

# Civil engineering insights on Heathrow's third runway and alternative proposals

## Overview

By 2050, the population of the UK is predicted to reach 75 million,<sup>1</sup> an increase of nine million people from the 2017 figure.<sup>2</sup> Air passenger demand is expected to continue to grow in the coming decades. Approximately 284 million passengers travelled through UK airports in 2017,<sup>3</sup> with 495 million passengers expected to do so by 2050.<sup>4</sup> Without sufficient infrastructure in place, the UK may struggle in future to give investors confidence that it is a prime location to invest in, and a country that supports enterprise and sustains a high quality of life for the population.<sup>5</sup>

Heathrow – as the UK's largest airport, the second-busiest airport in the world in terms of international passenger traffic and the busiest airport by total passengers in Europe – is a member of a select few global 'hub' airports. Hub airports connect regional air travellers with long-haul routes, as opposed to point-to-point airports which tend to fly direct routes to other regional airports on a short-haul basis.

Heathrow handled 80 million passengers in 2018,<sup>6</sup> more than Paris Charles de Gaulle's 72 million<sup>7</sup> and Amsterdam Schiphol's 71 million.<sup>8</sup> What separates these airports is the number of runways. Schiphol boasts six runways, Charles de Gaulle has four, Heathrow has two. Heathrow is now operating at 98% capacity, with flight movements capped at 480,000 a year.<sup>9</sup> Continuing passenger growth has been sustained through increasing the use of large aircraft.

Heathrow currently supports five of the top ten highest-grossing airline routes in the world, with British Airways' route to New York's JFK airport yielding \$1.15 billion per year, 33% above the value of the second most valuable route.<sup>10</sup> High route profitability at Heathrow is a key factor in its attractiveness to airlines, in particular long-haul flights.

Capacity to meet future demand is constrained, particularly in London and the Southeast. Gatwick is at near full capacity, while Luton and London City are expected to reach maximum capacity by 2030 and Stansted by 2040.<sup>11</sup> Heathrow directly employs 76,000 people on site<sup>12</sup> and handles over 25% of total UK exports by value, making it the UK's largest port by this measure.<sup>13</sup>

## Purpose of this paper

This paper provides insights into the costs and benefits of a third runway at Heathrow, as well as potential alternatives to the project. It combines insights from ICE Fellows, industry experts and available published evidence.

<sup>1</sup> ICE (2016) [National Needs Assessment](#)

<sup>2</sup> Office for National Statistics (2018) [Overview of the UK Population: November 2018](#)

<sup>3</sup> Department for Transport (2018) [Aviation 2050: The Future of UK Aviation](#)

<sup>4</sup> Department for Transport (2017) [UK Aviation Forecasts](#)

<sup>5</sup> ICE (2016) [National Needs Assessment](#)

<sup>6</sup> Civil Aviation Authority (2019) [Air Passengers by Type and Nationality of Operator 2018](#)

<sup>7</sup> Groupe ADP (2018) [Press Release: Traffic at Paris Aeroport up by 3.8% in 2018, at 105.3 Million Passengers](#)

<sup>8</sup> Schiphol Airport (2019) [Traffic and Transport Figures](#)

<sup>9</sup> Heathrow (2019) [Heathrow Today](#)

<sup>10</sup> OAG (2019) [Billion Dollar Route – Jewels in the Network](#)

<sup>11</sup> Department for Transport (2017) [UK Aviation Forecasts](#)

<sup>12</sup> Heathrow (2018) [Heathrow 2.0: 2018 Sustainability Progress](#)

<sup>13</sup> Ferrovial (2019) [Heathrow Airport](#)

## About the third runway at Heathrow

Modern plans for a third runway were endorsed by the Airports Commission in 2015. The Commission's final report<sup>14</sup> endorsed a new Northwest Runway. The Commission was convinced this made the strongest case, alongside a package of measures to address environmental and community impacts.<sup>15</sup> The plans were then put to Parliament in June 2018 as part of the National Policy Statement for Airports; the policy statement was approved by a majority of 296 in the House of Commons.<sup>16</sup>

The project is currently out for consultation as part of the Development Consent Order process<sup>17</sup> and is due to be submitted for final planning consent in 2020.<sup>18</sup> Construction is due to commence in 2021, with the first phase due to complete by 2026.<sup>19</sup>

## Identified benefits

Expansion in the Southeast of England is considered necessary to meet long-term air passenger and freight demand and deliver a long-haul route network central to the UK's economic prosperity.<sup>20</sup> A third runway has a number of economic and connectivity benefits which can be measured.

## A third runway and increasing capacity

The single biggest benefit of a third runway would be an increase in capacity for passengers and freight, enabling an additional 260,000 air transport movements per year.<sup>21</sup> The Department for Transport (DfT) estimates that this capacity would be exhausted within two years of the runway coming into operation,<sup>22</sup> although the realities of making these new routes operational may take more time than this. Heathrow's master plan also calls for a doubling of cargo-handling capacity to 3 million tonnes per year by 2040 and the handling of 142 million passengers per annum by 2050. It further stipulates the need for an expansion of terminal facilities and surface transport links to accommodate these increases.<sup>23</sup>

## A third runway, growth and jobs

The DfT believes that expansion at Heathrow through a third runway and supporting terminals could deliver up to £74 billion of benefits to passengers and the wider economy.<sup>24</sup> The National Policy Statement further estimated that expansion would generate 114,000 additional jobs in the local area by 2030.<sup>25</sup>

A failure to expand might incur costs for passengers, with the Airports Commission finding that capacity constraints could drive up the total cost of air travel by £3-4 billion by 2050.<sup>26</sup> It is worth noting that the proposal for a new runway is entirely privately financed and funded and, in the opinion of the Airports Commission, commercially viable.<sup>27</sup>

<sup>14</sup> Airports Commission (2015) [Final Report](#)

<sup>15</sup> Ibid

<sup>16</sup> Hansard (2018) [National Policy Statement: Airports](#)

<sup>17</sup> Heathrow (2019) [Heathrow Airport Expansion Consultation](#)

<sup>18</sup> Heathrow (2019) [Planning Process](#)

<sup>19</sup> House of Commons Transport Committee (2018) [Airports National Policy Statement](#)

<sup>20</sup> Airports Commission (2015) [Final Report](#)

<sup>21</sup> Department for Transport (2017) [UK Aviation Forecasts](#)

<sup>22</sup> House of Commons Transport Committee (2018) [Airports National Policy Statement](#)

<sup>23</sup> Heathrow (2019) [Airport Expansion Consultation, Preferred Masterplan](#)

<sup>24</sup> Department for Transport (2017) [Updated Appraisal Report, Airport Capacity in the South East](#)

<sup>25</sup> Department for Transport (2018) [Airports National Policy Statement: New Runway Capacity and Infrastructure at Airports in the South East of England](#)

<sup>26</sup> Airports Commission (2015) [Final Report](#)

<sup>27</sup> Airports Commission (2015) [Final Report](#)

## A third runway's role in maintaining Heathrow's hub status

The UK's overall air network makes it one of the best-connected countries in the world, with 100 countries directly connected to the UK by air over 370 direct routes.<sup>28</sup> This connectivity would be enhanced by an additional runway at Heathrow, allowing more long-haul destinations to be served. Capacity constraints at Heathrow have impacted on the availability of routes to less profitable destinations, reducing the number of connected airports overall.<sup>29</sup>

A key argument for expansion is to maintain Heathrow's status as a hub airport and its based carriers of British Airways and Virgin Atlantic. Competition arises primarily from Paris Charles de Gaulle and Frankfurt, both with four runways, and Amsterdam Schiphol airport, with six runways. These airports have greater capacity potential for their based airlines of Air France, Lufthansa and KLM respectively.

Hub status for an international airport increases its attractiveness to passengers, particularly those making transfers from one regional airport to another. Some 24 million of Heathrow's passengers in 2018 were transfer passengers of this type.<sup>30</sup> This offers more choice and greater efficiency by allowing airlines to concentrate operations at hubs, 'realising scale and scope economies of network concentration ... and ... network economies in a single location'.<sup>31</sup>

## A third runway, redundancy and resilience

Operating at 98% capacity means there is little in the way of resilience at Heathrow should something go wrong. Incidents can have a marked effect on passengers, whose journeys are disrupted, incurring costs for the airport, carriers and passengers.<sup>32</sup>

Heathrow has taken numerous steps to use capacity in a better way or set procedures for congestion and delay. While Heathrow does not currently operate in mixed-mode operation, with one runway for departures and the other for arrivals alternated at set intervals, an additional runway would allow for more flexibility. This could include enhanced opportunities to alternate runways and airspace, which would provide respite from noise for those living under flight paths.<sup>33</sup>

Heathrow also operates TEAM – Tactically Enhanced Arrivals Measures – which allows operation of both runways in an arrival-only mode to relieve congestion.<sup>34</sup> Currently simultaneous take-offs or landings do not take place,<sup>35</sup> but a change to the airspace arrangements, which Heathrow is seeking, will permit this and improve resilience in the short term.<sup>36</sup>

## Airport expansion – evidence from other airports

While the UK has debated the merits of a third runway at Heathrow, other world economies have delivered significant expansions in their aviation capacity.

### Amsterdam Schiphol

Amsterdam Schiphol airport boasts six runways. The first of these, Oostbaan, was opened in 1945, while the airport's newest runway, Polderbaan, opened in 2003.<sup>37</sup> This steady expansion has added significant capacity, which has in turn boosted economic growth. Indeed, the airport accounts for between 2% and 5% of GNP and between 120,000 and 360,000 jobs.<sup>38</sup>

<sup>28</sup> Department for Transport (2018) [Aviation 2050: The Future of UK Aviation](#)

<sup>29</sup> OECD International Transport Forum (2014) [Expanding Airport Capacity: Competition and Connectivity](#)

<sup>30</sup> Heathrow (2019) [Facts and Figures](#)

<sup>31</sup> OECD International Transport Forum (2014) [Expanding Airport Capacity: Competition and Connectivity](#)

<sup>32</sup> Hansard (2019) [Drones: Consultation Response](#)

<sup>33</sup> Heathrow (2019) [Airspace and Future Operations Consultation \(January–March 2019\)](#)

<sup>34</sup> Heathrow (2013) [Operational Freedoms Trial, Final Report](#)

<sup>35</sup> Heathrow (2018) [IPA Statement of Need](#)

<sup>36</sup> ICE Publishing (2018), Paul Le Blond, [Inside London's Airports Policy: Indecision, Decision and Counter-Decision](#)

<sup>37</sup> Schiphol (2019) [Facts about Schiphol Airport](#)

<sup>38</sup> Schiphol (2019) [What Schiphol Means for the Netherlands](#)

The airport supports growth by enabling other financial centres in Europe, including London, to be reached within an hour. It is at the heart of the Randstad, home to 7.1 million people and the four largest cities in the Netherlands, as well as the ports of Rotterdam and Amsterdam, making this area the 'economic engine of the Netherlands'.<sup>39</sup> This connectivity, alongside other factors like high educational attainment and high English proficiency, has supported inward investment, and attracted international companies.<sup>40</sup>

To illustrate its impact, the airport is a significant freight port, being responsible for 1.8 million tons of cargo<sup>41</sup> and facilitating the Netherlands' status as a top-five export country, despite its ranking as the 28th-largest world economy.<sup>42</sup>

## Hong Kong

Hong Kong International Airport is currently in the process of expanding from two to three runways, with delivery expected in 2024. In many ways, the challenges Hong Kong faces are similar to Heathrow and London. The airport is located in the Pearl River Delta, a major economic area of mainland China, and contributes around 4.6% of Hong Kong's GDP.<sup>43</sup>

Air connectivity is considered crucial to maintaining Hong Kong as an international business centre and a world city. The airport was designed for 87 million passengers and 8.9 million tonnes of cargo per annum, with 376,000 air traffic movements.<sup>44</sup> Enhancement has increased this capacity to 420,000 air traffic movements but it will reach capacity by 2022.<sup>45</sup>

## What do the public expect from air travel?

Passenger satisfaction is generally high, with 58% of passengers reporting they enjoy air travel, 61% confident of getting the service they have paid for and 75% confident of the safety of airports and aircraft.<sup>46</sup>

Almost half of UK adults have flown within the previous calendar year, according to the most recent government survey data, released in 2014.<sup>47</sup> This compares to almost two-thirds who used a train at least once in the previous year.<sup>48</sup>

The public are conscious of environmental concerns, with 42% agreeing that the price of a plane ticket should reflect the impact of aviation on the environment.<sup>49</sup> That said, since liberalisation of the market, passengers have become more resistant to increases in the cost of travel brought about by carbon taxes or constrained supply.<sup>50</sup>

The UK has Airport Passenger Duty (APD) that was set up as an environmental charge on all passengers departing from UK airports. This tax raises substantial sums for the Treasury and is scaled to penalise business more than leisure, with double the rates for all but economy seats. The APD charge is non-hypothecated and highly unpopular in the UK travel industry and has resulted in a significant differentiator for growth compared to European countries.

Nonetheless, in 2013 the Airports Commission considered APD to be a valuable feature of a sustainable aviation industry in the UK. APD has the potential to be an important demand-management tool that may be used by future governments, including devolved administrations, to ensure that the UK meets its commitments on aviation emissions. Although not targeted specifically at emissions, the tax is also a means by which consumers currently make a contribution to offset the

<sup>39</sup> Savills (2018) [Amsterdam](#)

<sup>40</sup> Ibid

<sup>41</sup> Ministry of Foreign Affairs (2018) [The Netherlands Compared](#)

<sup>42</sup> Schiphol (2019) [What Schiphol Means for the Netherlands](#)

<sup>43</sup> Hong Kong International Airport (2011) [Hong Kong International Airport Master Plan 2030](#)

<sup>44</sup> Ibid

<sup>45</sup> Ibid

<sup>46</sup> ComRes, for the Civil Aviation Authority (2018) [UK Aviation Consumer Survey](#)

<sup>47</sup> Department for Transport (2014) [Public Experiences of and Attitudes Towards Air Travel: 2014](#)

<sup>48</sup> Department for Transport (2018) [Public Attitudes Towards Train Services: Results from the February 2018 Opinions and Lifestyle Survey](#)

<sup>49</sup> Department for Transport (2019) [National Travel Attitudes Study: 2019 Wave 1](#)

<sup>50</sup> Department for Transport (2018) [Aviation 2050: The Future of UK Aviation](#)

social and environmental impacts of their aviation choices and it is noted that airlines do not pay VAT or fuel duty on aviation fuel.<sup>51</sup>

Some 79% of passengers who have ever flown cite the price of flights as the most important factor when deciding which airline to fly with.<sup>52</sup> A DfT study suggests that in the future passengers may also become more discerning about the quality of the service they receive and the reputation, solvency and track record of the airline they choose.<sup>53</sup>

## Business sentiment

Business is generally supportive of a third runway at Heathrow. The CBI considers the expansion needed for 'the UK ... to remain a globally competitive economy', citing the expansion as being able to provide 'new global links and routes' which will 'unlock jobs right across the UK'.<sup>54</sup> The British International Freight Association is also keen to see expanded airfreight capacity, saying, 'Our 1,500 member companies ... have been dismayed over the ongoing delay'.<sup>55</sup>

## Does Heathrow have sufficient connectivity to meet passenger needs?

The benefits of enhanced capacity can be maximised by improved surface access to airports.<sup>56</sup> Around 40% of journeys to Heathrow are currently made by public transport.<sup>57</sup> As part of the third runway programme, Government ministers have said that Heathrow must ensure more people travel by public transport to the airport.<sup>58</sup>

Heathrow's public transport links are through major rail and underground lines and will be enhanced when Crossrail is fully operational. There is road-borne connectivity through the M4 and M25. Additional rail connections are also in development, with a western rail link being developed by Network Rail<sup>59</sup> connecting through to Reading and GWR, and a southern rail link mooted as a market-led proposal.<sup>60</sup> Heathrow currently hosts the UK's busiest coach station and the number of passengers using this mode of transport is planned to double.

Attractiveness of travel by public transport is affected by a number of factors, including the availability of step-free interchanges; frequency, journey times and availability of services at times when people need them; pricing of the service; and reliability.

## The third runway – current status of the project

While major airports can bring great benefits, they also face opposition from those affected by construction or operation. This is particularly the case in terms of their impact on local communities and the environment, alongside concerns around cost.

## Environmental impact and noise pollution

International aviation emissions are not currently included in the UK's carbon budgets<sup>61</sup> but are a part of the UK's long-term target of net zero by 2050.<sup>62</sup> While aviation's contribution to UK emissions is low (6% in 2014<sup>63</sup>), aviation emissions have more than doubled since 1990, while overall emissions have fallen by 40%.<sup>64</sup> There is also evidence that damage to

<sup>51</sup> Airports Commission (2015) [Final Report](#)

<sup>52</sup> Ipsos Mori (2019) [Aviation Index 2019 – Public Attitudes Towards Aviation in the UK](#)

<sup>53</sup> Department for Transport (2018) [Aviation 2050: The Future of UK Aviation](#)

<sup>54</sup> CBI (2019) [CBI Comments on Heathrow Runway Ruling](#)

<sup>55</sup> British International Freight Association (2019) [Forwarders Welcome Heathrow Ruling](#)

<sup>56</sup> ICE (2016) [National Needs Assessment](#)

<sup>57</sup> Heathrow (2014) [Sustainable Transport Plan](#)

<sup>58</sup> Parliament.UK (2019) [Heathrow Expansion: Written Statement – HCWS1531](#)

<sup>59</sup> Network Rail (2019) [Western Rail Link to Heathrow](#)

<sup>60</sup> Aecom (2018) [Heathrow Southern Railway](#)

<sup>61</sup> House of Commons Library (2019) [UK Carbon Budgets](#)

<sup>62</sup> Committee on Climate Change (2019) [Letter to the Rt Hon Chris Grayling MP – Aviation 2050: The Future of UK Aviation](#)

<sup>63</sup> Committee on Climate Change (2016) [UK Aviation Emissions Must Be Consistent with UK Climate Change Commitments. CCC Says](#)

<sup>64</sup> Committee on Climate Change (2019) [Letter to the Rt Hon Chris Grayling MP – Aviation 2050: The Future of UK Aviation](#)

the environment is increased by the pollution being released at high altitude. The German Aerospace Centre (DLR) produced a report claiming that the climate impact of aircraft condensation trails and soot could treble by 2050.<sup>65</sup>

With the likelihood of only moderate fuel efficiency improvements for aviation in the foreseeable future,<sup>66</sup> it follows that any increase in the ceiling on the number of flights permitted will result in greater carbon emissions.

The Committee on Climate Change (CCC) set a target of 37.5 MtCO<sub>2</sub>e for aviation by 2050, or levels equivalent to those in 2005, for the Fifth Carbon Budget in 2015.<sup>67</sup> A third runway at Heathrow is estimated to add between 1.5 and 2.9 MtCO<sub>2</sub>e.<sup>68</sup> The committee believes long-term decreases in emissions per flight are achievable through 'new technologies and aircraft designs, improved airspace management, airline operations and use of sustainable fuels'.<sup>69</sup> Historically, engine technology has become more efficient, driven by a need to reduce the costs of fuel.<sup>70</sup> The overall impact could be further mitigated by initiatives such as the Carbon Offsetting and Reduction Scheme for International Aviation.<sup>71</sup>

The London Assembly is notably opposed to expansion. It cites increased carbon emissions, noise pollution from new air routes and additional road congestion, which will impact on local air quality.<sup>72</sup>

Heathrow believes some of the localised carbon impact can be mitigated. It will ensure the runway is carbon neutral in embedded terms and install a 'meadow' of grass which can 'sequester greater amounts of carbon into the ground'.<sup>73</sup> It is also developing a noise insulation scheme worth £700 million for local residents and those under flight paths.<sup>74</sup>

## Cost concerns

The third runway programme is expected to have capital costs of £14 billion in 2014 prices, all of which is financed privately by the airport itself.<sup>75</sup> This is expected to be funded through operational charges such as landing, passenger service and aircraft parking, paid by airlines, as well as non-operational income ranging from retail, car parking and advertising to rentals from businesses in terminals and on the airport property. Income is consolidated into a 'Single Till' that enables commercial performance to support and moderate the operational charges. It should also be noted that Heathrow Airport Limited is an entirely private entity owned by a number of international and UK institutions and relies on its operational margins to fund future development.

While fees and Heathrow's ability to finance the project are regulated by the Civil Aviation Authority (CAA), there is concern from political quarters that Heathrow's investment grade credit rating and ability to finance the new runway might come under stress from market conditions, with potential impacts on services and passengers.<sup>76</sup> This has prompted the CAA to consult on how to ensure the financial resilience of Heathrow.<sup>77</sup>

While Heathrow is contributing to new connecting infrastructure, several bodies, including the London Assembly, are concerned that any additional demand for increased surface access or external infrastructure may fall on the public purse.<sup>78</sup>

## Potential restrictions on expansion at other airports

Heathrow, as the dominant airport in the UK, could crowd out competitors, especially in the South of England. Other airports, such as Gatwick and Birmingham, have expansion plans which could be halted over limits on aviation emissions.

<sup>65</sup> Deutsches Zentrum für Luft- und Raumfahrt (2019) [Climate Impact of Clouds Formed from Aircraft Condensation Trails Could Treble by 2050](#)

<sup>66</sup> ICE (2016) [National Needs Assessment](#)

<sup>67</sup> Parliament.uk (2018) [Annex I: Carbon](#)

<sup>68</sup> Department for Transport (2017) [UK Aviation Forecasts](#)

<sup>69</sup> Committee on Climate Change (2019) [Letter to the Rt Hon Chris Grayling MP – Aviation 2050: The Future of UK Aviation](#)

<sup>70</sup> ICE Publishing (2018), Paul Le Blond, [Inside London's Airports Policy: Indecision, Decision and Counter-Decision](#)

<sup>71</sup> ICAO (2019) [Carbon Offsetting and Reduction Scheme for International Aviation \(CORSIA\)](#)

<sup>72</sup> London.gov.uk (2019) [Expanding Heathrow Airport is the Wrong Move](#)

<sup>73</sup> Heathrow (2019) [Airport Expansion Consultation, Preferred Masterplan](#)

<sup>74</sup> Heathrow (2019) [Noise Insulation Scheme](#)

<sup>75</sup> Civil Aviation Authority (2019) [Economic Regulation of Capacity Expansion at Heathrow Airport: Consultation on Early Costs and Regulatory Timetable](#)

<sup>76</sup> Parliament.UK (2019) [Heathrow Airport: Written Question – 286261 in the Name of Andy McDonald MP](#)

<sup>77</sup> Civil Aviation Authority (2019) [Economic Regulation of Heathrow Airport Limited: Working Paper on Financial Resilience and Ring Fencing](#)

<sup>78</sup> London Assembly (2019) [Heathrow Airport Expansion Consultation \(Response\)](#)

Lord Deben, chair of the CCC, explained, 'If Heathrow is built, it has to be built within the envelope of emissions which we have allowed for aviation. It has knock-on effects. It means you can't build similar things elsewhere in the country.'<sup>79</sup> Airport expansion will be considered by the government once airports have made best use of existing runway capacity.

## Impact on the local community

A third runway will necessitate the compulsory purchase of land around the airport, as well as diversion of the M25 and the redirection of bodies of water. Heathrow estimates that 761 homes will be relocated, along with commercial properties, railheads, community centres and schools. The airport's footprint will increase from circa 1,200 to 1,800 hectares.<sup>80</sup>

Physical expansion is opposed by some councils concerned about the potential adverse impact on local communities. Hounslow outlines that it would prefer Heathrow to 'concentrate on improving its efficiency within its current format',<sup>81</sup> while Sutton Council is opposed 'due to the impact on neighbouring local boroughs'.<sup>82</sup> Some local authorities are more supportive, with Buckinghamshire County Council citing potential economic benefits.<sup>83</sup>

## How viable would alternatives to expansion at Heathrow be?

The Airports Commission considered a second runway at Gatwick and extension of the north runway at Heathrow in addition to a third runway at Heathrow. It decided a new runway at Heathrow offered the best route forward. In this section, ICE Fellows and other experts have offered their insights on proposed alternatives to address the concerns raised in the previous section.

### An additional runway at Gatwick

Gatwick is the busiest single-runway airport in the world<sup>84</sup> and handles 14% more passengers per runway than Heathrow.<sup>85</sup> Gatwick has been prevented from building a second runway by an agreement with West Sussex County Council since 1979, which expires at the end of 2019. There are, in theory, two runways already in place. A shorter runway to the north of the main runway was built as part of the agreement as a standby, or emergency, runway.

Gatwick set out in its master plan for future growth that the standby runway could be brought into use for departure flights only, owing to the runway's close proximity to the main runway, adding around 10–15 air transport movements in peak hours.<sup>86</sup> This would not provide the same capacity as a second full runway at Gatwick, which would allow for 10,000 more air transport movements per year compared to a third runway at Heathrow.<sup>87</sup> Gatwick has safeguarded land earmarked for a second runway against development incompatible with a new runway, and it plans to continue to do this.<sup>88</sup>

While Gatwick had a strong case, expansion at Heathrow was favoured on the basis that long-haul and overall connectivity would be improved to a greater degree and that rail and transport connections would benefit a greater number of people. It is also believed that wider economic benefits, including jobs, would take longer to materialise and be smaller in scope with a Gatwick expansion.<sup>89</sup> A case for a second additional runway in the Southeast will arise at the latest by 2050<sup>90</sup> and given the ease of construction, strong economic case and steps already taken, Gatwick could prove a viable location at that time.

<sup>79</sup> Sky News (2019) [Heathrow's Third Runway May Prevent Other UK Airports from Expanding, Advisor Warns](#)

<sup>80</sup> Heathrow (2019) [Airport Expansion Consultation, Preferred Masterplan](#)

<sup>81</sup> London Borough of Hounslow (2019) [Public Consultation Launches on Heathrow Airport Expansion – Have Your Say For Hounslow!](#)

<sup>82</sup> Sutton Council (2019) [Heathrow Airport Proposed Expansion](#)

<sup>83</sup> Buckinghamshire County Council (2017) [Heathrow Expansion – Revised Airports National Policy Statement Consultation](#)

<sup>84</sup> Gatwick (2019) [Our History](#)

<sup>85</sup> Civil Aviation Authority (2019) [Air Passengers by Type and Nationality of Operator 2018](#)

<sup>86</sup> Gatwick (2018) [Gatwick Airport Draft Master Plan 2018](#)

<sup>87</sup> Department for Transport (2017) [UK Aviation Forecasts](#)

<sup>88</sup> Gatwick (2018) [Gatwick Airport Draft Master Plan 2018](#)

<sup>89</sup> Airports Commission (2015) [Final Report](#)

<sup>90</sup> Airports Commission (2013) [Interim Report](#)

## Expansion and connectivity at regional airports

Historically there has been a lack of demand-based need for expansion at regional airports.<sup>91</sup> However, improving connectivity at these airports would be likely to lead to a greater utilisation of capacity by creating new journey opportunities for both business and pleasure.

Indeed, a more recent report by Airlines UK found that UK airfreight would benefit from greater utilisation of regional capacity.<sup>92</sup> This would encourage greater competition and support regional businesses wishing to export. This is pertinent given that airfreight has grown in the last decade, with an increase of 8.2% between 2015 and 2016 alone.<sup>93</sup>

## High-speed rail

Since it started operating, High Speed One (HS1) has captured more than 80% of the market between London and Paris.<sup>94</sup> This has reduced carbon impacts due to modal shift from air and sea to rail and freed up capacity at airports.

Should HS2 go ahead, similar effects on domestic routes between Heathrow, Manchester and Scotland could occur. Catchment areas for all airports on HS2's route would benefit from much enhanced connectivity, providing passengers with more choice, utilising spare capacity in the Midlands and the North.

The principle could be extended further, to the near Continent. A link connecting HS1 and HS2 via Heathrow and Gatwick<sup>95</sup> with airports in Paris and the Netherlands could allow for these airports to work as a regional 'mega hub'. However, cost and practical challenges, including planning, would potentially prohibit the scheme. Additionally, the scheme would be subject to whatever new arrangements are developed following Britain's departure from the European Union.

HS1 has the capacity to accommodate future international growth. In 2017/18 there were 17,203 international train movements on HS1.<sup>96</sup> There would be capacity for up to 32,200 international train movements by 2040 from a combination of additional Eurostar services and a new entrant.<sup>97</sup> Further, there are examples of equivalent air-to-rail shifts in Europe, where Lufthansa provides an express rail service between Frankfurt and Cologne, replacing domestic flights on this route.<sup>98</sup>

<sup>91</sup> Airports Commission (2013) [Interim Report](#)

<sup>92</sup> Airlines UK (2018) [Assessment of the Value of Air Freight Services to the UK Economy](#)

<sup>93</sup> IATA (2016) [October Air Freight Demand Up 8.2%](#)

<sup>94</sup> HS1 Ltd (2019) [Five Year Asset Management Statement, Control Period 3](#)

<sup>95</sup> Expedition (2018) [HS4Air](#)

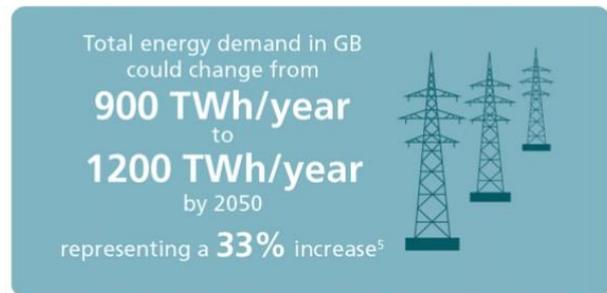
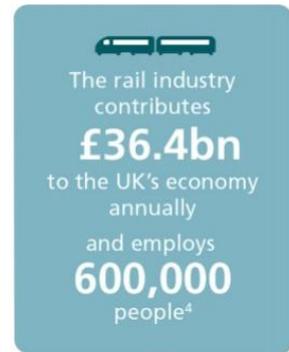
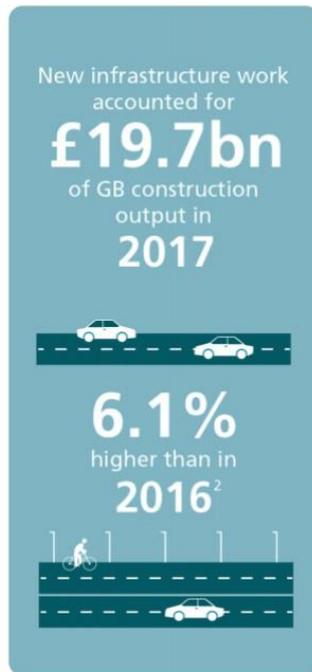
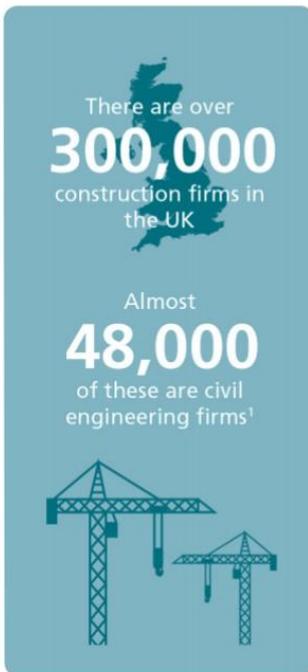
<sup>96</sup> HS1 Ltd (2019) [Five Year Asset Management Statement, Control Period 3](#)

<sup>97</sup> Ibid

<sup>98</sup> Frankfurt Airport (2019) [Lufthansa Express Rail](#)

## GB AND UK HEADLINES

From roads to railways and bridges to power stations, high-performing infrastructure is vital for economic growth and thriving communities.



1. ONS (2018) Construction statistics annual: Number 19, 2018 edition  
4. Oxford Economics (2018) The Economic Contribution of UK Rail

2. ONS (2018) Output in the construction industry  
5. ICE (2016) National Needs Assessment

3. ONS (2018) Gross Value Added (GVA)

## About ICE

Established in 1818 and with over 93,000 members worldwide, the Institution of Civil Engineers exists to deliver insights on infrastructure for societal benefit, using the professional engineering knowledge of our global membership.

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