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London Luton Airport Expansion

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8.121 Rail Impacts Summary

Infrastructure Planning (Examination Procedure) Rules 2010

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8.121 Rail Impacts Summary

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1 INTRODUCTION

1.1.1 This report summarises the capacity assessment of rail services to London Luton Airport ('the airport'), in terms of on-train crowding, capacity of the Luton DART (Direct Air-Rail Transit) and the capacity of Luton Airport Parkway station. Work on rail capacity for the Luton DART, Luton DART stations and Luton Airport Parkway Station was undertaken in 2019 and 2020.

1.1.2 The period between 2020 and the start of the examination for the application for development consent has seen a period of uncertainty and change within the rail sector. Rail demand has seen significant changes in commuting due to the change in working patterns occurring as a result of the Covid-19 pandemic. In response the Government has made changes to the service patterns to reduce costs. However, the future rail capacity work was based on the expectations of both demand (present and future forecasts) and proposed services levels at the time of assessment in 2019 (pre-Covid). With rail demand still recovering and new trends emerging a steady state of rail demand has not yet fully emerged from which to establish a new baseline.

2 FORECASTING RAIL DEMAND

2.1 Forecasting demand from the airport

2.1.1 Passenger rail demand was forecast based on the airport passenger demand and development phasing outlined in Table 6.5 of the **Need Case [AS-125]** and the expected mode share following the introduction of the Luton DART. This is set out in Section 6.2 and Table 6.1 of the **Transport Assessment [AS-123]** with mode share for rail forecast to increase from 21% prior to expansion to 23% in 2027 (21.5 mppa), 27% in 2039 (27 mppa) and 27% in 2043 (32 mppa). This increase is supported by the following interventions and expected wider transport changes, that have occurred subsequent to the baseline data collection exercise in 2019:

a. Luton DART and Thameslink 20/20;
b. EMR Connect Services;
c. Elizabeth Line;
d. Parking costs/differentials; and
e. Road congestion.

2.2 Forecasting peak period demand

2.2.1 As set out in Chapter 7 of Appendix H of the **Transport Assessment [APP-202]** ('Appendix H') the key crowding implication of Proposed Development occurs during the morning peak commuter period in the southbound direction (travelling from the airport) and northbound in the evening peak commuter period (travelling to the airport). By considering the forecast airport daily demand profile and the future mode share the morning and evening peak rail

demand can be derived, as set out in Table 7.1 of Appendix H and reproduced below.

Table 2.1: Air passengers as % of rail passengers southbound (S/B) to / from London and Luton Airport Parkway (LAP)

Airport Annual Demand	Arriving Air Passengers*	PT Mode share	Rail Mode Share	Air Passengers travelling S/B	Arriving Air Passengers by Rail (S/B)**	LAP Services Overall Rail Demand (S/B)**	Proportion of S/B rail passengers that are also air passengers
18 mppa	3,480	38%	21%	80%	577	4,298	13%
21.5 mppa (2027)	3,712	40%	23%	80%	683	5,847	12%
27 mppa (2039)	5,396	45%	27%	80%	1,157	7,956	15%
32 mppa (2043)	7,261	45%	27%	80%	1,557	8,998	17%
Annual growth 2019-2043	**3.1%**	**n/a**	**n/a**	**n/a**	**4.2%**	**3.1%**	**n/a**

* (at Luton Airport Parkway station or on the airport's road network between 06.00-09.30)
** arriving at London St Pancras between 07.00-10.00

Table 2.2: Air passengers as % of rail passengers northbound (N/B) to / from London and Luton Airport Parkway (LAP)

Airport Annual Demand	Departing Air Passengers +	PT Mode share	Rail Mode Share	Air Passengers travelling N/B	Departing Air Passengers by Rail (N/B) ++	London St Pancras (LAP Services) Overall Rail Demand (N/B departing between 16.00-19.00	Proportion of N/B rail passengers that are also air passengers
18 mppa	4,314	38%	21%	80%	715	9,109	8%
21.5 mppa (2027)	5,096	40%	23%	80%	938	12,393	8%
27 mppa (2039)	5,917	45%	27%	80%	1,269	16,862	8%
32 mppa (2043)	7,068	45%	27%	80%	1,515	19,072	8%

Airport Annual Demand	Departing Air Passengers +	PT Mode share	Rail Mode Share	Air Passengers travelling N/B	Departing Air Passengers by Rail (N/B) ++	London St Pancras (LAP Services) Overall Rail Demand (N/B departing between 16.00-19.00	Proportion of N/B rail passengers that are also air passengers
Annual growth 2019-2043	**2.1%**	**n/a**	**n/a**	**n/a**	**3.2%**	**3.1%**	**n/a**
+ (at Luton Airport Parkway station or on the airport's road network between 16.30-19.30) ++ departing from St Pancras between 16.00-19.00							

2.3 Forecasting background demand

2.3.1 Rail demand was forecast using a 3.1% annual growth rate from the 2019 base year. This was based on the long term recorded growth rate on the route between London and Luton Airport Parkway from 2000 to 2017 (excluding the impact of the airport growth in rail demand on the corridor). This was a period of significant growth in the level of commuting into London and represents a comparatively high growth (and therefore robust) scenario for background demand.

2.4 Changes in post-Covid-19 demand and services

2.4.1 There has been a significant reduction in demand as a result of Covid-19 and subsequent changes to commuting patterns. This has impacted both the total demand for rail and the distribution of those passengers, with stronger recovery in weekend travel and the biggest reductions on Monday and Friday peak times.

2.4.1 As stated in paragraph 2.3.1, the forecast background demand growth was 3.1% from 2019 base year levels. This is likely to be an optimistic forecast for rail growth given the impact of Covid-19 on travel demand. Overall rail demand according to the Department for Transport (DfT) (Ref 1) has recovered to 80% excluding passengers from the Elizabeth Line. Therefore, to reach the forecast background demand in 2043, growth would need to be around 4.5% per year.

2.4.2 The Government has responded to the fall in demand by taking greater revenue risk from railway operators and moving to service based contracts. The DfT has also reduced services in response to changing demands to reduce costs. Whilst in the short-term capacity may have been reduced, if demand growth returns in the long term, then capacity would be increased to reflect this.

2.4.3 Growth in rail demand from the airport in Assessment Phase 1 (2027) in the morning peak SB direction is only 106 (18%) passengers compared to the base year with the higher levels of growth delivered through the later stages of the Proposed Development. As a result, the assessment years considered in Appendix H are 2037 and 2043 where there is more significant growth in airport

passenger demand from Assessment Phases 2a (580 passengers) and 2b (980 passengers). There is therefore significant time for services to return to previously forecast.

2.5 Assessment of impacts

2.5.1 Appendix H sets out the impact on airport passengers from the forecast growth in background demand related to the Proposed Development (both assessment Phases 2a and 2b) at the airport, as follows:

a. In the AM peak there are available seats to accommodate passengers at Luton Airport Parkway station.

b. In the PM peak seats are forecast to be occupied but standing capacity would be available. Seats would become available as passengers alighted at intermediate stations between London St Pancras and Luton Airport Parkway.

2.6 Assessment of individual services

2.6.1 The assessment of rail impacts did not model individual services. This is due to:

a. The medium and long-term nature of the forecast meaning that timetables are likely to have changes before the airport growth materialises, which will impact demand for individual services.

b. The exact demand on each service from the airport would have significant variance over the year and between days; by looking at the average peak period this variance is reduced.

c. Non-airport passengers can reassign between services if they prefer less crowded trains within the peak periods, therefore wider capacity can be utilised.

2.7 Impact on stations outside Luton Airport Parkway

2.7.1 Appendix H does not evaluate the impact on other stations. Airport demand represents a small share of demand on the networks (in 2019, for example, it was around 8%) and passenger demand is widely distributed across days and times. It is therefore considered that the impact on station capacity is not significant due to the highly distributed nature of airport passenger travel.

2.7.2 Hertfordshire County Council (HCC) raised concerns in their **Written Representations [REP1-069]** regarding the impact of the Proposed Development on stations at St Albans and Harpenden. The impact at these stations is not expected to be significant for the following reasons:

a. Civil Aviation Authority (CAA) data indicates that St Albans (the Local Authority area) provides less than 3% of total rail passenger demand for airport passengers.

b. For the AM peak (06:00-09:30) and PM peak (16:30-19:30) periods there is forecast rail demand of 1,960 and 1,908 respectively in 2043 (when 32 mppa airport passengers is expected to be reached)

compared to 730 and 905 for the AM and PM peak periods in the base year. With 3% of passengers coming from St Albans this represents an increase of 36 and 30 passengers respectively in the peak direction over a 3-hour period compared to the base year.

c. These passengers would be distributed across both Harpenden and St Albans stations and over the 3-hour period. St Albans station has recently undergone a capacity upgrade including a second footbridge adding capacity for passengers.

2.7.3 It is the Applicant's position that when compared to existing demand at these stations during the peak, the low level of change (less than 40 passengers over the peak period) does not require further detailed assessment.

2.7.4 Repeating this analysis for other Network Rail stations outside of Luton Airport Parkway station would similarly result in insignificant marginal impacts from airport growth. As shown in Table 2.2, no local authority area accounts for more than 10% of total rail passengers.

Table 2.3: Origin of rail passengers travelling to Luton in the 2019 CAA passenger survey (Ref 2)

Local Authority	Share of rail passengers in 2019
London Borough of Camden	10%
Bedford Borough	10%
City of Westminster London Borough	5%
London Borough of Southwark	5%
City and County of the City of London	5%
London Borough of Islington	4%
London Borough of Tower Hamlets	3%
St. Albans	3%
London Borough of Hackney	3%
London Borough of Kensington and Chelsea	3%
All other Local Authorities	2% or less

2.7.5 London St Pancras represents the station with the largest share of passengers outside Luton Airport Parkway, as it is the terminus of East Midlands Services and is a stop on the Thameslink network. However, the increase in passengers remains small compared to the overall capacity of the station, a key Central London interchange and terminus. For example, in 2019 London St Pancras station had 44,400 AM peak domestic passenger arrivals (Ref 3). Ticketing data from the 2021-2022 origin and Destination Matrix (Ref 4) suggests that around 44% of passengers travel from Luton Airport Parkway to London St Pancras. This would imply an increase of around 500 passengers over the morning peak with assessment Phase 2b by 2043, an increase of around 1% over a 23-year period.

2.7.6 Through consultation, Transport for London (TfL) has raised concerns around the potential impact of increasing airport demand on London Underground services. The 2019 CAA survey data shows that 28% of rail passengers travelling to the airport also travelled by London Underground. If this share is maintained, then in the future morning peak, demand for London Underground services would increase by around 550 passengers per weekday peak. This represents a very small change in overall London Underground demand and would be distributed across multiple London Underground lines and services.

2.7.7 Passengers interchanging from London Underground to the airport are also distributed across several interchanges including West Hampstead, St Pancras, Farringdon, City Thameslink, Blackfriars and London Bridge. The introduction of the Elizabeth line also provides an additional interchange at Farringdon. The change in demand is very small when compared to the overall scale of interchanges which take place at key London Underground stations. For example, over 22,000 interchange trips were undertaken between services at Kings Cross Pancras Underground station in 2022 (Ref 5). Taking into account the scale of the stations in London, the Proposed Development will have an insignificant impact on London Underground station interchange capacity.

3 Basis of Demand for Luton DART and Luton Airport Parkway

3.1.1 Table 3.1 sets out the basis of design for the proposed Luton DART extension to Terminal 2 for the Proposed Development with 32 mppa and Table 3.2 the calculation for translating this into a peak flow.

Table 3.1: Demand projection used for developing Luton DART extension capacity requirements, 32 mppa

	Typical Day	Peak Day
2-way busy Hour	8,864	9,744
Arrival Busy Hour	4,510	4,924
Departure Busy Hour	5,612	**5,990**

Table 3.2: Peak hour flows projected on the Luton DART

			Luton DART Demand – passengers per hour per direction (pphpd)					
mppa	Airport Peak Hour	Rail Mode Share	Landside Factor	Airport Passengers	Airport Employees	Car Parks	Total	Equivalent Intra-Peak Hours
32 mppa (Typical Day)	5,612	26.8%	95.9%	1442	62	150	1654	2130
32 mppa (Peak Day)	**5,990**	**26.8%**	**98.4%**	**1580**	**62**	**150**	**1792**	**2314**

3.1.2 These projections resulted in the following design requirements for the peak demand flow which is **2,314** in the base peak hour peak day.

3.1.3 The Luton DART is currently operating at 14 services per hour with train capacity of 170 passengers per vehicle giving capacity of 2,380.

3.1.4 The vehicles are provided with wide doors to allow rapid boarding and alighting and are designed to take a peak load of 170 passengers (including 34 seated). The system can be expanded by the addition of two further carriages (45 passengers each).

3.1.5 Designs considered the likely changes to the airport's requirement through the long life of the structural assets and accommodate a variety of systems to be installed in future, such as an extension of the system to Terminal 2 in the event the DCO is approved and the airport is expanded.

3.1.6 Stations are futureproofed by designing platforms which can accommodate these longer trains, to minimise the need for costly changes and disruptive construction in the future. The airport Luton DART station is futureproofed and flexibly designed for potential further development of the Luton DART route on to a second terminal, if consented, and provides an extra wide 12m central platform that is resilient to surges in demand.

3.1.7 Provision has been made in the design for extension or capacity expansion of the system. The alignment, stations and structures incorporate provision for the system to be upgraded to accommodate higher capacity services.

3.1.8 The Luton Airport Parkway station capacity assessment was based on the following peak hour airport scenario at 32 mppa.

Table 3.3: Demand projection used for developing Luton Airport Parkway station capacity assessment

mppa	Arrival peak landside	Departures Peak Hour Landside	Rail mode share	2-way Hourly	Employees to Station[1]	Employees to Airport[2]	To MSCP[3]	From MSCP[4]	2 Way Total	2way hourly T1[5]	2way hourly T2[6]
32 mppa (Typical Busy Day)	3,278	3,487	26.8%	1813	214	36	522	306	**2891**	1626	1265
32 mppa (Peak day)	3278	3599	0.268	1987	214	36	522	306	**3065**	1724	1341

4 FUTURE RAIL SERVICES

4.1 Current and past airport services

4.1.1 The current service to the airport is 10 trains per hour (tph) in the AM peak hour (7:30-8:30) consisting of 8tph Thameslink and 2tph EMR Corby to St Pancras service marketed as the Luton Airport Express.

4.1.2 Previously, longer distance EMR services called at Luton Airport Parkway Station once per hour serving Leicester. This was replaced in 2020 with the 2tph EMR service which instead serves Corby with a more regular timetable.

4.2 Post Covid operating model of the Railway and the Williams/Shapps plan for rail

4.2.1 The impact of Covid-19 on passenger demand caused the Government to end the previous franchise agreement and move to EMA (Emergency Measures Agreements) and EMRA (Emergency Recovery Measures Agreements) contracts, effectively with the Government taking revenue risk and operators paid to operate a given service level. Previously with franchising the proposed timetable as set out in franchise agreement.

4.2.2 The Government was already developing new proposals for how the railway could operate resulting in the Shapps/Williams Plan for Rail (Ref 6), published in May 2021.

4.2.3 The Plan for Rail sets out how the railway will be planned in the future with the proposed Great British Railway (GBR) (a proposed state-owned public body to oversee rail in Great Britain) taking a greater role in the planning of the railway with train operators operating performance-based Passenger Service Contracts

(PSCs). GBR is yet to be granted these powers through legislation within the proposed Draft Rail Reform Bill (Ref 7).

4.2.4 Currently, train operators run services through a National Rail Contract (NRC). The current services at Luton are operated as follows:

a. Current Thameslink, Southern and Great Northern 2022 rail contract operating until 1 April 2025,

b. Current Abellio East Midlands Limited 2022 rail contract operating until 13 October 2030.

4.2.5 Annual commitments are made and agreed between DfT and operators through annual business plan commitments, published on the DfT website.

4.2.6 The 2023/24 Thameslink, Southern and Great Northern business plan (Ref 8) commitments include the following:

Luton and Gatwick Airports Collaboration: The Operator shall collaborate and engage with the operators of Luton Airport and Gatwick Airport in developing, and supporting the implementation of, strategies to increase rail modal share of journeys to and from those airports.

4.2.7 The 2023/24 EMR business plan (Ref 9) commitments include the following:

The Operator shall implement the developed brand strategy and plan for "Luton Airport Express Brand" for Passenger Services to and from Luton Airport Parkway as part of supporting the launch of the Luton Airport Dart and the promotion of the Luton Airport Express service together with a programme specifying the timescales for the implementation of the relevant marketing activities as approved by the Secretary of State (the "Luton Airport Brand Strategy").

4.2.8 There remains some uncertainty over the future operating model that will be adopted and the role for DfT, GBR and operators in planning future timetables. Under any model it would be expected that services levels would be planned logically in relation to demand and crowding levels.

4.3 Potential for future services at Luton Airport Parkway Station

4.3.1 The analysis of rail capacity is based upon reasonable assumptions at the time of production of the **Transport Assessment [APP-200-203, APP-205-206, AS-123]**, and relies upon commitments outlined in the franchise agreement proposal to introduce the proposed Thameslink 20/20 timetable (the level of service in GTR's Timetable Consultation Phase 2 in 2018, proposed to be introduced over the franchise). Currently Luton Airport Parkway station has 21 Thameslink services over the morning peak (7-10am) compared to 24 in the 20/20 timetable, in the evening peak (4-7pm) 20 services compared to 24 in the 20/20 timetable.

4.3.2 However, the rail assessment is based on the expected future services in 2027, 2039 and 2043 (and the early years rail growth is far less significant than later years). Should demand for services grow for Thameslink, then it is expected that the timetable would be altered to provide more services (most likely aligned

to the previously proposed 20/20 timetable). The decision on future timetable increases would need to be agreed by government and train operators in the short term, or in the medium and long term these powers could be taken on Great British Railway (GBR).

4.3.3 There is also potential for further services at Luton Airport Parkway Station. Previously, there was a proposal for a 4 tph EMR service, to match the services available at other London-based airports. Whilst this was not taken forward by the operator (with the 2ph service to Corby – St Pancras airport express introduced instead) however it remains a feasible ambition.

4.3.4 Growth at the airport (serving more destinations and at higher frequencies) will increase demand for passengers to travel to the airport, and the growth in the destination and frequency of flights will increase the airport's attractiveness and generate new demand which rail could seek to serve through increased services).

4.3.5 The benefit of stopping services at Luton Airport Parkway station would need to be significant enough to offset the cost of an additional stop as this would result in a longer journey time for passengers not beginning or ending their journey at the airport. Improvements such as further electrification of the Midland Mainline could support improved services at the airport.

4.3.6 Therefore, as the airport grows and its demand increases, the likelihood of the railway operator stopping services at the airport also increases whether this planning takes place through GBR/DfT or operated through either a franchise or open access operator. The growth in forecast rail demand because of the Proposed Development and higher mode share for rail from the opening of Luton DART and other **Surface Access Strategy [APP-228]** measures will make Luton Airport Parkway station an increasingly key station on the East Midland route.

5 SUMMARY

5.1.1 The forecasting of available future capacity is reliant on three factors, the future rail service, the level of background demand and the level of airport demand generated through the Proposed Development.

5.1.2 Forecasting background demand growth was based on the data available in 2019 with future growth based on growth factors based on growth in prior years. Current expectations based on the fall in commuting demand due to changing working patterns as a result of the Covid-19 pandemic means future growth is likely to be lower than previously forecast. Previously forecast background growth was 3.1% per year resulting in a 109% growth by 2043.

5.1.3 Forecast airport demand is not impacted by the changes to commuting patterns and will increase with the Proposed Development due to forecast increased mode share for rail (from 21% to 27%) and higher total airport demand, as shown in Table 3.2 and Table 3.3. The airport growth is far less significant in both the morning and evening peaks compared to the forecast growth in background demand.

5.1.4 The impact on demand set out in paragraph 5.1.2 has resulted in operational model changes within the railway sector and changes to service levels serving Luton Airport Parkway. Whilst the current rail service is not currently operating the future service assumed at the time the Transport Assessment was undertaken, in the long term the case for increased future services is linked to future rail demand growth, both at the airport and from non-airport demand.

5.1.5 Station capacity impacts outside Luton Airport Parkway are not significant, due to the highly dispersed nature of the airport's rail demand. Where demand is more concentrated for example at London St Pancras, the growth from the Proposed Development will remain an insignificantly small share of total station demand (around 1%).

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