The Chartered Institute of Logistics and Transport

Airport surface access

POLICY PAPER

AVIATION POLICY GROUP

Introduction

The Chartered Institute of Logistics and Transport (CILT) is a professional institution embracing all transport modes whose members are engaged in the provision of transport services for both passengers and freight, the management of logistics and the supply chain, transport planning, government and administration.

Our principal concern is that transport policies and procedures should be effective and efficient, based on objective analysis of the issues and practical experience, and that good practice should be widely disseminated and adopted. The Institute has a number of specialist forums, a nationwide structure of locally based groups and a Public Policies Committee which considers the broad canvass of transport policy. This paper draws on contributions principally by the Aviation Policy Group.

This paper is intended to inform CILT members and others involved in considering surface access at airports including central and local government (politicians and officials), airport owners and operators, ground transport and other organisations involved in the provision of airport surface access.

The report is structured as follows:

- **Introduction**
- **Surface access at individual UK airports**
- **What attracts air passengers to public transport**
- **Comparisons with non UK airports**
- **Conclusions**

Within this Introduction, the UK airports considered are listed, followed by a description of the CAA surveys from which the data is obtained. There is a short discussion of the surface access issues related to staff and other transport. The Introduction ends with a brief review of relevant Government policy.

This report considers the following airports with 2022 passenger numbers of more than 3 million. All of these handled more passengers in 2019. For each airport, a chart is presented of the mode shares over time, followed by a description of the history, current situation and potential future.

Airport	2022 Passengers (millions)
Heathrow	61.6
Gatwick	32.8
Manchester	23.3
Stansted	23.3
Luton	13.3
Edinburgh	11.2
Birmingham	9.6
Bristol	7.9
Glasgow	6.5
Belfast International	4.8
Newcastle	4.1
Liverpool	3.5
Leeds Bradford	3.3
East Midlands	3.2
London City	3

The CAA has been surveying departing passengers at airports since 1972[1]. It is much easier to survey departing passengers than arrivals because they are waiting in a lounge rather than looking for the next stage of their journey and the inherent assumption is that arriving passengers have the same characteristics as departing. Not every airport is surveyed every year, and the survey has changed, but the data provided is a very comprehensive and valuable resource. For surface access, the key questions asked are about the mode of transport used to get to the airport. The survey also asks many other questions about passengers which can be related to surface access (eg. origin, journey purpose, group size). The percentages noted are on a base of non-connecting passengers, and thus exclude connecting or transfer passengers who of course arrive at the airport on a flight and depart on another flight. This is particularly relevant at Heathrow, where connecting passengers account for up to 33% of the total, but is less relevant at other airports, although self-connecting (connecting between flights made on separate bookings) is potentially significant at Gatwick. Some airports collect data on surface access from their own surveys to supplement the CAA data or for specific inquiries or projects.

1. https://www.caa.co.uk/data-and-analysis/uk-aviation-market/consumer-research/departing-passenger-survey/

While a comprehensive database, it is nonetheless a survey and not full counts and some of the data from the earlier years may not be entirely robust. There is also less data for the smaller airports where the surveys were not as frequent. For some years, the questions were more limited and the only mode share data available is the split between private and public transport (in particular between 2008 and 2017 and in 2022). In the charts which follow for these years public transport (rail + underground/metro + bus/coach) is brown and private transport (private car + taxi + hire car) is dark grey. Hire car was a separate category until 2017 when it was included in private car. From 2017 onwards the surface access question was divided into two, with the last mode and main mode identified separately and the latter is used in this report from 2017. In the charts in this report, not all years when data is available are shown to make the charts less complex, but it is considered that this does not affect the trends or conclusions drawn. Note that, as mode share figures are percentages, the percentage is applied to the total non transfer passengers to get absolute numbers using any particular mode. Thus a 20% share of 50 million total passengers = 10 million while a 40% share of a 10 million total = 4 million.

This report focuses on surface access by air passengers but other journeys are made by staff and for servicing and deliveries. The key characteristic of staff is that they make frequent journeys on the same route between home and work (possibly around 250 each way per year). Airport staff may also have particular shift patterns for which some public transport is less suited while there might be less congestion outside peak times. Peak staff travel times are often noted at the shift changeover period in the early afternoon between early and late shifts. Data on staff transport is available at many airports, but there is no national survey system and so it relies on the actions of individual airports. In the sections on individual airports, some limited information is provided on staff journeys.

Government aviation policy is contained in a series of documents and statements, most of which include a section on surface access policy. Transport is also covered in other policy documents which also cover airport surface access. The key documents and their main points are as follows:

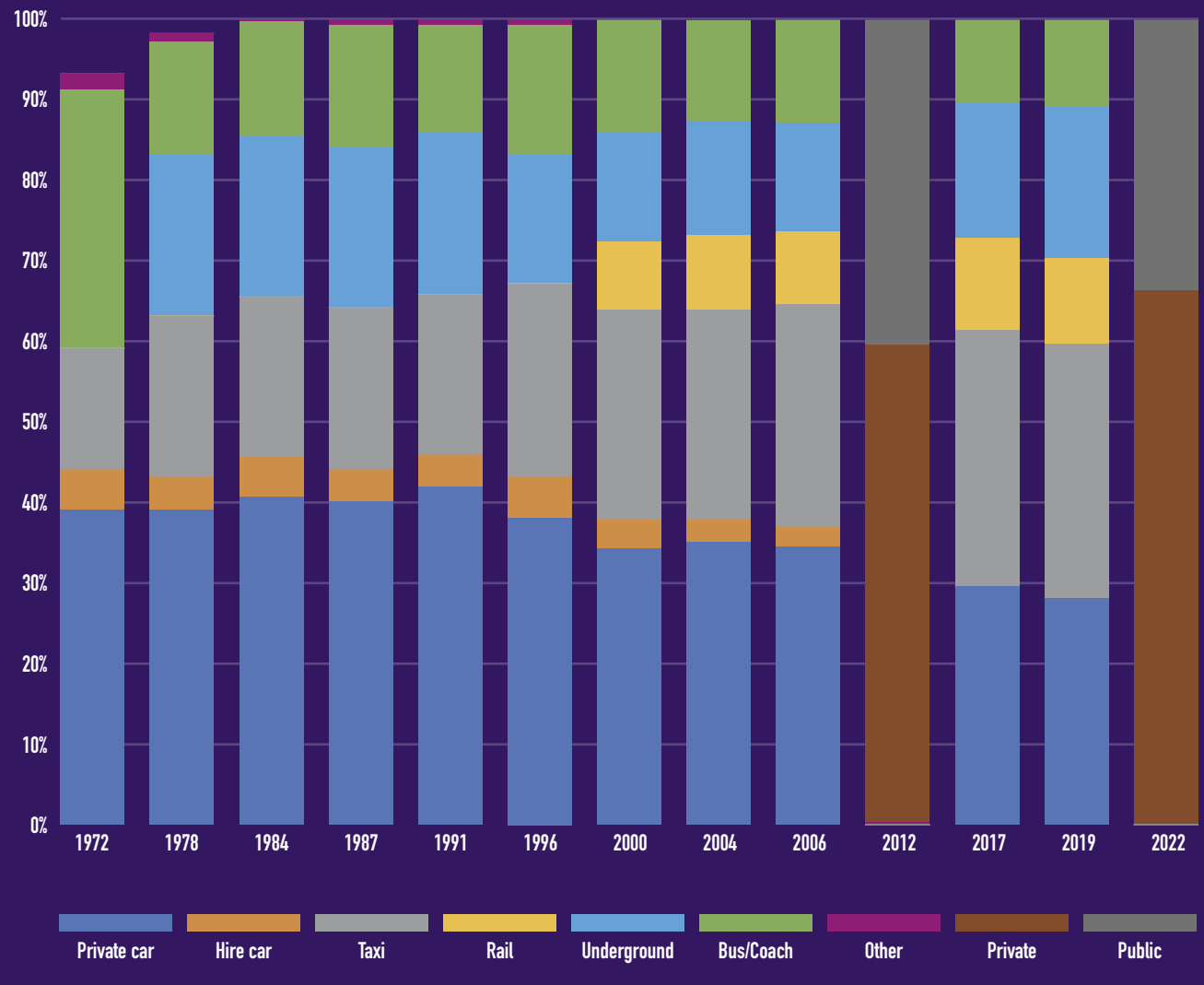
- **2012 National Planning Policy Framework (NPPF): Development acceptable unless impact on road is severe**
- **2013 Aviation Policy Framework (APF): Includes the requirement for Airport Transport Forums (ATF) and Airport Surface Access Strategies (ASAS), and the policy on paying for infrastructure**
- **2014 National Networks National Policy Statement (NNNPS): Road and rail networks, currently being reviewed**
- **2018 Airports National Policy Statement (ANPS): Supports a third runway at Heathrow and associated surface access arrangements.**
- **2018 Making Best Use (MBU): Policy for all other airports**
- **2022 Flightpath to the future: Refers to 2021 Union Connectivity Review.**
- **2022 Jet Zero: Aviation Net Zero 2050 policies, 2023 update**

Some of these policies have been tested in the Courts, for example the ANPS went as far as the Supreme Court when it was found to be legally sound. Policies have also been interpreted through decisions made by the Secretary of State or Planning Inspectors for proposed developments at individual airports and again these decisions have been tested for legal soundness in the courts.

... Our principal concern is that transport policies and procedures should be effective and efficient **...**

Heathrow

Air passenger mode shares



Heathrow opened in 1946 with access by airline coaches, private car and taxi using the A4. The M4 from Junction 1 to 5, including the Heathrow Spur, opened in 1965. In 1972, when the first survey data is available, around 30% of passengers (then around 20 million in total) used dedicated coaches from in town terminals. It is not known why the data for this year does not add to 100%. By 1978, the Piccadilly line had started operating and attracted a 20% share with public transport at around 33%. Shares remained steady until the mid 1990s (despite an increase in total passengers to around 54 million) when Private car started to decrease. Terminal 4 opened in 1986 with the Piccadilly line loop and the M25 had opened in stages and to Heathrow in 1986.

Heathrow Express opened in 1998 so the 2000 data shows rail for the first time and public transport rising to 36%. Private car share continued to decrease through the 2000s and 2010s but taxi grew to more than 30%, probably related to the introduction of Uber and similar services. Public transport rose to over 40%. Terminal 5 opened in 2008 with extensions of both Heathrow Express and the Piccadilly line. During this period the Heathrow Connect service began, calling at intermediate stations between the Airport and Paddington. This was taken over by TfL Rail in 2022 and is now operated as part of the Elizabeth line operating beyond Paddington to Abbey Wood.

Heathrow is a key hub on coach networks, such as National Express and Megabus, serving central London, regional and long distance routes and other airports. Mode share has been as high as 16% but in recent years appears steady at around 10-11%. As well as longer distance routes, coaches are particularly good where there are no direct rail services, such as from Oxford.

... More recent figures show that 31% of air passengers used the three rail services in May 2023 compared with 29.4% in 2019 ...

2022 data is only available for a public/private split but there was a clear reduction in public mode share to about 34%. Total passenger numbers were about 24% lower in 2022 compared with 2019 because of Covid-19 and there was clearly a reluctance to use public transport during this period. More recent figures show that 31% of air passengers used the three rail services in May 2023 compared with 29.4% in 2019.

2023 total passenger numbers are expected to be close to 2019 and growth is then expected to resume, albeit at a relatively slow rate due to the capacity limits at the Airport. The Airport's Surface Access Strategy calls for a 45% public transport share by 2026 and plans to achieve this by a range of management and physical changes. The full operation of the Elizabeth line from May 2023 has clearly provided an enhancement for passengers travelling to and from many parts of London. New and improved bus and coach routes are to be implemented (eg. the recent new and improved Railair and Superloop services). Managing demand is also apparent through the operation of a Forecourt Access Charge (currently £5) in addition to car parking charges and the expansion of the Mayor's ULEZ scheme to include Heathrow in September 2023. Taxis and private hire vehicles are also managed by price and physical controls. The Airport and its partners seek to promote public transport through a variety of marketing and information strategies.

Freight by rail is provided at Heathrow for construction materials and aviation fuel. A freight only line from the Great Western Main Line to Colnbrook provides access to a large construction compound for cement, aggregates and other bulk materials. The same line serves an aviation fuel terminal connected by a short pipeline to the Airport's fuel farm, although most aviation fuel comes by pipeline from Fawley.

In the medium and longer term, much will depend on Heathrow's expansion plans. Current Government policy is to support a third runway, but this is on hold and it will be for the Airport to decide if it wishes to bring this forward for consideration. A third runway would require the realignment of the M25 and the plans also include some radical changes to car parking arrangements that would see most car parking in very large car parks at airport entrances with limited parking at the terminals.

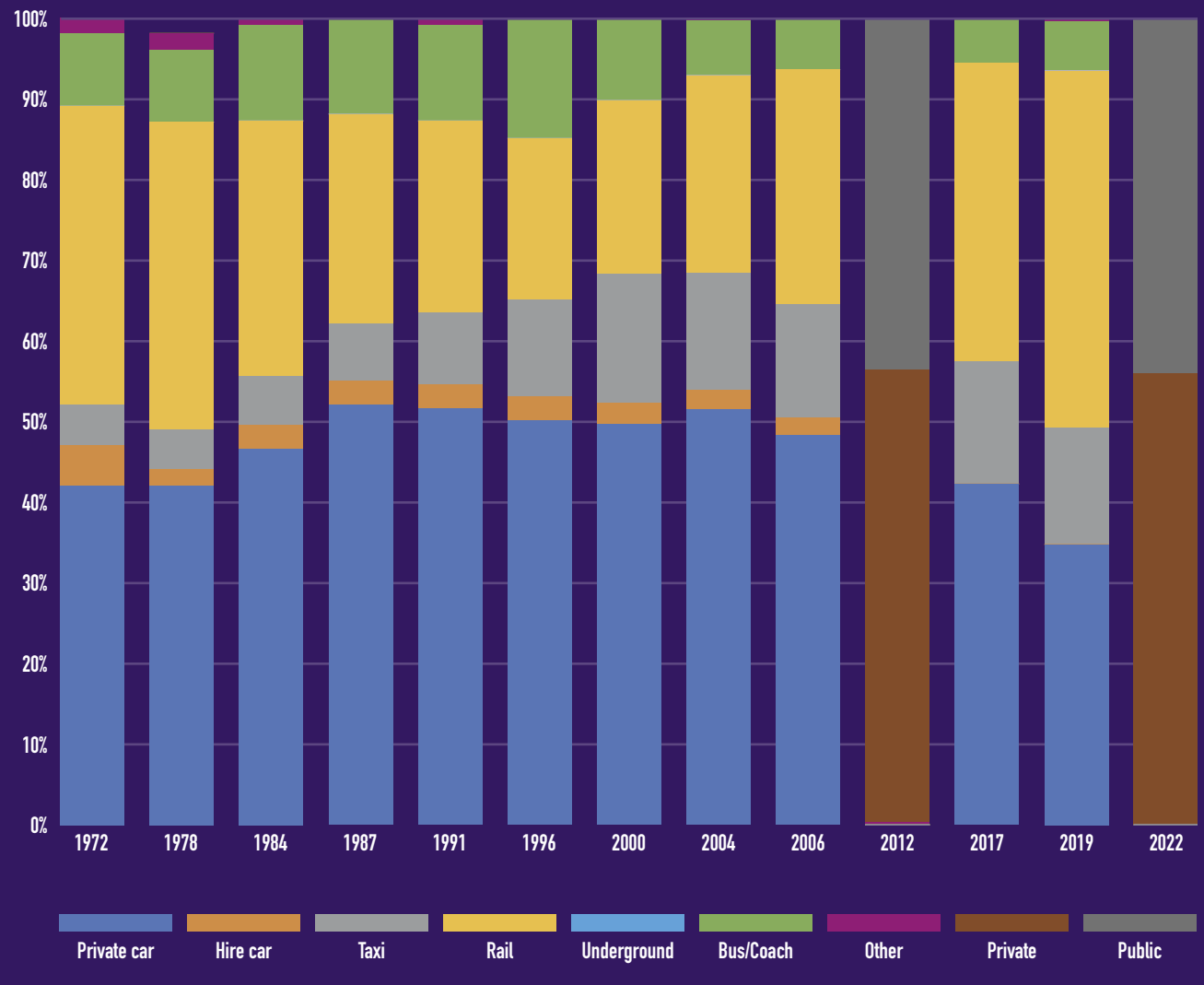
Independent of plans for a third runway are two rail schemes, a western and a southern link. The Western Rail Access to Heathrow (WRATH) scheme would connect the Great Western Main Line to Terminal 5 (using space already provided beneath the terminal adjacent to the existing stations) and enable primarily regional services between Heathrow and stations to the west. WRATH had reached the stage of submitting a DCO application but is currently paused by the impact of Covid-19. The Heathrow Southern Railway is proposed to run between Terminal 5 and Staines and Chertsey to give access to a number of routes to the south and west. It is also paused. Although both these schemes are independent of a third runway, it is clearly the case that their economics would be much better if the Airport was expanded and served significantly higher passenger numbers. The Airport's plans argued that these schemes were not essential for a third runway, although they could be made a condition of any permission.

Phase 1 of HS2 is due for completion to Old Oak Common between 2029 and 2033. With a new interchange station at Old Oak Common, this will provide connection opportunities for passengers on high speed services from Birmingham and the North. The Great Western Main Line runs at capacity in terms of train paths and the scope for additional services, or even to change the mix between the Main (fast) and Relief (stopping) lines is limited.

Many of the physical improvements are also attractive for staff journeys but there are special considerations for this group, in particular their shift patterns and their home locations, which make their travel characteristics different from air passengers. Discounts on public transport are applied and many local bus services are designed around the needs of staff. In addition, the Airport operates a large car sharing and active travel service (for all staff, irrespective of employer) and manages most (but not all) staff car parking. The London ULEZ is significant for staff and measures (such as car sharing and improved public transport) are in hand to mitigate the impact, in particular for those who live outside the ULEZ.

Gatwick

Air passenger mode shares



Gatwick's first rail station opened in the 1935 but a new station opened with the then new terminal in 1958 and the 1972 rail share was recorded at just under 40%. Rail services at Gatwick have comprised a mix of routes and types, but since 1984 the core has been four trains per hour on the following routes/service types: Gatwick Express, Victoria and London Bridge/Thameslink, with the addition of an hourly Great Western service to Reading.

The new terminal was initially served by the A23 but the M23 was opened in 1975, along with a complete new airport access, forecourts and car parks. The M25 opened in stages until 1986. The North Terminal was opened in 1988 with an extension of the road access from the M23 and an automated shuttle for passengers from the rail station. The M23 became a four lane all-lane-running motorway in 2020.

Rail share declined steadily from 1972 to 1996, in part replaced by bus/coach but also with increases in private car and taxi. Rail share began increasing after 1996 and total public transport was more than 50% by 2019. This declined to 44% in 2022, related to the reluctance to use public transport during the pandemic. In recent years bus and coach has remained at around 6% despite the airport being a key destination on coach networks.

In 2023 passenger numbers are expected to be close to 2019. Rail services have now been fully restored to 2019 levels and major improvements have been taking place at the station which will make using the rail services much easier from its completion in November 2023. Management of demand is through car park pricing, a forecourt charge and a range of marketing strategies.

The Brighton Main Line is very busy and, after major performance issues in 2016, a range of short, medium and long term improvements were proposed, some operational, some infrastructure. Many of these were implemented including a significant shift of services from Victoria to London Bridge but schemes to ease bottlenecks, for example at East Croydon, are now on hold given the reduction in commuting since the pandemic. Plans for improved east-west rail services, also in hand for some time, may however be brought forward to reflect the growth in the non-commuter market.

The Airport's Surface Access Strategy is part of the plans to make better use of its Northern Runway to enable an increase passenger numbers eventually to about 80 million per annum. Surface access improvements as part of the project are limited to some relatively minor changes to the access roads but, as noted above, the rail station upgrade is almost complete and the M23 became four lanes in 2020.

The key surface access commitments in the Northern Runway project are:

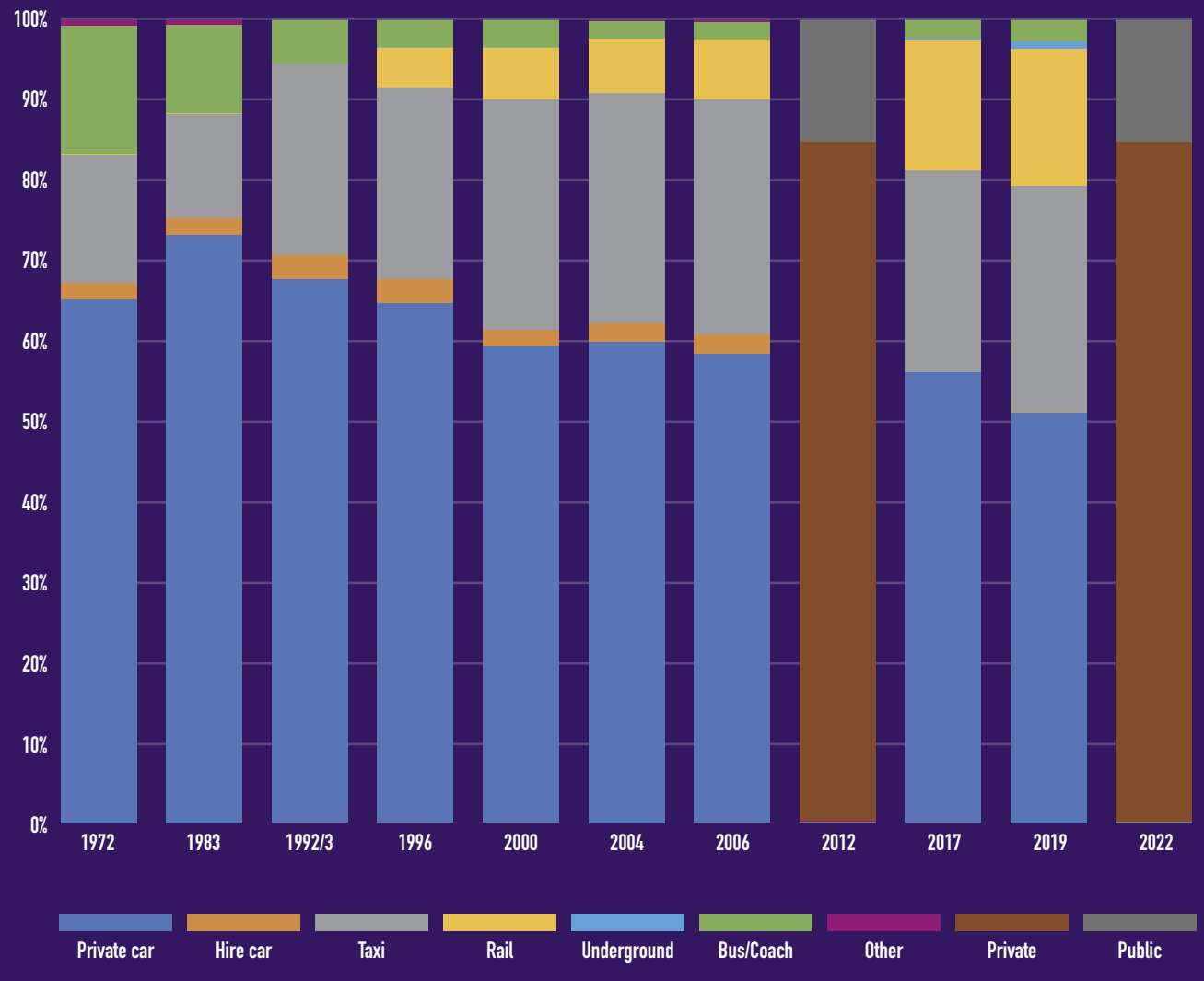
- **A minimum of 55% of air passenger journeys to and from the Airport to be made by public transport**
- **A minimum of 55% of airport staff journeys to and from the Airport to be made by public transport, shared travel and active modes**
- **A reduction of air passenger drop-off and pick-up car journeys at the Airport to a mode share of no more than 12% of surface access journeys**
- **At least 15% of airport staff journeys originating within 8km of the Airport to be made by active modes**

The 55% air passenger public transport commitment compares with just over 50% achieved in 2019, albeit with over 60% more total passengers, meaning the numbers using public transport will need to be nearly double the 2019 level. The 55% airport staff journeys commitment is perhaps more of a challenge given that this number was 31% when last measured. The two other commitments are complementary. The Northern Runway plans include a range of measures and mitigations for example to support improved bus and coach services and promote active travel.

The Northern Runway project is currently the subject of a Development Consent Order process by the Planning Inspectorate. Hearings are likely to take place through until 2024 and the Secretary of State will then make a decision. If approved, the Airport plans to open the new Northern Runway by 2029, with other aspects progressively being upgraded.

Manchester

Air passenger mode shares



Manchester Airport opened in 1938 and was then quickly put into wartime use, reverting to civilian use in 1946. New terminal buildings and runway extensions were built in the 1950s and 1960s. Initially access was from the Styal Road (now B5166). As the airport expanded a number of local roads were closed or diverted, including the A538. The M56 motorway including a spur to the airport was opened in 1972. Terminal 2 was opened in 1993 and a second parallel runway in 2001. The Manchester Airport Eastern Link Road, now the A55, was completed in 2018.

Heavy rail access was provided by the opening of a link to the Styal Line on the national rail network and Manchester Airport Station in 1993. The link is a two track line with a triangular junction at the main line to enable trains to travel north or south. The station was initially two platforms and the building also served bus and coach routes. The station is connected to the terminals by an elevated walkway known as the Sky Link. Third and fourth platforms were subsequently added and the station facilities were upgraded and expanded. Direct trains from the Airport serve Manchester Piccadilly and a range of destinations around the North of England, some extending to Scotland plus a service to North Wales, currently totalling nine trains per hour off peak. In addition, because of capacity limitations on the network, TransPennine Express services focus on connecting many cities to the Airport with an interchange at Manchester Piccadilly.

Light rail was added to the station in 2014 with an extension of the Metrolink network, which serves a number of residential areas north of the airport and runs through to the city centre. There are five Metrolink trams per hour.

Private car and taxi has been the predominant mode for air passengers since the first available data and remains in excess of 80%. Private car has declined from around 70% in the 1990s to 50% in 2019, but taxis have remained significant at nearly 30%. The Airport's passenger mix of mainly UK resident outbound leisure and VFR types, combined with the wide area of the North served means that private car is bound to be the dominant mode. The introduction of rail services in 1993 attracted some air passengers and by 2019 this had reached 17%, with bus and coach adding 3%. The low bus and coach share, despite a reasonable network of coach services from the region, may also be a reflection of the wide range of rail services. The 2022 figures indicate a reduction in public transport share, resulting from a reluctance to use public transport share during the pandemic.

Manchester Airport's surface access strategy is contained in the Sustainable Development Plan published in 2016. Like other major airports, the Airport co-ordinates with transport providers and organisations and seeks to promote sustainable transport, with complementary policies including car parking and forecourt access charges. Targets for the future include increasing rail share to 25% (from 17%), Metrolink to 5% (from less than 1%) and Bus/coach to 5% (from 3%), while specifically targeting reductions in 'Kiss & Fly' and taxi.

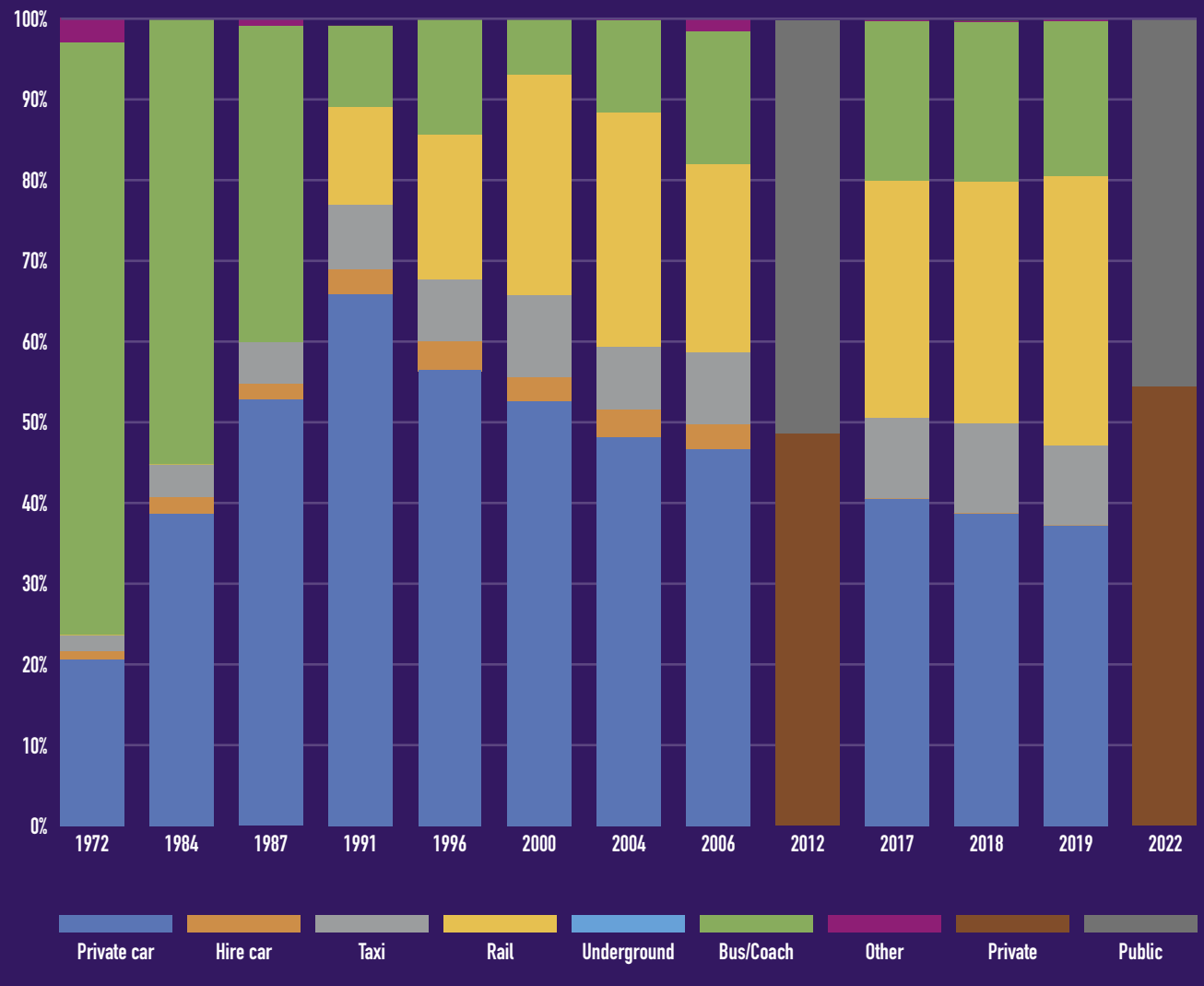
Currently 78.5% of staff use private cars and the targets seek to reduce this and, in particular, grow the Metrolink share. A significant element of the Sustainable Development Plan is the creation of 'Airport City' an area next to the terminals for the development of commercial property, including hotels, offices, logistics and other premises. People working at these locations will also use the airport private and public transport networks and the development is being designed to make using sustainable modes the first choice. In terms of terminals, the plan is to focus growth on Terminal 2 and the first stages of this development were completed in 2020-21 and the final stages will be complete by 2025.

In 2019, Manchester Airport handled 29.4 million passengers and this level will probably be reached in 2024. With a return to 'normal' conditions, the public transport mode shares are likely to increase.

Future plans for surface access will need to be revised following the decision not to build HS2 to Manchester. This plan would have seen a high speed rail station to the east of the Airport adjacent to the M56, with a link to the terminals. As at the time of drafting this report, the alternative schemes being considered are not clear, but will undoubtedly have to consider the role of Manchester Piccadilly Station and the network of train services from the Airport. At the Airport, an extension of the Metrolink may be particularly helpful in serving airport staff and those working in the Airport City development.

Stansted

Air passenger mode shares



Stansted was a World War 2 airfield that remained in national ownership after being decommissioned from military use. There were limited passenger services in the 1970s and 1980s, including Scandinavian charter flights that predominantly brought inbound passengers using coaches to get to central London. The new terminal was opened in 1991 along with a rail station and new access roads from the M11, which had been built in the late 1970s. Direct road links from the M11 supplemented the original elevated roundabout at M11 Junction 8 in 2002. A new Junction 7A opened to serve the north of Harlow in 2022.

From 2003 to 2010, major expansion was planned at Stansted including a second runway, with much enhanced surface access, but this plan was scrapped in 2010. Major expansion was also considered by the Airports Commission between 2012 and 2015 but did not make the shortlist, new runways at Heathrow and Gatwick being preferred. Prior to the pandemic the Airport handled 28 million passengers and, through a series of approvals, had permission to grow to 35 mppa. Permission to grow to 45 mppa was granted in 2022.

The rail service began as a dedicated train at a frequency of four per hour between Liverpool Street and the Airport with a stop at Tottenham Hale and a journey time of 40 minutes. This has been retained except for a reduction to two per hour during the pandemic (returning to four per hour in December 2023) but stops have been added such that the journey time is now around 50 minutes. Rolling stock has been changed several times and the trains are now 12 cars long. In addition to the London service, there is a service to Cambridge and on to Birmingham and to Norwich. There is an extensive bus and coach network at the Airport.

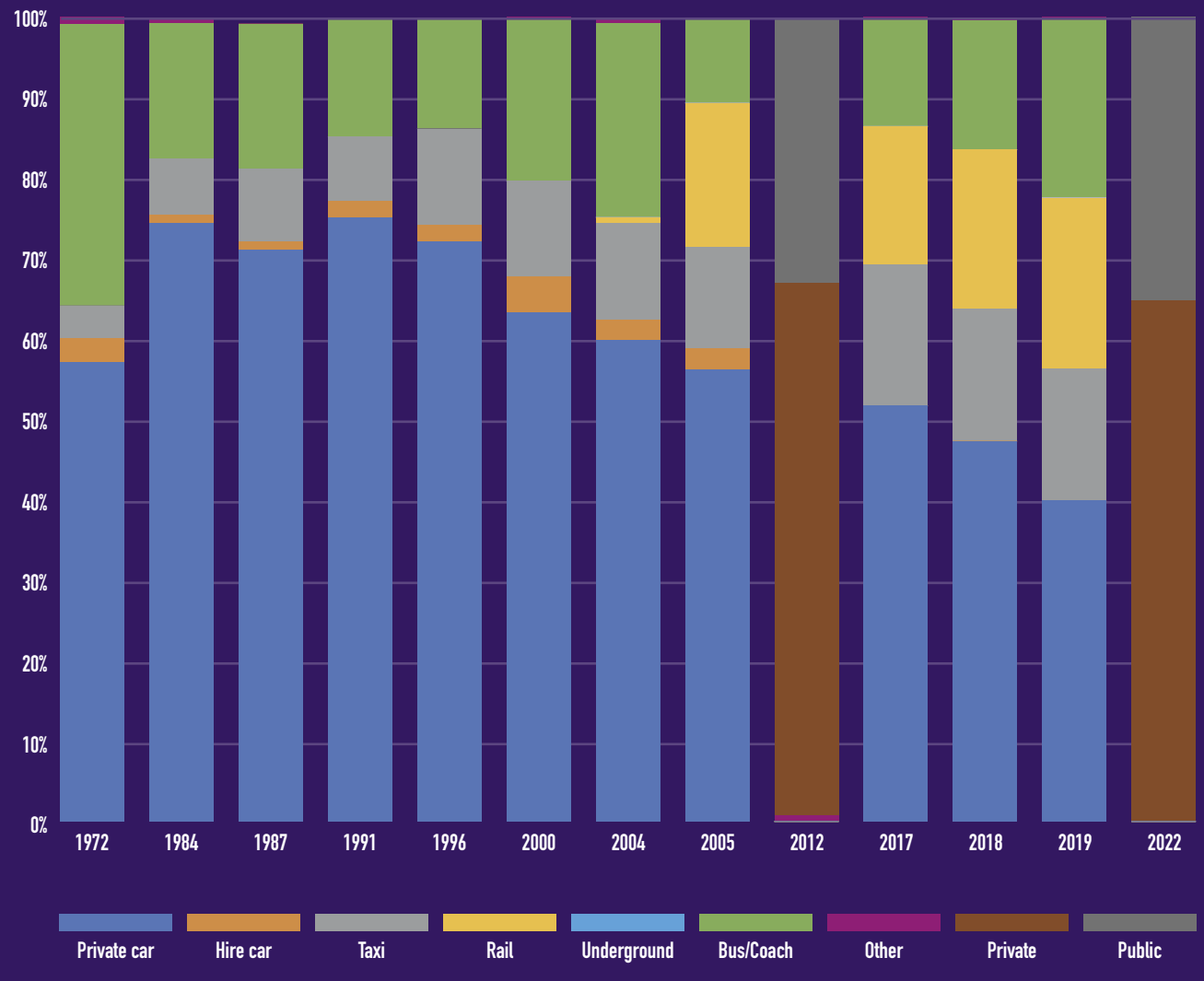
The high bus and coach mode share in the 1970s and 1980s related to the proportion of inbound charter passengers. Rail appears in 1991 and steadily grew to 33% in 2019. Bus and coach shares also rose in this period to give a total public transport share of over 50% and the coach share remains high despite the even higher rail share. Public transport mode share reduced in 2022 because of the reluctance to use public transport during the pandemic.

Stansted's surface access strategy is contained in the plans for expansion to 43 mppa which were approved in 2022. No significant issues on either the road or rail networks were identified. There have been long standing aspirations to reduce the rail journey time to 30 minutes but this depends on providing a cut off from Harlow and additional tracks on the Lea Vally Line where the fast Stansted Express trains and slower stopping services have to share tracks. Plans for additional tracks were included in the 2003-2010 plans and a third track and dead-end platform has been provided at the southern end of the line at Tottenham Hale, but the remainder of this plan is not in any current programme. However, in capacity terms, 4 trains per hour with 12 car trains should be sufficient for many years.

Surface access at Stansted is managed as at other airports with car parking charges and a forecourt charge. Public and other sustainable transport was used by over 40% of staff in 2019, one of the highest proportions at any airport and the car sharing scheme is particularly successful, in part because some airlines pass the costs of parking on to staff. Fly parking in local roads has become an issue as drivers seek to avoid charges.

Luton

Air passenger mode shares



Luton emerged as a major airport in the 1960s serving the package holiday market. The airport declined as this market changed but grew steadily with the advent of low cost airlines and by 2019 was handling more than 18 million passengers. Passenger numbers declined during the pandemic but had reached 13 million in 2022 and are continuing to grow in 2023. Some long haul services began in the 2000s but did not continue. Very little freight is carried on the low cost airlines. However, the airport is a major base for business aviation.

The Airport has been served by the M1 motorway since 1959, with southern extensions to London opening between 1965 and 1968 and then finally to its current end in 1977. It has been progressively widened and improved and Junction 10 improved. The link road to the Airport, the A1081, has similarly been improved and its capacity increased and is now dual two lanes. Car park capacity has been increased, in particular by the provision of multi storey short stay car parks, and a forecourt management scheme has been introduced for car and taxi set down and pick up.

Luton Airport Parkway Station opened in 1999 on the Midland Main Line, served by Midland Main Line and Thameslink trains. Shuttle buses connected the station to the airport until the opening of the DART automated people mover in 2023. With the rail line in a valley and the airport on a hill, the height difference precluded a direct rail link and the DART is a cable hauled system which, even so, has an underground station at the airport to reduce the height difference. Currently, East Midlands Trains provides 2 trains per hour from London St Pancras to Corby, branded as Luton Airport Express, with a journey time to St Pancras of about 20 minutes. Thameslink has 6 trains per hour, 4 of which go to Gatwick Airport and then further south, and 2 of which serve North Kent, plus additional services at peak times. The Thameslink trains all call at several London stations.

... The Airport is served by a range of local buses and coaches, with dedicated services to central London ...

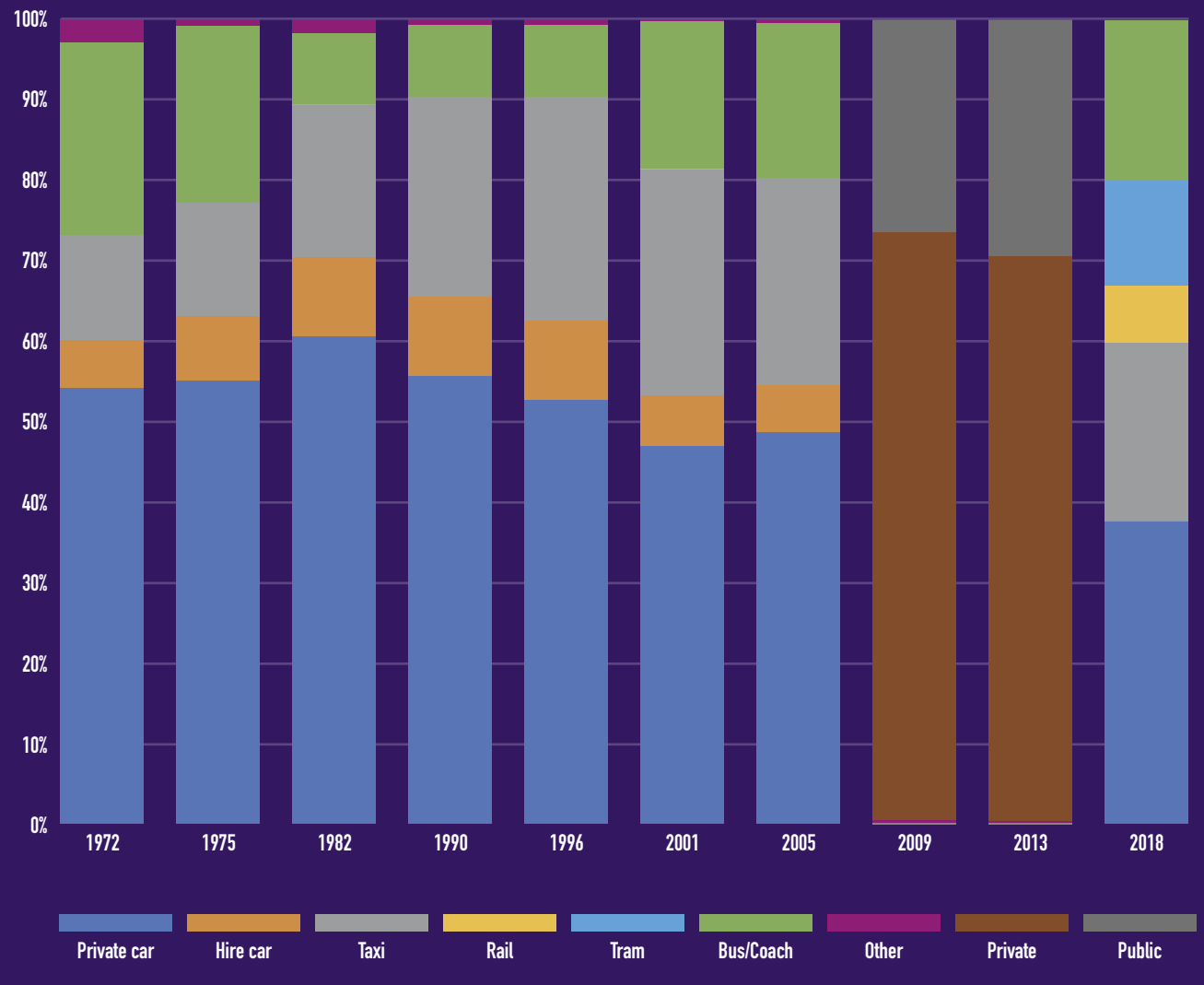
Until the Parkway Station opened, access was road based. The 2000 and 2004 air passenger mode shares show growth in bus and coach, but this is mostly the shuttle bus from the station. Rail share is shown from 2005 and has steadily grown, alongside an increase in bus and coach, to give a 44% public transport share in 2019, which dropped to 35% in 2022. The Airport is served by a range of local buses and coaches, with dedicated services to central London. Bus and coach has been particularly successful in recent years reaching over 22% in 2019. With growth in the taxi share, the private car share had dropped to below 40% in 2019. Private car demand is managed by car parking and forecourt access charges.

The Airport has sought permission to expand with two plans. The first is a short term expansion from the current capacity of 18 mppa to 19 mppa. An inquiry into this plan took place in 2022 and approval was given on 13 October 2023. The Surface Access Strategy that went alongside that plan sought to reduce air passenger private car and taxi share to 47% (from 51% in 2017) and to reduce staff car use. The DART link was a key part of the strategy, alongside improvements to the train services. Other elements included car sharing and public transport discounts for staff and support for bus and coach services.

The short term plan to grow to 19 mppa has been overtaken by a longer term proposal to grow to 32 mppa with a second terminal, for which an application has been made and an inquiry is taking place. The Traffic and Transport section of the Environmental Statement for this proposal contains the strategy to accommodate this growth. To assess the impact the assumption is that air passenger mode shares will be 18% for bus and coach and 27% for rail for the future situation, noting that this would be a 'worst case' in terms of the highway impacts. The overall conclusion is that the road and rail networks can accommodate the surface access demand from this growth. As well as being assumptions in the impact analysis, these mode shares are part of a proposed 'Green Controlled Growth' (GCG) mechanism, whereby growth is only permitted if certain mode shares are achieved. The limit for the GCG after the new terminal has been built is that air passenger mode share for non-sustainable travel should be no more than 55%, with a similar limit for staff travel. A decision on this application is possible in 2024.

Edinburgh

Air passenger mode shares



After military use in both world wars, the Airport was opened to commercial traffic in 1947. Domestic routes, especially to London, have always been significant (eg. over 80% in 1983) but in more recent years international routes, including some long haul, have been developed and accounted for 64% of the 2019 total of 14.7 million passengers. A new runway and passenger terminal were opened in 1977.

Initially the Airport was served by local roads connected to Edinburgh's radial routes, with bus & coach, taxi and private car dominating. The new terminal opened in 1977 had access from the A8 Glasgow Road. The A720 Edinburgh City Bypass was built in sections between 1980 and 1989, connecting the main long distance radial routes including the M8 (completed 1980) and M9 (completed 1972) near the Airport. The Forth Road Bridge (1964) and the Queensferry Crossing (2017) are also connected to the nearby road network. The early 1980s showed an increase in the private car and hire car mode shares but this then steadily declined throughout the 1990s and 2000s with taxi and later bus and coach taking an increasing share, the latter associated with new dedicated bus services.

Public transport share continued to grow in the 2010s in particular following the opening of the Edinburgh Trams link in 2014, to over 40% in 2018 (note that the 2018 data shows Rail as well as Tram, probably because some passengers did not distinguish between the two modes). Trams operate around every 7 minutes and the journey to and from the city centre is about 30 minutes. In 2023, the Tram was extended from the city centre to Leith and Newhaven.

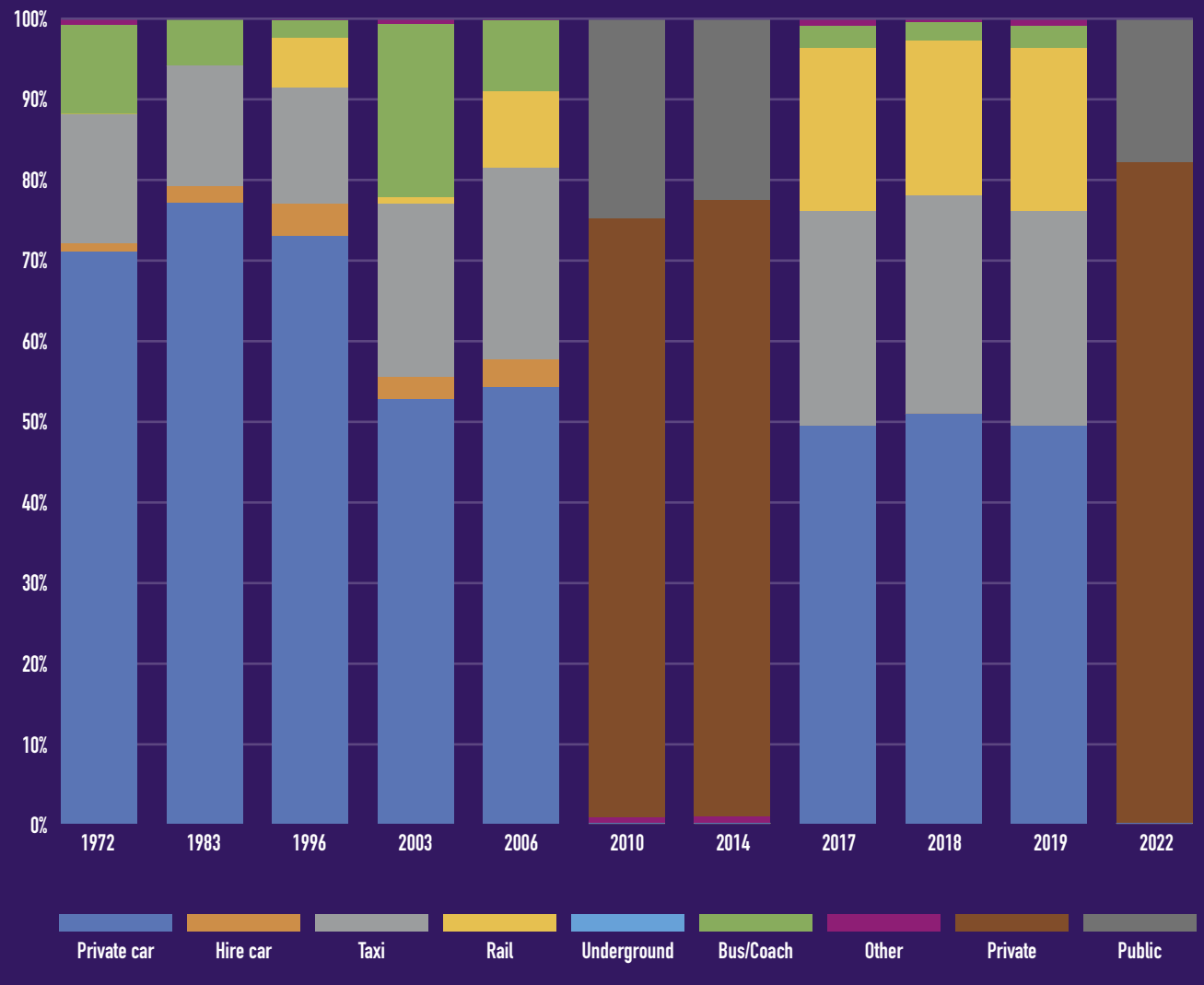
... In 2023, the Tram was extended from the city centre to Leith and Newhaven ...

Before the Tram was built, there were plans for a heavy rail link from the nearby rail network and an Act was passed by the Scottish Parliament in 2007, but subsequently cancelled by the Scottish Government. Although it does not appear to be part of an entirely coherent strategy, the Tram has stops at Edinburgh Gateway and Edinburgh Park which are interchanges with the heavy rail network close to the Airport serving a wide range of destinations.

The longer term plan for the Airport was set out in a Master Plan in 2016 although this predated the pandemic. The Airport continues to safeguard land for a second runway, although this is not envisaged to be needed before 2040. Long term passenger forecasts are up to 30 mppa by 2050 and the master plan envisages extensions to the terminal and apron. The main transport improvement would be access from the west side of the Airport and direct motorway links. The master plan did not contain any long term mode share targets and the short term target of 35% public transport has already been achieved.

Birmingham

Air passenger mode shares



Birmingham Airport was established as a municipal airport, opening in 1939 but almost immediately was requisitioned for military service, reopening to civilian operations in 1946. The original passenger terminal was located on the west side of the Airport served by the A45 Coventry Road. A new terminal on the east side of the Airport opened in 1984 and has been significantly expanded since then. The new terminal was served by a new junction on the A45 with links to the M42 which opened in 1976 and these junctions have been significantly improved. The new terminal was also served by Birmingham International Rail Station which had opened in 1976 and linked to it by an automated people mover, initially a maglev but subsequently replaced by a cable hauled system. The runway was extended southwards in 2014 and this required the diversion of the A45. The Airport handled 12.7 million passengers in 2019 and had recovered to 9.6 million in 2022.

CAA data for the earlier years may not be consistent as the rail and bus/coach shares vary significantly. However, by 2006 data appears more robust and shows that rail and bus/coach were achieving about 20% share. The public transport share increased a little in the 2010s with rail becoming dominant and bus/coach declining. As at other airports, the 2022 public transport mode share is significantly down on 2019.

In a 2003 National Airports Policy White Paper, a second runway was suggested and the Airport brought forward plans for the longer term. The second runway plan was also considered by the Airports Commission of 2012-2015 but not taken forward and the plan has effectively been scrapped, with the Airport focusing on its existing site.

... A master plan was published in 2018 for growth to between 18 and 24 million passengers in 2033 ...

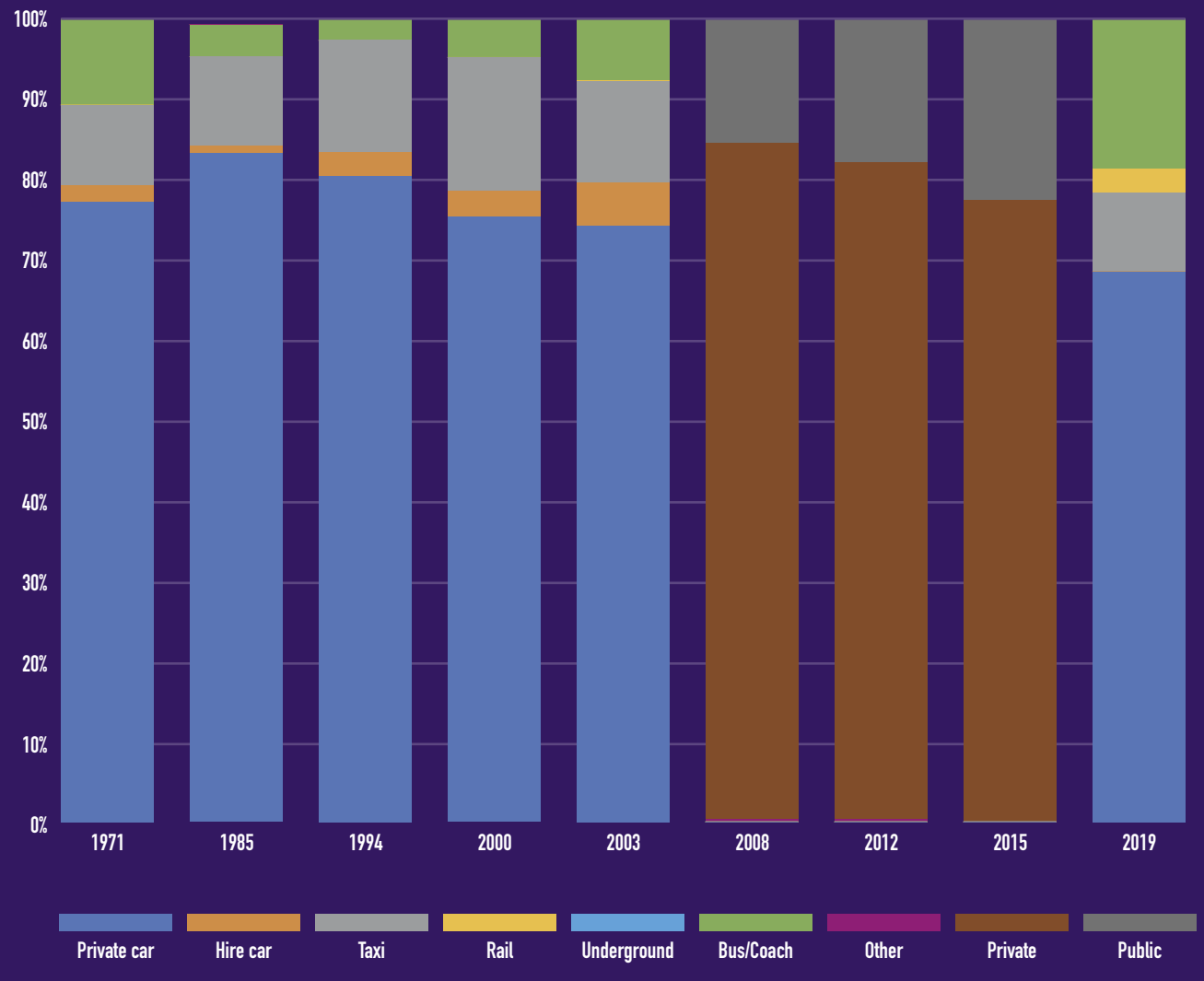
A master plan was published in 2018 for growth to between 18 and 24 million passengers in 2033. Like all pre-pandemic plans, this is now open for review. The associated Surface Access Strategy included a 2023 target for air passenger public transport shares of 30% and 37% for the longer term. It also includes a range of measures to make sustainable modes more attractive for passengers and staff and to manage road traffic demand.

Probably the most significant future development is the Birmingham Interchange Station on HS2, due for completion between 2029 and 2033. This is part of Phase 1 of HS2, between Birmingham and London and is located about 3km east of the Airport. It will be connected by an automated people mover which will also serve the National Exhibition Centre and the existing station, with a journey time of six minutes. This will open the opportunity for the Airport to serve the London market.

In addition to the HS2 Birmingham Interchange Station, there are plans for a bus based rapid transit system (Sprint) and extensions of the West Midlands light rail Metro to serve the area, at various stages of approval and delivery.

Bristol

Air passenger mode shares



The current Bristol Airport began life as a military airfield in the Second World War but was acquired by the Bristol Corporation in 1955 and various extensions and buildings were added. The current terminal building was opened in 2000 and has subsequently been expanded. The Airport is served by the A38 road which is a trunk route from the South West to the Midlands, although this long distance role was overtaken by the opening of the M5 in stages through the 1960s and 1970s. The A38 was diverted in 2001 to enable the installation of a Cat 3 ILS. By 2000 the Airport was handling over 2 million passengers and this grew steadily to nearly 10 million in 2019. After the pandemic when passenger numbers dropped dramatically, the Airport recovered to almost 8 million passengers in 2022. Passengers are mostly short haul outbound leisure but there are a number of UK domestic links and there have been, from time to time, a few long haul services.

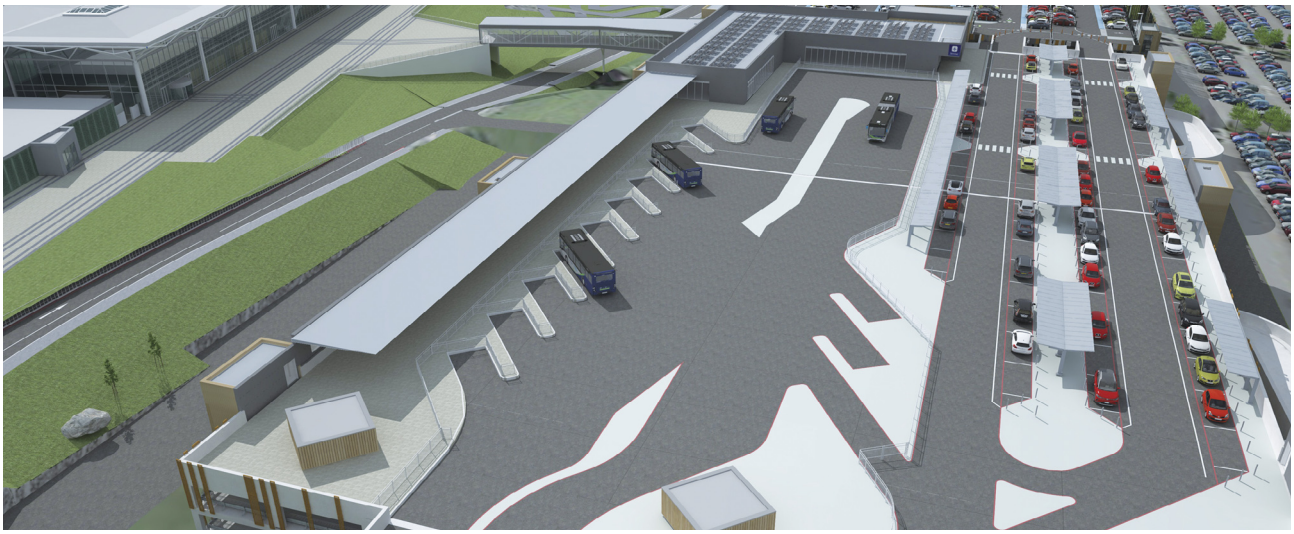
The A38 is mostly single carriageway from Bristol City Centre, but there have been road improvements including the South Bristol Link Road (now A4174 Colliters Way) which provides access to other parts of the road network. A dedicated bus, the Airport Flyer, operates every 12 minutes over 24 hours to Bristol Temple Meads rail station and there are also services to Weston-super-Mare and other locations in the region, and to South Wales. Private transport demand is managed through car park and forecourt pricing and the promotion of public transport alternatives.

The CAA data shows the public transport mode share at around 20% for many years and increasing steadily since 2008 and reaching 22.8% by 2015. The rail share noted in 2019 is for passengers interchanging with rail as from this survey the main mode of transport was noted.

In 2018, the Airport sought permission to grow from 10 to 12 mppa. Permission was granted on appeal in 2022 after a public inquiry. The main surface access issues considered were the adequacy of the A38, the opportunities for sustainable transport and car parking. Some junction improvements are to take place on the A38 but the impact of the expansion was not considered to be sufficient to refuse the application. The public transport mode share data given at the inquiry was that it was 21.8% in 2019 and would increase by 2.5%. Car parking was an issue because the demand related to outbound leisure passengers required an increase in the land used for car parking, which is designated as Green Belt. However, as there is no suitable alternative location, this was considered acceptable.

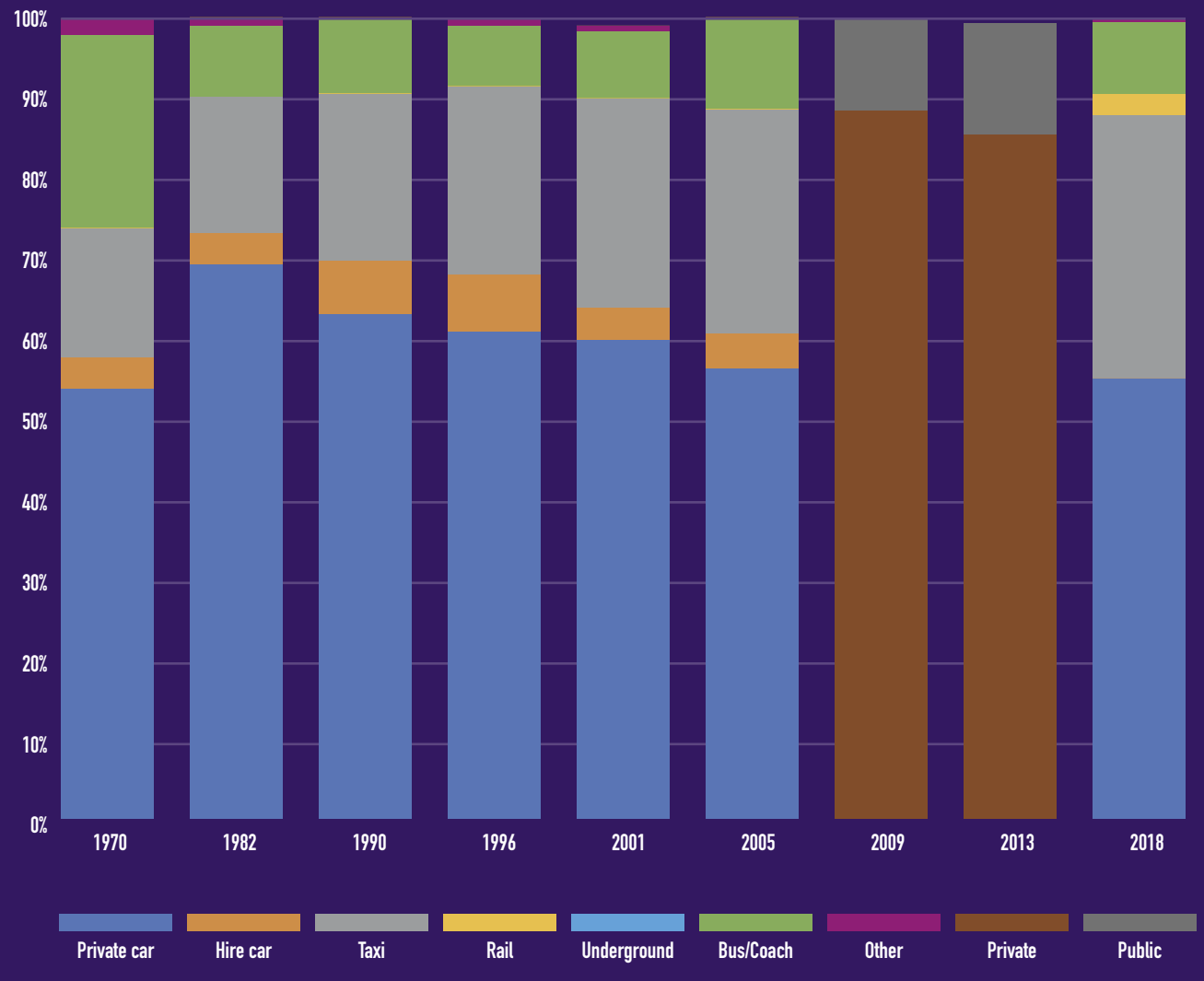
Following approval of the expansion, the Airport has embarked on an updated Surface Access Strategy. It has also started work on creating a public transport interchange hub and multi-story car park, as was envisaged at the inquiry. The public transport hub will form the top level of the car park and will provide additional bus and coach bays and should be completed in 2025.

Bristol is the largest UK airport without a rail link (other than the Airport Flyer bus link) and various proposals have been made. Bristol City Council and other local authorities are currently working on a mass transit system which includes ‘over or underground rapid routes’ to the Airport. The timescale and funding for this is not clear but the Government recently announced that additional funding would be provided to the West of England Combined Authority for transport schemes following the cancellation of HS2 Phase 2.



Glasgow

Air passenger mode shares



The site of the current Glasgow Airport was used by the military from the 1930s but became the city's main airport in 1966. Nearly 10 million passengers were handled in 2017 but the following years there was a decline and in 2022, after the low years of the pandemic, passenger numbers were 6.5 million. Short haul routes are dominant, in particular to London, Dublin and Belfast, but there are services to hubs at Dubai and Frankfurt.

The Airport is 16km from the city center and connected directly to the M8 motorway which was built in stages in the 1960s and 1970s. The dedicated Airport Express 500 bus operates for 24 hours a day with a peak frequency of every 15 minutes. Buses and coaches also serve other locations, including Paisley Gilmour Street Station where there is an interchange with rail services.

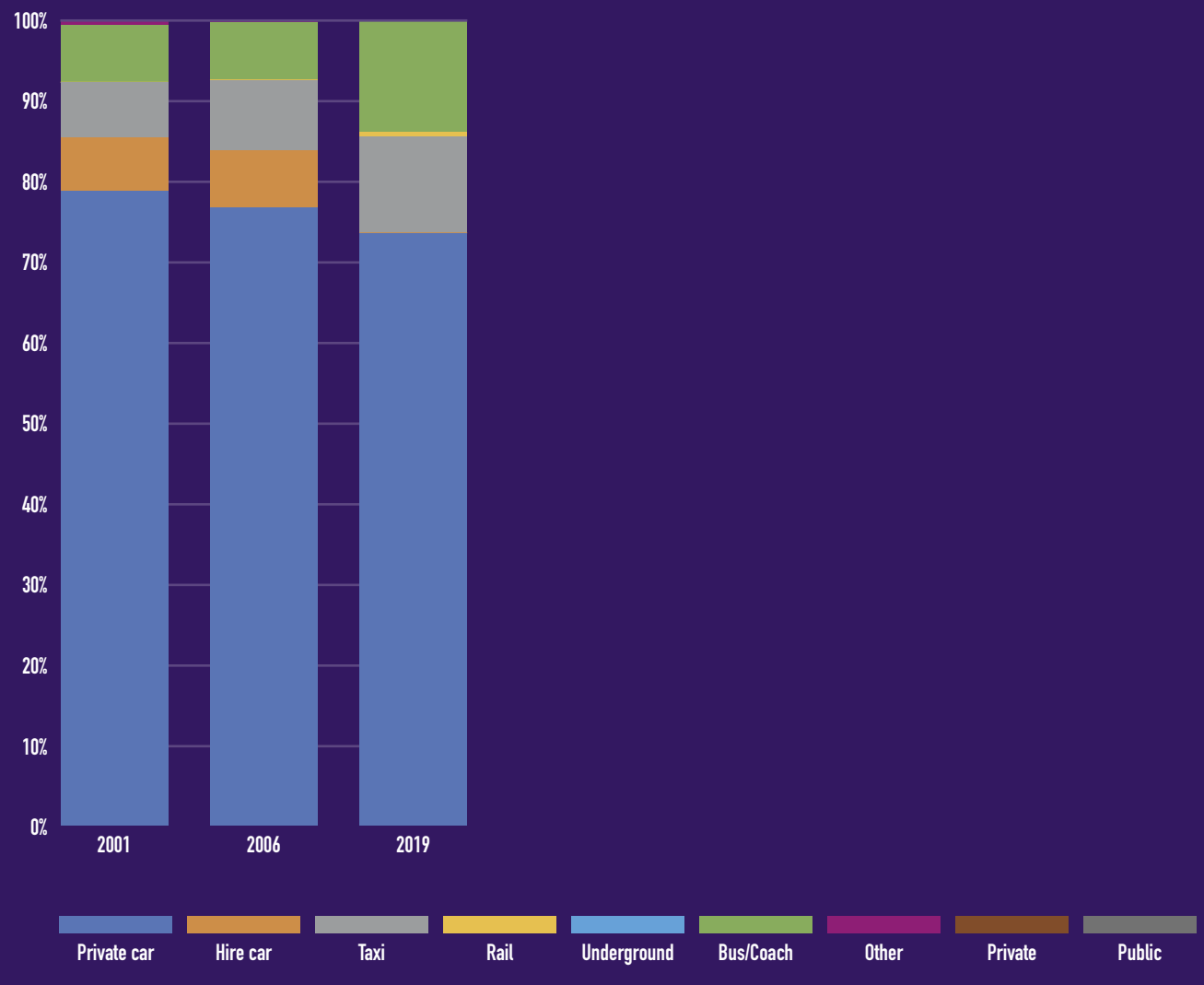
Apart from 1970, private car and taxi have been dominant although the taxi share has increased while car decreased. Public transport was beginning to make some inroads by 2013 but this was reversed by 2018. The rail share in 2018, albeit small, may be from the Paisley Gilmour Street interchange.

The current master plan for the Airport dates from 2011 and envisaged growth to around 10 million passengers in 2020 (which was actually reached in 2017) and 16 million by 2040. The longer term plan safeguards for a second runway but it was not required before 2040. The passenger terminal and associated facilities would need to be enlarged and improved. The longer term plan also suggested that improvements would be required for the airport junction on the M8. The Surface Access Strategy from the same period proposed an air passenger public transport mode share of 15%.

Consideration has been given to several options for a rail link over the years, and a plan to a heavy rail link from Paisley Gilmour Street was cancelled in 2009. One of the challenges is the lack of north-south rail links making the airport hard to reach from the North and East. The most recent plan is for a 'Clyde Metro' which is a network of existing and proposed lines which includes a 'heavy metro' line through the Airport, part of which would use existing rail routes. Although this plan has a high priority the timescale is not yet clear.

Belfast International

Air passenger mode shares



Civil operations at the Airport began in the 1920s and its flights are a vital link to the rest of the UK. 5 million passengers per annum were handled in the 2000s but numbers remained at or around this level partly because of competition from Belfast City Airport. Growth resumed in the late 2010s resulting in 6.3 million passengers in 2019. After the pandemic, 4.8 million passengers were handled in 2022.

The Airport is 21 km from the city centre and is served by the M2 motorway and A57. Express bus service 300 runs 24 hours a day to the city centre and there are also bus links to Antrim Station.

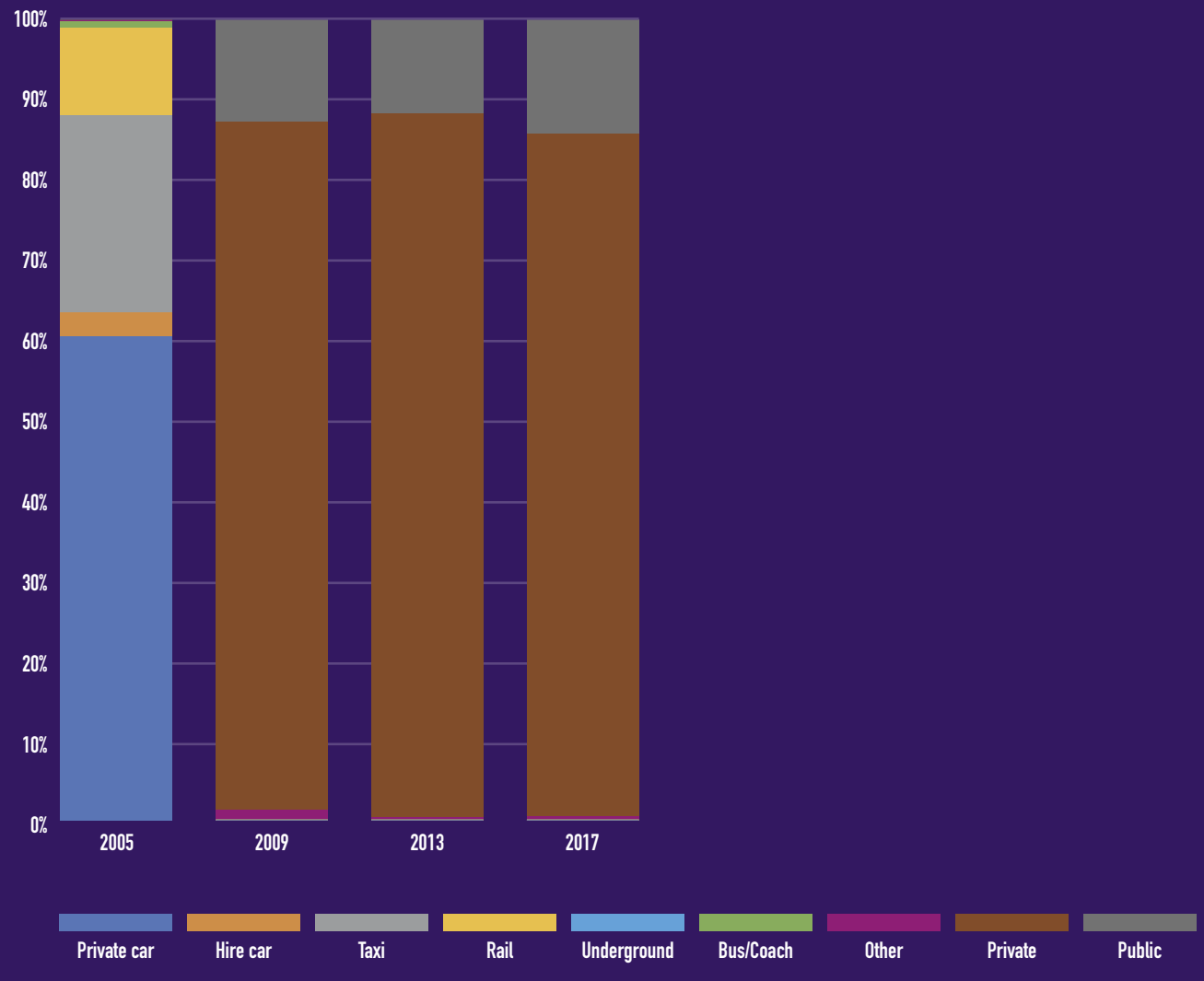
CAA data is limited but shows that a 15% public transport share was achieved in 2019.

Improvements and expansions of the airport's facilities have taken place from time to time. Currently, Translink, the operator of Northern Ireland Railways, are exploring the possibility of reopening a line which runs close to the Airport, and this link was included in an All-Ireland rail strategy launched in 2023.

... Growth resumed in the late 2010s resulting in 6.3 million passengers in 2019. After the pandemic, 4.8 million passengers were handled in 2022 ...

Newcastle

Air passenger mode shares



Newcastle Airport began life in the 1920s as a civil airfield and was used for military purposes in the Second World War. The current runway and terminal building were initially built in 1967. Various extensions and improvements have taken place over the years. Passenger numbers reached 5.7 million in 2007, but subsequently declined then recovered to 5.3 million in 2017 and 2018. After the pandemic downturn, 4.1 million passengers were handled in 2022. The main routes are outbound leisure short haul, but with key routes to London, European and Middle East hubs.

The Airport is connected to the city (about 12 km distant) by the A696 and A167 roads, most of which are dual carriageway. These roads connect to the A1 which originally passed through the centre of Newcastle but which in 1993 took a western route by passing the city. There are local bus services to the city centre.

The Tyne & Wear Metro opened to the Airport in 1991 and currently provides five trains per hour with a 25 minute journey to the city centre. The Metro also serves many other stations in Newcastle and Sunderland with through ticketing onto the national rail network. New rolling stock is being introduced and the plan is to increase frequency to six per hour.

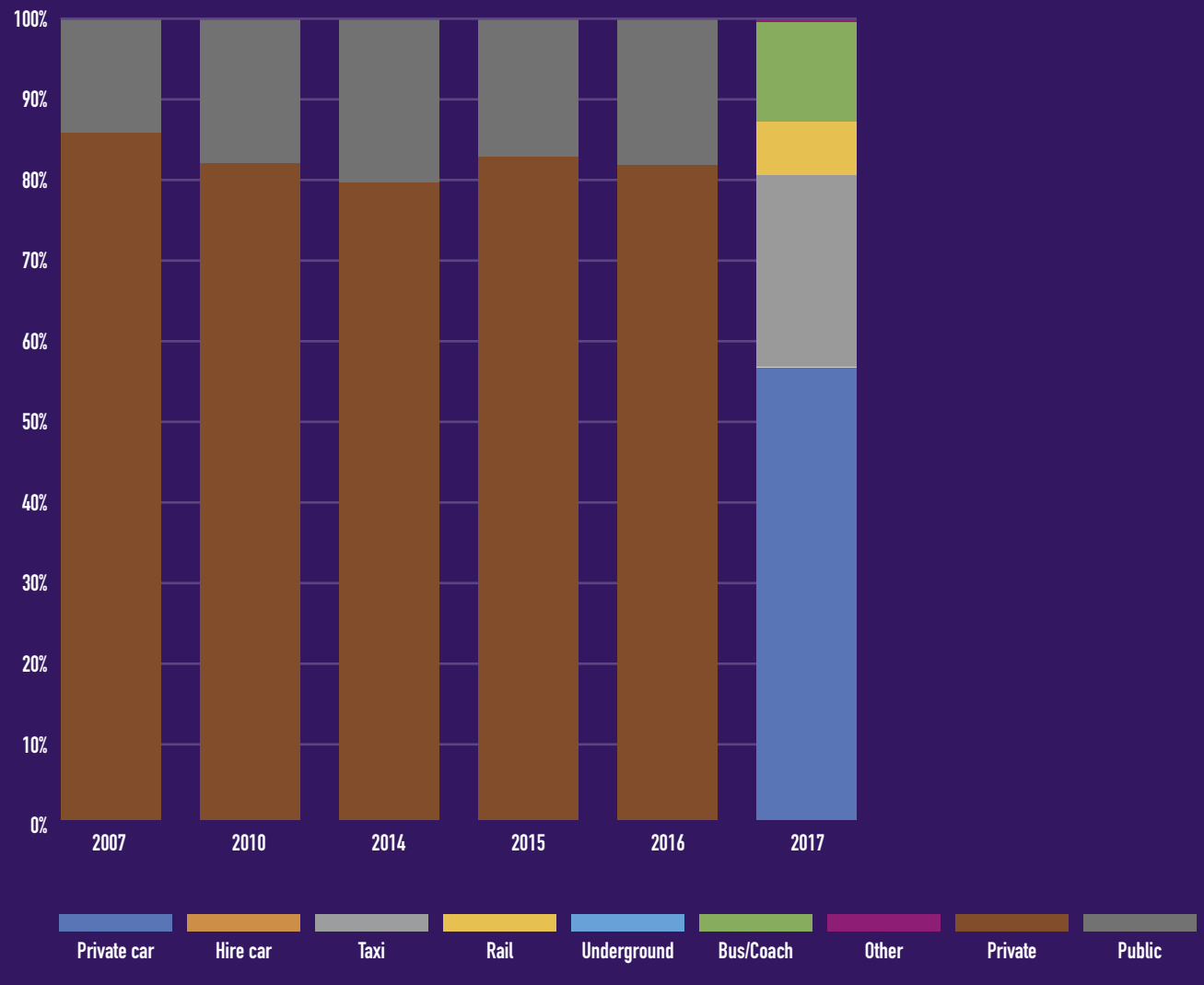
CAA data shows that the Metro and bus services achieved a 14% share of air passenger journeys.

A master plan published before the pandemic suggested that passenger numbers could grow to 9.4 million by 2035. That master plan is now under review but it included mode share targets to increase the share of passenger journeys using sustainable transport to 30%. The plan noted various road improvements and potential extensions to the Metro which are also now under review. However, several improvement schemes for the Metro have or are being implemented including the replacement of the train fleet which are in the process of being delivered.

... Passenger numbers reached 5.7 million in 2007 ...

Liverpool

Air passenger mode shares



Liverpool Speke Airport began scheduled services in 1930 and was used as an RAF base in the Second World War. Civil operations restarted in 1945 under the ownership of the Ministry of Aviation. The City of Liverpool took over in 1961 and a new runway was opened in 1966 to the south east of the old site and a new terminal next to the new runway opened in 2002. Now known as Liverpool John Lennon Airport, ownership passed to Merseyside councils and is now shared by the Peel Group (80%) and Liverpool City Council (20%). Passenger numbers grew to 5.5 million in 2007 but subsequently fell and rose to 5.0 million in 2019. After significant reductions in 2020 to 2022, the airport recovered to 4.2 million passengers in 2023. The main routes are outbound leisure with some key links to Northern Ireland and the Republic of Ireland.

Liverpool Airport is about 12 km from the city centre linked by the city's road network. There are regular bus services on a range of routes including the 500 dedicated service. Liverpool South Parkway Rail Station is 5 km from the Airport with a wide range of services and is connected by a frequent shuttle bus.

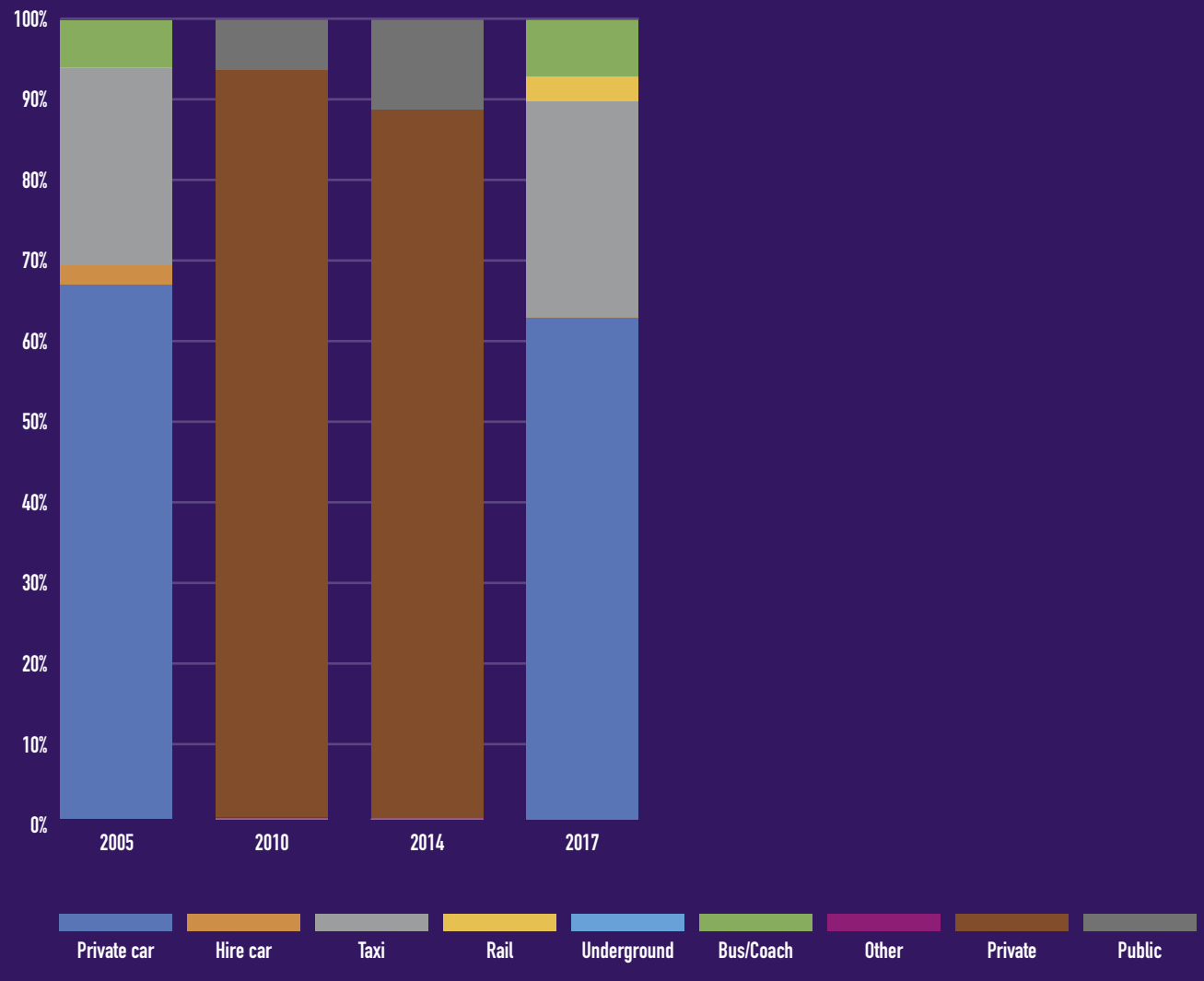
CAA data shows that the bus and rail services achieved a 19% share of air passenger journeys in 2017.

The Airport has a Strategic Vision to 2030 and a Master Plan to 2050. These suggest growth to 8 million passengers by 2030 and a master plan that includes a new road access from the east and an enhance public transport corridor.

... The City of Liverpool took over in 1961 and a new runway was opened in 1966 to the south east of the old site and a new terminal next to the new runway opened in 2002 ...

Leeds Bradford

Air passenger mode shares



The Airport opened as a civil airfield in 1931. Its runway and terminal were extended and improved, the current terminal dating originally from the late 1960s although it has been considerably updated and extended. Most of the passengers are short haul leisure with no current long haul flights. Growth was steady and reached over 4 million in 2017 and 2018, and has recovered to 3.3 million in 2022.

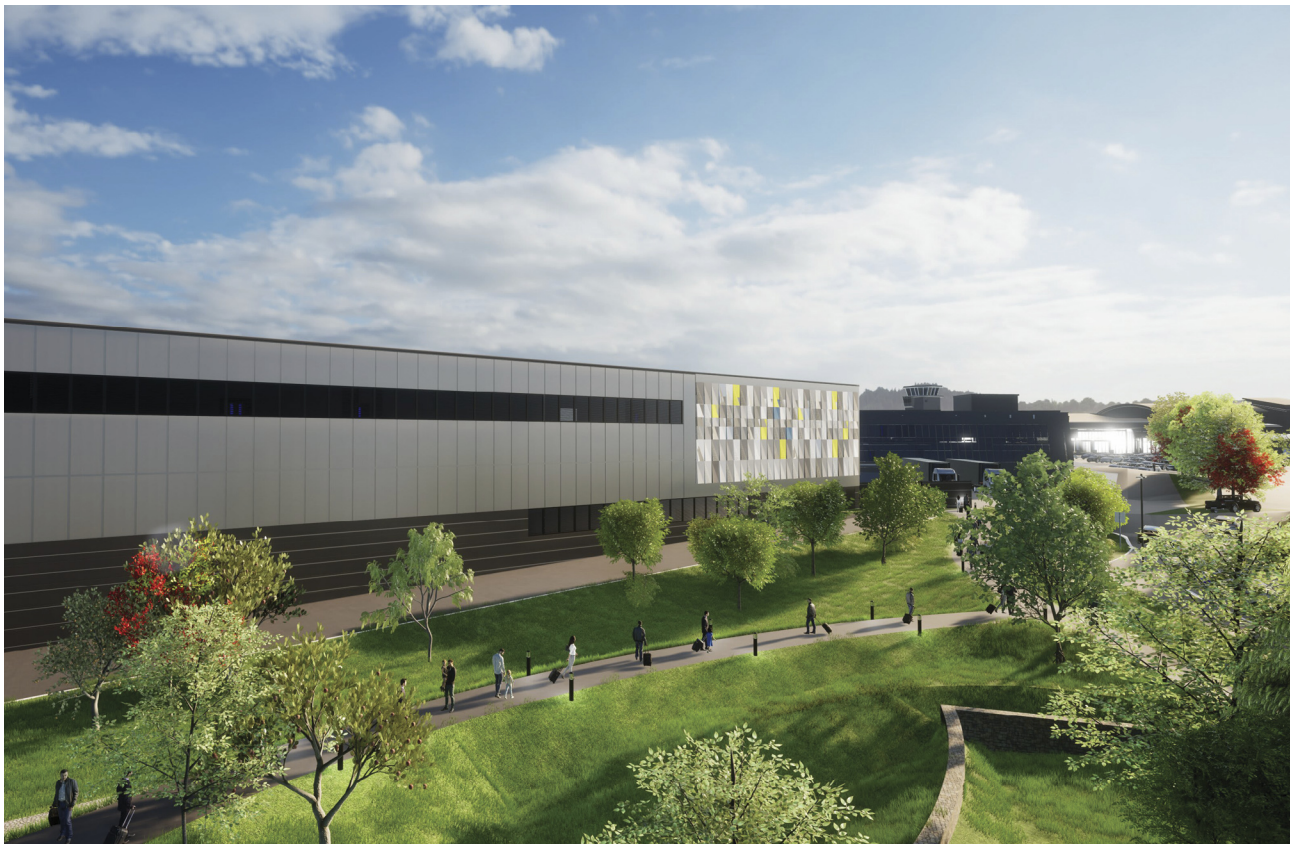
The airport is about 11km from Leeds city centre and 14km from Bradford. Road access is currently via a single carriageway link to the A658 Bradford to Harrogate Road, which in turn links to the Leeds and Bradford Ring Roads and the city centres. Dedicated buses operate under the Flyer brand to Leeds Bradford and Harrogate, where there are interchanges at rail stations.

Public transport mode shares are around 11% with some of this being noted as by rail, which is probably passengers interchanging at stations.

Plans for a new terminal on the eastern side of the airport were brought forward in 2020 which were approved by Leeds City Council but, after the Government announced that the application would be called in, the Airport abandoned this plan and reverted to an extant planning permission to extend the existing terminal, which is now proceeding and should be completed by 2026 enabling growth to 7 million passengers per annum.

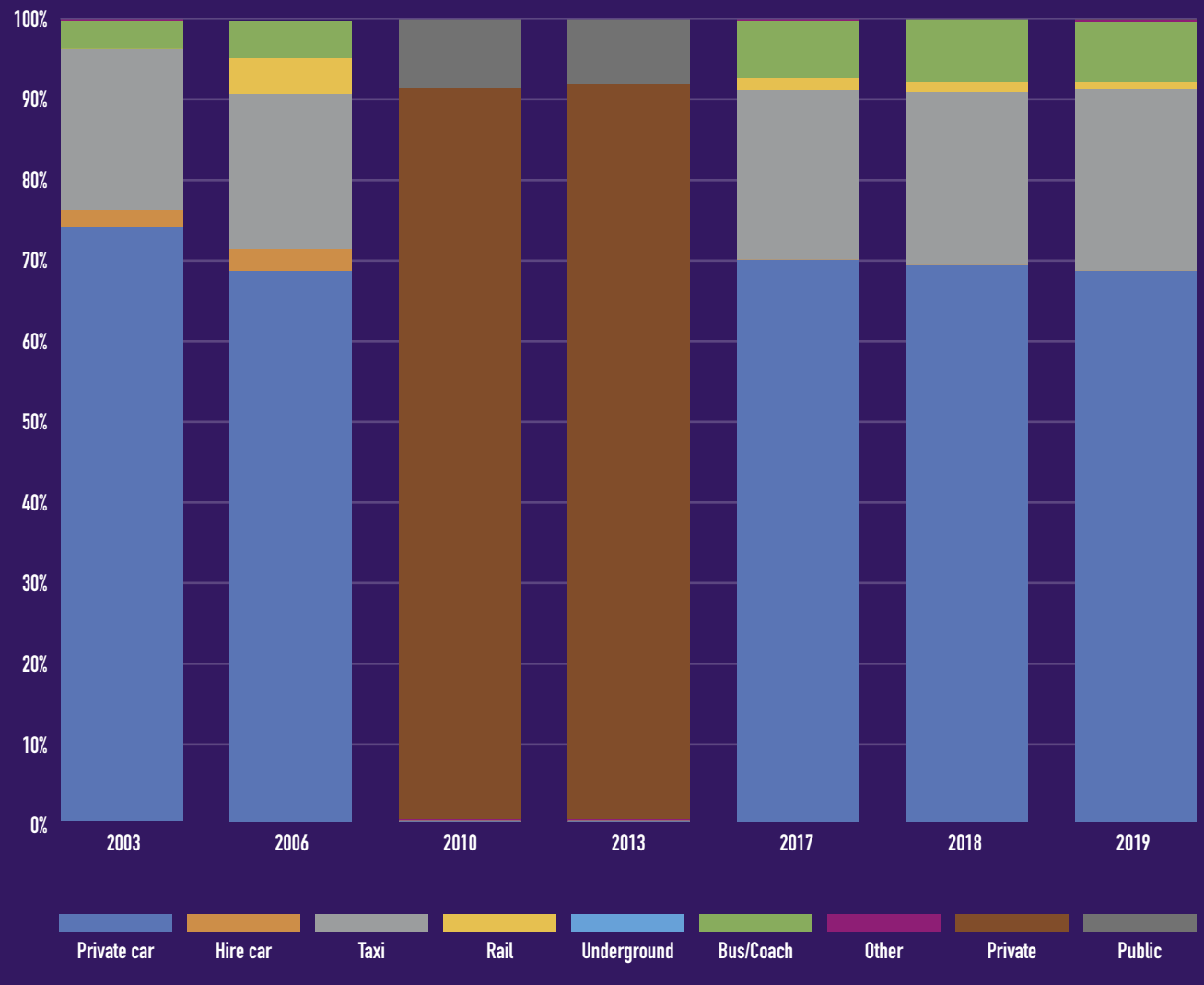
A new parkway station on the Leeds to Harrogate rail line is being developed. The station would be about 2 km from the airport but (as at Luton) there is a significant height difference between the rail line and the airport such that a direct rail route is not possible. However, the Parkway Station is to be linked to the local road network on which there would be a bus transfer to the airport. The station would also serve as a park & ride for the local area including a major employment expansion area next to the airport.

A Surface Access Strategy was published in 2017 which noted a range of improvements for the short, medium and long terms and included public transport mode share targets of 18% by 2024 and 25% by 2030 (note that these shares include bus links to car parks which are not included in the CAA definition of public transport).



East Midlands

Air passenger mode shares



The airfield was first used as a military base in the Second World War and. Although decommissioned immediately after the war, it did not open for civil air transport until 1965 with a new runway and terminal. Passenger flights are mainly for short haul leisure passengers. Through the 2010s passenger numbers were in excess of 4 million per annum, rising to 4.8 million in 2018, before dropping during the pandemic and then recovering to 3.2 million in 2022.

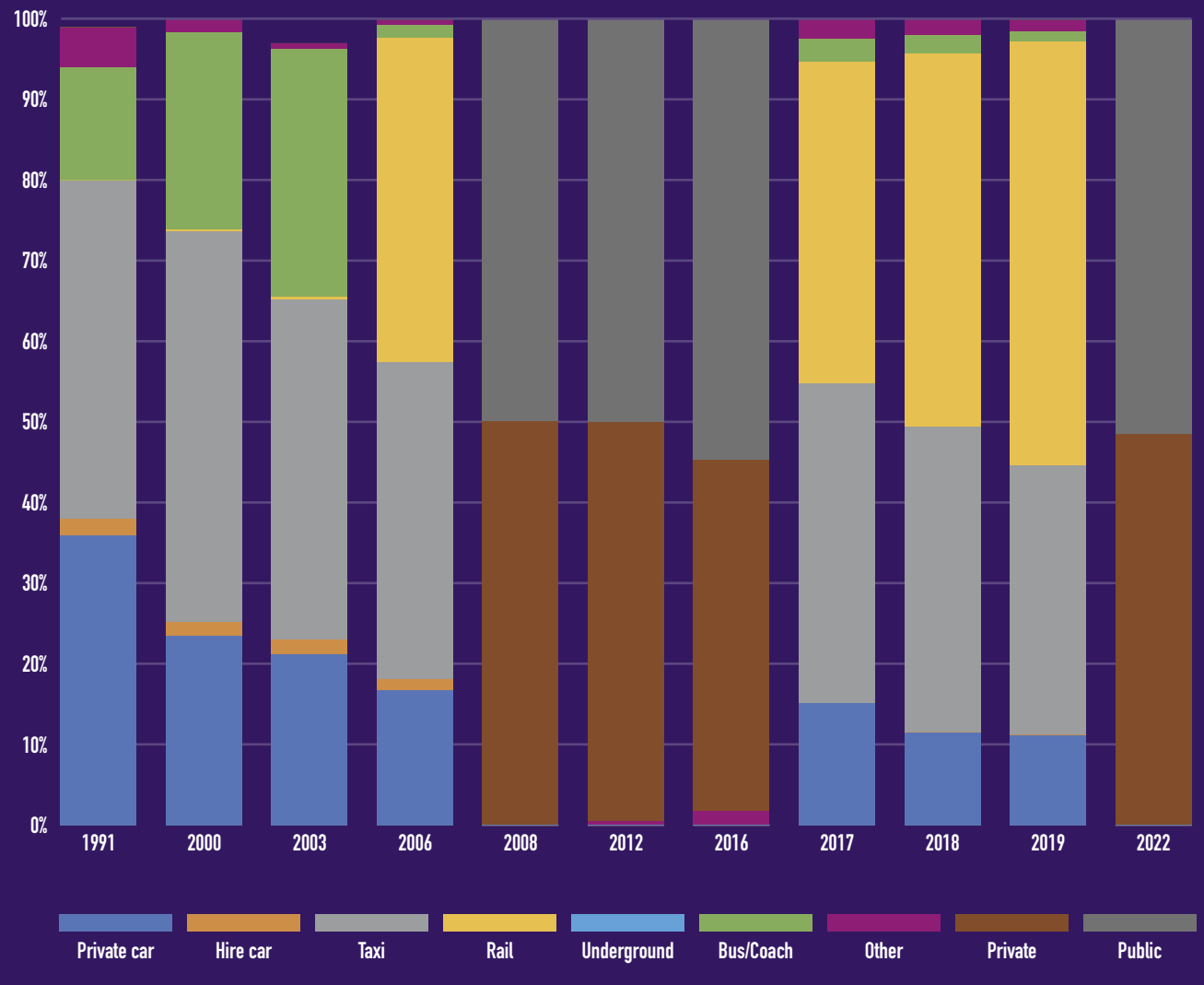
East Midlands is the UK's second largest air cargo hub (after Heathrow) handling over 400,000 tonnes in 2021. Unlike passenger numbers during the pandemic, cargo tonnage grew (not least to carry the large amounts of medical supplies) although it has since dropped back. In particular, East Midlands Airport is the home to major operations by DHL and other operators, who use it as a hub as well as a distribution centre.

The Airport is close to Derby, Leicester and Nottingham but more significantly it is connected directly to the M1 and other links in the strategic road network and is centrally located in England for logistics. Significant improvements to the motorway and its junctions and link roads have taken place in recent years. The nearest rail station is East Midlands Parkway on the Midland Main Line which is currently linked by an on-demand bus service. At one stage it was mooted as a node on HS2, but this plan was not taken forward. There are bus services to Leicester, Derby, Nottingham and other locations. CAA data shows the air passenger public transport mode share at just under 10%.

The Airport's Sustainable Development Plan dates from 2015 and looked forward to growth up to 10 million passengers and over 600,000 tonnes of cargo. The passenger forecasts are probably now optimistic but the cargo growth is very likely. A passenger public transport mode share target of 15% was suggested but a bigger challenge may well be the ability to handle the cargo traffic on the road network. However, a significant proportion of the cargo handled is connecting between flights, in particular in the night period, so does not involve a surface journey. The night time peak of freight activity also coincides with periods on the roads when capacity is available.

London City

Air passenger mode shares



London City Airport opened in 1987 on part of the former Royal Docks. The initial very short runway had been extended and the terminal building has also grown. Being close to the City of London and Canary Wharf, the initial model was to attract business passengers on short haul routes, but an increasing number of leisure passengers also now use the Airport. There has also been an all-business class service to New York by a specially adapted aircraft. By 1991 more than 1 million passengers were handled and this grew to over 5 million in 2109, then declining in the pandemic and recovering to 3 million in 2022.

The Airport is 19 km from the City and 5 km from Canary Wharf. The main road access is the A1020 and A112 and close to the A13. This road network has been improved as the Docklands area has developed. The key surface access improvement was the opening of the Docklands Light Railway (DLR) to the Airport in 2005, which serves the City and Canary Wharf and has many interchanges with Underground lines, and crossed the River Thames. The DLR has been extended and additional trains acquired and the service at the Airport is 12 trains per hour in each direction off peak and up to 16 per hour in the peak. The station is

Not surprisingly, given the airport's location and the DLR service, the public transport share has been at or around 50% for some time. Before the DLR opened, there were dedicated bus services which captured significant numbers of passengers, and limited buses continue, mainly used by staff. Taxis attract the second largest share, with private cars down to 11%. Although small, there are also passengers in the 'other' category, which includes access from Thames Clippers at Royal Wharf on the River Thames.

Expansion has been permitted following applications and inquiries and the most recent plan is to grow from the current capacity of 6.5 mppa to 9 mppa. This was initially rejected by the London Borough of Newham but is now the subject of an appeal. The application included a mode share target of 80% by 'sustainable transport' but this definition includes electric taxis. The Elizabeth Line runs nearby (about 200 metres) but there is no station and no plans for one, despite some pressure from the Airport.

What attracts air passengers to public transport?

The choice of surface access mode has been studied and tested over many years and the CAA data is a key input into the forecasting process, which is essentially as follows:

- **Passengers are divided into market segments – international/domestic, leisure/business, UK/Foreign, Origin/Destination**
- **Each mode's attributes such as journey time, frequency, cost etc. are noted**
- **The current numbers using each mode in each market segment is then calculated from the survey results**
- **Forecasts of future shares are made by considering changes in any of the attributes**

This is known as a Nested Hierarchical Logit Model and can be simply illustrated as in Figure 1. The model has been validated but the theory is that travellers know the costs, journey time and other attributes of the alternatives. While this is more likely to be true for regular journeys (eg. commuting) it may be less so for airport access journeys which are less frequent.

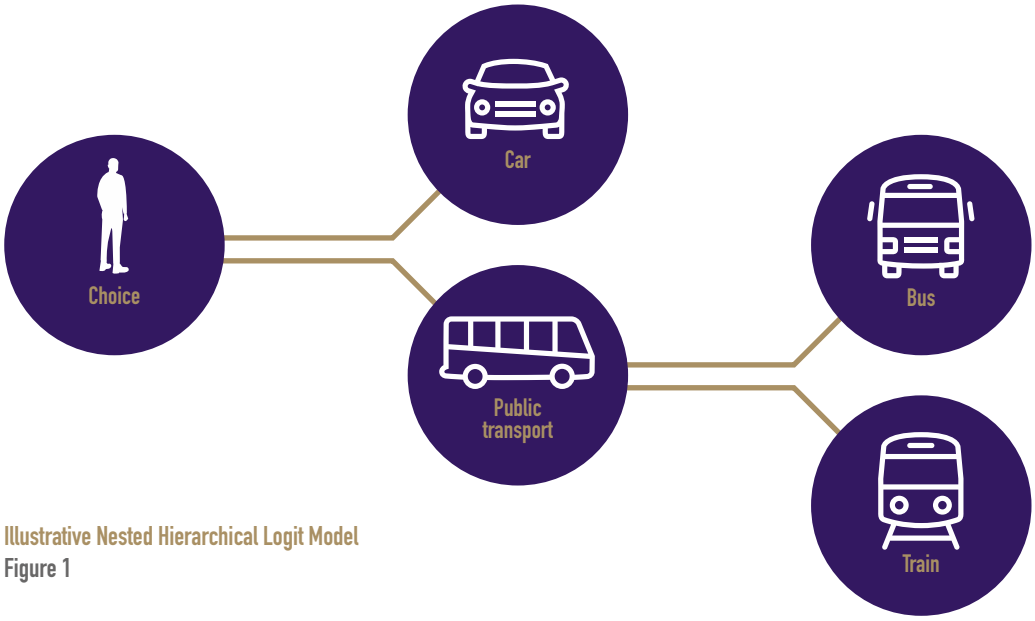
From the CAA data it is possible to see which market segments tend to use public transport. Figure 2 shows that Foreign passengers tend to use Pubic Transport and of course the corollary is that UK passengers tend to use Private modes. There are a couple of outliers – Heathrow has the highest percentage of Foreign passengers but not the highest Public Transport share, and Leeds Bradford has a low Public Transport share for its percentage of Foreign passengers.

There does not appear to be much of a relationship between Public Transport percentage and the Business/Leisure split, as shown in Figure 3. London City is an outlier, with its high percentages of both Public Transport and Business.

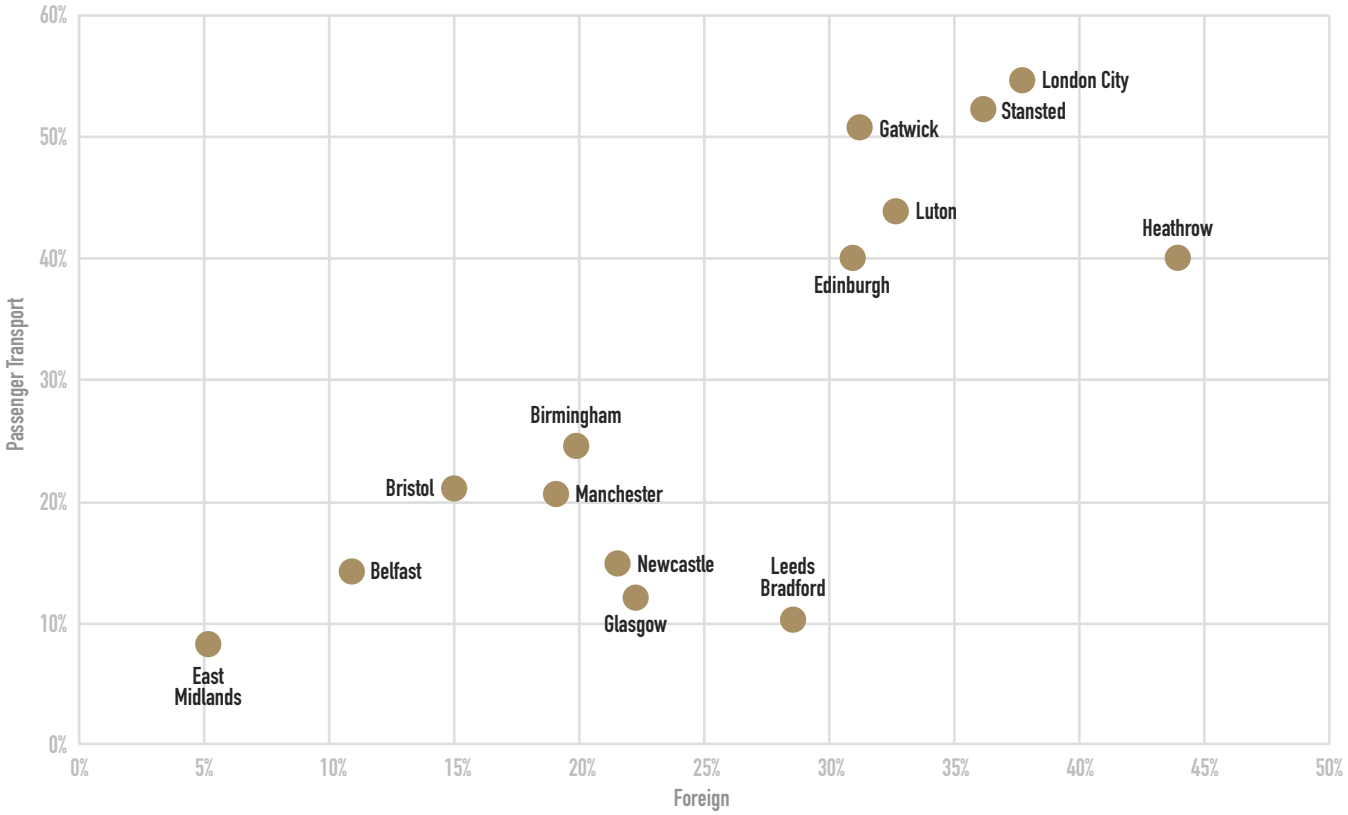
The origin or destination of the passenger is of course a key determinant of the choice of mode, related to the availability of that mode on the particular route. Thus, public transport is always available on the airport-city centre route, but it is more limited to other locations, depending on the size of the market. Airports and surface access providers look very closely at origin/destination data to decide if a potential public transport service is likely to be viable.

Other factors are also relevant. There is a good (inverse) correlation between Group Size and Public Transport use, for the obvious reason that a group in a car costs the same as a single passenger, whereas each public transport passenger has to pay a fare (although there are some group fares). The more disaggregated the data, the easier it is to see if there is a correlation.

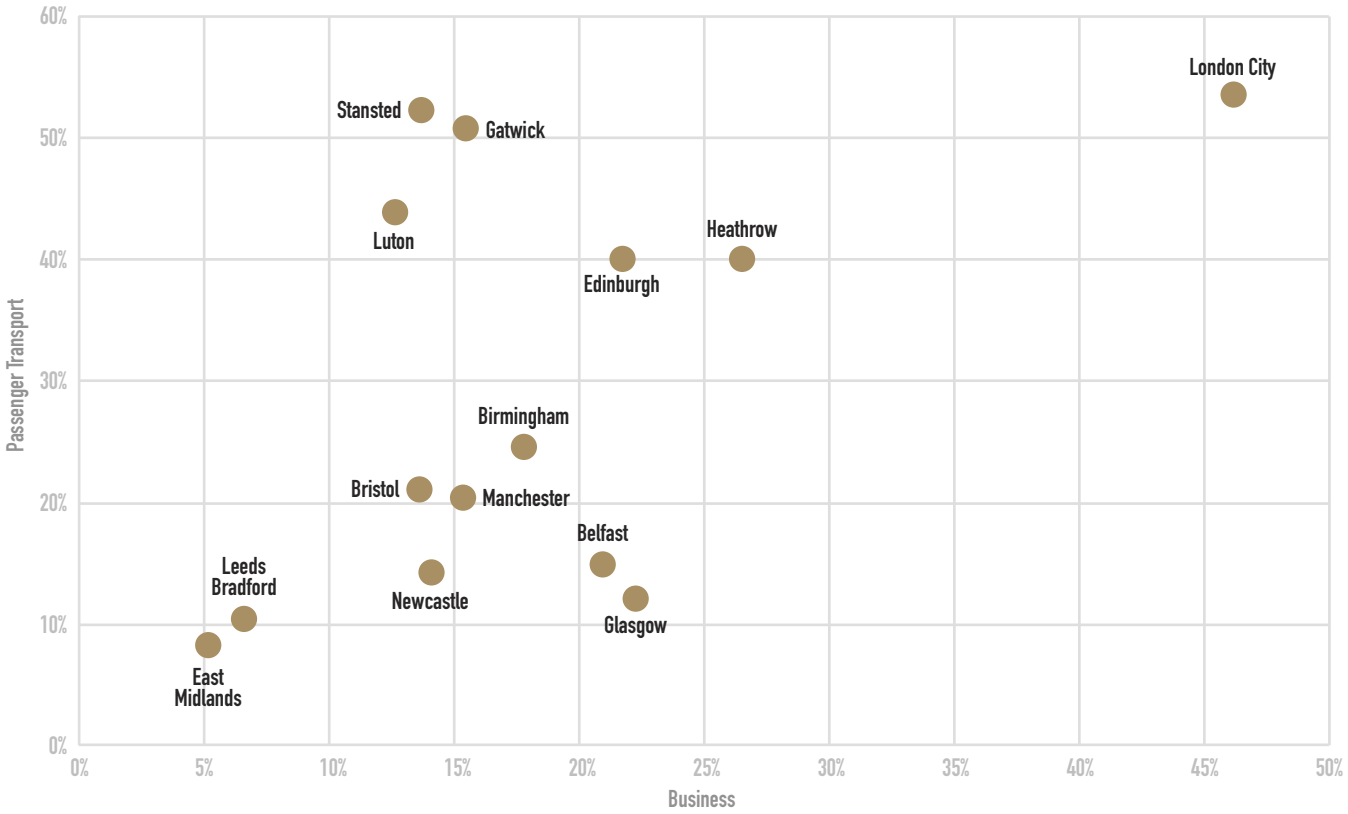
The point of this analysis is partly to explain some of the mode shares. The attributes (journey time etc.) are clearly important but the first choice is between Public and Private Transport. There is a fairly obvious reason for the trend in Figure 2 and it is that Foreign passengers tend not to have the use of a Private Car and also tend to have an destination in the centre of the city at a hotel or business, so Private Car is less attractive and Public Transport more so. The corollary is that UK passengers probably have a Private Car and



Illustrative Nested Hierarchical Logit Model
Figure 1



% Public Transport and % Foreign
Figure 2



% Public Transport and % Business
Figure 3

tend to have origins at their homes, which are more dispersed. This can be shown illustratively and in a simplified way as in Figure 4. So an airport with a high proportion of UK passengers, such as towards the bottom left of Figure 2, will tend to have a challenge to make public transport viable. There is also a complication when looking at domestic passengers. The UK/Foreign data is based on residence so that, at the destination of an outbound journey, a domestic passenger is less likely to have a car available and more likely to be heading for the city centre.

More Public Transport	More Private Transport
Foreign	UK
Business	Leisure
Individual	Group

Simplified market sectors' propensity to use Public or Private Transport
Figure 4

Once the choice between Public and Private Transport is made, the second choice then tends to be related to the attributes. Taxi is categorised as a Private Transport mode but of course tends to be used by Foreign passengers. Taxi is also a relatively expensive mode so tends to be used by Business passengers, although Uber and other ride hailing serves has widened this market in recent years. Journey time, frequency and fare are all important factors for public transport, but there are also less quantifiable factors such as comfort and baggage arrangements. One factor which is sometimes controversial is the 'dedicated' nature of some Public Transport, such as the Gatwick Express train or the Airport Link coach services. These are more expensive than other public transport and sometimes with similar journey times and frequencies. Nevertheless they attract a higher share than can be explained by the quantifiable attributes, so the forecasts need to be adjusted to reflect this factor.

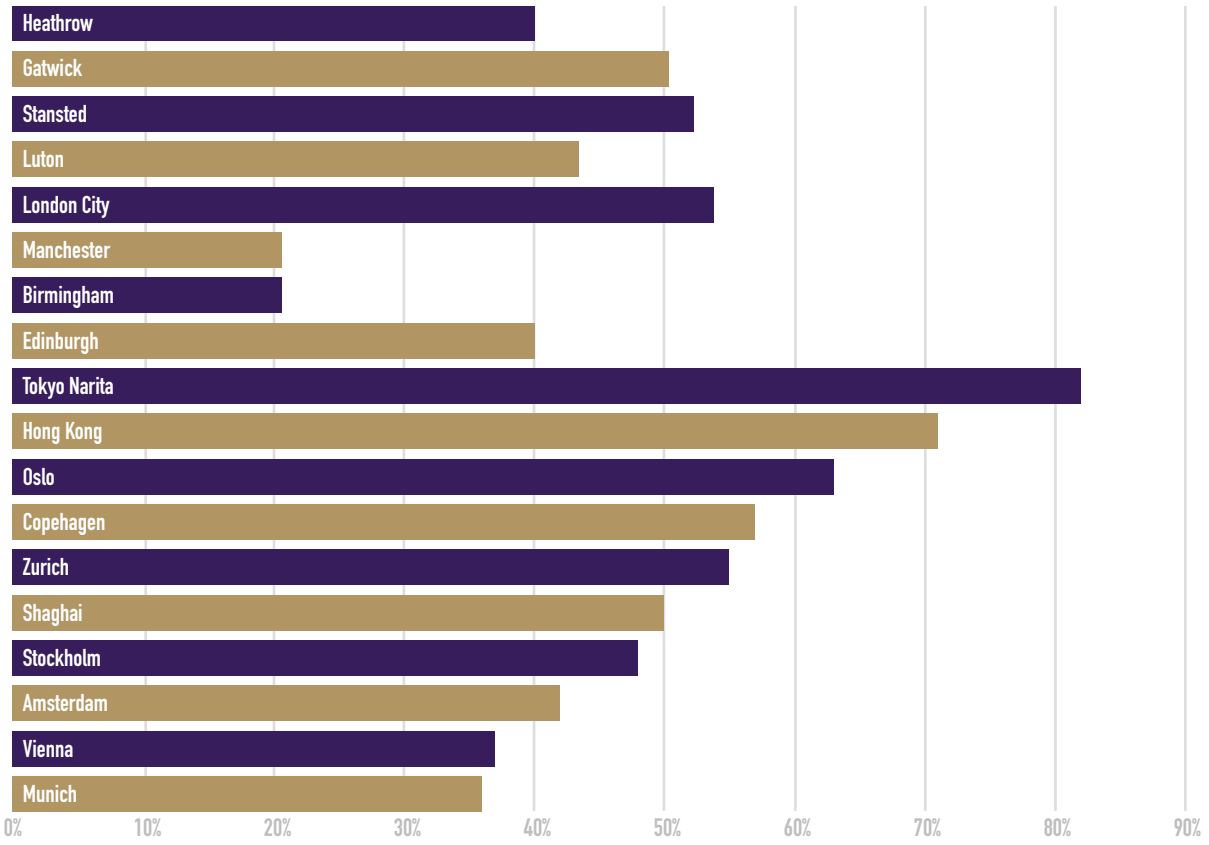
Passengers with Reduced Mobility (PRM) are a particular category which the CAA Survey does not measure but who are increasing as a proportion of total passengers and are a significant market group. There are specific challenges for passengers with a range or abilities in terms of access to ground transport modes (ie. rail, coach, taxi or private car) which are common to all journeys (not just airport access). For airport access, disabled passengers may travel with extra equipment or medication which make public transport very difficult if not impossible. There are also specific challenges within the airport terminal, embarking and disembarking aircraft, and travelling on aircraft, but these are not covered in this report. PRM can be defined to include older passengers who may have reduced mobility but also have other attributes which affect their modal choice. This is a market segment which almost wholly travels for leisure purposes and has a lower value of time, but a higher concern for comfort and convenience. Research by Graham et al.[2] on ground access for ageing passengers concluded that (inter alia) ground access is viewed as more satisfactory than other elements of their journey, and that ease and comfort are more important factors in determining choice than other factors such as price. The lesson here is that, if more of this (growing) market segment is to be attracted to public transport for airport access, it must demonstrate high levels of comfort and convenience which rival and exceed the standards provided by a private car or taxi.

Staff transport mode share can also be forecast in a similar way, but the key factors to consider are the home location, the shift start and finish times and the ability and cost of parking. Airports are also in the forefront of measures to improve active travel (cycling and walking) and car sharing.

... Journey time, frequency and fare are all important factors for public transport, but there are also less quantifiable factors such as comfort and baggage arrangements ...

2. Graham et al, 2023, Ageing passenger perceptions of ground access journeys to airports: A survey of UK residents, *Journal of Air Transport Management,* 107.

Comparisons with non UK airports



% Public transport share at selected airports
Figure 5

Data from non UK airports is difficult to obtain, in particular for recent years, and may not be comparable with the CAA data for UK airports. However, from a variety of sources, Figure 5 shows the public transport share at a number of airports with some of the UK airports for comparison.

Some Asian airports show very high mode shares given their locations and rail and bus connections. In Europe, the Oslo and Copenhagen achieve high public transport shares, while others are comparable with the London airports. No North American airports are shown, but the highest shares in Canada are 25% in Vancouver and in the US around 15% at Washington National.

Summary & Conclusion

This report uses data from the CAA's Departing Passenger Surveys over the last 50 years to review how surface access has developed at the larger UK airports. The largest airports generally achieve higher public transport shares in part because the volumes are sufficient to make public transport investments economically viable, but also because they tend to have higher proportions of non UK passengers who are more likely to use public transport.

Historically it is possible to track how the provision of new road of rail links has impacted on mode shares, again with the high cost of rail infrastructure often only being possible at the largest airports. Bus and coach, however, can provide a very effective means of public transport for a wide range of origins and destinations and, even at airports with extensive rail links, provide public transport options for the 'thinner' routes.

Individual airports analyse the CAA data in much more detail in order to plan and implement transport improvements through their Airport Transport Forums and as set out in their Airport Surface Access Strategies. Government policy has been consistent and this degree of certainty has enabled some longer term decisions to be made for the benefit of passengers and communities.

The Chartered Institute of Logistics and Transport has the expertise in and understanding of these types of long-term, UK-wide trends such that it can provide a strategic overview of the trends and success or otherwise of policies and initiatives.

... Historically it is possible to track how the provision of new road and rail links has impacted on mode shares, again with the high cost of rail infrastructure often only being possible at the largest airports ...

Contact

The Chartered Institute of Logistics and Transport UK (CILT) provides insight into pivotal decisions and policies. Our recommendations emanate from the extensive collective knowledge and expertise of industry experts from CILT's members and focus on delivering prosperity for the United Kingdom. We invite you to engage with us and use this expertise to unlock sustainable growth, reshape our transport infrastructure for heightened efficiency and explore the transformative potential of transport and logistics.

If you have any comments on what you have read, please contact:

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