Development of Bristol Airport to Accommodate 12 Million Passengers Per Annum: November 2020 Update to the Parking Demand Study

Teneo Consulting, 2020

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1. Introduction, purpose and scope

1.1 - A Parking Demand Study[1] was submitted to North Somerset Council (NSC) as part of Bristol Airport Limited's (BAL) planning application (reference 18/P/5118/OUT) to increase the permitted passenger cap of Bristol Airport from 10 million passengers per annum (mppa) to 12 mppa. The planning application, which includes improvements to existing infrastructure, delivery of new infrastructure and amendments to current operations, was refused by NSC on 19 March 2020. On 10 September 2020, BAL made an appeal to the Planning Inspectorate, pursuant to Section 78 of the Town and Country Planning Act 1990.

1.2 – Since refusal of the planning application, the global COVID-19 pandemic has particularly affected the aviation sector and, like other UK airports, passenger throughput at Bristol Airport has been temporarily suppressed. As a result, the forecasts that informed the 12 mppa planning application and provided the basis for the original Parking Demand Study (2018) and subsequent Parking Demand Study Addendum (2019)[2] have been updated in order to consider the effect of the pandemic and address the uncertainties associated with tdhe rate at which demand will return. BAL has therefore commissioned Teneo Consulting to produce an update to the Parking Demand Study to ensure that the findings of the assessment are accurate, considering the updated forecasts. The update also reviews other information that has been released since the original report, including the most recent Civil Aviation Authority (CAA) Passenger Survey (2019)[3] and parking data from BAL (2018 and 2019).

1.3 – The aim of this report is to identify the level of car parking required up to 12 mppa, considering the updated passenger forecasts, and to review BAL's proposed parking solution in this context. The projected demand for car parking up to 12 mppa considers public transport modal share, the future catchment area for passengers and the anticipated type of parking demand. The study assumes an increase in public transport modal share of 2.5% relative to the 10 mppa consented target level. This is consistent with the Transport Assessment Addendum provided by Stantec Limited[4] and reflects the stretch public transport mode share target for the planning application agreed with NSC officers as set out in the Draft Section 106 Agreement.

[1] Development of Bristol Airport to Accommodate 12 Million Passengers Per Annum: Parking Demand Study, Teneo Consulting, 2018

[2] Development of Bristol Airport Cogloop 1 and Cogloop 2 for Winter use: Parking Demand Study, Teneo Consulting, 2019

[3] Civil Aviation Authority 2019 Passenger survey report, CAA, 2019

[4] Transport Assessment Addendum, Stantec UK Limited, 2020

1.4 – This update report reviews the methodology, inputs and conclusions of the 2018 Parking Demand Study and the 2019 Addendum (Winter Parking Demand); it should be read in conjunction with both documents. This report does not reiterate methodological approaches employed in the development of the parking forecasts and does not repeat information unchanged from the original report. As such, this report should be viewed only as an update to the aforementioned, more detailed documents.

1.5 – This report provides an overview of the inputs which have been updated since the original Parking Demand Study in 2018, before providing an overview of changes to key outputs as a result of these updates. **Only where changes have occurred are charts and commentary included within this report,** and it should therefore only be read as a supplement to the original report.

The structure of this report is as follows:

- Section 1: Introduction, purpose and scope (above)
- Section 2: Update summary
- Section 3: Updates to historic parking demand (2018 and 2019)
- Section 4: Updates to future parking demand and capacity
- Section 5: Impact of public transport mode share targets
- Section 6: Impact of proposed capacity increases by Bristol Airport
- Section 7: Summary of changes and conclusion

2. Update summary

2.1 – The overarching methodology for forecasting on-site parking demand for BAL within the Parking Demand Study has not changed from the original 2018 report, nor its 2019 addendum. As such, reference should be made to the original Parking Demand Study (2018) for full details of the methodology employed in order to forecast parking demand. This methodology was not challenged by NSC officers during determination of the planning application and, therefore, has not been reviewed, altered or updated in any way.

2.2 – However, since refusal of the planning application, the global COVID-19 pandemic has particularly affected the aviation sector, specifically in relation to current and forecasted passenger demand. Further, more recent information is now available for key forecasting inputs for the assessment of parking demand, including the CAA Passenger Survey (2019) and two additional years of actual data relating to car park entries and exits. As such, several inputs to the Parking Demand Study forecasting model have been updated in order to ensure it reflects both the updated passenger forecast for the airport, and the latest available information relating to parking demand. A comprehensive list of input changes is provided in Table 1 below, along with the rationale for the change, and the broad manner in which this affects the forecast. No changes beyond those listed below have been made to the modelling inputs, and no methodological changes have been made whatsoever.

Table 1: Updates to forecasting model inputs

Input update	Reason for change	Element of forecast impacted
Overall passenger demand. The total number of passengers forecast to use the airport in future years, as provided by York Aviation LLP (hereafter: YAL). *The updated forecast has been used to update total passenger demand exhaustively within the forecasting model.*	The primary driver of parking demand at the airport is total passenger volume. As a result of the COVID-19 pandemic and the new forecasts provided by YAL, the updated passenger volume forecast is different to that used in the original Parking Demand Study (2018).	As passenger volume is the primary driver of the number of parking spaces required, this update has a fundamental impact upon the forecast number of spaces in every year of the Parking Demand Study.
UK / foreign split of passenger demand. The updated aviation forecast includes an updated view	As foreign-based passengers are deemed exceptionally unlikely to park, the proportion of total	As foreign-based passengers are deemed exceptionally unlikely to park, a change in the proportion of

on the proportion of total passenger demand which is UK / foreign originating. *The new forecast has been used to update total passenger demand exhaustively within the forecasting model.*	demand which is UK / foreign based is an important input to the Parking Demand Study and should be consistent with the updated passenger forecast.	passengers who are foreign based will have an impact on the total amount of passenger throughput which is not relevant to calculating overall parking demand, affecting the total number of spaces required to service overall passenger demand.
Geographical segmentation of UK passenger demand. As part of the updated aviation forecast, provided by YAL, an updated geographic segmentation of UK passenger demand was calculated, providing an updated view of where passenger demand originates. *The new segmentation has been used to update UK geographic segmentation exhaustively within the forecasting model.*	A primary driver of 'likelihood to park' within the forecasting model is the 'home geography' of passengers as this impacts their decision to 'drive and park' versus other forms of transportation. The relative attractiveness of parking at the airport compared with other options (e.g. getting public transport or taking a taxi) depends on where passengers are coming from, as such, it is appropriate to reflect updates to geographic segmentation within the Parking Demand Study.	Changes to geographic segmentation or 'home geography' of passengers impacts 'likelihood to park' in the forecasting model and will therefore impact the total number of cars forecast to park and spaces required to service this demand beyond raw passenger volumes.
CAA Passenger Survey. The CAA conducts periodic surveys of passengers using UK airports which can be used to estimate segmentation of passengers. A more recent survey was conducted in 2019 (last survey: 2015) and this has been updated within the forecasting model. *Given the comparatively low sample size sused within CAA surveys, this update uses* ***an***	Several segmentations of the passenger demand at BAL rely upon the data collected in the CAA survey, including group size, and key demographic indicators of 'likelihood to park' including age and gender.	The update of the CAA Passenger Survey data impacts the forecasting model in two ways: 1. The update to group size will adjust the conversion of passengers parking at the airport and number of cars parking; and 2. The update to key demographics will impact

average of the 2015 and 2019 surveys.		'likelihood to park' in the forecasting model.
Occupancy / demand ratio. A key metric in determining the number of spaces required is the historic ratio of total cars parked to spaces required to service these cars. This ratio is calibrated using historic data. This update *has calculated the ratio for 2018 and 2019 and* ***taken an average of the 2017, 2018 and 2019*** *occupancy/ demand ratio.*	The occupancy / demand ratio is a key modelling input in calculating the number of spaces required and relies upon historic car entrances and manual occupancy counts to calculate. It is appropriate to include more recent information captured in 2018 and 2019 as this reflects more recent trends. However, the update has taken a 2017 – 2019 average to reflect both the sensitivity and importance of this input.	The occupancy / demand ratio impacts the conversion of number of cars wishing to park at the airport and the volume of spaces required to service this demand in every month of the year. As such, updating this ratio will impact the forecast for the total number of spaces required to service demand beyond total passenger demand, 'likelihood to park,' and the number of cars parking.
Bristol Airport car parking capacity. Determining the exact number of additional spaces required to service demand (and in which year) requires a precise estimate of capacity at on-site parking locations in every year. *Planned capacity remains as per the 2018 report, albeit the timing of development has been revised to take into account the updated passenger forecasts.*	The exact number of spaces available in any year of the forecast relies upon the total net capacity available at the airport. Given two years have passed since the original study, the forecast capacity has been updated based on the latest airport view of development (planned capacity remains as per the 2018 report albeit the timing of development has been revised to take into account the updated passenger forecasts).	Changes to the total forecast capacity (without further additions) impacts the total number of 'additional' spaces required to service demand. This is a key output of the forecasting model.

2.3 – In the sections that follow, the impact of the changes outlined above on the output of the forecasting model is set out. However, an exhaustive update of all methodology and outputs from the original report is not provided. **As such, these sections should be read in conjunction with the original 2018 Parking Demand Study and Winter Parking Demand Addendum (2019). The relevant sections of those reports are highlighted at the beginning of each section in this report.**

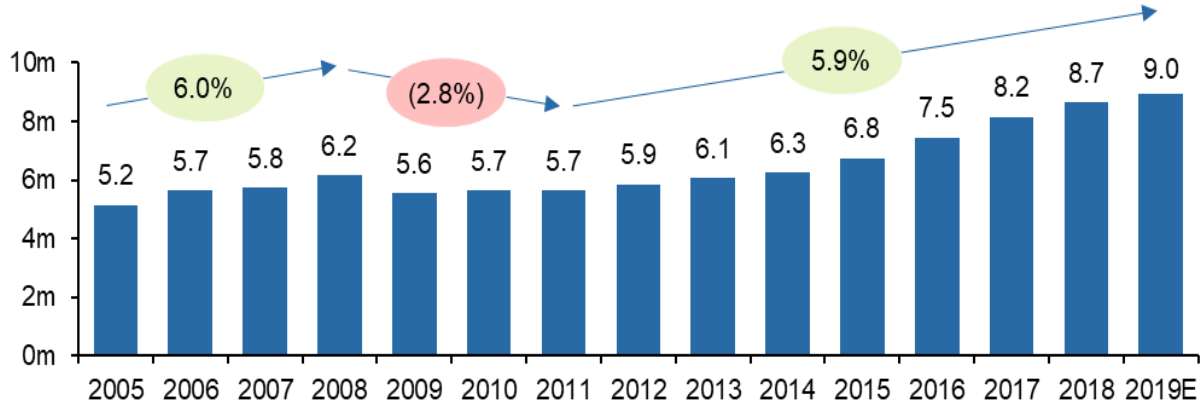
3. Updates to historic parking demand (2018 and 2019 data)

To be read in conjunction with sections 2.1 – 2.6 of the 2018 Parking Demand Study and section 2.1 of the 2019 Parking Demand Study Addendum.

Bristol Airport has continued to grow passenger numbers by 5.9% per annum since 2011; however, it is anticipated that 2020 will be severely impacted by COVID-19

3.1 - Since 2011, Bristol Airport has achieved strong passenger growth with numbers increasing from c.5.7m to c.9.0m in 2019, at an average annual rate of 5.9%, as shown in Figure 1, below. 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 1 - Bristol Airport passenger numbers (2005 – 2019E)



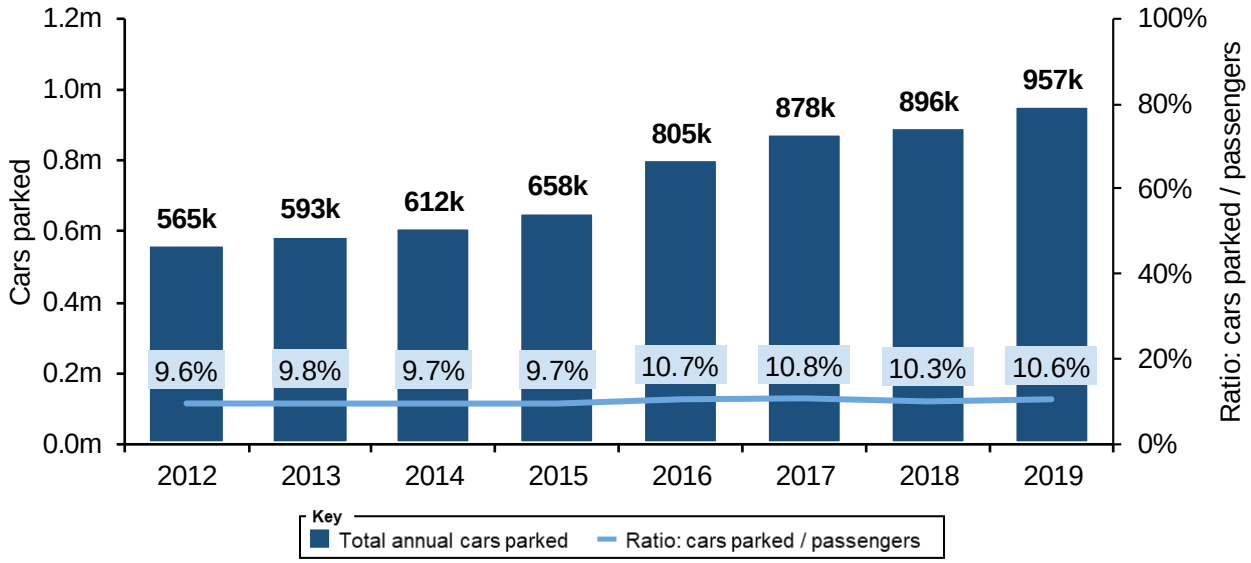
The number of cars parked at the airport has also continued to increase at a steady rate, generally in line with passenger growth

3.2 - The number of cars parked at the airport has increased in recent years, with total car park exits measured at c. 957k in 2019 (excluding drop-offs and visitors), compared to c. 565k in 2012; this represents an average annual growth rate of 7.8%, (Figure 2, below). 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 c.10% to 11% over the same period), shown in Figure 2. This underlying increase in the proportion of passengers choosing to park at the airport is explored within the original Parking Demand Study, but the key factors associated with the increase are summarised as follows:

- Limited sub-regional public transport infrastructure due to lower public investment compared to other parts of the country, although overall public transport mode share at Bristol Airport has increased;

- 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 potentially weaker compared to the immediate Bristol surrounds;
- 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 (however, we note this is likely to be impacted negatively in 2020 and potentially beyond due to the COVID-19 pandemic); 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. Whist 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.

Figure 2 - Number of car park exits at Bristol Airport (2012 - 2019)

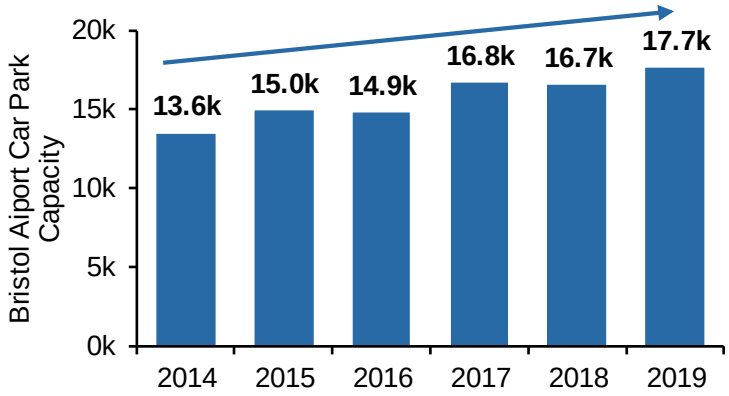


The increase in the number of cars parking at Bristol Airport continues to lead to a greater demand for car parking spaces at the airport

3.3 - 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 2019, maximum occupancy peaked at c.16,600 vehicles parked at official airport sites. This figure does not include the number of cars parked at competitor off-site locations.

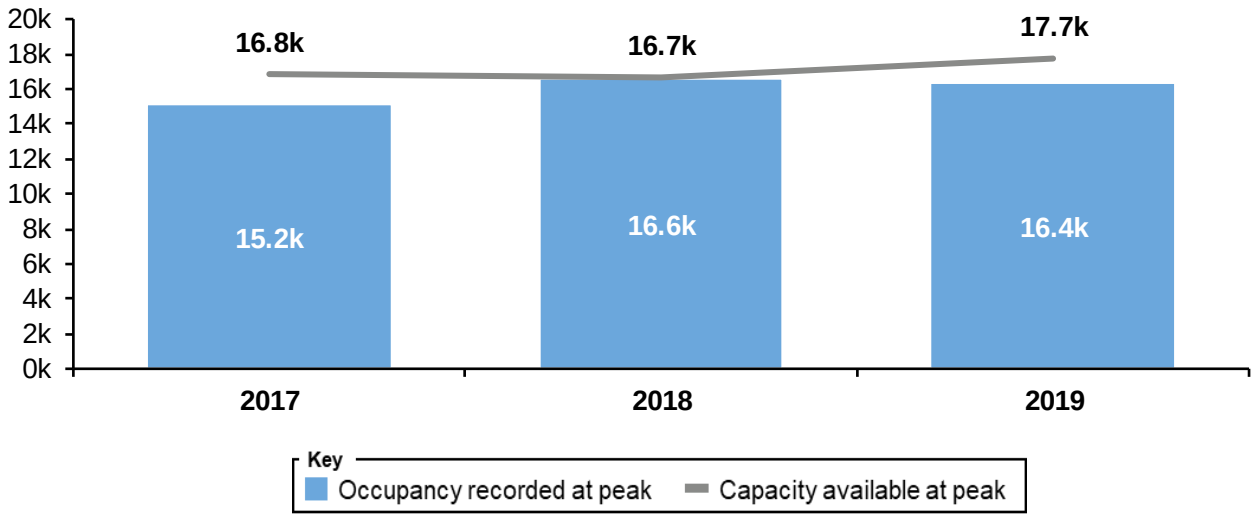
3.4 - To manage the additional demand, the airport has permanently increased its capacity over recent years through the construction of both phases of Multi-Story Car Park (MSCP1) in 2018 and 2019 and delivery of a seasonal expansion to Silver Zone (*Silver Zone Extension Phase One*), adding c. 3,650 additional spaces, as shown in Figure 3, right. The *Silver Zone Extension Phase One* became operational in 2017 and is currently the only way the airport can meet peak seasonal demand. 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 (due to buffers required to efficiently operate a car park with a flight schedule), the airport has at times become close to filling its existing capacity, both inside and outside of the summer peak.

Figure 3 - Historical airport capacity increases (2014-2019)



3.5 - Even with this additional capacity, the airport has come close to full capacity during the peak summer months in each of the last three years, as shown in Figure 4, below. In each of the last three years, and specifically in 2018, peak demand has been within 10% of total airport capacity.

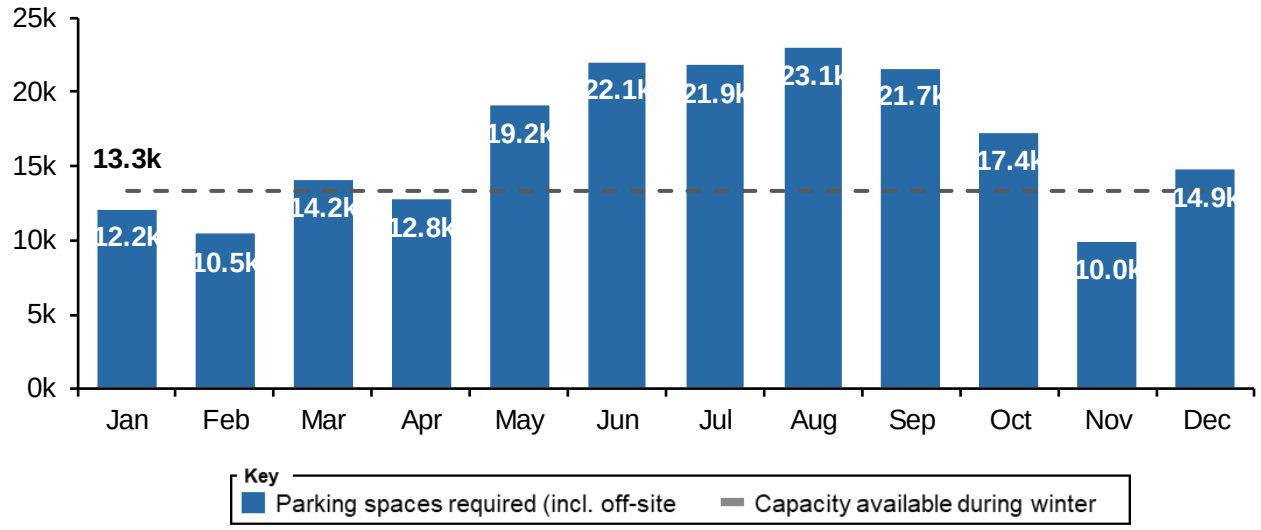
Figure 4: Comparison of capacity and peak demand over last three years



Winter demand continues to approach capacity during critical peak periods, such as Christmas

3.6 - While demand is lower during the winter months, available 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. As shown in Figure 5 below, total Park and Fly demand (including offsite, as assumed to be minimal off-site capacity in winter months) is close to/over total available airport capacity in the winter months due to the closure of additional airport capacity provided by the seasonal extension to the Silver Zone Car Park.

Figure 5: Forecast demand for spaces in during 2019, including spaces used at off-site car parks, vs. winter capacity (Park & Fly)



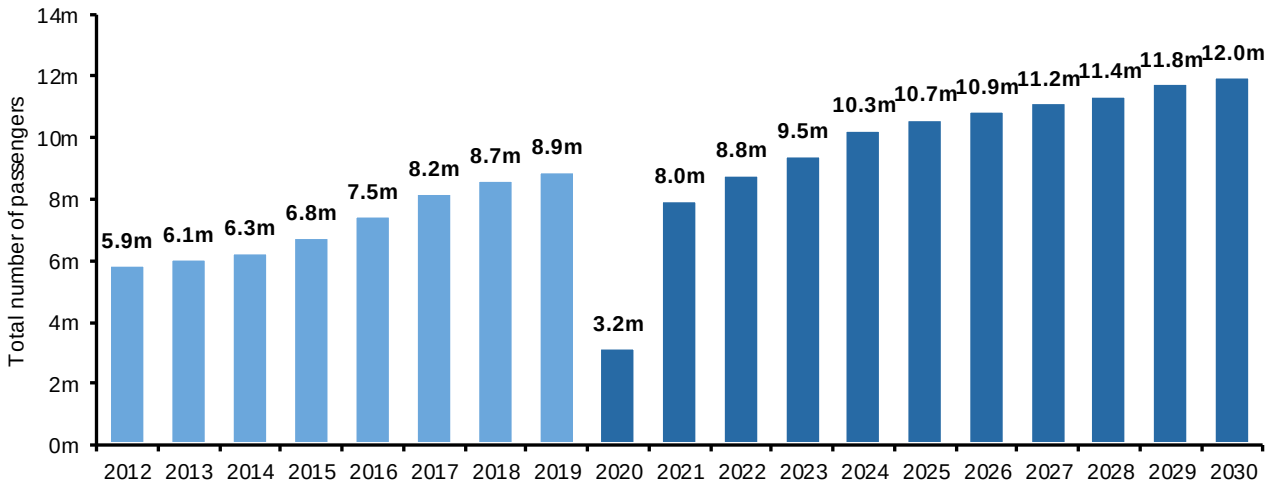
4. Updates to future parking demand and capacity

To be read in conjunction with sections 3.1 – 3.20 of the 2018 Parking Demand Study and section 2.1 of the 2019 Parking Demand Study Addendum.

The updated aviation forecast has generated changes to the overall levels of passenger demand and proportion of expected foreign passengers (those based outside of the UK flying into Bristol)

4.1 The updated passenger forecasts prepared by YAL indicate that passenger throughput will now reach c.12m by 2030, as shown in Figure 6, below. This forecast represents a change from the aviation forecast used within the original Parking Demand Study (2018) where 12 mppa was projected to be reached in 2026. This is the Core Case adopted in this assessment. The updated passenger forecasts also identify a reasonable Faster Growth Case and Slower Growth Case. The Faster Growth Case sees Bristol Airport reach 10 mppa in 2022 and 12 mppa in 2027. The Slower Growth Case sees 10 mppa reached in 2027 and 12 mppa in 2034. Both the Faster and Slower Growth Cases have been considered in preparing this Addendum; however, they would not affect the overall level of parking demand forecast, only the timing of when additional car parking capacity is required, commensurate with passenger growth. In consequence, the Faster Growth Case and Slower Growth Case are not considered further in this report as they do not materially affect the conclusions of the Parking Demand Study.

Figure 6: Updated aviation demand forecast (YAL, 2020)

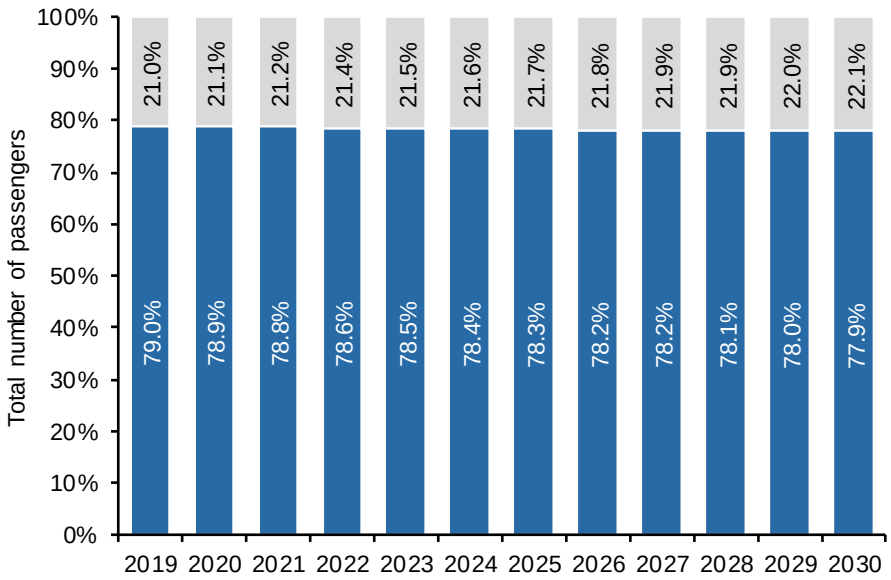


4.2 – An underlying increase in passenger numbers will lead to an increased level of parking demand (although increased inbound foreign and domestic passengers tends to supress overall parking demand, see below).

4.3 - 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. As shown in Figure 7 below, YAL forecasts that the percentage of foreign and domestic inbound passengers will increase from an estimated 21.0% in 2019 to 22.1% in 2030, which represents a change from the original Parking Demand Study (2018).

4.4. – Foreign passengers (shown in grey in Figure 7 below) are very unlikely to drive parking demand and, therefore, this will lead to a relative reduction in overall parking demand (for example, CAA surveys show that foreign passengers are very unlikely to need to park because they use hire cars or public transport.)

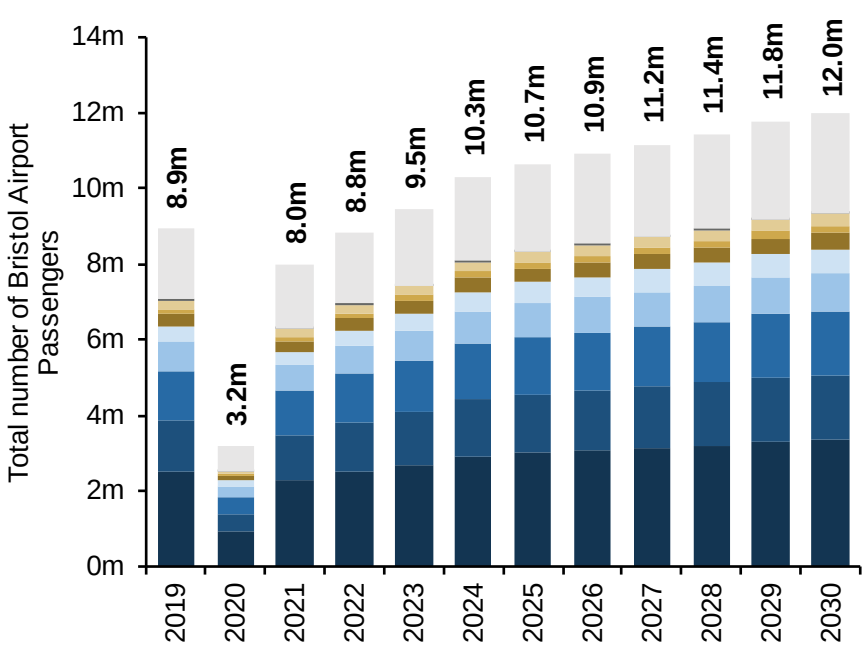
Figure 7: Forecast proportion of foreign passengers



The updated aviation forecast provides new inputs relating to the home geography of UK-based passengers, which is an important driver of likelihood to park

4.5 - Along with the total passenger demand forecast, the forecast of the number of cars arriving at Bristol Airport up to 2030 has been used to forecast changes to passenger origin (provided by YAL) over time and applied these to the sub-catchments identified. As shown in Figure 8, YAL forecast a *proportional* growth of passengers arriving at the airport having travelled from the Eastern Corridor (stemming between Bristol and Reading, see the original Parking Demand Study (2018) for full map), between 2019 and 2030, which represents a change from the original Parking Demand Study (2018).

Figure 8 - YAL passenger demand forecast, by corridor (2019-2030)



Corridor	2019-30 % pts. delta
Foreign	1.1%
Other UK geographies	0.0%
Rest of Wales	(0.1%)
South Eastern	0.2%
North East & Birmingham	0.1%
Eastern	0.8%
South Devon & Cornwall	(0.3%)
North Devon & Cornwall	(0.5%)
South Wales & Cardiff	(0.6%)
Bristol & Surrounding Area	(0.5%)

The updated geographic segmentation drives a small increase in the proportion of passengers travelling from the Eastern Corridor which will drive increased usage of public transport to access the airport

4.6 – Passengers travelling from areas with better public transport links are more likely to travel to the airport by bus or train than passengers from areas with weaker transport links. As it is forecast that growth will be proportionally greater from the Eastern Corridor (where public transport links into the Bristol area are superior to the south western corridors, e.g. London to Bristol main rail line), this is anticipated to drive the increase in public transport surface access mode share. Full details of the anticipated growth in public transport are contained within the Transport Assessment Addendum (Stantec UK, 2020).

4.7 – Notwithstanding the increased likelihood of passengers using public transport, it is noted that, overall, in the South West, there are fewer public transport choices for passengers compared to other regions. *The Joint Local Transport Plan*[5] 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.

[5] The Joint Local Transport Plan, 2030 – 2036, Travelwest, March 2020

4.8 – This update has also considered future demographic and economic impacts (including average age, wealth and car ownership) on the overall *likelihood to park* within the catchment (Figure 9). As shown in Figure 10, within the passenger segmentation column, the impact of geographic origin shift and other demographic and economic segmentations is very minor. Almost all small shifts in the proportion of passengers travelling from areas with a higher likelihood of parking are offset by a similar shift in passengers from areas with a lower likelihood of parking; the net impact is that any change in parking demand due to changes in passenger origin are negligible.

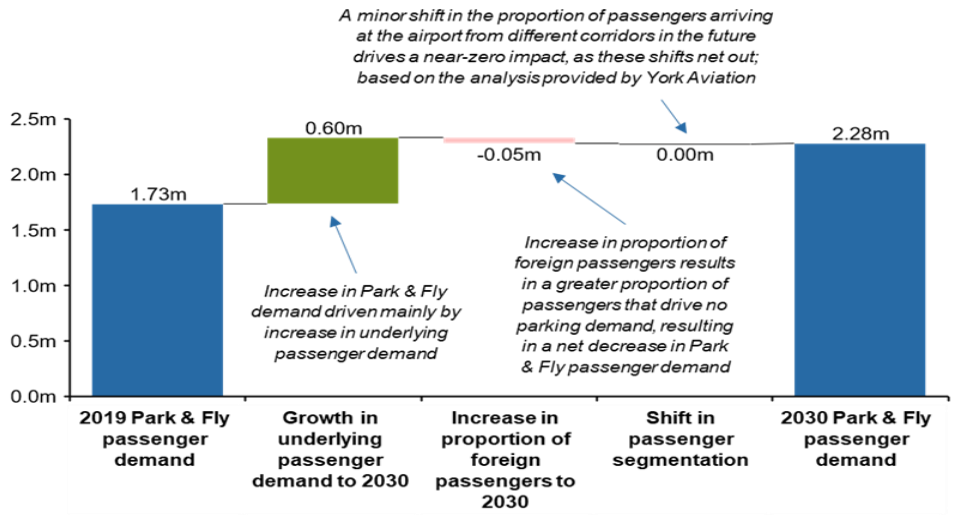
Figure 9 – Forecast impact of geographic and demographic changes on likelihood to park

Future dynamics	Hypotheses	Impact on propensity to Park & Fly
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	↑
Disruptive automobile technology in the medium to long term	• Disruptive technology holds the potential to dramatically alter car ownership and parking dynamics	↓

The impact of passenger growth, foreign passenger proportion change and UK passenger home geography change over time continues to drive Park and Fly demand, but the updated inputs have resulted in changes to overall Park and Fly demand from the original Parking Demand Study (2018)

4.9 – The overall change in Park and Fly demand between 2019 and 2030 is shown in Figure 10 below, with the relative impact of the different factors highlighted. Park and Fly demand refer to the total number of passengers who are forecast to choose parking a private vehicle at the airport as their mode choice. Park and Fly demand increases in absolute terms over the study period, as outlined in Figure 10, below. As in the original Parking Demand Study (2018), the most significant factor by some margin is overall passenger number increase. A great number of passengers choosing to Park and Fly will in turn generate greater parking demand, as outlined in the following sections. The Park and Fly calculation implicitly includes the target increase in public transport, as outlined in Section 5: Impact of public transport mode share targets, below.

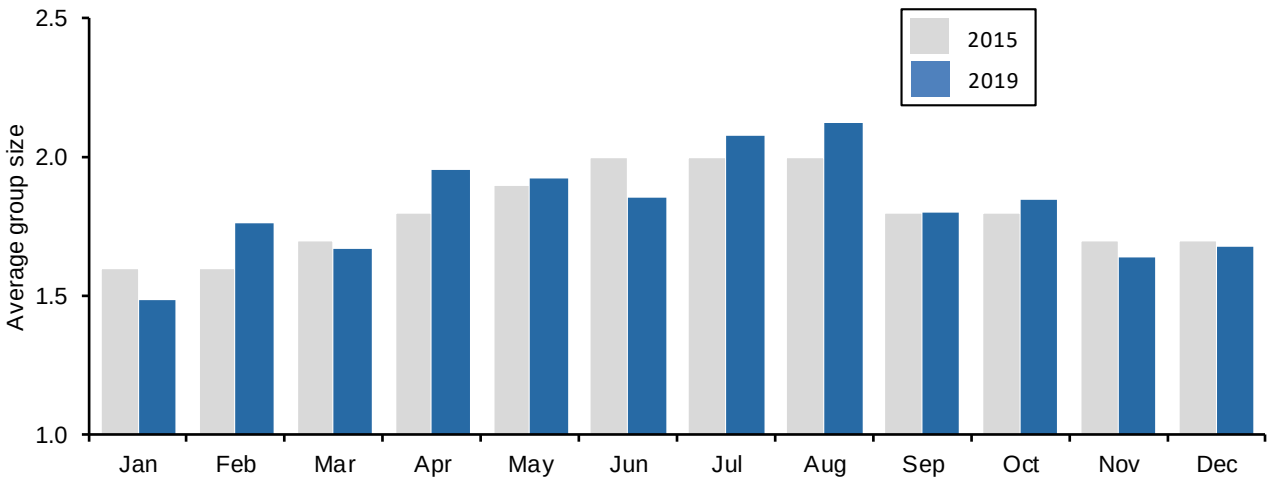
Figure 10 - Drivers of Park & Fly passenger demand (2019-2030)



Passenger group size has been updated using an average of the 2015 and 2019 CAA Passenger Surveys, which has an impact upon the conversion of Park and Fly demand and cars parking at the airport

4.10 – More recent data relating to group size has become available through the release of the 2019 CAA Passenger Survey. This assessment has taken an average of the 2015 and 2019 group size inputs derived from the CAA surveys, as shown in Figure 11 below. This was done in order to increase the total sample size used within the forecast therefore increasing reliability and accuracy.

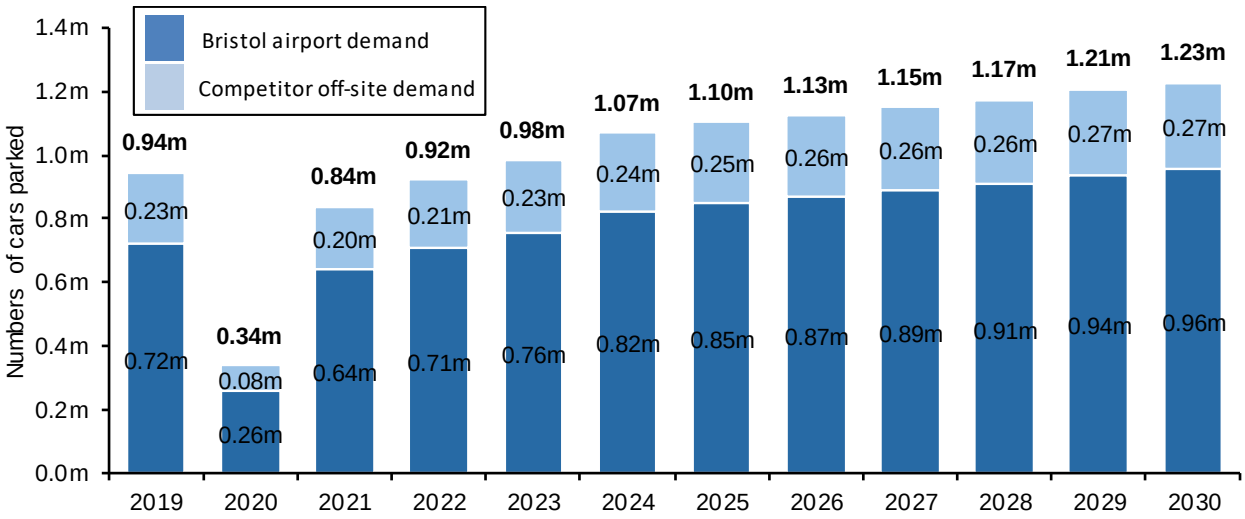
Figure 11: Group size from 2015 and 2019 CAA Passenger Survey



4.11 – The total number of cars driven by passengers and then parked in the Bristol Airport area is expected to grow at 2.5% annually leading to an estimated c.1.23m cars parked by customers using

Bristol Airport (including off-site providers to official parking) in 2030, as shown in Figure 12 below. The rate of growth forecast has not adjusted materially from the original Parking Demand Study.

Figure 12: Cars parked annually by airport passengers (Park and Fly)



4.12 –The competition assumptions used in the original Parking Demand Study (2018) have not been updated and, therefore, they are not assessed here.

4.13 – It is understood that a request for an Environmental Impact Assessment (EIA) scoping opinion has been submitted to NSC for a proposed park and ride facility adjacent to Heathfield Park, Hewish. However, there is currently insufficient information to permit detailed consideration of the proposal.

The occupancy / demand ratio has been updated by taking an average of the 2017, 2018 and 2019 car park entrance and occupancy data provided by BAL

4.14 – The occupancy / demand ratio is the key input for converting the number of cars arriving at the airport to park to parking spaces required to service them, and is largely a function of trip duration (for full details, please see the original Parking Demand Study (2018) Section 3.8 – 3.12). The occupancy / demand ratio is calculated using actual historic data relating to car park entrances and manual car park occupancy counts. Two further years of actual data are now available for 2018 and 2019 to further calibrate this ratio. An average of the 2017, 2018 and 2019 occupancy / demand ratio has been taken due to the sensitivity of this input (the greater the amount of data the more accurate it is likely to be). An average has been taken to reduce the impact of any one-off changes (e.g. timing of school holidays, small variations in flight schedules etc.) which may have led to changes in the OD ratio in any one give year.

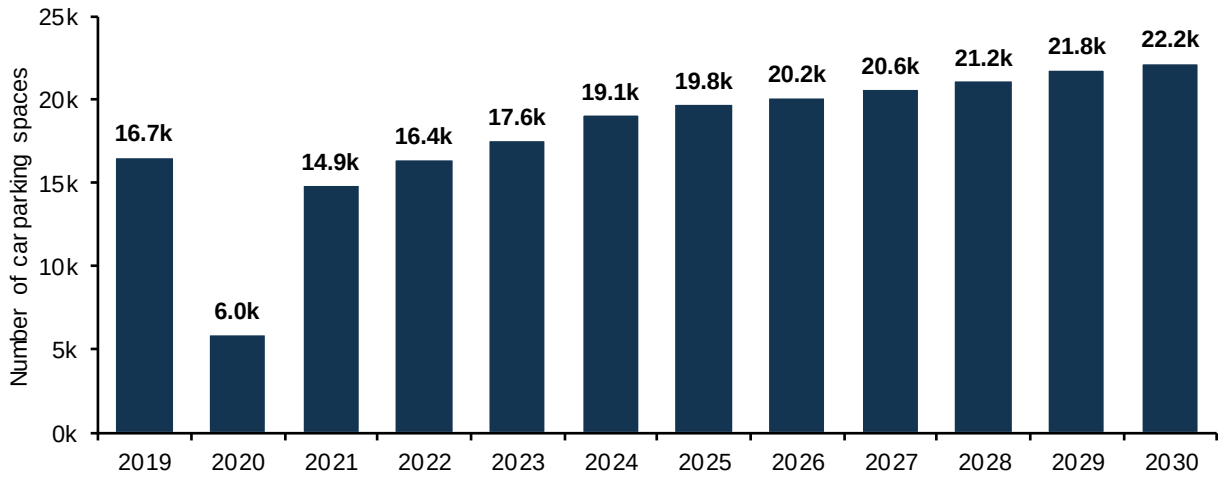
Table 2: Average OD ratios (2017 - 2019)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Average O/D ratio	0.19	0.19	0.18	0.19	0.22	0.22	0.23	0.24	0.23	0.20	0.17	0.25

Based on the updated inputs relating to group size and occupancy / demand (on top of the changes to overall demand), the total number of peak spaces required at the airport is forecast to be 19,100 in 2024 and 22,200 in 2030

4.15 – Using the number of cars parking per month and assuming a constant occupancy / demand ratio in each month, the total number of parking spaces required at the airport in each month from 2019-2030 has been calculated (all methodological calculations are laid out in the 2018 Parking Demand Study). The total number of spaces required to meet peak Bristol Airport's parking demand is forecast to rise from c.16,700 in 2019 to c. 22,200 in 2030, as shown in Figure 13, below.

Figure 13: Number of peak spaces required (2019 - 2030)



Without further development, the number of spaces available during peak months at the airport is anticipated to remain stable in the coming years

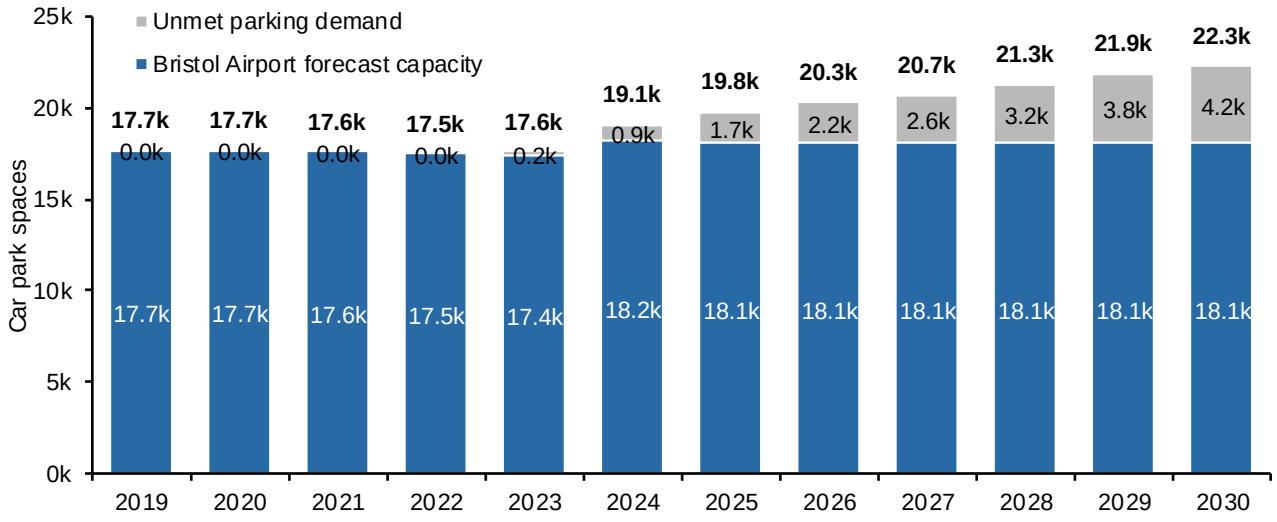
4.16 – Planned capacity remains as per the 2018 report, albeit the timing of development has been revised to consider the updated passenger forecasts, settling at 18,000 spaces from 2026 onwards. Full details of adjustments are provided in the 2018 Parking Demand Study.

Table 3: Available airport capacity without development ('000 spaces)

	19	20	21	22	23	24	25	26	27	28	29	30
Total Baseline	17.7	17.7	17.6	17.5	17.4	18.2	18.1	18.1	18.1	18.1	18.1	18.1

4.17 - Based on the current and consented levels of capacity available at the airport, the forecast demand will lead to a shortfall in parking spaces during peak times of 900 in 2024 and 4,200 in 2030, as shown in Figure 14, below.

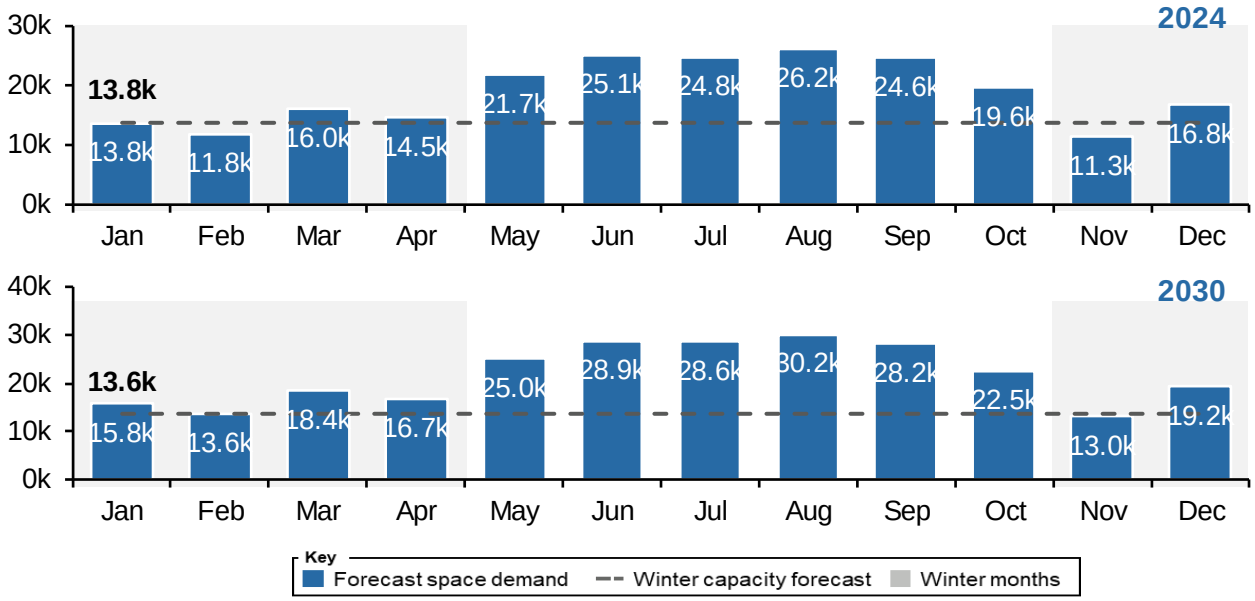
Figure 14: Unmet demand at Bristol Airport parking sites



The revised demand forecast also impacts the expected winter space requirement for January 2024 and January 2030

4.18 – The revised parking demand forecast also impacts the expected level of winter peak demand which was originally assessed in the Parking Demand Study Addendum (2019). The level of demand in the winter peak is shown below for 2024 and 2030, indicating demand exceeding winter capacity by March 2022, as a result of assumed reduced off-site provision and the closure of the Silver Zone Car Park seasonal extension in the winter months. As such, the Cogloop1 winter extension will be required in both the key years of 2024 and 2030, as shown in Figure 15, below.

Figure 15: Forecast demand (including off-site competition) compared to forecast parking capacity during winter at Bristol Airport, 2024 and 2030 (Park & Fly)



5. Impact of public transport mode share targets

To be read in conjunction with sections 4.1 – 4.7 in the original 2018 Parking Demand Study.

5.1 - BAL is committed to increasing public transport modal share for passengers and staff as part of the 12 mppa application. The current method of measuring public transport usage adopted by BAL and agreed with NSC uses bus ticket data. This data, showing a 12.5% public transport use in 2017, was used as the basis for setting mode share targets which are set out below:

- 10 mppa development: target of 15% of passenger trips to be made by public transport as per the Section 106 Agreement (see Part 1 'Obligations relating to surface access' of Schedule 4) signed as part of the 10 mppa planning permission (LPA ref. no. 09/P/1020/OT2); and

- 12 mppa development: target of 17.5% of passenger trips to be made by public transport as agreed with NSC officers and set out in the Draft Section 106 Agreement.

5.3 – The above targets will be rebased, as necessary, in consultation with NSC as part of the proposed annual monitoring process using a method of measurement consistent with that of the CAA, but the key factor is the proposed percentage increase in public transport use (+2.5%), rather than the actual value, which may vary depending on the agreed method of measurement.

5.4 – In addition, BAL is proposing to introduce measures to reduce the proportion of surface access trips by 'Kiss and Fly' (Drop-off) to further reduce highways impact (i.e. a kiss and fly trip contains both an inbound and outbound car trip for the arrival and departure segment of the journey, whereas a self-park trip contains only one inbound and one outbound leg, thereby reducing road traffic). This reflects the hierarchy of targets aimed at reducing the number of overall car trips on the network (i.e. car drive and park is preferable to car drop-off and pick up or taxi, public transport is preferable to all other modes. The adoption of this hierarchy will therefore result in an increase in both public transport trips and parking demand but a reduced number of highway trips.

5.5 – Since our analysis is based on actual parking demand data as the starting point (rather than an estimate based on applying a mode split to the number of passengers), we have considered the impact of the proposed relative increase in public transport use, as well as other measures, such as those targeted at reducing kiss and fly trips, on overall forecast parking demand.

6. Impact of proposed capacity increases by Bristol Airport

The recommendations relating to the provision of additional capacity made in the original Parking Demand Study (2018) have not been altered as a result of this update

6.1 – Within the original Parking Demand Study (2018), the following proposed car parking solution was considered:

- The extension to the Silver Zone Car Park, referred to here as *Silver Zone Extension Phase Two* for unrestricted use as a car park (providing net 2,700 spaces); and
- The building of a new Multi-Storey Car Park (MSCP3) (providing net 1,500 spaces)

The Parking Demand Study concluded that both investments were required in order to meet forecast demand for on-site car parking in every year to 12 mppa. Based on the analysis presented in this update, it is concluded that both investments continue to be required, due to:

- The expected shortfall of spaces based on the revised forecast, which is 1,000 in 2024 and 4,200 in 2030;
- The additional capacity provided by these two investments is 4,200 spaces; a single solution would not be enough in meeting demand at 2030;
- Any years with surplus capacity could potentially reduce the use of unofficial off-site locations and would provide flexibility to respond to the ongoing operational needs of the airport; and
- As noted above , in peak times car parks cannot operate at 100% utilisation due to the need for operational buffers, as such some surplus capacity is always required.

6.2 – Table 4 below outlines how and when the two proposed developments will add additional spaces to the airport capacity in net terms (see Table 4).

Table 4: Overall provision of capacity after proposed development (2019 - 2030)[6]

	2019	2020	2021	2020	2023	2024	2025	2026	2027	2028	2029	2030
Base without development (see Table 3, above)	17.7k	17.7k	17.6k	17.5k	17.4k	18.2k	18.1k	18.1k	18.1k	18.1k	18.1k	18.1k
Additional spaces generated by the Silver Zone Car Park Extension (Phase 2)							2.7k	2.7k	2.7k	2.7k	2.7k	2.7k
Spaces lost through construction of the Silver Zone Extension (Phase 2)							0	0	0	0	0	0
Additional spaces generated by MSCP3										2.15k	2.15k	2.15k
Spaces lost through construction of MSCP3									(.65k)	(.65k)	(.65k)	(.65k)
Total spaces post development	17.7k	17.7k	17.6k	17.5k	17.4k	18.2k	20.8k	20.8k	20.2k	22.3k	22.3k	22.3k

6.3 – As MSCP2 has been consented as part of the extant 10 mppa permission, the model and phasing adopted in this assessment assumes that this facility will be delivered in 2024. This is consistent with the approach taken in the original Parking Demand Study (2018). However, the phasing of car parking delivery is subject to change and the draft Section 106 Agreement currently anticipates the *Silver Zone Extension Phase 2* being delivered in advance of MSCP2, as reflected in the construction programme contained in the Environmental Statement Addendum. Should the phasing of car parking delivery change, this would not affect the overall parking demand requirement identified in this assessment.

6.4 – The table below (Table 5) outlines how the proposed construction of the *Silver Zone Extension Phase Two* and *MSCP3* will aid in removing the forecast shortfall in capacity in the years to 2030.

Table 5: Impact of new car parking development on current parking capacity shortfall (2019-30, Park & Fly)

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Park & Fly parking space demand	16.7k	6.0k	14.9k	16.4k	17.6k	19.1k	19.8k	20.2k	20.6k	21.2k	21.8k	22.2k
Total capacity, with new parking development	17.7k	17.7k	17.6k	17.5k	17.4k	18.2k	20.8k	20.8k	20.2k	22.3k	22.3k	22.3k
Unmet demand forecast	-1k	-11.7k	-2.7k	-1.1k	0.2k	0.9k	-1k	-0.6k	0.5k	-1.1k	-0.5k	-0.1k

6.5 – The changes to the Parking Demand Study as a result of the updates in this report do not change the conclusion relating to the relative merit of *Silver Zone Extension Phase Two* and *MSCP3* in terms of priority. Based on demographic analysis of the catchment, lower cost parking solutions (such as those provided by the Silver Zone Extension Phase 2) are still more likely to meet customer needs and effectively attract customers who may otherwise choose to park at off-site locations.

6.6 – With this in mind, while the construction of the second phase of the Silver Zone extension and MSCP3 will both be required to meet anticipated demand in 2030, 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. This rationale is consistent and explained more fully in the 2018 Parking Demand Study.

6.7 – Equally, the proposed year-round opening of the existing Silver Zone Extension (Phase 1) assessed within the Parking Study Addendum (2019) remains a necessary development in order to meet winter demand and reduce the use of unauthorised off-site providers. Specifically, the additional 3.65k spaces provided throughout the winter by this facility continue to be an effective measure to meet the forecast unmet demand from March 2022 onwards.

7. Summary of changes and conclusion

7.1 – Figures 17 and 18 summarise how the altered inputs (outlined in the introduction) have adjusted the forecast for the number of spaces required at the key study intervals of 10 mppa and 12 mppa. In summary, the changes are driven by:

- A change in the proportion of foreign passengers expected at each of these key intervals, as provided by the updated passenger and traffic forecast, prepared by YAL;
- A change in the geographical segmentation or 'home geography' of UK passengers, with a knock-on impact upon 'likelihood to park', due to the updated geographical segmentation provided by the passenger and traffic forecast prepared by YAL;
- A change in 'likelihood to park' forecasts driven by the CAA Passenger Surveys;
- A change in group size, impacting the conversion of passengers to cars, driven by the CAA Passenger Surveys, and
- A change in occupancy / demand ratio, impacting the conversion of cars to spaces, driven by using an average of 2017, 2018 and 2019 car park entrance to occupancy counts.

7.2 - We have not shown a year-by-year comparison as the significant adjustments in the overall passenger demand forecast, driven by COVID-19, yield significant variations which are not instructive.

Figure 16: Drivers of change to forecast number of parking spaces required at 10mppa; original 2018 study vs. latest 2020 study

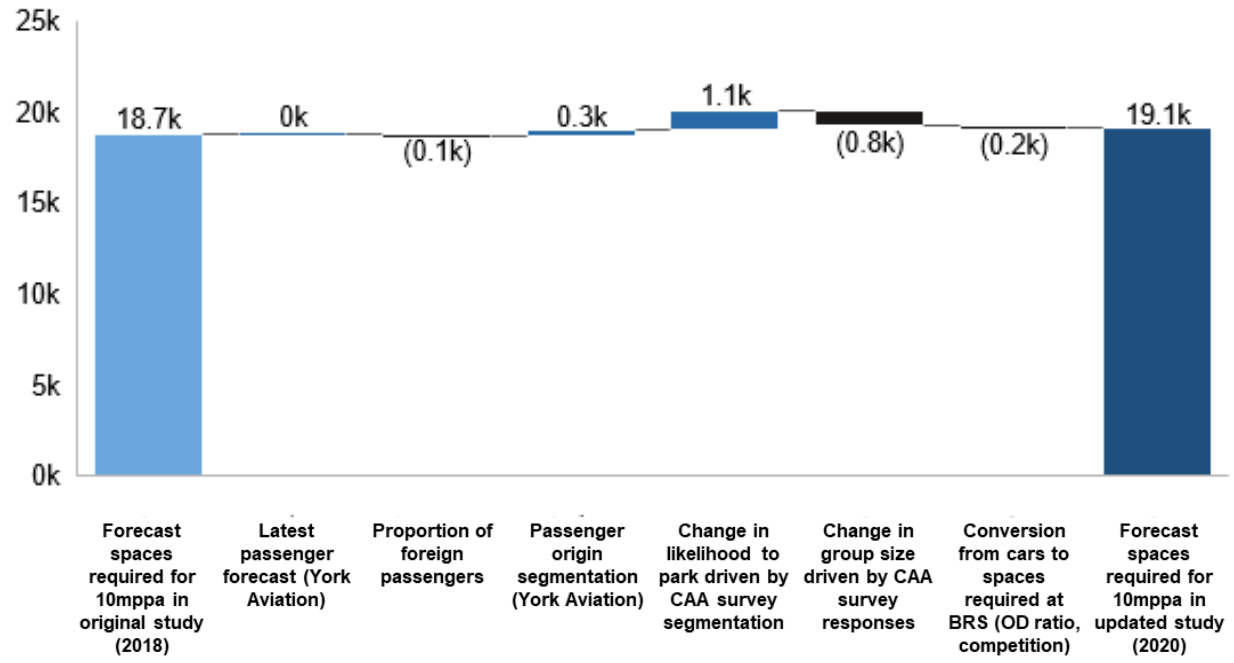
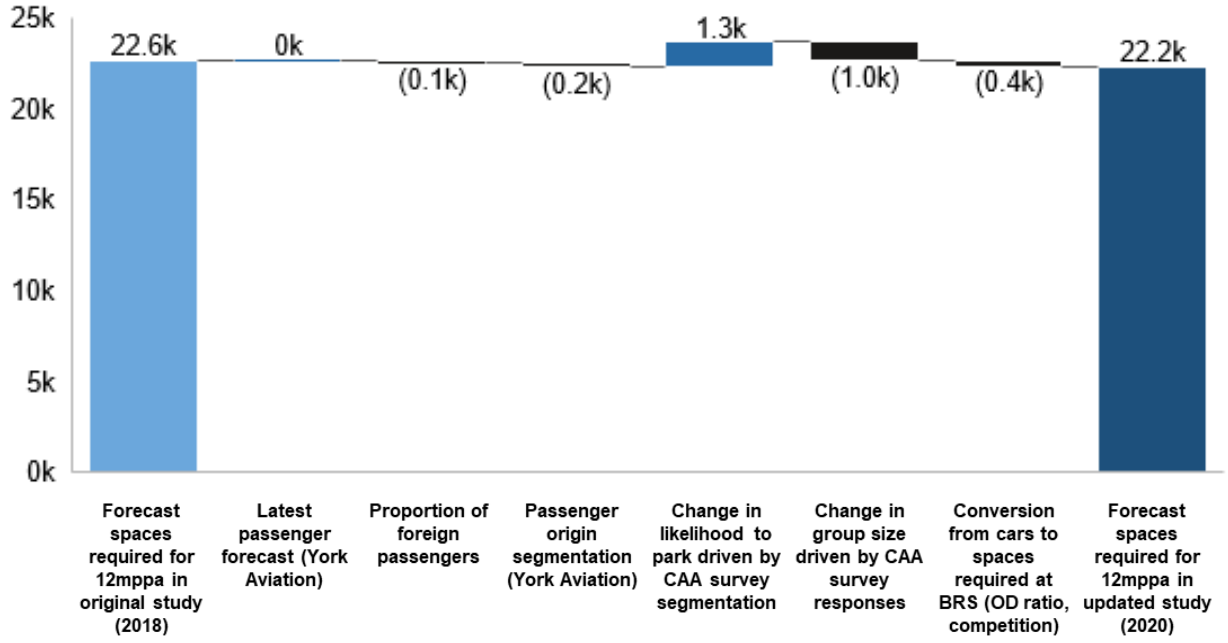


Figure 17: Drivers of change to forecast number of parking spaces required at 12mppa; original 2018 study vs. latest 2020 study



7.3 – In conclusion, the key outputs of the car park demand study have been slightly revised for the critical points of 10 mppa and 12 mppa (reached in 2024 and 2030 respectively), as follows:

- 10 mppa (2024): 19,100 spaces required, compared to 18,700 reported in the 2018 Parking Demand Study; and
- 12 mppa (2030): 22,200 spaces required, compared to 22,600 in the 2018 Parking Demand Study.

7.4 – We consider these adjustments to be both consistent with the updated inputs provided during the update of the forecast and within the broad margin of error of the overall forecast. As such, we do not consider it appropriate to alter any of the conclusions reached in the 2018 Parking Demand Study or the 2019 Addendum.

7.5 – This forecast is the Core Case adopted in this assessment. The updated passenger forecasts provided by YAL also identify a reasonable Faster Growth Case and Slower Growth Case. The Faster Growth Case sees Bristol Airport reach 10 mppa in 2022 and 12 mppa in 2027. The Slower Growth Case sees 10 mppa reached in 2027 and 12 mppa in 2034. Both the Faster and Slower Growth Cases have been considered in preparing this Addendum; however, they would not affect the overall level of parking demand forecast, only the timing of when additional car parking capacity is required, commensurate with passenger growth. In consequence, the Faster Growth Case and Slower Growth Case are not considered to materially affect the conclusions of the Parking Demand Study.