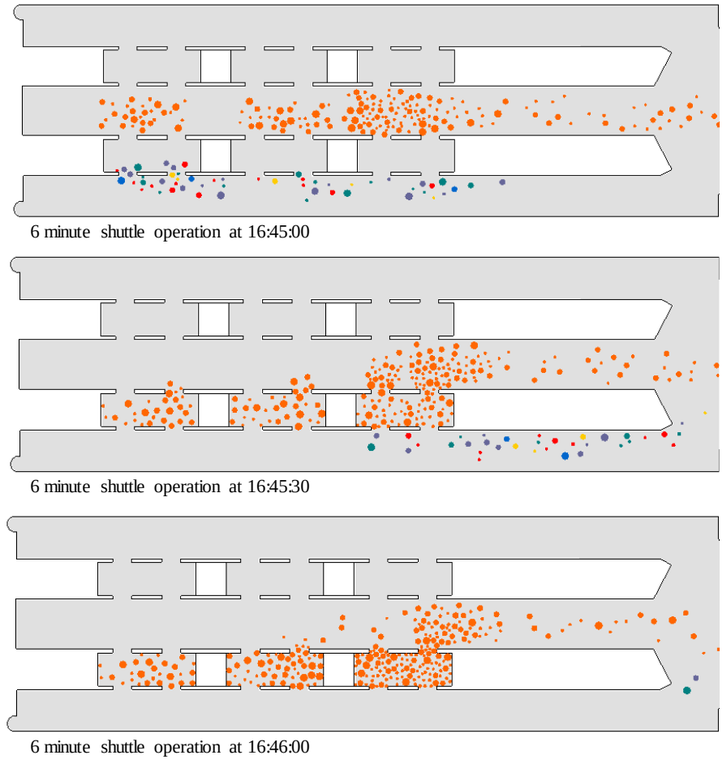
Shuttle Station

2047 with Project

13.5.21 Modelling to 2047 with the Project shows that the boarding platform of the shuttle stations, particularly at the South Terminal, can become congested at peak times and that congestion blocks the platform and prevents full use of shuttle capacity.

13.5.22 Diagram 13.5.12 shows platform loading in 2047 assuming a 6 minute shuttle headway, which is the current peak frequency (which with two trains each operating on their own track, means that passengers never wait more than 3 minutes for a train at peak times).

Diagram 13.5.12: Shuttle platform loading, PM Peak (16:45 – 16:46), 6 minute headway



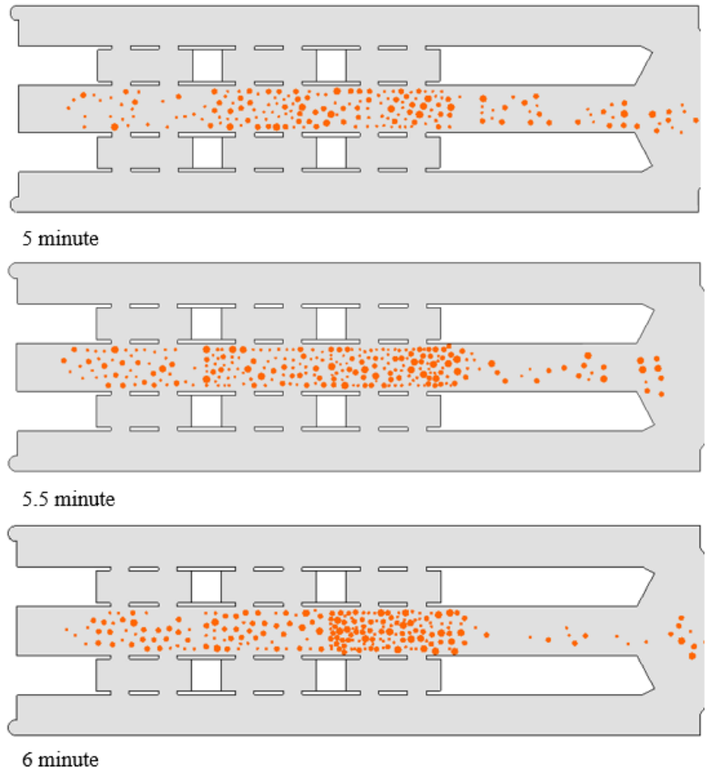
13.5.23 The first image shows peak passenger queuing on the boarding platform just before the shuttle doors open. The second image shows passengers moving to the shuttle car closest to them and boarding. The final image shows the spare capacity in the northern car with the remaining passengers left on the platform at the southern end. These are predominantly passengers who have just arrived on the boarding platform at the southern end of the South Terminal shuttle station.

2047 with Project and Potential Mitigation

Changing Shuttle Headway

13.5.24 The shuttle operation has therefore been assessed to see what the impact of 5, 5.5 and 6-minute shuttle headways will have on crowding levels at the shuttle boarding platforms.

Diagram 13.5.13: Shuttle platform loading, PM Peak (16:45 – 16:46), various headways



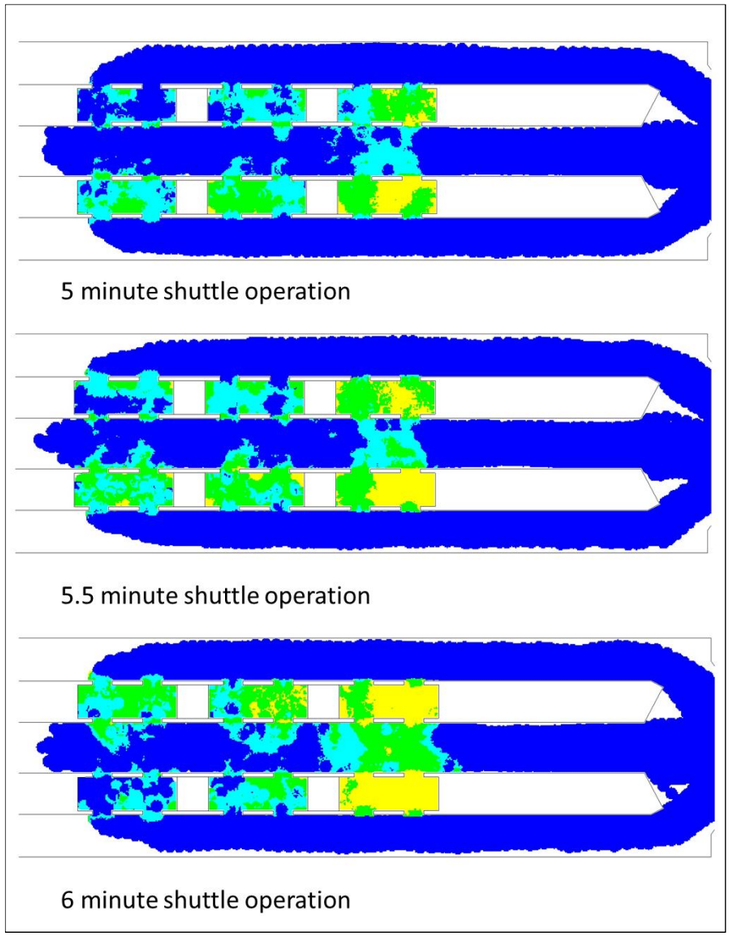
13.5.25 As can be seen from Diagram 13.5.14, the busyness at the southern end of the platform and in the southern shuttle car is reduced with a shorter headway. This is reaffirmed by the Level of Service analysis which shows reduced congestion and improvement to LoS B on the boarding platform with a 5 minute headway.

13.5.26 Analysis shows that this reduction in congestion leads to a more efficient loading of the shuttle.

Four car shuttle operation

13.5.27 Additionally, a test model considers the impact of the shuttle comprising four cars rather than the current configuration of three cars, ie a potential 33% uplift in capacity, to understand what this enhancement might provide. This analysis shows that adding an additional shuttle car reduces density and number of passengers left on the platform during the peak period. However, no discernible improvement occurs outside of the peak period and indeed the peak impacts are nominal, owing to congestion on the boarding platform full and even utilisation of the fourth car.

Diagram 13.5.14: Shuttle platform Level of Service, Fruin Queuing, PM Peak (16:45 – 16:46), various headways



13.6 Conclusions

13.6.1 Improvements to Gatwick Station are the subject of a separate consenting process, with a planning application submitted by Network Rail to Crawley Borough Council in April 2018. Consent has been granted and these improvements are currently under construction, despite the Covid pandemic, and will be complete by the time the Project is operational.

13.6.2 Analysis and modelling with the Project shows that no further improvements will be required to the railway station platforms or concourse.

13.6.3 Modelling to 2047 with the Project shows that the boarding platform of the shuttle stations, particularly at the South Terminal, can become congested at peak times and that congestion blocks the platform and prevents full use of shuttle capacity. Analysis indicates that reducing the headway of the system from 6 minutes down to 5 minutes has the greatest benefit. Adding a fourth car to the system does not provide an additional 33% capacity as the boarding platform remains congested unless the shuttle headway is changed. GAL therefore proposes to reduce the shuttle headway to achieve appropriate additional capacity in peak periods by 2047.

14 Impacts of Construction

14.1 Introduction

14.1.1 This section describes the impacts of construction on the transport network for the PEIR. For the final Transport Assessment, this section will additionally reference Gatwick Airport's Construction Traffic Management Plan for the Project and the associated Appendices related to construction vehicle traffic management and construction workforce travel planning which are currently in development.

14.1.2 The section describes impacts related to two construction scenarios, namely:

- Understanding the impact of peak construction vehicle traffic on the highway network.
- 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.

14.2 Construction Inputs

Indicative Construction Programme

14.2.1 Gatwick has developed a programme of works covering all of the construction activities related to the project and when these will occur. The programme will likely evolve and change however the initial timings are presented in Chapter 5: Project Description of the PEIR.

Construction Workforce

14.2.2 This construction programme generates a peak of construction activity over winter 2026/27, with over 1,300 construction workers on site.

Construction Sites

14.2.3 Various construction compounds have been identified as follows:

- Main contractor compound (MA1) – the main site and compound for airfield works.
- Airfield satellite contractor compound – this compound will support most of the core airfield works to the North West of the airfield.
- Surface access satellite contractor compounds – up to three off airport locations to be used for construction activities related to highway works at South Terminal, North Terminal and Longbridge roundabout works.

14.2.4 There will be construction-related and construction workforce-related trips to these locations at various project stages. However, the location for construction workforce car parking will be MA1 and therefore the highest number of overall trips will be made to this location.

Diagram 14.2.1: Peak Construction Workforce

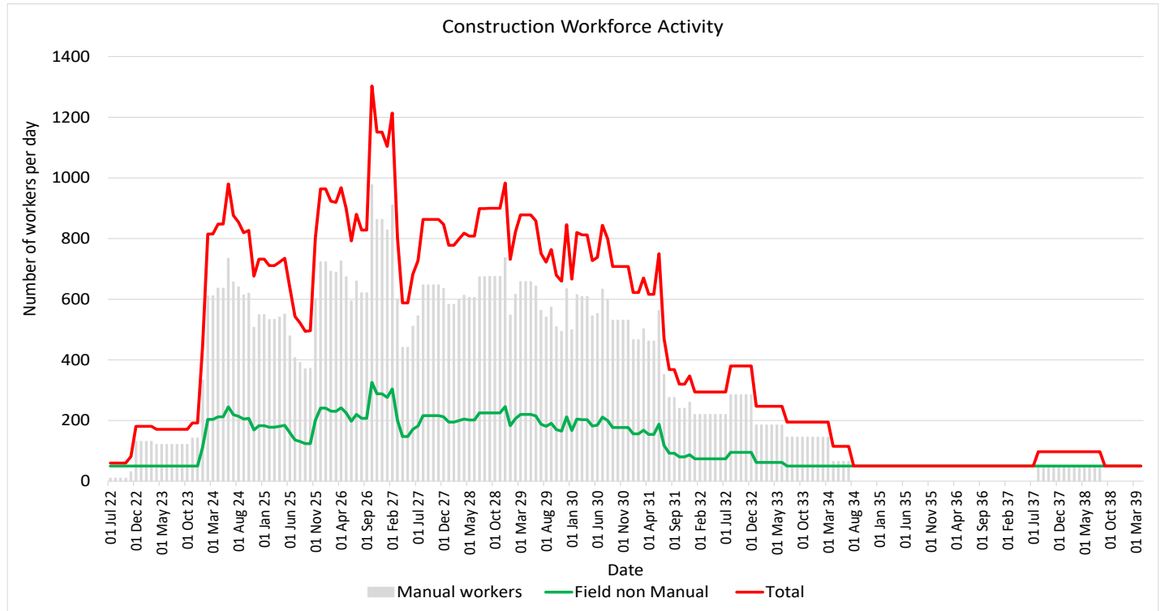
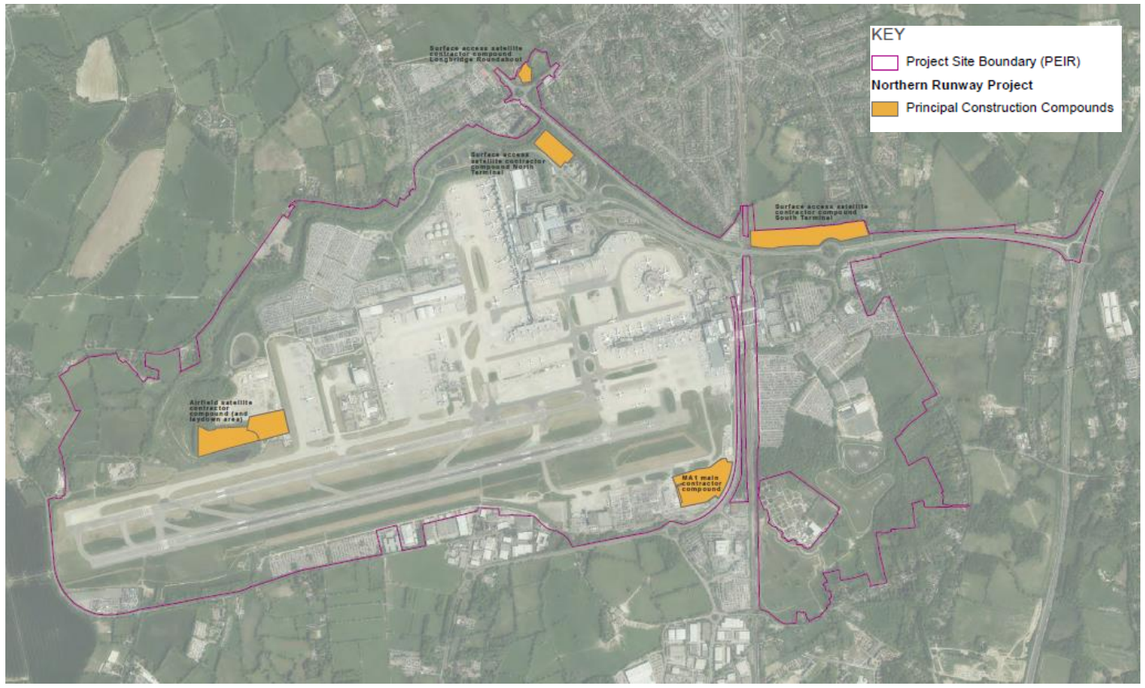


Diagram 14.2.2: Proposed Construction Compounds



14.3 Impacts of Airfield Construction Trips

14.3.1 This section relates to vehicles carrying materials to and waste from the Airport, typically Heavy Goods Vehicles (HGVs over 7.5 tons), Light Goods Vehicles (LGVs between 3.5 tons and 7.5 tons) and small delivery vans.

14.3.2 The objective of the Construction Traffic Management Plan will be to reduce the impact of construction traffic including:

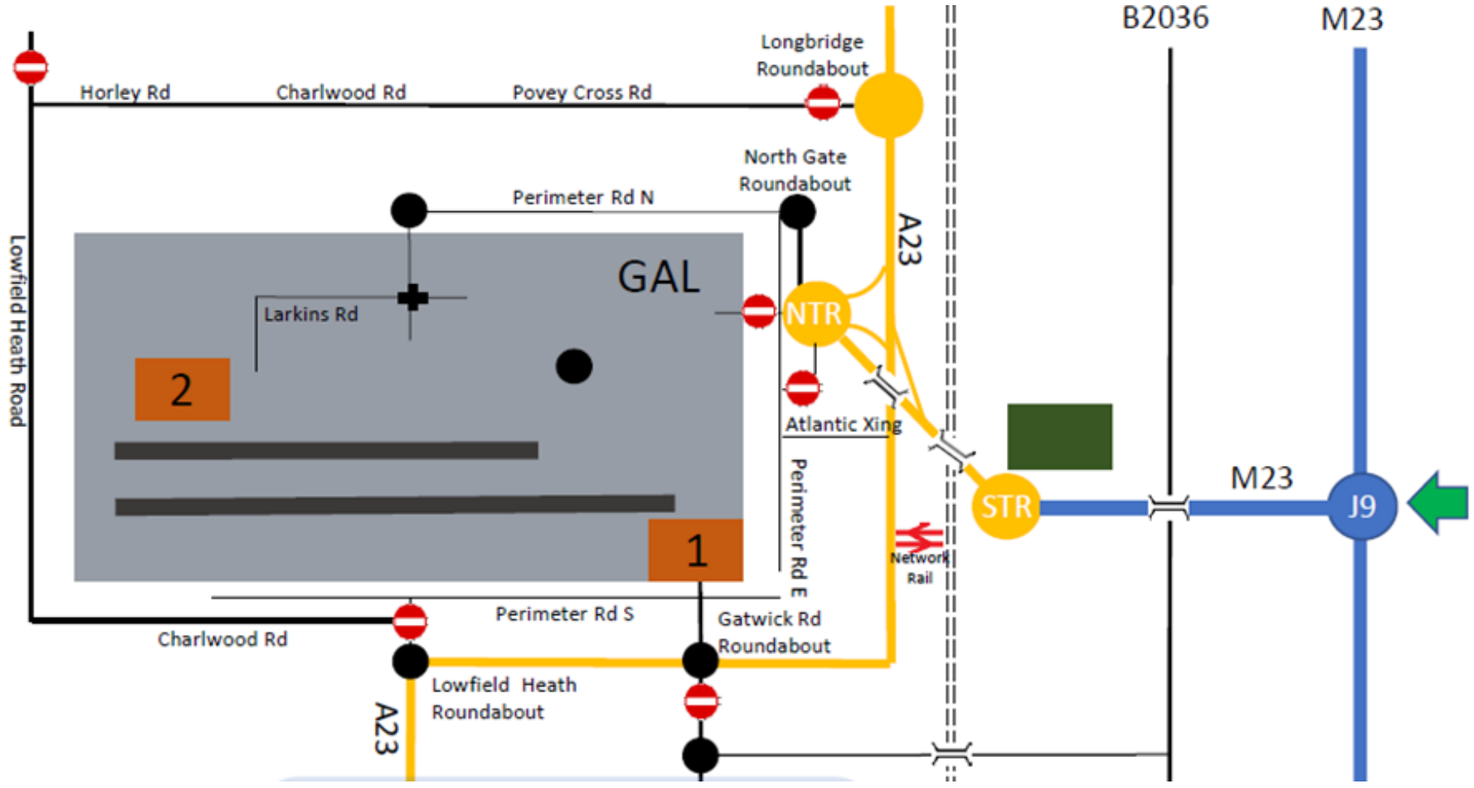
- reducing potential congestion impacts, caused by additional vehicles on the network over and above typical traffic levels;
- reducing safety risks related to construction vehicle movements;
- minimising emission levels;
- limiting noise impacts; and
- minimising other impacts such as wear and tear of the road network and dust from construction traffic.

14.3.3 In order to achieve this, Gatwick Airport has prescribed a single route into the Airport, with all construction traffic coming via Junction 9 of the M23, as shown in Diagram 14.3.1. Access will be via M23 Junction 9 through South Terminal roundabout (STR), onto North Terminal roundabout (NTR) and around Longbridge Roundabout. Construction vehicles then take the A23 south to Gatwick Road roundabout and from there into the MA1 site.

14.3.4 An option had been discussed which allowed construction vehicles to access the Airport via Junction 9 and Junction 10. However, whilst this approach distributes the impact of construction traffic and therefore potentially reduces its intensity, it also has the effect of spreading the impact of construction traffic across a wider area, specifically into north Crawley and is therefore not preferred and has not been taken forward for assessment.

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

Diagram 14.3.1: Prescribed Routes for Construction Traffic



14.4 Impacts of Airfield Construction Staff Trips

14.4.1 An outline Construction Workforce Travel Plan (CWTP) is being developed for the Project. It will focus on how the construction workforce will travel to and from the Airport, including measures that encourage alternatives to the use of private car in particular single-occupancy car journeys. The intent of the Travel Plan is to put forward a range of travel options for the construction workforce which encourage and deliver a high sustainable mode share and, through this, reduce any potential capacity and environmental impacts of the Project.

14.4.2 It should be noted that each contractor appointed by Gatwick to deliver the Project will be responsible for developing their own detailed CWTP and will be monitored against it to ensure compliance. The outline CWTP is therefore a guidance document to inform appropriate strategies from contractors, which will then become enshrined in contracts and obligations as the Project moves forward.

Aims of Construction Workforce Travel Plan

14.4.3 The aims of the outline Construction Workforce Travel Plan are to:

- Increase the workforce awareness of more sustainable and healthier travel choices.
- Through this, to achieve the highest possible mode share by public transport, walking and cycling as sustainable transport modes.
- Reduce travel by private car, particularly single occupancy car journeys.
- But where car travel is the only viable mode, to encourage multi-occupancy car use to reduce the number of trips.

14.4.4 Through this, the outcomes of the CWTP are to:

- Reduce congestion on key routes / junctions, especially during traditional morning and evening peak travel times. This will benefit Airport passengers, staff and the local community.
- Identify appropriate bus and shuttle services for the construction workforce to augment existing rail, bus and coach connectivity.
- Maintain safety and comfort by minimising increases in traffic levels on local routes; and
- Minimise noise and air quality impacts throughout the Project.

Total Construction Workforce

14.4.5 The construction workforce is estimated to reach a peak of approximately 1,300 workers over the winter of 2026/27 and then reduce to approximately 800 - 900 workers to summer 2030, with workforce numbers reducing after that point to less than 400 by mid-2031.

Rail

14.4.6 Gatwick is the UK's best connected airport by rail. 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.

14.4.7 Prior to Covid, rail already accounted for a reasonable proportion of staff travel, 12%, and this was increasing. 2019 timetable changes with earlier and more frequent services as well as potential future measures, such as increasing the Staff Travel Discount, will likely help to drive rail mode share amongst employees even higher.

14.4.8 Accordingly, rail could be a viable mode for some of the construction workforce, particularly those that live in towns and cities along the Brighton Main Line or the Arun Valley Line. Discounted travel could be used to incentivise rail usage.

Local Bus Services

14.4.9 Most Gatwick employees who use bus/coach live in Crawley and Horley, with smaller clusters in surrounding towns and villages including Horsham, Redhill, Reigate and East Grinstead. The 2016 employee mode share by bus/coach was 16% of all staff.

14.4.10 Construction workers living in these locations could make use of existing bus/coach connectivity to access the Airport and, depending on the Metrobus route used, some of the construction workforce may be able to be dropped at bus-stops directly adjacent to construction sites (e.g. Metrobus routes 4 and 5 from Crawley/County Oak will pass construction compound MA1).

Specific Construction-Related Bus Services

14.4.11 Rail services are accessed via the station at South Terminal, and bus routes pick up and drop off at both the South and North Terminals. As such, the workforce arriving at those locations will require a method of travelling the final leg of their journey to site. A construction workforce shuttle bus would provide this service. This will require bus service planning, procurement of a supplier and identification of locations for pick-up, drop-off and layover.

14.4.12 The possibility of developing one or more 'Park and Ride' hub stations outside of the Airport and creating a dedicated workforce bus connection from these locations directly to site is being considered. This would reduce any potential impact of construction workers using the rail and local bus services.

14.4.13 At a minimum, lower emission Euro 6 engines would be expected in all construction-related vehicles, including buses, accessing the Airport. This would reduce the air quality impacts of emissions related to construction traffic.

14.4.14 Further development of a system for dedicated worker buses is underway and will be further defined within the CWTP.

Active Travel

14.4.15 The following initiatives are being considered to support walking and cycling for the construction workforce.

- A 'cycle to work bundle' including discounts on bike and equipment purchases and free bike servicing.
- Safe routes - design consideration is being given to access routes for walking and cycling (as described in Section 11).
- Cycle stands - secure cycle parking to be provided in a convenient location relative to the desired arrival route and site location.
- Showering and locker facilities - provided in the welfare facilities specifically for cyclists.
- Workforce recruitment - a drive to recruit a significant proportion of the workforce from the local area.

Car Parking and Car Sharing

14.4.16 Some of the workforce will continue to drive to work, particularly those working non-standard hours or those carrying equipment and tools. Parking will be provided only at the MA1 compound located near the A23 in the south east corner of the Airport. An internal shuttle bus service will then transport the workforce to their site locations.

14.4.17 The CWTP will develop the parking strategy further based on refined modelling of the workforce profile. However, at this stage, it is envisaged that around 500 car parking spaces may be provided, which can accommodate the total peak project workforce (even assuming some overlap of parking demand at shift changeover – please also see 14.5.8).

14.4.18 This means that 10% of the workforce will need to come by other modes such as public transport and active travel, which is conservative when considering the mode share of current Airport staff. Gatwick will also encourage car sharing by providing incentives for workers to travel to work together (priority parking spots, meal vouchers etc). The current assumption is 1.5 construction workers per vehicle and car parking provision reflects this.

14.5 Impacts of Airfield Construction Trips on Highway Network

14.5.1 A peak airfield construction scenario has been tested with construction trips added on 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.

14.5.2 Construction vehicle data has been generated on a monthly basis by GAL's construction team in relation to core and non-core construction activities to deliver the Northern Runway Project. The data is based on project activity, with vehicle numbers for core works generated from quantities for earthworks, pavement works, drainage, aeronautical ground lighting, navaids etc and non-core works based on an intensity factor and costs of the various projects at design status of RIBA 0-1.

14.5.3 The busiest month for construction vehicle activity is December 2026 with 38,450 construction vehicles for the busiest shift across the month. This comprises16,360 construction workforce or Person Owned Vehicles (POVs) and 22,090 other construction vehicles as a mix of HGVs, LGVs and Liveried Vans with two shifts per day.

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

14.5.5 Accordingly, the modelling and assessment considers the highest summer month which occurs in August 2027 with 21,834 vehicles for the busiest shift across that month, comprising 7,326 POVs and 14,508 other construction vehicles and with three shifts per day (two x 10 hour shifts and an 8 hour night shift).

14.5.6 Monthly data has been used to generate daily and peak period traffic volumes by:

- Considering shift patterns.

- Dividing monthly vehicle numbers by 22 working days per month.
- Assuming 1.5 construction workers per vehicle, which is considered to be conservative. GAL's construction team have data which suggests that a reasonable proportion of the recent workforce on airside projects at the Airport came to site in minivans with up to 6 people per van. As such, 1.5 construction workers per vehicle is considered a conservative case.
- Assuming 10% construction workforce public transport mode share. Again, this is a low percentage given the excellent connectivity provided by Gatwick Airport railway station, as well as local bus and long-distance coach services.

14.5.7 The three shifts in August 2027 mean that, for the busiest daytime peak, the monthly total POVs is 7,326 vehicles, equivalent to 3,663 POVs in one direction. When divided by 22 working days and factored by 90% to reflect 10% of construction workers on public transport, this gives 150 construction worker vehicles travelling into the MA1 site in the AM peak period (07:00-08:00) and out of the site after the PM peak period (18:00-19:00) in August 2027.

14.5.8 Note that the peak construction worker vehicle activity is higher in the autumn and winter months, with between 330 and 440 POVs for a single shift ie 180 to 290 vehicles more than the August peak. However, traffic into Gatwick Airport is lower in these months - for example, traffic heading into South Terminal roundabout is estimated to be more than 400 vehicles lower in December 2026 than August 2027. Accordingly, there is greater capacity on the network to accommodate these additional vehicles.

14.5.9 The 150 construction worker vehicles travel into the MA1 site in the AM peak period (07:00-08:00) and out of the site after the PM peak period (18:00-19:00) in August 2027.

14.5.10 In order to provide a reasonable distribution of potential locations from which construction workers will travel to/from, the modelling assumes that construction workers are drawn from Croydon, the Gatwick Diamond area and Brighton and Hove. Whilst some construction workers will be drawn from a wider catchment, the length of the Northern Runway construction works over several years, is likely to result in construction workers staying in the area temporarily while working at the Airport and this is the assumption used for modelling. The distribution of construction workers by Local Authority reflects the proportion of construction workers living in those areas from 2019 Office of National Statistics data. The trips are distributed evenly between zones in these Local Authority areas. Given that it will be very difficult to mandate and then monitor routes for construction workers, it is assumed that these vehicles will arrive at MA1 via the most appropriate highway route from or to each zone.

14.5.11 For HGVs and LGVs, the shift patterns in August 2027 mean that, for the busiest daytime shift, the monthly total construction vehicles are 14,508 vehicles, equivalent to 7,254 in one direction. When divided by 22 working days and spread over a 10 hour shift, the estimated vehicle trip generation is 33 vehicles (HGVs and LGVs) in and out every hour along the M23 Spur. At this stage, material-carrying construction vehicles, i.e. LGVs and HGVs, have not been excluded from peak hours on the highway network to test the impact of extra construction traffic in the peak.

14.5.12 The modelling has tested the summer peak level of construction activity in August 2027 on 2029 baseline airport and background traffic levels to provide a robust assessment of potential construction impacts. The difference in traffic flows between 2027 and 2029 will be small (up to 5% higher) and accordingly within the daily variation in any given year.

14.5.13 Traffic flows have been provided to environmental modelling workstreams, specifically air quality and noise, for modelling and input to the draft EIA. Those flows have been provided as 24 hour AADT.

Comparison of Baseline and Project

14.5.14 The proposal is for all construction vehicles to travel to and from the airport from via M23 Junction 9, and no restrictions are proposed for construction worker vehicles. Construction traffic would be monitored to ensure compliance with proposed routes, unless disruption causes these to be unavailable and signed diversionary routes provided.

14.5.15 The estimated vehicle trip generation is 33 vehicles (HGVs and LGVs) in and out an hour along the M23 Spur, and 150 construction worker vehicles in the AM peak hour.

14.5.16 In line with IEMA guidance, the assessment considers highway links where traffic flows will increase by more than 30% (or the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%); or links through any other specifically sensitive areas where traffic flows have increased by 10% or more.

14.5.17 Strategic modelling shows that no link within the study area exceeds an increase in traffic of over 30%, which is expected given the volume of airfield construction traffic generated by the Project.

14.5.18 Flows on Old Brighton Road South, Lowfield Heath Roundabout-Perimeter Road South are 20% higher in the AM peak and 25% higher in the afternoon inter-peak owing to the location of the MA1 site off this junction.

14.5.19 The modelling shows that HGV flows increase by more than 30% on some roads into the Airport in the AM and PM peaks, which is expected given the requirement for construction HGVs related to the Project to use the Strategic Road Network. The roads impacted are as follows:

- M23 Spur, J9-South Terminal roundabout
- A23 Airport Way
- A23 London road, North Terminal-Longbridge Roundabout
- A23 London Road, Beehive Ring Road-South Terminal
- A23 London Road, Beehive Ring Road-A23 London Road

14.5.20 No other roads into the Airport show HGV increases of 30% or more in the AM and PM peaks. Moreover, with the 150 construction worker vehicles coming from nine Local Authority areas, the most vehicles from one Local Authority area is between 20 and 30 vehicles in an hour. This is only a small increase in traffic when considered against other demand on highways and roads around the Airport.

14.5.21 The above effects are shown in Diagram 14.5.1 for the AM peak hour, with a 30 to 100 vehicle two-way flow change shown predominantly on the M23, M23 Spur and A23. There are also minor vehicle increases on Charlwood Road south of the Airport and a number of smaller roads in North Crawley. 30 vehicles per hour two-way is equivalent 15 vehicles per hour in each direction, or one every 4 minutes.

14.5.22 Given the limited impact of construction traffic, it is not anticipated that there would be overlap between construction traffic when considering Heathrow R3 construction on a cumulative basis. However, this will be reviewed for the application for development consent.

Diagram 14.5.1: Roads impacted during the Airfield Construction Scenario (AM Peak)

Mitigation of Construction Traffic Impacts

14.5.23 Based on the levels of construction traffic described above, it is not considered that peak airfield construction will have a significant impact on the performance of the highway network around the Airport.

14.5.24 Further work will be undertaken for the Environmental Statement to explore measures to mitigate the potential impacts from construction traffic during peak periods and reduce the overall construction traffic loading created by the Project.

14.5.25 Whilst the modelling indicates that there is available capacity in peak hours on the network, a conservative assumption is to aim for minimal additional construction traffic at these times to make sure construction works related to the Project do not negatively impact on network capacity and safety.

14.5.26 Potential traffic mitigation measures could include the following and would need to be modelled and assessed to confirm effectiveness prior to being taken forward.

- Developing a Travel Plan for deliveries including HGVs: A Travel Plan which puts in place a series of sustainable measures to address the delivery or removal of materials to or from site. This may include the use of low or zero emission delivery vehicles and the leveraging of the rail network that supports Gatwick including the potential for setting up local rail hub(s) for the delivery of bulk materials. It will also include measures to consolidate deliveries to site. This measure has the potential to reduce the number of vehicle movements during peak and off-peak periods.
- Restrict material deliveries and waste away to outside of peak hours: This measure is not intended to reduce vehicle movements overall but rather to flatten the vehicle loading across the day and remove any vehicle movements that are not time-critical during the morning and evening traffic peak hours. This measure may require more capacity in holding and layover areas to maintain reliable arrival times on site.
- Restricting car parking spaces for the construction workforce: This is a base measure which is already included in the mitigation, limiting car parking to 45% of the peak workforce.
- Travel Plan for staff and workforce: A Travel Plan which puts in place a series of sustainable measures to address the impacts of workers travelling to and from site and which promotes sustainable travel. Measures might include staff travel discounts to maximise the use of public transport (including rail), incentives for car sharing, and the provision of 'cycle to work' schemes. The elements of the plan would build on Gatwick's existing staff travel plan, which includes discount schemes for public transport use.
- Provide 'Park and Ride' services for construction workers: Provision of 'Park and Ride' hubs in towns and cities around the airport where Project construction workers will be drawn from. Providing 'Park and Ride' bus operations will address vehicle impacts on roads leading to the airport by consolidating the vehicles, however the location of the car parks will govern the extent of the benefit and may result in additional, unwanted congestion at or near the sites themselves.
- Use of bus lanes for construction workforce buses: This option is intended to speed up the transport of workers from car parks (including 'Park and Ride' sites etc.), the railway station and off-site bussing to the compounds. This option would not reduce the number of vehicle movements directly but would speed up the transit time of buses to and from site and as such may indirectly reduce the vehicle movements by making bus travel more attractive. However, this option may also result in slowing down existing public bus services so its advantages and disadvantages need to be further assessed.
- Reduce the amount of 'business as usual' construction work: Reduce the volume of 'business as usual' construction work to a minimum during the peak Project construction period(s). It is intended that this measure would reduce some of the existing traffic thereby releasing some capacity for Project construction vehicles.
- Increase non-day shift working: Undertaking more work on a back shift (from late afternoon until midnight) or night shift, especially in the summer when daylight hours are longer. This measure is not intended to reduce overall vehicle movements but to flatten or remove construction vehicle activity from the morning and evening peak hours. This measure could not be applied to all project activities but could be applied to selected works.
- Stagger shift patterns: This measure could be used to flatten or remove construction vehicle activity from the morning and evening peak hours. This measure may not need to be applied to all project activities and may only be applied to selected areas of work. This is an approach commonly taken for large development projects near congested networks and has been adopted by several DCO projects.
- Move selected construction activities to the winter months: Moving selected construction activities to the winter months would reduce the impact on the roads during spring and summer months when the roads can be busier. The extent of the impact would be dependent on the activities to be moved. This may also impact the overall completion date for the works. At this stage, it is envisaged that peak airfield construction will occur during the winter months of 2026/27.

14.6 Sequencing and Impacts of Highway Construction

14.6.1 Understanding the impact of constructing highway mitigation, including potential grade-separation, has been assessed for a conservative construction phase which envisages works at both South and North Terminal junctions at the same time. Further scenarios will need to be considered in conjunction with Highways England and local highway authorities prior to DCO submission.

Overview of Highway Works

14.6.2 All highways construction activities tend to follow a broadly similar construction sequence, with the duration and detail dependent upon the scale and complexity of the scheme in question, as follows:

- Activities normally start with delineation of the boundary to the work, site clearance where required for the work and protection or diversion of utilities affected by the scheme.
- Prior to site clearance, any trees or vegetation to be retained are identified and safe paths maintained through or around the works for pedestrians, cyclists and other non-motorised users of the network who may be affected by the construction activities.
- Once the site is cleared, topsoil and possibly also subsoil will be removed where roads are widened, or new roads are to be built. Soils are placed in stockpiles for re-use.
- Structure foundations are then built, and earth or other materials removed to sufficient depth to prepare the ground for new road embankments or road pavement layers. Various ancillary items can be constructed at this stage including access chambers, sign and gantry foundations, draw pits, drainage pipes and ducts for highway communications systems or traffic signals.
- The next stage comprises above ground structures such as bridge piers or abutments and bridge decks, as well as the laying and compaction of road pavement sub-base materials.
- Kerbs are then installed and new road pavements constructed.

- Finishing works include verges, re-soiling of earthworks' side-slopes and the installation and commissioning of vehicle restraint systems, street furniture, traffic lights, road lighting, wayfinding and the like. Final tasks include road markings, diversion of traffic onto the new road layout, removal and making good of redundant sections of road, soft landscaping and the removal and restoration of any temporary contractor's compounds or other facilities.

South Terminal Roundabout and M23 Spur

14.6.3 The Project involves providing grade separation of the traffic movements at the existing South Terminal roundabout, together with conversion of the existing eastbound hard shoulder on the M23 Spur to a permanent running lane up to M23 Junction 9.

14.6.4 The roundabout itself will remain in its current position and be connected to the new flyover by four new slip roads. Space to construct the slip roads is restricted in some places and, where this is the case, retaining structures will be needed to support them clear of the surface features that need to be avoided, such as, for example, the water storage pond to the south of Airport Way and east of the Brighton-London main line. The need to incorporate slip roads to/from the M23 Spur motorway also means that the existing bridge over B2036 Balcombe Road will have to be extended and may have to be replaced altogether.

14.6.5 After site clearance and diversion or protection of utilities, the proposed construction sequence envisages the retaining structures and portions of the new Balcombe Road overbridge being built. This will be followed by earthworks and roadworks necessary to enable the traffic to be diverted off Airport Way and M23 Spur onto the slip roads, connecting to the South Terminal roundabout. It is likely that each slip road will need to temporarily support two lanes of traffic.

14.6.6 The flyover structure across the roundabout will then be completed, along with the associated retaining walls, earthworks and road pavements leading up to it.

14.6.7 Once any works to the existing in-line B2036 Balcombe Road overbridge are completed, through traffic can then be diverted from the slip roads onto the flyover. This should reduce the traffic flows on the slip roads, enabling them to be reconfigured into their final layout.

14.6.8 The M23 Spur eastbound carriageway will be widened slightly to enable it to carry three permanent lanes of traffic. The construction sequence and activities will be very similar to those carried out in 2018/2019 on the westbound carriageway for Highways England. The road will remain within the existing highway boundary and two lanes of traffic will be maintained for the construction duration, unless short-term temporary lane closures are needed.

14.6.9 All construction activities will take into account the need to maintain safe working zones, with appropriate temporary speed limits, clearances and safety barriers between construction areas and trafficked lanes. Where necessary, short-duration temporary lane closures will be needed to allow construction activities to proceed safely. Occasional temporary full closures of carriageways or roads may be needed for certain critical activities and these will be timed to avoid the busiest times of the day or night, with appropriate alternate routes in place and signposted. Access along Balcombe Road will be maintained except for occasional short-term closures to enable certain bridge deck construction activities to take place safely. Access into the Gatwick Airport South Terminal area will be maintained at all times.

North Terminal Roundabout

14.6.10 This scheme involves providing grade separation of the traffic movements at the North Terminal roundabout.

14.6.11 Overall, the objective will be to maintain safe working zones, with appropriate temporary speed limits, clearances and safety barriers between construction areas and lanes that are open to traffic. Where necessary, short to medium-duration temporary lane closures will be needed to allow construction activities to proceed safely. Occasional temporary full closures of carriageways or roads may be needed for certain critical activities and these will be timed to avoid the busiest times of the day or night, with appropriate alternate routes in place and signposted. Some night-working will be required.

14.6.12 The overall sequence will be to first clear the site and divert or protect utilities and other services to be retained. Work can then begin on the reconfiguration of the road layout, which starts with foundations and substructures for the new flyover. The new link roads can each be built in turn, to ensure that traffic can continue to flow through the junction whilst construction is underway. As each new link is completed and can be opened to traffic, sections of the existing junction or link roads can be closed, enabling construction to take place at those locations.

14.6.13 As well as the flyover, other key stages will involve creating the signalised junction which will accommodate traffic moves into and out of North Terminal, replacing the current roundabout.

Longbridge Roundabout

14.6.14 The capacity of Longbridge roundabout will be increased by providing full width running lanes throughout the junction and signalising certain arms. The new roundabout will have a slightly larger circulatory and will extend further west and north to accommodate wider circulating lanes, additional pedestrian crossing facilities and improved capacity on exit and entry lanes, particularly for the A23 arm to and from Horley.

14.6.15 All works will take place at the same levels or very slightly higher than the existing road network.

14.6.16 Construction methods will be typical of this type of construction activity and are not expected to include the use of unusual or exceptional plant or equipment. One item of work will be to widen the road bridge over the River Mole. Whilst this is done, safe routes for pedestrians and cyclists will be maintained.

14.6.17 All construction activities will take into account the need to maintain safe working zones, with appropriate clearances and safety barriers between construction areas and trafficked lanes. Where necessary, short-duration temporary lane closures may be needed to allow construction activities to proceed safely, however it is not expected that the roundabout will need to be fully closed to traffic.

Terminal Access Roads and Forecourts

14.6.18 Works to the terminal access roads and forecourt areas will be required to ensure they can safely and efficiently accommodate the predicted increase in demand. The highway-related aspects to this work include selective widening of the roads that enter and leave the terminal areas, improved or refreshed road markings and signage to aid and inform road users and improved footpaths and road crossings for users other than vehicles and their occupants.

14.6.19 The work will be timed to minimise disruption to existing users and to ensure airport operations can continue as efficiently as possible whilst maintaining safe working zones to construction activities.

14.6.20 All works will take place at the same levels as the existing road network.

14.6.21 Construction methods will be typical of this type of construction activity and are not expected to include the use of unusual or exceptional plant or equipment.

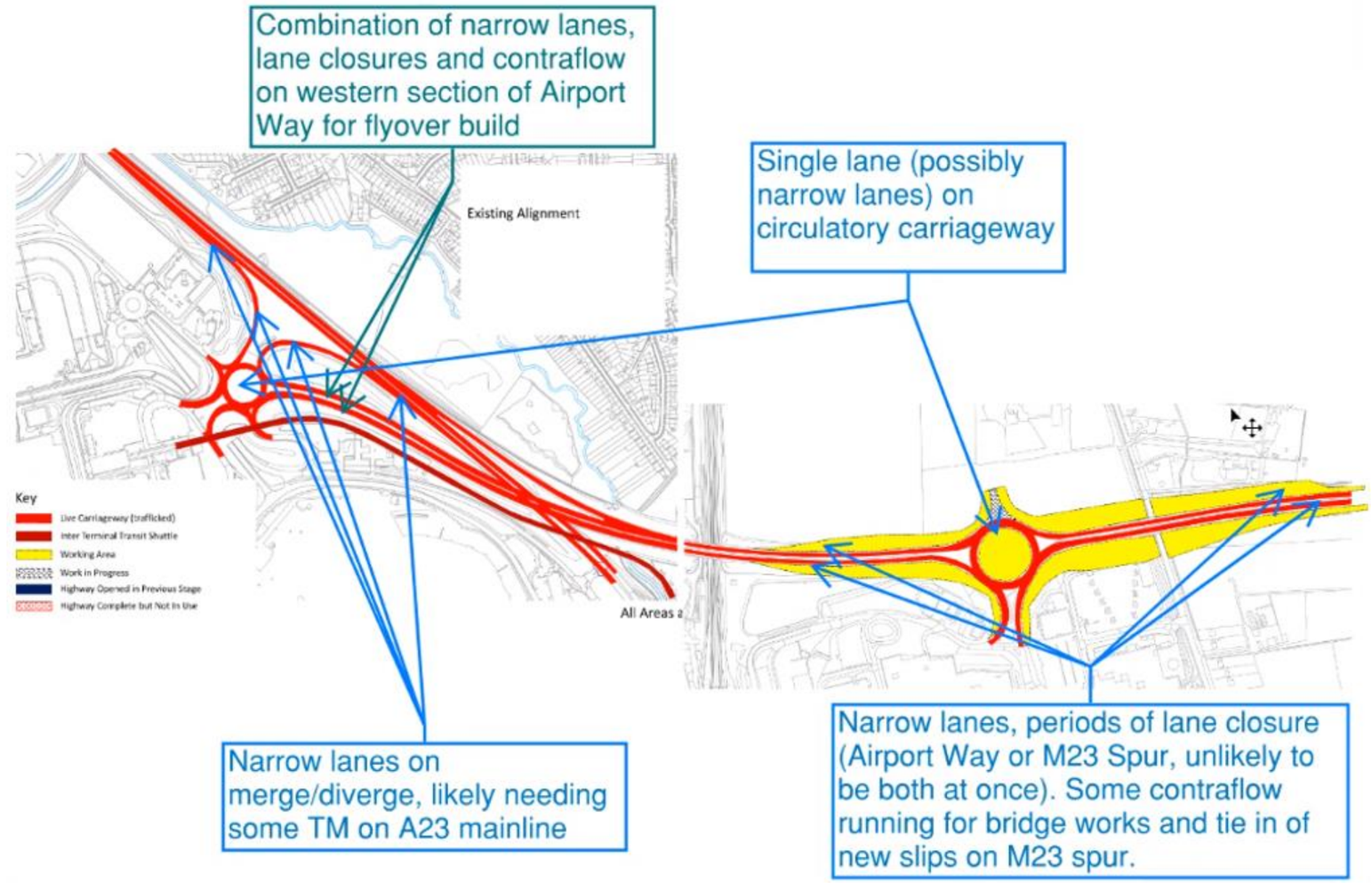
14.6.22 Access into the Gatwick Airport terminal areas will be maintained at all times and during busy periods the number of lanes open to traffic will not be reduced.

14.6.23 Access to side roads and facilities alongside the primary roads to be widened will be maintained at all times. If temporary road, access or lanes closures are required to maintain safe working zones whilst completing the works, signed alternative access arrangements will be put in place.

Assessment of Impacts

14.6.24 The most complex highway construction phase as currently envisaged would involve a combination of construction works at both the South and North Terminal roundabouts, as shown in Diagram 14.6.1. The construction methods are typical for the works envisaged but the sequencing of these to avoid unnecessary disruption creates complexity.

Diagram 14.6.1: Potential Highway Construction Phase



14.6.25 The highway construction works could last for a period of up to four months and would include:

South Terminal roundabout

- Narrow lane running or periods of temporary lane closure on the M23 Spur and/or Airport Way, with some contraflow running for bridge works and tying in the new slips back to the M23 Spur.
- No right turn into the Airport, owing to the reduced capacity of the roundabout, with traffic being sent to Junction 9 to u-turn.

Both roundabouts

- Single of narrow lanes on the circulatory of both roundabouts.

North Terminal roundabout

- Narrow lanes on merges and diverges, likely requiring some traffic management on the A23.
- A combination of narrow lanes and/or lane closures and contraflow running on the western section of Airport Way to allow the flyover to be built.

14.6.26 It is envisaged that these works would take place November through to February.

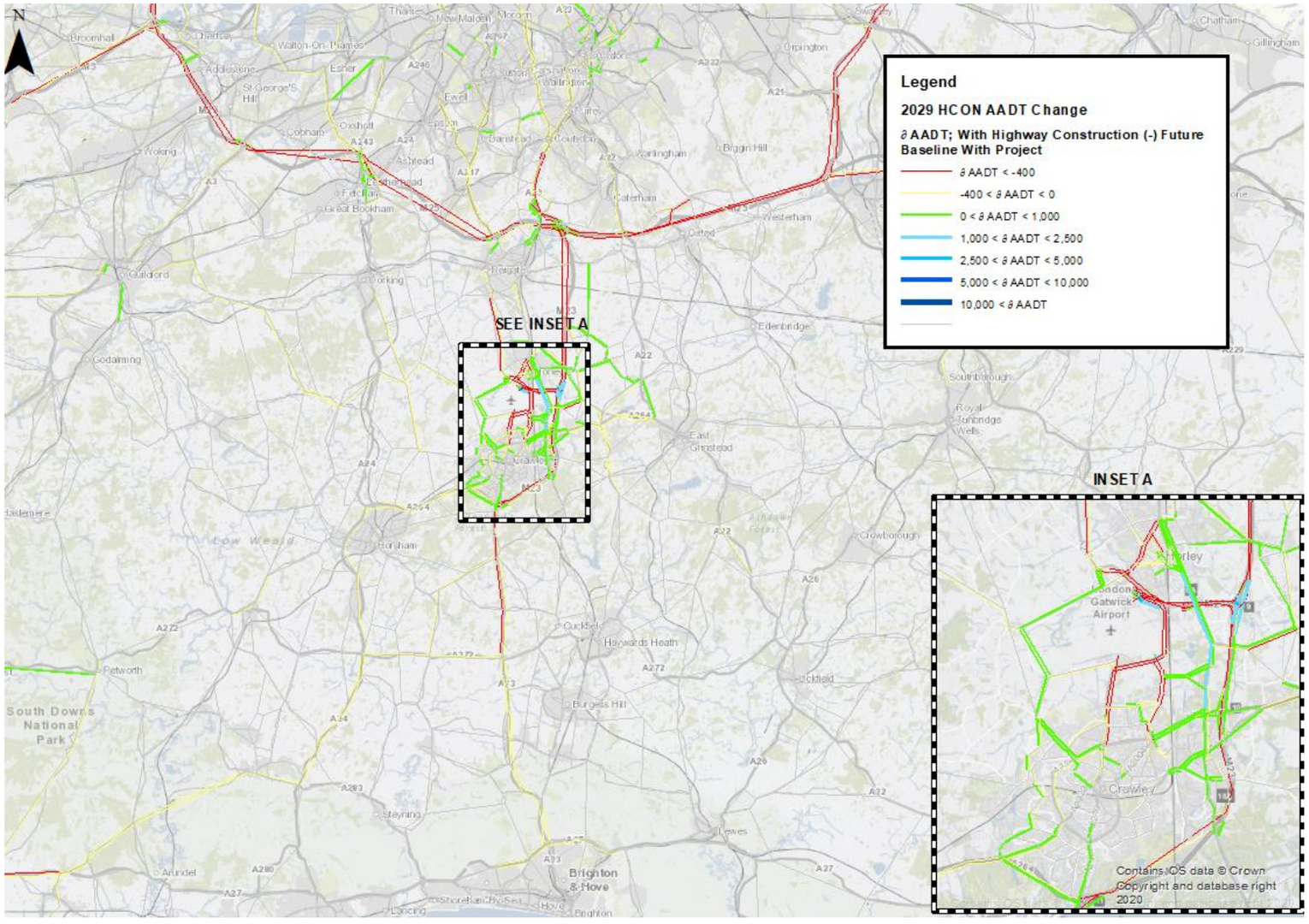
14.6.27 Accordingly, strategic modelling has tested the most conservative construction phase against winter Airport traffic assuming 2029 with Project demand, ie assuming the Northern Runway is open, to provide a robust assessment of potential construction impacts with additional demand generated by increased runway capacity.

14.6.28 Traffic flows on a peak Friday in winter are 72% of those of a peak summer day, reflecting that this is a quieter period at the Airport and therefore when it would make the most sense to sequence the more complex phases of highway construction at this time.

14.6.29 Modelling of this scenario shows reassignment of traffic owing to the temporary highway works on the M23 Spur, as per Diagram 14.6.2. The links shown in red indicate a reduction in traffic. It can be seen that traffic reduces on the M23 Spur, this being background traffic not needing to access the Airport, seeking alternative routes. The works also impact on traffic levels on the M23 itself with reductions also shown by the model on the motorway. M23 Junction 9 shows an increase in traffic flows related to right-turning into the Airport being forbidden during this construction phase and therefore traffic from the west heading to South Terminal having to u-turn at Junction 9.

14.6.30 The modelling shows increases on highway or road links shown in green and blue. Notable changes include north-south traffic between Horley and Crawley rerouting via Balcombe Road as well as some traffic taking a route on the west side of the Airport from Ifield Avenue in Crawley via Bonnets Lane, Lowfield Heath Road, Horley Road and Charlwood Road and into Horley via Povey Cross.

Diagram 14.6.2: Reassignment of Traffic during Highway Construction



14.6.31 It should be noted that flows are shown as Annual Average Daily Traffic, equivalent to average 24 hour flows. As such, where red is shown, traffic flow has reduced by 400 AADT or more, which is equivalent to a reduction of 17 vehicles or more per hour on average on those roads. Green shows increases of between 0 and 1000 AADT, which is equivalent to between 42 more vehicles per hour on average on those roads. These changes are therefore relatively small, less than one vehicle per minute, which is reflected in changes in junction performance.

14.6.32 In general, temporary capacity issues at junctions are only observed on the SRN where works are taking place or at junctions on Airport. Minor changes in capacity are shown in Redhill and Copthorne owing to some local traffic reassignment in the model.

Diagram 0.1: Junction Analysis during Highway Construction

14.6.33 At this stage, the effects associated with highway networks, such as potential congestion and traffic reassignment, are preliminary as construction sequencing has not been fully developed or agreed with Highways England.

15 Freight, Cargo and Logistics

15.1 Definition of Freight Movements

15.1.1 At Gatwick, there are four types of goods vehicle movements, as described below.

- Air cargo: movements related to shipments that have been brought in or will be taken away by air, typically in the belly of passenger aircraft.
- Logistics: movements that relate to goods delivered to businesses that operate on airport, including retailers, food and beverage outlets and catering. The reverse flow of waste away is also included in logistics movements.
- Airline servicing: movements related to inflight catering, including movements to the consolidation centre near Perimeter Road South, as well as those between the consolidation centre and the aircraft.
- Airport servicing: movements related to construction and maintenance on the airport estate.

15.1.2 Each of these movements occurs in a different area of the airport.

- Air cargo and logistics are handled in the cargo area north of the airfield and west of North Terminal.
- Waste consolidation occurs south of the cargo area along Larkins Road.
- Airline servicing is based south of the airfield in the Gatwick Gate Industrial Estate.
- Airport servicing originates from both north and south of the airfield, depending on the type of activity.

15.1.3 This section describes these different types of traffic, their activity within each freight zone and impact on the road network. For the purposes of the assessment, freight traffic comprises Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs).

15.2 Air Cargo

Current demand and future growth

15.2.1 In 2019, Gatwick handled over 150,000 tonnes of cargo driven by additional long-haul services. A high proportion of Gatwick's cargo traffic involves non-EU markets and most of this cargo is carried by passenger aircraft in the form of belly cargo. This is expected to continue into the future.

15.2.2 Gatwick's cargo volumes are forecast to grow to over 229,000 tonnes by 2047 in the baseline and to over 303,000 tonnes with the Project.

15.2.3 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.

Cargo Handling Area

15.2.4 The Cargo facility covers an area of 10 hectares. This is made up of 23,000 m² of cargo sheds, plus office accommodation, areas for HGV loading, unloading and parking, and open equipment parking areas.

15.2.5 The cargo sheds are owned by a third party with a long-term ground lease. Gatwick has no direct commercial involvement with the cargo operation, although GAL manages the Border Inspection Post located there. The inspection post is used for temporary storage, inspection and clearance of live animals and foodstuffs.

15.2.6 The Gatwick Direct logistics operation run by DHL, consolidates deliveries and some of the waste collection operation, is also located in part of the cargo building (see Section 15.3).

15.2.7 In the mid-2000s, the cargo area handled 300,000 tonnes of air freight annually. Therefore, it is envisaged the return to these historic air cargo levels by 2047 can be accommodated within the existing air cargo area.

15.2.8 The cargo area is shown in Diagram 15.2.1. Access is via the North Terminal roundabout. The Project envisages reconfiguring this junction to provide additional capacity. Longbridge roundabout will also be upgraded as part of the Project. These enhancements and their performance are discussed in more detail in Sections 9 and 11.

Current Cargo Traffic

15.2.9 When considering cargo growth into the future, the following can be inferred from current operations.

- Landside vehicle movements related to air cargo tend to be outside typical commuter peak periods.
- The last decade has witnessed an increase in consolidation with fewer but larger shipments on heavier vehicles, such as typical 30 tonne HGVs.
- The number of cargo vehicles is typically low when compared against other vehicle movements to and from Gatwick. Cargo handlers typically expect a maximum of between 50 and 60 LGVs and HGVs per day.

15.2.10 Data from August 2019 shows an average two vehicles per hour (55 across the day) into Dnata's area of the cargo centre. Whilst there is no current data for Royal Mail, WFS movements and other cargo movements, it is estimated that a maximum of five vehicles of varying size arrive at the cargo centre in any given hour currently. When compared to traffic on the highway network around the Airport, this is a very low level of vehicle activity.

Diagram 15.2.1: Location and scale of cargo and freight facilities

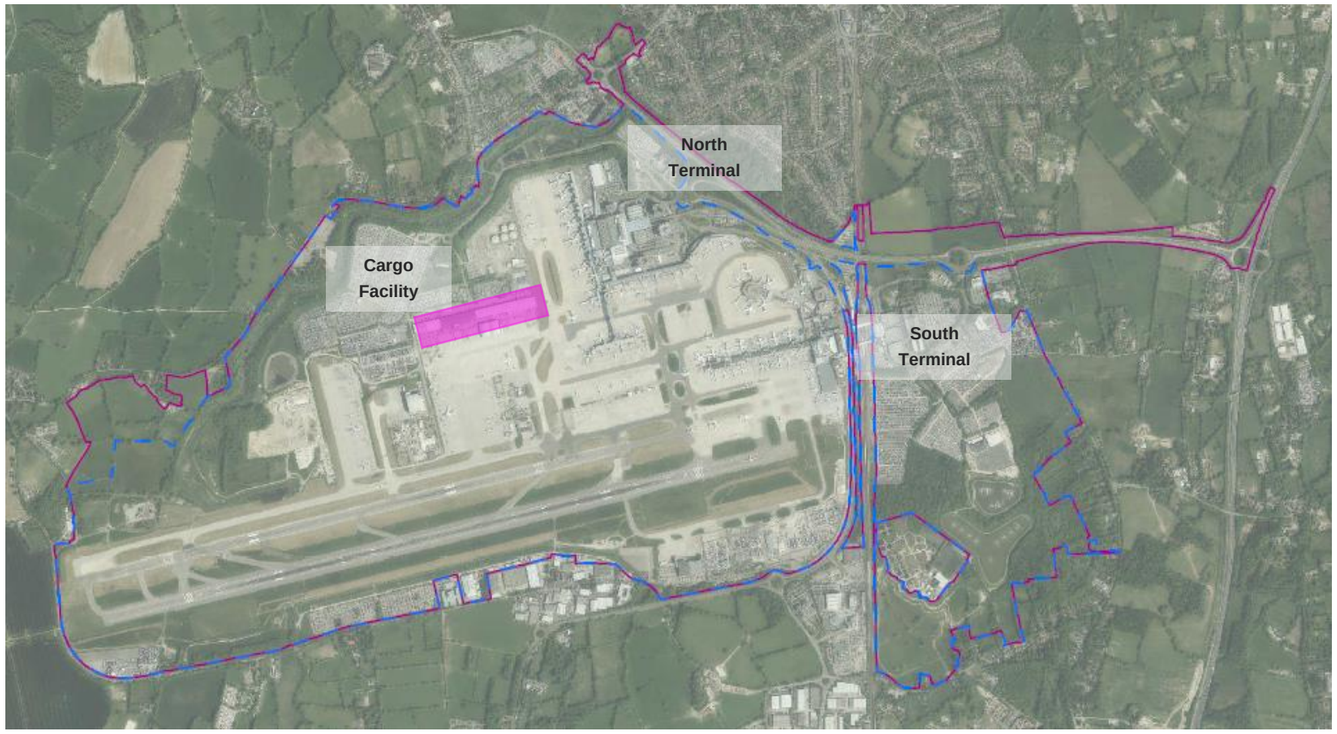


Diagram 15.2.2: Cargo Facility during Commuter Peak Period – Low Activity

15.3 Logistics

Gatwick Direct

15.3.1 Gatwick Direct is a consolidation centre, which opened in November 2013, for the handling of consumer goods that are sold by retail concessionaires in the terminal buildings. This is a fully secure operation, controlled by Gatwick security and with CCTV throughout, but operated by DHL.

15.3.2 The Gatwick Direct facility is located at the eastern end of the cargo facility. There is an airside / landside boundary that runs through the Gatwick Direct warehouse, with screening being conducted through a security fence from one side of the building to the other.

15.3.3 All vehicles arriving at Gatwick Direct must have an online, system-generated valid booking reference with a specific timed delivery. This allows DHL to manage incoming flows to suit operations and / or peak traffic hours on road networks. Vehicles are directed to specific loading bays by the booking reference.

15.3.4 When goods arrive, they are unloaded against the booking-in information and marshalled prior to being screened through the control point (CP) fence. Gatwick has introduced paying for screening, the cost of which is invoiced to Gatwick Direct users.

15.3.5 The major benefits to concessionaires are in time-saving and potentially stockroom savings, therefore cost reduction. Moreover, there is no need to have airside passes/training for staff. The benefit to Gatwick is that fewer vehicles are allowed, or need to pass, airside.

15.3.6 The service has reduced airside vehicle traffic, and through managed deliveries and increased volumes should help to reduce landside vehicles and spread the deliveries over non-peak hours. Both will be of benefit for the access strategy for Gatwick.

15.3.7 Gatwick Direct therefore brings advantages in terms of efficiency and security, but importantly for the road network, also in terms of potential consolidation and a reduction in vehicle movements.

15.3.8 Data from August 2019 shows an average four vehicles per hour (84 across the day) from 350 different suppliers into the Gatwick Direct area managed by DHL. 50% of vehicles entered between 05:00-12:00, peaking at 05:00-06:00 and 10:00-11:00, with peak hour arrivals up to 7 vehicles. 46% of all vehicles booked in by DHL were LGVs, with most arrivals through the morning and middle of the day. On average, two HGVs arrived per hour across the day. Again, these numbers are not significant compared to flows on the wider network.

Waste

15.3.9 There are three groups of waste movements: Gatwick airside, Gatwick landside and third party. Data from October 2019 shows an average one vehicle per hour (16 across the day) into the waste centre.

15.4 Airline Servicing

15.4.1 Airline servicing includes provision of fuel, catering and other services.

15.4.2 At this stage, data on tanker trips to / from the fuel farm from outside the airport are still being analysed. This is also true of supplier trips to / from the catering consolidation centre from outside the airport.

15.4.3 This data will be included in the strategic modelling when available.

15.5 Airport Servicing

15.5.1 Airport servicing includes movements by construction, facilities maintenance, air traffic control and other services.

15.5.2 Data exists for business-as-usual construction traffic and this data will be used to inform baseline construction and maintenance and activity in terms of number of vehicles as compared to capital expenditure of works.

15.6 Conclusions

15.6.1 Strategic highway modelling of future highway network around the Airport, including air cargo and logistics activities, is described in Section 10, with more localised capacity modelling of junctions around the Airport described in Section 11. These models include the main access points to the Gatwick Airport site from the wider road network for cargo and logistics vehicles.

16 Catchment Areas

16.1.1 Surface access connectivity is important in terms of widening and spreading the benefits of air traffic growth across the South-East and the rest of the UK. This section sets out the extent of Gatwick Airport's catchment.

16.1.2 This section is supported by GIS mapping, provided in Annex A, which reflects the journey times and accessibility of transport services from parts of the UK as well as proximity and ease of access to Gatwick. In particular, it provides specific "quality of life" analysis of:

- the geographical proximity of Gatwick in 5 mile, 10 mile, 25 mile and under 50 mile catchments; and
- the surface access journey time proximity to Gatwick at less than 30 minutes, less than one hour, less than two hours and less than four hours.

16.2 Current Catchment

16.2.1 In terms of catchment and based on the current geographical location of population, the number of people living in 5 mile, 10 mile, 25 mile and 50 mile catchments from Gatwick is as follows:

- 170,000 people between 0 and 5 miles.
- 248,000 people between 5 and 10 miles, equivalent to 418,000 between 0 and 10 miles of the airport.
- 5.662 million people within 10 and 25 miles, equivalent to 5.910 million between 0 and 25 miles of the airport.
- 11.193 million people within 25 and 50 miles, equivalent to 16.855 million people within 0 and 50 miles of the airport.

16.3 Current Journey Times (All Modes)

16.3.1 In terms of current journey times across all modes, the number of people between 0 and 4 hours from Gatwick is as follows:

- 494,000 people between 0 and 30 minutes.
- 4.259 million people between 30 and 60 minutes, equivalent to 4.75 million within 0 to 60 minutes from the airport.
- 8.831 million people between 60 and 90 minutes, equivalent to 13.584 million people within 0 and 90 minutes from the airport.
- 7.574 people within 90 and 120 minutes, equivalent to 21.158 million persons within 0 and 120 minutes of the airport.
- 25.538 million people within 120 and 240 minutes, equivalent to 46.696 million people within 0 to 120 minutes from the airport.

17 Resiliency and Reliability of Transportation Networks

17.1.1 Gatwick currently has a 24/7 surface transport operational response team to enable it to react and respond to incidents or accidents at the airport, as well as on transport networks approaching the airport.

17.1.2 Gatwick is the only UK airport to still have this type of team with other airports having disbanded their teams and passed responsibility to other agencies.

17.1.3 The role of the operational response team is to make sure everything runs smoothly. This includes managing and inspecting the road network and using established safety techniques to monitor, analyse and prevent accidents. In addition, Gatwick's team is also equipped with a snow fleet to clear roads in winter conditions as well as flooding kits, in order to be able to respond to extreme wet weather events.

17.1.4 Gatwick has implemented joined-up rail contingency planning with Network Rail, relevant Train Operating Companies and Transport for London. This aligned thinking and coordinated response has been clearly demonstrated during planned closures, as described in Section 17.2.

17.1.5 The safety response to accidents and incidents on the road network is governed principally by Highways Regulations. Gatwick's approach is to have a comprehensive strategy to manage these risks, based on leadership and behaviours, effective management systems, assurance systems and performance management. In addition, protocols are in place with key stakeholders and agencies, including West Sussex Police, to deliver a rapid and coordinated response.

17.2 Resilience and Reliability of the Rail Network

Configuration of the Network

17.2.1 The Brighton-London main line is one of the busiest railway lines in the country, and therefore the performance and resilience of this part of the network is important to the whole of the south of England.

17.2.2 It is important to note that the Brighton-London main line is not a single corridor, it has a number of built-in diversionary routes, which increase its resilience.

- North of Gatwick there are two independent routes as far as Purley, known as the Quarry Line and the Redhill line.
- Beyond East Croydon there are three independent routes to London termini, again able to be used to divert services when necessary.
- From South Croydon, there are five tracks to provide additional 'tidal flow' capability.
- A completely independent route to London is also available via Horsham and Epsom.
- In times of operational disruption, all trains from Gatwick can use any route to London.
- There is also scope to turn trains back at Three Bridges helped by one of the Thameslink depots being there.

Investment in capacity and asset resilience

17.2.3 The Network Rail Sussex Area Route Study, published in 2015, identifies the long-term strategy for the Sussex Route, particularly in terms of enhancing capacity to meet forecast traffic growth through projects such as the Thameslink Programme, whilst also considering the need for a renewal programme to address sustainability, resilience and asset performance along the Brighton-London main line. The Plan recognises that there is a balance required between increasing capacity and improving reliability through planned upgrades.

17.2.4 Data collected by Network Rail shows that passenger numbers on the line have more than doubled since the year 2000, with around 300,000 people using the route each day. This means busier services and more crowded trains in peak periods, particularly north of Croydon.

17.2.5 As described in Section 7, a major infrastructure proposal exists to eliminate bottlenecks in the Croydon and Windmill Bridge area to release more train paths that can be used to run additional train services to reduce crowding and support future growth.

17.2.6 In addition, removing the bottlenecks on the line will provide greater resilience. At the moment, these bottlenecks *'magnify the impact of even the most minor incident or delay along the line, making it much harder to get trains back on time when things go wrong'.* (Network Rail, 2018)

17.2.7 Accordingly, passengers on the Brighton-London main line are more likely to experience 60% more knock-on delay when an incident occurs when compared to the South West Main Line. The South West Main Line is a useful comparator as it has similar passenger numbers and train service frequencies as the Brighton-London main line.

17.2.8 In addition to major investment, Network Rail has also been carrying out a progressive series of renewals and repairs to improve reliability and performance on the Brighton-London main line, including a major 9-day closure in February 2019 and an additional series of weekend closures around it.

17.2.9 The focus of these improvements has been towards the southern end of the line between Three Bridges and Brighton / Lewes, with engineering work to repair bridges and tunnels, improve drainage, as well as replace or upgrade power supply, points, signals and track. The works have included the railway itself as well as the Victorian-era tunnels at Balcombe, Clayton, Haywards Heath and Patcham.

17.2.10 The main works undertaken during the 9-day closure related to renewal of the Balcombe Tunnel Junction along with upgrades to lineside signalling and power systems between Haywards Heath and Preston Park. The Brighton-London main line was closed south of Gatwick Airport and the airport played its part in supporting this coordinated operation, providing pre-booked car parking for those who wished to park and ride on train services north of the Airport. Direct trains to London Victoria continued to operate every 30 minutes from Gatwick Airport but on a diversionary route via Horsham.

17.2.11 In total, more than 36,000 hours of work were carried out which Network Rail estimated as being the equivalent of 79 separate weekend closures.

17.2.12 Separate weekend closures were also carried out, with works including ballast cleaning, signal upgrades, improved track formation (Preston Park Station), rerailing through Keymer level crossing and deep cleaning of track and other infrastructure (Wivelsfield Station).

17.2.13 The works described above represent £67 million in upgrades to the Brighton-London main line corridor which will improve reliability along the line. In addition, north of London, engineering works on the East Coast Main Line will significantly improve reliability for all operators, including Great Northern and Thameslink.

Service reliability

17.2.14 Gatwick has one of the widest ranges of through train destinations of any station in the south of England, which makes it an ideal transport hub with a number of alternative routes, including two to London in terms of Victoria and London Bridge. In particular, the improvement works related to the Thameslink

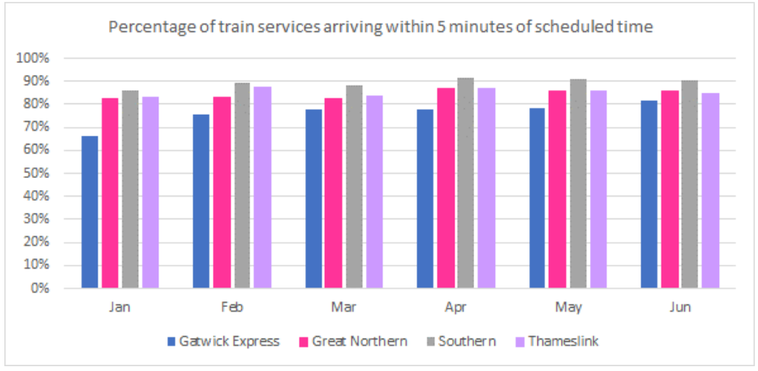
Programme, including redevelopment of London Bridge station, means reduced dependency of Gatwick services on the London Victoria route and a robust second connection to central London via Thameslink. There are also turnback facilities at London Bridge and Blackfriars for Thameslink services.

17.2.15 As such, the very busyness of the Brighton-London main line provides the service resilience required to accommodate airport expansion.

17.2.16 In 2015, Network Rail noted the *'exceptional level of connectivity'* from Gatwick Airport, leading *'the Route Study to conclude that on the Brighton Main Line there is no specific connectivity gap to/from London at Gatwick Airport'* (Network Rail, 2015).

17.2.17 Diagram 17.2.1 shows the percentage of trains arriving at destination within five minutes of scheduled time for the first 6 months of 2019 for the four train services. Punctuality in June 2019 was 80% or above on all services. Punctuality information from 2020/21 has not been reported here owing to the passenger impact of Covid.

Diagram 17.2.1: Percentage of train services arriving within 5 minutes of scheduled time (January to June 2019)



Relationship with the Train Operating Companies

17.2.18 Overall communications between Gatwick and the Train Operating Companies (TOCs) are strong, with joint ownership of issues and contingency response, such that both parties work to resolve incidents jointly using consistent passenger communications.

17.2.19 Govia Thameslink Railway (GTR) works very closely with Network Rail and operates a joint Regional Operations Centre at Three Bridges, which now controls all trains on the network, with staff working alongside each other and taking joint operational decisions.

17.2.20 The Regional Operations Centre (ROC), essentially the main control centre, for the whole Thameslink franchise is located less than a mile from Gatwick at Three Bridges. This includes a new signalling facility which will eventually control most of the railway across Sussex and Surrey, as one of 12 similar facilities planned to operate the entire rail network across the UK. From this centre, Network Rail can work with operators on emergency response planning and keep the maximum capacity available for as much time as possible. The proximity to the airport facilitates a close operational relationship between Gatwick, GTR and Network Rail.

17.2.21 The management approach based on the new ROC extends to the way in which communication systems help a more effective response to different factors affecting the railway, including:

- power supply interruptions;
- critical and seasonal weather;
- network maintenance plans; and
- renewals and replacement programmes.

Summary

17.2.22 The following provides a summary for rail.

- Gatwick has one of the widest ranges of through train destinations of any station in the south of England, which makes it an ideal transport hub with a number of alternative routes, including two to London in terms of Victoria and London Bridge.
- Significant investment is going into the Brighton-London main line to increase capacity and reliability.
- The very busyness of the Brighton-London main line provides the service resilience required to accommodate airport expansion.
- Gatwick works closely with TOCs to provide a coordinated response to incidents, supported by the Thameslink ROC, essentially the main control centre, for the whole franchise being located less than a mile from Gatwick at Three Bridges.

17.3 Resilience and Reliability of the Highways Network

Configuration of the Network

17.3.1 Gatwick is well connected to the strategic highway network with direct access from the M23. Junction 9 of the M23 is the main access point with an onward link of dual carriageway motorway standard road to Junction 9a at the airport's South Terminal roundabout. The M23 provides strategic access to the M25 (Junction 7).

17.3.2 There are a number of parallel routes between Gatwick and the M25 that can provide alternatives to the M23 in the event of a major incident and absorb a large volume of traffic. The A23 provides an alternative highway access and links the airport with Crawley and other nearby towns.

17.3.3 In addition, whilst not the preferred routing, access to the Airport can also occur via Junction 10 of the M23.

Investment in Capacity and Asset Resilience

17.3.4 Highways England recognises that the M23 is a crucial part of the UK strategic road network connecting Crawley and Gatwick Airport to the M25 motorway, routes into London and the rest of the UK. This stretch of the M23 is heavily used by traffic travelling to and from Gatwick Airport and between Brighton and London, especially in peak hours as well as during UK holiday periods. As a result, safety, congestion and journey times are all key issues that need to be considered.

17.3.5 Highways England's M23 Smart Motorway project therefore aims to:

- reduce congestion by smoothing the flow of traffic to improve journey times and make them more reliable;
- facilitate economic growth within the region, by providing much-needed capacity on the motorway; and
- maximise motorway capacity while maintaining safety.

17.3.6 The Smart Motorways scheme has enabled proactive management of the M23 carriageway, including the link roads from/to the M25 at Junction 8, Junction 9 and the Spur to Gatwick Airport, as well as Junction 10. The scheme includes:

- converting the hard shoulder to create a permanent fourth lane between Junctions 8 and 10;
- converting the westbound hard shoulder along the Spur to Gatwick Airport (towards Junction 9a) to create three permanent lanes;
- redefined junction layouts to accommodate the fourth lane - in particular a dedicated northbound slip road before Junction 9 to minimise congestion as traffic leaves the motorway and heads towards Gatwick Airport;

- new gantries with variable message signs, providing drivers with better information;
- installing new electronic information signs, signals and CCTV cameras - these will be used to vary speed limits and manage traffic flow and incidents;
- installing 12 emergency areas to use in place of the hard shoulder which include emergency roadside telephones and CCTV cameras to improve emergency service response times;
- improving the central reserve and adding a reinforced barrier to improve safety;
- adding new noise barriers in built up areas; and
- creating a new emergency turn-around facility at Coopers Hill Road to minimise response times to incidents.

17.3.7 The project was completed in 2020, and the additional running lane in each direction adds capacity and resilience to the strategic network serving Gatwick Airport at peak times. Dynamic signage should improve reliability and improve information provision and management of incidents.

17.3.8 Highways England is committed to improving conditions on the M25, through a variety of committed enhancements as well as the M25 South West Quadrant study, which is looking at ways to enhance capacity from Junctions 7 (for the M23) to 16 (for the M40).

17.3.9 Highways England's "M25 South West Quadrant Strategic Study, Stage 3 Report" (Highways England, 2017) recognised that this is the busiest section of road in the country. The evidence gathered to date suggests that directly adding capacity to the M25 (beyond what is already committed in the first Road Investment Strategy) is technically challenging and would have significant effects on surrounding communities.

17.3.10 The study recommends that the focus of future work should not be on widening the existing road. Instead, attention should be given to how to reduce pressures and provide parallel capacity to relieve the motorway network. This should work first to find alternatives to travel, or to move traffic to more sustainable modes. The volume of travel would mean that road enhancements are also likely to be needed.

Service Reliability

17.3.11 Highways England published the "London Orbital and M23 to Gatwick Route Strategy" in March 2017 (Highways England, 2017). Route Strategies provide a high-level view of the current performance of the strategic road network as well as issues perceived by our stakeholders that affect the network.

17.3.12 The report recognises that an essential facet of a resilient road network is the ability to effectively divert traffic away from closed carriageways in the event of an unplanned incident. Within proximity of Gatwick Airport, the A23 south, together with the A2011 and A265 east, is identified as being part of the diversionary route network.

17.3.13 There are a number of alternative A standard routes that run parallel along the M23 corridor including the A23, A217, A264 / A22 and A24 which can act as diversionary routes.

Relationship with the Highway Authorities

17.3.14 Gatwick has a strong working relationship with West Sussex and Surrey County Councils, Highways England and West Sussex Police. Incidents are resolved as quickly as possible using protocols in place with key stakeholders and agencies to deliver a rapid and coordinated response.

18 Impacts of Future Transport Trends

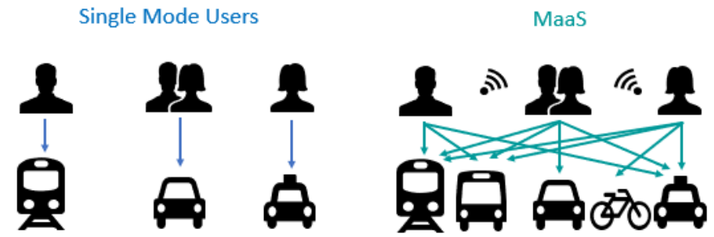
18.1 Mobility-as-a-Service

18.1.1 Mobility-as-a-Service, sometimes referenced as MaaS, reflects a move towards buying transport as a service and therefore travellers having access to up-to-date information to enable them to choose from a range of transport providers and modes for any specific journey. It implies a change in the way people buy mobility with more shared services and a move away from car ownership.

18.1.2 To support these changes, Gatwick is considering ways to develop an integrated travel planning tool, either hosted on or directed via the Airport's website and accessible on a mobile device through an app.

18.1.3 Using this app, passengers, customers and employees will be able to choose across a range of surface transport modes weighing up next available service, frequency of service and cost in one integrated platform.

Diagram 18.1.1: Single mode or Mobility-as-a-Service



18.1.4 The benefit to passengers is that they are able to assess the most appropriate mode for their journey, augmented by real-time information on fares, journey time, delays and incidents.

18.1.5 The benefit for transport operators is that it creates a transparent platform enabling more sustainable mode choices driven by greater awareness and certainty of available public transport options.

18.1.6 Challenges to Mobility-as-a-Service include the need to integrate data from multiple stakeholders in single user friendly platform. Also, as demonstrated by the success of private hire services such as Uber and Lyft, MaaS may simply shift some car users into a different type of car rather than onto public transport. However, some operators, such as BlueCity, which operated from Gatwick before Covid-19, are 100% electric and thus provide improved sustainability.

18.1.7 The effectiveness of Mobility-as-a-Service for Gatwick in the context of the Project needs further exploration as part of developing the DCO and is not included in the PEIR assessment.

18.2 Electric Vehicles (EVs) and Zero Emission Vehicles (ZEVs)

18.2.1 Alternative fuel platforms, such as electric vehicles (EVs), offer a potential pathway for reducing additional carbon and air pollutant emissions associated with increased airport traffic. The strong growth anticipated in the EV market also could also result in additional demand for EV charging at the airport more generally, which will need to be considered as part of the airport's overall parking and sustainability strategy.

Electric Vehicles in the UK

18.2.2 At the end of 2018, there were just over 184,000 EVs in the UK. While this represents a small fraction of the vehicle fleet in the UK (around 0.5%), market growth is strong.

18.2.3 The primary types of electric vehicles operating in the UK are plug-in hybrid (PHEVs) and pure, battery electric vehicles (BEVs). Historically, most EVs sold in the UK have been PHEVs, which make up nearly two thirds of the EV fleet while BEVs comprised around a third. The small remainder of the market is comprised of range extended and hydrogen fuel cell vehicles.

18.2.4 Although PHEV vehicles have been a prominent feature of the early technology cycle for EVs, they are widely seen as a steppingstone in a transition to fully electric vehicles. Recently, PHEVs were excluded from government grants programs for low-emission vehicles, which resulted in 34% drop in sales (Autocar, 2019). At the same time, improvements to battery technology resulting in improved vehicle range, wider availability of charging infrastructure, and development of rapid charging networks are also increasing consumer acceptance of 100% battery electric vehicles.

18.2.5 EV batteries are charged by plugging the vehicle into a charge point. A spectrum of alternating and direct current (AC and DC) charging infrastructure exists, which may be characterised as slow to rapid charging. Power is measured in kW and the greater the power supplied by charge point, the faster the battery will charge. While larger batteries usually supply greater range – the same way a larger petrol tank would – they also take longer to reach a full state of charge.

18.2.6 Depending on the vehicle and type of charging infrastructure used, current vehicles may take up to 8 hours to reach a full state of charge from empty. However, fast and rapid charging infrastructure is increasingly available. A 50kw DC rapid-charge point can recharge 80% of a typical vehicle's capacity in less than 1 hour. The following table provides an overview of charging equipment. The total time required to charge an EV varies both by battery capacity and the on-board charging equipment – which receives and manages the supplied load.

Table 18.2.1: Electric Vehicle Charging Infrastructure Levels

Type	Power Supplied	Charge Time	Typical Application
Slow	3 kW AC	6 - 12 hours	Overnight home charging
Fast	7 kW -22 kW AC	3 - 4 hours	Workplace charging; public charging
Rapid	> 50 kW DC	80% charge in 30 - 60 minutes	Fuel stations; public charging; taxi ranks

Source: www.zap-map.com

18.2.7 Industry continues to invest in improving charging infrastructure to provide consumers with an experience in line with traditional petrol stations. Ultra-rapid chargers, with power levels between 150 and 350 kW could provide compatible vehicles with well over 200 miles of range in about 10 minutes (Current News, 2019).

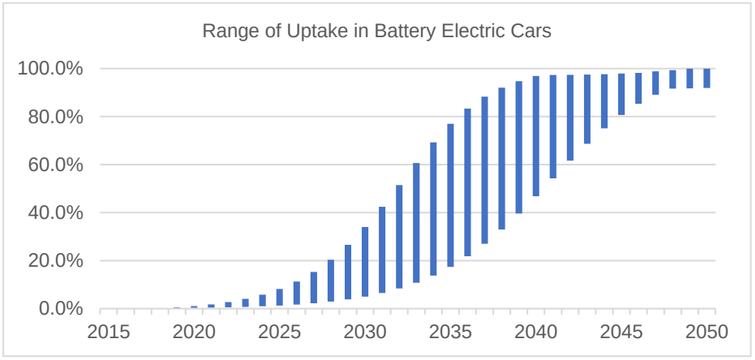
EV market forecasts

18.2.8 National Grid's annual Future Energy Scenarios publication provides scenario-based forecasts of EV uptake throughout the UK (National Grid, 2019). These forecasts provide a reasonable estimate of the potential growth in the EV market out to 2050. They are based on varied assumptions regarding government policy and technological advancement, including Net Zero by 2050.

18.2.9 In all scenarios, it is anticipated that most vehicles sold in the future will be fully battery electric, with the speed of transition varying between scenarios. By 2050, it is envisaged that battery electric cars and vans will comprise 80 to 90% of all vehicles on UK roads.

18.2.10 Those passengers and staff who continue to drive to Gatwick in the future will transition to electric vehicles faster than most other vehicle types. The chart below presents the range (low to high) of BEV uptake amongst cars only. The ranges begin to converge in late 2040s indicating relative confidence in long term market for EVs, with a much greater bandwidth in the 2020s and 2030s.

Diagram 18.2.1: National Grid, Battery Electric Car Scenarios (2015-2050)



Source: FES 2019

18.2.11 While the ranges above are large, the direction is clear that, within the next 10 years, several thousand cars parked at Gatwick Airport at any given time are likely to be EVs.

General planning considerations

18.2.12 In the context of tens of thousands of EVs at the Airport in the next 20 years, developing a sensible and appropriate strategy to accommodate this increased in EV activity is important for the DCO and for the Project ASAS.

18.2.13 That said, it is unlikely that most EVs will require on-airport charging. Overnight, home-based charging is likely to remain the most prevalent behaviour short-term and the growth and spread of EV infrastructure in local areas surrounding the Airport will play a part in reducing the need for lots of charging activity on Airport.

18.2.14 Increasing vehicle range is also an important factor in determining the overall charging demand for airport users. Ranges of up to 200 to 500 km (125 to 315 miles) are typical of the current generation of EVs, with premium vehicles such as the Tesla Model S reaching ranges of up to 500 km (315 miles).[5] Even as driving range improves, the current ranges are high enough to support a return journey from home to the Airport for all staff and a large proportion of Gatwick passengers.

[5] Analysis of popular vehicles on ev-database.co.uk. Ranges vary by driving conditions and weather and is highest in urban areas and in mild temperatures.

18.2.15 For those users who do require a charge or top-off while at the airport, several models of infrastructure delivery could be deployed. Each has advantages and disadvantages and a comprehensive strategy is likely to rely on elements of each. These include:

- Distributed slow charging – a large, distributed network of low-power charge points deployed across parking facilities, typically serving only one parking space. This model is employed at Oslo airport, which features over 700 chargers in two passenger parking facilities. Whilst comparatively easy to provide, this method can be relatively inefficient with low-utilisation per space, eg an air passenger taking a two week trip may only require the use of the charger for a small portion of their overall parking duration but remain parked at that space for the entirety of their trip.
- Valet model – Under a valet model, a parking attendant would be able to move multiple vehicles each day and charge them on the same charge points. Passengers or staff would leave their car with the attendant, who would fuel the vehicle at a charging hub prior to parking it at a designated location (or prior to collection). Chargers could be fast to rapid. An alternative to this model could employ mobile charging units, which have been developed by several companies. This model, which is actively managed, requires less infrastructure to charge the same number of vehicles and could be offered as a premium parking product. The process could also be automated using robot technology.
- Rapid charging hub –Charging hubs would feature clusters of rapid and ultrarapid chargers, likely en-route from parking locations to the airport exit, or within the airport's immediate surrounds. These locations would be comparable to a conventional petrol station, providing an opportunity for EV drivers to "fuel" before leaving the airport. This model establishes confidence among EV owners that their vehicle can be charged as needed. 50 kW rapid charge points could replete the bulk of an EVs battery capacity in about 30 minutes. Use could be time limited to manage demand and queuing and to encourage turnover, maximising the use available infrastructure.

Considerations for specific airport users

18.2.16 Gatwick will be able to influence different airport users to varying degrees, as follows:

- Airport passengers – the largest user group but the one that Gatwick Airport has least direct influence over in terms of uptake of EVs. The average consumers' decision to purchase an EV rather than a conventional vehicle depends on government incentives, lifestyle factors, and the availability of convenient charging infrastructure to serve their daily needs. Nonetheless, Gatwick could support those passengers that do own EVs by providing sufficient, flexible charging options for those drivers that require it.
- Airport staff – Gatwick has much more influence over airport staff choices. A variety of incentive programs could be developed for those choosing to drive electric cars. However, any incentives should avoid encouraging driving EVs rather than using other sustainable modes.
- Taxis and private hire vehicles – Gatwick's official taxi operator already uses an electric fleet (see below). Gatwick does not have direct influence over other taxi operators or private-hire vehicle companies. However, Gatwick can support operators and government initiatives to transition to electric fleet.
- Buses and coaches – Gatwick can influence certain bus operations directly, such as long-stay car park buses, and has some influence over third party providers in terms of a transition to electric buses and coaches. The only existing electric buses operating at the Airport today are hydrogen powered and are fuelled off Airport (see below).
- Freight – Gatwick has a high level of influence over its own supply chains, but less so for the delivery of goods to other on Airport businesses. Businesses operating on Airport can be incentivised to choose sustainable suppliers and Gatwick itself could facilitate identification of suppliers for airport businesses.

Current EV infrastructure and Initiatives at Gatwick

18.2.17 Gatwick currently has several initiatives to promote the use of EVs at the Airport.

Charging Network

18.2.18 For passenger convenience, Gatwick has installed two EV chargers at short stay car parks at both North and South Terminals (four in total). These 22 kW AC fast chargers each feature two connections and are operated as part of the national PodPoint charging network. While previously free to use, the airport now charges an energy tariff of £0.22 per kWh – a cost of under £10 to fully charge a typical electric vehicle with a 40 kWh battery. Charge time will vary by vehicle capability at these locations, ranging from about two to six hours for a full charge. While PodPoint does not require a membership to use its network of chargers, users must download their smartphone app to use the equipment.

18.2.19 In addition to PodPoint chargers, Gatwick has installed an additional 28 vehicles chargers. These primarily serve airport vehicles and are located at the fleet vehicle campus and public short stay car parks (Advance, 2019).

BlueCity Electric Car Club

18.2.20 Gatwick partnered with BlueCity to expand its London-based car club to the airport. The company used three-door, four-seater electric vehicles manufactured by Bollore with a range of about 200 km (125 miles). Space for 10 vehicles were dedicated on the upper forecourt of South Terminal, directly in front of the short stay car parks with dedicated charge points. These vehicles were available for trips to and from London. Access to vehicles requires membership in the car club (£5 per month). Vehicles were rented at a fee of £0.19 per minute, fully inclusive, with a £8.50 surcharge for trips to and from Gatwick.

Electric Taxis

18.2.21 Beginning in 2016, Gatwick partnered with its official taxi operator to transition their fleet to electric and hybrid vehicles. All vehicles will transition to electric platforms from 2020 and will operate in emissions free mode within 10 km from the airport (Gatwick Airport Ltd, 2019).

Hydrogen Buses

18.2.22 Gatwick has partnered with MetroBus to support innovative trials for hydrogen fuel cell (HFC) electric buses on its network. In 2018, MetroBus introduced the region's first HFC bus on the Fastway 100 route. The company has plans to procure a total of 20 fuel cell buses with the intention of operating these on its network serving the Airport. Gatwick's support has included funding for upgrades at the Manor Royal bus depot that will support the zero-emission fleet.

Electric Forecourt

18.2.23 In collaboration with Gridserve Gatwick is currently investigating the feasibility of an electric forecourt, equivalent to a petrol station, on Airport, with charging points for 36 EVs. Initial plans include provision of fast and rapid charging infrastructure, with co-located retail and amenities, and additional solar electricity generation.

Future Electric Vehicle Infrastructure Strategy

18.2.24 Into the future, Gatwick is committed to minimising its carbon emissions and is therefore actively considering the following.

- Encouraging greater use of EVs by airport passengers and staff through provision of flexible charging options in line with observed growth in EV demand, investing progressively in new charging technology and upgrading power supply as part of major planning and design projects to accommodate future charging needs. For passengers, this could include provision of a mix of charging options such as distributed charging valet charging, and rapid or ultra-rapid charging hub such as an electric forecourt(s).
- Potential provision of a rapid or ultra-rapid charging hub(s) for taxi and private hire vehicle operators as they require the fastest charging options available, along with provision of amenities and welfare. The location of this hub will need to be carefully considered to prevent non-airport related taxi use which will create unnecessary trips on Airport.
- Transition of Gatwick vehicle fleets supporting airport operations, including its own vehicles (such as long-stay buses), third-party authorised operators, airside vehicles, and ground service equipment to EVs.

18.3 Autonomous Vehicles (AVs)

Understanding Autonomous Vehicles

18.3.1 The advent of Autonomous Vehicles (AVs) promises an array of benefits to transport users and systems, making driving more efficient, productive, safer, and more sustainable. The timescales and scope of impacts, depends on several factors including manufacturers' ability to introduce high levels of automation at scale, government and indeed public acceptance as well as consumers' preferred models for meeting their mobility needs.

18.3.2 The transition to an AV future will occur in stages, with driving functions progressively shifting from driver to vehicle.

18.3.3 The Society of Automotive Engineers (SAE) framework describes six levels of autonomy, ranging from no autonomy (Level 0) to full autonomous operation (Level 5) (SAE, 2019). Many vehicles on the market today have features that correspond to Levels 0 and 1, with some having Level 2 features.

Table 18.3.1: SAE Levels of Autonomy

Driver Support	Level 0	Limited assistance features, such as blind spot or lane departure warnings, automated emergency braking, etc.
	Level 1	*Either* steering *or* acceleration/braking support. Typical features are lane centring and adaptive cruise control.
	Level 2	*Both* steering *and* acceleration/braking support. Level 2 vehicles have both lane centring and adaptive cruise control.
Automated Driving	Level 3	Vehicle can drive itself under specific conditions but human driver must take control when system requests. Examples include traffic jam chauffeur features.
	Level 4	Vehicle can drive itself under specific conditions without human intervention. Examples include local, driverless taxis. Steering wheels or pedals may be absent.
	Level 5	Vehicle can drive itself under any conditions without human intervention.

18.3.4 Although vehicles with Level 3 or better advanced levels of autonomy are being tested across the globe in various transport markets segments, such as public transport and in the taxi sector, such vehicles are not yet in widespread production or operation. Several pilot projects exist in the UK , including Bristol, London, Milton Keynes, Oxford, Cambridge, and the West Midlands.

18.3.5 Radical changes to the mobility landscape will be required with introduction of Level 4 and 5 vehicles which have true self-driving technology. The key difference between these technologies is that Level 5 autonomous driving functions must be advanced enough to perform under all conditions, while Level 4 vehicles are expected to be limited to specific geographic areas and driving conditions (known as the "operational design domain").

Market Timescales

18.3.6 Timescales for deployment of advanced AV technologies remain uncertain, with predictions of Level 4 and 5 vehicles becoming more widespread in the 2030s. Highways England has stated that they expect the Strategic Road Network to be fully autonomous by 2050 (Highways England, 2017).

18.3.7 Based on these ranges, it appears likely that significant growth in self-driving vehicles in the UK is likely to begin toward the end the of the next decade and continue into the 2040s. However, markets such as taxis/private hire vehicles, buses, and freight may begin transitioning to automated technologies more quickly.

AVs Impacts on Airports

18.3.8 In long term, the primary impact of AVs on airports is likely to be a reduction in the overall parking requirements and the potential need to shift parking to more remote locations. However, the magnitude of the impact is dependent on whether vehicles are primarily shared or privately owned.

18.3.9 Private AVs could conduct pick-up and drop-off near terminals, subsequently parking in more remote locations – or even returning home – while their owner's travel. If AVs are primarily a shared mobility service, fewer vehicles may need to park for long periods on-site. Instead vehicles will likely circulate to the arrivals area to pick up new passengers and leave the airport.

18.3.10 In either scenario, more intensive pick-up and drop-off activity near the terminal is likely, requiring more space in the forecourts which could be through repurposing of short-stay parking. New technological and physical design solutions may be needed to facilitate passenger-vehicle meet up locations. In addition, new user charging mechanisms may need to be considered to manage traffic levels. In particular, lower operating costs for shared AV trips may make AV trips more attractive than public transport which will in turn impact on highway capacity.

18.3.11 By reducing or shifting parking demand to new locations, valuable space nearby the terminals dedicated to short-term parking could be repurposed to serve other landside transport needs, to provide additional passenger amenities, or be given over to other airport operating functions.

18.3.12 AVs will change how parking is provided and indeed Gatwick is already exploring optimising long-term parking through its robotic valet pilot, which uses small tows capable of lifting a vehicle by the wheels and moving it to secure storage area. This system has the potential to store 50% more vehicles within a given area than traditional, self-parking arrangements (Airport Technology, 2019).

18.3.13 AV buses could serve a wide variety of landside transportation functions. Driverless shuttles could be operated higher on frequencies, providing convenient circulators to move staff and passengers between terminals, remote parking facilities, rental car centres, and worksites across the airport. This type of

operation is likely to be easier to introduce on the airside where vehicle types are more controlled.

18.3.14 In conclusion, AVs will introduce changes to the operation of the Airport into the future, potentially from the end of the assessment period onwards. Given that this technology is in its infancy, Gatwick will respond to AVs and their introduction as the technology begins to emerge and be relevant to airports of comparable size and scale. Gatwick will therefore evolve and adapt its AV strategy over time but at this stage AVs have not been included in this PTAR.

18.3.15 There are many opportunities which Gatwick is keen to take advantage of, including connecting AVs with the Airport's infrastructure through communications technology to actively manage the location and quantity of vehicles across the Airport throughout the day to help balance capacity and demand.

19 Conclusions

19.1 Summary of Identified Impacts and Mitigation

19.1.1 The following impacts and mitigation have been identified through transport modelling and analysis to date.

Rail

19.1.2 Modelling indicates no additional mitigation other than that already proposed by the rail industry and as included in the future baseline.

Bus and coach

19.1.3 Potential mitigation may include additional peak period services or network changes including consideration of new or revised routes, such as a new bus route hourly Uckfield to Gatwick via East Grinstead and a new coach route two-hourly Chatham - Maidstone - Sevenoaks – Gatwick, in line with GAL's bus and coach strategy. With these enhancements, modelling indicates no adverse effects with Project on bus and coach operations.

Highway network

19.1.4 2047 flows with the Project can be accommodated on the main strategic highway routes currently used by airport traffic.

19.1.5 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. Furthermore, committed schemes improve reliability along the corridor.

19.1.6 Given the above, GAL is not proposing any additional mitigation for the SRN over and above that already envisaged by the highway authorities, with the exception of the M23 Spur between Junction 9 and Longbridge Roundabout.

19.1.7 Modelling undertaken to date has identified the Croydon area of the network as being 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.

19.1.8 Modelling shows that the future baseline to 2029 can be accommodated on the M23 Spur with local widening and signalisation works that will be delivered prior to 2029.

19.1.9 Given the congestion shown by the model for 2032 future baseline, Gatwick has made the decision that more significant improvements will be required on the highway network to support additional growth with the Project, otherwise there will be potential for delays on the network.

19.1.10 With Project and background traffic growth to 2047, modelling shows some localised areas where congestion would still be expected, even with highway improvements. However, congestion levels are manageable and at expected levels for 15 years after opening, indicating that the improvements are appropriate and proportionate - ie it is sufficient to provide for expected growth but does not over-provide network capacity.

19.1.11 Through to DCO submission, the highway designs will be adjusted in line with VISSIM modelling to provide further improvements.

Walking and Cycling

19.1.12 Gatwick is exploring options to improve walking and cycling and have submitted proposals to improve linkages alongside the CIP improvements proposed for highways (see Section 11.2.10).

19.1.13 The final ASAS accompanying the application for development consent will further develop Gatwick's strategic plan for walking and cycling. Strategies that will be explored will include increased and improved amenities, upgraded routes on and, where appropriate, off airport, improved wayfinding and a programme of maintenance for existing routes.

Station and Shuttle

19.1.14 Analysis and modelling with Project show that no further improvements will be required to the railway station platforms or concourse.

19.1.15 Modelling to 2047 with the Project shows that the boarding platform of the shuttle stations, particularly at the South Terminal, can become congested at peak times and that congestion blocks the platform and prevents full use of shuttle capacity. Analysis indicates that reducing the headway of the system from 6 minutes down to 5 minutes would have the greatest benefit in increasing capacity.

Construction

19.1.16 In terms of airfield construction, preferred option is to have all material-carrying construction traffic (HGVs and LGVs) use Junction 9 and the M23 Spur which form part of the SRN. The SRN is designed to handle higher volumes of traffic. Construction workforce traffic has been modelled as coming via the shortest route.

19.1.17 Based on the levels of construction traffic estimated for the Project, it is not considered that peak airfield construction will have a significant effect on the performance of the highway network around the Airport. Further work will be undertaken for the Environmental Statement to explore measures to mitigate the potential impacts from construction traffic during peak periods (such as excluding LGVs and HGVs from peak hours on the highway network) and reduce the overall construction traffic loading created by the Project.

19.1.18 Modelling of highway construction shows reassignment of traffic owing to the temporary highway works on the M23 Spur, with traffic volumes reducing on the M23 Spur as background traffic not needing to access the Airport seeks alternative routes. The works also impact on traffic levels on the M23 itself with reductions also shown by the model on the motorway. M23 Junction 9 shows an increase in traffic flows related to right-turning into the Airport being forbidden during this construction phase and therefore traffic from the west heading to South Terminal having to u-turn at Junction 9.

19.1.19 The modelling shows increases in north-south traffic between Horley and Crawley rerouting via Balcombe Road as well as

some traffic taking a route on the west side of the Airport from Ifield Avenue in Crawley via Bonnets Lane, Lowfield Heath Road, Horley Road and Charlwood Road and into Horley via Povey Cross.

19.1.20 These temporary changes are relatively small in traffic terms, less than one vehicle per minute. As such, capacity issues at junctions are only observed on the SRN where works are taking place or at junctions on Airport.

19.2 Airport Surface Access Strategy and Travel Plan for Gatwick

19.2.1 Draft actions and targets for the Airport Surface Access Strategy are included for consultation in this PTAR. 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.

19.2.2 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.

19.2.3 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.

20 References

Advance, 2019. *Dyer & Butler install EV charging points at Gatwick Airport.* [Online]
Available at: https://www.adsadvance.co.uk/dyer-butler-install-ev-charging-points-at-gatwick-airport.html

AECOM, 2016. *West Sussex Infrastructure Study.* [Online]
Available at:
http://www.businesswestsussex.co.uk/storage/downloads/resource_westsussexinfrastructurestudy_1472035643.pdf

Airport Technology, 2019. *Gatwick Airport and Stanley Robotics to test valet parking robots.* [Online]
Available at: https://www.airport-technology.com/news/gatwick-airport-stanley-robotics/

Airports Commission, 2015. [Online]
Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/440316/airports-commission-final-report.pdf

Autocar, 2019. *Exclusive: Government won't reinstate plug-in hybrid grants.* [Online]
Available at: https://www.autocar.co.uk/car-news/industry/exclusive-government-wont-reinstate-plug-hybrid-grants

Chartered Institute of Highways and Transportation, 2010. *Manual for Streets 2.* [Online].

Coast to Capital, 2018. *Gatwick 360 Straetgic Economic Plan 2018-2030.* [Online]
Available at:
https://www.coast2capital.org.uk/storage/downloads/coast_to_capital_strategic_economic_plan_2018-2030_pdf-1535099447.pdf

Crawley Borough Council, 2020. *Crawley's Local Cycling and Walking Infrastructure Plan, consultation draft.* [Online].

Current News, 2019. *BP Chargemaster lauds first 150kW ultra rapid charging hub in London.* [Online]
Available at: https://www.current-news.co.uk/news/bp-chargemaster-lauds-first-150kw-ultra-rapid-charging-hub-in-london

Department for Transport, 2007. *Manual for Streets.* [Online].

Department for Transport, 2013. *The Strategic Road Network and the Delivery of Sustainable Development.* [Online]
Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/237412/dft-circular-strategic-road.pdf

Department for Transport, 2014. *TAG Unit M1: Principles of Modelling and Forecasting,* s.l.: s.n.

Department for Transport, 2015. *National Policy Statement for National Networks.* [Online]
Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387223/npsnn-web.pdf

Department for Transport, 2018. *Airports National Policy Statement: New Runway Capacity and Infrastructure in the South East of England.* [Online]
Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/714106/airports-nps-new-runway-capacity-and-infrastructure-at-airports-in-the-south-east-of-england-web-version.pdf

Department for Transport, 2019. *Transport analysis guidance.* [Online]
Available at: https://www.gov.uk/guidance/transport-analysis-guidance-webtag

Department for Transport, 2020. *Road Investment Strategy 2: 2020-2025.* [Online]
Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951100/road-investment-strategy-2-2020-2025.pdf

East Sussex County Council, 2011. *Local Transport Plan 2011-2026.* [Online]
Available at:
https://www.eastsussex.gov.uk/media/2336/ltp3_main_doc_2011-2026.pdf

Fruin, J., 1987. *Pedestrian Planning and Design.* Revised Edition ed. Mobile: Elevator World.

Gatwick Airport Limited, 2021. *Second Decade of Change to 2030.* s.l.:s.n.

Gatwick Airport Ltd, 2016. *Gatwick Employer and Travel to Work Survey,* s.l.: s.n.

Gatwick Airport Ltd, 2019. *Decade of Change: 2018 Performance Report,* s.l.: s.n.

Gatwick Airport Ltd, 2019. *Gatwick Airport Master Plan 2019.* [Online]
Available at: https://www.gatwickairport.com/globalassets/business--community/growing-gatwick/master-plan-2019/gatwick-master-plan-2019.pdf

Greater London Authority, 2018. *Mayor's Transport Strategy.* [Online]
Available at: https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf

Greater London Authority, 2021. *The London Plan.* [Online]
Available at:
https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf

Highways England, 2017. *Connecting the Country: Planning for the Long Term,* s.l.: s.n.

Highways England, 2017. *London Orbital and M23 to Gatwick Route Strategy,*
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/600313/London_Orbital___M23_to_Gatwick_Final.pdf: s.n.

Highways England, 2017. *M25 South West Quadrant Strategic Study - Stage 3 Report,* s.l.: s.n.

Highways England, 2019. *Design Manual for Roads and Bridges.* [Online]
Available at: http://www.standardsforhighways.co.uk/ha/standards/dmrb/

Highways England, p. H. A., 1995. *DMRB Volume 5 Section 1 Part 2 (TD 37/93) Assessment and preparation of road schemes. Assessment of road schemes. Scheme assessment reporting.* s.l.:s.n.

Horsham District Council, 2020. *Draft Infrastructure Delivery Plan.* [Online]
Available at:
https://www.horsham.gov.uk/__data/assets/pdf_file/0012/80220/HDC-Infrastructure-Delivery-Plan-2020.pdf

Kent County Council, 2017. *Local Transport Plan 4: Growth Without Gridlock 2016-2031.* [Online]
Available at:
https://www.kent.gov.uk/__data/assets/pdf_file/0011/72668/Local-transport-plan-4.pdf

Mid Sussex District Council, 2016. *Mid Sussex Infrastructure Delivery Plan.* [Online]
Available at: https://www.midsussex.gov.uk/media/3229/ep42_idp-august2016-vdistrictplan-final2.pdf

Ministry of Housing, Communities and Local Government, 2019. *Planning Practice Guidance.* [Online]
Available at: https://www.gov.uk/government/collections/planning-practice-guidance

Ministry of Housing, Communities and Local Government, 2021. *National Planning Policy Framework.* [Online]

Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

National Grid, 2019. *Future Energy Scenarios,* s.l.: s.n.

Network Rail, 2015. *South East Route: Sussex Area Route Study,* s.l.: s.n.

Network Rail, 2016. *Station Capacity Planning Guidance,* https://cdn.networkrail.co.uk/wp-content/uploads/2019/03/Station-capacity-planning-guidance.pdf: s.n.

Network Rail, 2018. *Consultation announced on 'transformational' plan to remove Britain's worst railway bottleneck and provide a step-change in reliability.* [Online]
Available at: https://www.networkrailmediacentre.co.uk/news/consultation-announced-on-transformational-plan-to-remove-britains-worst-railway-bottleneck-and-provide-a-step-change-in-reliability
[Accessed October].

Network Rail, 2018. *Our Delivery Plan for 2019 – 2024.* [Online]
Available at: https://www.networkrail.co.uk/who-we-are/publications-and-resources/our-delivery-plan-for-2019-2024

Network Rail, 2019. *South East Route Control Period 6 Delivery Plan.* s.l.:s.n.

Office of Rail and Road, 2018. *Periodic review 2018 (PR18).* [Online]
Available at: https://orr.gov.uk/rail/economic-regulation/regulation-of-network-rail/price-controls/periodic-review-2018

SAE, 2019. *SAE Standards News: J3016 automated-driving graphic update.* [Online]
Available at: https://www.sae.org/news/2019/01/sae-updates-j3016-automated-driving-graphic

Surrey County Council, 2018. *Surrey Transport Plan (LTP 3).* [Online]
Available at: https://www.surreycc.gov.uk/roads-and-transport/policies-plans-consultations/transport-plan

Surrey County Council, 2021. *Draft Surrey Local Transport Plan 2022–2032 (LTP4).* [Online]
Available at: https://s3-eu-west-2.amazonaws.com/commonplace-customer-assets/surreyltp4/Surrey%20Transport%20Plan.pdf

Transport for the South East, 2019. *Transport Strategy for the South East: Consultation Draft.* [Online]
Available at: https://transportforthesoutheast.org.uk/wp-content/uploads/2019/10/TfSE-Draft-Transport-Strategy-v24.0.pdf

West Sussex County Council, 2011. *West Sussex Transport Plan 2011-2026.* [Online]
Available at:
https://www.westsussex.gov.uk/media/3042/west_sussex_transport_plan_2011-2026_low_res.pdf

West Sussex County Council, 2016. *West Sussex Walking and Cycling Strategy 2016-2026.* [Online]
Available at:
https://www.westsussex.gov.uk/media/9584/walking_cycling_strategy.pdf

West Sussex County Council, 2018. *Highway Infrastruture Policy and Strategy.* [Online]
Available at: https://www.westsussex.gov.uk/about-the-council/policies-and-reports/roads-and-travel-policy-and-reports/highway-infrastructure-policy-and-strategy/

West Sussex County Council, 2019. *West Sussex Cycling Design Guide.* [Online]
Available at:
https://www.westsussex.gov.uk/media/13164/cycling_design_guide.pdf

West Sussex County Council, 2020. *West Sussex Guidance on Parking at New Developments.* [Online]
Available at:
https://www.westsussex.gov.uk/media/1847/guidance_parking_res_dev.pdf

West Sussex County Council, 2021. *Draft West Sussex Transport Plan 2022 to 2036.* [Online]
Available at:
https://yourvoice.westsussex.gov.uk/9868/widgets/28223/documents/13943

West Sussex Couny Council, 2007. *West Sussex Transport Assessment Methodology.* [Online]
Available at:
http://www2.westsussex.gov.uk/roadsandtransport/WSCC%20Transport%20Assessments%20-%20Guidance%20on%20Methodology%20for%20Developers.pdf

21 Glossary

Term	Description
AADT	Annual Average Daily Traffic
ANPR	Automatic Number Plate Recognition
AQMA	Air Quality Management Area
ASAS	Airport Surface Access Strategy
AV	Autonomous Vehicle
CAA	Civil Aviation Authority
CARS	Croydon Area Remodelling Scheme
CIF	Common interface file
CP5	Control Period 5
CP6	Control Period 6 (2019-2024)
CP7	Control Period 7 (2024-2029)
DCO	Development Consent Order
DfT	Department for Transport
DLR	Docklands Light Railway
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
EV	Electric Vehicle
GAL	Gatwick Airport Limited
HGV	Heavy Goods Vehicle
LGV	Light Goods Vehicle
LoS	Level of Service
LTP	Local Transport Plan
MCC	Manual Classified Counts
mppa	Millions of passengers per annum
NCN	National Cycling Network
NCR	National Cycle Route
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
ORR	Office of Rail and Road
PEIR	Preliminary Environmental Information Report
PGC	Passenger Guidance Capacity
PHEV	Plug-in Hybrid Electric Vehicle
PHV	Private Hire Vehicle
PINS	Planning Inspectorate
PR	Periodic Review
PTAR	Preliminary Transport Assessment Report
RIS	Road Investment Strategy
SERTM	South East Regional Transport Model
SRN	Strategic Road Network
TA	Transport Assessment
TEMPRO	Trip End Model Presentation Program
TfL	Transport for London

Term	Description
tph	Trains per hour
vehs	Vehicles
ZEV	Zero Emissions Vehicle