



Development of Bristol Airport to Accommodate 12 Million Passengers Per Annum: Parking Demand Study

Teneo Consulting, 2018

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Summary	Historic parking demand	Forecast future demand	Impact of public transport improvements	Sensitivity testing forecast parking demand	Impact on unauthorised parking	Capacity requirements

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Summary

1. Summary

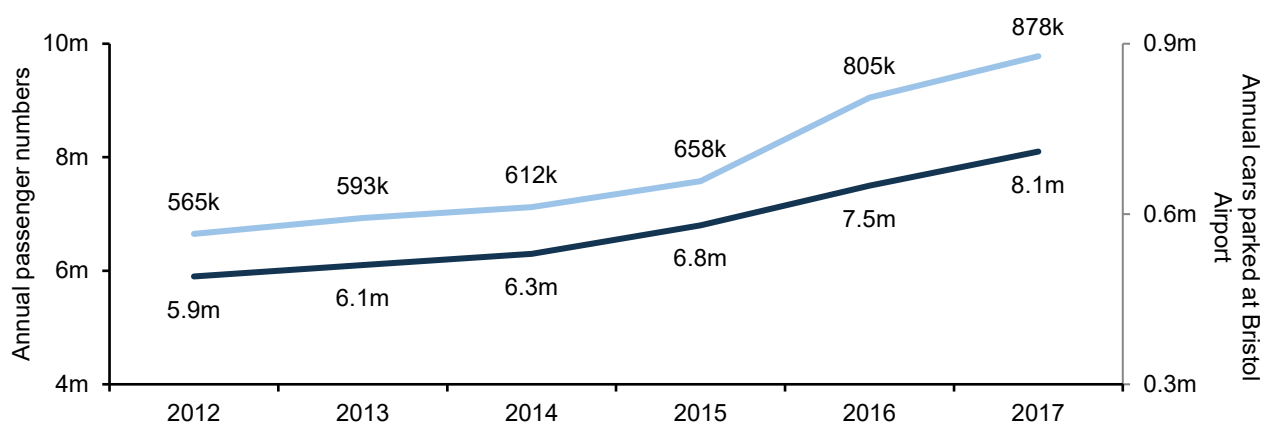
Purpose and scope of this report

1.1 This report supports the planning application submitted by Bristol Airport Limited (BAL), seeking to enable growth in passenger numbers to 12mppa (million passengers per annum) with associated infrastructure. The aim of this report is to identify the level of car parking required up to 12mppa considering development under the 10mppa planning permission, and to consider potential options to meet increased demand. The projected demand for car parking up to 12mppa considers public transport modal share, the future catchment area for passengers and anticipated type of parking demand. We assume a constant 12.5% public transport modal share for our calculations and then run a sensitivity of 15% to assess the accuracy of forecasts in this scenario.

Historic demand and capacity

1.2. Passenger numbers at Bristol Airport have increased by c. 2.3m between 2012 and 2017 (Figure 1) at an average annual growth rate of 6.1 percent, far exceeding average levels of growth amongst other UK airports over the same period. From 2012 to 2017, the number of cars parked at the airport has increased from c. 565,000 per annum to c. 878,000 per annum alongside growth in public transport usage. We estimate that there were 1.66m passengers who drove and parked in 2017 (based on surface access studies, CAA data and car park entries). One of the key reasons why the demand for parking has increased at the airport is the introduction of new airline routes and higher frequencies, attracting passengers from a wider catchment area. Customers drawn from beyond the immediate Bristol area are considerably more likely to drive to the airport due to the comparative

Figure 1 - Comparison of Bristol Airport passenger growth relative to cars parked



availability of direct public transport links. Paragraph 13.3.1 of the *West of England Joint Transport Report 2017* notes that transport investment in the West of England and across the South West is less than half the expenditure that could be expected in other parts of the country. One outcome of this is fewer public transport choices for passengers across the region, resulting in Bristol Airport experiencing a higher proportion of car-borne passengers compared to airports in other regions as its catchment area expands.

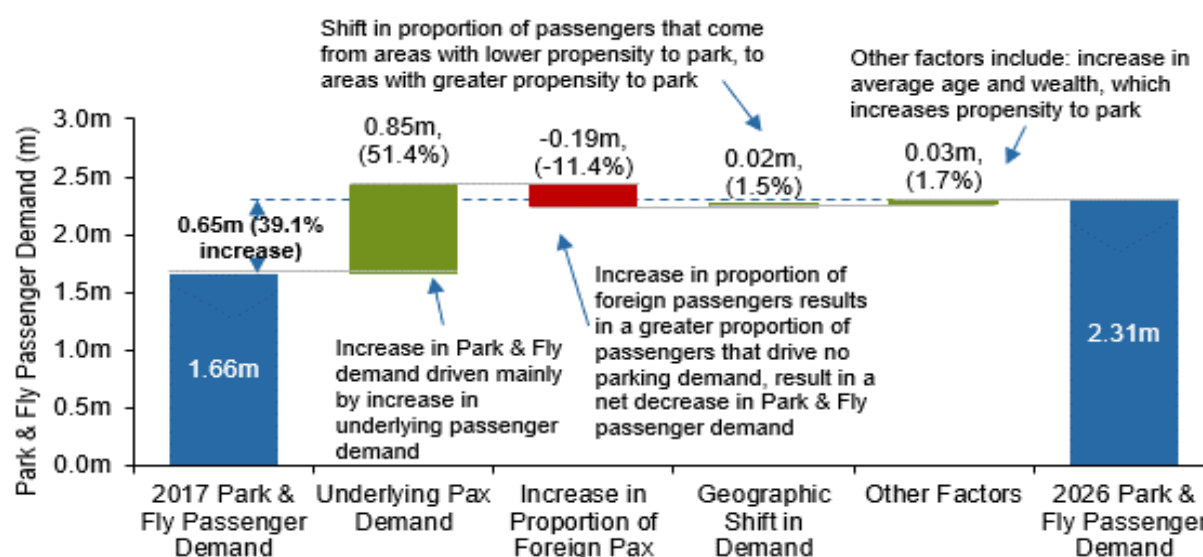
1.3 As a result of this growth, and especially the likelihood of those from further afield to drive due to a limited supply of public transport options across the South West, the airport has seen increased pressure on its car parking capacity, particularly in the summer season when Bristol Airport serves a tourism market with high levels of outbound travel. Typically, September is the month with highest demand. During the summer of 2017, occupancy at Bristol Airport official sites peaked at c. 15,000 cars in the month of September, with this demand only met through the opening of *Silver Zone Extension Phase One* (a seasonal extension to Silver Zone).

1.4 Due to airport passenger growth, total parking demand during the summer months sometimes exceeds the available on-site airport capacity. This creates a market for unofficial off-site car parking operators. As a result, off-site parking has increased steadily in recent years and we have observed (based on an annual visual survey conducted by the Airport) that in 2017 there were approximately 4,800 parking spaces available in off-site locations. These are highly utilised during the summer months.

Future demand and capacity

1.5 Bristol Airport forecasts passenger numbers will increase from c. 8.2m in 2017 to c. 12m in 2026. This represents 4.3% average annual growth. We forecast that this growth in passenger numbers and several other factors, including a shift in the proportion of foreign passengers, a lack of sub regional public transport options (despite the significant investment proposed by BAL to support public transport), changes to the airport's UK catchment, and other demographic changes, will lead to a c. 39% increase in the number of passengers parking at the airport between 2017 and 2026, (assuming a stable 12.5% public transport mode share), equivalent to 4.2% average annual growth, as seen in Figure 2 below. The figure only includes passengers who Park & Fly (where passengers drive to the airport and park their car for the duration of their trip) and excludes drop-offs which use parking spaces for only a short time and therefore are not a key driver of parking demand.

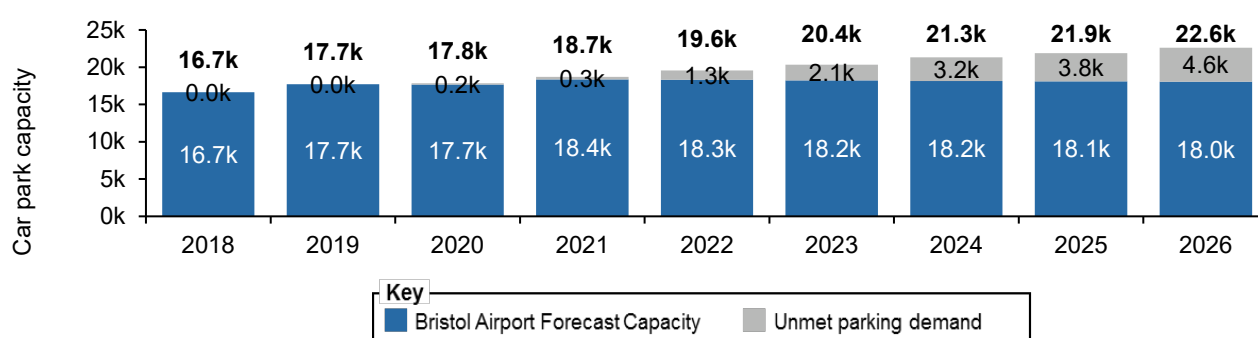
Figure 2 - Drivers of Park & Fly passenger demand (2017-2026)



1.6 We convert these passenger numbers into the likely number of cars parking at the airport (based on average group size taken from CAA surveys) and the number of spaces required to service this demand (based on historic demand / occupancy ratios). The results of this analysis, detailed in full within the report, indicate that Bristol Airport will require **over 22,600 spaces** to service peak demand given passenger demand for parking in 2026.

1.7 As part of the 10mppa planning permission, the airport currently has plans to increase car park capacity from c. 16,700 in 2018 to c. 18,400 in 2021 through the construction of the second phase of the existing multi-storey car park and the construction of the second multi-storey car park (with associated public transport interchange). Note that for this assessment, we have used the official car park capacity count from May 2018 (c. 16,700). Despite future increases in parking provision, we forecast that they will be insufficient to prevent capacity pressure as passenger numbers increase to 12m by 2026, as the previous application only accommodated for 10mppa, leading to an **expected shortfall of 4,600 spaces**¹ assuming current mode shares are maintained (Figure 3). Modal share is assessed in full in later sections. At present, some demand is absorbed through unofficial off-site parking sites near the airport (as noted above); it is highly likely that without the provision of additional capacity at the airport the use of these unofficial off-site providers will increase, or the airport will not be able to accommodate the forecast increase in passenger numbers.

Figure 3 - Forecast car parking capacity required to service demand



Potential impact of public transport improvements

1.8 At present, approximately 12.5% of passengers travel to the airport by public transport and our central forecast for parking capacity assumes that this percentage remains unchanged. However, Bristol Airport is committed to increase public transport modal share for customers as part of the 10mppa application. This will include improved bus connections (please see section 9 of the Transport Assessment). Modelling from the surface access strategy estimates that the mode share for public transport will increase to 15%; therefore, we have run a sensitivity on our forecasts assuming the targeted level of 15% of all passengers using public transport is met by 2026. We estimate that an **additional 3,900 spaces** (compared to 4,600) will be sufficient to meet demand with public transport usage reaching 15%. Further to this, we have run a 'super-sensitivity' to assess the levels of public

¹ Note that current planned car park capacity decreases from 2022 onwards allowing some flexibility for contractor and staff car parking as well as loss of spaces as a result of detailed design. This will be reviewed in the context of progress against public transport mode shift targets and final parking numbers post detailed design.

transport required for *Silver Zone Extension Phase Two* not to be required in 2026 (but still require MSCP3) and estimate this to be in the region of 29%, which we consider to be an unrealistic scenario.

Impact of proposed capacity increases by Bristol Airport

1.9 The options for providing increased parking capacity have been considered within this report at a high level. In order to make best use of the existing site, additional multi-storey car provision in the north of the airport has been evaluated. On the south side, an extension to the Silver Zone car park within land currently owned by Bristol Airport has been assessed. In summary, existing capacity will be insufficient to meet forecasted future demand without planning permission to (i) open the existing Silver Zone car park known as *Silver Zone Extension Phase One* from a summer seasonal restriction to year round use as a car park, (ii) the extension to the Silver Zone car park, referred to here as *Silver Zone Extension Phase Two* for unrestricted use as a car park and (iii) the building of a new Multi-Storey Car Park (MSCP3) (as detailed in the planning application). If these investments in capacity are made, we estimate that demand will be met in future years to 2026, with some additional excess capacity (c. 1,000 spaces in 2026) which potentially could reduce the use of unofficial off-site locations and to provide flexibility to respond to the ongoing operational needs of the airport.

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Historic parking demand

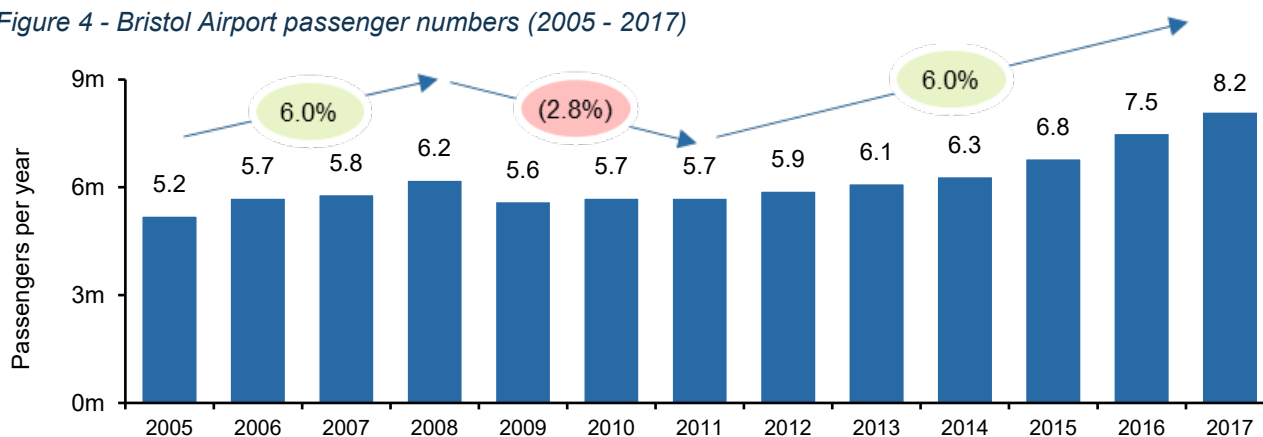
2. Historic parking demand

Bristol airport has grown passenger numbers by 5.9% per annum since 2011

2.1 Parking demand is driven by several factors including passenger numbers, passenger likelihood to park (the proportion of passengers who choose to drive and park over other modes) and the number of cars parking at the airport over other providers (market share).

2.2 Since 2011, Bristol Airport has achieved strong passenger growth with numbers increasing from 5.8m to 8.2m in 2017, at an average annual rate of 5.9%. Growth prior to 2011 was disrupted by the 2008 financial crisis; however, in the years leading up to 2008, Bristol Airport's passenger numbers were growing at rates ahead of the wider UK aviation industry indicating healthy underlying regional demand.

Figure 4 - Bristol Airport passenger numbers (2005 - 2017)

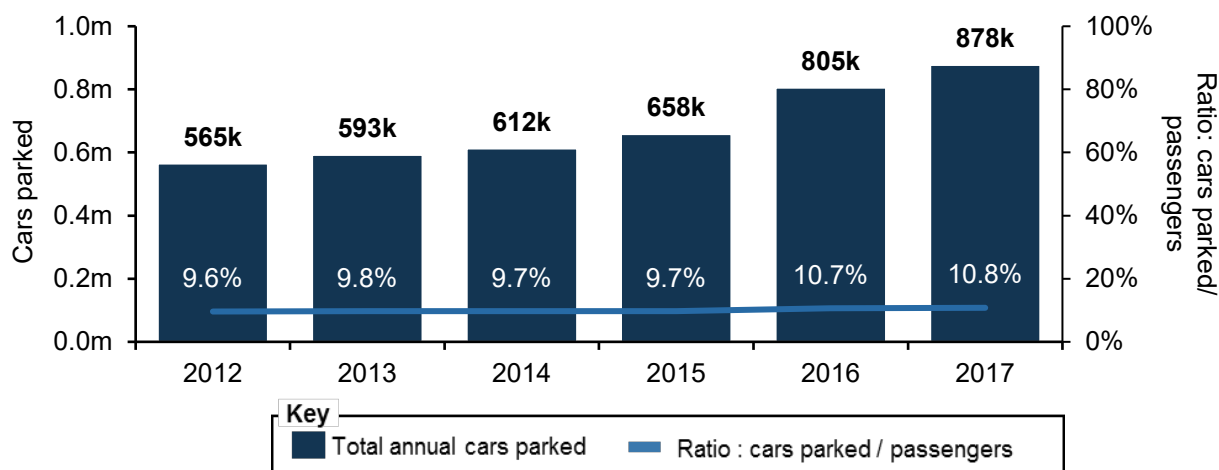


The number of cars parked at the airport has also increased at a steady rate, generally in line with passenger growth

2.3 The number of cars parked at the airport has also increased in recent years, with total car park exits measured at c. 878k in 2017, compared to c. 565k in 2012 (at an average annual growth rate of 7.6%, Figure 5). Much of this growth is undoubtedly because of the increasing number of passengers using the airport. However, the proportion of passengers choosing to park at the airport has also increased, as shown by the ratio of cars parked to total passengers (increasing from 10-11% over the same period), shown in Figure 5. This underlying increase in the proportion of passengers choosing to park at the airport (compared to using other forms of transport) is explored in greater detail in later sections (see Section 3 below); however, some of the drivers of this increase are believed to be:

- Limited sub-regional public transport infrastructure due to lower public investment compared to other parts of the country;
- Ongoing development of the airport, including the implementation of new routes and higher frequencies. This has drawn in customers from outside the immediate Bristol area, where public transport links are comparatively weaker;
- Increasing levels of real and disposable income as a result of a recovery from the 2007 financial crisis leading to greater use of vehicles and parking for convenience; and
- A migration from the Drop Off Express Car Park to the Short Stay Car Park for operational reasons led to inflated transaction volumes in 2016. Whilst drop off at the express car park is not included in the figures drop offs at the short stay car park is included although our modelling indicates that only c. 1% of Bristol Airport total parking capacity is due to drop offs (see paragraph 3.11 below).

Figure 5 - Number of car park exits at Bristol Airport (2012 - 2017)



The increase in the number of cars parking at Bristol Airport has led to greater demand for car parking spaces at the airport

2.4 Parking demand at Bristol Airport peaks in the summer months due to increased leisure travel at this time of the year, driven by summer and school holidays; however, there are secondary peaks during school holidays through the rest of the year. During the summer of 2017, maximum occupancy peaked at just under 15,000 vehicles parked at official airport sites, with thousands of other vehicles parked at competitor off-site locations (see below for more detail). While demand is lower during the winter months, capacity has been reduced in recent years due to ongoing construction work and the seasonal nature of the airport resulting in periods of low spare capacity, particularly over Christmas.

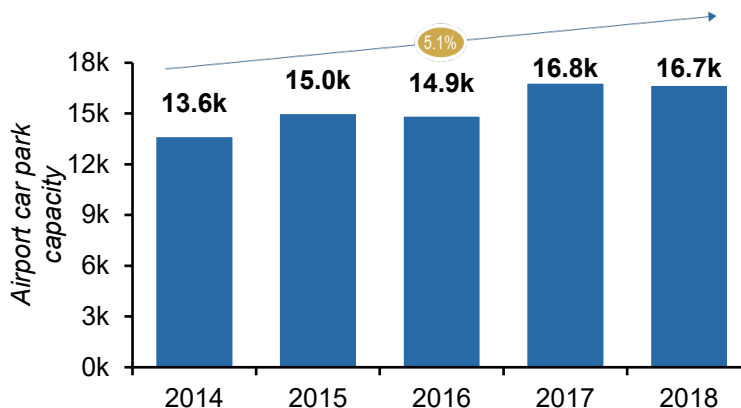
2.5 To manage the additional demand, the airport has both permanently increased its capacity over recent years through the construction of the first phase of a Multi-Story Car Park (MSCP1) in 2018 and a seasonal expansion to Silver Zone

(Silver Zone Extension Phase One), *Figure 6 - Historical airport capacity increases (2014-20107)*

adding c. 3,650 additional spaces. Silver

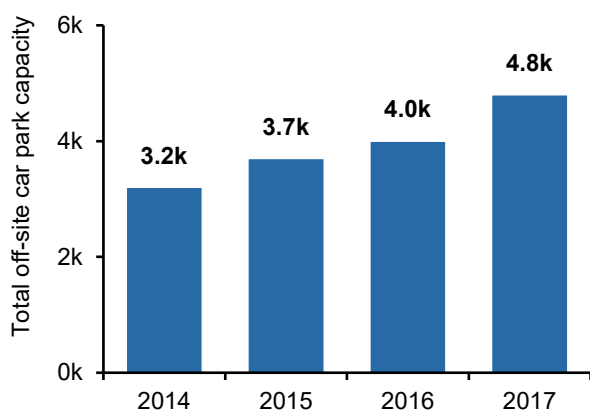
Zone Extension Phase One was first used in 2017 following council approval and again in summer 2018. Currently the only way the airport can meet peak demand is due to the seasonal capacity of Silver Zone Extension Phase One. It should be noted that seasonal restrictions for car parking are not

commonplace for UK airports. Seasonal restrictions are more challenging to manage and do not address peaks at other times of the year. Assuming 95% operational utilisation as the maximum possible, the airport has at times become close to filling its existing capacity in the last 12 months, both inside and outside of the summer peak.



Despite these investments, increasing demand for car parking spaces has led to an increase in the number of unofficial off-site car parks²

Figure 7 - Estimated off-site car park capacity (2014-2017)



2.6 Unofficial off-site car parks have increased their capacity in recent years and we estimate (based on aerial photographs) that in Summer 2017, capacity was c. 4.8k spaces (Figure 7). Most unofficial off-site parking is believed to be provided at unauthorised car parking sites³. There is no precise data available on the exact proportion of off-site parking which is unauthorised.

² The term “unofficial” refers to off-airport car parks which are not operated, regulated, or sanctioned by BAL

³ The term “unauthorised” refers to those unofficial off-site car parking sites which BAL have evidence operate without express or implied planning consent or lawful development certificates. In BAL's experience, the vast majority of unofficial off-site car parking sites operate without the necessary planning certification

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Forecast future demand

3. Forecast future demand

Forecast future passenger numbers and people wanting to park

We forecast the number of individual passengers wishing to Park & Fly will increase by 2026 in line with an increase in passenger growth

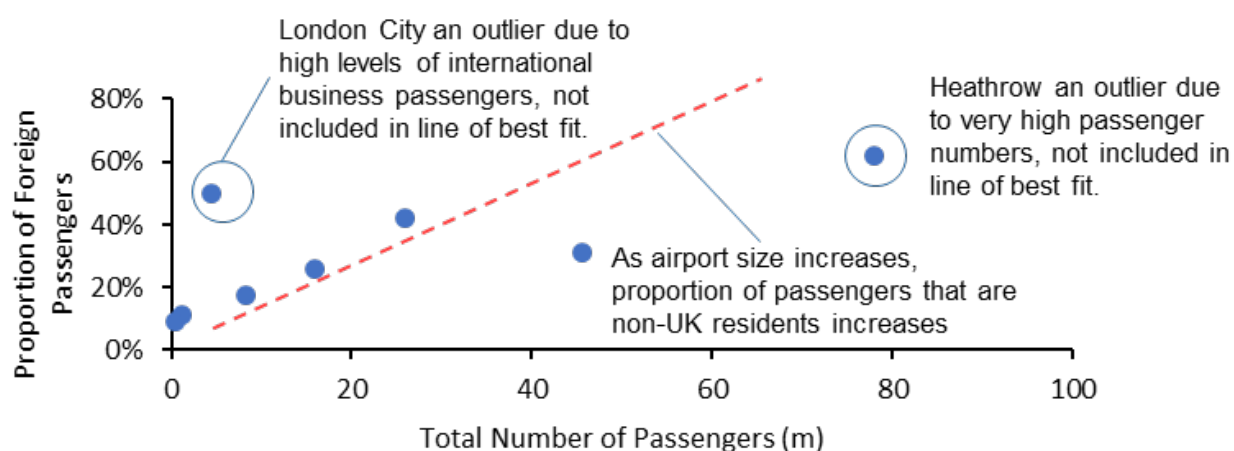
3.1 In 2017, an estimated 1.7m passengers travelled to Bristol Airport by car and parked for the duration of their trip. By 2026, we forecast that the demand for the airport's official parking sites will increase by 39% to c. 2.3m passengers. It is important to note that this figure represents the number of passengers arriving in a car as opposed to the total number of cars. This is explained further in section 3.12. The parking forecast is driven by five key factors:

- Growth in underlying passenger demand at Bristol Airport;
- An increase in the proportion of inbound passengers arriving at Bristol Airport;
- An increase in the overall *likelihood to park* amongst UK Bristol Airport passengers;
- Forecast changes in Bristol Airport's UK catchment area; and
- Lack of sub regional public transport options.

3.2 Bristol Airport forecasts that its activities and growth strategy will lead to passenger numbers that will reach c. 12.m by 2026; Bristol Airport is therefore applying for permission to reach 12mppa. The figure of 12.m has been independently verified by the consultancy Mott MacDonald (submitted as an appendix to the Planning Statement). An underlying increase in passenger numbers will lead to an increased level of parking demand although increased inbound foreign passengers tends to suppress overall parking demand.

3.3 Historically, inbound passengers have accounted for between 16.5% and 20.4% of total passenger numbers at Bristol Airport. These figures are based upon Civil Aviation Authority (CAA) survey responses from 2008, 2012 and 2015. As passenger numbers grow, the proportion of foreign passengers is forecast to increase in line with industry trends which suggest that larger airports tend to have a higher percentage of inbound passengers (see Figure 8). Therefore, we expect the percentage of foreign passengers to increase from an estimated 19.5% in 2017 to 21.2% in 2026. Foreign passengers are deemed exceptionally unlikely to drive parking demand and therefore this will lead to a relative suppression of overall parking demand which may aid in meeting overall levels of demand.

Figure 8 - Correlation between airport size and proportion of passengers that are non-UK residents (2016)



Beyond passenger demand, changes to the composition of Bristol Airport's catchment and demographic / economic factors will also impact the likelihood of passengers to park

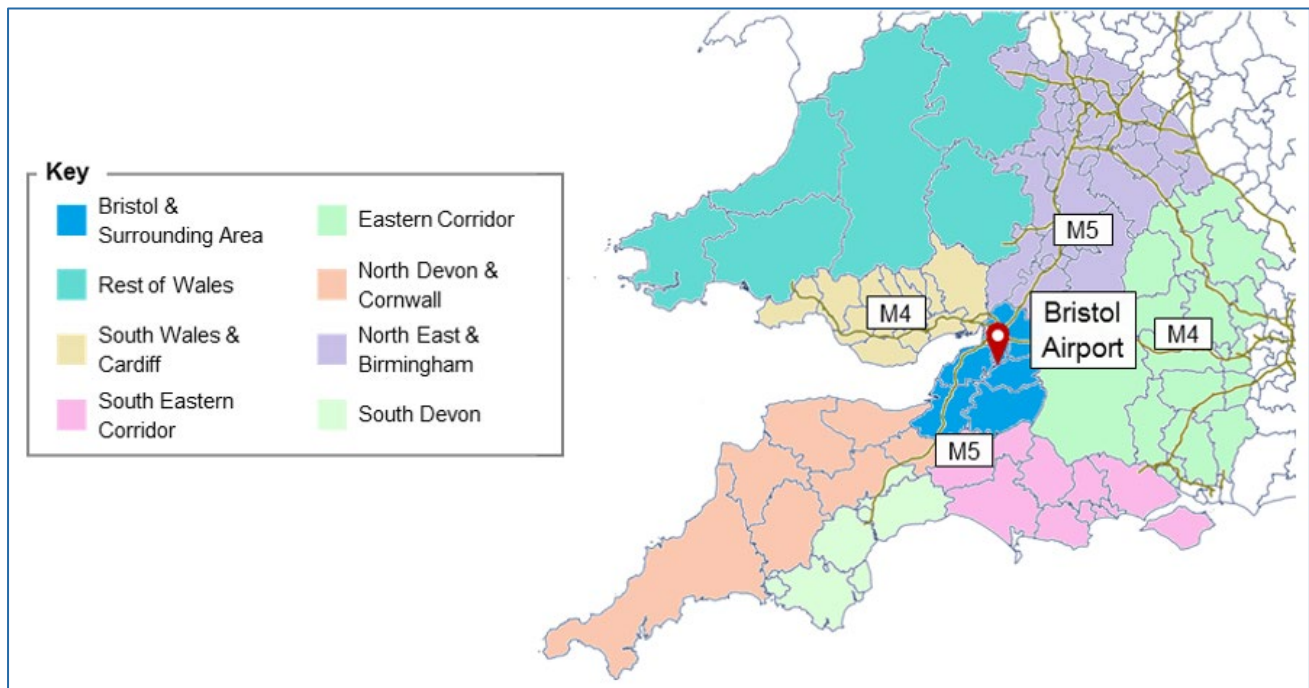
3.4 A passenger's likelihood to arrive by car to Bristol Airport and leave the car parked either at the on-site airport parking, or an off-site third-party car park, is defined as the *likelihood to park*. Both passengers who have driven or have been driven, e.g. by a fellow passenger, are included in our modelling of *likelihood to park*. We model passengers who are dropped off by car separately from those who leave a car at a parking site for the duration of their trip (see *Passengers parking for their holidays cause different capacity impacts than passenger drop offs* below). Taxis are not included in this group.

3.5 A passenger's *likelihood to park* is based on a wide variety of factors such as origin of travel, public transport options, age, time of airport arrival, group size, trip purpose, income and whether a trip is short or long haul. For example, passengers with a higher income are more likely to drive and park due to a desire for convenience. Therefore, future car parking demand cannot be calculated by simply converting growth in passenger numbers directly to the number of spaces required in future.

3.6 We have identified how the current *likelihood to park* at Bristol Airport varies by different passenger geographies and demographics by using CAA data (2015 Passenger survey report) and surface access reports (2012 ASAS and 2018 Transport Assessment). To ensure that our analysis reflected the most up to date information, we cross-checked the CAA data with Bristol Airport's own data on public transport share and parking rates in 2017. Following this, we have forecast likely changes to future segmentations over time and then assessed the subsequent impact upon overall level of parking because of these changes. For passengers living in the UK, we consider 'home geography' to be a key differentiator of demand and therefore split the catchment area into eight sub-catchments

to assess the potential impact of changes to airport's catchment area upon future parking demand. Our catchment split is based on likely differences in the use of the airport and modal choice rather than traditional authority boundaries.

Figure 9 – Bristol Airport sub-catchments



The greatest impact upon *likelihood to park* is expected to be the relative growth of sub-catchments further away from Bristol due to the development of the airport

3.7 Overall demand is highly focused in the areas immediately surrounding Bristol as this sub-catchment represented 30% of demand in 2015. Immediate proximity to the airport and high population density is likely to drive demand in this area. Beyond this immediate sub-catchment, demand appears to be driven by levels of accessibility, specifically by road. The sub-catchments with the next highest levels of demand are South Wales (served by the M4) and South West of the airport (served by the M5). By comparison, the South East corridor towards Southampton (which is a similar distance from the airport as Cardiff or Exeter) has much lower levels of demand, likely due to reduced levels of accessibility, specifically by road. More generally, areas to the West of the airport tend to have higher levels of demand than areas to the East. One of the primary drivers for this is likely to be the significant levels of competition which exist to the North and East of Bristol Airport, specifically from Birmingham and the London airports.

3.8 The geographic split of UK outbound demand has evolved significantly in the last 10 years. This is calculated using data from CAA surveys, combined with Pragma⁴ research and surface access reports (Bristol Airport Car Parking Study – 2017, Pragma). The most substantial change is the decreasing proportion of passengers who come from the Bristol and Surrounding Area sub-catchment. This has been balanced by increases in the proportion of passengers originating from South Wales and the two South West sub-catchments. We have not completed any specific research on the reasons for this but hypothesise that this shift is a natural progression as a result of growth of the airport, with new routes and increased frequency driving additional demand from the less competed South and West regions.

3.9 We predict that new routes and increased frequency attract new customers from further afield, but specifically attract those customers who currently must travel past Bristol Airport to access other airports. As the airport continues to develop, including the launch of new routes and increased frequencies, we expect this trend to continue, further increasing the levels of proportional demand from regions further from Bristol, specifically those South West of the airport. We also anticipate demographic and economic changes (including average age, wealth and car ownership) to have a minor impact on the overall *likelihood to park* within the catchment, as shown in Figure 11. We note that paragraph 13.3.1 of the *West of England Joint Transport Study 2017* provides evidence that transport investment in the West of England and across the South West is less than half the expenditure that could be expected in other parts of the country. This results in fewer public transport choices for passengers across the region resulting in Bristol Airport experiencing a higher proportion of car borne passengers compared to airports in other regions. We therefore expect the trend for greater car use from passengers from further afield to grow in absolute terms adding to the demand for car parking (see Figure 10 and Figure 11.)

⁴ Pragma is a retail and commercial strategy consultancy which carried out passenger research on behalf of BAL

Figure 10 - Drivers of Park & Fly passenger demand (2017-2026)

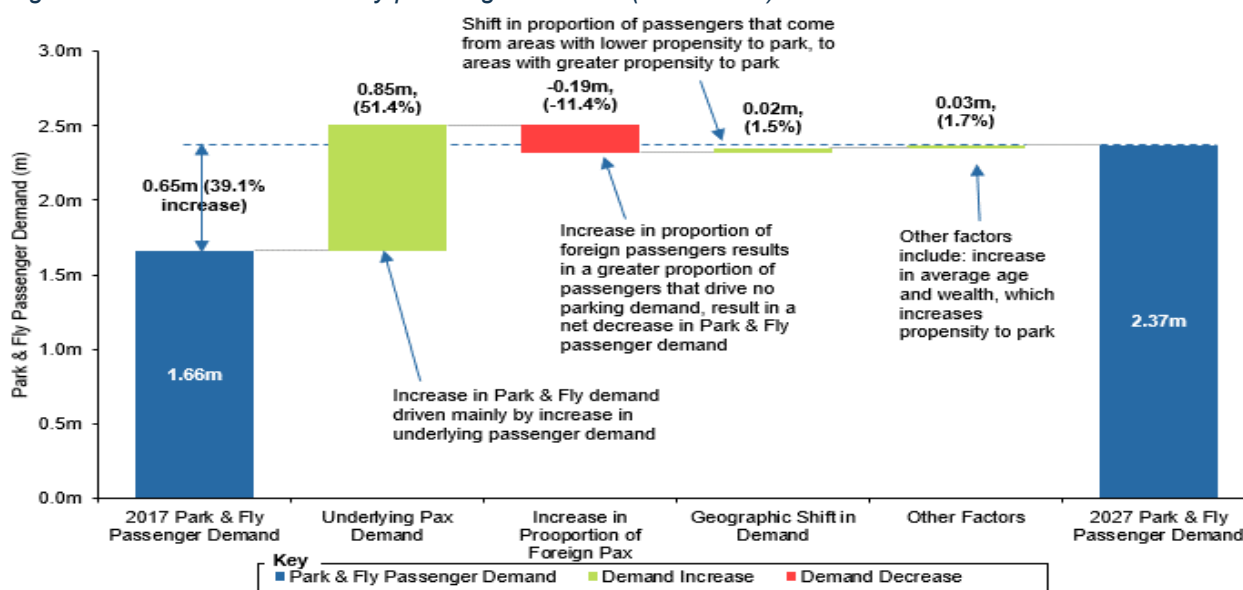








Figure 11 – Forecast impact of geographic and demographic changes on likelihood to park

Future dynamics	Hypotheses	Impact on likelihood to park
 Growth of passenger demand from the South and West catchment areas	• Pax growth in the South West is likely to generate higher levels of parking demand as road connections are significantly better than public transport, meaning that these passengers have a higher propensity to park	↑
 Average age increase in BRS catchment areas	• As age increases, propensity to park increases; as the UK population ages, we expect BRS's passenger base to age, driving up the propensity to park	↑
 Average wealth increases in BRS catchment areas	• Increasing levels of wealth leads to increasing propensity for passengers to arrive by car; average wealth in the region is forecast to increase, which is expected to lead to a greater proportion of passengers arriving by car	↑
 Levels of car ownership expected to increase	• As car ownership increases, more passengers are presented with the choice of travelling to the airport by car, which will increase demand for parking spaces	↑
 Inclusion of new routes to more distant destinations	• As flight duration increases, average trip duration increases, as does cost of parking; passengers taking these new flights may be less likely to park as the economics of a taxi or a lift becomes more attractive	↓
 Disruptive automobile technology in the medium to long term	• Disruptive technology holds the potential to dramatically alter car ownership and parking dynamics	↓

Passengers parking their own vehicle for the duration of their trip generate different capacity impacts compared to passenger drop offs by a third-party vehicle

3.10 There are three methods by which passengers arrive at the airport by private car:

- **Park & Fly:** Passengers who arrive at the airport via private vehicle which is parked at the airport for the duration of their trip. Passengers may be the driver of the car, or part of a group.
- **Park & Drop:** Passengers who are dropped off (or picked up) at the airport via private vehicle which is parked in the Short Stay car park for a limited amount of time.

- **Kiss & Fly** Passengers who are dropped off (or picked up) at the airport by private vehicle from the Express drop-off location (i.e. no parking space required).

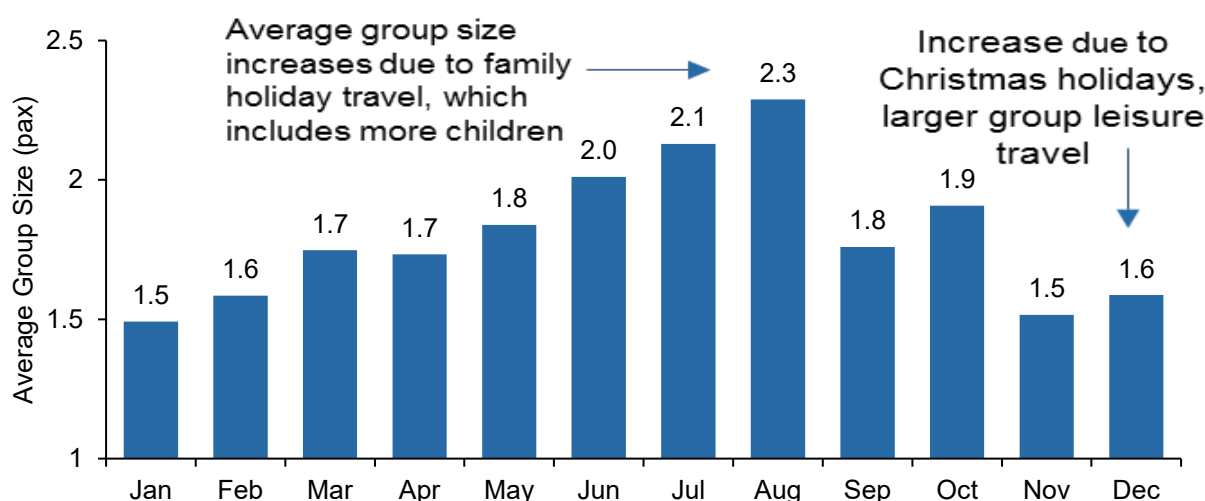
3.11 Kiss & Fly passengers do not use parking spaces⁵ and are therefore excluded in car parking capacity modelling. Park & Drop passengers use cars which park for a much shorter period of time than Park & Fly passengers and therefore the impact of these passengers on parking capacity is marginal. Our modelling indicates that c. 1% of Bristol Airport parking capacity is required due to Park & Drop (due to the relatively short period of time each space is required for). For this reason, we do not discuss this group in detail in this report.

Cars parked per passenger arriving by car

We calculate the number of cars arriving at the airport by dividing the passengers who arrive by car by average group size

3.12 Once the number of passengers who will be looking to drive to the airport and park has been established, the next step is calculating the number of cars those passengers will be parking. The primary driver of number of cars (as a proportion of passengers who park) is group size (calculated from 2015 CAA data), which varies with time of year. The average group size of customers directly impacts the total number of cars being parked at the airport. The average group size of passengers that drive parking demand at Bristol Airport fluctuates between 1.5 and 2.3 over the year, with a larger average group size in the summer months, due to summer holidays where passengers are more likely

Figure 12 - Seasonality effects on average group size (CAA, 2015)

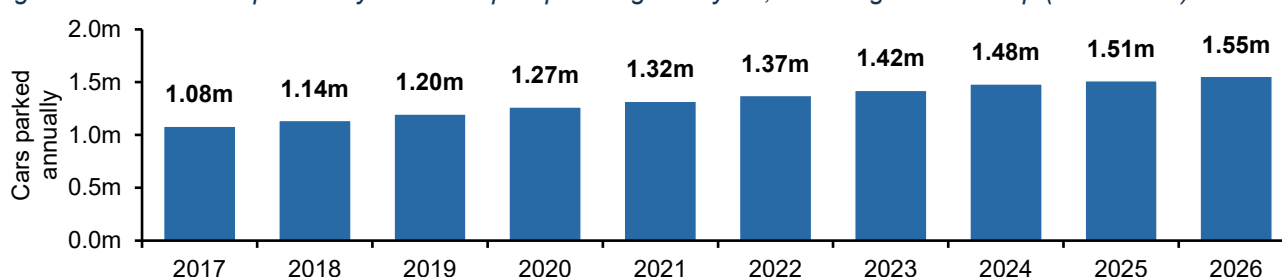


⁵ The low capacity of the drop-off lay-by within the express drop-off car park means that Kiss & Fly passengers will sometimes use a short-stay space for a very short period, but for the purpose of this assessment we have assumed that this does not impact parking capacity requirements

to travel in groups and with children. Group size fluctuations mean that increases in the number of passengers arriving by car and the number of cars is not necessarily proportional. There is some difference in group sizes between sub-catchments.

3.13 For our forecast, we assume that group sizes remain constant in each sub-catchment from 2017-26. Therefore, the overall ratio of passengers to cars only changes based on how the proportion of passengers from each sub-catchment changes. The total number of cars driven by passengers and then parked in the Bristol Airport area is expected to grow at 4.7% annually leading to an estimated c. 1.6m cars parked by customers using Bristol Airport (including off-site competitors to official parking) in 2026.

Figure 13 - Total cars parked by Bristol Airport passengers a year, including Park & Drop (2017-2026)



Estimating car parking market share

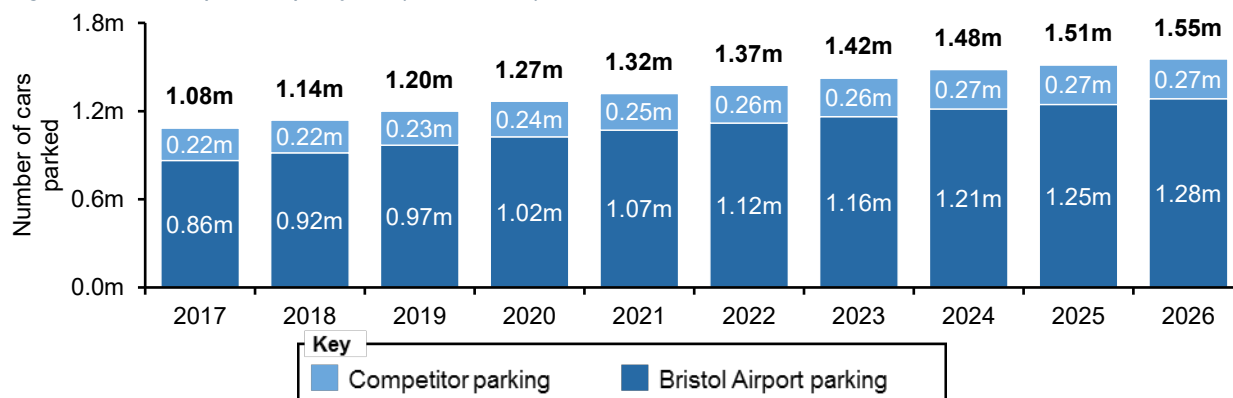
Capacity at unofficial off-site car parks was c. 5k in Summer 2017, implying the airport currently holds c. 75% market share of total cars parked for airport business

3.14 Bristol Airport does not have 100% market share of Park & Fly car parking demand as there are several alternative parking options available near to the airport. In 2017 Bristol Airport on-site car parks served on average c. 76% of passenger cars parked over the year, but this fluctuated between 70% and 80% throughout the year. This is largely because, in the winter months, capacity at the airport is less constrained and therefore passengers are less likely to look elsewhere for parking provision. By adding more capacity in future, unauthorised parking may reduce across the year, thus avoiding local amenity impacts associated with off-airport car parking.

Using the future demand for on-site parking, we calculate the number of cars parking at the Airport

3.15 We project the total number of cars parking on-site at Bristol Airport to increase from 900k in 2017, to 1.3m in 2026. Overall, we assume that the proportion of on-airport parking increases over time, due in part to limited possibilities of further unauthorised expansion in the green belt.

Figure 14 - Cars parked per year (2017-2026)



Calculating the number of spaces required to meet passenger parking demand

Using historical ratios for peak cars to parking spaces we can estimate future demand for car parking spaces

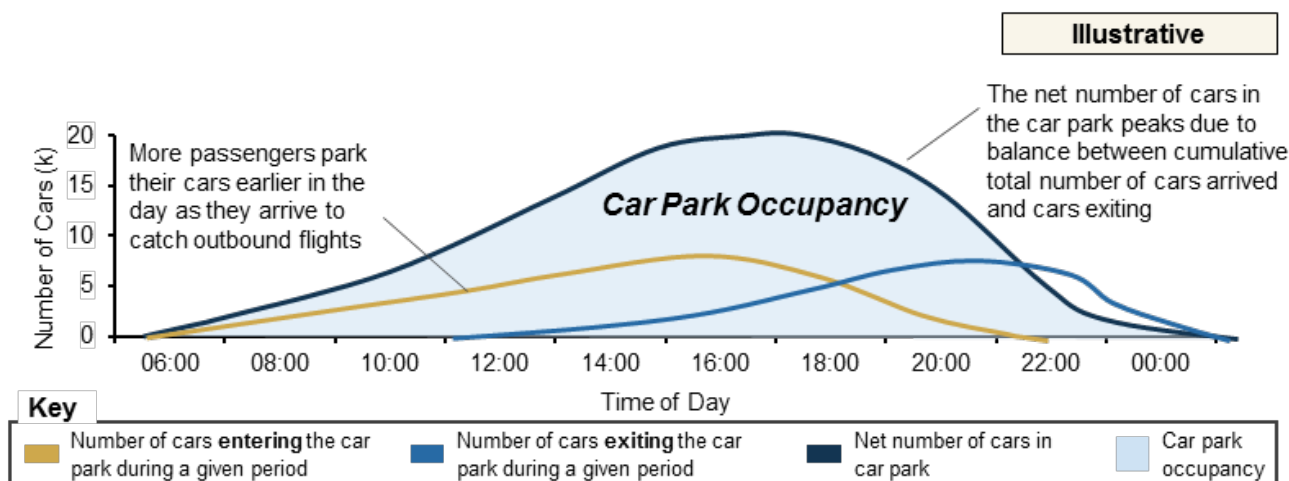
3.16 The actual number of parking spaces required to meet demand generated for parking at the airport is dependent upon:

- total number of cars entering vs. leaving
- the time that these cars enter and leave; and
- parking duration.

3.17 The level of utilisation will vary over the course of the day. It is a product of when cars enter and leave, and how long that they stay for. We can convert the forecast number of cars entering Bristol Airport car parks into the number of spaces required to fulfil demand by using the ratio between historical occupancy and demand. We have termed this the Occupancy to Demand ratio (O/D ratio).

3.18 The O/D ratio expresses the total number of spaces required to meet a certain level of car parking demand. As this ratio is based on historical data recorded at Bristol Airport, it accurately reflects the three factors described above. We have used historical O/D ratio at a monthly level to convert cars parking to spaces required.

Figure 15 - Illustrative graphic to demonstrate how various factors impact car park occupancy



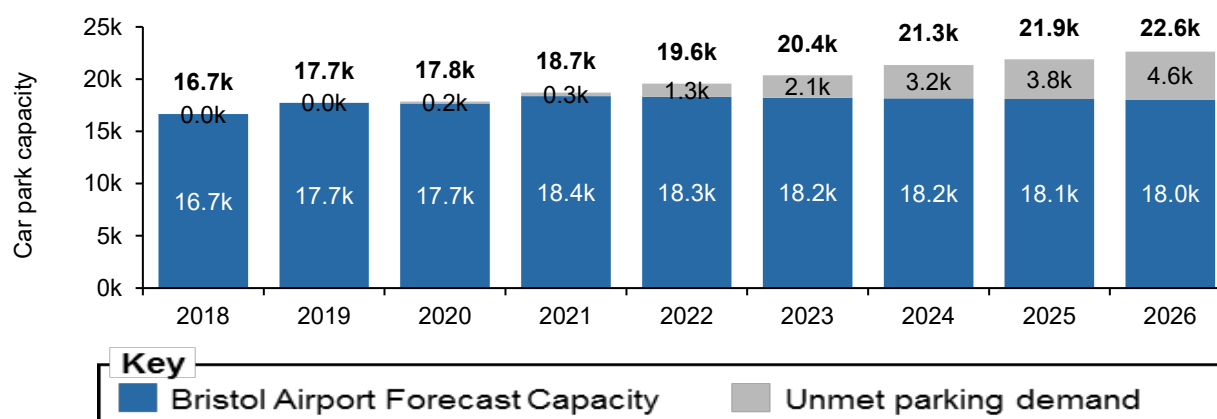
3.19 When calculated at a monthly level, we see that the O/D ratio fluctuates over time. Fluctuation can be attributed to a greater number of passengers travelling for longer holiday durations during peak leisure holiday seasons, resulting in cars occupying spaces for longer, meaning more spaces are required to meet demand. In order to forecast the number of parking spaces required to meet the demand of Bristol Airport passengers, we assume that seasonal parking behaviours remain constant up to 2026.

Figure 16 - Seasonality of Park & Fly occupancy to demand ratios (excluding short stay)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
O/D Ratio (2018-2040)	0.17	0.18	0.17	0.19	0.22	0.22	0.22	0.24	0.23	0.20	0.16	0.28

3.20 Using the number of cars parking per month and assuming a constant O/D ratio in each month we are able to calculate the total number of parking spaces required at the airport in each month from 2017-2026. The total number of spaces required meet peak Bristol Airport parking demand is forecast to rise from c. 16,000 in 2018 to c. **22,600 in 2026**, assuming a 12.5% public transport modal share.

Figure 17 - Forecast car parking capacity required to service demand



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**Impact of public
transport improvements**

4. Impact of public transport improvements

A lack of a direct rail/mass transit link limited the opportunity for growth of public transport usage

4.1 One major driver of the parking demand at Bristol Airport is the lack of direct, mass transit links to the airport. In recent years the airport has helped make material improvements to public transport provision in both Bristol and the surrounding area to in an attempt to counteract this. It has further commitments to improve transport links as part of its plan to expand to 10m passengers a year and beyond. However, for many passengers, particularly those coming from further afield, a lack of direct rail, other mass transit or improved bus services make driving the most attractive option to travel to the airport.

4.2 In 2017, BAL estimates that 12.5% of passengers used public transport to travel to the airport. In contrast, other airports with better rail and bus access such as Heathrow (39%), Birmingham (22%) and Manchester (16%) have higher public transport usage rates.

Planned improvements to public transport provision will increase modal share





4.3 As part of the consent to grow to 10mppa, Bristol Airport has committed to an ambitious public transport mode share target of 15% as detailed in the 2009 *Transport Assessment* produced by ARUP; Teneo has not reviewed this target as part of this work. Independent assessment has also been carried out by Peter Brett Associates, which is set out in the 2018 *Transport Assessment*, this concludes that a 15% public transport mode share is also achievable and appropriate for development up to 12mppa, although measures and commitments will be put in place to seek to improve upon this in the future.

4.4 Improved public transport links in and around the Bristol area, and improved connectivity from the wider region, could reduce *likelihood to park*, particularly within this sub-catchment. There are a range of public transport improvements in the design stage, under construction, or recently implemented which may lead to an increase the uptake of public transport. Some public transport improvements are aimed at reducing congestion on the roads and improving access by bus, while others focus on improving the reliability and frequency of both bus and rail connections; detail on initiatives are shown in Figure 18. These improvements are focussed in the Bristol sub-catchment area and may result in fewer passengers opting to drive to the airport from Bristol City, as public transport options provide a potentially more convenient and affordable option. In the table below, we have listed public transport

improvements in the Bristol Airport catchment area. In addition, there are several improvements to bus accessibility which have been introduced as part of Bristol Airport's strategy to grow to 10mppa. These include:

- Increasing frequency and capacity of bus services between Bristol City Centre and the airport;
- Increasing the frequency of bus services between Weston Super Mare and the airport;
- Setting up a public transport fund to support local services and to more effectively link the airport to its nearest train station (Nailsea and Backwell railway station);
- The introduction of a coach service to Cardiff; and
- The introduction of bus services to Bath and Plymouth from the airport.

Figure 18 - Emerging public transport improvements in the Bristol Airport catchment areas

Catchment	Description	Impact on likelihood to drive	Comment
South Bristol Link	Opened in January 2017, the SBL is expected to reduce traffic on roads linking residential areas of South Bristol to the city centre via Bedminster		Likely to affect passengers from Bristol the most, as travel to the airport becomes more rapid
West of England Joint Transport Study	In 2015, four West of England councils started major study to support the development of transport network of next twenty years		Proposals include a mass transit link between Bristol City Centre and BRS, highway improvement, bypasses on the A38, and a new M5 junction
Network Rail Bristol Upgrades	Re-signalling at Bristol Temple Meads and increased tracking will increase trains between Bristol and London (2018)		Will affect the Eastern Corridor the most, as travel to Bristol will become more reliable and frequent
Great Western Railway Improvements (South West)	Planned general improvements on the GWR Route from Cornwall to Bristol; faster trains, improved reliability		Travelling to BRS via train will become more attractive to customers from Cornwall as speed and reliability improves

Increasing use of public transport will not prevent the need for additional parking capacity

4.5 Based on the Transport Assessment written by Peter Brett Associates (Transport Assessment, 2018) on proposed bus service improvements, and our understanding of current origins of passengers and their *likelihood to park*, we forecast the impact of these improvements on public transport on demand for parking across the airport's catchment. This is based on the sub-catchments where investment in public transport will be most relevant to Bristol Airport passengers. In addition, we have made the assumption that public transport improvements will have the greatest impact on foreign passengers, who are the largest users of public transport currently. We have used 2015 CAA data to estimate the relative public transport share by sub-catchment and then adjusted to ensure that total public transport share was 12.5%. We have then increased public transport share differentially based on the assumptions described above and used the projected passenger numbers by catchment area in 2026 to ensure that the weighted average usage of public transport is 15%. This is shown in Figure 19.⁶

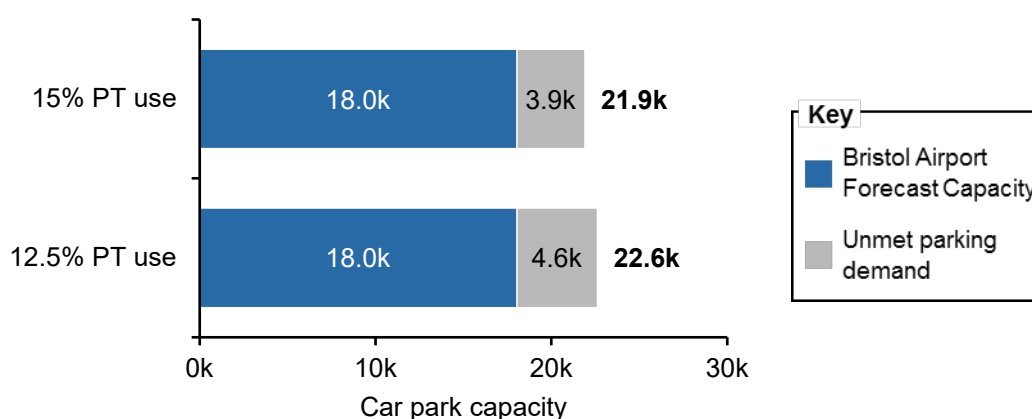
Figure 19 - Proposed passenger public transport (PT) % use by region of origin in 2026⁶

Origin	2017 Pax numbers	2026 Pax numbers	2017 % of total Pax numbers	2026 % of total Pax numbers	CAA 2015 PT % ¹	Adjusted CAA PT % ²	p.p. adjustment to reach target PT %	2026 PT% requirement	Implied additional pax on PT
Bristol & Surrounding Area	2.31m	2.87m	28%	24%	13%	10%	4%	14%	117k
South Wales & Cardiff	1.27m	2.01m	15%	17%	16%	13%	1%	14%	21k
North Devon & Cornwall	0.79m	1.51m	10%	13%	8%	6%	0%	6%	0k
South Devon & Cornwall	0.72m	1.13m	9%	9%	15%	11%	1%	12%	12k
Eastern Corridor	0.49m	0.69m	6%	6%	13%	10%	0%	10%	0k
North and East Birmingham	0.45m	0.67m	6%	5%	10%	8%	0%	8%	0k
South Eastern Corridor	0.34m	0.30m	4%	2%	6%	4%	0%	4%	0k
Rest of Wales	0.25m	0.38m	3%	3%	12%	9%	0%	9%	0k
Other (Inc. foreign passengers)	1.60m	2.32m	19%	21%	30%	23%	5%	28%	132k
Total	8.23m	11.87m	100%	100%	16.1%	12.5%	-	15.0%	282k

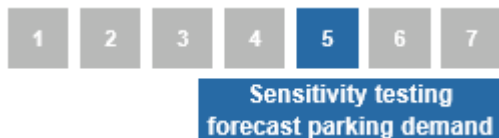
⁶ It should be noted that the public transport percentages in this report (taken and adjusted from the CAA survey) are different from the TA, because of different source data and methodology. Within this report the CAA 2015 PT number (1) is adjusted (2) to correct for known total levels of PT derived from surface access reports and surveys

4.6 Despite planned improvements to public transport, there will still be significant unmet parking demand at Bristol Airport. Assuming public transport modal share reaches 15%, our analysis indicates that there will be a modest reduction in car parking demand by 2026 relative to our initial analysis, with an additional 3.9k spaces required, down from 4.6k if no increase in public transport modal share is achieved (12.5% public transport usage is maintained). Therefore, while improvements to public transport will have an impact on the number of cars parking at the airport, and at third party parking providers, there will still be demand for spaces beyond what is currently planned.

Figure 20 - Difference between unmet demand in 2026 assuming 12.5% or 15% public transport usage



4.7 Further to this, we have run a 'super-sensitivity' to assess the levels of public transport required for *Silver Zone Extension Phase Two* not to be required in 2026 (but still require MSCP3) and estimate this to be in the region of 29%, which we consider to be an unrealistic scenario.



5. Sensitivity testing forecast parking demand

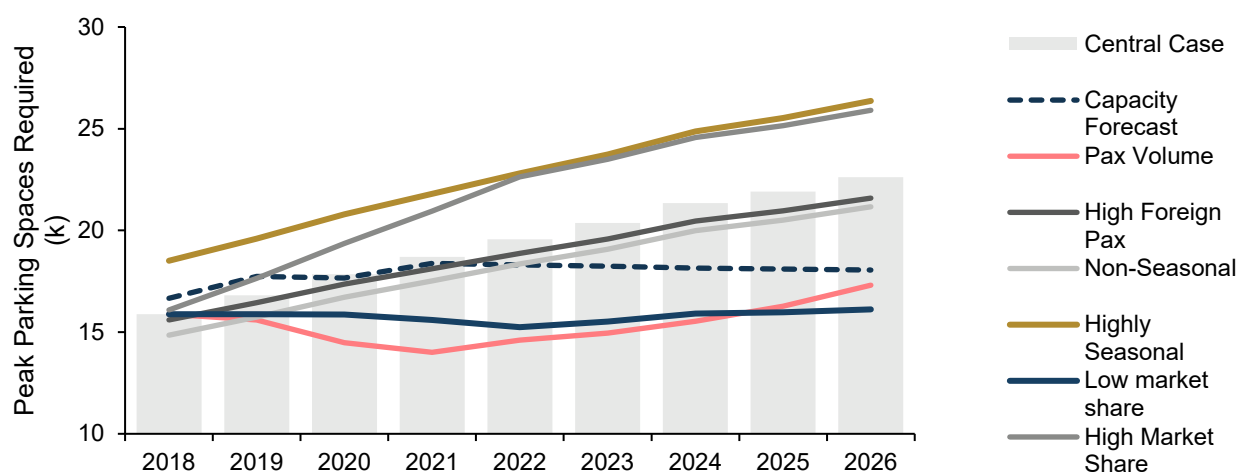
We have modelled the impact of a number of potential scenarios, including passenger number downturn, seasonality of demand and changes to airport parking market share

5.1 To understand how robust our parking demand forecasts are, we have analysed the impact of a range of potential scenarios up to 2026. Our analysis demonstrates that in the majority of potential scenarios: declines in passenger numbers, changes in demand profiles or increased unauthorised off-site parking, demand is not reduced below predicted capacity. We have also considered the impact of autonomous vehicles on parking demand. However, our research and analysis indicate that there would be no impact until 2030. Therefore, any consideration of how vehicle autonomy would disrupt parking demand at the airport is not required at this stage.

Figure 21 - Description of scenarios tested for impact on parking demand

Scenario	Brief Description of Scenario	Change	Additional capacity required
A Volume Reduction	<ul style="list-style-type: none"> Bristol Airport has forecast near-linear levels of passenger growth; Historically, UK aviation demand has seen periodic, sharp drops, which may be due to economic downturn, terrorism, etc. We model a sharp decline in passenger numbers in 2019 - 21, similar to the decline experienced by UK airports in 2009 	<ul style="list-style-type: none"> Fewer passengers 	✗
B Foreign Passengers	<ul style="list-style-type: none"> The central case sees the proportion of foreign passengers gradually increase, which can be expected with pax growth We model more extreme high and low cases, whereby passenger numbers are disproportionately high or low 	<ul style="list-style-type: none"> Increasing proportion of foreign passengers 	✓
C Demand Profile	<ul style="list-style-type: none"> Bristol's annual demand profile is relatively seasonal, with the majority of demand focussed in the peak holiday season 	<ul style="list-style-type: none"> Non-seasonal 	✓
D	<ul style="list-style-type: none"> We model 2 scenarios, one where BRS's demand spreads more evenly across the year, and one which becomes highly seasonal 	<ul style="list-style-type: none"> Highly seasonal 	✓✓
E Parking Market Share	<ul style="list-style-type: none"> Competitor parking sites present in the BRS area capture some of BRS's parking demand today (approximately 20% at peak) 	<ul style="list-style-type: none"> Low market share 	✗
F	<ul style="list-style-type: none"> We model the outcome of these competitors being given council permission to operate and expand, and one where they are shut 	<ul style="list-style-type: none"> High market share 	✓✓

Figure 22 - Forecast impact of sensitivity scenarios on the total number of parking spaces required (2018-2026)





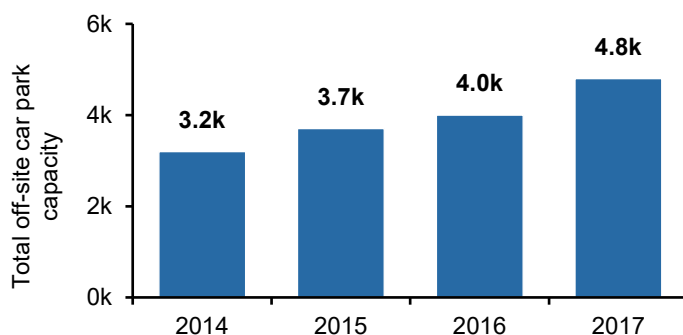
6. Impact of increased demand on off-site unauthorised parking

Increased demand for parking in the summer months has led to increased levels of competition from off-site providers around the airport

6.1 Unofficial off-site parking capacity has increased. This is due to a number of factors, including pricing and advertisement by the operators. A significant proportion of these off-site locations will be unauthorised, causing harm to the amenity of the area in which they are located. Passengers use these services, often without knowledge that they are potentially unauthorised because they can be cheaper than onsite Bristol Airport options. These off-site locations typically require a transfer to the airport site. In this section we analyse the impact of increased demand on the growth of unauthorised off-site parking.

If insufficient additional on-airport parking is provided, unmet demand will continue to be partially met by unauthorised off-site parking.

Figure 23 - Estimated off-site car park capacity (2014-2017)



6.2 We have estimated that an additional 4.8k of car park capacity is required to meet demand in 2026, or 3.9k assuming 15% public transport modal share. If this capacity is not added at the airport, then it is likely that this unmet demand would be met by off-site providers. However, many off-site providers are also in the green belt and may

have difficulty increasing capacity in response to unmet parking demand at the airport. This could potentially lead to an increase in on-street parking in residential areas and rural streets.

6.3 When Bristol Airport implements the entirety of its car parking strategy, our analysis indicates that it will provide capacity to meet future demand and potentially excess capacity, which will be able to serve passengers who are currently using unauthorised car parks. Due to the reputational issues, some third-party providers are encountering in the press; on-site parking provision may become more attractive. Therefore, any excess capacity at the airport could meet parking demand which is currently being met by unauthorised providers.



7. Likely future capacity requirements

Following our analysis of the likely future demand for car parking at Bristol Airport, we also assessed the planned capacity increases presented by the airport and their ability to meet this forecast demand. This report cannot and does not comment on the deliverability of these proposed capacity increases from a planning or practical perspective; however, this section will detail the following points:

- Bristol Airport will require c. 4.6k additional parking spaces to meet demand by 2026 (or c. 3.9k) in a 15% public transport scenario
- The current total parking capacity at the time of writing is c. 16.7k
- Bristol Airport has permission to increase capacity by an additional c. 1.7k from 2018 to 2021; however, beyond this the estimated 4.6k spaces will be required to cater for the 12mppa
- The proposed building of *Silver Zone Extension Phase Two* and MSCP3 are viable options to address the growing demand for parking (from a capacity perspective)
- Based on the demographics of forecast future customers and other factors, prioritising the building of a low-cost parking solution is more likely to meet customer needs, fulfil demand and potentially attract larger volumes of customers currently parking at other unauthorised off-site locations

Current car park space is near capacity during peak periods and it will be necessary to increase capacity to satisfy future demand

Current parking situation

7.1 Bristol Airport currently has four main onsite car parks, with long stay provision broadly split into three classes (premium, standard, economy), with a total parking capacity of c. 16.7k as of May 2018. Additional capacity was added in 2017 through the 3,650-space *Silver Zone Extension Phase One* seasonal car park.

- A Silver Zone:** Cheapest parking with a short bus ride to the terminal; utilises manual block parking. The Silver Zone includes *Silver Zone Extension Phase One* which is currently utilised in the peak summer months (Note: planning permission to use *Silver Zone Extension Phase One* for Winter Use granted for 2018/19 LPA Ref. 18/P/4007/FUL)
- B Long Stay:** A mid-range parking option that is a short walk or bus ride to the terminal, but substantially closer than Silver Zone

- C Short stay:** A more expensive parking option that is located within close proximity to the terminal
- D Meet and Greet (Express):** Most convenient option that allows for passenger cars to be picked up and dropped off next to the terminal

Figure 24 - Map of onsite car parks



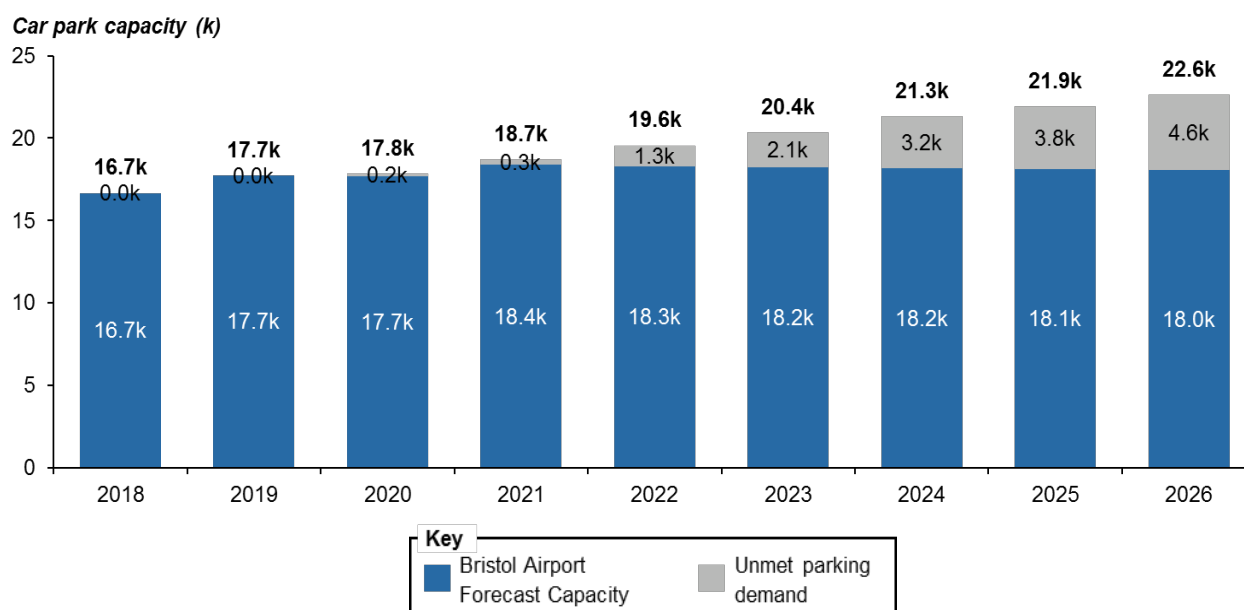
Approved capacity increases

7.2 Bristol Airport already has approved plans to increase car park capacity, delivering an additional c. 1.7k spaces from 2018 to 2021. This additional capacity is being delivered under the existing 10mppa outline planning permission. The airport has recently completed construction of Phase 1a of its first Multi-Storey Car Park. Phase 1b is due for delivery by the summer peak of 2019. In total, MSCP1 will add 1.9k parking spaces to the capacity of the airport. A second MSCP is expected to be completed by 2021, adding a further 1.8k of capacity. Several smaller additions to capacity are planned, mostly through the conversion of unused areas to parking spaces. It should be noted that the net impact on car parking is less than the capacity of the new additions, due to the multi-storey car parks being built on land currently in use for parking.

Additional parking capacity required to meet demand from 12m passengers

7.3 Our modelling of future parking demand, based on Bristol Airport's passenger number forecasts indicate that by 2026, Bristol Airport may require an additional 4.6k spaces (beyond current planned investment to 2021) in order to meet increased demand, based on 12.5% public transport mode share and maintaining current market share of total parking demand (on-site/off-site); This number of additional spaces is assuming that no change in public transport usage occurs.

Figure 25 - Bristol Airport car park capacity vs demand (2018-2026)

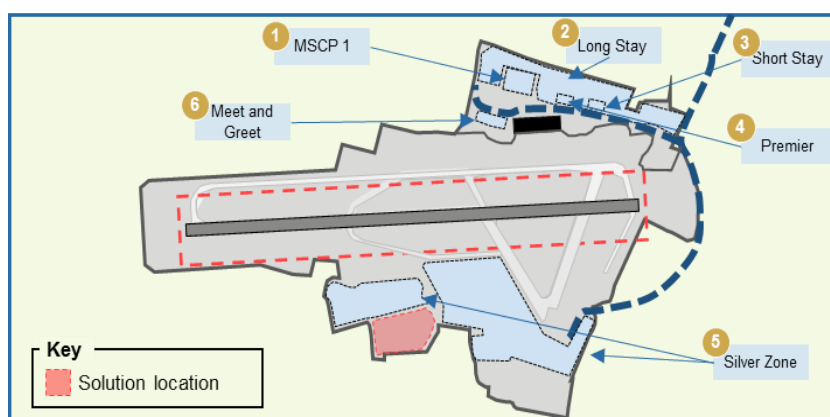


There are two options for additional on-site capacity to meet demand

The proposed construction of *Silver Zone Extension Phase Two* would increase capacity by c. 2,700 spaces

7.4 One of the proposed capacity increases included in Bristol Airport's planning application is the development of a further extension to the low-cost parking areas known as Silver Zone on the South Side of the Airport. There is currently an extension in place known as *Silver Zone Extension Phase One*, with the proposed

Figure 26 - Future location of Silver Zone Extension Phase Two



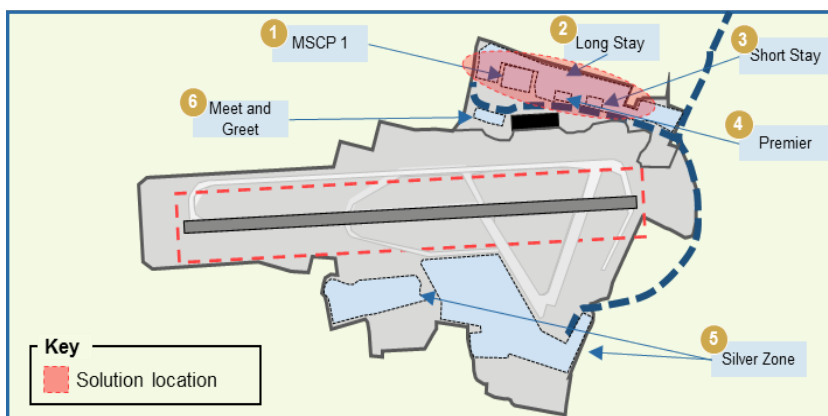
second extension referred to as *Silver Zone Extension Phase Two*. This additional capacity would be

marketed as Silver Zone parking and would therefore be part of the airport's low-cost parking provision. Vehicles would be manually blocked parked to improve space efficiency.

The proposed construction of MSCP3 will increase capacity by c. 2,150 spaces

7.5 The second proposed capacity increase included in Bristol Airport's planning application is the construction of a third multi-story car park within the existing Airport site on land currently occupied by long-stay car parking; this development is known as MSCP3. Based on the existing long-stay car parks in this

Figure 27 - Future location of MSCP3 at the airport



location and the other multi-story car parks under construction, we expect this additional capacity to be within the higher end of car park pricing, due to the relative proximity of the car park to the terminal and the additional protection and security offered by multi-story car parks.

7.6 The construction of both options is required to fulfil the capacity requirements for 2026 based on our forecasts, as shown in the Figure below. However, as part of our report we have assessed the relative benefit of constructing either the *Silver Zone Extension Phase Two* or MSCP3 first from a demand perspective. Given the differences between these two developments from a product and likely customer cost perspective, the order of construction may have a material impact on the volume of customers attracted to the new capacity and specifically the ability of new capacity to reduce the use of unauthorised off-site providers.

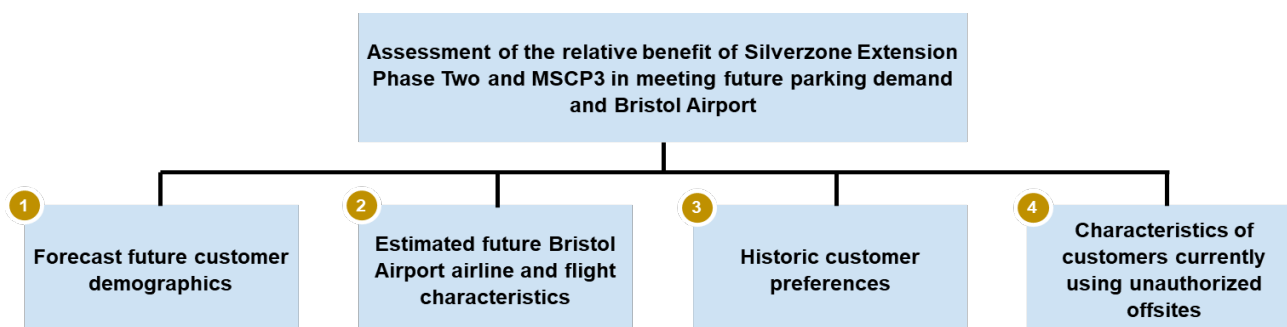
Strategic framework to assess relative attractiveness of Silver Zone Extension Phase Two and MSCP3

Customer type must be assessed to ensure appropriate capacity provision

7.7 In order to establish the likely requirements of future car parking capacity it is necessary to understand the type of customer who is likely to fill this future capacity. Specifically, understanding the preferences of future customers will determine whether prioritising the construction of *Silver Zone Extension Phase Two* or MSCP3 will lead to meeting customer needs, ensuring new capacity is fully utilised and (where possible) reduce the proportion of customers parking at unauthorised off-site locations.

7.8 To this aim we have developed a simple strategic framework to assess the relative merits in the construction of the two-proposed capacity increases in terms of best meeting forecast customer requirements. This framework is laid out in Figure 28 below.

Figure 28 – High-level strategic framework for assessing capacity provision



7.9 The demographics and other characteristics of future customers are a key factor in determining the likely value and success of proposed capacity increases. A car parking solution which is more aligned to the requirements of future customers is more likely to be fully utilised. Beyond this, we also assess the potential impact of any changes to the operations of Bristol Airport on customers' parking requirements. Our third area of assessment is of historic customer referencing between different forms of airport car park capacity using historic booking data; this will help to inform likely future customer preferences between *Silver Zone Extension Phase Two* and MSCP3. Finally, as the reduction in the proportion of customers who use unauthorised off-site providers is a key aim of the construction of additional car park capacity, we assess the likely characteristics of customers currently using this provision to ascertain whether one of *Silver Zone Extension Phase Two* or MSCP3 is better suited to attracting this customer type.

Assessment of Silver Zone Extension Phase Two and MSCP3 against framework

Criteria One: Forecast future demographics of Park & Fly customers

7.10 We anticipate that a large and growing proportion of customers prefer low-cost parking due to a lower ability and willingness to pay, their reason for travel, and their trip duration.

7.11 The geographic make-up of Bristol Airport passengers will evolve over time, as noted in earlier sections of this report. We forecast the largest increase in demand for Bristol Airport from 2015 to 2026 will be in North Devon & Cornwall and South Wales. Conversely, demand from other regions such as the Eastern and South Eastern Corridor is forecast to grow at a much lower level (see Figure 29). As these areas in South West England and Wales become a larger proportion of the overall demand, their preferences will be increasingly important to the investment decision for additional parking capacity, as they will use a larger proportion of the extra capacity.

Figure 29 - Current and forecast split to UK geographic demand

Geography	2015	2026 (Forecast)	Forecast Change to Geog. Split ¹
North Devon & Cornwall	12.2%	c. 16.8%	↑
South Wales and Cardiff	19.0%	c. 20.9%	↗
Rest of Wales	3.7%	c. 3.9%	↗
Eastern Corridor	7.4%	c. 7.3%	→
South Eastern Corridor	5.0%	c. 3.0%	↘

7.12 Whilst we note in paragraph 2.3 above that there has been increasing levels of disposable income leading to greater use of vehicles, household economic data (ONS, 2015) indicates that residents of North Devon & Cornwall and Wales are on average in the lower quartile of household income in the UK (as seen in Figure 31). These customers are more likely to have a lower ability / willingness to pay for car parking, and are more price-sensitive, so are more likely to prefer a low-cost parking option. We forecast that demand for low-cost parking will increase as these regions represent a growing proportion of the overall demand. As such the provision of additional low-cost parking

Figure 30 - Geographic spread of passenger demand (2026)

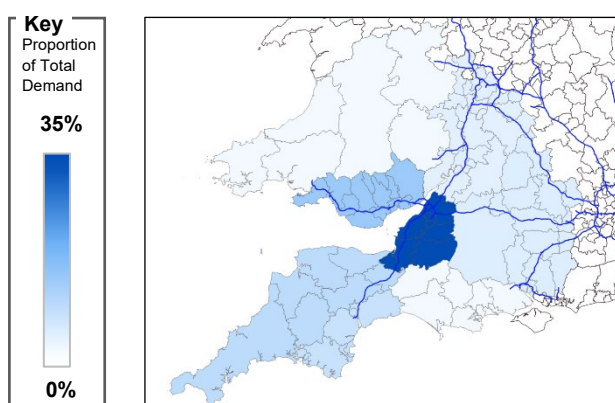
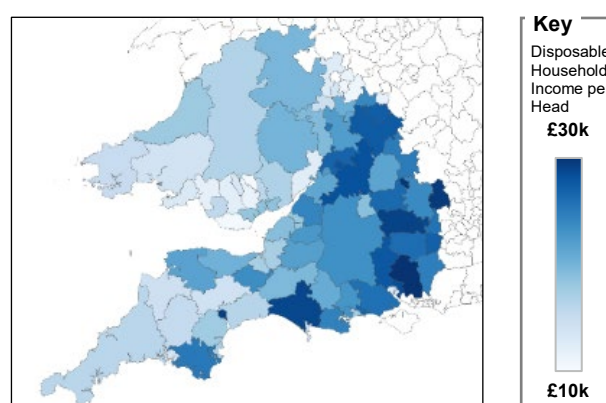


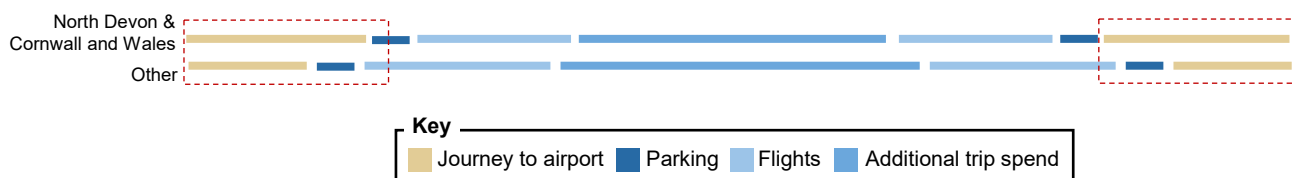
Figure 31 - Average gross disposable household income by capita per local authority (2015)



(Silver Zone Extension Phase Two as an extension of Silver Zone) is likely to better meet average customer requirements in the future.

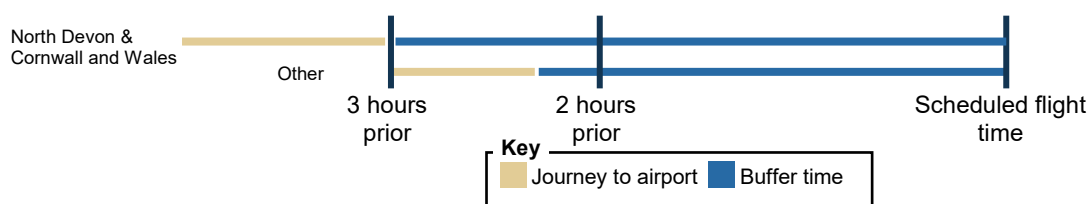
7.13 We believe this effect is compounded by the fact that passengers from these regions also travel further on average to reach the airport, as the North Devon, Cornwall and South Wales corridors are a longer distance from the airport than others. As such, passengers from the growth corridors of North Devon & Cornwall and Wales on average have a higher incremental cost of travelling to the airport than other corridors. As they live further from the airport, their journey to the airport is longer, and are likely spend more on fuel. Because this expense is considered part of the cost of the overall trip, passengers from these regions are likely to spend a higher proportion of their overall cost on the journey to and from the airport (see Figure 32); therefore, we hypothesise these customers are likely to be highly motivated to reduce their cost of parking in order to reduce the total cost of travel to the airport.

Figure 32 – Indicative breakdown of travel costs by region



7.14 Related to this effect is the amount of time that passengers from these corridors spend travelling to the airport. Associated with the longer journey time, we hypothesise a longer “buffer time”: the additional time between arriving at the airport and the scheduled flight take-off time. As their journey to the airport is on average longer, passengers from these regions are more likely to factor in extra time for potential delays in their journey such as traffic. Therefore, they are more likely to have time to park slightly further away from the airport and they will likely have the time to travel to from the car park to the airport via connecting bus. Conversely, passengers travelling from closer to the airport are more likely view the additional time required to park away from the airport and connect as highly inconvenient as it represents a far greater proportion of overall travel time to the airport. Given the aforementioned growth in passengers from the North Devon, Cornwall and South Wales corridors, we believe that lower-cost car parking provision, slightly further away from the terminal is likely to be increasingly attractive to the average customer in the future.

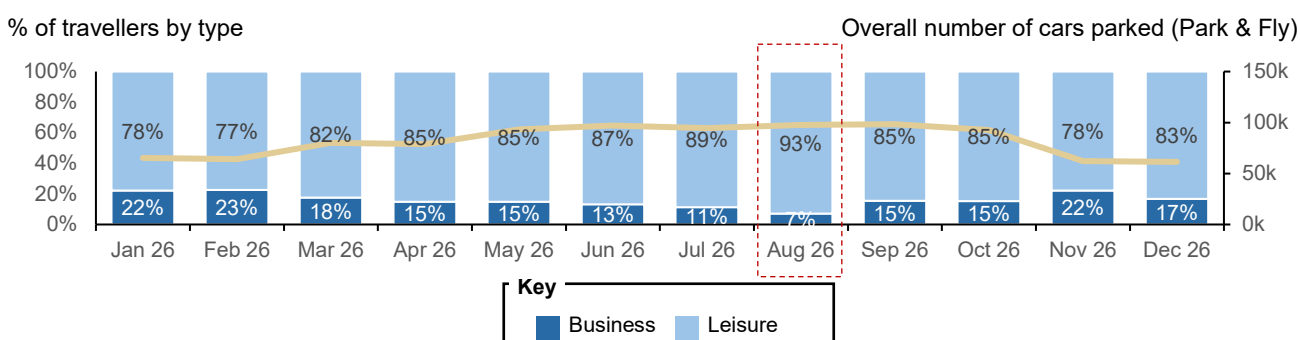
Figure 33 – Indicative breakdown of “buffer time” by region



7.15 The reason for air travel is also likely to influence a passenger's willingness to pay for parking. During the peak periods, leisure travellers make up a higher proportion of total passengers, as shown in Figure 34. The additional capacity is most likely to be used during peak periods, and therefore will be predominantly catering for leisure travellers during those times.

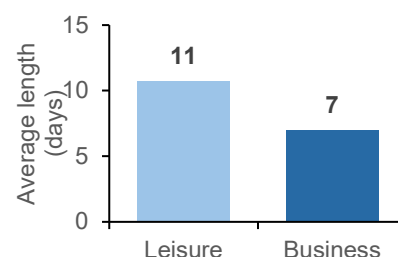
7.16 Leisure customers are likely to be more price-sensitive, as they will incur the total cost of their travel, while business travellers often have a higher budget or do not incur the total cost of travel themselves. The International Air Transport Association (IATA) states in the *Air Travel Demand Report 2016* that the price elasticity for a short-haul flight and associated costs is on average -1.5 for a leisure passenger and -0.7 for a business passenger; this signifies that for any 1% price increase, the quantity of flights demanded decreases by 1.5% for leisure customers but only 0.7% for a business passenger; indicating leisure customers are more price-sensitive and likely to favour low cost parking. In the summer where demand is greatest, and the additional capacity is required, the highest proportion of passengers are leisure customers, and therefore prioritising low-cost parking provided by *Silver Zone Extension Phase Two* would be most likely satisfy the preferences of these customers.

Figure 34 - Comparison of business v leisure travellers by month (2026)



7.17 Trip length may also affect parking preference. Leisure customers have an average trip length of c. 11 days, compared to business travellers who travel on average c. 7 days, based on 2017 CAA data (see Figure 35). Therefore, leisure travellers will require longer parking durations than business customers which is likely to incur greater cost for parking. We hypothesise this may contribute to leisure customers opting to utilise low cost parking options. In combination we believe that the greater proportion of leisure customers in the peak months and their relative desire for low-cost parking will drive greater demand for the provision of low-cost parking capacity (provided *Silver Zone Extension Phase Two*) compared to MSCP3.

Figure 35 - Average length of trip by passenger type



Criteria Two: Bristol Airport airline and flight characteristics

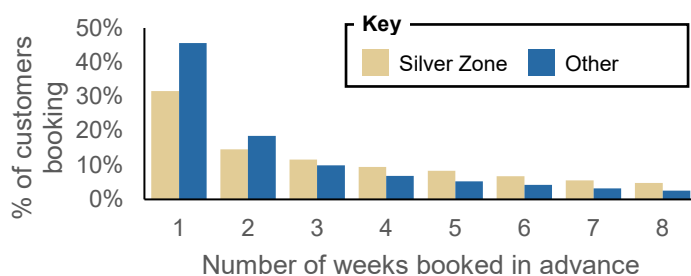
7.18 Bristol Airport currently hosts a large number of based aircraft; aircraft which are parked in the airport overnight and leave early in the morning with a first full load of passengers. In the peak months of 2018, 27.8% of all flights outbound from Bristol Airport were in this “first wave” and were serviced by base aircraft. This number of based aircraft is forecast to grow in the period up to 12mppa, based on the airport’s growth plans.

7.19 Bristol Airport estimates the vast majority of passengers on first wave flights are leisure travellers. As shown in 7.17, leisure customers are more likely to prefer low-cost parking. Moreover, a majority of based aircraft are of a budget or package holiday airline, which indicates that customers on these flights may consider price more strongly when making travel plans and choose a lower-cost parking option.

7.20 Bristol Airport forecasts a growth of based aircraft until 2026. As shown, this will correlate with a growth in demand for low-cost parking, therefore the Airport should set to increase low-cost parking capacity in line with growth of based aircraft.

Criteria Three: Historic customer preferences

Figure 36 - Percentage of customers booking in advance (2017)



7.21 Data shows an existing customer preference for low-cost parking amongst Bristol Airport customers. Silver Zone (the low-cost official parking) is more likely to be booked further in advance than the Long Stay or Premium Parking, based on data

collected by Bristol Airport (see Figure 36). As such, c. 54% of customers who book Silver Zone do so at least two weeks in advance, as opposed to only c. 36% of customers for other airport car parks. This potentially indicates a greater underlying demand for Silver Zone compared to other forms of parking. Given *Silver Zone Extension Phase Two* is an extension of Silver Zone, it is likely that this additional capacity would benefit from similar levels of underlying customer preference and demand.

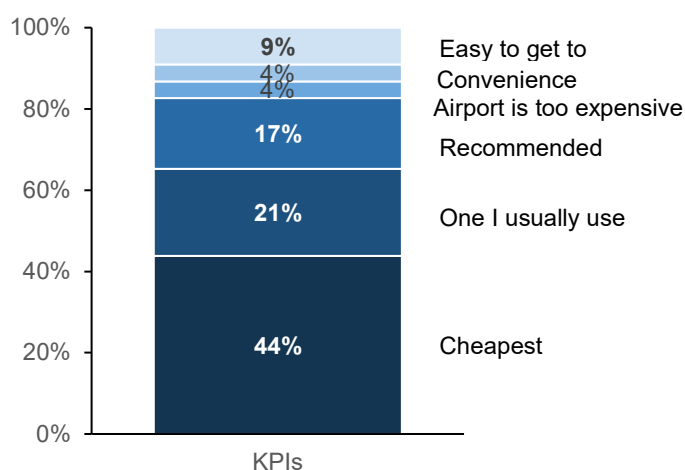
Criteria Four: Characteristics of passengers currently using unofficial off-site parking sites

7.25 Unofficial parking is on average less expensive than official airport parking; for example, in 2018 the average 7-day stay in a Bristol Airport Silver Zone car park is £64.99, whereas the average for the same length of stay in an alternative is £53.98, c. 15% cheaper, as shown in Figure 37.

Figure 37 - Comparison of cost of parking for 7 days (2018)



Figure 38 - KPCs of unofficial parking passengers (2017)



7.26 In a survey conducted by Pragma in 2017, 53% of unofficial off-site parking customers chose to park in those locations because it was the cheapest option. Additional internal analysis comparing airport parking with alternatives supported this conclusion, as unofficial off-site parking was rated lower in every other category (convenience, quality, security, and ease of finding) as shown in Figure 38, indicating that customers choose to park off-site due to the low prices regardless of the lack of other services provided. In order to capture share from those unauthorised sites which form the vast majority of unofficial off-site car parks, we believe that Bristol Airport would be better served by providing a greater volume of low-cost parking to attract more passengers who value price most when choosing where to park.

Comparative analysis of *Silver Zone Extension Phase Two* and MSCP3

7.27 Silver Zone Extension Phase Two will be an expansion of Silver Zone, which is c. 30% less expensive than the Bristol Airport Long Stay MSCPs. MSCP3 will be priced similarly to that of the existing multi-story car park. Between *Silver Zone Extension Phase Two* and MSCP3, *Silver Zone Extension Phase Two* will be considerably the lower-cost option. Our high-level analysis indicates that a low-cost parking option is likely to better meet customer needs and benefit from greater levels of underlying demand, while also being better positioned to reduce the market share of unauthorised off-site providers. For these reasons, we view the development of *Silver Zone Extension Phase Two* as being a more practical first step in the development of further parking capacity at the airport.

Figure 39 - Comparison of Silver Zone Extension Phase Two and MSCP3 in terms of satisfying passenger demand for parking

Criteria		<i>Silver Zone Extension Phase Two</i>	MSCP3
Characteristics of Park & Fly customers	Household income	✓	✗
	Buffer time	✓	✓
	Incremental cost of journey to airport	✓	✓
	Reason for travel	✓	(✓)
	Trip length	✓	✗
Based aircraft demand		✓	(✓)
Historical patterns of parking behaviour		✓	✗
Characteristics of unauthorised parking customers		✓	✗

In conclusion, a detailed assessment of likely future parking demand demonstrates a substantial requirement for further parking capacity. This requirement is the same in both a stable and growth public transport scenario, indicating that investments in public transport alone cannot effectively meet future demand requirements. Based on demographic analysis of the catchment, lower cost parking solutions are more likely to meet customer needs and effectively attract customers currently parking at unauthorised off-site locations. With this in mind, while the construction of the second phase of the Silverzone extension and MSCP3 will both be required to meet anticipated demand in 2026, the construction of the former should be prioritised in order to most effectively meet demand and reduce the use of unauthorised sites across the region.