



YOUR LONDON AIRPORT
Gatwick

*Our northern runway:
making best use of Gatwick*

**Preliminary Environmental Information Report
Chapter 3: Need and Alternatives Considered**

September 2021

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3 Need and Alternatives Considered

3.1. Introduction

3.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) provides a summary of the need for the Project and the main alternatives considered by Gatwick Airport Limited (GAL) during the early optioneering and Project design process. It includes a summary of the reasons for the design evolution with a description of the main alternative design and layout options that have been considered.

3.2. Need for the Project

3.2.1 In recent months the aviation industry has been particularly affected by the Covid-19 pandemic and, over the years, has also been a focus of attention in the urgent need to address climate change. Whilst both issues are of global importance, neither affect the underlying case for continued investment in infrastructure to preserve and enhance international connectivity.

3.2.2 The Covid-19 pandemic had a devastating impact on the global aviation industry in 2020. Gatwick, along with all other UK airports, experienced a significant reduction in passenger traffic levels as a result of both Government imposed restrictions on air travel and reduced passenger demand, driven by low consumer confidence. UK passenger volumes in 2020 were 78% down on volumes for 2019. It is expected that Government travel restrictions will continue to have an impact on passenger demand and traffic levels throughout 2021, but that by the end of 2021 traffic levels will start to recover.

3.2.3 While the immediate outlook therefore remains challenging, there is confidence across the aviation industry that passenger and airline demand at Gatwick will return to previous levels over the course of the next few years and then continue to grow thereafter.

3.2.4 Overall, updated forecasts predict that it will take approximately four to five years for passenger traffic at Gatwick to return to levels seen in 2019 and that, by the end of the 2020s, passenger levels at Gatwick will have returned broadly to where they would have been had the pandemic not occurred. This reflects the inherent strength of demand for air travel generally, but particularly at Gatwick, and the constraints on airport capacity in London and the south-east.

3.2.5 Government policy has consistently recognised the importance of aviation. The most recent expression of policy is set out in the Transport Decarbonisation Plan, published in July 2021 (Department for Transport, 2021a), in which the Government explains that:

“International connectivity is a vital part of Global Britain and everyone should continue to have access to affordable flights, allowing them to go on holiday, visit family and do business.”

3.2.6 At the same time, the Government published ‘*Jet Zero Consultation, A consultation on our strategy for net zero aviation*’ (Department for Transport, 2021b), which explains the Government’s absolute commitment to decarbonise the aviation sector whilst continuing to benefit from the connectivity, jobs and economic benefits it provides. The aim of the strategy is for aviation “*to decarbonise in a way that preserves the benefits of air travel and delivers clean growth of the UK sector by maximising the opportunities that decarbonisation can bring*”.

- 3.2.7 These publications bring the aviation debate up to date and they also explicitly confirm that the Government remains committed to support and enhance the aviation sector as a key component of the UK economy in view of the critical contribution it makes. In doing so, the Government has confirmed that its existing planning policies for aviation continue to have “full effect”.¹
- 3.2.8 Those policies include a commitment to growth to respond to forecast increases in demand and to strengthen the aviation sector and the contribution it makes to a number of Government policy objectives. Whilst future levels of growth are necessarily uncertain, as explained further below, there is a particular case to add capacity at Gatwick Airport.
- 3.2.9 This chapter sets out the context of forecast demand generally before considering the specific case for expansion at Gatwick.

UK Aviation Demand

- 3.2.10 Government policy on airports and aviation over the years has consistently recognised that aviation has long been at the heart of the UK’s economic success. In 2019, the UK had the largest aviation network in Europe and the third largest in the world. Prior to the Covid-19 pandemic, the UK’s aviation industry contributed at least £22 billion per annum to the UK economy, along with over 230,000 jobs (Department for Transport, 2018a). Pre-pandemic, aviation was also growing at a rapid rate to meet rising demand with passenger numbers having increased for seven consecutive years.
- 3.2.11 The need for increased capacity in the sector is well established. In September 2012, the Coalition Government established the Independent Airports Commission to examine the scale and timing of any requirement for additional capacity to maintain the UK’s position as Europe’s most important aviation hub, and identify and evaluate how any need for additional capacity should be met in the short, medium and long term.
- 3.2.12 The work of the Airports Commission informed the development of aviation planning policy, the details of which are examined in Chapter 2: Planning Policy Context. In particular, the Government designated the Airports National Policy Statement (NPS) in 2018 (Department for Transport, 2018b). The Airports NPS explained the importance of the aviation sector to the UK economy, as follows:
- “International connectivity, underpinned by strong airports and airlines, is important to the success of the UK economy. It is essential to allow domestic and foreign companies to access existing and new markets, and to help deliver trade and investment, linking us to valuable international markets and ensuring that the UK is open for business. It facilitates trade in goods and services, enables the movement of workers and tourists, and drives business innovation and investment, being particularly important for many of the fastest growing sectors of the economy.”*
- 3.2.13 The Airports NPS is clear on the need for new airport capacity in the south east and paragraph 2.12 states that:
- “Aviation demand is likely to increase significantly between now and 2050. All major airports in the South East of England are expected to be full by the mid-2030s, with four*

¹ Jet Zero Consultation page 51.

out of five full by the mid-2020s. By 2050 demand at these airports is expected to outstrip capacity by at least 34%, even on the department's low demand forecast. There is relatively little scope to redistribute demand away from the region to less heavily utilised capacity elsewhere in the country."

- 3.2.14 The Airports NPS recognises that the UK's hub status is already being challenged by restricted connectivity, whilst airports in Europe have spare capacity. Paragraphs 2.14 -2.16 of the NPS state that:

"The consequences of not increasing airport capacity in the South East of England –the 'do nothing' or 'do minimum scenarios' – are detrimental to the UK economy and the UK's hub status. International connectivity will be restricted as capacity restrictions mean airlines prioritise their routes, seeking to maximise their profits. Capacity constraints therefore lead to trade-offs in destinations, and while there is scope to respond to changing demand patterns, this necessarily comes at the expense of other connections. Domestic connectivity into the largest London airports will also decline as competition for slots encourages airlines to prioritise more profitable routes.

Operating existing capacity at its limits means there will be little resilience to unforeseen disruptions, leading to delays. Fares are likely to rise as demand outstrips supply, and the lack of available slots makes it more difficult for new competitors to enter the market.

The Government believes that not increasing capacity will impose costs on passengers and on the wider economy."

- 3.2.15 The policy position is more fully explained in Chapter 2: Planning Policy Context, which sets out the Government's consistent policy support for more airport capacity in the south east through both the construction of a third runway at Heathrow, and the need to make best use of infrastructure at other airports.
- 3.2.16 The UK airports handled a record 300 million passengers in 2019, of which the London airports accounted for 181 million or 60% of the total activity. Demand in the London system has been subject to strong growth, with over 34 million passengers added in the five-year period to 2019.
- 3.2.17 The latest demand forecasts from the Department for Transport (2017) predicted continued growth in demand of around 1.7% per annum in the long term (2016-2050). This period was forecast to see demand increase by an additional 230 million passengers across the UK's airports.
- 3.2.18 Recent short-term performance pre-Covid-19 has already outperformed the Department for Transport's projection. Annual growth rates between 2016 and 2019 were stronger than forecast (3.4%), resulting in demand already being at least one year ahead of the Department for Transport's central case forecast.
- 3.2.19 It is widely recognised that airports in London and the South East of England are increasingly facing longer term capacity issues and, even with a third runway at Heathrow being considered, the Department for Transport forecasts show that demand will outstrip capacity in the London airports system by the mid-2030s.

- 3.2.20 The forecasts observe that Heathrow and Gatwick are already ‘full’, whilst Luton is operating close to its planning limit. By 2030, an additional 50 million+ passengers are forecast in the London market - far in excess of today’s available capacity, indicating significant need for capacity development.
- 3.2.21 Further details of forecast growth are set out in the Forecast Data Book at Appendix 4.3.1, however the summary above sets the context within which the specific need for expansion at Gatwick should be considered.

Growth at Gatwick Airport

- 3.2.22 Despite peak capacity constraints, Gatwick has seen significant levels of growth in the recent years, prior to the Covid-19 pandemic. Over the last decade Gatwick has grown by over 14 million passengers, reaching 46.6 million in the most recent full year of operations (2019). This represents a 44% growth in passengers since 2009, resulting from 15% growth in air traffic movements combined with the use of larger and fuller aircraft.
- 3.2.23 During this period, domestic volumes remained relatively flat, whilst over 10 million and 4 million passengers were added in the short haul and long haul market categories respectively. The growth in short haul markets has been driven by the continued expansion of low cost carriers, who account for a significant share of growth in the European aviation market. Long haul growth has been driven by many new intercontinental destinations being added by a range of carriers as Gatwick continues to expand its long haul connectivity.
- 3.2.24 Growth at Gatwick has consistently outstripped Department for Transport forecasts. In 2013, the Department for Transport forecast that Gatwick would accommodate 34 million passengers by 2017, whereas over 40 million passengers were actually handled in that year. The Department for Transport’s updated 2017 forecast continues to underestimate passenger demand at Gatwick, suggesting 45 million passengers would be reached by 2030 – a figure which was exceeded in 2017/18.

Future Growth Forecasts

- 3.2.25 During 2019, Gatwick Airport accommodated the following:
- total passengers: 46.6 million;
 - commercial air traffic movements: 283,000; and
 - total cargo: 150,000 tonnes.
- 3.2.26 As set out in Chapter 4: Existing Site and Operation, it is predicted that by 2038, passenger throughput would increase to approximately 62.4 million passengers per annum in the absence of the Project. This is influenced by three main factors.
- Growth in runway utilisation in off-peak periods: whilst GAL is anticipating only minor changes in the number of daily aircraft movements during current peak summer months (July to September), during the off-peak periods – the shoulder months of summer (April to June and October) and in the winter months (November to March) – the number of daily aircraft movements is expected to increase by a greater amount than in the peak months.
 - Up-gauging of aircraft fleets to larger aircraft: reflecting the trend for airlines to update their fleets with larger aircraft and/or reconfigured cabins with more seats.
 - Increased load factors: an increase in the average occupancy levels of flights.

- 3.2.27 Despite a seemingly positive outlook, this level of forecast growth represents a 3% decline in Gatwick's share of the UK south east aviation market without the Project. The decline would be from 26% of the market in 2019 to 23% in 2047 (Appendix 4.3.1 Table 8.2.1) – a decline driven by the severe constraints on capacity at the airport.
- 3.2.28 Further details of forecast growth, and the factors that underlie it, are provided in Chapter 4: Existing Site and Operation and the Forecast Data Book (Appendix 4.3.1).
- 3.2.29 The Project would enhance Gatwick's capacity, enabling the airport to respond to demand within its catchment. With the Project, through the early 2030s, Gatwick is forecast to grow towards 70 million passengers, reaching 75.6 million by 2038; 13.2 million more passengers than would be the case without the Project. This growth would see Gatwick capturing a greater share of London demand as other airports will have relatively limited capacity to grow further. The economic benefits of this expansion are analysed in the Economic Impact Report prepared by consultants Oxera (2021) submitted alongside this PEIR.

The Need for Capacity at Gatwick

- 3.2.30 Gatwick is a key piece of national infrastructure, an economic engine for local and regional growth, and the airport of choice for millions of passengers; serving an extensive catchment with a growing population. In 2019, it was ranked 12th in the world for the number of long-haul destinations served. Gatwick contributed £5.3 billion to the UK economy (pre-pandemic) and has supported over 85,000 jobs.
- 3.2.31 In 2019 Gatwick Airport handled some 285,000 aircraft movements, serving over 46.6 million passengers travelling to 228 destinations with 53 different airlines. Until 2017, Gatwick had the world's busiest single runway (55 aircraft movements per hour)², and still has the world's busiest single runway operation during the day.
- 3.2.32 This intensity of operation brings particular challenges. With a declared runway capacity of up to 55 movements per hour, Gatwick processes an aircraft approximately every minute. That sustained intensity is greater than any other runway and it is forecast to increase. For the total summer season (April to October), daily commercial air traffic movements are forecast to increase 7% from an average of 851 in 2019 to 915 in 2038 and to 927 in 2047.
- 3.2.33 Whilst the forecasts suggest that some incremental growth is possible in response to intense demand, in practical operational terms, by normal standards, Gatwick as a single runway airport is 'full'. This was recognised as long ago as 2013 by the Airports Commission, whose interim report recorded that:

"Gatwick operates at over 85% capacity over the course of the year and above 90% in the summer peak season. Almost no take-off or landing slots are un-used in the busiest hours of the day." (Airports Commission 2013, paragraph 3.55).

"Gatwick is operating at more than 85% of its maximum capacity and is completely full at peak times. It is becoming increasingly difficult for airports and airlines to operate

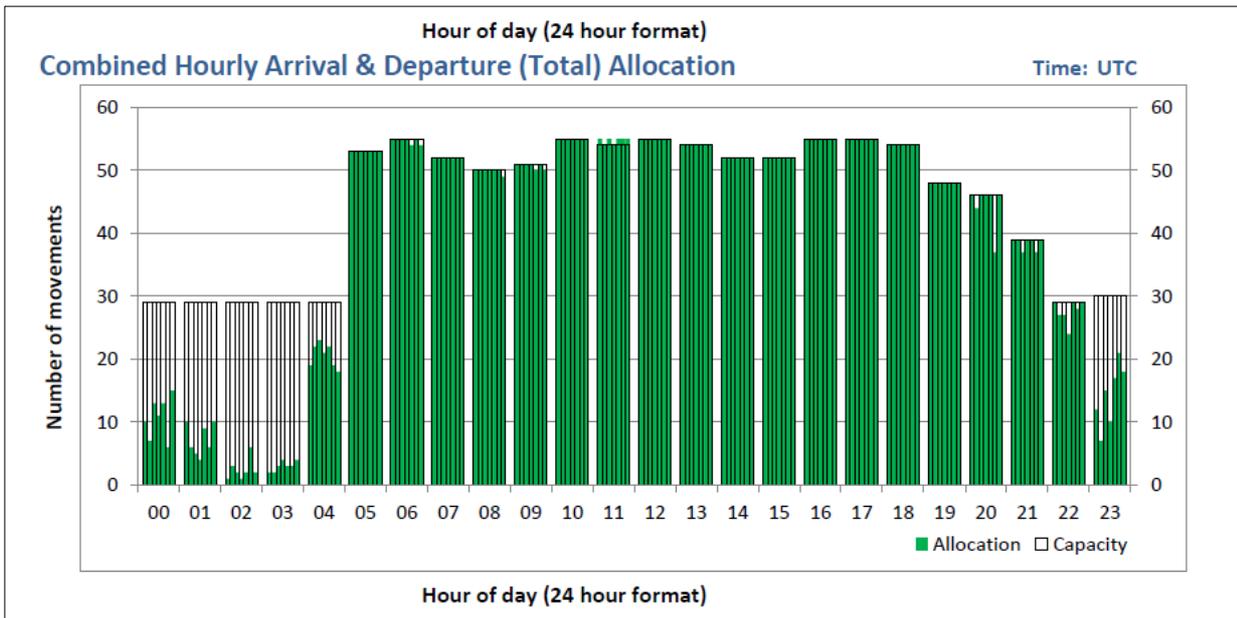
² In 2018, Mumbai International Airport created a new world record for single-runway operations handling 980 arrivals and takeoffs in 24 hours

efficiently within the constraints of existing infrastructure". (Airport's Commission 2013 paragraph 20).

3.2.34 Since that analysis, throughput at Gatwick has grown by 8.5 million passengers, more than any other UK airport (see Appendix 4.3.1).

3.2.35 Graph 3.2.1 and Graph 3.2.2 below demonstrate that this intensity of activity is sustained throughout the majority of the day and is a feature of the airport for much of the year.

Graph 3.2.1: Combined Hourly Arrival and Departure (Total) Allocation

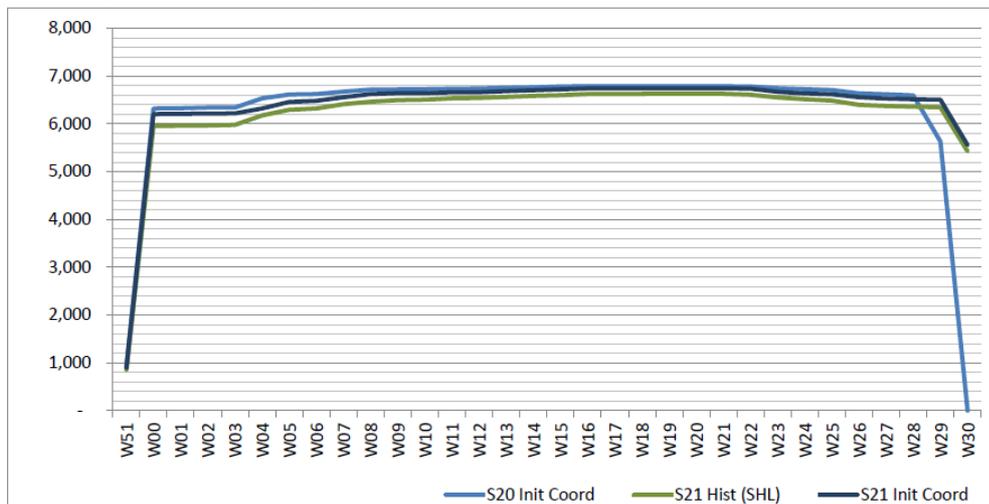


Graph 3.2.2: Air Traffic Movements by Week of Season

Full Season - Seasonality



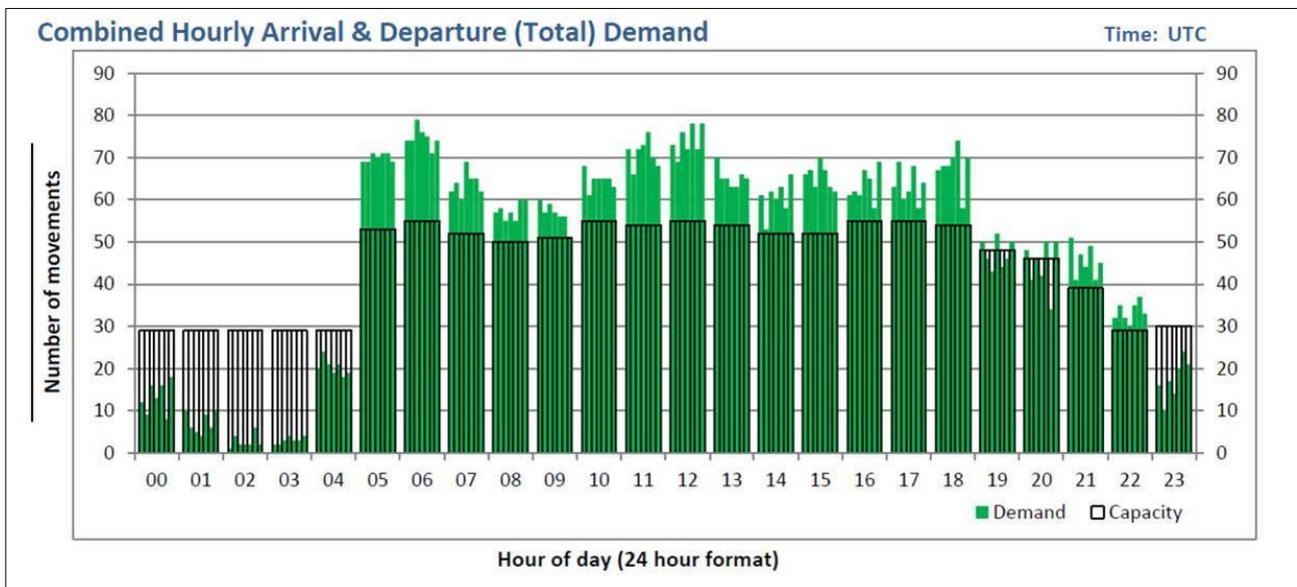
Air Transport Movements by week of season



- 3.2.36 A key benefit of the Project is enhanced operational resilience, particularly the ability for the airport to recover from unexpected events. Appendix A3 of the Economic Impact Report (Oxera, 2021) demonstrates that Gatwick suffers greater than average delays from scheduled flight times compared to any other UK airport, with obvious consequences for airlines and businesses.
- 3.2.37 Airports publish key performance indicator data, which allow comparison to be made with other airports³. The data demonstrate the following.
- Aircraft taxi times for departures at Gatwick (at more than 19 minutes) are comparable to Heathrow, despite the size of the airport, on the opening of the northern runway project, these are forecast to reduce by 33%.
 - On average planes are held on the runway pending departure for more than 7 minutes, the increased capacity from the Project would reduce this by 43%.
 - Delays in runway availability cause arriving planes to take longer routes or adopt airborne holding patterns. These could be reduced by at least 25% with the availability for use of the northern runway (with the Project).
- 3.2.38 These are average conditions but operating consistently with a full schedule also means that the airport can struggle to recover from routine but unplanned events or from more serious incidents. Recovery capacity is a key indicator of airport resilience and an inability to recover quickly from disruption can have disproportionate effects on airlines, airport staff and passengers. It can also impact on the local community as planes run late or adopt holding patterns for longer. Gatwick estimates that the airport would be able to recover three times more quickly from disruption if the northern runway was made available – for example, to enable dual runway operations to allow delayed departures to get away and free up the main runway for arrivals. The Project would:
- reduce the intensity of main runway operations to an average of 48 movements per hour;
 - maintain continuity of operations, even if one runway is temporarily out of use, avoiding the current loss of time in switching to the standby runway;
 - improve capacity at the busiest times by removing smaller aircraft departures from the main runway;
 - reduce taxi times and airborne holding times; and,
 - reduce the risk of delay and time overruns to the benefit of passengers, airlines and the local community.
- 3.2.39 The availability of the northern runway would also enable the release of additional slots to meet pent up demand, This would drive connectivity, offer passengers a wider choice of destinations and create competition with consequential benefits to air fares.
- 3.2.40 Airport Coordination Limited (ACL) (2019), who are appointed to co-ordinate arrival and departure slots at Gatwick report that demand for runway slots exceeds capacity at peak times:
- “Capacity demand was strong across most hours and days of the week, with demand peaking at 80 movements on runway totals in the 0600 and 1200 hours, that is 25 movements over the declared limit of 55.”*
- 3.2.41 This is illustrated in Graph 3.2.3 below which is extracted from the ACL report:

³ Eurocontrol coda data for 2018.

Graph 3.2.3: Combined Hourly Arrival and Departure (Total) Demand



3.2.42 There are several consequences of demand outstripping capacity, as described below.

- As Gatwick has become increasingly constrained, a secondary market for slots has started to emerge. The first significant ‘trade’ occurred when Flybe sold most of their Gatwick slot portfolio to easyJet in 2012. 25 slot pairs were exchanged for an average of £0.8 million per pair. In the last few years, the values attached to Gatwick slots increased significantly, valuing them at around £3 million per pair. These costs are inevitably passed on to passengers.
- Demand cannot be satisfied. Competition for the ex-Thomas Cook slots in 2018 was fierce, with interest from easyJet, Wizz Air, IAG, TUI and other reported bidders. By definition, with current capacity constraints demand is turned away and this includes opportunities for increased competition and, an increased range of destinations.
- Gatwick continues to be actively engaged by airlines around the world seeking to access its unique and large catchment. For commercial reasons, many of the airlines, from all continents, remain confidential. However, recent applicants for slots at Gatwick include:
 - existing airlines seeking to grow both short haul (eg Wizz, Ryanair, easyJet, Turkish Airlines, Vueling) and long haul (eg China Eastern, WestJet); and
 - new airlines seeking to enter the Gatwick market (eg SunExpress, SAS, Alitalia) and long haul (eg China Southern to China, Vistara to India, JetBlue to USA).
- Where demand can be satisfied, the addition of new services adds to consumer choice and drives competition. Recent examples which increased competition, encouraged reduced ticket prices and enable new opportunities include WestJet launching operations to up to six Canadian cities growing the London-Canada market.

3.2.43 Addressing these issues and enabling this increase in capacity, competition and international connectivity is directly consistent with long held and recently restated government policy.

- 3.2.44 Government policy has been consistently supportive over the last 20 years of making the best use of existing capacity at UK airports to improve performance, resilience and the passenger experience as a sustainable and balanced approach to meeting capacity demand. The Project is a direct and sustainable response to meeting known and future expected demand at Gatwick but also within the London and wider south east regions.

3.3. Alternatives Considered

Legislative Context

- 3.3.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended (hereafter referred to as 'the EIA Regulations'), require that an Environmental Statement (ES) should include:

'(d) a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking in to account the effects of the development on the environment;...' (Regulation 14(2)(d)).

- 3.3.2 In addition, Schedule 4 of the EIA Regulations states:

'2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.'

- 3.3.3 This section of the PEIR sets out the work undertaken to date on alternative options considered by GAL and the key reasons for the selection of the Project elements, taking into account environmental effects.

Gatwick Airport Master Plan Options

- 3.3.4 As part of the airport planning process, GAL regularly publishes a master plan, setting out long term plans for airport growth and development.

- 3.3.5 As a result of increasing demand, the 2019 master plan (GAL, 2019) considered the following scenarios:

- Scenario 1: where Gatwick remains a single-runway operation using the existing main runway. This scenario would use technology to increase the capacity of the main runway, leading to incremental growth through more efficient operations;
- Scenario 2: where the existing northern runway is routinely used together with the main runway; and
- Scenario 3: where GAL continues to safeguard for an additional runway to the south.

Scenario 1

- 3.3.6 Scenario 1 looked at options to make best use of the existing main runway. The master plan predicted that this scenario would see passenger throughput increase to approximately 57 to 61 million passengers per annum (mppa) in 2032 through investments in terminal facilities,

operational efficiency and resilience, improvements to surface access and car parking and provision of additional commercial facilities.

3.3.7 Within this scenario, year on year growth rates would decline as the runway constraints become increasingly binding. Most of the growth would be outside the current peak times and therefore the requirement for additional infrastructure would be relatively modest. With the introduction of quieter aircraft, Gatwick's noise footprint could reduce despite the increase in aircraft movements.

3.3.8 Although the airport could grow to provide for up to approximately 61 mppa with the existing single-runway operation, this growth would be constrained at that level by the limits on available runway capacity. The master plan stated that:

'Even with a third runway at Heathrow, the DfT [Department for Transport] is forecasting a shortfall in UK airport capacity in 2030 and this shortfall is predicted to increase over the following 20 years. Therefore, it is highly likely that by 2032, capacity constraints across the London airport system will mean that some travel demand is unmet, and as a result the UK will lose valuable connectivity to international destinations and markets.'

Scenario 2

3.3.9 The existing northern runway at Gatwick was consented in 1979 and is located 198 metres to the north of the main runway. Its use has historically been constrained by a planning condition and an agreement with West Sussex County Council that prevents its use simultaneously with the main runway. The agreement expired in August 2019.

3.3.10 Scenario 2 proposed that a strip of additional pavement is laid to the northern edge of the existing northern runway, so as to allow the corresponding adjustment of its centreline north of its current position. This would allow the dual operation of the main runway and northern runway together to increase the number of aircraft movements and achieve higher passenger throughput. This is in accordance with Government policy of making best use of existing runways.

3.3.11 The master plan predicted that this option would allow passenger throughput to increase to approximately 68 to 70 mppa by 2032 (and up to 74 mppa by 2038).

3.3.12 Within this scenario the airport would remain a two terminal operation (with some requirement for reconfiguration of airfield and other facilities and for new supporting facilities).

Scenario 3

3.3.13 Scenario 3 would continue to safeguard land for an additional runway to the south of the existing main runway for development at some point in the future. The additional runway scenario was predicted to accommodate a throughput of approximately 95 mppa and would require development of the safeguarded land as well as significantly more changes to the existing airport and surrounding roads.

Conclusion

3.3.14 A do minimum option (Scenario 1) was considered to restrict future growth and Gatwick's ability to contribute to meeting future demand for increased aviation capacity. This option would not allow Gatwick to maintain best use of its existing runways, as only one runway would be operational at any time.

- 3.3.15 GAL is not actively pursuing Scenario 3 in light of the Government's support for the third runway at Heathrow, but considers that it is in the national interest for the land to continue to be safeguarded to allow for a new runway to be constructed to the south of the airport, to allow for the possibility that it is required in the future.
- 3.3.16 GAL is pursuing Scenario 2 and, therefore, this PEIR relates to Scenario 2 (use of the northern runway alongside the main runway), given that it results in the following benefits.
- Aligns with Government policy of making best use of existing runways at all UK airports.
 - In comparison to the existing situation and Scenario 1, provides greater UK point-to-point airport capacity to assist in delivering unmet Department for Transport-forecasted aviation demand to 2050, whilst complementing the existing UK hub capacity provided at Heathrow (and in view of any additional capacity potentially introduced by the proposed third runway).
 - Provides an increase in flights, improved connectivity, increased employment and economic benefits to the local area with a much reduced scale of environmental impact compared to that arising from an additional new runway (Scenario 3).
 - Creates economic benefits to the national, regional, and London economies, including through supporting inward investment for business travellers, and tourism.
 - Provides additional operational resilience for the airport with the flexibility to routinely use two runways.
 - Minimises growth outside of the airport boundary.
 - Does not prejudice the long-term safeguarding of the land to the south of the airport for a future additional runway.
 - Delivers significant local economic benefits, including further employment and training opportunities for local people, supply chain opportunities for local businesses, increased local retail and leisure expenditure, and other economic stimuli to the local area.
- 3.3.17 Overall, it is considered that Scenario 2 offers the most sustainable approach to providing greater operational resilience both at Gatwick Airport and improved UK airport capacity compared with Scenarios 1 and 3.

Alternative Design and Technology Options

- 3.3.18 Making best use of the two existing runways at Gatwick Airport requires alterations to the northern runway to provide a minimum separation distance of 210 metres from the main runway. In turn, this requires relocation of a number of other airfield facilities. In addition, the Project would require amendments to be made to both airside and landside elements of Gatwick Airport, in order to accommodate the increase in aircraft and passenger throughput.
- 3.3.19 The development of the design for the Project is iterative and will continue to form a key part of the ongoing EIA process. To date, the design has been informed by a number of existing constraints, including:
- the location and layout of existing airport facilities;
 - operational airport constraints, such as height restrictions for buildings on or close to the runway and operational areas of the airfield;
 - the availability of land within the existing airport and the desire to minimise land take outside the existing airport boundary, as far as practicable;
 - the location of existing infrastructure, including the highway network and junctions; and
 - the location of existing environmental receptors, including watercourses.

3.3.20 In order to secure an aerodrome license and certification, airports need to demonstrate they comply with Civil Aviation Authority (CAA) and European Aviation Safety Agency (EASA) regulations and specifications as well as International Civil Aviation Organization (ICAO) design recommendations or seek exceptions in the form of deviations from the standard. The main documents that influence design through physical/technical requirements or recommendations for design of aerodromes, runways, taxiways, aprons, aeronautical equipment and other airfield infrastructure are set out below:

- Aerodrome Design Manual - Document 9157 (various dates);
- Annex 14 to the Convention on International Civil Aviation: Aerodromes (ICAO, 2018); and
- CAP 168: Licensing of Aerodromes (CAA, 2019).

Assesment Process

3.3.21 An options appraisal for the design and layout of the Project components has been undertaken by specialists to consider the feasibility and potential impacts of each of the component options. The process assesses each option for suitability, operational viability, cost and environmental effects. The following criteria have been used to identify appropriate options to be considered in the appraisal:

- each option must be an option that is genuinely possible to deliver (ie they must be a reasonable alternative);
- each option must be identified bearing in mind potential implications for other Project components; and
- each option must be identified bearing in mind potential implications for the remainder of the airport that is not proposed to be affected by the Project.

3.3.22 Using these criteria, a number of design and layout options were identified. The following components were considered within the options appraisal.

- A. Runways
- B. Taxiways
- C. Aircraft holding areas
- D. Terminals (including International Departure Lounge (IDL))
- E. Piers
- F. Hangars
- G. Hotels, offices and car parks
- H. Foul water
- I. Surface water drainage
- J. Fluvial flood risk mitigation
- K. Waste management facilities
- L. Longbridge roundabout
- M. North Terminal roundabout
- N. South Terminal roundabout
- O. Rail access
- P. Inter Terminal Transit System (ITTS)
- Q. Airfield compounds
- R. Highways compounds

3.3.23 Table 3.3.1 summarises the criteria used to assess each option.

Table 3.3.1: Assessment Criteria

Category	Sub-criteria
Operations	Safety: Will the option allow for continuous safe operation of the component and the airport as a whole?
	Security: Will the option have any implications on airport security?
	Resilience: Will the option be future proof?
	Airfield operations and performance: Will the option allow for continuous effective and efficient operation of the airport?
	Terminal operations: Will the option have any implications on how the terminals operate?
	Passenger experience: What impact will the option have on passenger experience?
Business Case	Capacity: Will the option be able to accommodate passenger growth of at least 75.6 mppa?
	Capital costs: is it considered to be cost-efficient based on the nature of the works?
	Operating cost: is this a cost-efficient option over the lifespan of the component?
	Airline cost: Will the option impact upon airline revenue, eg servicing aircrafts and / or passengers?
	Value for Money: Does the option represent value for money?
Deliverability	Programme implications: Can the option be delivered within the Project programme (ie can it be operational by the year it is anticipated to be required)?
	Buildability: Are there any engineering constraints and can the component physically be constructed?
	Construction logistics: Are there any complexities or constraints around construction, for example parallel works on another component?
	Safe working: Are there any implications for safety during construction and if so, can these be mitigated?
Planning	Consenting requirements: What consents, licenses or permits are required to deliver the option?
	Consenting risk: Does the component comply with national and local policy and regulatory requirements?
Surface Access	Performance: Will the option allow for the efficient operation of the (altered) surface access network?
	Current network: Will the option have any impacts on the efficient operation of the current surface access network?
	Sustainable Travel: will the option impact upon the existing and future travel opportunities?
Water	Flood risk: Will the option result in any increase or decrease in flood risk and if so, to what extent?
	Water environment: Will the option result in any impacts on the water environment including ground water?
Environment (ecology,	Designations: Will the option result in any harm to designated or non-designated heritage assets?

Category	Sub-criteria
heritage, soils, visual)	Land and soils: Will the option result in the loss of best and most versatile soils or geodiversity?
	Ecology: Will the option result in any impacts on designated or non-designated habitats? Will the option provide opportunities for habitat provision or enhancement?
	Landscape: Will the option result in any impacts on landscape character?
Community (noise, air quality, health, socio-economic)	Emissions: Will the option have the potential to result in emissions that could have an impact on communities (noise, dust or odour)?
	Employment: Will the option impact upon local businesses and/or employment?
Land and Property	Loss of land and/or buildings: Will the option result in a loss of land currently used for other land uses, or existing buildings, in particular where they are not within GAL's ownership?

3.3.24 For each category a colour rated 'scoring' system was used to qualitatively assess each option using professional judgement and experience of the site and surrounding area. The scoring system allowed for a consistent approach to be applied to each category. A description of each category is provided in Table 3.3.2.

Table 3.3.2: Scoring Criteria for Alternative Options

	A good option: Appears likely to be acceptable in terms of the relevant appraisal attributes. Meets land availability, deliverability, cost and business case criteria. Environmental effects and/or consenting risks may arise but on balance appear likely to be acceptable with mitigation.
	A relatively good option. Land agreements, deliverability, cost and business case requirements appear achievable, although not as ideal as a good option. Environmental effects and / or consenting risks may arise but on balance appear likely to be acceptable with mitigation.
	A feasible option: Land agreements, deliverability, cost and business case requirements appear to be achievable but may require compromise. Environmental effects and / or consenting risks may arise but appear likely to be acceptable on balance with mitigation.
	A less feasible option: Where the achievement of land agreements, deliverability, cost and business case requirements may be problematical. Environmental effects and / or consenting risks are likely to arise and it is not certain that all such effects could be successfully mitigated.
	A high-risk option: Effects, policy conflicts and / or consenting risks that are likely to remain after mitigation are likely to carry such weight that the site is unlikely to be granted consent. deliverability and/or cost and business case criteria are unlikely to be achievable.

Summary of Main Alternatives

3.3.25 A summary of the main alternatives and the reasons for selecting the Project layout is provided in the following sections. A table summarising the key construction/operational requirements which have influenced the identification of the options is presented in Appendix 3.3.1. The options taken forward as part of the Project are summarised at the end of each section and summarised in Table 3.3.3.

Runways

- 3.3.26 Gatwick's existing main runway (08R/26L) has a usable length of 3,311 metres in the 08R (easterly) direction and 3,399 metres in the 26L (westerly) direction⁴. Gatwick's parallel northern runway (08L/26R), is located 198 metres to the north of the main runway. The northern runway is currently not used as a runway at the same time as the main runway. The northern runway is shorter with a length of 3,040 metres in the 08L direction and 2,703 metres in the 26R direction.
- 3.3.27 In order to operate as a dual runway airport there must be a separation distance of 210 metres between the northern runway and the main runway. This distance is required to meet EASA standards for closely spaced parallel runways.
- 3.3.28 Four options have been identified based on the requirements set out in Appendix 3.3.1 to ensure the separation distance between runways is maintained. The options considered are presented below.
- Option A1 - moving the existing northern runway centreline north by 12 metres to achieve a separation distance of 210 metres. This enables the main and northern runway to operate simultaneously, in a dependent dual runway configuration. This option would also require moving Taxiway Juliet northwards, alterations to Taxiway Lima, provision of end around taxiways and provision of a runway holding area for the northern runway.
 - Option A2 - challenge the EASA 210 metre separation distances. This option would involve CAA approval of a safety case to permit the airport to operate both runways simultaneously in a dependent dual runway configuration, whilst separated by 198 metres. The northern runway would remain as is today, 198 metres away from the main runway, however other enabling airfield works would still be required. This would include moving Taxiway Juliet northwards, alterations to Taxiway Lima, provision of end around taxiways and provision of a runway holding area for the northern runway. This would necessitate a robust safety case to validate that a dependent operation of two closely spaced parallel runways would be safe as the regulations stipulate minimum separation of 210 metres for non-instrumented runways.
 - Option A3 - moving the main runway centreline south by 12 metres. This option would involve widening the main runway such that the centreline is moved 12 metres to the south. This option would also require the reconfiguration of navigational aids and equipment servicing the main runway. Other airfield enabling works, such as the re-alignment of Taxiway Juliet, Taxiway Lima, provision of end around taxiways and a runway holding area for northern runway would still be required. The northern runway would remain in its current position.
 - Option A4 - re-purpose the northern runway for smaller aircraft only. This option would involve re-sizing the northern runway to restrict operations to Code C aircraft only. This would result in the runway centreline being moved and the runway strip narrowed to accommodate Code C aircraft or smaller only (aircraft categories are described in Chapter 4: Existing Site and Operation). This would provide a 206 metre separation between the main runway and Taxiway Juliet, which is insufficient for simultaneous, closely spaced runway operations. Other enabling airfield works, such as moving Taxiway Juliet northwards, alterations to Taxiway Lima, provision of end around taxiways and provision of a runway holding area for the northern runway would still be required.

⁴ 26L and 08R relate to the direction of use of the runway depending on the wind direction. A description of this is provided in Chapter 4: Existing Site and Operation.

- 3.3.29 Options A1 to A4 are shown on Figure 3.3.1.
- 3.3.30 Option A1 would require construction works to be undertaken on or near to both the northern and main runways and therefore would require careful phasing and coordination to ensure continual safe operations. Although the option scores slightly lower in terms of the operations criteria compared to some other options, it is still deemed deliverable. Capital costs are considered relatively low compared to other options and the option scores as 'feasible' against the business case. As the extent of the works is contained within the current operational zone, away from many sensitive receptors, the option is therefore deemed to perform well against the environmental, community and surface access criteria. The option is largely within GAL owned land and makes use of existing runways, as set out in Government policy so scores well against the planning and land criteria. Part of the work is located within the fluvial floodplain and would require mitigation.
- 3.3.31 Option A2 achieves the highest score against the business case, surface access, environment and land on account of there being no capital expenditure and no physical works required to directly deliver the option (although it is noted other works would be required within the airfield to account for additional capacity). It also scores well against deliverability and community impact as a result. However, this option would necessitate development of a new, unprecedented dependent runway model and would reduce resilience capability. Consequently, there is high risk that it would not attain regulatory consent.
- 3.3.32 Option A3 would require less capital investment compared with Option A1, due to fewer construction works required to deliver the solution. However, this option would necessitate the main runway being out of operation for the period of construction. This would result in the northern runway being used for aircraft operations during construction, which would have a high impact on traffic movement volumes and provide no resilience in low visibility (as the northern runway is a non-instrument runway). As a result, this option scores as 'high risk' against the business case criteria and as 'feasible' against the operations criteria. Some use of third party land would be required to change navigational aids servicing the main runway, meaning the option performs worse than others against the land criteria. Environmentally this option would require the removal of a strip of amenity grassland, albeit of low ecological value. Part of the work is located within flood zone 2 and would require mitigation. As with Option A1, the extent of the works is contained within the current operational zone, away from sensitive receptors. The option is therefore deemed to perform well against the environmental, community and surface access criteria.
- 3.3.33 Option A4 scores well against the environmental, business case and deliverability criteria. However, it scores as 'high risk' in terms of operations due to impacts on existing infrastructure after the runways are operational. The option also scores as 'high risk' in terms of the planning criteria, since securing regulatory consent would be challenging due to the resulting separation distance being below the regulatory minimum of 210 metres.

Preferred Option

- 3.3.34 Option A1, whilst presenting challenges that would require careful phasing to operations during construction, in its end state is able to deliver a dependent runway model, which is safe, resilient and generates the requisite capability to meet the business case requirements. Option A1 also scores as satisfactory against the environmental, planning, land, business case and deliverability criteria. As the only option with no high risk ratings, Option A1 is the preferred option.

Taxiways

Taxiway Juliet and other Airfield Taxiways

- 3.3.35 Gatwick's existing Taxiway Juliet provides a parallel taxiway to the north of the northern runway. In addition, the airfield includes:
- a network of taxiways to the north of Taxiway Juliet, providing the ability for aircraft to move around the airfield and access the existing piers, stands, Taxiway Juliet and the runways;
 - an end around taxiway at the eastern end the main runway, connecting to Taxiway Victor; and
 - exit/entrance taxiways between Taxiway Juliet and the existing northern runway.
- 3.3.36 To accommodate the 12 metre strip on the northern edge of the northern runway (preferred Option A1) and increased capacity, a number of alterations to the existing taxiways would be required. Taxiway Juliet would need to be repositioned northwards to enable aircraft to use the taxiway independently of northern runway. A new spur (known as the Taxiway Juliet West Spur) would be required to the north west of Taxiway Juliet in order to provide a passing lane and allow air traffic control to effectively sequence aircraft for departure on the main and northern runways during easterly operations. In addition, alterations to Taxiways Lima, Tango, Whiskey, Victor and Zulu would be required to ensure smooth operation of the airfield. Further detail on the proposed changes to taxiways as part of the Project are presented in Chapter 5: Project Description and shown on Figure 5.2.1.
- 3.3.37 The alterations to these individual taxiways have not been subject to the options appraisal process due to complex safety and operational constraints. The smooth operation of aircraft movement around the airfield relies on a suitable configuration of taxiways, holding areas and piers which are subject to safety standards. The changes to Taxiway Juliet and other taxiways detailed as part of the Project are considered necessary to deliver the realigned Northern Runway as there are no other feasible alternative options and a 'Do Nothing' scenario would not be compatible with the relocation of the Northern Runway. Therefore, the taxiways have been identified as a 'single option' solution that would assist with aircraft flow and easing congestion on Taxiway Juliet. The changes to the Taxiways Lima and Tango would provide the opportunity to construct additional stands and a pier within the areas adjacent to them. The pier and stand options are considered further below.

End Around and Exit/Entrance Taxiways

- 3.3.38 Gatwick currently has taxiways between the main runway and the northern runway. Additional taxiways and amendments to the existing taxiways would be required to allow movement of aircraft between the main and northern runways, and between the northern runway and Taxiway Juliet.
- 3.3.39 Based on the requirements outlined in Appendix 3.3.1, the following options were identified.
- Option B1 - vacate onto a new end around taxiway inside the airport boundary.
 - Option B2 - taxi the full length of the runway and wait to vacate at the end.
 - Option B3 - arriving aircraft to taxi across the northern runway behind a departing aircraft, further optimised by holding smaller aircraft on exit taxiways between the two runways.

- Option B4 - vacate onto a new dependent end around taxiway at the western end of the airfield but outside the boundary (not a feasible option when the main runway is operating in an easterly direction (08R) due to the train line).
- Option B5 - vacate onto a new rapid exit taxiway to join a new independent end around taxiway outside the boundary.
- Option B6 - a new southern taxiway with rapid exit taxiway connections from the main runway in combination with Option B2, B3 or B4 and within the boundary if possible.

3.3.40 Options B1 to B6 are presented on Figure 3.3.2.

3.3.41 Option B1 would impact upon runway length, due to the reduced runway end safety area. However, from a business case perspective, this option would meet capacity requirements conditional on traffic and flow mix. The option would result in loss of some trees and vegetation. Additionally, the option would require acquisition of third party land to enable delivery. The option scores well in deliverability, for planning, surface access and community. The works would be contained within the existing airport boundary and the solution is estimated to generate negligible noise impact and could be delivered well within the required timeline. This option is located within Flood Zone 3 and would require mitigation.

3.3.42 Options B2 and B3 score well against the environmental, planning and property criteria as they require no new built development and no additional hardstanding. However, the options would not deliver the required capacity, so score poorly against the business case criteria.

3.3.43 Options B4 and B5 score poorly against planning, environment, community and property criteria as they involve development of new infrastructure on greenfield land beyond the western extent of the airport boundary. The works would also require acquisition of third-party land. However, Option B5 is a good option against the operational criteria.

3.3.44 Option B6 scores less well on the business case criterion, being the most expensive and expensive option in terms of build, along with the added requirement to acquire multiple third party sites to the south of the main runway. However, it is considered feasible in terms of delivering the base flow and resilience. In terms of deliverability, the option performs worse than Options B1 to B4 due to the requirement for works in close vicinity to the runway. The option scores poorly against surface access due to the additional construction vehicle movements associated with the scale of construction. Finally, the option scores less well for the environmental criteria due to the location within the flood zone and considerable loss of trees, planting, hedgerows and soil.

Preferred Option

3.3.45 Based on the information presented above, the preferred option arrangement for exit taxiways is a combination of Option B1, B2 and B3. None of the options on their own would deliver the necessary resilience and flexibility required to operate a dual-runway operation and deliver up to 75.6 mppa, but a combination offers flexible, resilient operations that would achieve this objective.

Aircraft Holding Areas

3.3.46 Currently, a holding area known as 'Alpha Box' is located east of the northern runway, west of Pier 1 and north east of the main runway. This area serves as a holding and sequencing zone for the main runway, when operating in a westerly direction (26L). When operating in easterly

direction on the main runway (08R), aircraft hold on the northern runway and along Taxiway Juliet.

3.3.47 Based on the requirements set out in Appendix 3.3.1, the following options were identified.

- Option C1 - Beta Box sited predominantly on the existing 140s stands, central to the airfield operation, at the north eastern end of the northern runway. The Beta Box would principally provide eight parking stands adjacent to the northern runway, with the seven 130s stands to the north remaining available as remote serviced stands, as they are today. A Code C taxiway, between 130s and 140s stands would be provided to serve as access and egress route for aircraft utilising the Beta Box.
- Option C2 – Juliet Box sited on the existing Taxiway Juliet, central to the airfield operation, north of the northern runway. The Juliet Box would consist of two Code C centrelines and a single code F centreline, facilitating interdependent flow and holding operation on Taxiway Juliet.
- Option C3 - Charlie Box sited on the existing 130 and 140 stands, central to the airfield operation, northeast of the northern runway. The new configuration would provide aircraft stands and operational aircraft hold points which allow aircraft to be held just prior to accessing the northern runway to optimise runway occupancy efficiency and remove aircraft from busy taxiways. The Charlie Box would include new taxiways across the existing apron area, including: four routes for Code E aircraft linking Taxiway Kilo and the northern runway/Taxiway Alpha November; an east-west route for Code C aircraft to allow independent access/egress from all positions; and two routes for Code C aircraft with a Code F taxi lane on Taxiway Kilo to link with taxiways Papa and Quebec and provide alternative routing for Code F aircraft to the runway.

3.3.48 Options C1 to C3 are presented on Figure 3.3.3.

3.3.49 All options would be located in areas of existing hardstanding within the airport. None of the options would result in any additional greenfield land take or require any land outside of the existing airport. In terms of environmental effects, all score similarly and are not likely to result in adverse effects.

3.3.50 All three of the options score ‘good’ or ‘relatively good’ against the planning, surface access, environment, community, water and land criteria. In terms of deliverability, Option C3 scores ‘feasible’, which is less favourable than Options C1 and C2. All three options score ‘less feasible’ against the business case criteria; all options show different constraints in terms of operation and the mitigation required. Option C1 scores ‘high risk’ for operability criterion because it fails to provide a through route for Code F traffic, meaning that the northern runway would need to be utilised. Option C2 scores ‘high risk’ because it necessitates complex aircraft coordination which could present risks.

Preferred Option

3.3.51 Option C3 would deliver against all stated requirements, apart from business case, where this was assessed as ‘less feasible’, as did Options C1 and C2. However, the impacts that cause the option to score ‘less feasible’ can all be successfully mitigated without compromising the other requirements. This is not possible with Options C1 and C2 which would continue to score ‘high risk’ for other standards. Option C3 is therefore the preferred option.

Terminals (including International Departure Lounge (IDL))

- 3.3.52 Gatwick's existing passenger terminals are the North Terminal and South Terminal. They are directly served by the M23 motorway spur off the M23, which runs approximately 1.7 km to the east of the airport. The airport sits on the Brighton-London mainline railway. Gatwick Airport's railway station is located at the South Terminal, and there is a direct transit link to the North Terminal. The North Terminal opened in 1988, and the South Terminal opened in 1958. The existing terminals have gross floor areas of approximately 98,100 m² and 119,300 m² respectively (not including the piers or those parts of the baggage operation that are outside of the terminal buildings).
- 3.3.53 A number of options have been identified to address the increase in passenger numbers associated with dual runway operations. The options include new terminal buildings as well as extensions to the existing terminals. Based on the requirements set out in Appendix 3.3.1, the following options were identified.
- Option D1 - 'do nothing' scenario, ie no changes would be made to the existing North and South Terminals. The existing terminals would have to cope with the additional passenger throughput of up to 75.6 mppa.
 - Option D2 - a new terminal in the north western part of the Project site on current airport car parking land to provide a total terminal capacity for 75.6 mppa. New surface transport modes (eg additional shuttle links) to provide access to the new terminal would be required.
 - Option D3 - a new terminal in the southern part of the Project site, to the south of the main runway, to provide a total terminal capacity for 75.6 mppa. New surface transport modes (eg additional shuttle links) to provide access to the new terminal would be required. The new terminal and a new pier (which would also be required for this option) would be constructed on land currently safeguarded for another runway, which is outside of the existing airport boundary.
 - Option D4 - expand the existing South Terminal only to provide a total terminal capacity for 75.6 mppa.
 - Option D5 - expand the existing North Terminal only to provide a total terminal capacity for 75.6 mppa.
 - Option D6 - expand both existing South and North Terminals to provide a total terminal capacity for 75.6 mppa. The forecourts and approaches to both existing terminals would be enhanced, with routes providing access to the terminal frontage, multi-storey and long stay car parks, hotels and pick-up and drop-off areas for different transport modes.
- 3.3.54 Options D1 to D6 are presented on Figure 3.3.4.
- 3.3.55 Although Option D1 would result in the lowest costs and lowest environmental impacts as no changes would occur, it would not be capable of accommodating the proposed increase in passenger throughput. This is due to space and capacity limitations within the terminal buildings to accommodate the increase in passenger numbers. Therefore, this option has been discounted.
- 3.3.56 As a result of being located within the airport on land already occupied by hardstanding, none of the other options are likely to result in significant issues relating to water/flooding, environment (ecology, heritage, soils, visual) or community (noise, air quality, health, socio-economic) impacts, with the exception of Option D3. Option D3 is located on the southern edge of the operational airport and would be likely to be visible from receptors outside of the airport. In relation to

operational, business, planning and land-related matters, some options score significantly better than others.

- 3.3.57 A new terminal, as outlined in Options D2 and D3, would provide the required capacity but would be expensive to deliver and operate. Extensive landside infrastructure would be required to get the passengers to and from the terminal (especially to / from the train station). In addition, Option D3 would require the considerable acquisition of land and would prejudice long term development in an area currently safeguarded for a new runway (in the event that it is required) outside of the airport boundary.
- 3.3.58 Options D4 and D5 are both deliverable. However, the terminals do not currently have sufficient pier infrastructure to accommodate the anticipated passenger numbers and therefore infrastructure would need to be increased significantly. The extensions to each terminal would occur on airport land, however the facilities which would need to be displaced to create room for the terminal expansion may result in third party land take. Extending only one terminal could also create surface access issues.
- 3.3.59 Option D6 would create the smallest expansion requirement in each terminal with the fewest consequential requirements in terms of additional pier infrastructure or displaced areas requiring relocation. The option also scores well in relation to the environment and community as the extensions would occur within the airfield would not require any additional greenfield land take.

Preferred Option

- 3.3.60 Option D6 performs best overall as it maintains a balanced split of demand that makes the best use of the combined residual capacity in each terminal, thereby limiting the size of expansion required in each. This option would not require the acquisition of additional land outside of the airport boundaries, as the expansion would be undertaken within existing boundaries and this balance of growth would avoid placing too much pressure on any particular element of surface access infrastructure, eg North or South Terminal roundabouts.

Piers

- 3.3.61 Gatwick Airport currently supports six piers from which passengers embark and disembark aircraft (Piers 1, 2 and 3 at the South Terminal and Piers 4, 5 and 6 at the North Terminal). The number of aircraft stands serviced by each pier is dependent on the type and size of aircraft. Additional pier capacity would be required to support the additional number of aircraft movements and maintain current standards for pier service for passengers.
- 3.3.62 Based on the requirements set out in Appendix 3.3.1, the following 12 options have been identified:
- Option E1 - Pier 6 extension full service⁵ proposal;
 - Option E2 - new tower stand full service proposal;
 - Option E3 - new tower stands (fast-turn);
 - Option E4 - new Pier 7 in the location of the existing cargo facility (single loaded⁶);
 - Option E5 - new Pier 7 in the location of the existing cargo facility (double loaded⁷);
 - Option E6 - Pier 6 extension (single loaded);

⁵ A full service pier allows passengers to board aircraft via a boarding bridge or jetty.

⁶ A single loaded pier only allows aircraft to access one side of the pier.

⁷ A double loaded pier allows aircraft to access both sides of the pier.

- Option E7 - Pier 6 extension (double loaded);
- Option E8 - Pier 4 and 5 reconfiguration;
- Option E9 - Pier 5 west extension;
- Option E10 - new Pier 7 immediately south and west of the existing cargo facility (single loaded);
- Option E11 - Pier 3 western extension; and
- Option E12 - other Pier 3 alternative options (enhancement and reconfiguration).

3.3.63 Options E1 to E12 are shown on Figure 3.3.5.

3.3.64 None of the options would require any greenfield land take or land take outside of the current airport boundary. Options E2, E3, E4, E5 and E10 would all involve the construction of new piers located: in the existing location of the cargo facility (E4 and E5), to the south and west of the cargo facility in an area of car parking (E10) or in the location of existing remote stands to the north of Taxiway Juliet (E2 and E3). Options E4, E5 and E10 would introduce aircraft to a part of the airfield which currently doesn't experience aircraft movement, resulting in noise and air quality emissions closer to receptors to the north west of the airport (mainly the Bear and Bunny Nursery, Povey Cross and the River Mole corridor). All other options are located in an area of the airfield currently supporting aircraft movement.

3.3.65 Options E1, E6 and E7 would involve the extension and/or reconfiguration of Pier 6, while Options E8, E9, E11 and E2 include the extension and/or reconfiguration of other piers. The deliverability of Options E1, E2, E3, E8, E9 and E11 would involve complex airfield reconfiguration which would result in major disruption to the airport during construction. Similarly, due to the location of Options E6, E7 and E12, the flow of aircraft within the airfield would be severely disrupted (both during construction and operation) meaning these options have been discounted. Options E4 and E5 would be located in the area of the existing cargo centre meaning displacement of the cargo functionality could result in these options being cost prohibitive.

Preferred Option

3.3.66 Option E10 was the only option that scores no lower than 'feasible' against any of the criteria and performed best overall. The case for selecting Option E10 as the preferred option is further supported by its proximity to the proposed Taxiway Lima extension. The linking of a newly constructed pier and associated stands in this location would provide for the optimum free-flow of aircraft on the taxiway system and avoid the risk of delays caused by congestion associated with the vast majority of the other options. The loss of car parking spaces can adequately be re-provided in other parts of the airport. The options for car parking are provided later in this chapter (paragraphs 3.3.88 to 3.3.92).

Hangars

3.3.67 There are currently four existing on-airport hangars which are operated by British Airways, Virgin Atlantic, easyJet and Boeing. It is currently anticipated that a further hangar would be required as part of the Project. The hangar would be required to house facilities for larger aircraft.

3.3.68 Based on the requirements set out in Appendix 3.3.1, the following options have been identified:

- Option F1 - a site which is currently used for car parking (Long Stay Summer Special car park);

- Option F2 - a site adjacent to Hangar 6 (British Airways Hangar) (south of the main runway) currently used for car parking;
- Option F3 - a site within an area of the airport known as Oscar, adjacent to the existing Virgin hangar;
- Option F4 - a site currently used for Long Stay Summer Special car parking (block park storage and front of house provision); and
- Option F5 - land adjacent to the Boeing Hangar.

3.3.69 Options F1 to F5 are presented on Figure 3.3.6.

3.3.70 All options are located within the airport boundary and are located in areas of existing hardstanding.

3.3.71 Option F1 is a feasible option in terms of operational requirements and business case, albeit it would impact the availability of car parking, which would need to be re-provided elsewhere. No issues in terms of deliverability, planning or environmental factors are considered likely.

3.3.72 Option F2 would present significant concerns in terms of operational requirements as it would require aircraft to cross the runways. This option would also reduce car parking which would need to be re-provided elsewhere. No issues are envisaged with deliverability, planning or environmental factors for this option.

3.3.73 Options F3 and F4 raise concerns in terms of operational and business case requirements as the useable areas proposed (taking into account the need to share the space with other airfield infrastructure) are insufficiently sized for larger aircraft. The location for F3 would also be required for new stands and therefore a hangar co-located in this location would interfere with the movement of larger aircraft using Taxiway Juliet. Option F4 is located in the preferred areas for the construction of a new pier (see paragraph 3.3.66) and Taxiway Lima, therefore, the option would require consideration of the deliverability of other necessary airport infrastructure. These options would also require construction in a congested part of the airfield. Both options are partially located within flood zones 2 and 3 and therefore additional mitigation would be required. No further issues are envisaged with deliverability, planning or environmental factors for these options.

3.3.74 Option F5 raises concerns in relation to operations and the business case, as the area is insufficiently sized to deliver the hangar, associated infrastructure and manoeuvring areas. Due to the location, Option F5 would be more straight forward in terms of construction compared to F3 and F4. The location is adjacent to the River Mole corridor and Pond A and is located within flood zones 2 and 3. Therefore, appropriate drainage infrastructure and pollution control would be required during construction and operation. In addition, areas of grass would need to be removed to allow for the construction of this option.

Preferred Option

3.3.75 Option F1 performed best overall, in particular against the operations criteria given it provides a site of sufficient size allowing for other airfield infrastructure and would be contiguous with an existing taxiway. Its location is well placed in relation to the emerging preferred pier and stand options and Taxiway Lima extension works and would not compromise the smooth running of other airfield operations.

Hotels, Offices and Car Parks

3.3.76 Gatwick is currently served by a number of on and off-site hotels with eight on airport hotels, providing approximately 3,000 rooms in total. Gatwick also has on-site car parking, providing approximately 46,700 passenger and staff spaces (as of summer 2019). In addition, there is approximately 34,590 m² of on-site office space in main office buildings. In the absence of the Project (in the future baseline scenario), additional capacity is currently planned to be implemented as follows:

- extension to the existing BLOC hotel (approximately 200 additional bedrooms);
- reconfiguration of the existing Hilton hotel to provide 50 additional bedrooms;
- multi-storey car park (MSCP) 4 (South Terminal): 1,500 spaces;
- MSCP 7 (North Terminal): 2,750 additional spaces; and
- use of robotics technology within existing long stay car parking areas to increase capacity, resulting in an additional 2,500 spaces.

3.3.77 In addition to the above, it is anticipated that the Project would generate a requirement for:

- up to 1,000 additional hotel bedrooms on-airport (further capacity may be required off-site, to be provided by third parties if/when required)
- approximately 9,000 m² of additional office floor space; and
- approximately 18,500 additional car parking spaces.

3.3.78 Based on the requirements set out in Appendix 3.3.1, the following options have been identified:

- Hotels
 - Option G1 - located within the existing car park H;
 - Option G2 - located within the existing car park Y; and
 - Option G3 - located at a building compound adjacent to the car rental site.
- Offices
 - Option G4 - provision of office space within the site of car park H; and
 - Option G5 – provision of office space within the site of car park Y.
- Car Parks
 - Option G6 - new surface car park in the location of Pentagon Field;
 - Option G7 - new decked car park in the location of Pentagon Field;
 - Option G8 - new MSCP in the location of existing car park H (1) (north);
 - Option G9 — new MSCP in the location of existing car park H (2) (south);
 - Option G10 - new MSCP in the location of existing car park Y;
 - Option G11 - new MSCP in the location of existing car park J (currently used for car rental);
 - Option G12 - new decked parking in the location of existing self-park north car park (one deck);
 - Option G13 - new decked parking in the location of existing self-park north car park (additional deck);
 - Option G14 - new car park in the location of Crawter's Field;
 - Option G15 - new decked car park in the location of existing car park X; and

- Option G16 - new decked car park in location of existing valet MA-1 car park.

3.3.79 Options G1 to G16 are presented on Figure 3.3.7.

Hotels

- 3.3.80 A number of the options score well and could be taken forward as design solutions; however, no single option alone would be capable of delivering the solution required
- 3.3.81 Option G1 scores well against all criteria as it proposes new development within an existing area of built development/hardstanding within close proximity to the South Terminal and the train station, with an existing access to the South Terminal roundabout. There are anticipated to be limited impacts upon the environment or community and the site is within the airport boundary. However, additional tall built infrastructure could be visible from receptors within and outside of the airport.
- 3.3.82 Option G2 scores lower than the other options in terms of business case and deliverability. The land could also be needed for flood storage. G2 would require the consideration of adjacent land uses, including the potential for land to be used as a construction compound. The site for G2 and G3 (in part) are located within Flood Zone 3 and G2 may be visible from Riverside Garden Park and adjacent properties.
- 3.3.83 Option G3 performs well against all criteria. As it does not impact upon existing car parks, affecting instead the car rental (which has been temporarily relocated due to current station works and could remain in this new area permanently), it scores higher than Options 1 and 2 against the operations and business case criteria.

Preferred Option

- 3.3.84 None of the options assessed score as 'high risk' against any of the criteria and Options G1 and G3 score well across all criteria. Whilst not performing as well as Options G1 and G3 in terms of the business case, deliverability criteria and water criteria, Option G2 is considered to be a 'feasible' option given the requirement to provide sufficient provision to serve the future capacity requirements (ie 1,000 additional on-airport bedrooms). Options G1 and G2 would separately have the capacity to fulfil the entire quota of 1,000 rooms, however based on the need to balance additional hotel space between both terminals and to allow choice and suitable access for passengers, all three options are considered the preferred options.

Offices

- 3.3.85 In terms of the office provision, Option G4 scores well against all criteria on account of being located on existing hardstanding within proximity of the South Terminal, train station and the South Terminal roundabout. There are not anticipated to be any large scale impacts upon the environment or community and the site is located within GAL ownership.
- 3.3.86 Option G5 scores lower than Option G4 in terms of the business case and deliverability as a result of the requirement to provide underground tanks and the potential interfaces with adjacent uses, including a potential construction compound. The site is located within Flood Zone 3 and may be visible from Riverside Garden Park and adjacent properties.

Preferred Option

- 3.3.87 Option G4 performs well against all criteria. It is better located to support sustainable transport, would not give rise to impacts from flooding, is anticipated to be less likely to give rise to potential environmental and community impacts and is capable of providing for office floorspace required. Option G4 is therefore the preferred option.

Car Parks

- 3.3.88 A number of the options score well and could be taken forward as design solutions; however, no single option alone would be capable of delivering the solution and number of spaces required.
- 3.3.89 Options G6 and G7 have links to existing bus routes and use current entrance/entry points, and would therefore offer a good passenger experience, with no operational or safety issues envisaged. However, these options would involve the development of a greenfield site and would therefore require drainage to be provided to ensure no increase in flood risk. Development of this greenfield site would be visible from adjacent roads and public rights of way both within and outside the Project site boundary. Both options are adjacent to ancient woodland and a red Archaeological Notification Area (West Sussex) and therefore appropriate mitigation would be required to avoid a potential impact.
- 3.3.90 Options G8 to G13 would also offer a good passenger experience to access the terminals as they are either within walking distance or could include a relatively easy transfer (via bus). Options G10 and G11 are partially situated in a Flood Zone 3 and would require appropriate drainage to be provided to ensure no increase in flood risk. Options G12 and G13 would have limited environmental constraints, due to the existing use of the site as a long-term car park. All of these options (G8 to G13) would involve the conversion of surface parking to decked or multi-storey parking. Options G8 and G9 would be visible against an already built up view being located adjacent to the South Terminal. Option G11 is not likely to be visible outside of the airport boundary due to its location next to the North Terminal. Options G10, G12 and G13 are located close to the airport boundary and therefore have the potential to be visible from outside of the airport (depending on height). However, as for other options, these would be seen in the context of existing airport infrastructure, some of which are tall in nature.
- 3.3.91 Options G14, G15 and G16 are all located on the southern boundary of the airport and rely on existing access. They are the three furthest options from both the North Terminal and South Terminal and therefore would require additional internal transfer capabilities or only used for staff parking. Option G14 is located in Flood Zone 3 and would require extensive drainage works. The access and drainage work would result in higher construction costs. Furthermore, Options G14 and G15 are situated adjacent to multiple watercourses, archaeological sites and listed buildings, which would require appropriate mitigation measures to be developed. The location of Option G16 has also been identified as a feasible location for a construction compound (see paragraphs 3.3.168 to 3.3.171).

Preferred Option

- 3.3.92 Due to the need to provide for up to 18,500 additional parking spaces and on the basis that there may be several areas of existing parking lost in order to facilitate a number of Project related works, it was initially proposed that all of the options, apart from Option G16 (due to the proposed construction compound), were the preferred options. Further work undertaken following that initial decision has identified a potential solution (requiring increased decking elsewhere) that allows

Option G14 (Crawter's Field) to be avoided. Therefore, the preferred solution incorporates all options apart from G14 and G16.

Foul Water

- 3.3.93 Foul drainage from the South Terminal, which pre-dates the establishment of Crawley Sewage Treatment Works (STW), drains north to the Horley STW. This catchment includes the developments to the east of the railway and flows are pumped where necessary but generally leave the airport under gravity. The North Terminal and the airfield drain south to the Crawley STW. Based on the requirements outlined in Appendix 3.3.1, the following 11 options have been identified and are presented on Figure 3.3.8.
- Option H1 – South Terminal. Upgrade main pipeline to Horley STW which would improve flow from the South Terminal to Horley STW removing the pinch point.
 - Option H2 – South Terminal. Re-route two existing pipelines (pumping station 19 and 23) to Crawley STW to reduce future flow to Horley STW.
 - Option H3 – South Terminal. Storage tanks provided with managed release to Horley STW which would reduce the peak flow to maintain current loads.
 - Option H4 - South Terminal. Pipeline and sewer line upgrade to solve localised pinch point.
 - Option H5 – South Terminal. Connection to Crawley STW underneath the railway line to reduce future flow to Horley STW.
 - Option H6 – New GAL owned waste water treatment works where all additional flows generated by growth could be handled on-site.
 - Option H7 – Airfield. Relocate pipelines and pumping station to accommodate relocation of Taxiway Juliet to an alternative location.
 - Option H8 – Airfield. Reinforce pipeline at pumping station 3 to allow the relocation of Taxiway Juliet and reduce ingress of storm water.
 - Option H9 – Airfield. Add a new pipeline to accommodate relocation of Taxiway Juliet and combine with flows from two existing pumping stations (pumping station 2 and 3) in to one new pumping station.
 - Option H10 – North Terminal. Route to Horley STW to reduce all loads to Crawley STW making room for growth in the region.
 - Option H11 – North Terminal. New pipeline and pumping station to solve localised pinch point.
- 3.3.94 A number of the options score well and could be taken forward as design solutions; however, no single option alone would be capable of delivering the solution required. The options which perform best in terms of deliverability are Options H2, H4, H9 and H11. These options would create additional capacity without affecting existing operations. Therefore, disruption to the foul network during operation would be limited. Some works would be required to deliver H4 however these would be limited.
- 3.3.95 Options H2, H3, H6, H7 and H8 score poorly in terms of cost due to maintenance and additional facilities within GAL control.
- 3.3.96 Option H2 would avoid an area known as Horleyland Wood, designated as ancient woodland and as a Local Wildlife Site to avoid the loss of habitat. Options which score lower in terms of the environment are H5 and H10, which could result in significant disruption to the local highway network and the residents in Povey Cross (Option H10). Option H10 would also require the crossing of the River Mole and pass through an area of woodland. Option H6 is located within an

area of greenfield land and would require appropriate drainage incorporated into the design of any facility.

- 3.3.97 Option H1 scores poorly with regard to deliverability as there is a high dependency on third-party land and it has been assumed that the STW in Horley is full and would not be expanded. The option could also have impacts upon the existing highway network, creating delays as a result of temporary closures in order to deliver the improvements.
- 3.3.98 Option H5 is considered a less suitable option in terms of business case and deliverability requirements, due to the complexity of delivery across/below water, roads and railway. The option also scores poorly in terms of planning, surface access and environment given the potential impacts upon the river and associated habitats and potential delays caused on the highway network.

Preferred Option

- 3.3.99 Options H2, H9 and H11 could be combined together to create an overall solution which could meet the capacity requirements. The combination of options would avoid the need to construct a new storage facility or carry out works that could require crossing the railway, river, areas of ecological value or highway network, which could potentially give rise to greater impacts upon surface access, environment and community. Therefore these three options are included in the Project.
- 3.3.100 In the event that there is not sufficient capacity within the existing Thames Water Treatment Works or that improvements cannot be made to provide this capacity, an expansion to the existing Crawley Sewage Treatment Works may be required. This could be undertaken separately by Thames Water. However, an area of land has been identified to allow the expansion on land owned by GAL, in case this is required.

Surface Water Drainage

- 3.3.101 The airfield has several catchments that are discharged into local water courses via balancing ponds: Ponds E and F drain to the Gatwick Stream, and Ponds A, M, Dog Kennel and Pond D drain directly to the River Mole in accordance with discharge consent. If the water quality in Ponds A, M and Dog Kennel does not meet the discharge consent standard it is routed through Pond D for treatment and quality control preventing pollution of the River Mole. If necessary polluted water can be pumped to Gatwick Airport pollution lagoons for further treatment before being discharged to the river system.
- 3.3.102 Based on the requirements set out in Appendix 3.3.1, five options have been identified to control the increase in surface water runoff which would occur as a result of the Project and to mitigate the loss of existing ponds to Project features.
- Option I1 – re-provision of Pond A in a location known as Museum Field owned by GAL;
 - Option I2 – reconfiguration of Pond A drainage catchment so it drains to pond M instead;
 - Option I3 – creation of an open storage pond for additional surface water storage prior to Pond D;
 - Option I4 – creation of underground storage at car park Y for additional surface water storage prior to Pond D, maintaining development opportunities for the land; and
 - Option I5 – move Pond A north in line with Taxiway Juliet providing local storage and relocate the River Mole.

- 3.3.103 Options I1 to I5 are presented on Figure 3.3.9.
- 3.3.104 Option I1 is considered to be high risk against the business case criteria as the option would prevent this land being used for fluvial storage capacity (see below). In terms of deliverability, the option is considered feasible. Against the water criteria the option is considered 'less feasible' as it would affect existing watercourses, whilst in terms of the environmental criteria the works would result in some tree loss and potential impacts upon soils and buried archaeology. As a result of these potential impacts, the option scores as 'feasible' against the planning criteria as it is considered to be only partially compliant with planning policy.
- 3.3.105 Option I2 scores poorly with regard to business case criteria compared with a number of other options given the costs associated with establishing and operating a pumping station. The construction would require significant and close coordination given airfield interfaces, meaning the option scores as 'feasible' against the deliverability criteria. As the option is located within the airport and would not result in any loss of planting or habitats, it scores positively in terms of planning, surface water, land, community and environment.
- 3.3.106 Option I3 scores poorly in business case terms as it would result in the loss of existing car parking which would need to be replaced. Its location near to a number of existing and potential Project works means it scores as 'less feasible' given the potential interfaces and complexities. As there is potential for some tree loss depending on the exact location of the pond and impacts upon soils, the option scores lower than several others in terms of the environment. In terms of surface access, it is considered that the displacement of the existing car parking spaces could give rise to impacts on the surrounding network. As a result of the potential environmental and surface access impacts, the option scores lower than several others against the planning criteria as these impacts may result in some non-compliance with planning policy.
- 3.3.107 Option I4 underneath car park Y performs well against operations criteria and scores better than the other options in terms of business case, though it may result in the loss of an area that could be used for commercial uses. In terms of deliverability, the option is considered feasible, though sequencing of the works could give rise to programme delays due to interfaces with other potential works. There would be potential impacts on soils and archaeology.
- 3.3.108 Option I5 scores well operationally as it would provide a source of buffering and reduce the requirement for car park Y storage (Option I4). There are some deliverability impacts associated with sequencing the works in order to ensure there are no impacts on the existing infrastructure. The option scores positively against all other criteria.

Preferred Option

- 3.3.109 Options I4 and I5 perform best in relation to the operations criteria. Option I4 scores the highest in relation to the business case for which other options (such as Option I2) score poorly. Both options present some complexities in relation to deliverability, though are still considered viable. These options perform positively against planning and water criteria Whilst Option I4 would result in potential impacts upon archaeology, the option is still considered to be feasible. Therefore, both Options I4 and I5 are the preferred options.

Fluvial Flood Risk Mitigation

- 3.3.110 Due to the reconfiguration of the hardstanding and drainage features associated with the Project, additional fluvial flood risk mitigation would be required to ensure there is no increase to flood risk

off-site and that the operation of the airfield remains resilient to flooding. The River Mole flows through the airport, passing under the main and existing northern runways in culvert. Tributaries of the River Mole, including the Crawter's Brook, the Gatwick Stream and Westfield Stream all run through or adjacent to the Project site

- 3.3.111 The final arrangement and location of the fluvial mitigation will be determined by detailed modelling work undertaken to support the Flood Risk Assessment submitted for the ES. A draft Flood Risk Assessment is provided at Appendix 11.9.1 of the PEIR.
- 3.3.112 Based on the requirements set out in Appendix 3.3.1, 10 options for additional storage have been identified at this stage:
- Option J1 – located within and adjacent to land known as Museum Field;
 - Option J2 – located at the existing Summer Holiday Parking;
 - Option J3 – located within car park X;
 - Option J4 – located within car park Z;
 - Option J5 – located within car park B;
 - Option J6 – utilising an area to the east of Gatwick Stream, retaining existing trees;
 - Option J7 – utilising an area to the east of Gatwick Stream, removing existing trees;
 - Option J8 – utilise the areas in between the proposed End Around Taxiway West;
 - Option J9 – utilise the areas in between the proposed End Around Taxiway East; and
 - Option J10 – relocate the existing River Mole into a two-stage channel providing additional flood alleviation.
- 3.3.113 Options J1 to J10 are presented on Figure 3.3.10.
- 3.3.114 Option J1 performs strongly across all criteria. Whilst the site is greenfield land, it is anticipated that the works provide the opportunity for habitat improvements and therefore score as a good option with regard to the environment. It is anticipated that the works can be undertaken independently of any other works as they are away from airfield operations. The site is located outside of the existing airport boundary but is within GAL ownership. However, given its identified need and the potential benefits it can offer, the option scores as feasible for the planning criteria.
- 3.3.115 Option J2 is considered a high risk option against the business case criteria as it does not contribute significantly to achieving the target protection. It would also result in the loss of parking spaces which would need to be re-provided.
- 3.3.116 Option J3 is considered feasible against the business case criteria. However, it would result in the loss of parking spaces which would need to be re-provided. The option could be delivered over the winter months to minimise the extent of car parking space loss over the busier period. The option would result in some tree loss and potential impacts on soils.
- 3.3.117 Option J4 and J5 scores poorly against the operational criteria as it is anticipated that it would not provide sufficient protection against flooding. The loss of parking spaces and loss of trees and soils results in the option scoring lower than a number of other options.
- 3.3.118 Option J6 and J7 scores well against the operations criteria as it is considered capable of offering the necessary protection from flooding. As the works can be undertaken independently of other linked works it scores as a good option for deliverability. The loss of trees and soils mean the option scores as feasible in terms of environment. Option J7 scores low in terms of community as

the loss of trees adjacent to the STW could potentially reduce the visual and noise screening for the community.

- 3.3.119 Option J8 and J9 scores as high risk against the operations criteria as it is considered to offer poor protection against flooding and potentially give rise to safeguarding issues. In terms of deliverability, the restriction on construction hours to avoid impacts on runway operations were considered to affect the programme. The cost of delays is considered to have a potential impact on the business case.
- 3.3.120 Option J10 is an opportunity created by the option chosen for surface water (Pond A) and scores well against all criteria, although there are some concerns around the proximity of an open watercourse near the airport boundary in relation to attracting birds.

Preferred Option

- 3.3.121 Options J1, J3, J6 and J10 perform best in combination overall and are the preferred options. In addition to the options that are anticipated to provide the necessary additional flood risk mitigation, there may be a requirement for additional works to existing surface water infrastructure, runoff areas and treatment solutions (many of which are detailed above as part of the Surface Water and Foul Water Drainage options). A requirement for any such works will be identified through further design development and detailed water modelling for the ES.

Waste Management Facilities

- 3.3.122 Gatwick's existing waste management facilities are located within an area of the existing airfield known as Oscar to the north of Taxiway Juliet. The Central Area Recycling and Waste Enclosure (CARE) facility comprises a biomass boiler, a waste processing building, compound area and bin store. This area is required to be reconfigured to provide space for other airfield components as part of the Project. The relocated CARE facility would include a flue stack up to a maximum of 50 metres in height (above ground level).
- 3.3.123 Based on the requirements set out in Appendix 3.3.1, two options for the relocation of the CARE facility have been identified:
- Option K1 – in an area currently used as valet north 'Flying Pan' car park (north of the cargo facility); and
 - Option K2 – in an area currently used as car park self-park north.
- 3.3.124 Options K1 and K2 are presented on Figure 3.3.11.
- 3.3.125 Both options are located in areas of existing hardstanding and therefore no greenfield land take would be required. Both options would require measures to be put in place to ensure their resilience to surface water flooding.
- 3.3.126 Option K1 is located slightly further inside the airport boundary, and is considered more favourable in terms of the business case (reducing the distance travelled by waste vehicles). There is considered to be a lower probability of the waste management site being visible from outside the airport and there would be no requirements to construct a new enabling roadway to service the development, meaning the site scores better from a surface access perspective.

- 3.3.127 Option K2 would require heavy goods vehicles (HGVs) to travel a greater distance within the airport to reach the facility. This option would be located closer to the airport boundary therefore the flue stack could potentially be slightly more visible from outside the airport.

Preferred option

- 3.3.128 Whilst Option K1 scores marginally better in terms of the business case, surface access and environment criteria, both options perform well overall. Only one option would be required however at the current time both options have been assessed within PEIR. These options will be refined and one option will be taken forward for the ES.

Surface Access

- 3.3.129 In order to accommodate the proposed increase in passenger numbers accessing the airport, and taking into account other known and planned developments in the area, improvements are required to the highways that serve the airport to add capacity. It is anticipated that works would be required to the Longbridge Roundabout, North Terminal Roundabout and South Terminal Roundabout. This section describes the appraisal process undertaken for different options for these three junctions. The options have been developed as part of the traffic modelling in accordance with Transport Analysis Guidance (TAG) (Department for Transport, 2018). Due to the availability of specific guidance, the appraisal of the surface access options has been undertaken using a separate methodology. Further details of the design process is provided in Appendix 12.9.1 (Preliminary Transport Assessment Report (PTAR)) of the PEIR.

- 3.3.130 The preferred options for surface access are provided on Figure 3.3.12.

Longbridge Roundabout

- 3.3.131 Longbridge Roundabout is located to the north of the airport and is currently a four-arm signalised roundabout where the A23 intersects with Povey Cross Road and the A217. Pedestrian crossing facilities are provided on each arm of the junction.

- 3.3.132 The design iteration process included a number of options being tested through strategic modelling of the highway network. A full description of the options considered through this process is provided in Annex C of Appendix 12.9.1 (PTAR). A summary of the options are provided here:

- Option L1: existing roundabout to be replaced with a signal-controlled junction;
- Option L2: local improvements to the existing signal controlled roundabout whilst retaining the existing junction footprint; and
- Option L3: improvements to the existing signal controlled roundabout to increase the junction size and capacity.

- 3.3.133 Option L1 involves upgrades to each of the four arms of the junction including widening of the running lanes. Pedestrian and cyclist facilities would be retained at each arm of the junction via staggered signal-controlled crossings. These changes would provide safety benefits compared to the existing layout, in particular in relation to HGV turning movements. The existing supporting structure for the left turn lane from A23 Brighton Road onto A23 London Road would be retained minimising construction costs and habitat removal. This option however, would not provide sufficient capacity to accommodate the Project. Significant costs would be involved to change the

junction from a roundabout to a signal controlled junction, including the upgrade or provision of a new A23 Brighton Road overbridge.

- 3.3.134 Modelling was undertaken to identify if Option L2 could accommodate the increased traffic volumes associated with the Project. Under this option the existing roundabout central island would be retained, avoiding design changes that would result in requiring additional land. This option aims to minimise the impact to adjacent residential and commercial properties and avoid impacting the existing segregated left turn lane and the associated stilt structure. The results showed that it is not likely sufficient capacity would be provided by this option. Furthermore, safety issues pertaining to the existing layout related to insufficient carriageway width would not be addressed with the implementation of Option L2.
- 3.3.135 Option L3 would result in an enlarged junction footprint. The existing elevated stilt structure that supports the junctions segregated left turn lane between A23 Brighton Road and A23 London Road would need to be modified or replaced. The A23 Brighton Road overbridge that passes over the River Mole would also need to be modified or replaced to accommodate changes to the highway footprint on the A23 Brighton Road. These modifications would increase the construction costs however the option would provide the sufficient capacity required.

Preferred Option

- 3.3.136 Of the three options assessed for Longbridge Roundabout, only Option L3 would provide the required capacity for the modelled increase in traffic as a result of the Project. Therefore Option L3 is the preferred option.

North Terminal Roundabout

- 3.3.137 The North Terminal roundabout is the entry point to the North Terminal and local access roads, including the northern and east perimeter roads. The existing layout consists of a circular five-arm at-grade roundabout to the north east of the North Terminal, to the south west of the A23. There is currently no direct entry to the roundabout southbound from Horley and no direct exit from the roundabout on to the A23 southbound towards Crawley. Further local improvements, involving signalisation and minor widening of entries / exits, are proposed in the absence of the Project.
- 3.3.138 Improvements to the roundabout are considered necessary to mitigate capacity impacts arising as a result of the Project.
- 3.3.139 The design iteration process included a number of options being tested through strategic modelling of the highway network. A full description of the options considered through this process is provided in Annex C of Appendix 12.9.1 (PTAR). A summary of the options are provided here:
- Option M1: grade separated junction – provision of an at-grade elongated gyratory junction with a through route for the A23 London Road via a flyover constrained by Riverside Garden park and Gatwick estate, constrained to 40mph;
 - Option M2: grade separated junction – provision of an at-grade elongated gyratory junction with a through route for the A23 London Road via a flyover constrained by Riverside Garden park and Gatwick estate, constrained to 50mph;
 - Option M3: grade separated junction – provision of an at-grade elongated gyratory junction with a through route for the A23 London Road via a flyover using land from Riverside Garden Park to the north, constrained to 50mph;

- Option M4: grade separated junction – provision of an at-grade elongated gyratory junction with a through route for the A23 London Road via a flyover using land from the Gatwick estate to the south, constrained to 50mph;
- Option M5: at-grade signal controlled junction – existing roundabout junction to be replaced with an at-grade signal controlled junction providing free flow links between the A23 London Road, Airport Way and the North Terminal. A through route for the Airport Way Westbound connection onto the A23 London Road Northbound to be provided via a flyover; and
- Option M6: at-grade offline signal-controlled junction – modifications to the existing North Terminal roundabout with the provision of a new offline roundabout in Staff Car Park Y. Improvements to Longbridge Way and Longbridge Way roundabout to facilitate changes in traffic flow.

- 3.3.140 Options M1 and M2 would lead to the existing Northern Terminal roundabout being replaced with an elongated gyratory junction with connections to adjacent roads being modified accordingly. A grade-separated junction arrangement would introduce a through route for the A23 London Road, raising the carriageway over the gyratory junction via a four-span viaduct. Option M2 would involve a longer flyover alignment to account for the faster speed limit of 50mph. These two options would not result in the permanent land take of Riverside Garden Park north nor would they encroach on GAL owned land to the south. The junction layout would remain largely within the existing highway boundary. The options would allow for non-airport traffic to bypass the junction reducing the volume of traffic required to use it.
- 3.3.141 The options for M1 and M2 would however require the constriction of retaining wall structures and potential works to the Inter Terminal Transit System (ITTS) viaduct structure (further details on the ITTS is provided below). The works would be likely to result in substantial disruption to road users during construction. Due to complex construction sequencing these options are likely to lead to higher costs compared with at-grade layouts.
- 3.3.142 Options M3 and M4 would be similar to Options M1 and M2 however the works would not be constrained to the existing highway boundary allowing the A23 to be moved to the northeast (Option M3) or developing the gyratory further to the south (Option M4). This would allow greater distances between slip roads and a greater flexibility for links to the south of the junction. Option M3 would result in the loss of land from Riverside Garden Park which would impact on recreational use of the park. Similarly, Option M4 would result in the use of GAL owned land to the south of the junction, impacting on the ITTS viaduct, Perimeter Road and some airport infrastructure. Option M4 would also result in impacts on the Shell Filling Station and the Premier Inn Hotel. As with Options M1 and M2 the works would be likely to result in substantial disruption to road users during construction.
- 3.3.143 Option M5 would replace the existing roundabout with an at-grade signal-controlled junction, providing a number of free flow links between the A23 London Road, Airport Way and the connector roads to the North Terminal facilities. An at-grade solution resolves access problems and mitigates the forecasted increase traffic volumes at the junction whilst minimising the extent of construction works, environmental impact and disruption to the existing network through the reduced junction footprint. The option would remain largely within the existing highway boundary minimising the land take of Riverside Garden Park.
- 3.3.144 Option M6 is an at grade solution modifying the existing North Terminal roundabout junction and introducing a new offline roundabout at the existing GAL Staff Car Park Y. The primary function of

this roundabout would be to provide a connection between the A23 London Road northbound and southbound to the GAL estate. The option introduces issues within the GAL internal road network, which would require a significant upgrade to cope with the increased traffic using Perimeter Road North and Longbridge Way. It is anticipated that this option would demonstrate issues with queuing on Perimeter Road North and Longbridge Way and could block the exit from the North Terminal. There is also potential for queuing traffic to back up the GAL internal highway network and the surrounding road network. There would be no loss of land from Riverside Garden Park if this option was taken forward.

Preferred Option

- 3.3.145 Option M5 is the preferred option as it would provide the required capacity to accommodate in the increase in traffic flows as well as reducing the impact on Riverside Garden Park and GAL estate land to the south. The option would result in lower disruption during construction compared with some of the other options.

South Terminal Roundabout

- 3.3.146 The South Terminal roundabout (also known as the Welcome Roundabout) is the sole entry point into the South Terminal area and for local access roads, including the terminal forecourt, long stay car parks and commercial premises. It is served by the M23 Gatwick Spur to the east (leading from the M23 Junction 9) and Airport Way from the west (leading from the North Terminal roundabout). The majority of Gatwick traffic accesses the airport from the M23 and traffic for both North Terminal and South Terminal must pass through this roundabout. The M23 Gatwick Spur has recently been upgraded as part of the Highways England M23 Smart Motorway Project. The hard shoulder of the westbound carriageway has become a permanent running lane, providing a total of three lanes approaching the airport. Further local improvements, involving signalisation and minor widening of entries / exits, are proposed in the absence of the Project.
- 3.3.147 Improvements to the roundabout are considered necessary to mitigate capacity impacts arising as a result of the Project.
- 3.3.148 The design iteration process included a number of options being tested through strategic modelling of the highway network. A full description of the options considered through this process is provided in Annex C of Appendix 12.9.1 (PTAR). A summary of the options are provided here.
- Option N1: grade separated junction - M23 Spur/Airport Way Flyover (40mph);
 - Option N2: grade separated junction - M23 Spur/Airport Way Flyover (50mph);
 - Option N3: grade separated junction including a northern access arm to accommodate future potential developments to the north - M23 Spur/Airport Way Flyover (50mph); and
 - Option N4: grade separated junction with an elevated roundabout and a new through route for the M23 Spur/Airport Way.
- 3.3.149 Option N1 includes the provision of a flyover for the M23 Spur/Airport Way to maintain a through route over the existing at-grade roundabout. The M23 Spur/Airport Way mainline would be designed to be suitable for a 40mph speed limit. Access to the South Terminal would be maintained in its current position and new slip roads would be provided to link the existing roundabout to the flyover. This option builds upon Option N2 (below) and the 40mph limit was designed to test if the B2036 Balcombe Road overbridge could be retained. However, modelling

suggests that it is likely the overbridge would need to be replaced. The option would allow the free movement between the M23 Spur and Airport Way, removing non-airport traffic from the junction. This would result in less congestion and a safer highway environment. The retention of the at grade roundabout would reduce costs and disruption to road users during construction. The footprint of Option N1 is also smaller than some of the other options (N3 and N4) and therefore would result in less land take.

- 3.3.150 Option N2 would be similar to Option N1 however, the speed limit over the flyover would be increased to 50mph, tying back into the 40mph limit on Airport Way to the west of the junction. The higher speed limit would increase capacity at the junction although would require the replacement of the B2036 Balcombe Road overbridge. The earthworks associated with constructing the flyover and slip roads would require increased land-take beyond the existing highway boundary and would impact existing buildings to the south of the mainline, as would Option N1. The option however, would provide the required capacity to mitigate the effects of the Project traffic on the junction.
- 3.3.151 Option N3 is the same as N2 however, this option would accommodate additional traffic resulting from potential future developments to the north of the South Terminal. The design would include a new northern arm on the at-grade roundabout to access such potential future developments. The access provision would include two new segregated left turn lanes to facilitate traffic entering and exiting the northern arm. The capacity of the M23 Spur eastbound merge slip road would be increased through the provision of a second lane and an increase in the proposed length of the slip road. This option shares similar benefits to Option N2 however it also allows for future capacity if required. The additional northern arm would result in greater land take than Options N1 and N2 and would increase the cost of construction. The requirement for future potential developments to the north of the junction has not been confirmed at this design stage, therefore this option was not progressed further in the traffic modelling.
- 3.3.152 Under Option N4 the South Terminal roundabout would be elevated introducing an at-grade through route for the M23 Spur/Airport Way underneath. Access to the South Terminal, car parking and hotels/offices would be maintained to the south and slip roads would be provided to link the roundabout circulatory carriageway back to the existing M23 Spur/Airport Way. The proposed design speed for the through alignment and slip roads would be suitable for a 40mph speed limit under the assumption that the same speed limits would be applied to key routes at the North Terminal. The key benefits of this option include the provision of a through route to non-airport traffic which would also improve safety. The B2036 Balcombe Road overbridge would also be partially retained reducing costs and disruption. This option, however, would result in larger land take and would involve substantial earthworks and retaining walls. This would increase the disruption during construction and result in greater costs.

Preferred Option

- 3.3.153 Option N2 is the preferred option as it provides the capacity required to accommodate the increase in traffic while minimising the associated land take. The 50mph proposed for N2 limit would allow greater capacity through the junction compared with the 40mph limit of Option N1 and would tie into the existing 40mph limit on Airport Way.

Rail Access

- 3.3.154 Gatwick Station is located adjacent to the South Terminal. The station is predominately located on Network Rail's operational land. However, sections of the site fall within the ownership of GAL. It is anticipated that Gatwick will see a sustained increase in rail mode share over the next 10 to 15 years. The rate of change will depend on a number of factors, including the maintenance of a reliable and punctual service. Improvements to Gatwick Station are the subject of a separate planning application, with construction ongoing. The current works include an upgrade to almost double the size of the station concourse and provide additional lifts and escalators, improving access to platforms and the passenger experience. The enhancement will provide for further growth in rail passengers and mode share. These improvements are anticipated to be complete in 2022.
- 3.3.155 Based on the requirements set out in Appendix 3.3.1, three options have been identified:
- Option O1 – do minimum which involves seeing the completion of the Gatwick Station improvements outlined above;
 - Option O2 - extension of a new station concourse over Platform 3/4, with additional escalators/lifts/stairs to and from platform level; and
 - Option O3 - extension of a new concourse to full deck, with additional escalators/lifts/stairs to and from platform level.
- 3.3.156 Options O2 and O3 are shown on Figure 3.3.13.
- 3.3.157 Option O1 scores well across all topics as it would involve maximising the use of the improvements that are currently under construction. Therefore, no additional construction or operational costs would be required and there would be no construction works that could give rise to environmental impacts, or requirements for further consents or land. Initial analysis indicates that, upon completion of the works, there will be sufficient capacity at the station to accommodate the proposed increase in passengers and the future rail travel targets.
- 3.3.158 If further work shows a need for additional capacity of Gatwick Station, Options O2 and O3 offer the ability to provide this.

Preferred Option

- 3.3.159 Option O1 is the preferred option as it is considered that it would still provide the necessary capacity required to accommodate the anticipated future passenger numbers without adversely affecting airport operations and passenger experience. With funding already in place and works being completed independently from the Project, the option scores well in terms of deliverability and business case.

Inter Terminal Transit System

- 3.3.160 The ITTS is an automated people mover (monorail shuttle service) which links the South Terminal and North Terminal. This currently operates two three-car trains every few minutes between the terminals.
- 3.3.161 Based on the requirements set out in Appendix 3.3.1, the following options have been identified.

- Option P1 – Do minimum. This assumes no change to the current operation (frequency and hours of operation) or capacity. The existing system would be maintained until end of life and a subsequent business decision would be made on refurbishment or replacement.
- Option P2 – Optimise current operating pattern. This assumes that the current system would be optimised to operate at its maximum frequency (a shuttle every five minutes on each track in peak periods) and maintenance schedules are amended to increase capacity availability in accordance with peak demand.
- Option P3 – Extend to four-car trains and extend platforms. This assumes that as well as optimising the service (Option P2) both trains would be lengthened by adding an additional carriage, thereby increasing capacity by 33%.
- Option P4 – Add crossover for maximum platform utilisation. This assumes that two crossovers would be installed along the track allowing up to four trains to operate at once and minimising wait times for passengers. Train lengths would be optimised to accommodate peak demand (two-car or three-car trains).
- Option P5 – Add bypass loops and maintenance area. This assumes a similar operation to Option P4 but with the introduction of a maintenance area midway along the tracks to allow trains to be taken out of service without reducing station capacity.

- 3.3.162 Due to the nature of the options only Options P3, P4 and P5 are shown on Figure 3.3.14. The other options are not able to be visually represented.
- 3.3.163 Option P1 would not meet full capacity/operational requirements for growth up to 75.6 mppa so there would be an anticipated deterioration in passenger experience, which could impact on safety, and the potential for increased maintenance requirement and risk of reduced service. Option P2 makes best use of the existing system with the lowest business cost and impacts. By avoiding any infrastructure changes it represents a neutral business decision for system life and/or replacement/refurbishment. Neither of these options would have any adverse impacts on the environment as no additional built infrastructure would be required.
- 3.3.164 Options P3, P4 and P5 would all require some form of built infrastructure by way of platform extension or rail infrastructure. Based on the positioning of the ITTS within the airport no greenfield land take would be required. The additional track infrastructure associated with Options P4 and P5 would only be likely to be visible within the airport; however, the canopy extensions associated with the extended platforms for Option P3 could be visible from outside the airport.
- 3.3.165 Of the options delivering additional physical capacity, Option P3 would have the least impact and cost but with some disruption during construction.
- 3.3.166 Options P4 and P5 would require changes to the trackwork of the system, which may be incompatible with future operations, noting potential refurbishment/replacement. The options could result in an unknown period of disruption during construction.

Preferred Option

- 3.3.167 Further work will determine the scale of intervention necessary to adequately cater for demand, noting that some improvements can be made within the existing operation. The PEIR assesses Option P3.

Construction Compounds

Airfield Compounds

- 3.3.168 A number of generally small scale compounds are currently located on the airport which are used to support ongoing construction works. However, it is anticipated that the scale of the Project would result in the need for additional compound capacity. The compounds would need to provide space for a number of activities and must be located centrally for access to most airport construction activities. Further details on the requirements are included in Appendix 3.3.1.
- 3.3.169 A number of on-airport options were identified, most of which were considered to be inappropriate in terms of location and size to be viable alternatives and therefore weren't considered further. Four options located outside of the Project site boundary were identified for potential airfield construction compounds (Figure 3.3.15) and a further three inside the boundary. These seven options are considered in this chapter.
- Option Q1 – field to the south of the airfield and London Road, outside the Project site boundary.
 - Option Q2 – field to the south of the airfield and London Road, outside the Project site boundary adjacent to the A23.
 - Option Q3 – field to the south of the A23 and airfield, outside the Project site boundary.
 - Option Q4 – field to the south of the A23 and airfield, outside the Project site boundary and to the east of Option Q3.
 - Option Q5 – land adjacent to the existing Boeing hangar north of the northern runway.
 - Option Q6 – land adjacent to the British Airways hangar to the south of Taxiway Yankee.
 - Option Q7 – land adjacent to the British Airways hangar to the south of Taxiway Yankee and north east of Option Q6.
- 3.3.170 Options Q1 and Q2 are located to the south of the airport boundary on the southern side of London Road. Although the sites would be big enough to contain all the required activities, they are greenfield sites which are currently used for agriculture. A further two sites to the east of Q1 and Q2 (Q3 and Q4) are also located on agricultural land and located adjacent to an area of ancient woodland, therefore scoring poorly in terms of environment. All four of the options are in locations that have potential for buried archaeology and could result in effects on the setting of listed buildings. Options Q1 and Q2 are in an area of land outside of GAL control.
- 3.3.171 Options Q5, Q6 and Q7 are located within the airport boundary; Q5 next to the Boeing Hangar to the north of the northern runway, and Q6 and Q7 in the far south east of the airfield. These locations would provide the access required to the different areas of the airfield, are within GAL control and would have no impact on the current operation of the airport. Options Q6 and Q7 would not be of a suitable size if they were considered in isolation but could be joined together to provide the required area.
- Preferred Option*
- 3.3.172 A minimum of one site north and one site south of the runways are required to ensure works are delivered safely and efficiently. Of the southern options, Options Q6 and Q7 performed best overall given their proximity to the works area and status as areas of existing hardstanding. Both sites are therefore considered as the preferred options. Of the northern options, Option Q5 performed best given its direct access to the airfield and is therefore the preferred option.

Surface Access Compounds

- 3.3.173 Given the nature of the proposed highway works it is anticipated that at least one construction compound would be required to support these works.
- 3.3.174 Based on the requirements set out in Appendix 3.3.1, the following options for the surface access construction compounds have been identified.
- Option R1 - located in Reigate Field which is a greenfield site located immediately north of the South Terminal roundabout;
 - Option R2 - located in Balcombe Road Field which is a greenfield site located immediately south of the M23 spur;
 - Option R3 - use of car park H which is located immediately east of the Hilton Hotel within the airport boundary;
 - Option R4 - use of car park Y which is located north west of the North Terminal roundabout within the airport boundary;
 - Option R5 - located at Peeks Brook Lane North which is an existing industrial site currently used as a compound for the M23 spur works;
 - Option R6 - located at Peeks Brook Lane South which is a brownfield site currently used temporarily as a car park;
 - Option R7 - use of the M23 Compound North located north east of the airport alongside the northbound carriageway of the M23 motorway and currently used as a compound to service the M23 works;
 - Option R8 - use of the M23 Compound South which is an existing industrial site located on the eastern side of the M23 motorway;
 - Option R9 - located at Junction 10 Copthorne is a partially built industrial site containing a number of industrial units; and
 - Option R10 - an area adjacent to the River Mole to the north of Longbridge Roundabout.
- 3.3.175 The above highway construction compound options are presented on Figure 3.3.15.
- 3.3.176 Options R1 and R10 score best in terms of deliverability given their proximity to the highway works sites. They score lower than several options in terms of planning and environment on account of being greenfield sites that could be of ecological value. They are also located within close proximity to a number of residential properties so score lower than other options with regard to community impacts. The sites are not within GAL ownership. In terms of the business case, the sites are considered to be a relatively good option.
- 3.3.177 Whilst being well located in relation to the works, Option R2 scores lower with regard to planning and environment given its location outside of the airport. It is also located within close proximity to a number of residential properties so scores lower than other options in regard to community. The site is also outside of GAL ownership. In terms of deliverability, it would require additional works to create the access, but it considered feasible subject to access from the M23 spur being agreed with Highways England.
- 3.3.178 As existing developed sites (car parks), Options R3 and R4 score well against the planning, environment and deliverability criteria. Option R3 scores poorly for surface access as it would result in impacts for South Terminal access/egress capacity and conflicts with adjacent uses (eg Hilton Hotel), whilst Option R4 is located partially within the floodplain.

- 3.3.179 Options R5 and R6 comprise existing brownfield sites, scoring well in relation to the environment. However, both are considered to be less feasible options with regard to surface access given the impacts on M23 spur and difficulty gaining vehicle access. Neither of the options are owned by GAL.
- 3.3.180 Options R7 and R8 perform well in relation to operational requirements, given their location away from the airport. However, both are considered to be high risk options in terms of surface access and deliverability given the access restrictions onto the M23 and the longer traffic routing that would be required to gain access to and from the main highway works sites. Option R8 has previously been used by Highways England and a requirement for compulsory acquisition would be likely.
- 3.3.181 Option R9 also scores well against operational requirements given its location away from the airport. However, this has meant it scores poorly in terms of deliverability, given the requirement to be located near to the works.

Preferred Option

- 3.3.182 Whilst Option R1 and R10 score lower than several other on-airport options in relation to environmental and planning on account of being greenfield sites, their proximity to the proposed highway works sites means they score highly in regard to deliverability. The compounds would be temporary and any effects on the environment would be short term in nature. Given the works would take place on a congested section of highway, a key requirement has been for the works areas to be located as close as possible to the work in order to avoid the need for construction traffic to interface with existing traffic on the network. Similarly, Option R4 is located close to the highway works and on an area of existing car parking. Therefore, given their locations adjacent to the existing highway, Options R1, R4 and R10 are the preferred options.

Preferred Options

- 3.3.183 Following the appraisal process and based on the above, the options identified as performing best against the criteria have been taken forward to form part of the current design for the Project. Table 3.3.3 summarises the preferred option(s) taken forward within the current design and assessed within the PEIR.

Table 3.3.3: Preferred Design and Layout Options

Component	Preferred Option(s)
Runways	Option A1 - moving the existing northern runway centreline north by 12 metres to achieve a separation distance of 210 metres. This enables the main and northern runway to operate simultaneously, in a dependent dual runway configuration.
End Around and Exit Taxiways	Option B1 - vacate onto a new end around taxiway inside the airport boundary. Option B2 - taxi the full length of the runway and wait to vacate at the end. Option B3 - arriving aircraft to taxi across the northern runway behind a departing aircraft.
Holding Areas	Option C3 - Charlie Box.

Component	Preferred Option(s)
Terminals	Option D6 - expand both existing South and North Terminals to provide a total terminal capacity for 75.6 mppa.
Piers	Option E10 - new Pier 7 immediately south and west of the existing cargo facility (single loaded).
Hangars	Option F1 - a site which is currently used for car parking (Long Stay Summer Special car park).
Hotels	Option G1 – located within the existing car park H. Option G2 – located within the existing car park Y. Option G3 - located at a building compound adjacent to the car rental site.
Offices	Option G4 - construction of approximately 13,935 m2 of additional office space on the site of car park H. To be provided by three equally sized buildings.
Car Parks	Options G6 – G15 have all been proposed for inclusion at this stage.
Foul Water	Option H2 – South Terminal. Re-route two existing pipelines (pumping station 19 and 23) to Crawley STW to reduce future flow to Horley STW. Option H9 – Airfield. Add a new pipeline to accommodate relocation of Taxiway Juliet and combine with flows from two existing pumping stations (pumping station 2 and 3) in to one new pumping station. Option H11 – North Terminal. New pipeline and pumping station to solve localised pinch point.
Surface Water Drainage	Option I4 – creation of an underground storage pond for additional surface water storage prior to Pond D, maintaining development opportunities for the land. Option I5 – move Pond A north in line with Taxiway Juliet providing local storage and relocate the River Mole.
Fluvial Flood Risk Mitigation	Option J1 – located within and adjacent to land known as Museum Field. Option J3 – located within car park X. Option J6 – utilising an area to the east of Gatwick Stream, retaining existing trees. Option J10 – relocate the existing River Mole into a two-stage channel providing additional flood alleviation.
Waste Management	Option K1 – in an area currently used as valet north ‘Flying Pan’ car park (north of cargo).
Longbridge Roundabout	L3 – improvements to the existing signal controlled roundabout to increase the junction size and capacity.
North Terminal Roundabout	M5 – at grade signal controlled junction – existing roundabout junction to be replaced with an at-grade signal controlled junction providing free flow links between the A23 London Road, Airport Way and the North Terminal. A through route for the Airport Way Westbound connection onto the A23 London Road Northbound to be provided via a flyover.
South Terminal Roundabout	N2 – grade separated junction - M23 Spur/Airport Way Flyover (50mph).
Rail Access	Option O1 - do minimum.
Shuttle	Option P3 - Extend to four-car trains and extend platforms.

Component	Preferred Option(s)
Airfield Compounds	Option Q5 - Adjacent to the existing Boeing Hangar. Option Q6 - In the location of existing car park Valet MA-1. Option Q7 - In the location of existing car park Valet MA-1.
Highway Compounds	Option R1 - Reigate Field. Option R4 - Car Park Y. Option R10 - Field north of Longbridge Roundabout.

3.3.184 For some options, a conflict of land use has been identified. This is anticipated to be overcome by phasing of the Project construction to allow the same parcel of land to be used for multiple purposes.

3.4. Conclusion

3.4.1 The Gatwick Airport Master Plan (GAL, 2019) reported that Gatwick Airport contributes £5.3 billion to the UK economy and supported over 85,000 jobs prior to the pandemic. At peak times, it is the busiest single-runway airport in the world.

3.4.2 Since publication of the previous master plan in 2012, Gatwick increased throughput by almost 12 million passengers, a greater increase across the six-year period than any other UK airport. Previous Department for Transport forecasts have underestimated Gatwick's growth, forecasting 34 million passengers for 2017, over 10 million less than were actually handled that year. Forecasts indicate that demand is anticipated to return later in 2021, with demand returning to pre-pandemic levels by mid 2020s.

3.4.3 A do minimum option with regard to passenger throughput and airport improvements (Scenario 1) would restrict future growth and Gatwick's ability to contribute to meeting future demand for increased aviation capacity. This option would not allow Gatwick to maintain best use of its existing runways as only one runway would be operational at any time.

3.4.4 GAL is not actively pursuing the option of a second runway to the south of the existing main runway (Scenario 3) in light of the Government's support for the third runway at Heathrow, but considers it to be in the national interest for land to continue to be safeguarded to allow for a new runway to be constructed, if required in the future.

3.4.5 GAL is pursuing Scenario 2 (making best use of its existing runways) and, therefore, this PEIR relates to Scenario 2, given that it results in the following benefits.

- Aligns with Government policy of making best use of existing runways at all UK airports .
- In comparison to the existing situation and Scenario 1, provides greater UK point-to-point airport capacity to assist in delivering unmet Department for Transport-forecasted aviation demand to 2050, whilst complementing the existing UK hub capacity provided at Heathrow (and in view of any additional capacity potentially introduced by the proposed third runway).
- An increase in flights, improved connectivity, increased employment and economic benefits to the local area with a much reduced scale of environmental impact compared to that arising from an additional new runway (Scenario 3).
- Creates economic benefits to the national, regional, and London economies, including through supporting inward investment for business travellers, and tourism.

- Provides additional operational resilience for the airport with the flexibility to routinely use two runways .
- Minimising growth outside of the airport boundary.
- Does not prejudice the long-term safeguarding of the land to the south of the airport for a future additional runway.
- Delivers significant local economic benefits, including further employment and training opportunities for local people, supply chain opportunities for local businesses, increased local retail and leisure expenditure, and other economic stimuli to the local area.

3.4.6 A review of design and layout options has been undertaken through an iterative design process for the Project. This review has taken into account the following criteria:

- operational;
- business case;
- deliverability;
- planning;
- surface access;
- water;
- environment (ecology, heritage, soils, visual);
- community (noise, air quality, health, socio-economic); and
- land and property.

3.4.7 The current design and layout of the Project layout is described in Chapter 5: Project Description. Overall, it is considered that the selected options offer a sustainable approach to providing greater operational resilience both at Gatwick Airport and improved UK airport capacity.

3.5. Next Steps

3.5.1 The option appraisal work will continue throughout the ongoing EIA process and any new options will be appraised against the criteria identified in this chapter. The final ES will include an appraisal of any options identified throughout the consultation period and any changes to the design since the publication of this document.

3.6. References

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3.7. Glossary

Table 3.7.1: Glossary of Terms

Term	Description
ACL	Airport Coordination Limited
ATM	Air transport movements
CAA	Civil Aviation Authority
CARE	Central Area Recycling Enclosure
EAT	End around taxiway

Term	Description
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESEA	European Aviation Safety Agency
GAL	Gatwick Airport Limited
HGV	Heavy Goods Vehicle
ICAO	International Civil Aviation Organization
IDL	International Departure Lounge
ITTS	Inter Terminal Transit System
mppa	million passengers per annum
MSCP	Multi-storey car park
NPS	National Policy Statement
PEIR	Preliminary Environmental Information Report
PTAR	Preliminary Transport Assessment Report
STW	Sewage Treatment Works