London Luton Airport

MASTER PLAN 19 MPPA

IDOM

LONDON LUTON AIRPORT MASTER PLAN 19 MPPA
Final Report (Version 2.6)
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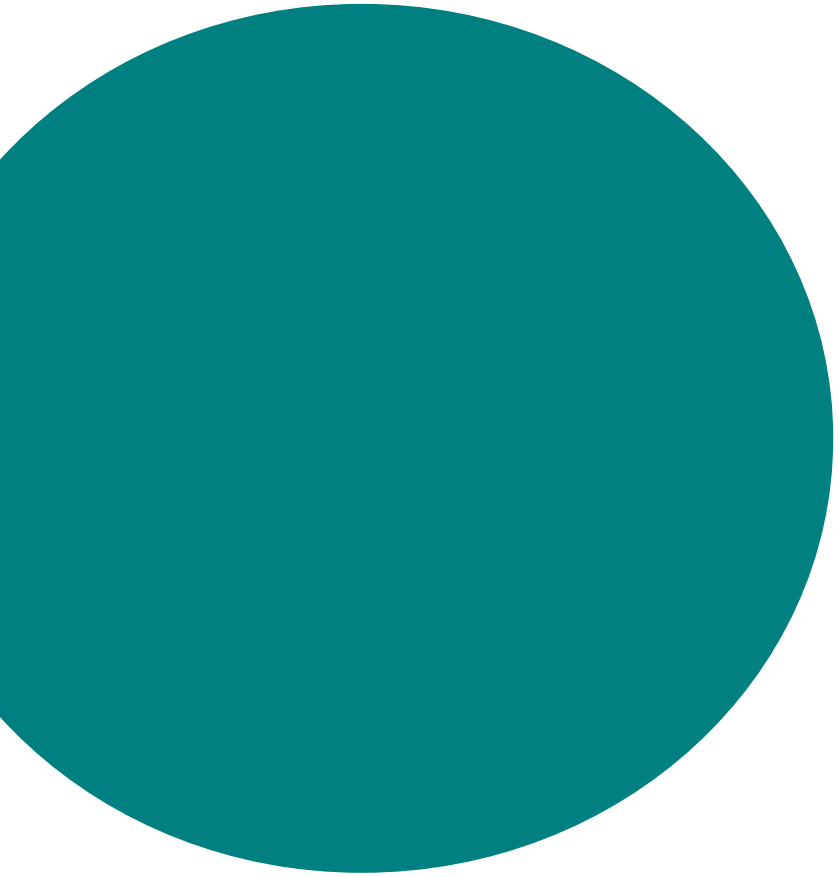

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EXECUTIVE SUMMARY

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0 EXECUTIVE SUMMARY

IDOM Consulting, Engineering, Architecture, SAU (IDOM) has been appointed by London Luton Airport Operations Limited (LLAOL) to develop a Master Plan for London Luton Airport in connection with the planning application under the Town and Country Planning Act (TCPA) to increase capacity at the airport to 19 million passengers per annum (mppa). In light of the COVID-19 pandemic, it is anticipated that the 19mppa traffic horizon will be reached around 2024 ("planning horizon").

It is acknowledged that London Luton Airport Ltd (LLAL), the airport owner, is currently in the process of a Development Consent Order (DCO) application for the longer term expansion of the airport to accommodate 32 mppa. This long-term vision for 32 mppa is to be achieved through the development of a new, second terminal building. This Master Plan for 19 mppa does not envisage the development of a new terminal and seeks to make the most efficient use of the existing terminal building. Therefore, this Master Plan is entirely independent of, and does not affect, the emerging DCO proposals.

This Master Plan is intended to serve as a framework for guiding the short-term development of the airport to increase its capacity from 18 million annual passengers to 19 million annual passengers. The present document collects the results of the different analyses undertaken as part of the Master Plan assessment including traffic forecast, capacity analysis, capacity requirements definition, and impact on people and natural environment.

0.1 Forecast

0.1.1 Due to the short-term nature of the Master Plan only one traffic forecast scenario has been identified for the planning horizon of 19 mppa. The volume horizon of 19 mppa was originally expected to be achieved between 2020 and 2021, if the annual growth rate experienced by LLA during previous years remain the same. However, as a result of the COVID-19 outbreak, LLA is experiencing a substantial reduction in passenger traffic in year 2020. In accordance with some recovery indicators and the current pandemic situation, it is expected that the airport will recover to the 18mppa traffic horizon around 2023 and the 19mppa traffic horizon will be achieved around 2024.

0.1.2 Annual aircraft movements (total and scheduled and charter) and peak hour figures (passengers and aircraft) have been forecasted for the planning horizon. The former has been estimated with the correlation of historic annual passengers and aircraft movements while the latter has been forecasted with the typical peak hour methodology. Potential changes in activity and historic evolution of key traffic parameters such as traffic composition have also been taken into consideration. In this manner, following traffic figures have resulted:

Table 0.1. Traffic forecast results for the design horizon

Parameter	Value
Total Annual Passengers	19,000,000
Total Domestic Passengers	1,216,000 (6.4%)
Total International Passengers	17,784,000 (93.6%)
Total EU Passengers	14,920,776 (83.9%)
Total non-EU Passengers	2,863,224 (16.1%)
Departures Peak Hour Passengers (PHP)	3,758
Domestic Departures Peak Hour Passengers (PHP)	241
International Departures Peak Hour Passengers (PHP)	3,517
Arrivals Peak Hour Passengers (PHP)	3,120
Domestic Arrivals Peak Hour Passengers (PHP)	200
International Arrivals Peak Hour Passengers (PHP)	2,920
Total Annual Aircraft Movements	142,566
Scheduled and Charter Annual Aircraft Movements	112,634
Peak Hour Aircraft (PHA)	36

Source: IDOM

0.1.3 According to the results shown in the table above, 19 mppa will cause an increase of 0.8% in terms of total annual aircraft movements and 1.9% in terms of scheduled and charter annual aircraft movements compared to 18 mppa. The discrepancy between annual passengers compound annual growth rate and annual ATMs compound annual growth rate is based on the fact that airlines will continue upgrading their

fleet to aircraft with higher seat capacity (186 and 235 seats instead of 156) over the planning horizon.

0.2 Existing Situation

0.2.1 London Luton Airport, LLA, is a civil international airport located in Luton. In 2018 the Curium investment plan was completed including the expansion of the Passenger Terminal Building and the increase of the airport's capacity to up to 18 mppa. LLA comprises one Passenger Terminal Building, PTB, one 2,162 metres long runway, four commercial aprons, and six taxiways. PTB and airfield facilities main capacity figures are shown in the tables below.

Table 0.2. Existing Passenger Terminal Building capacity

Facility	Area (m^2)	Equipment (no.)
Check-in Counters	1,351	62 counters
Boarding Pass Control before screening	369	11 gates
Passenger Security Screening	3,580	16 lanes + 8 body scanners
Waiting Lounge before Gate Announcement – Public Seating	1,074	689 seats
Waiting Lounge before Gate Announcement – Retail	4,042	-
Waiting Lounge before Gate Announcement – Food & Beverages	3,282	1,427 seats
Waiting Lounge before Gate Announcement – Duty-Free	1,690	-
Boarding Gates	-	31 gates
Immigration – Manual	639	15 manual booths
Immigration – Automated	230	15 gates
Baggage Reclaim – Domestic	740	1 belt
Baggage Reclaim – International	3,840	6 belts
Customs	145	1 x-ray
Arrivals Hall – Public Area	1,690	-

Source: IDOM

Table 0.3. Existing airfield capacity

Facility	Capacity
Runway	37 Peak Hour Aircraft
Stands	43 Code C

Source: IDOM

0.3 Planning Standards

0.3.1 The methodology used to determine facility requirements generally follows IATA's Airport Development Reference Manual (ADRM), 10th edition issued in May 2017 in its fifth roll-out. This assumes an Optimum Level of Service (LoS) with planning factors adjusted to reflect actual use characteristics at London Luton Airport, differing in some cases from the Optimum LoS range of values.

0.4 Facility Requirements

0.4.1 Capacity requirements for Passenger Terminal Building facilities (check-in, boarding pass control, passenger security screening, waiting lounge, boarding gates, immigration, baggage reclaim, customs, and arrivals hall) have been assessed by a combination of IATA ADRM capacity equations and best practices and planning experience at London Luton Airport to better reflect the airport's particular needs. Table 0.4 summarises the results.

Table 0.4. Passenger Terminal Building facilities requirements for 19 mppa

	Equipment (no)	Area (m^2)		
		Queuing	Process & Egress	Total
Self-Service Kiosks	**27**	**86**	**97**	**183**
Check-in	**40**	473	389	862
Bag Drop	19	88	185	273
Traditional	21	384	204	589
Boarding Pass Control	**8**	276	41	317
Passenger Security Screening	**15**	**903**	**1,500**	**2,403**
Waiting Lounge				
Public Seating	712 seats	-	-	1,459
F&B	713 seats	-	-	1,247
Retail	-	-	-	713
Corridor	-	-	-	428
Boarding Gates	**31**	-	-	-
Immigration	27	540	339	879
Manual	16	335	234	569
Automated	11	205	105	310
Baggage Reclaim	**7**	-	-	-
Domestic	1	-	-	-
International	6	-	-	-
Customs	**1**	**8**	**18**	**26**
Arrivals Hall	-	-	-	**1,062**

Source: IDOM

0.4.2 Airfield facilities (aprons, taxiways, and runway) requirements to cope with 19 mppa have been estimated based on the combination of historic real data and correlation of passengers and aircraft movements. In respect of taxiways, there is no need to increase the capacity for 19 mppa scenario because, the annual ATMs figure grows only 0.8% in this period. Stands and runway capacity requirements for 19 mppa are shown in Table 0.5.

Table 0.5. Airfield facilities requirements for 19 mppa

	Required Capacity
Apron	43 Code C commercial stands
Runway	36 Peak Hour Aircraft

Source: IDOM

0.5 19 mppa Plan

0.5.1 A facility requirements assessment for 19 mppa identified that the following facilities have enough capacity to cope with the forecasted demand:

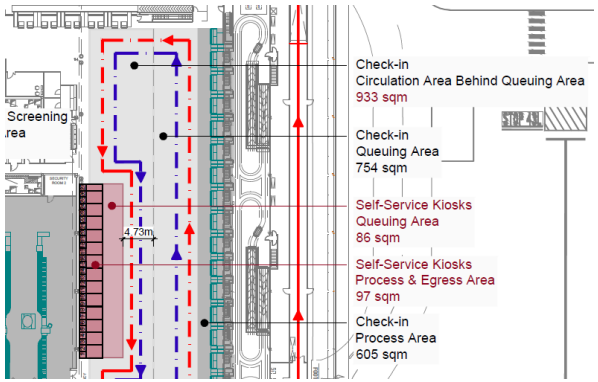
- Check-in (traditional and bag drop).
- Boarding pass control before security.
- Passenger security screening.
- Boarding gates.
- Baggage reclaim.
- Customs.
- Arrivals hall.
- Taxiways.
- Runway.

0.5.2 In contrast, the analysis showed a shortfall in capacity of the following Passenger Terminal facilities: self-service kiosks, waiting lounge public seating and immigration. However, no major expansion works are envisaged within the present Master Plan since the capacity of the mentioned facilities can be increased by means of minor refurbishment works, as summarised below.

- Self-Service Kiosks

The Master Plan includes the provision of self-service kiosks. The installation of 27 kiosks covering an area of 183 m^2 in front of the check-in counters is proposed.

Figure 0.1. Self-service kiosks provision at London Luton Airport



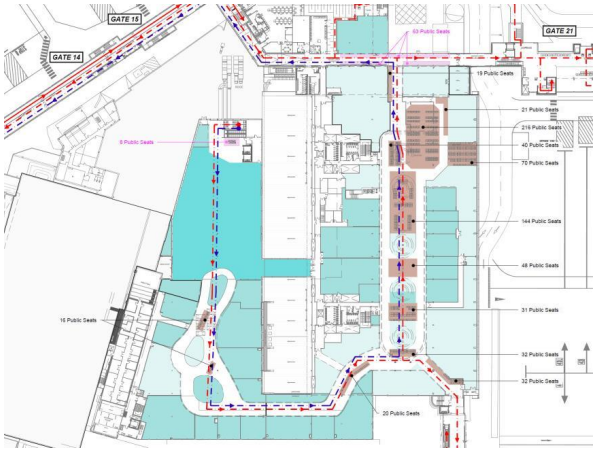
Source: IDOM

- Waiting Lounge – Public Seating

The capacity analysis has shown a shortfall of 23 public seats but also an excess on total available seats by IATA of 120 seats, located in the Food and Beverages facilities area. The excess of available Food and Beverage seats combined with additional public seating areas (excluded from the initial existing seats calculation because of their location before Duty-Free and at the end of the waiting lounge area) means that the Master Plan does

not envisage further refurbishment or expansion works to be necessary.

Figure 0.2. Waiting lounge with additional existing public seating areas

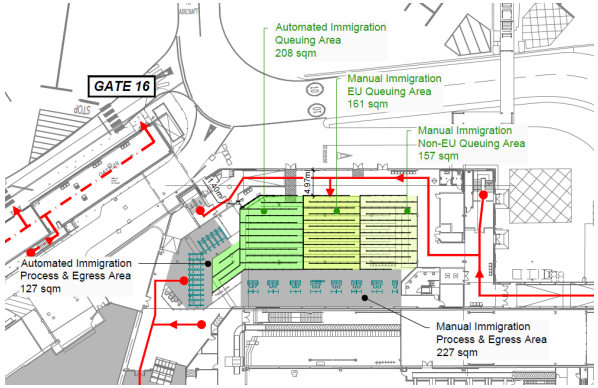


Source: IDOM

- Immigration

The shortfall of capacity for immigration derives from the queuing and process and egress area, as well as from the requirement to install one additional manual passport control booth .This is attributed to the increased usage of electronic gates and higher queuing time for non-European passengers. The required capacity can be achieved by reconfiguring the existing queuing area distribution and introducing one additional manual booth, without requiring further major expansion or refurbishment works, as shown in Figure 0.3.

Figure 0.3. Passenger immigration reconfiguration at London Luton Airport



Source: IDOM

0.5.3 The capacity requirements for 19mppa has not identified any lack of capacity in airfield facilities and therefore this Master Plan does not envisage any airfield expansion works.

0.6 Land Use Plan

0.6.1 The existing Land Use Plan is considered valid as no major expansion works (Passenger Terminal Building and airfield) have been envisaged for the planning horizon.

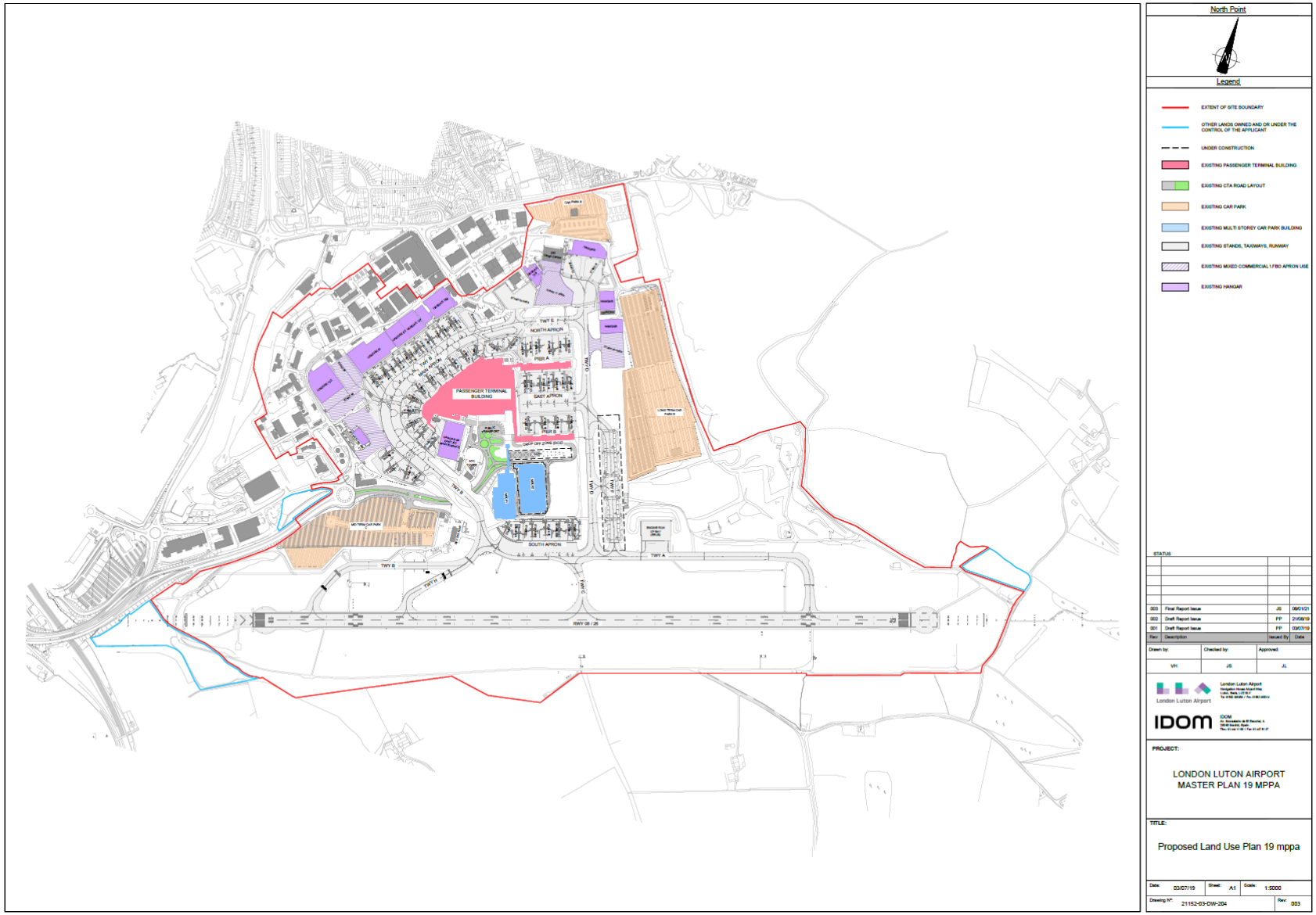
0.7 Impact on People and the Natural Environment

0.7.1 The existing and continued use of the airport leads to inevitable impacts on people and on the natural environment and the proposed changes to operations proposed in this Masterplan require consideration on those impacts. Of all environmental topics assessed it is considered that relevant impacts are expected only in respect of noise, air quality, waste and energy and climate change. The total number of air traffic movements is expected to increase by 0.8% with respect to the 18 mppa levels but the peak hour aircraft numbers will not increase. Impact will therefore be in respect of the overall average noise contours rather than peak noise levels. Control measures will be required to ensure that the noise levels from operations are contained within planning conditions. Air quality impacts, particularly from ground transport, are expected and will require additional assessment and control measures. Increases in waste generation and energy and climate change impacts could be expected in the absence of mitigation measures. No other significant impacts are expected. More detailed consideration of the specific impacts will be required as part of any planning applications for increased capacity.

0.8 Proposals to Minimise and Mitigate Impacts

0.8.1 The potential noise and air quality impacts arising from the increased intensity of operations will require specific mitigation measures to ensure that the impacts on people and the environment are acceptable. With respect to noise, available mitigation measures are provided within the existing noise action plan. In the longer term, mitigation measures will likely include the migration of the fleet to more modern and quieter aircraft. Noise levels will be controlled by planning conditions and legal agreement (if relevant). It will be LLAOL's obligation to meet those at all times including under increased passenger numbers. A detailed air quality assessment will accompany the planning application. Recommendations arising from that assessment will inform the mitigation measures which will include the opening of the DART and a reduction in road vehicles together with a travel plans and financial incentives. Waste and climate change impacts will be mitigated by LLAOL's ongoing waste and energy policies which call for continuous improvement in resource efficiency.

Figure 0.4. Proposed Land Use Plan for 19 mppa



Source: IDOM

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INTRODUCTION

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1 INTRODUCTION

IDOM Consulting, Engineering, Architecture, SAU (IDOM) has been appointed by London Luton Airport Operations Limited (LLAOL) to develop a Master Plan for London Luton Airport in connection with the planning application under the Town and Country Planning Act (TCPA) to increase capacity at the airport to 19 million passengers per annum

LLAOL has been responsible for London Luton Airport's management, operation and development since 1998, when LLAOL entered into a Concession Agreement with the local authority, Luton Borough Council (LBC), who owns the airport through London Luton Airport Ltd (LLAL).

It is acknowledged that LLAL is currently in the process of a Development Consent Order (DCO) application for the longer term expansion of the airport to accommodate 32 million passengers per annum (mppa). This long-term vision for 32 mppa is to be achieved through the development of a new, second terminal building. This Master Plan for 19 mppa does not envisage the development of a new terminal and seeks to make the most efficient use of the existing terminal building. Therefore, this Master Plan is entirely independent of, and does not affect, LLAL's emerging DCO proposals.

1.1 Need for a Master Plan

1.1.1 London Luton Airport (LLA) has grown from a small municipal aerodrome to one of the largest airports in the UK with 16.6 million passengers handled in 2018. The record-breaking figures registered at the airport in recent years have led to its increase in capacity to 18 mppa. The so-called Curium Project reached its culmination in 2018 with the opening of the expanded terminal facility increasing the airport's capacity to 18 mppa.

The airport's traffic numbers are predicted to continue to increase, requiring consideration of the next planning stage for LLA development. As a result, IDOM was appointed to develop LLA's Master Plan for 19 mppa.

1.2 Stakeholder Engagement

1.2.1 London Luton Airport plays an active role in the economic activity of the region and is essential to connect Bedfordshire to the world. In order to produce a Master Plan that meets the aspirations of the community, multiple actions of stakeholder engagement took place throughout the development of this document.

1.2.2 One of the key stakeholders that were liaised while developing this Master Plan was Luton Borough Council. The primary form of engagement was through technical meetings were held between LLAOL representatives and Luton Borough Council and their Consultants. During these meetings, LLAOL representatives presented the proposal and addressed comments from the local planning authority. Feedback received on these technical meetings has been duly considered during the development of this Master Plan.

1.2.3 In addition to engagement with Luton Borough Council, it is worth noting that the Master Plan has undergone other series of stakeholder engagement actions which included:

- A Non-Statutory Public Consultation was undertaken in Q3 2020;
- Presentation of the Master Plan to the Airport Forum and the London Luton Airport Consultative Committee (LLACC)

1.2.4 The comments received during these stakeholder engagement actions were analysed and it was concluded that the majority were related to environmental aspects of the Master Plan. To this end, Chapter 5 was revised in order to provide additional details to address these comments.

1.3 Master Plan Structure and Methodology

1.3.1 The present document describes London Luton Airport's Master Plan including the envisaged developments at the airport to increase capacity to 19 mppa.

1.3.2 It is important to note that a Master Plan is intended to serve as an airport short-term development guide and not as a design or implementation programme.

1.3.3 The present Master Plan is divided into six chapters and one appendix:

- Chapter 1 – Introduction

  This chapter.

- Chapter 2 – Forecast

  This chapter sets out the forecasting in terms of annual aircraft movements and peak hour figures for 19 mppa based on the analysis of the airport's historical activity and the potential changes in activity. Peak hour figures are estimated based on the 30th busiest hour methodology.

- Chapter 3 – Infrastructure Proposals

  This chapter comprises the description of the airport's current infrastructure and the capacity requirements analysis to cope with the forecasted demand in terms of Passenger Terminal Building (PTB) facilities (check-in, boarding pass control, passenger security screening,

waiting lounge, boarding gates, immigration, baggage reclaim, customs, and arrivals hall) and airfield facilities (aprons, taxiways, and runway). This chapter considers the proposed expansion solutions to increase the capacity of the facilities. The methodology used to determine facility requirements generally follows IATA's Airport Development Reference Manual (ADRM) 10th edition issued in May 2017 in its fifth roll-out, with planning factors adjusted to reflect actual use characteristics at London Luton Airport.

- Chapter 4 – Land Use Plan

  This chapter contains London Luton Airport's existing Land Use Plan and proposed Land Use Plan for the planning horizon.

- Chapter 5 – Impact on People and the Natural Environment

  This chapter addresses the potential impact on people and on the environment associated with both the traffic increase and the expansion solutions in terms of noise, air quality, waste, energy and climate change, ecology and biodiversity, ground and water conditions, and landscape.

- Chapter 6 – Proposals to Minimise and Mitigate Impacts

  This chapter sets out the proposed methods to minimise and mitigate the impacts on the environment in terms of noise, air quality, waste, and energy and climate change.

1.3.4 The Master Plan includes the following drawings as part of the appendix:

- 21152-03-DW-101 Existing Situation.
- 21152-03-DW-102 Existing Passenger Terminal Building Level 00.
- 21152-03-DW-103 Existing Passenger Terminal Building Level 10.
- 21152-03-DW-104 Existing Passenger Terminal Building Level 20.
- 21152-03-DW-105 Existing Land Use Plan.
- 21152-03-DW-201 Proposed Passenger Terminal Building Level 00.
- 21152-03-DW-202 Proposed Passenger Terminal Building Level 10.
- 21152-03-DW-203 Proposed Passenger Terminal Building Level 20.
- 21152-03-DW-204 Proposed Land Use Plan.

1.4 Abbreviations

1.4.1 The table below contains the list of abbreviations used in the present document.

Table 1.1. List of abbreviations

Acronym	Definition
ACS	Automated Control System
ADRM	Airport Development Reference Manual
AIP	Aeronautical Information Publication
AMD	Arch Metal Detector
ARR	Arrival
ASDA	Accelerate Stop Distance Available
ATC	Air Traffic Control
ATM	Aircraft Traffic Movements
CAA	Civil Aviation Authority (United Kingdom)
CTA	Central Terminal Area
CUTE	Common Use Terminal Equipment
DART	Direct Air Rail Transit
DCO	Development Consent Order
DEP	Departures
DOM	Domestic
DOZ	Drop off Zone
est	Estimated
ETD	Estimated Time of Departure
EU	European Union
FAA	Federal Aviation Administration (USA)
FBO	Fixed Base Operator
FSC	Full Service Carrier
GA	General Aviation
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
IFR/VFR	Instrumental/Visual Flight Rules
ILS	Instrumental Landing System
INT	International
LDA	Landing Distance Available

Acronym	Definition
LLA	London Luton Airport
LLAL	London Luton Airport Ltd
LLAOL	London Luton Airport Operations Limited
LBC	Luton Borough Council (LBC)
LCC	Low Cost Carrier
LoS	Level of Service
MARS	Multiple Aircraft Ramp System
MISC	Miscellaneous
MPAX	Million Passengers
mppa	Million passengers per annum
MSCP	Multi Storey Car Park
NB	Narrow Body
O&D	Origin and Destination
PAPI	Precision Approach Path Indicator
PAX	Passengers
PCN	Pavement Classification Number
PHA	Peak Hour Aircraft
PHD	Design Hour Passengers
PHP	Peak Hour Passengers
PM_{10}	Particulate Matter of 10 Microns in diameter or smaller
$PM_{2.5}$	Particulate Matter of 2.5 Microns in diameter or smaller
PRM	Persons with Reduced Mobility
PTB	Passenger Terminal Building
PT	Processing Time
RFF	Rescue and Fire Fighting
RWY	Runway
SBR	Standard Busy Rate
TCPA	Town and Country Planning Act
THR	Runway Threshold
TODA	Take-Off Distance Available
TORA	Take-Off Run Available
TWY	Taxiway
UK	United Kingdom
VOR	Very High Frequency Omni directional Range
WB	Wide Body

Source: IDOM

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FORECAST

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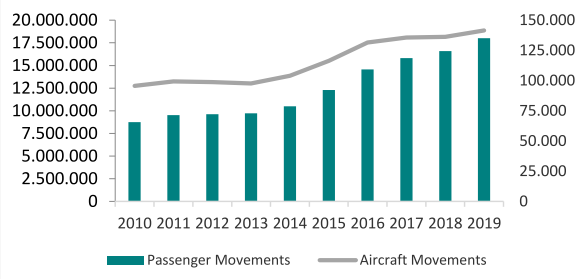
2 FORECAST

2.1 Historical Activity

2.1.1 The airport has grown from a small municipal aerodrome to one of the country's largest airports with 18 million passengers handled in 2019, representing an overall growth of 8.6% compared to 2018. LLA also handled 141,481 aircraft movements in 2019, about 4.8% more than the previous year. The following figure and table provide an overview of the historic traffic development, both passengers and aircraft, for Luton Airport since 2010. Passenger traffic at LLA increased with an average annual growth rate of 8.5% during the last decade.

Figure 2.1. Historic passengers and aircraft movements (2010 to 2019)



Source: LLAOL

Table 2.1. Overview of historic passengers and aircraft movements (2010 to 2019)

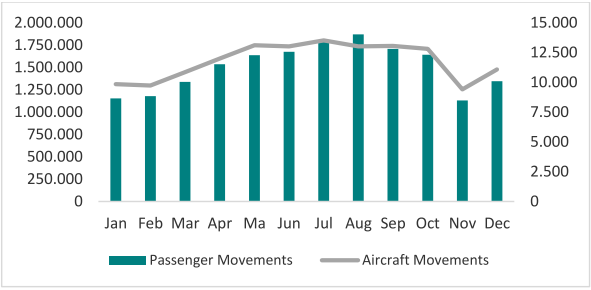
Year	Passenger Movements		Aircraft Movements	
	Total	% of change	Total	% of change
2010	8,751,598		95,604	
2011	9,526,659	8.9%	99,287	3.9%
2012	9,630,969	1.1%	98,732	-0.6%
2013	9,709,149	0.8%	97,596	-1.2%
2014	10,500,132	8.1%	103,928	6.5%
2015	12,279,176	16.9%	116,412	12.0%
2016	14,551,774	18.5%	131,536	13.0%
2017	15,799,219	8.6%	135,538	3.0%
2018	16,580,725	5.0%	136,267	0.9%
2019	17,999,969	8.6%	141,481	4.8%

Source: LLAOL

Seasonality

2.1.2 The airport's busiest time of the year is from May to October with peaks in July and August, as shown in the figure below. In 2019, LLA handled more than 1.8 million passengers in August, representing 10.4% of the total number of passengers registered in 2019 (18 mppa) and 20% more passengers than the monthly average in 2019 (1.5 million passengers). However, the busiest month in terms of aircraft movements was July with 13,711 movements (2019), suggesting the load factor, or average passengers per flight, was higher in August than in July. This pattern of seasonality is generally expected to continue over the planning horizon. Refer to Figure 2.2.

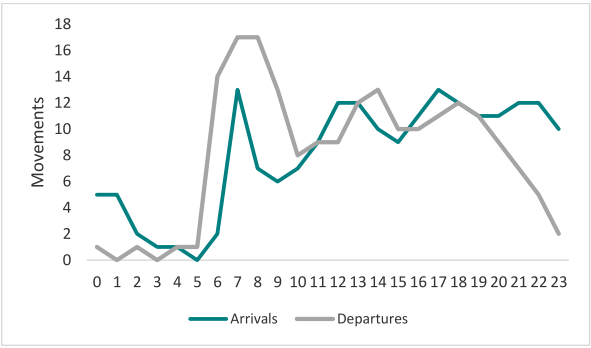
Figure 2.2. Seasonality at London Luton Airport (2019)



Source: LLAOL

2.1.3 The busiest time on average during 2019 for departures (grey line in Figure 2.3) was from 07:00 to 08:59, with another peak between 14:00 and 14:59. The average busiest hours for arrivals (green line in figure Figure 2.3) were from 07:00 to 07:59, with a second peak between 17:00 and 17:59. The graph also shows a low level of average movements for both departures and arrivals during the hours of 00:00 to 04:00.

Figure 2.3. Annual average hourly movements (2019)



Source: LLAOL Annual Monitoring Report 2019

Airlines

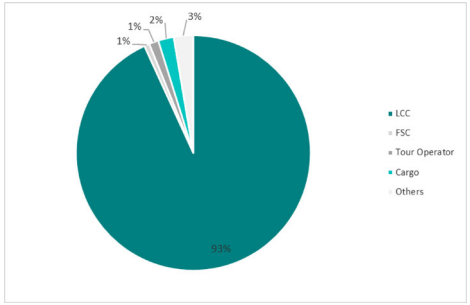
2.1.4 The annual average hourly movements are characterized by the airline type operating at the airport. The early morning peaks are usually distinctive for Low Cost Carriers (LCC) and Tour Operator Airlines. 93% of the aircraft movements handled at LLA in 2019 correspond to LCC.

Table 2.2. Operator aircraft movements (excluding GA) (2019)

Operator	Operator Type	Aircraft Movements	
		Total	%
easyJet	LCC	48,080	42%
Wizz	LCC	40,811	36%
Ryanair	LCC	13,438	12%
Blue Air	LCC	2,388	2%
Vueling	LCC	902	1%
TUI	Tour Operator	1,475	1%
DHL	Cargo	2,430	2%
El Al	FSC	822	1%
Others	Undefined	3,033	3%
Total		**113,379**	**100%**

Source: LLAOL

Figure 2.4. Aircraft movements by operator type (2019)



Source: LLAOL

Aircraft Mix

2.1.5 The analysis of LLA's fleet mix has shown that the majority of total aircraft movements are carried out with Code C aircraft, mainly A320, A319, A321 and B737-800. The International Civil Aviation Organization (ICAO) establishes six Code Letter categories of aircraft types based on the combination of aircraft wingspan and outer main gear wheel span (Code C corresponds to 24 m up to but not including 36 m wingspan and Code D corresponds to 36 m up to but not including 52 m wingspan). Code D passenger aircraft operations represent 2.3% of the total number of aircraft movements. The number of Code C aircraft can be attributed to the airline type operating at the airport, mainly LCC (95%).

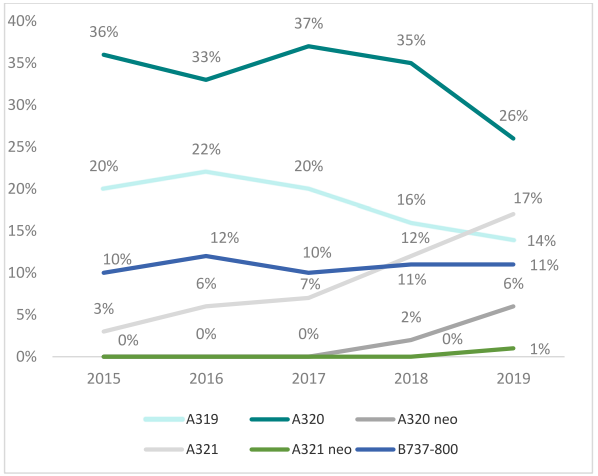
Table 2.3. Overview of LLA's passenger aircraft fleet mix (2019)

Aircraft Type	ACFT CODE	Movements	% of Total Movement
Airbus A319	C	21,642	15%
Airbus A320	C	44,074	31%
Airbus A320 NEO	C	6,013	4%
Airbus A321 & A321 NEO	C	20,356	14%
Boeing B737-300, -400, -500	C	932	1%
Boeing B737-700, -800, -900	C	17,460	12%
Boeing B757 & B767	D	1,440	1%
Other Aircraft	-	29,564	21%
Total		**141,481**	**100%**

Source: LLAOL

2.1.6 Regarding the historic development of aircraft types at London Luton Airport, the presence of bigger Code C and new generation aircraft models such as the A320neo (186 seats, easyJet) or A321neo (235 seats, easyJet) is growing, whilst smaller aircraft models such as the A319 (156 seats, easyJet) are reducing their operations at the airport, as highlighted in the figure below. It should also be noted that the airport's main operator, easyJet, is renewing and expanding its fleet of 318 A320 family aircraft and is planning on operating with 100 no. A320neo by the end of 2022. The airline welcomed its first A320neo in 2017. Moreover, the airline has recently added four A321neo aircraft with 235 seats capacity.

Figure 2.5. Historic development of LLA's five main aircraft types (2015 to 2019)

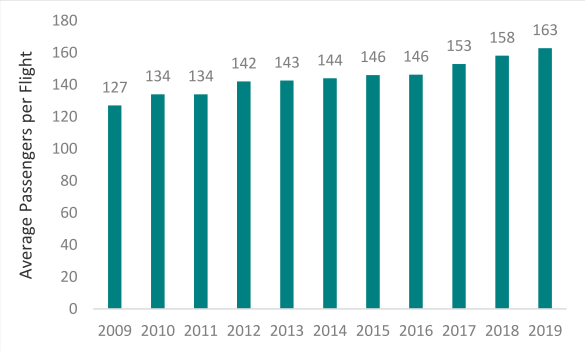


Source: LLAOL Quarterly Monitoring Report (Q4 2019)

Average Passengers per Flight

2.1.7 The total average passengers per flights (including both charter and scheduled passengers) has experienced a continuous growth trend since 2010, with an average annual growth rate of 2.6% during the historic period reviewed. In 2019, 163 total average passengers per flights have been handled, as shown in the figure below. The significant increase in the average of passengers per flight in from 2017 can be largely attributed to the introduction of new generation larger aircraft models. It is expected that the growth trend will continue over the planning horizon, which is consistent with LLA airlines' fleet renewal plans, e.g. easyJet is replacing current aircraft models A319 with 156 seats by larger aircraft models, A320 with 186 seats or A321neo with 235 seats.

Figure 2.6. Historic development of LLA's average passengers per flight (2009 to 2019)

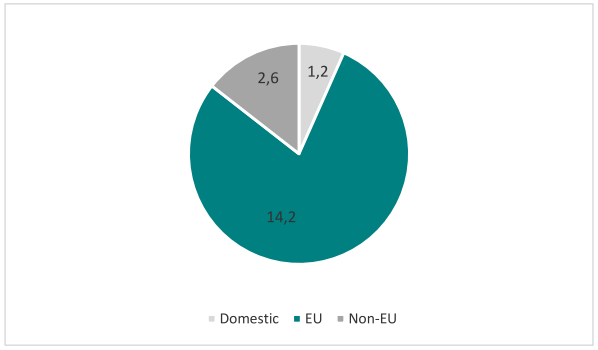


Source: LLAOL

Traffic Composition

2.1.8 London Luton Airport is considered an Origin and Destination (O&D) traffic airport, so transfer passengers are almost inexistent at LLA. It is expected that the O&D pattern continues over the planning period. In addition, 2019 passengers traffic figures analysis has revealed that 98.6% of the flights were scheduled (9% increase compared with 2018) and 1.4% chartered. The LLA traffic market is considered not only scheduled but also mainly international; 93.3% of the passengers handled in 2019 were international (84.5% EU and 15.5% non-EU), representing an increase of 9% compared to 2018. It should also be highlighted that the number of non-EU passengers grew 15% in 2019.

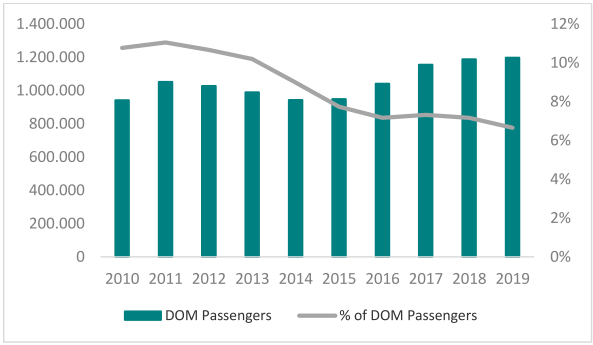
Figure 2.7. Passenger's composition in mppa (2019)



Source: LLAOL

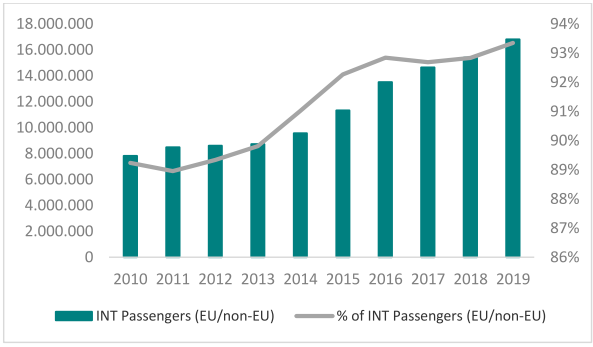
2.1.9 According to historic LLA passenger data, the percentage of domestic passengers has been decreasing. Whereas domestic passengers accounted for almost 11% of total passengers in 2010, this value has dropped to 6.7% in 2019, as shown in the figures and table below. In contrast, the proportion of international passengers has increased year on year; from 89.2% in 2010 to 93.3% in 2019, as indicated in the figures below.

Figure 2.8. Historic domestic passengers (2010 to 2019)



Source: LLAOL

Figure 2.9. Historic international passengers (2010 to 2019)



Source: LLAOL

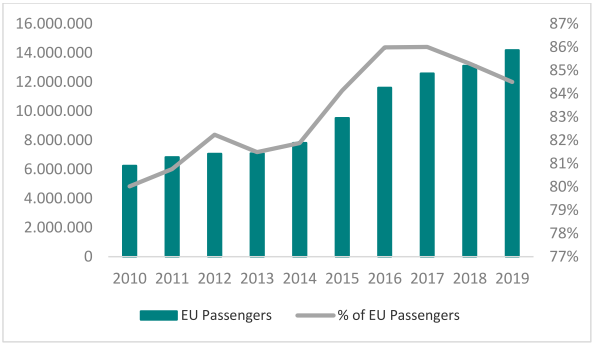
Table 2.4. Overview of domestic and international passengers (2010 to 2019)

Year	Domestic Passengers		International Passengers (EU/non-EU)	
	Total	%	Total	%
2010	941,889	10.8%	7,809,709	89.2%
2011	1,052,472	11.0%	8,474,187	89.0%
2012	1,027,350	10.7%	8,603,619	89.3%
2013	989,391	10.2%	8,719,758	89.8%
2014	942,910	9.0%	9,557,222	91.0%
2015	949,328	7.7%	11,329,848	92.3%
2016	1,041,862	7.2%	13,509,912	92.8%
2017	1,155,521	7.3%	14,643,698	92.7%
2018	1,188,543	7.2%	15,392,182	92.8%
2019	1,197,578	6.7%	16,802,391	93.3%

Source: LLAOL

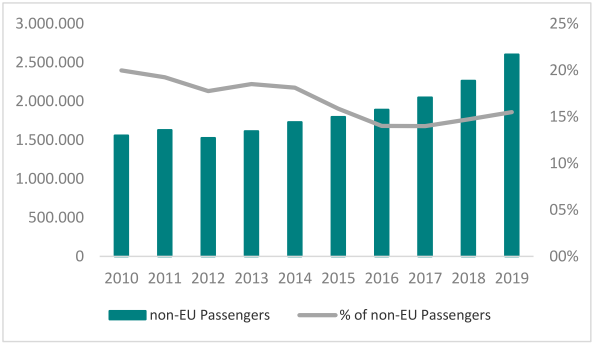
2.1.10 EU and non-EU passengers do not share the same pattern of growth. The percentage of non-EU passengers has dropped from 20% in 2010 to 14% in 2017 whereas EU passengers' figures have grown from 80% in 2010 to 86% in 2017. However, recent traffic figures show a slightly different pattern, with 85.3% EU passengers and 14.7% non-EU passengers registered in 2018 and 84.5% EU passengers and 15.5% non-EU passengers registered in 2019. This change in the pattern shows that the non-EU traffic has grown on higher rates than the EU traffic.

Figure 2.10. Historic EU passengers (2010 to 2019)



Source: LLAOL

Figure 2.11. Historic non-EU passengers (2010 to 2019)



Source: LLAOL

Table 2.5. Overview of EU and non-EU passengers (2010 to 2019)

Year	EU Pax	% of EU Pax	non-EU Pax	% of non-EU Pax
2010	6,249,271	80.0%	1,560,438	20.0%
2011	6,843,479	80.8%	1,630,708	19.2%
2012	7,075,339	82.2%	1,528,280	17.8%
2013	7,105,291	81.5%	1,614,467	18.5%
2014	7,825,318	81.9%	1,731,904	18.1%
2015	9,531,649	84.1%	1,798,199	15.9%
2016	11,616,589	86.0%	1,893,323	14.0%
2017	12,594,284	86.0%	2,049,414	14.0%
2018	13,127,370	85.3%	2,264,812	14.7%
2019	14,197,633	84.5%	2,604,758	15.5%

Source: LLAOL

Destinations

2.1.11 The high number of international passengers can be attributed to the top five destinations (by passengers) flown to and from London Luton Airport: Amsterdam, Bucharest, Budapest, Warsaw, and Barcelona. These destinations represent 15.9% of the total number of passengers registered in the first half of 2019. LLA is connected to 154 destinations in 43 countries via 195 routes (2019).

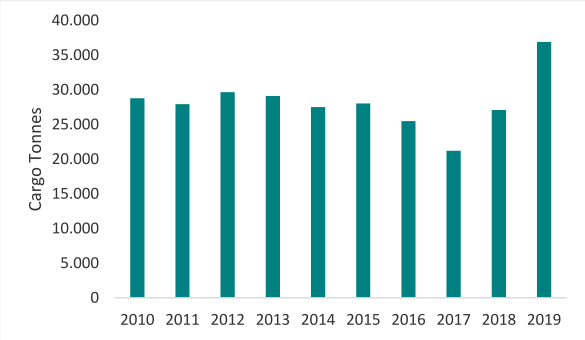
Cargo

2.1.12 Cargo operations represent just over 1% of all air transport movements at London Luton Airport. Historic cargo data at London Luton Airport shows a decreasing trend before 2018. The airport handled more than 28,000 tonnes in 2010, but in

2017 the cargo volume dropped to 21,000 tonnes. However, cargo has experienced a significant increase since then, reaching a total volume of 36,897 tonnes in 2019. In this manner, the average annual growth rate of the historic period reviewed (2010 to 2019) has been 4%. In contrast, cargo movements have been fairly balanced in the mentioned period with an average annual growth rate of 2.7%.

2.1.13 In 2019 total cargo volume (tonnes) increased by 36.2% which is a significant increase in relation to previous years. However, in terms of cargo movements there was a slight fall of -5.9% compared to 2018. The following figures and tables show the historic development of cargo volume and cargo movements by calendar year. It is important to note that there is an overall upward trend in terms of cargo movements and tonnes.

Figure 2.12. Historic cargo tonnes (2010 to 2019)



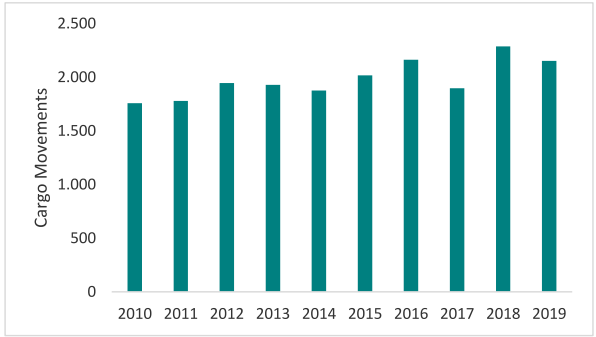
Source: LLAOL

Table 2.6. Overview of historic cargo tonnes (2010 to 2019)

Year	Cargo Tonnes	
	Total	% of change
2010	28,785	
2011	27,942	-2.9%
2012	29,663	6.2%
2013	29,092	-1.9%
2014	27,500	-5.5%
2015	28,041	2.0%
2016	25,464	-9.2%
2017	21,199	-16.7%
2018	27,096	27.8%
2019	36,897	36.2%

Source: LLAOL Annual Monitoring Report 2019

Figure 2.13. Historic cargo movements (2010 to 2019)



Source: LLAOL

Table 2.7. Overview of historic cargo movements (2010 to 2019)

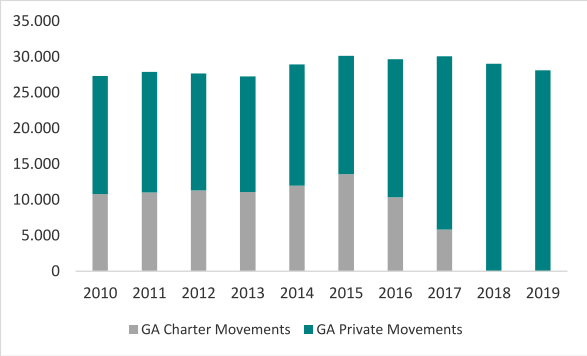
Year	Cargo Movements	
	Total	% of change
2010	1,758	
2011	1,778	1.1%
2012	1,945	9.4%
2013	1,928	-0.9%
2014	1,876	-2.7%
2015	2,018	7.6%
2016	2,163	7.2%
2017	1,897	-12.3%
2018	2,288	20.6%
2019	2,152	-5.9%

Source: LLAOL Annual Monitoring Report 2019

General Aviation

2.1.14 General aviation (GA) volume has been fairly balanced during the historic period reviewed (2010 to 2019) with an average annual growth rate of 0.4%. GA aircraft movements accounted for 19.8% of total aircraft movements in 2019, a value slightly lower than the average across the historic period (25.8%), but in line with the previous three years. It is important to note that the statistical treatment of GA traffic data has varied significantly since 2017. Where total GA movements were categorized as charter or private GA movements in the beginning of the historic period analysed, in recent years GA charter movements have been considered as GA private movements. It should be noted that GA movements decreased 3.2% in 2019, compared to the previous year.

Figure 2.14. Historic general aviation (GA) movements (2010 to 2019)



Source: LLAOL

Table 2.8. Overview of general aviation (GA) movements (2010 to 2019)

Year	GA Charter		GA Private		Total GA	
	Total	% of change	Total	% of change	Total	% of change
2010	10,787		16,525		27,312	
2011	11,033	2.3%	16,848	2.0%	27,881	2.1%
2012	11,303	2.4%	16,369	-2.8%	27,672	-0.7%
2013	11,080	-2.0%	16,177	-1.2%	27,257	-1.5%
2014	11,977	8.1%	16,964	4.9%	28,941	6.2%
2015	13,589	13.5%	16,547	-2.5%	30,136	4.1%
2016	10,366	-23.7%	19,285	16.5%	29,651	-1.6%
2017	5,832	-43.7%	24,254	25.8%	30,086	1.5%
2018	0	-100.0%	29,027	19.7%	29,027	-3.5%
2019	0	0%	28,102	-3.2%	28,102	-3.2%

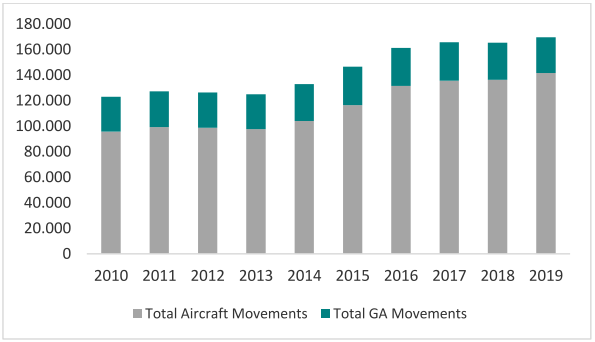
Source: LLAOL

Table 2.9. Overview of general aviation (GA) movements versus total aircraft movements (2010 to 2019)

Year	Total Aircraft Movements	Total GA Movements	% of GA
2010	95,604	27,312	28.6%
2011	99,287	27,881	28.1%
2012	98,732	27,672	28.0%
2013	97,596	27,257	27.9%
2014	103,928	28,941	27.8%
2015	116,412	30,136	25.9%
2016	131,536	29,651	22.5%
2017	135,538	30,086	22.2%
2018	136,267	29,027	21.2%
2019	141,481	28,102	19,8%

Source: LLAOL

Figure 2.15. Historic general aviation (GA) movements versus total aircraft movements (2010 to 2019)



Source: LLAOL

2.2 Forecasting Approach

2.2.1 The 2012 planning application has led to an investment plan of £160 million to transform the airport and increase capacity to 18 million passengers per year by 2020. The so-called Curium Project reached its culmination in 2018 with the opening of the expanded terminal facility.

2.2.2 This study has been finished in the middle of the COVID-19 pandemic. Despite this being an unprecedented situation in the aviation history where consider relevant, consideration has been given in the Master Plan to the impact on traffic scenarios based on current pandemic situation and industry expectations.

Annual Traffic Forecast

Passengers

2.2.3 IDOM's approach to annual passenger traffic forecasting takes into consideration real traffic figures of LLA and LLA's maximum capacity (18 mppa). In this manner, an annual growth rate of 7.4% has been coincident with the compound annual growth rate between 2017 and 2019

Table 2.10. Historic annual passengers traffic figures (2014 to 2019)

Year	mppa	Growth
2014	10.5	8.1%
2015	12.3	16.9%
2016	14.6	18.5%
2017	15.8	8.6%
2018	16.6	5.0%
2019	18.0	8.5%
Average (2017-2019)		**7.4%**

Source: LLAOL

Aircraft Movements

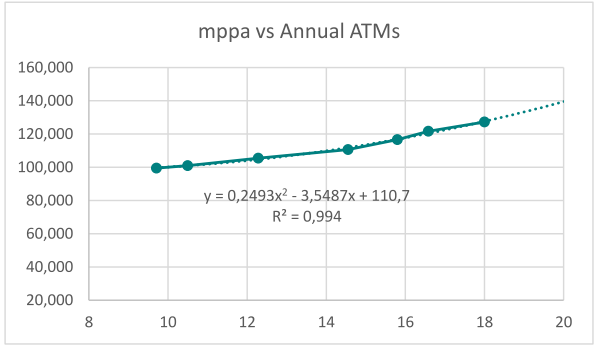
2.2.4 Commercial passenger airline aircraft movements (in general and commercial scheduled passenger airline in particular) comprise the majority of total air traffic movements (ATMs). However, this Master Plan contains both the forecast of total ATMs and commercial passengers ATMs for 19 mppa. The estimation of ATMs is based on the historic traffic figures and the correlation of annual passengers and aircraft movements.

Table 2.11. Historic total annual passengers vs total annual ATMs (2013 – 2019)

Year	Total Annual Pax	Total Annual ATMs	Annual Pax per Annual ATMs
2013	9,709,149	97,596	99.48
2014	10,500,132	103,928	101.03
2015	12,279,176	116,412	105.48
2016	14,551,774	131,536	110.63
2017	15,799,219	135,538	116.57
2018	16,580,725	136,267	121.68
2019	17,999,969	141,481	127.23

Source: LLAOL

Figure 2.16. Relation between total annual passengers and total annual ATMs



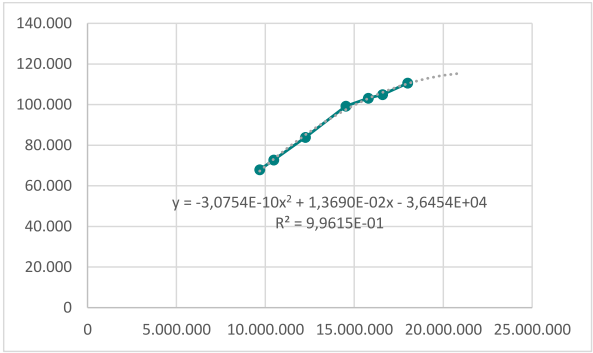
Source: IDOM

Table 2.12. Historic scheduled and charter annual passengers vs scheduled and charter annual ATMs (2013 – 2019)

Year	Scheduled/Charter Annual Pax	Scheduled/Charter Annual ATMs	Annual Pax vs Annual ATMs
2013	9,678,886	67,907	142.5
2014	10,468,276	72,715	144.0
2015	12,242,084	83,835	146.0
2016	14,523,872	99,265	146.3
2017	15,782,781	103,175	153.0
2018	16,580,725	104,861	158.1
2019	17,999,969	110,549	162.8

Source: LLAOL

Figure 2.17. Relation between scheduled and charter annual passengers and scheduled and charter annual ATMs



Source: IDOM

Peak Period Forecast

Peak Hour Passengers

2.2.5 Annual traffic forecasts are generally translated to peak period forecasts for planning purposes, to provide a design level that sizes facilities to ensure they are neither underutilised nor overcrowded too often. The peak period approach may vary by region, airport, desired level of service, and availability of data. Thus, international aviation organisations, such as the International Air Transport Association (IATA), the Civil Aviation Authority (CAA) in the UK or the Federal Aviation Administration (FAA), propose several methodologies such as the Busy Day (IATA), the Peak Month Average Day (FAA) or the Standard Busy Rate (SBR). The latter was promulgated by Heathrow Airport Limited and corresponds to the 30th highest hour of annual passenger flow calculated by means of ranking the hourly data in order of magnitude, so that the 30th busiest hour is identified as the SBR.

2.2.6 IDOM's approach to passenger peak hour forecast is based on the evolution of the parameter SBR / mppa, against the mppa for every year. This evolution has a high degree of correlation, and the actual numbers for SBR and mppa for 2017, 2018 and 2019 show the consistency of this assumption for both arrivals and departures.

Peak Hour Aircraft

2.2.7 In terms of ATMs, the peak hour aircraft (PHA) value for the planning horizon has been estimated through the annual aircraft movements. Therefore, the historic (2013 to 2019) correlation of annual aircraft movements and peak hour aircraft has been analysed. It should be noted that the 30th busiest hour aircraft has been used for this calculation. The selection of 30th busiest hour runway indicator, instead of maximum PHA, answers to the need of having a more regular parameter to analyse against the Annual ATMs.

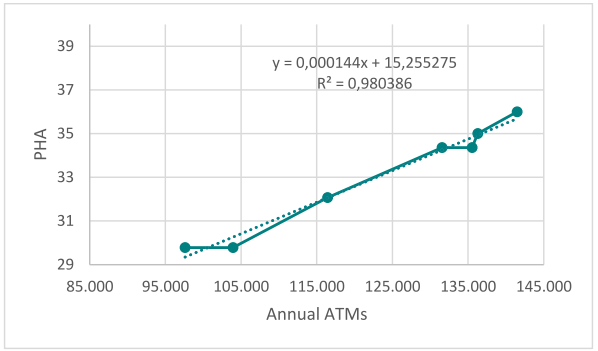
Table 2.13. Overview of historical data for peak hour aircraft (2013 to 2019)

Year	Total PHA	Annual ATMs	mppa
2013	30	97,596	9.7
2014	30	103,928	10.5
2015	32	116,412	12.3
2016	34	131,536	14.6
2017	34	135,538	15.8
2018	35	136,267	16.6
2019	36	141,481	18.0

Source: LLAOL and IDOM calculation

2.2.8 The objective of the traffic forecasting is the estimation of PHA from the mppa, through the annual ATMs. The following relation between the annual ATMs and the PHA is based on the historical data:

Figure 2.18. Relation between PHA and annual ATMs



Source: IDOM

Traffic Composition

2.2.9 Regarding the passengers' composition, the analysis of historic traffic figures reveals a decreasing trend in the percentage of domestic passengers, as shown in Figure 2.8. In 2019, London Luton Airport registered 0.5% drop in the proportion of domestic passengers and 0.5% increase in international passengers compared with 2018. It is expected that this trend continues over the planning period. In this manner, a distribution of 93.6% international (EU and non-EU) and 6.4% domestic passengers has been assumed for 19 mppa.

2.2.10 For international passengers, it has been assumed a composition of 83.9% EU passengers and 16.1% non-EU passengers. The latter is based on the historic evolution of the mentioned distribution as well as on 2018 and 2019 figures which registered an increase in the percentage of non-EU passengers, breaking the historic trend.

2.3 Annual Traffic Forecast

Passengers

2.3.1 Annual passenger traffic forecast was based on an annual growth rate for 2020 of 7.4% coincident with the average annual growth rate of 2017, 2018 and 2019 and a progressive decrease of annual growth rate after reaching LLA maximum capacity. The volume horizon of 19 million passengers was originally expected to be achieved between 2020 and 2021, should the annual growth rate that LLA has been experiencing during the past few years would have remained the same. However, as a result of the COVID-19 outbreak, LLA is experiencing a substantial reduction in passenger traffic in year 2020.

2.3.2 It is expected that by summer of 2021 airlines will be required to use their allocated slots if they want to retain slots that are deemed to hold value. Therefore, aircraft movements are likely to go back to pre-pandemic levels. Despite that, passenger volumes will need some time to get back to year 2019 levels due to the average number of passengers per flight is not expected to recover as fast as the number of operations.

2.3.3 Based on industry expectations and on current pandemic situation, it is expected that the airport will recover to the 18mppa traffic horizon around 2023 and the 19mppa traffic horizon will be around 2024.

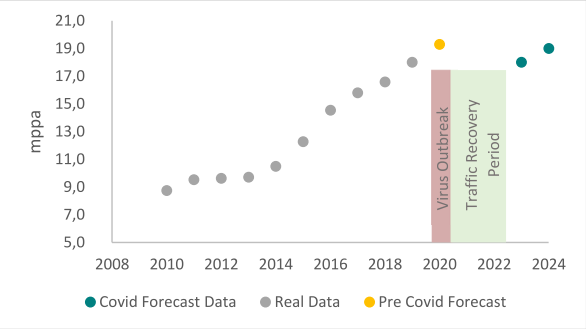
Table 2.14. Annual passenger traffic forecast

	Year	mppa	Growth
REAL DATA	2010	8.8	
	2011	9.5	8.9%
	2012	9.6	1.1%
	2013	9.7	0.8%
	2014	10.5	8.1%
	2015	12.3	16.9%
	2016	14.6	18.5%
	2017	15.8	8.6%
	2018	16.6	5.0%
	2019	18.0	8.5%
PRE-COVID FORECAST DATA	2020	19.3	7.4%
COVUD FORECAST DATA	2020	Subject to COVID-19 pandemic movement restrictions	
	2021-2022	Traffic Recovery Period	
	2023	18.0	0%[1]
	2024	19.0	5.5%[1]

Source: LLA & IDOM

[1] Growth when compared with 2019 traffic figures

Figure 2.19. Annual passenger traffic forecast versus real traffic figures



Source: LLAOL and IDOM

Aircraft Movements

2.3.4 142,566 total ATMs including 112,634 scheduled and charter ATMs have been estimated for the 19 mppa planning horizon following the approach described in the previous section (2.2 Forecasting Approach). The discrepancy between annual passengers compound annual growth rate and ATMs CAGR is based on the assumption that the current trend of airlines upgrading their fleet to aircraft with higher seat capacity will continue over the planning horizon, together with typical fluctuations of load factor.

Table 2.15. Annual ATMs forecast

Year	Total Annual ATMs	% change	Scheduled / Charter Annual ATMs	% change
2013 (real)	97,596		67,907	
2014 (real)	103,928	6.5%	72,715	7.1%
2015 (real)	116,412	12.0%	83,835	15.3%
2016 (real)	131,536	13.0%	99,265	18.4%
2017 (real)	135,538	3.0%	103,175	3.9%
2018 (real)	136,267	0.5%	104,861	1.6%
2019 (real)	141,481	3.8%	110,549	5.4%
(19 mppa)	**142,566**	0.8%	**112,634**	1.9%

Source: LLAOL and IDOM calculation

2.3.5 Minor variances in Annual air traffic movements versus the Environmental studies is due to different methodologies in calculating annual movement totals. The environmental analysis uses forecast 92 day movement volumes multiplied by historic annual share of movements in the 92 day period, whilst the Masterplan extrapolates historic movements using the ratio between annual ATMs and mppa. In all cases the 2019 actual schedules have been used as a base for predicting future movements.

Traffic Composition

2.3.6 Regarding passenger composition for 19 mppa, the table below shows the resulting composition taking into consideration the assumed distribution of 6.4% domestic and 93.6% international passengers.

Table 2.16. Passengers' composition for 19 mppa

Total Annual Passengers	Total Domestic Passengers	Total International Passengers
19,000,000	1,216,000	17,784,000

Source: IDOM

2.3.7 Moreover, a distribution of 83.9% EU passengers and 16.1% non-EU passengers has been assumed based on the historic data.

Table 2.17. International passengers' composition for 19 mppa

Total Annual International Passengers	Total Annual EU Passengers	Total Annual non-EU Passengers
17,784,000	14,920,776	2,863,224

Source: IDOM

2.4 Peak Period Forecast

Peak Hour Passengers

2.4.1 IDOM's approach to peak passenger period forecasting has been based on the SBR methodology or 30th busiest hour (described in section 2.2 Forecasting Approach). In this manner, the following peak hour passengers (PHP) results have been obtained.

Table 2.18. PHP forecast

Year	PHP_{DEP}	PHP_{ARR}
2013 (real)	2,497	1,905
2014 (real)	2,509	1,949
2015 (real)	2,725	2,161
2016 (real)	2,939	2,455
2017 (real)	3,138	2,612
2018 (real)	3,343	2,671
2019 (real)	3,523	2,816
(19 mppa)	**3,758**	**3,120**

Source: LLAOL and IDOM calculation

Table 2.19. PHP forecast for 19 mppa

PHP_{DEP}	$PHP_{DOM\ DEP}$	$PHP_{INT\ DEP}$	PHP_{ARR}	$PHP_{DOM\ ARR}$	$PHP_{INT\ ARR}$
3,758	241	3,517	**3,120**	200	2,920

Source: IDOM

Peak Hour Aircraft

2.4.2 A total of 36 peak hour aircraft (PHA) has been estimated for the planning horizon based on the calculation methodology described previously (see section 2.2 Forecasting Approach).

Table 2.20. PHA forecast

Year	Annual ATMs	mppa	PHA
2013 (real)	97,596	9.7	30
2014 (real)	103,928	10.5	30
2015 (real)	116,412	12.3	32
2016 (real)	131,536	14.6	34
2017 (real)	135,538	15.8	34
2018 (real)	136,267	16.6	35
2019 (real)	141,481	18	36
(19 mppa)	142,566 (est)	19 (est)	**36 (est)**

Source: LLAOL and IDOM calculation

2.5 Design Horizon

2.5.1 This Master Plan is intended to analyse the required capacity to cope with 19 million annual passengers. Taking into consideration the approach described in the previous paragraphs, the following figures should be assumed for planning purposes.

Table 2.21. Design horizon traffic figures

Parameter	Value
Total Annual Passengers	19,000,000
Total Domestic Passengers	1,216,000 (6.4%)
Total International Passengers	17,784,000 (93.6%)
Total EU Passengers	14,920,776 (83.9%)
Total non-EU Passengers	2,863,224 (16.1%)
Departures PHP	3,758
Domestic Departures PHP	241
International Departures PHP	3,517
Arrivals PHP	3,120
Domestic Arrivals PHP	200
International Arrivals PHP	2,920
Annual ATMs (Total)	142,566
Annual ATMs (Scheduled and Charter)	112,634
PHA	36

Source: IDOM

2.6 Potential Changes in Activity

2.6.1 This study has been finished in the middle of the COVID-19 outbreak. Despite this being an unprecedented situation in the aviation history where considered relevant, consideration has been given in the Master Plan to the impact on traffic scenarios based on current pandemic situation and industry expectations. However, it should be noted this forecast is dependent on the evolution of the pandemic.

2.6.2 The developed forecast provides the basis for planning for the facilities requirements to cope with future demand at London Luton Airport. However, potential uncertainties and fluctuations inherent in the aviation industry such as airline business strategies variations (e.g. cessation of operation, new entrants, or new routes) or aircraft fleet changes might have an impact on airport facilities requirements. Thus, several potential changes to London Luton Airport have been identified and listed below as part of this Master Plan.

2.6.3 Different airline business strategy scenarios were explored resulting in following most likely scenarios:

- Potential increase of domestic passengers based on the latest LLA figures that show an increase in the number of local people using the airport. In particular, according to CAA, 5 million passengers passing through the airport were from Bedfordshire, Hertfordshire and Buckinghamshire in 2018, accounting for around 30% of total passenger numbers for the year. Local increase was specially driven by passengers from Hertfordshire, which registered a growth of 11% compared with 2017. This scenario is more likely to happen and has thus been taken into consideration for establishing the expected

passenger composition for the planning horizon of 19 mppa.

- Potential opening of long-haul routes from London Luton Airport to United States and Canada operated by low cost carriers as a result of next generation aircraft models able to fly long haul routes. This scenario could lead to a significant increase in international passengers in general and non-EU in particular with direct impact on airport facilities such as security or passport control facilities. However, this scenario has not been taken into consideration for the present Master Plan since the planning horizon (19 mppa) is in the short-term, in 2024 (18 mppa current airport capacity).
- Significant reduction of LLA-based airlines, mainly easyJet, presence at London Luton Airport due to a change in their business strategy (e.g. strategic alliances with other airlines) causing a significant drop in both number of aircraft movements and passengers. This scenario is also very unlikely to happen since the planning horizon is expected to be reached in the short term (2024).

2.6.4 Aircraft fleet alterations should consider the fleet purchasing plans of easyJet, Wizz Air, and Ryanair, which account for 90% of total aircraft movements at LLA (data from 2018 and similar situation for 2019):

- easyJet's fleet comprises 318 Airbus A320 family aircraft including A319, A320, A320neo, and A321neo. The airline has started to operate with the new generation of A320neo and plans to have 100 of these in service by the end of 2022. In addition, easyJet has started to operate four A321neo with capacity for 235 seats each, 49 and 79 additional seats compared with the capacity of their A320neo and A319, respectively. Changes in easyJet's fleet have been considered for the estimation of the average passengers per flight ratio for the planning horizon.
- Wizz Air operates a fleet of 83 Airbus A320 family aircraft including 64 A320 and 19 A321. The airline has placed an order of 110 new generation A321neo aircraft which is expected to be delivered in 2019. The introduction of A321neo aircraft is expected to have an impact on the available seat capacity and thus in the load factor. In this manner, the present Master Plan takes into consideration both the historic load factor development and next generation aircraft models for the definition of the average passengers per flight ratio for 19 mppa.
- The Irish airline, Ryanair, operates a fleet of over 300 Boeing B737-800 aircraft. Ryanair has placed order for only B737-800 to increase their fleet to over 520 airplanes with capacity for 160 million passengers per year by 2024. Ryanair is also likely to upgrade to next generation aircraft such as the B737MAX200 with greater capacity. The present Master Plan considers Ryanair's potential fleet upgrading for defining the average passengers per flight ratio for the planning horizon.

3

INFRASTRUCTURE PROPOSALS

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3 INFRASTRUCTURE PROPOSALS

3.1 Existing Situation

3.1.1 London Luton Airport is a civil, international airport located at 1.5 nautical miles east of Luton town, in Bedfordshire, England. This airport serves the London metropolitan area, which lies 30.5 nm south of Luton, and is a key economic driver for the region.

3.1.2 The airport is authorized to provide IFR/VFR and 24-hour operations, but its main commercial activity is conducted within daytime schedule. Apart from commercial aircraft, LLA also hosts air freight and general aviation operations, as well as maintenance activities.

Figure 3.1. London Luton Airport site plan

Source: LLAOL/IDOM

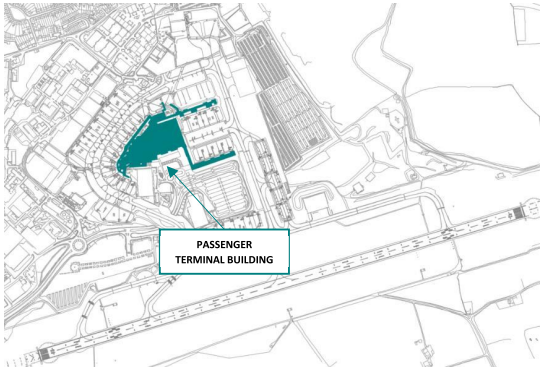
3.1.3 LLA currently has one Passenger Terminal Building (PTB), which is surrounded by three commercial aprons with another remote commercial apron located at south of PTB, and one single Runway 07-25 that is located at the south of the core Terminal Area. Thus, all the facilities of the airport are placed to the north of the runway, including facilities such as general aviation hangars, cargo apron and maintenance areas, as highlighted in the figure above.

3.1.4 London Luton Airport comprises a total area of approximately 233.5 ha, corresponding to the area within the red boundary in the figure above.

Passenger Terminal Building

3.1.5 London Luton Airport's Passenger Terminal Building is located at the centre of the airport and it is the main processor for all passenger operations related to commercial flights. The PTB comprises one central building with two piers, Pier A and Pier B, both located at the east side of the main building. The terminal building covers a total area of approximately 87,350 m^2, distributed as indicated in the table below. It should be noted that both domestic and international passengers are handled in the same terminal building.

Figure 3.2. London Luton Airport's Passenger Terminal location



Source: IDOM

Table 3.1. Passenger Terminal Building's zones

Zone	Area (m^2)
Passenger Circulation	27,904
Commercial Area	11,785
Gate Lounge & Pier	7,401
Operational Area	2,317
MISC Areas	37,943
TOTAL	**87,350**

Source: IDOM

3.1.6 The passenger terminal consists of six levels (level 00, level 05, level 10, level 15, level 20, and level 25), whereby passengers circulate generally across four levels (level 00, level 10, level 20, and level 25). Main arrivals and departures facilities are located at the ground floor and departure lounge at the first floor. Boarding gates are located at the ground and first floor. In this manner, each level comprises the following facilities:

- **Level 00:** Boarding gates (departures and arrivals) located at the south side of Pier A as well as at Pier B, Baggage Handling System, technical rooms, and ancillary facilities.
- **Level 10 or Ground Floor:** Departures hall, check-in, boarding pass check before screening, screening, boarding gates, Pier A arrivals, Pier B departures, immigration, baggage reclaim, customs, arrivals hall, and ancillary facilities.
- **Level 20 or First Floor:** departures, commercial area, boarding gates, and ancillary facilities.
- **Level 25:** Executive lounge.

3.1.7 The departures section on the ground floor is located at the east side of the building and comprises the following passenger processing facilities:

- Departures hall.
- Check-in.
- Boarding pass control before security.
- Passenger security screening.

3.1.8 The departures hall consists of a public circulation area, retail and food & beverages (F&B) facilities, a 'persons with reduced mobility' (PRM) facility, airline ticket desks, one currency exchange stand and a travel centre.

3.1.9 The check-in hall is located at the east side of the departures hall covering a total area of 1,351 m^2 plus 1,073 m^2 for additional circulation area behind the queues. 62 check-in counters are available to passengers wanting to check their baggage plus an additional outsize baggage booth at the end of the check-in hall. Currently, no self-service kiosks are available at LLA.

3.1.10 The boarding pass control facility is located in front of the departures entrance and before the passenger security control. The former consists of 11 automated control gates and one counter distributed along a floor surface of 369 m^2 (including estimated priority queuing area of 20 m^2). Moreover, there is an additional dedicated counter for priority passengers.

3.1.11 The passenger security control is divided into three areas; the preparation area, the queuing area, and the process and egress area. The latter comprises 16 lanes with 16 x-ray channels and eight body scanners or arch metal detectors. The facility covers a total area of 3,580 m^2 (including 201 m^2 preparation area and 51 m^2 priority queuing area). It should be highlighted that one lane is used for priority passengers. However, this lane is not considered as a dedicated priority channel since the layout of the facility enables its use by non-priority passengers during periods of higher demand.

3.1.12 After security, passengers are directed to the waiting lounge section on the first floor. Since boarding gates are not announced until 45 minutes before the estimated time of departure (ETD) of the flight at LLA, passengers are obliged to wait in the central waiting lounge. This area comprises a walkthrough duty free (1,690 m^2), various areas of retail and Food & Beverages facilities (7,324 m^2), circulation area or corridors (2,374 m^2) and public seating areas (1,075 m^2). Moreover, the central waiting lounge before gate announcement includes 2,116 seats distributed along the public seating area (689 seats) and the F&B facilities (1,427 seats).

3.1.13 Boarding gates are spread along the west side of the main processor and the piers, as shown in the table below.

Table 3.2. Boarding gates distribution

	Boarding Gates (no)
Main Apron	14
Pier A	8
Pier B	4
Coaching Gates	5
Total	**31**

Source: IDOM

3.1.14 Regarding the arrivals section, the following arriving passengers processing facilities are located at LLA terminal building ground floor:

- Immigration.
- Baggage reclaim.
- Customs.
- Arrivals hall.

3.1.15 International deplaning passengers arrive directly to the airport's immigration facility, located at the north side of the PTB. Passports are controlled automatically with 15 automated control system (ACS) gates or manually by means of 15 manual booths. The facility covers a total area of approximately 869 m^2.

3.1.16 After immigration, international passengers are directed to the international baggage reclaim hall which comprises six belts distributed along 3,840 m^2. In contrast, domestic deplaning passengers access directly to the domestic baggage reclaim hall (740 m^2) which includes one dedicated belt.

3.1.17 In contrast to domestic passengers who may access the arrivals hall directly after collecting their bags, international passengers must go through customs (green, blue or red channel). LLA customs inspection facility includes one x-ray unit covering a total area of 145 m^2.

3.1.18 The arrivals hall comprises both public waiting area and commercial facilities (retail and F&B) covering a total public seating and circulation area of 1,690 m^2 (not including commercial facilities).

3.1.19 An overview of the LLA Passenger Terminal Building capacity in terms of existing floor areas and equipment is shown in the tables below. It should be noted that LLA's PTB has a departing

passenger flow capacity per hour of 3,240 according to LLA's Winter Declaration for 2019. Similarly, the arrivals passenger flow has a capacity of 2,800 international passengers per hour and 700 domestic passengers.

Table 3.3. PTB equipment at LLA

Facility	Quantity
Check-in Counters	62 counters
Boarding Pass Control before screening	11 gates
Passenger Security Screening	16 lanes + 8 body scanners
Waiting Lounge before Gate Announcement – Public Seating	689 seats
Waiting Lounge before Gate Announcement – F&B Seating	1,427 seats
Boarding Gates	31 gates
Immigration – Manual	15 booths
Immigration – ACS	15 gates
Baggage Reclaim – Domestic	1 belt
Baggage Reclaim – International	6 belts
Customs	1 x-ray

Source: IDOM

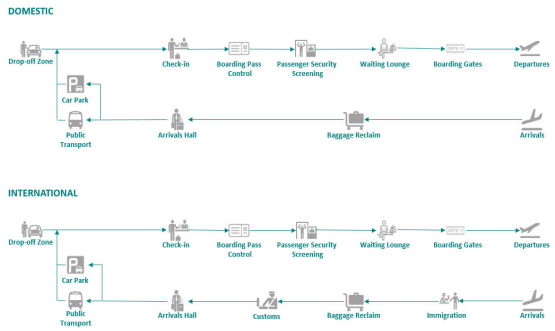
Table 3.4. Floor areas at LLA

Areas	Area (m^2)
Check-in	1,351 + 1,073
Boarding Pass Control before Screening	369
Passenger Security Screening	3,580
Waiting Lounge before Gate Announcement – Public Seating	1,075
Waiting Lounge before Gate Announcement – Retail	4,042
Waiting Lounge before Gate Announcement – F&B	3,282
Waiting Lounge before Gate Announcement – Duty-Free	1,690
Immigration	869
Baggage Reclaim – Domestic	740
Baggage Reclaim – International	3,840
Customs	145
Arrivals Hall – Public Area	1,690

Source: IDOM

3.1.20 Regarding passenger flows, four flows have been considered based on LLA particularities; departing domestic passengers, departing international passengers, arriving domestic passengers, and arriving international passengers, as described schematically in the figure below.

Figure 3.3. Diagram passenger flows



Source: IDOM

3.1.21 In terms of departing passengers, passengers access the terminal building by means of one of the two entrances located at Level 10, and then turn right to enter the check-in area. After the check-in process, the passengers proceed to the boarding pass control located in front and in the middle of the main entrances. Immediately after boarding pass control, the passengers arrive at the screening preparation and queuing area. Once passed the security control, each passenger must take the stairs or the lift located to the left to reach the departures waiting area located in the first floor. Once arrived at the first floor the passengers must walk through a duty free to reach the commercial areas, comprising both retail and F&B facilities, and the public seating areas. Passengers are intended to wait in the waiting lounge until the corresponding boarding gate is announced. Once the boarding gate is announced, passengers proceed to walk through a series of corridors to reach their assigned boarding gate:

- **Gate 1 to 6:** Passengers must turn to the left and walk through the pier departures corridor to reach the stairs to go down to the gate lounges located at level 10.
- **Gate 7:** Passengers must turn to the left and walk through the pier departures corridor to reach the gate lounge.
- **Gate 10 to 16:** Passengers must turn to the left and walk through the pier departures corridor to reach the stairs to go down to the gate lounges located at level 10.
- **Gate 17:** Flights assigned to gate 17 have a separate gate lounge located in front of the commercial area at the level 20.
- **Gate 20 to 28**: Passengers must turn to the right to reach Pier A boarding gate lounges. All these boarding gates for departures are located at level 20.

- **Gate 30 to 43:** Passengers must take the stairs or lift to go down to level 10 and reach Pier B departures corridor and gates 30, 31 32, and 33. The gate lounges 40,41,42, and 43 are located at level 00 of Pier B.

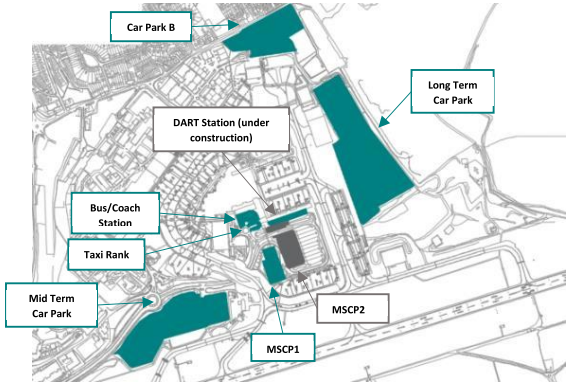
3.1.22 Deplaned international passengers must pass the immigration control located in the ground floor before entering the baggage reclaim area. After claiming their luggage, passengers have three channels for leaving the reclaim area; green, blue or red customs channel. In contrast to international passengers, domestic passengers have their own way to directly reach the domestic dedicated baggage reclaim belt and the arrivals hall (immigration control and customs not required for domestic passengers).

Road Surface Access Infrastructure

3.1.23 Road surface access to London Luton Airport is via a roundabout located at the south west of the Passenger Terminal Building (PTB) adjacent to the Holiday Inn Express Hotel. This roundabout provides access to the Central Terminal Area (CTA), where the PTB is located with all the facilities that ensure the correct operation of the airport, with zones destined to public transport and private vehicles.

3.1.24 The CTA is surrounded by airside and access is through an underpass that runs under Taxiway Bravo. Currently, there are a number of developments ongoing within the CTA, including the construction of a Direct Air to Rail Transit (DART) system. The road constitutes the main access and egress point for passengers, staff and construction vehicles.

Figure 3.4. London Luton Airport's road access facilities



Source: IDOM

The surface access facilities of London Luton Airport are the following: a mid-term car park located before the underpass, a staff car park to the west of the PTB, a bus/coach station and taxi rank in front of the PTB and two multi storey car parks (MSCP1 & MSCP2) for short stay parking located between the Pier B and the South Apron. Furthermore, there is a long term car park located to the east of the airport area and a staff car park (Car Park B) to the north. The access to these two facilities is not directly connected to the main access to the PTB.

3.1.25 Regarding public transport facilities, London Luton Airport has a bus/coach station with an estimated area of 3,338 m^2, comprising 18 bays. Next to this area, there is a taxi rank with capacity for 25 vehicles that covers approximately 1,000 m^2.

3.1.26 The current parking provision for private vehicles on the CTA are the MSCP1, MSCP2 and the Drop Off Zone (DOZ), which is located on MSCP2's ground floor. Private vehicles accessing the CTA are lead to a gyratory road that surrounds the MSCP2 and that serves for entering to these parking facilities and for access/ egress of vehicles serving the PTB. Access to the MSCP2 is located on its north side, just in front of the future DART station, and its exit is located on the west side. The DOZ can be accessed through two access points both located on the east side of the MSCP2. The exit from the DOZ is on the south façade of this facility. Lastly, the access and exit to the MSCP1 is located to the south west of the MSCP2. This gyratory road ends up surrounding the MSCP1 and then goes under Taxiway Bravo before reaching the roundabout that is next to the Holiday Inn Express Hotel. The MSCP1 extends on an area of roughly 7,880 m^2 and has a capacity for 1,699 vehicles. The MSCP2 extends on an area of roughly 11,200 m^2 and has a capacity of 1,924 vehicles. The DOZ is on MSCP2's ground floor and has enough kerb length for accommodating 130 vehicles. Furthermore, private vehicles can use the mid-term car park situated before Taxiway Bravo underpass, Car Park B located to the north of cargo centre building, and the long-term car park located to the east of the PTB, next to Taxiway Delta.

Airfield Facilities

3.1.27 This section addresses the following elements of the airfield configuration:

- **Runway:** 07-25.
- **Aprons:** Main, North, East, South, and Cargo.
- **Taxiways**: Alpha, Bravo, Charlie, Delta, Echo, and Hotel.

Runway

3.1.28 London Luton Airport has a single runway with the designation of 07-25, with a length of 2,162 metres and a width of 46 metres, according to the Aeronautical Information Publication (AIP). The physical characteristics of the runway are set out in the table below.

Figure 3.5. London Luton Airport's runway

Source: IDOM

Table 3.5. Runway 07-25's characteristics

Physical Characteristics	Runway 07	Runway 25
True bearing	074.38°	254.41°
Dimensions of RWY	2,162x46 m	2,162x46 m
Surface and Strength	Asphalt Grooved PCN 75/R/D/X/T	Asphalt Grooved PCN 75/R/D/X/T
THR coordinates	515219.25N 0002300.91W	515237.36N 0002116.15W
THR elevation	157 m	155 m

Source: LLAOL

3.1.29 The runway pavement classification number (PCN) is certificated as PCN 75/R/D/X/T. Additionally, according to AIP, the runway has following protection surfaces; a stopway for runway 25 (dimensions of 57 x 46 m), and two strips for both runway 07 and runway 27 (dimensions 2,280 x 300 m).

3.1.30 In terms of runway aircraft operations, since LLA has a single runway, it is used to land and take off, for commercial and general aviation operations.

3.1.31 The threshold of runway 25 is displaced by 82 metres whereas runway 07 matches with the beginning of the runway. Thus, the declared distances for landings differ between RWY 07 and RWY 25, as shown in the table below.

Table 3.6. Declared distances for Runway 07-25

Declared Distances	Runway 07 (m)	Runway 25 (m)
Take Off Run Available (TORA)	2,162	2,162
Take Off Distance Available (TODA)	3,243	3,243
Accelerate Stop Distance Available (ASDA)	2,162	2,219
Landing Distance Available (LDA)	2,162	2,080

Source: LLAOL

3.1.32 The current capacity of RWY 07-25 is 38,348 commercial passenger movements per winter season. The airport's runway has a maximum capacity in winter season and within any hour of the day of 4 departures or arrivals in any 5 minute-period, according to the airport's winter declaration 2019. In addition, the LLA's runway has a capacity of maximum 37 total movements per 60-minute (26 or 23 arrivals and 23 or 26 departures), as shown in the table below.

Table 3.7. Runway capacity in each 60-minute period from 00:00 to 13:00 hours

Hour UTC	00	01	02	to	05	06	07	08	09	to	13
ARR	11	11	>	4	<	6	**23**	20	>	21	<
DEP	4	4	>	4	<	17	**26**	23	>	24	<
Total	11	11	>	8	<	17	**37**	31	>	33	<

Source: London Luton Airport Scheduling Declaration for Winter 2019

Table 3.8. Runway capacity in each 60-minute period from 14:00 to 23:00 hours

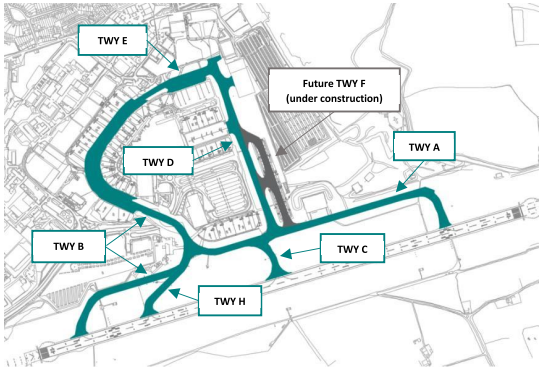
Hour UTC	14	15	16	to	20	21	22	23
ARR	**23**	20	>	21	<	**26**	21	13
DEP	**26**	23	>	24	<	**23**	14	4
Total	**37**	31	>	33	<	**37**	26	15

Source: London Luton Airport Scheduling Declaration for Winter 2019

Taxiways

3.1.33 LLA's taxiway system consists of six main taxiways connecting the runway, taxiways, and aircraft stands; Alpha, Bravo, Charlie, Delta, Echo, and Hotel. Moreover, a second parallel taxiway to Taxiway Delta is under construction; Taxiway Foxtrot. TWY Alpha and TWY Bravo are parallel to the runway and are linked to the runway and TWY Hotel and TWY Charlie connect the runway with Taxiway Bravo and Alpha, respectively.

Figure 3.6. London Luton Airport's taxiways



Source: IDOM

3.1.34 It should be highlighted that none of the taxiways provide a direct connection with the runway's ends. In this manner, aircraft requiring longer take-off distances must use the turn pad provided at both runway ends enabling 180-degree turns.

Table 3.9. London Luton Airport's taxiways characteristics

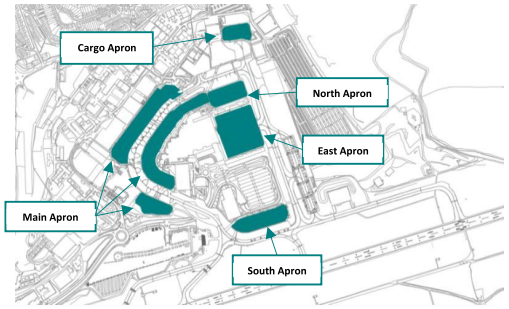
Taxiway Designation	Surface	Width (m)
Alpha	Asphalt	23
Bravo	Asphalt	23
Charlie	Asphalt	23
Delta	Asphalt	23
Echo	Concrete	19
Hotel	Asphalt	23

Source: LLAOL

Aprons

3.1.35 The term apron refers to aircraft parking areas to load or unload passengers, baggage, mail or cargo, fuelling, or undertake maintenance. The figure below shows the main existing aprons (commercial and cargo) of London Luton Airport.

Figure 3.7. London Luton Airport's aprons



Source: IDOM

3.1.36 The airport has a total of four commercial aviation aprons (Main Apron, North Apron, East Apron, and South Apron) and one cargo apron. The commercial aprons surround the Passenger Terminal Building, except for South Apron which is situated at the south of the PTB, close to the runway. The cargo apron lies north of the CTA, adjacent to the airport boundary. In addition to these aprons, there are other facilities such as FBO apron, Gulfstream hangar, and additional non-commercial stand areas.

3.1.37 The Main Apron, located between the terminal building and the hangars situated at the north-east of PTB, is the principal apron of the airport and consists of two areas separated by the central taxiway, Taxiway Bravo. Consequently, the aircraft access the stands of the Main Apron via Taxiway Echo at the north, and via Taxiway Bravo at the south. The Main Apron has a total capacity of 24 commercial Code C aircraft stands.

3.1.38 The North Apron serves the north side of the PTB's Pier A and is adjacent to the Main Apron. Aircraft access to North Apron is via Taxiway Echo, which is linked to Taxiway Delta and Taxiway Bravo for runway access or egress. The aircraft parking capacity of the North Apron is of five Code C stands. It should be noted that four of these stands have a Multi Aircraft Ramping Stands (MARS) configuration that generally enables the use of the stand for two small aircraft simultaneously or one bigger aircraft.

3.1.39 The East Apron is located at the opposite side of Pier A between Pier A and Pier B and is connected to the runway via Taxiway Delta. A taxilane divides the apron and aircraft stands are distributed at both sides of the taxilane. The apron has a total capacity of up to eight Code C stands, four of them considered MARS stands.

3.1.40 The South Apron is a remote apron located parallel to the runway and has a capacity of up to six Code C stands, four of them MARS type. Aircraft access the mentioned stands directly from Taxiway Alpha.

Table 3.10. London Luton Airport's parking stands by apron

Apron	Stands Designation	Equivalent Code C Max Capacity
Main Apron	1R, 1, 2, 3, 4, 5, 6, 7, 8, 9, 9L, 60, 10, 10R, 11, 11R, 11L, 12, 12R, 13, 13L, 13R, 14, 14L, 15, 15L, 16, 17, 18, and 19	24
North Apron	61, 41, 41L, 41R ,42, 42R, and 42L	5

Apron	Stands Designation	Equivalent Code C Max Capacity
East Apron	43, 43L, 44, 44L, 44R, 45, 45R, 46, 47, 48, and 49	8
South Apron	20, 21, 21L, 21R, 22, 23, 23L, and 23R	6
Total		**43**

Source: LLAOL/IDOM

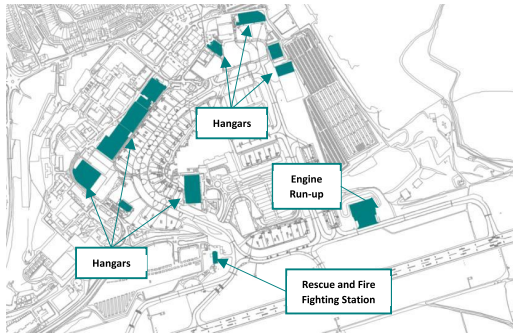
3.1.41 In addition to the commercial aprons' capacity, there are two cargo stands located at the Cargo Apron and five maintenance stands.

Aviation Support Facilities

3.1.42 This section addresses the following aviation support facilities:

- Aircraft maintenance facilities.
- Engine run-up bay.
- Rescue and Fire Fighting (RFF) station.
- Other aviation support facilities.

Figure 3.8. Runway capacity in each 60-minute period from 14:00 to 23:00 hours



Source: IDOM

3.1.43 Maintenance service is provided within the airport's hangar. There are several hangars distributed along the airfield including easyJet's hangar (hangar 89), located south of Passenger Terminal Building.

3.1.44 The engine run-up bay is an isolated area where aircraft can test their engines. This facility is located to the south-east of the terminal building, between future TWY Foxtrot and TWY Alpha, but is accessed via Taxiway Alpha.

3.1.45 London Luton Airport has also one Rescue and Fire Fighting (RFF) station located at the south-west of the PTB, adjacent to the intersection point of TWY Alpha and TWY Bravo.

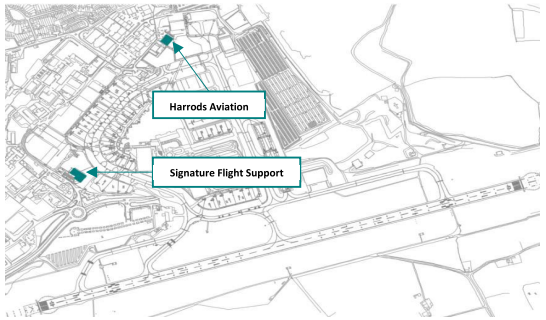
3.1.46 Other aviation support facilities at London Luton Airport are:

- **Air Traffic Control:** including ATC tower which is located between the MSCP1 and hangar 89.
- **Aircraft Navigation Systems:** including special systems that provide navigation aid to aircraft, such as VOR station, ILS or PAPI, among others.
- **Meteorological Observation Site**.

General Aviation Facilities

3.1.47 London Luton Airport also provides facilities that support private or general aviation (GA) operations. The main business and private aviation companies operating from LLA are Harrods Aviation and Signature Flight Support. These Fixed Base Operators (FBOs) whose private terminals have landside accesses via Prince Way and Percival Way roads, respectively.

London Luton Airport's general aviation facilities

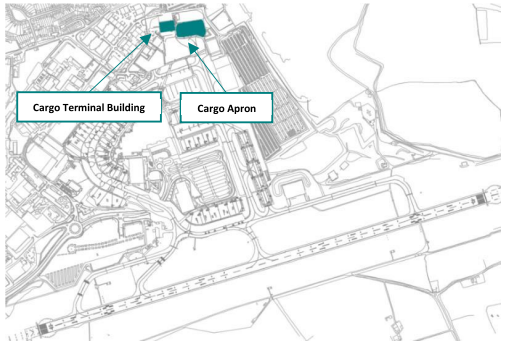


Source: IDOM

Cargo Facilities

3.1.48 The cargo centre is located at the north of the Passenger Terminal Building, in front of Pier A and North Apron. There is a dedicated cargo apron with two stands.

Figure 3.9. London Luton Airport's cargo facilities



Source: IDOM

3.2 Planning Standards

3.2.1 The capacity requirements of LLA's PTB for 19 mppa have been developed following IATA's Airport Development Reference Manual (ADRM), 10th edition issued in May 2017 in its fifth roll-out.

Level of Service

3.2.2 The ADRM provides guidelines and best practices for planning new airports or extending existing airport infrastructure and seeks to promote the development of sustainable world-class airport facilities. In this manner, the latest edition of the ADRM adopts a different approach towards the calculations methodology and Level of Service (LoS) to better reflect the current aviation market.

3.2.3 The Level of Service is mainly defined by two variables; waiting time and space, which are given in form of a range of values to allow an airport to tailor its service level to the market and region it serves. IATA provides a LoS Space-Time Matrix (refer to Table 3.11) to be used for processing facilities. In this manner, an Optimum Level of Service would be achieved if both space and time LoS axes show acceptable service, as highlighted in the matrix below.

Table 3.11. Level of Service space–time diagram for processing facilities

			Space		
			Over-Design *Excessive or empty space*	Optimum *Sufficient space*	Sub-Optimum *Crowded and uncomfortable*
Waiting Time	Over-Design	*Overprovision*	Over-Design	Optimum	Sub-Optimum
	Optimum	*Acceptable*	Optimum	Optimum	Sub-Optimum
	Sub-Optimum	*Unacceptable*	Sub-Optimum	Sub-Optimum	Under-provided

Source: IATA

3.2.4 Following IATA recommendation, this Master Plan sets the Optimum Level of Service as the target LoS to cope with 19 mppa. The following parameters have been used for the calculation of the capacity requirements for this planning horizon. Several parameters have been adjusted to London Luton Airport taking into consideration its specific characteristics. It should be noted that the ADRM does not include any reference in terms of LoS range values for the facility "Boarding Pass Control before Security". The proposed values are thus based on best practices.

Table 3.12. Space parameters used for capacity calculations

Area	Space (m²/pax)	
	IATA Optimum	Used
Check-in		
Self-Service Kiosk	1.3 - 1.8	1.55
Bag Drop Desk (Economy)	1.3 - 1.8	1.55
Bag Drop Desk (Business)	1.3 - 1.8	1.55
Check-in Desk (Economy)	1.3 - 1.8	1.55
Check-in Desk (Business)	1.3 - 1.8	1.55
Security Control	1.0 - 1.2	1.1
Departure Lounge		
Seating	1.5 - 1.7	1.5
Standing	1.0 - 1.2	1.0
Immigration Control		
Manual Control (EU)	1.0 - 1.2	1.0
Manual Control (non-EU)	1.0 - 1.2	1.0
Automated Control	1.0 - 1.2	1.0
Customs	1.3 - 1.8	1.55
Arrivals	2.0 - 2.3	2.15
Boarding Pass Control before Security	-	1

Source: IDOM

Table 3.13. Time parameters used for capacity calculations

Area	Maximum Queuing Time (min)		
	IATA Optimum	Used	Remarks
Check-in			
Self-Service Kiosk	1 - 2	1.5	
Bag Drop Desk (Economy)	1 - 5	3	
Bag Drop Desk (Business)	1 - 3	2	
Check-in Desk (Economy)	10 - 20	15	
Check-in Desk (Business)	3 - 5	4	
Security Control	5 - 10	15	Adjusted to LLA
Immigration Control			
Manual Control (EU)	5 - 10	25	Adjusted to LLA
Manual Control (non-EU)	5 - 10	45	Adjusted to LLA
Automated Control	5 - 10	5	
Customs	1 - 5	3	
Boarding Pass Control before Security	-	3	

Source: IDOM

Calculation Methodology

3.2.5 IATA provides within the ADRM a complete overview of several aspects that are involved in any airport project. However, the complexity associated with all airport developments implies that many variables are subject to different interpretations and can lead to significantly different conclusions. Thus, the manual should be considered as the initial source of design guidance for airport development studies and should be complemented with the analysis of national standards and airport particularities. In this manner, the requirements of many of the PTB processing facilities have been assessed following IATA's ADRM, but the requirements of other airport facilities have been developed with other methodologies based on London Luton Airport specific characteristics and needs.

3.2.6 Thus, the capacity requirements for following passenger processing facilities have been calculated with IATA's ADRM 10th edition.

- Self-service kiosks.
- Bag drop off check-in.
- Traditional check-in.
- Boarding pass control before security.
- Passenger security screening.
- Immigration control.
- Baggage reclaim.
- Customs.
- Arrivals hall.

3.2.7 The required capacity to cope with 19 mppa of following airport facilities has been calculated taking into consideration LLA particularities and historic trends.

- Waiting lounge before boarding gate announcement.
- Boarding gates.
- Stands.
- Taxiways.
- Runway.

Planning Standards Overview

3.2.8 In addition to the parameters related to the Level of Service (maximum queuing time and space per passenger) the following planning standards have been considered for calculating the required capacity for the planning horizon. It should be noted that these values are based on London Luton Airport specific characteristics.

Table 3.14. Planning standards for capacity calculations

Item	Standard
Peak 30-minute Factor (in % of PHP)	60%
Self-Service Facilities	
Ratio of Passengers Using Self-Service Kiosks (in %)	20%
Process Time per Passenger at Self-Service Kiosk (in seconds)	90
Check-in (Bag Drop and Traditional Facilities)	
Proportion of Business Class Passengers (in % of PHP)	5%
Proportion of First-Class Passengers (in % of PHP)	0%
Passengers not going directly to Security (in % of PHP)	51.6%
Ratio of Passengers Using the Bag Drop Facilities (in %)	40%
Process Time per Passenger at Baggage Drop for Economy Class (in sec)	60
Process Time per Passenger at Baggage Drop for Business Class (in sec)	60
Process Time per Passenger at Baggage Drop for First Class (in sec)	60

Item	Standard
Ratio of Passengers Using Traditional Check-in Facilities (in %)	60%
Process Time per Passenger at Check-in Desk for Economy Class (in sec)	60
Process Time per Passenger at Check-in Desk for Business Class (in sec)	60
Process Time per Passenger at Check-in Desk for First Class (in sec)	60
Passenger Security Screening	
Process (throughput) Time per Passenger at Security (in seconds)	16.48
Boarding Pass Check before Security Screening	
Process Time per Passenger at the Boarding Pass Access Gate (in seconds)	5
Waiting Lounge before Gate Announcement	
Dwell Time (in minutes)	45.5
Ratio of Seated Passengers (in %)	50%
Adjustment Factor to Seat Ratio (in %)	10%
Arrivals Immigration	
Ratio of Passengers using Automated Kiosk (EU)	76.14%
Ratio of Passengers using Automated Kiosk (non-EU)	4.03%
Ratio of EU Passengers	83.9%
Ratio of non-EU Passengers	16.1%
Process Time per Passenger at Arrival Passport Control for EU (in seconds) - Manual Booth	45
Process Time per Passenger at Arrival Passport Control for non-EU (in seconds) - Manual Booth	180
Process Time per Passenger at Arrival Passport Control (in seconds) - Automated Booth	15
Baggage Claim	
Number of passengers in the design aircraft (Narrow Body)	170
Claim frontage per passenger (m)	0.8
Ratio of passengers collecting bags (in %)	51.6%
Recirculation rate. Percentage of bags that will recirculate on the carousel using up space and preventing other bags from joining the carousel (in %)	50%
Proportion of passengers arriving by narrow body aircraft (in %)	100%
Average claim device occupancy time per narrow body (minutes)	20
Customs	
Process (throughput) Time per Passenger at X-ray Facility (in seconds)	15
Ratio of passengers to be inspected (in %)	2%
Arrivals Hall	
Dwell Time for Passengers (in minutes)	2
Dwell Time for Visitors (in minutes)	30
Number of Visitors per Passenger	0.25
Seat Ratio (in %)	15%

Source: IDOM

Conclusions

3.2.9 The forecasted peak period traffic figures, the planning standards and the required Level of Service are used as basis for determining the capacity requirements of the Passenger Terminal Building to cope with the planning horizon. The results of the capacity-demand analysis are summarized in the following sections.

3.3 Facilities Requirements

3.3.1 This section summarises both the capacity analysis and facility requirements for London Luton Airport through the planning horizon (19 mppa) including:

- Passenger Terminal Building facilities.
- Airfield facilities.

3.3.2 The various airfield and PTB components were analysed separately to determine their capacity to serve future demand and this analysis was used to identify general facility requirements. The methodology used to determine facility requirements generally follows industry standards, with planning factors adjusted, as appropriate, to reflect actual use characteristics at London Luton Airport, as shown in the previous section 3.2 Planning Standards. Planning experience at London Luton Airport and knowledge of other airports were also used to determine requirements.

Passenger Terminal Building

3.3.3 Regarding the Passenger Terminal Building, the Level of Service parameters as well as the planning standards (refer to 3.2 Planning Standards) are used in combination with the peak hour forecast (refer to Chapter 2) to determine the required number of processing facilities (e.g. counters and channels).

Following processing facilities have been considered within the PTB:

- Check-in.
- Boarding pass check before security control.
- Passenger security screening.
- Waiting lounge before gate announcement.
- Boarding gates.
- Immigration.
- Baggage reclaim.
- Customs.
- Arrivals hall.

3.3.4 The check-in process has changed dramatically over the last decade mainly due to the modification of the airlines policies towards checked baggage and the replacement of traditional check-in desks by self-service kiosks and bag drop facilities. These facilities are more space efficient, allowing to increase the departure hall capacity without requiring additional physical space. Thus, the ADRM includes calculations for self-service kiosks, bag drop and traditional check-in counters requirements. It has been estimated that a total of 21 traditional check-in counters and 19 bag drop counters (total 40 check-in desks) are required to cope with 19 mppa based on the aforementioned calculation methodologies and the following assumptions.

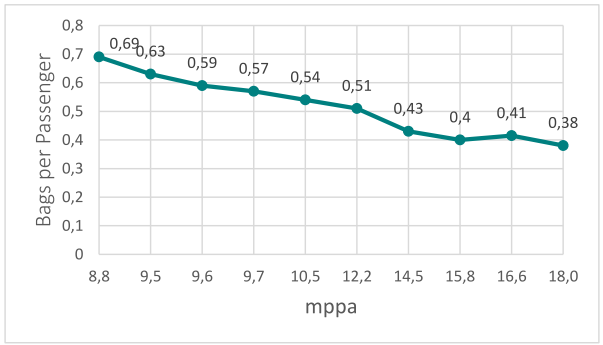
- Although the analysis of the bags per passenger ratio during the historic period of 2010 to 2019 reveals a significant decrease, this is not expected to continue during the planning period, mainly driven by the recently modified low cost carriers cabin baggage policies. A ratio of 0.516 bags per passenger equivalent to 51.6% of passengers not going directly to security has been assumed.

Table 3.15. Bags per passenger ratio

Year	Bags per passenger
2010	0.69
2011	0.63
2012	0.59
2013	0.57
2014	0.54
2015	0.51
2016	0.43
2017	0.40
2018	0.41
2019	0.38
Average	**0.516**

Source: IDOM

Figure 3.10. Overview bags per passenger ratio



Source: IDOM

- The airport will install a Common Use Terminal Equipment (CUTE) system to provide flexibility in the counters assignment process.
- 15% increase in the number of economy traditional check-in desks following IATA recommendation of increasing the number of check-in counters by 10% to 20% when the peak 30-minute factor is lower than 65% (60% used value) and the planning maximum queuing time ranges from 10-20 minutes (15 min used value).

Table 3.16. Check-in requirements for 19 mppa

	Counters (no)	Area (m^2)			
		Queuing	Process	Total	Additional Circulation behind the Queue
Existing Available	62	754	602	1,351	1,073
Total Minimum Required	40	473	389	862	288
Bag Drop Minimum Required	19	88	185	273	137
Traditional Minimum Required	21	384	204	589	151
Result - Existing vs Minimum Required	-	-	-	-	-

Source: IDOM

3.3.5 Currently, LLA does not have any self-service kiosks within the check-in facilities. Nevertheless, this equipment is envisaged to be installed in the upcoming years and therefore, self-service kiosks requirements have been also considered for the planning horizon (19 mppa).

Table 3.17. Self-service kiosks requirements for 19 mppa

	Counters (no)	Area (m^2)		
		Queuing	Process & Egress	Total
Existing Available	-	-	-	-
Minimum Required	27	86	97	183
Result - Existing vs Minimum Required	27	86	97	183

Source: IDOM

3.3.6 The boarding pass check facility before security control has been calculated using the ADRM analytical approach and capacity equation resulting in eight boarding pass access gates for 19 mppa, as shown in the table below. Both queuing and process and egress areas do not include priority facilities.

Table 3.18. Boarding pass check before security control requirements for 19 mppa

	Counters/Gates (no)	Area (m^2)		
		Queuing	Process & Egress	Total
Existing Available	11 + 1	292	57	349
Minimum Required	8	276	41	317
Result - Existing vs Minimum Required	-	-	-	-

Source: IDOM

3.3.7 The security facility requirements for the planning horizon have been estimated based on the methodology included in the ADRM and the following assumptions.

- There is no passenger segmentation in the security lanes. However, one of the 16 existing security lanes can be assigned either to priority or to general passengers so as to satisfy the real demand.
- There is a higher average throughput time (16.47 sec per passenger) compared to the target processing time of 15 sec, which is estimated based on the trials undertaken during the peak hours by LLAOL in August 2018. The table below shows the calculation of the processing time (PT) with the actual average throughput of the two existing Arch Metal Detectors (AMDs), designated as AMD2 and AMD3.

Table 3.19. AMD real average throughput and estimated processing time during peak hours

	AMD2			AMD3		
Hour	**Average Through put**	**Pax per min**	**PT (sec)**	**Average Through put**	**Pax per min**	**PT (sec)**
4:00	434	3,614	16,604	3,287	18,254	3,287
5:00	449	3,739	16,046	3,641	**16,477**	3,641
6:00	445	3,705	16,194	3,514	17,076	3,514

Source: LLAOL and IDOM calculation

- A maximum queuing time value equivalent to the queue target provided by LLAOL (15 min).
- The preparation area (201 m^2) is not part of the queuing area and thus is excluded from the existing areas calculation.

Table 3.20. Passenger security screening requirements for 19 mppa

	Channels (no)	Area (m^2)		
		Queuing	Process & Egress	Total
Existing Available	16	976	2,403	3,379
Minimum Required	15	903	1,500	2,403
Result - Existing vs Minimum Required	-	-	-	-

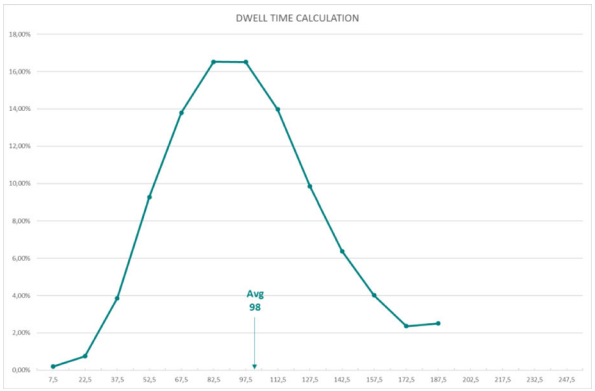
Source: IDOM

3.3.8 IATA ADRM calculation methodology and planning experience at London Luton Airport were used to determine waiting lounge requirements for 19 mppa. The area requirements of four different zones within the following waiting lounge areas have been assessed; public seating, food and beverages, retail and corridor. The term 'waiting lounge' refers to the PTB's central waiting lounge area located at level 20 where passengers are waiting until their boarding gate is announced, which occurs 45 minutes prior the ETD. The calculation results shown in the table below are based on following assumptions:

- A dwell time of 45.5 min based on the analysis of real data of passenger presentation time at security and assuming 15 min screening time and 45 min gate announcement time. The analysis estimates an average passenger presenting time at security of 98 minutes, equivalent to 38 minutes dwell time after deducting 60 minutes (screening time plus gate announcement time). This value has been increased by 7.5 min to reduce possible errors due to minimisation in the interpretation of the average value of every interval, thus resulting in an average passenger presentation time of 105.5

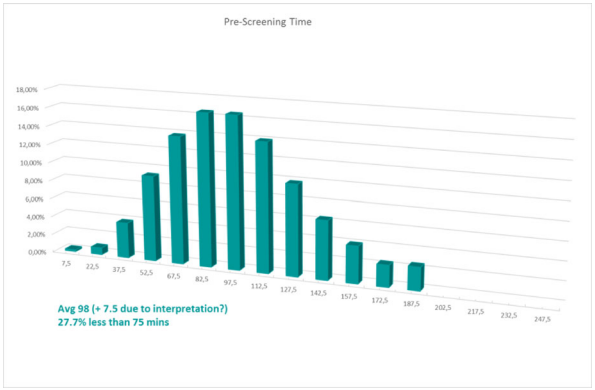
minutes pre-screening, equivalent to 45.5 min dwell time.

Figure 3.11. Dwell Time calculation



Source: IDOM

Figure 3.12. Passengers presentation time at screening



Source: IDOM

- A seat adjustment ratio of 10% additional seats to account for the loss of capacity caused by seated passengers who use an available seat next to them to put their personal belongings and thus prevent standing passengers to sit, following IATA recommendation.
- Seated passengers (50% of total dwell time PHP) are distributed along both public seating areas (50%) and food & beverages areas (50%).
- 60% of existing food & beverages seats (856 seats instead of 1,427 seats) are considered as usable seats to take into account the loss of capacity due to passengers not sharing tables.
- Standing passengers (50% of total dwell time PHP) are distributed along three areas; corridors (30%), commercial areas (55%) and seating areas (15%), whereby:
  - 25% of existing corridor area (2,374 m^2) considered as standing area.
  - 20% of existing total commercial areas (retail and duty-free, 5,732 m^2) considered as standing area.
  - 5% of food and beverages area (3,282 m^2) considered as standing area.
- In respect to COVID-19, the approach followed is in accordance with IATA recommendations. IATA does not support mandating social distancing measures that would leave seats between passengers' empty. This approach is based on the principle that the risk of transmission is low due to passengers and staff are required to wear a face mask.

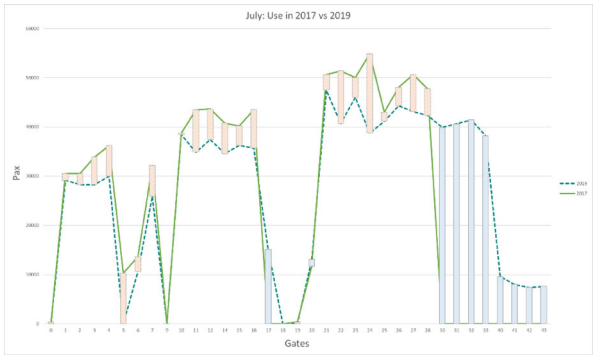
Table 3.21. Waiting lounge requirements for 19 mppa

	Seats (no)	Area (m^2)			
		Seating	Standing	Other	Total
Existing Available	**1,545**				12,464
Public Seating	689				1,075
F&B	856	1,438	164	1,680	3,282
Retail & Duty-Free	n/a	n/a	1,147	4,586	5,733
Corridor	n/a	n/a	594	1,780	2,374
Minimum Required	**1,425**	**2,351**	**1,425**	**69**	**3,846**
Public Seating	712	1,176	214	69	1,459
F&B	713	1,176	71	n/a	1,247
Retail	n/a	n/a	713	n/a	713
Corridor	n/a	n/a	428	n/a	428
Result - Existing vs Minimum Required (Public Seating)	**23**	**101**	**214**	**69**	**384**

Source: IDOM

3.3.9 The number of boarding gates required to cope with 19 mppa has been estimated to be 31. In calculating the boarding gates requirements, LLA usage of gates from 2013 to 2019 has been analysed along with the impact of the new pier on every gate use in terms of passengers per gate during July 2017 versus July 2019. A comparison of gate usage between July 2017 (grey line) and July 2019 (green line) is shown in the figure below.

Figure 3.13. Gates usage July 2017 vs July 2019



Source: IDOM

3.3.10 This comparison with 2017 is to indicate the additional room of usability for 2019, as 2017 represented the ultimate usability for gates, before the opening of the new pier. The new pier comprises 8 boarding gates that started to operate in 2018 (gates no. 17, 30, 31, 32, 33, 40, 41, 42 and 43). This allowed the airport to reduce the passenger gate usage in the rest of the active gates and therefore balance the overall gate occupancy in the last two years.

Table 3.22. Boarding gates requirements for 19 mppa

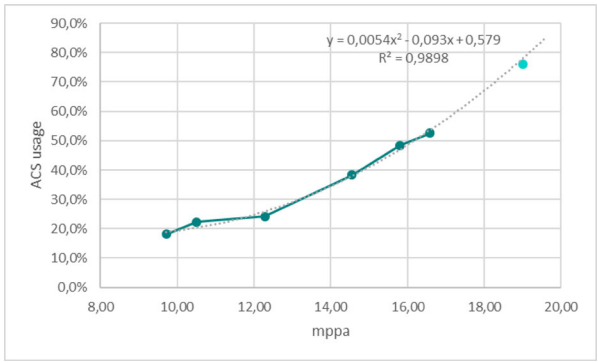
	Boarding gates (no)
Existing Available	31
Minimum Required	31
Result - Existing vs Minimum Required	-

Source: IDOM

3.3.11 Similar to the check-in process, the passport control process has changed significantly over the recent years due to the replacement of manual passport control booths by automated service (modern electronic passport and biometric control technologies). Both control systems (manual and automated) are currently in place at London Luton Airport immigration facility. Therefore, ADRM analytical approach and capacity equation have been used to estimate the required number of manual passport control booths as well as of Automated Control System (ACS) gates to cope with 19 mppa along with following criteria:

- 93.6% of total passengers considered as international passengers of which 16.1% are assumed to be non-EU passengers and 83.9% EU passengers.
- Since the government has recently expanded the use of ePassport gates to seven more non-EU countries (Australia, Canada, Japan, New Zealand, Singapore, South Korea, and the United States) passengers with these nationalities can now use the ACS to enter the UK. Therefore, some non-EU passengers are no longer directed only to manual passport control. It has been assumed that a quarter of non-EU passengers (4.0%) use ACS in the planning horizon.
- The ACS usage is assumed to continue to increase estimating that 76.1% of international passengers (EU only) will make use of ACS in the planning horizon. In assessing the ACS usage for 19 mppa, the interpolation of the real ACS usage values has been used.

Figure 3.14. ACS usage



Source: IDOM

Table 3.23. Immigration requirements for 19 mppa

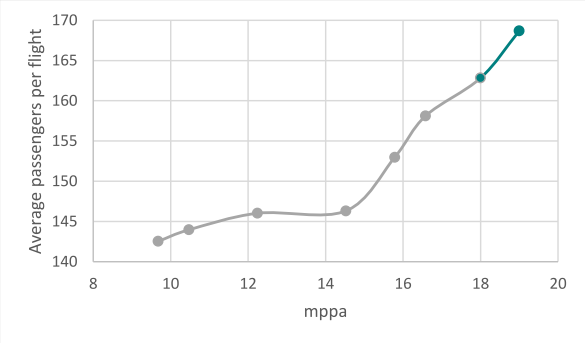
	Counters (no)	Area (m^2)		
		Queuing	Process & Egress	Total
Existing Available	**30**	**515**	**354**	**869**
Automated	15	103	127	639
Manual	15	412	227	230
Minimum Required	**27**	**540**	**339**	**879**
Automated	11	205	105	310
Manual	16	335	234	569
Result - Existing vs Minimum Required (Automated)		**102**	**-**	**102**
Result - Existing vs Minimum Required (Manual)	**1**	**-**	**7**	**7**

Source: IDOM

3.3.12 ADRM calculation equation and consideration of London Luton Airport particularities have been used for estimating the required number of baggage reclaim belts for 19 mppa. Two different calculations have been undertaken to assess the required number of domestic baggage reclaim belts and international baggage reclaim belts. The results show a need of one domestic reclaim belt and six international belts for the planning horizon based on following assumptions:

- 169 average passengers per flight, estimated by analysing the historic trend (2013-2019) and interpolating the ratio annual passengers versus annual ATMs. The figure shows real average passengers per flight ratios in grey and 19 mppa estimated ratio in green.

Figure 3.15. Average passengers per flight evolution



Source: IDOM calculation

- 100% of London Luton Airport movements are operated by narrow body aircraft models in general and Code C aircraft in particular.
- 0.561 bags per passenger ratio equivalent to 56.1% passengers collecting baggage for consistency reasons with check-in process.

Table 3.24. Baggage reclaim requirements for 19 mppa

	Domestic Belts (no)	International Belts (no)	Total Belts (no)
Existing Available	1	6	**7**
Minimum Required	1	6	**7**
Result - Existing vs Minimum Required	-	-	**-**

Source: IDOM

3.3.13 IATA's ADRM analytical approach and capacity equation have been used for assessing the required capacity for customs assuming an inspection ratio of 2%, applicable only to international passengers.

Table 3.25. Customs requirements for 19 mppa

	X-ray (no)	Area for X-ray (m^2)		
		Queuing	Process & Egress	Total
Existing Available	1	17	128	145
Minimum Required	1	8	18	26
Result - Existing vs Minimum Required	-	-	-	-

Source: IDOM

3.3.14 The capacity of the arrivals hall to cope with 19 mppa has also been assessed using IATA's ADRM calculations. In this manner, following criteria have been assumed:

- A proportion of seated occupants of 15% (lower limit of IATA' ADRM range of values for Optimum LoS) due to the existing F&B facilities within the arrivals' hall (1,016 m^2).
- A visitor ratio of 0.25 per passenger.

Table 3.26. Arrivals hall requirements for 19 mppa

	Area (m^2)
Existing Available	**1,690**
Minimum Required	**1,062**
Result - Existing vs Minimum Required	**-**

Source: IDOM

3.3.15 The table below shows the main passenger facilities for the planning horizon, area and equipment requirements.

Table 3.27. PTB passenger processing facilities minimum requirements for 19 mppa

	Minimum Equipment Required (no)	Minimum Area Required (m^2)		
		Queuing	Process & Egress	Total
Self-Service Kiosks	**27**	**86**	**97**	**183**
Check-in	40	473	389	862
Bag Drop	19	88	185	273
Traditional	21	384	204	589
Boarding Pass Control	8	276	41	317
Passenger Security Screening	**15**	**903**	**1,500**	**2,403**
Waiting Lounge				
Public Seating	712 seats	-	-	1,459
F&B	713 seats	-	-	1,247

	Minimum Equipment Required (no)	Minimum Area Required (m^2)		
		Queuing	Process & Egress	Total
Retail	-	-	-	713
Corridor	-	-	-	428
Boarding Gates	**31**	-	-	-
Immigration	**27**	**540**	**339**	**879**
Manual	16	335	234	569
Automated	11	205	105	310
Baggage Reclaim	**7**	-	-	-
Domestic	1	-	-	-
International	6	-	-	-
Customs	**1**	**8**	**18**	**26**
Arrivals Hall	-	-	-	**1,062**

Source: IDOM

3.3.16 The comparison of the existing area and equipment with the minimum required area and equipment to cope with 19 mppa (Table 3.27) sets out what main passenger processing facilities require additional area or equipment to meet the forecasted demand. The table below shows the additional requirements.

Table 3.28. PTB passenger processing facilities additional equipment and area required for 19 mppa (compared to existing available infrastructure)

	Additional Equipment Required (no)	Additional Area Required (m^2)		
		Queuing	Process & Egress	Total
Self-Service Kiosks	**27**	**86**	**97**	**183**
Check-in	**-**	**-**	**-**	**-**
Bag Drop	-	-	-	-
Traditional	-	-	-	-
Boarding Pass Control	-	-	-	-
Passenger Security Screening	-	-	-	-
Waiting Lounge				
Public Seating	23 seats	**-**	**-**	384
F&B	**-**	**-**	**-**	**-**
Retail	**-**	**-**	**-**	**-**
Corridor	-	-	-	**-**
Boarding Gates	**-**	-	-	-
Immigration	**-**	**-**	**-**	**102**
Manual	**1**	-	**7**	7
Automated	**-**	102	**-**	102
Baggage Reclaim	**-**	-	-	-
Domestic	**-**	-	-	-
International	**-**	-	-	-
Customs	**-**	**-**	**-**	**-**
Arrivals Hall	**-**	**-**	**-**	**-**

Source: IDOM

Airfield Facilities

3.3.17 In terms of airfield facilities, all the estimations for 19 mppa have been done based on historical data of PHA or PHP and their forecast for the future as this is considered the most probable scenario. The capacity of the following airfield facilities for the planning horizon have been analysed:

- Aprons.
- Taxiways.
- Runways.

Aprons

3.3.18 The estimation for the increase of the number of stands between 18 and 19 mppa has been based on two amalgamated factors:

- The stand occupation vs the PHP.
- The increase in the number of passengers per aircraft for commercial flights.

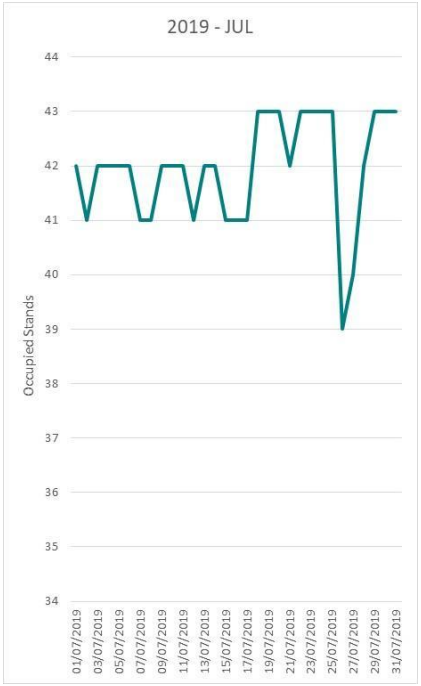
3.3.19 The first factor is a consequence of the maximum occupation of the apron, during July in the last five years (up to 2019). An example of the occupation for 2019 is shown the figures below.

Table 3.29. Occupation of the apron in July 2019 (18.0 mppa)

Date	Occupied Stands (no)
01/07/19	42
02/07/19	41
03/07/19	42
04/07/19	42
05/07/19	42
06/07/19	42
07/07/19	41
08/07/19	41
09/07/19	42
10/07/19	42
11/07/19	42
12/07/19	41
13/07/19	42
14/07/19	42
15/07/19	41
16/07/19	41
17/07/19	41
18/07/19	43
19/07/19	43
20/07/19	43
21/07/19	42
22/07/19	43
23/07/19	43
24/07/19	43
25/07/19	43
26/07/19	39
27/07/19	40
28/07/19	42
29/07/19	43
30/07/19	43
31/07/19	43
Average	**41.9**

Source: IDOM

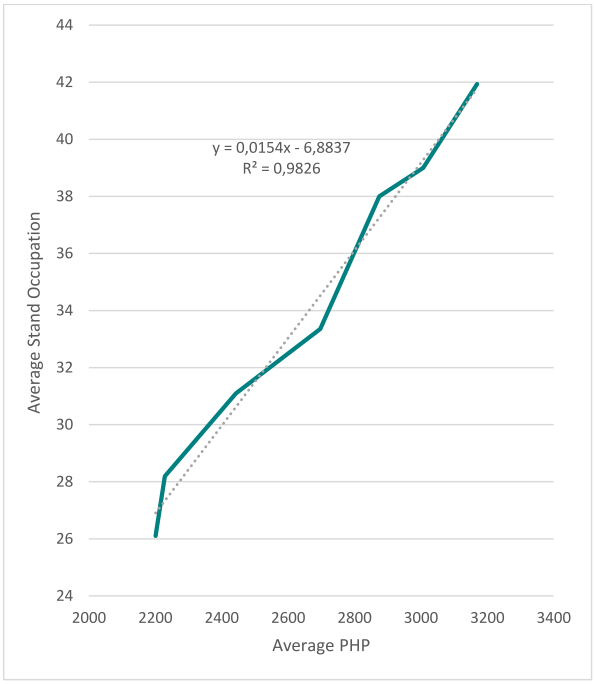
Figure 3.16. Occupation of the apron in July 2019 (18.0 mppa)



Source: IDOM

3.3.20 The monthly average for the daily maximum occupation of stands showed the best correlation with Peak Hour Passenger:

Figure 3.17. Stand occupation vs PHP (2019)



Source: IDOM

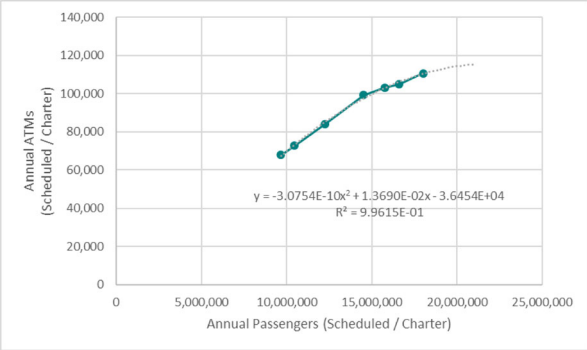
3.3.21 The above estimation works for an airport with a steady number of the ratio of passengers per aircraft; but recently (since winter 2016), the airlines have been changing the use of Airbus model 319 (156 seats) to 320 (186 seats) or 321 (235 seats). To consider this, the ratio of passengers per aircraft and its evolution to 19 mppa have been included.

Table 3.30. Ratio of passenger per aircraft

Year	Annual ATMS Scheduled/Charter	Annual Pax Scheduled/Charter	PAX Ratio
2013	67,907	9,678,886	142.5
2014	72,715	10,468,276	144.0
2015	83,835	12,242,084	146.0
2016	99,265	14,523,872	146.3
2017	103,175	15,782,781	153.0
2018	104,861	16,580,725	158.1
2019	110,549	17,999,969	162.8
(19 mppa)	112,634	19,000,000	168.7

Source: IDOM

Figure 3.18. Evolution of Annual ATMs vs Annual Passengers



Source: IDOM

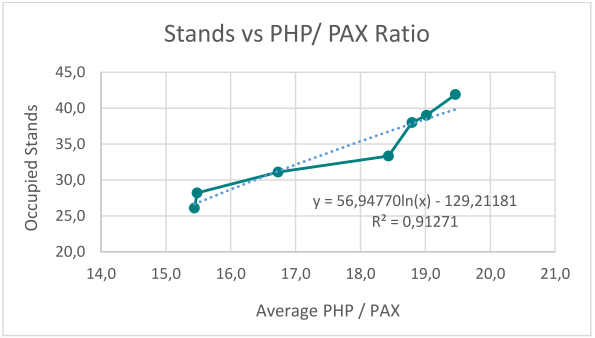
3.3.22 Following the initial concept of the stand occupation based on the average PHP, but corrected with the PAX Ratio:

Table 3.31. Ratio of passenger per aircraft

Year	Average PHP	PAX Ratio	MAX Stands
2013	2,201	142.5	28
2014	2,229	144.0	33
2015	2,443	146.0	33
2016	2,697	146.3	35
2017	2,875	153.0	41
2018	3,007	158.1	41
2019	3,170	162.8	43
(19 mppa)	**3,439**	**168.7**	**43**

Source: IDOM

Figure 3.19. Stand Occupation vs PHP / PAX Ratio



Source: IDOM

3.3.23 The need for commercial stands is therefore 43, assuming all are Code C, with some combined as MARS.

Table 3.32. Stands requirements for 19 mppa

	Code C Stands
Existing Available	**43**
Minimum Required	**43**
Result - Existing vs Minimum Required	**-**

Source: IDOM

Taxiways

3.3.24 There is no additional demand for taxiways as a result of the increase from 18 to 19mppa, mainly due to the fact that the total annual ATMs figure grows only 0.8% in this period.

Runway

3.3.25 The runway capacity requirements for the planning horizon have been estimated with the peak hour aircraft value, calculated according to the 30th busiest hour and taking into consideration the PHA values for previous years, as described in Chapter 2.

Table 3.33. Required runway capacity for 19 mppa

	PHA
Existing Available	37
Minimum Required	36
Result - Existing vs Minimum Required	**-**

Source: IDOM

Conclusions

3.3.26 The table below summarizes the main airfield facilities requirements for the planning horizon, 19 mppa.

Table 3.34. Airfield facilities requirements for 19 mppa

	Minimum Required Capacity
Apron	43 stands
Taxiways	n/a
Runway	36 PHA

Source: IDOM

3.4 19 mppa Plan

3.4.1 In the context of the current Master Plan and following the analysis of the previous sections, this section sets out the expansion solutions of the facilities within both the PTB and the airfield which will not have enough capacity to cope with the forecasted demand for the planning horizon of 19 mppa.

Passenger Terminal Building

3.4.2 The Passenger Terminal Building facilities requirements analysed in the previous section 3.3 Facilities Requirements showed that the following passenger processing facilities have enough capacity to handle the expected demand as their existing floor areas and equipment are higher than required for the planning horizon:

- Check-in (traditional and bag drop).
- Boarding pass control before security.
- Passenger security screening.
- Boarding gates.
- Baggage Reclaim.
- Customs.
- Arrivals hall.

3.4.3 The remaining passenger processing facilities will not have capacity to cope with the estimated demand of the planning horizon.

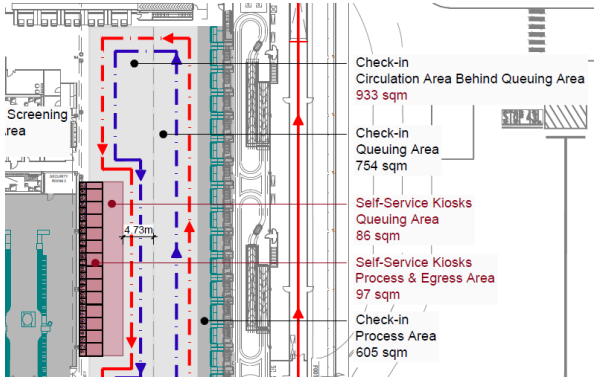
3.4.4 Only minor refurbishment works have been considered to expand the capacity of following facilities and no significant expansion works (e.g. structural works, new building, …) are envisaged in this Master Plan:

- Self-Service kiosks.
- Waiting lounge – public seating.
- Immigration.

Self Service kiosks

3.4.5 This Master Plan proposes the installation of self-service kiosks in the check-in hall in front of the existing check-in counters. The check-in hall has a 1,073 m^2 circulation area and a free width of 11.9 m from queue to wall. The new self-service kiosk facility is proposed to be located as shown in Figure 3.20 and will comprise 27 kiosks covering a total area of 183 m^2. The remaining corridor width (4.7 m) between self-service kiosks queuing area and check-in queuing area provides enough circulation space between both queues.

Figure 3.20. Proposed new self-service kiosks facility at London Luton Airport



Source: IDOM

Waiting Lounge

3.4.6 Regarding the waiting lounge, the previous analysis has set out a shortfall of 23 public seats. However, the provision of additional public seats has not been envisaged in this Master Plan due to following reasons:

- The calculation has also shown an excess on total available seating by IATA standards of 120 seats (1,425 seats required for the planning horizon versus 1,545 existing seats) resulting from an excess on available Food & Beverages seats. In this manner, the shortfall of public seats can be compensated by the excess of Food & Beverages seats.
- There are two additional public seating areas excluded from initial estimation of existing facilities due to their location at both ends of the waiting lounge area. One area is located at the duty-free entrance and the other at the northern side of the waiting lounge area, designated as Ferrari doors area, with 8 seats and 63

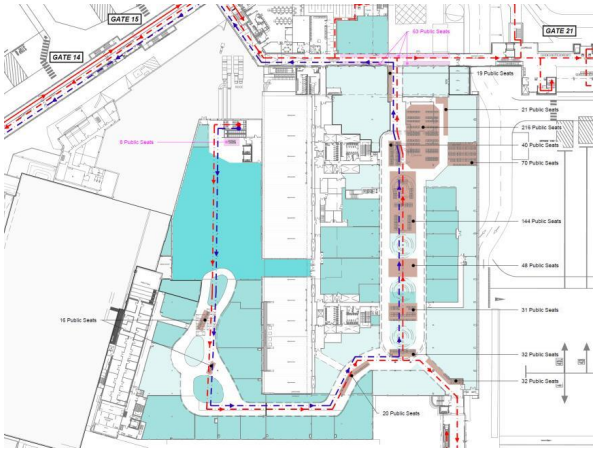
seats, respectively. The mentioned public seats zones cover an area of 18 m^2 and 120 m^2, respectively.

Table 3.35. Public seating comparison

	Seats	Area (m^2)
Total Existing Public Seating	**760**	**1,213**
Existing Public Seating considered for IATA calculations	689	1,075
Duty-Free Entrance Public Seating (excluded from IATA calculations)	8	18
Ferrari Doors Public Seating Area (excluded from IATA calculations)	63	120
Minimum Required Public Seating	**713**	**1,459**

Source: IDOM

Figure 3.21. Existing additional public seating areas (in pink) at London Luton Airport



Source: IDOM

3.4.7 In terms of waiting lounge floor areas, after considering the aforementioned additional seating areas, a shortfall of 246 m^2 has been calculated for the circulation area and the area for standing passengers within the public seating area. However, this shortfall can be compensated by the wide circulation area that surrounds each public seating area as shown in the figure above. Thus, this Master Plan does not envisage the expansion of the waiting lounge.

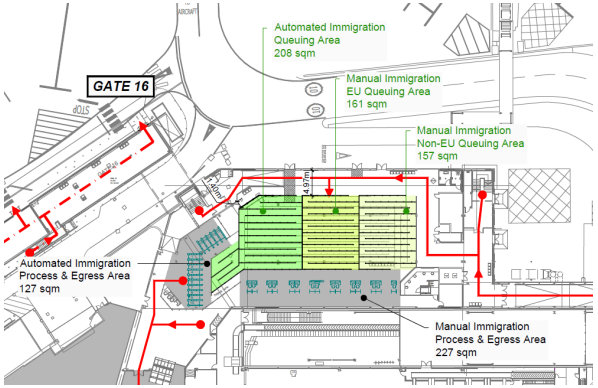
Immigration

3.4.8 The current distribution of immigration queuing and process and egress areas do not align with the forecasted demand requirements;

- Bigger floor queuing area for manual passport control.
- Bigger floor process and egress area for e-Gates.

3.4.9 The increase in automated control systems (ACS) and non-EU queuing area requirements can be largely attributed to the combined effects of increasing the ACS usage ratio (76.1% EU and 4.0% non-EU) and the high maximum queuing time of non-EU passengers (45 min). The solution proposed in the figure below provides 176 m^2 for non-EU queuing area (existing 49 m^2), 159 m^2 for EU queuing area (available 363 m^2) and 205 m^2 for ACS queuing area (current 103 m^2). In terms of equipment, one additional manual passport control booth is required. This solution involves the reconfiguration of the queuing areas and the introduction of one additional manual booth without requiring further major expansion or refurbishment works (e.g. structural works, new building,…).

Figure 3.22. Proposed immigration reconfiguration at London Luton Airport



Source: IDOM

Airfield

3.4.10 In terms of airfield facilities, the analysis undertaken in the previous section 3.3 Facilities Requirements has shown that apron capacity is not enough to cope with the estimated stand occupation. However, no expansion works are envisaged for taxiways and runway as the existing capacity of these facilities are enough to cope with the forecasted demand:

- Aprons – It has been estimated that a total of 43 Code C commercial stands are required for the planning horizon, which is equivalent to the current number of Code C commercial stands.
- Taxiways – The estimated annual ATMs value for the planning horizon represents an increase of only 0.8% with respect to the current horizon (18 mppa).
- Runway – The current runway capacity (37 total operations per hour) is higher than the forecasted PHA for the planning horizon (36 PHA).

4

LAND USE PLAN

INDEX

4 LAND USE PLAN

4.1 Introduction

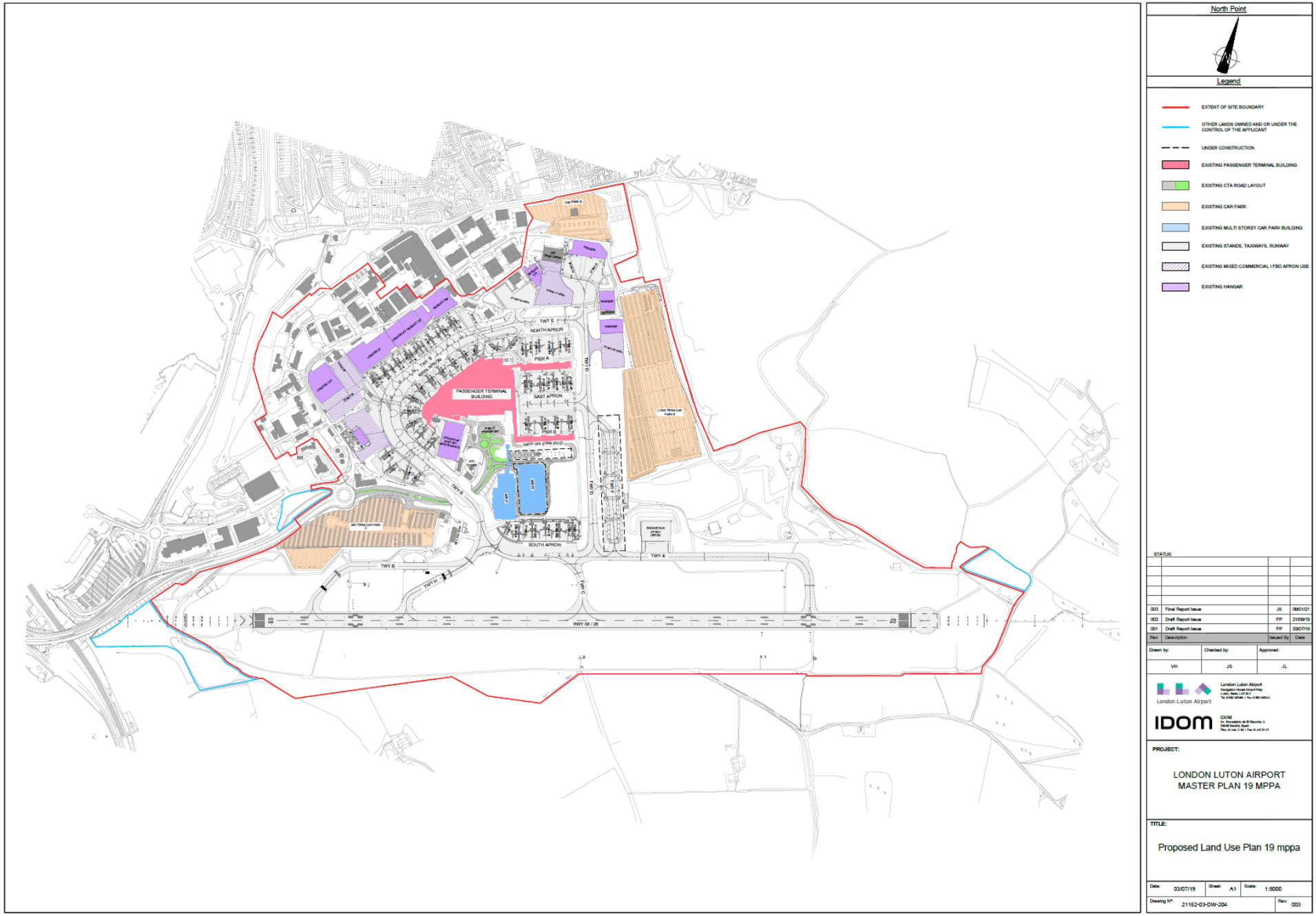
4.1.1 In the context of the current Master Plan and following the analysis in Chapter 2 Forecast and Chapter 3 Master Plan, this Chapter sets out the Proposed Land Use Plan for 19 mppa which is considered equivalent to the existing Land Use Plan (18 mppa) based on:

- No major Passenger Terminal Building expansion works are envisaged as analysed facilities that showed under capacity for the planning horizon can increase their capacity with minor refurbishment works (i.e. installation of new equipment in existing check-in hall corridor and reconfiguration of existing immigration queuing areas).
- No airfield expansion works in terms of aprons, taxiways or runway, are envisaged to cope with the demand of the planning horizon.

4.2 Existing


North Point
Legend
EXTENT OF SITE BOUNDARY
OTHER LANDS OWNED AND OR UNDER THE CONTROL OF THE APPLICANT
UNDER CONSTRUCTION
PASSENGER TERMINAL BUILDING
CTA ROAD LAYOUT
CAR PARK
MULTI STOREY CAR PARK BUILDING
STANDS, TAXIWAYS, RUNWAY
MIXED COMMERCIAL / FBO APRON USE
HANGAR
STATUS
003 Final Report Issue JS 09/01/20
002 Draft Report Issue PP 21/08/19
002 Draft Report Issue PP 03/07/19
Rev. Description Issued By Date
Drawn by: VH
Checked by: JS
Approved: JL
London Luton Airport
IDOM
PROJECT:
LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA
TITLE:
Existing Land Use Plan
Date: 03/07/19
Sheet: A1
Scale: 1:5000
Drawing N°: 21152-03-DW-105
Rev: 003
PASSENGER TERMINAL BUILDING
NORTH APRON
EAST APRON
SOUTH APRON
PIER A
PIER B
TWY E
TWY D
TWY C
TWY A
TWY B
TWY H
RWY 08 / 26

4.3 Proposed


North Point
Legend
EXTENT OF SITE BOUNDARY
OTHER LANDS OWNED AND OR UNDER THE CONTROL OF THE APPLICANT
UNDER CONSTRUCTION
EXISTING PASSENGER TERMINAL BUILDING
EXISTING CTA ROAD LAYOUT
EXISTING CAR PARK
EXISTING MULTI STOREY CAR PARK BUILDING
EXISTING STANDS, TAXIWAYS, RUNWAY
EXISTING MIXED COMMERCIAL \ FBO APRON USE
EXISTING HANGAR
STATUS
003 Final Report Issue JS 09/01/21
002 Draft Report Issue PP 21/08/19
001 Draft Report Issue PP 03/07/19
Rev Description Issued By Date
Drawn by: VH
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London Luton Airport
IDOM
PROJECT:
LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA
TITLE:
Proposed Land Use Plan 19 mppa
Date: 03/07/19
Sheet: A1
Scale: 1:5000
Drawing N°: 21152-03-DW-204
Rev: 003
PASSENGER TERMINAL BUILDING
NORTH APRON
EAST APRON
SOUTH APRON
PIER A
PIER B
TWY A
TWY B
TWY E
RWY 08 / 26

5

IMPACT ON PEOPLE AND THE NATURAL ENVIRONMENT

INDEX

5 IMPACT ON PEOPLE AND THE NATURAL ENVIRONMENT

5.1 Introduction

5.1.1 It is accepted that the existing and continued use of the airport leads to inevitable impacts on people and on the natural environment. It is therefore appropriate that any Master Plan for changes to operations considers those potential impacts and the methods by which they can be controlled to within acceptable levels. Chapter 5 and 6 discuss potential impacts associated with the Master Plan and the means to mitigate these effects.

5.1.2 In particular, this Master Plan considers the following environmental topics which are discussed in turn below:.

- Noise.
- Air quality.
- Waste.
- Energy and climate change.
- Ecology and biodiversity.
- Ground and water conditions.
- Landscape.

5.2 Noise

5.2.1 The generation of airborne sound is an inevitable consequence of airport operations and the perception of that unwanted sound by residents and facilities users is defined as noise. As the most immediate environmental effect experienced by humans, the control and mitigation of noise effects is paramount in the airport's current and future operations.

5.2.2 Receptors for noise include both residential and sensitive non-residential parties able to distinguish specific aircraft noise generated by flight operations. Most significant effects are experienced by those who live or work within the corridor of low altitude operations (take-off and landing). In part, those areas exposed to low altitude operations fall into reasonably high background noise environments, but others are in quieter background environments in which aircraft noise will be more dominant.

5.2.3 Activities other than aircraft movements also have the capability of generating noise including transport to and from the airport and from some activities within the airport (e.g. maintenance and construction). Such activities are much more likely to be localised and will not have an extensive ground footprint of action in contrast to flying operations.

5.2.4 The impact of noise from air operations is well-understood and the means to monitor and control it are wide and varied. Nevertheless, there are always associated challenges in the operation of those controls. In the case of the current operations at LLA, externally applied planning and legal controls exist to ensure that noise is controlled.

5.2.5 LLAOL has commissioned Wood to undertake a Noise Impact Assessment for change to the existing daytime and night-time noise contours and the change of the passenger throughput to 19 mppa. The increase in passenger numbers can be achieved by the combined effects of increasing the occupancy levels of flights currently operated and by migration in the average passenger capacity of flights by adoption of large aircraft.

5.2.6 Aircraft type is an important factor in the noise generation. Substantial reductions in sound power output have been achieved over recent years between aircraft and engine manufacturers, allowing newer aircraft to carry equivalent numbers of passengers with lower noise signatures. Increased utilisation of new generation aircraft will be a principal means of allowing the increased passenger numbers while still meeting the noise requirements.

5.2.7 The Noise Assessment has considered the ATM which are expected in the 92-day peak summer period and makes a forecast for the expected noise signature (daytime and night-time contours) based on these assumptions.

5.2.8 Forecasts for 92-day peak air traffic movements show that for 19 mppa the figures for total ATMs will increase by a small amount compared to the consented 18 mppa. While the increase must be a consideration in respect of noise impact, it is considered that the noise conditions, which already exist or have been applied for, will be achievable by the occupancy and fleet changes anticipated. The routes served in the context of the planned passenger expansion are not forecast to change.

5.2.9 The Noise Assessment considers the impacts of the proposed changes to increase the daytime and night-time noise contours and the passenger throughput cap from 18 mppa to 19 mppa from 2024.

5.2.10 When comparing all of the assessment scenarios (2021 18 mppa, 2022 18 mppa, 2023 18 mppa, or 2024 19 mppa) daytime noise levels with the existing 18 mppa noise contours for 2021 - 2027, the results show that there are no significant increases of more than 3 dB between the LOAEL (51 dB) and SOAEL (63 dB). Further, there are no increases of 1 dB or more for any residents experiencing noise above SOAEL. On this basis, the effect of the Proposed Scheme during daytime of 2021 would not be significant.

5.2.11 When comparing all the assessment scenarios (2021 18 mppa, 2022 18 mppa, 2023 18 mppa, or 2024 19 mppa) night-time noise levels with the existing 18 mppa noise contours for 2021 - 2027, the results show that there are no increases of more than 3 dB between the LOAEL (45 dB) and SOAEL (55 dB). For most of the assessment scenarios, there are increases of 1 - 1.9 dB for: 144 dwellings (2021 18 mppa), 1,877 dwellings (2022 18 mppa), 1,877 dwellings (2023 18 mppa), 1,470 dwellings (2024 19 mppa), experiencing noise above SOAEL. On this basis, the effect of the Proposed Scheme during night-time would be significant.

5.2.12 When comparing the 2028 19 mppa noise levels with a revised noise contour condition for 2028 onwards, the results show that there are no increases of more than 3 dB between the LOAEL (51 dB) and SOAEL (63 dB) daytime or LOAEL (45 dB) and SOAEL (55 dB) night-time. In addition, there are no increases of 1 dB or more for any residents experiencing noise above SOAEL. On this basis, the effect of the Proposed Scheme during day time or night-time of 2028 would not be significant.

5.2.13 For non-residential receptors, the results show that there would be changes of 1 dB or more above the threshold criteria at Caddington, Park Town, Breachwood Green, St Pauls Walden, Slip End and at Stevenage Station. These significant effects are mainly predicted in 2022, except for ongoing significant effects in Park Town, Luton to 2024, and at Slip End to 2023. On this basis, the effect of the Proposed Scheme at these locations would be significant.

5.2.14 Additional noise environmental measures are required to reduce the effects of noise exposure at the additional residential properties experiencing noise above the SOAEL during the night-time. These are described in Section 6.

5.3 Air Quality

5.3.1 Evaluation of current air quality and future years needs to consider the addition to the atmosphere of relevant pollutants associated with combustion of fuels (aircraft, road traffic and other transport, heating *etc*). The most significant contaminants are likely to be as fine particulates (PM_{10} and $PM_{2.5}$ and nitrogen oxides). Air quality objectives exist for these and plans must recognise the need to meet the relevant standards.

5.3.2 An Air Quality Assessment has been produced by Wood. The assessment considers the forecast effects of the development on the emissions from operations at the airport.

5.3.3 Air traffic movements and aircraft ground movements represent one of the principal sources of airborne contaminants. As discussed above, the plans for increased passenger capacity do not entail significant increases to the average or total number of aircraft movements at the airport.

5.3.4 Surface transport, particularly road transport, is expected to be increased but the increase in total capacity from 18 mppa to 19 mppa will not be reflected in a proportionate number of journeys or a proportionate rate of mass increase in pollutant emission due to other trends including mode shift from cars to rail – promoted by the introduction of DART.

5.3.5 Other less significant sources of relevant airborne pollutants are ground operations and combustion heating undertaken at the site. No significant increases in either of these are expected as a result of the capacity change.

5.3.6 The Air Quality Assessment includes qualitative description of the identified increases and concludes that the impact from nitrogen oxides, PM_{10}, and $PM_{2.5}$ are negligible at all relevant receptors. In addition, the assessment concludes that the ecological effects from airborne nitrogen oxides and from nitrogen and acid deposition are not significant. Mitigation options are discussed in Chapter 6.

5.4 Waste

5.4.1 The production of waste within the airport is dominated by domestic and catering activities and by waste disposal from packaging (principally of food items) by passengers. As such, and without mitigation of this effect, there would be expected to be a proportionate increase in the generation of waste.

5.4.2 Wood has produced a Site Waste Management Plan (SWMP) for the airport which considers the amounts of waste which may be generated by the increase in number of passengers. The absolute increase has been considered in a number of ways but in each case assumes a per passenger waste production rate.

5.4.3 The absolute increase in waste expected depends upon the per passenger rate and the SWMP for the airport shows that this has itself reduced over time.

5.4.4 All waste generated at the site is dealt with by the airport operators and its consignees. Capacity to increase the waste handling operations is available.

5.4.5 Methods to avoid proportional increase in the mass of waste generated are discussed in Chapter 6.

5.4.6 The proposals do not entail any significant construction activities and therefore there is not expected to be any significant generation of construction waste associated with the capacity increase. Routine maintenance and refurbishment operations may produce waste but there is not expected to be any proportionate increase in this due to the capacity increase.

5.5 Energy and Climate Change

5.5.1 The increase in passengers associated with this Master Plan is inevitably associated with increase in travel both by surface and air modes.

5.5.2 A Greenhouse Gas Assessment has been undertaken by Wood. The assessment shows that in all cases modelled the largest contribution to greenhouse gas emissions is from air traffic. Surface transport accounts for the next largest contribution.

5.5.3 As expounded before, the forecast increased occupancy of aircraft and the migration in aircraft fleet will ensure emissions increase less rapidly than would be expected proportionally.

5.5.4 There are not expected to be any significant increases in main heating energy required but slight increases in energy uses for building services and catering is expected.

5.5.5 The change in surface passenger transport mode from private cars to the DART would reduce the proportional impact on greenhouse gas emission from increased passenger numbers. The assessment carried out by Wood forecasts that greenhouse gas emission will reduce due to the increased migration to more fuel-efficient aircraft and also migration to renewable electricity sources.

5.5.6 Other measures available to reduce the impact on greenhouse gas emissions from transport sources are discussed in Chapter 6.

5.6 Ecology and Biodiversity

5.6.1 The airport is operationally intensive with substantial coverings of hardstanding and buildings and does not contain any significant habitats. For operational safety reasons, fauna is discouraged.

5.6.2 As the changes to air traffic movements are very small, no impact on any wider habitat is expected.

5.7 Ground and Water Conditions

5.7.1 No changes to airport structures are proposed as part of the Master Plan proposals and the effect on ground and groundwater resources is considered negligible.

5.7.2 The site remains positively drained and no changes to this or hydrological conditions are expected.

5.8 Landscape and Visual

5.8.1 The Master Plan proposals do not entail any works which are considered capable of affecting the landscape and visual environment of the site. Minor increases in air traffic movements will not result in significant change in landscape character.

6

PROPOSALS TO MINIMISE AND MITIGATE IMPACTS

INDEX

6 PROPOSALS TO MINIMISE AND MITIGATE IMPACTS

6.1 Overview

6.1.1 As part of its overall Environmental Policy LLAOL recognises its responsibility to minimise the environmental impacts of its activities. Where analysis of the activities demonstrates that existing or proposed activities could have significant impacts, then the airport will take steps to mitigate the impacts and, therefore, the effects.

6.1.2 In the context of the Master Plan and following the analysis in Chapter 4, this Chapter sets out the proposed methods to minimise and mitigate the impacts from relevant environmental aspects which are considered to be:

- Noise
- Air quality
- Waste
- Energy and climate change.

6.1.3 No measurable changes to the impacts and effects in other environmental aspects are expected and therefore no specific minimisation or mitigation actions are identified above the general environment policy objects of LLAOL. Overall, the environmental policy confirms LLAOL's commitment to continuously review its environmental performance to manage environmental impacts.

6.2 Noise

6.2.1 The control and mitigation of noise nuisance at London Luton Airport is a priority requirement due to the inherent sound generation implications of passenger and general air transport operations. For this reason, the noise environment and its control is managed by a number of internal initiatives and external obligations.

6.2.2 Noise generation and impact is strictly controlled by the planning permissions under which the airport operates. The most recent permission with planning conditions is ref: 15/00950/VARCON. In addition, a legal agreement (section 106) between LLAOL as operator and LLAL as owner and Luton Borough Council places further requirements to operate the airport within strict noise parameters including noise limits, monitoring requirements and reporting obligations.

6.2.3 The planning permission contains four conditions relating to noise (conditions 9 to 12). The conditions place limits on numbers of aircraft within specific noise signature bands; noise violation limits for individual aircraft; progressive reductions in the noise violation limits; overall size of ground noise contour footprints; requirements to reduce that footprint over time; and requirements to operate in accordance with the specified noise control scheme, noise report, noise control monitoring scheme and scheme to control ground noise.

6.2.4 The agreed noise control reports referred to above contains detailed schemes of action to ensure that the obligations of the planning conditions are met.

6.2.5 Specific and detailed schemes are included for operation of a quota count system based on systems operated by other UK airports. This system classifies aircraft based on noise source characteristics into various QC scores and is intended to demonstrate means of compliance with planning. Limits are set on the basis of an overall quota count permitted annually. The effect of this overall QC limit is to incentivise the use of aircraft with lower sound power profiles. Specific targets for day-time night-time movements and movements within the morning shoulder are specified.

6.2.6 The quota count scheme requires three-monthly reporting to allow the planning regulators to monitor the number of exceedances of the specified limits.

6.2.7 The noise report also specifies LLAOL intentions and obligations with respect to the modelling of noise contours and the reporting of these annually to show compliance with planning condition.

6.2.8 Furthermore, the report specifies the measures taken including the specification of the fixed ground monitoring stations for noise; details of the complaint handling system; sanctions to be imposed in case of individual violation limits; and arrangements for verification of information.

6.2.9 LLAOL is required under the Environmental Noise (England) Regulations 2006 to draw up a Noise Action Plan every five years and to review and, if necessary, revise existing plans.

6.2.10 The noise action plan contains actions designed to improve noise management. Those measures include actions based on planning commitments but also include many voluntary actions demonstrating LLAOL commitment to comply with and exceed environmental noise targets.

6.2.11 Mitigation of noise nuisance within the action plan is an ongoing process, mandated by external restrictions but driven by a requirement of LLAOL to be a good neighbour and to minimise its external impacts. Mitigation measures can be broken down into five categories:

- Operational procedures
- Deployment of quieter aircraft

- Operational restriction
- Land use planning and mitigation at receptors
- Cooperation with local community.

6.2.12 Mitigation measures are fully detailed within the noise action plan and, while all of the mitigation measures are intended to apply to the existing 18mppa capacity limit, they are equally applicable to and relevant for the increased capacity operations in the masterplan. In the longer term the most important mitigation measure will be a reduction in the number of noisier aircraft by migration to a more modern operational fleet.

6.2.13 The Noise Assessment identifies a number of specific mitigation measures which are recommended as a result of the increase in the number of properties exposed to noise at levels in excess of the SOAEL.

6.2.14 In order to achieve this, LLAOL will enhance its existing noise mitigation measure as follows:

- increase the contribution to the Noise Insulation Fund
- The cost of insulation is given to the dwellings with highest noise levels as priority, and the increase in funding of the scheme will allow dwellings to receive insulation at an accelerated rate; and
- One-off grants to local councils exposed to noise levels between LOAEL and SOAEL based on the forecasted noise contours. Grants are to be used to provide community improvements.

6.2.15 In addition the following commitments will be made as part of the proposed variation to noise planning conditions

- For Summer 2020 and all subsequent seasons, no night-time (23:30 to 07:00) slots will be allocated to aircraft with a value greater than QC1;
- No further day time slots will be allocated to aircraft greater than QC1 (06:00-21:59 GMT 1st June – 30th September);
- No "non-emergency" Diverted Flights will be accepted;
- New airline / aircraft slots at night not to exceed QC 0.5; and
- Differential charging will be implemented to incentivise the rapid modernisation of fleet.

6.3 Air Quality

6.3.1 The increase in maximum capacity of passengers from 18 mppa to 19 mppa, whist modest in percentage terms, may entail an increase in road transport related air emissions and it will be necessary to undertake a detailed assessment of the likely impact of this when the formal planning application is made. The method will entail a detailed consideration of those receptors adjacent to the transport routes at highest risk of exceeding the relevant objectives as specified in the Air Quality Standards Regulations 2010. If any exceedances of air quality objectives are indicated, mitigation measures will need to be developed based on specific findings of the study.

6.3.2 Some mitigation of the road transport related emissions is already expected to occur from the introduction of the DART which will allow a modal change away from individual road vehicles.

6.3.3 Other mitigation measures available will include:

- Preparation of a travel plan; and
- Financial incentives and/or penalties to encourage sustainable means of transport.

6.4 Waste

6.4.1 Methods to mitigate the potential increase in waste associated with increased passenger numbers will rely upon LLAOL's own waste minimisation plan.

6.4.2 Waste reduction at the airport is based upon recycling of waste. The airport sets recycling targets annually and each year it makes the targets more demanding.

6.4.3 This process will continue in the context of the masterplan process and it is not expected that the increased capacity will result in a proportionate increase in waste production.

6.5 Energy and Climate Change

6.5.1 In accordance with LLAOL's commitment to improving its overall energy efficiency, it has adopted an energy policy which calls for continuous improvement in energy management and efficiency.

6.5.2 The airport operates an energy management system in accordance with ISO50001.

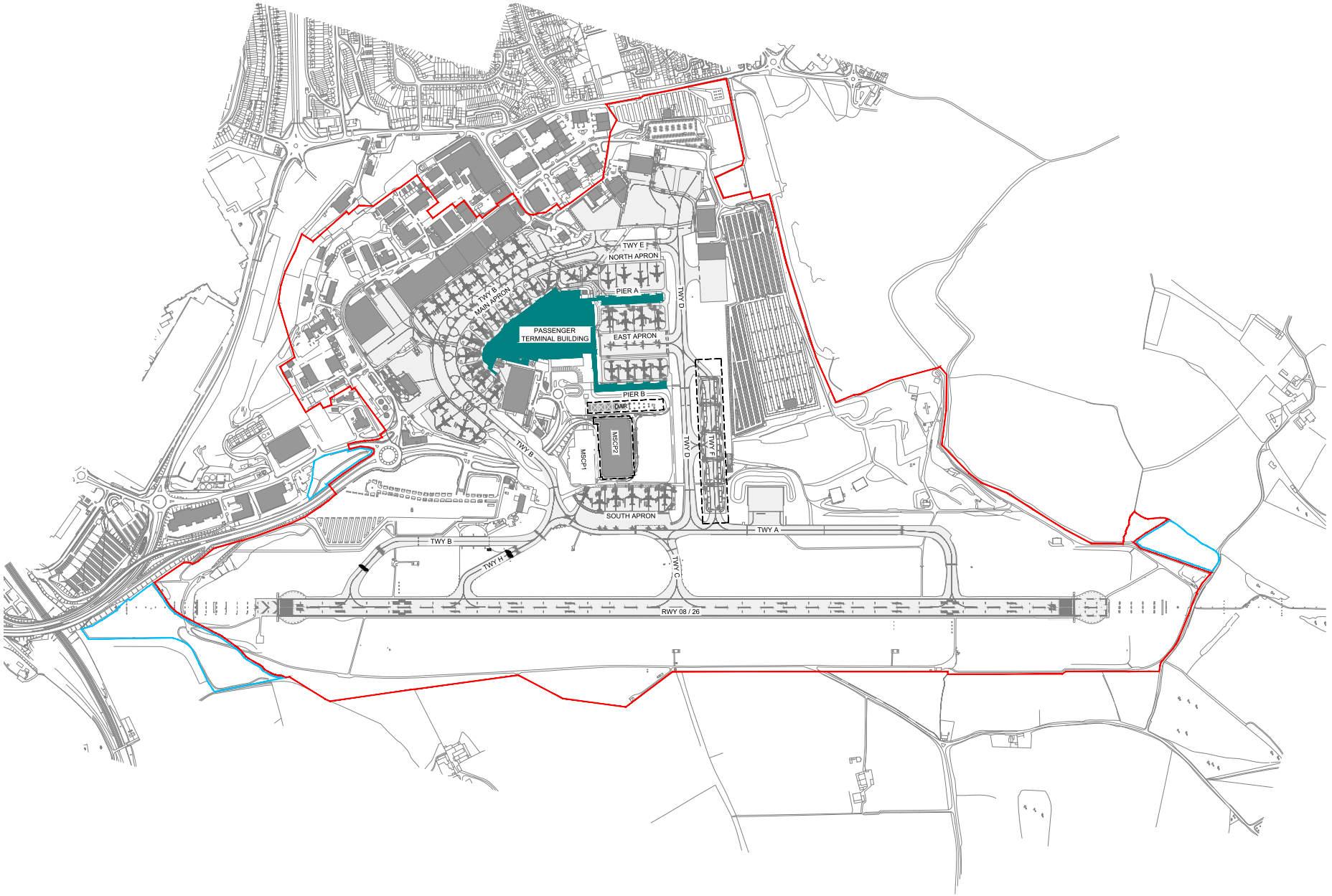
6.5.3 The Travel Plan to be developed as part of the expansion scheme will entail measures to reduce surface access emission and this will in turn aid in reducing greenhouse gas emissions.

6.5.4 The migration of the fleet serving the airport to more modern aircraft will serve to mitigate the impacts of greenhouse gas emissions.

6.5.5 The proposed masterplan commitments do not present any impediment to the continued minimisation and energy efficiency programmes in operation.

APPENDIX

INDEX



North Point

Legend

- EXTENT OF SITE BOUNDARY
- OTHER LANDS OWNED AND OR UNDER THE CONTROL OF THE APPLICANT
- PASSENGER TERMINAL BUILDING
- UNDER CONSTRUCTION
- CODE C COMMERCIAL STANDS

STATUS

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PROJECT:

LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

Existing Situation

Date:	Sheet:	Scale:
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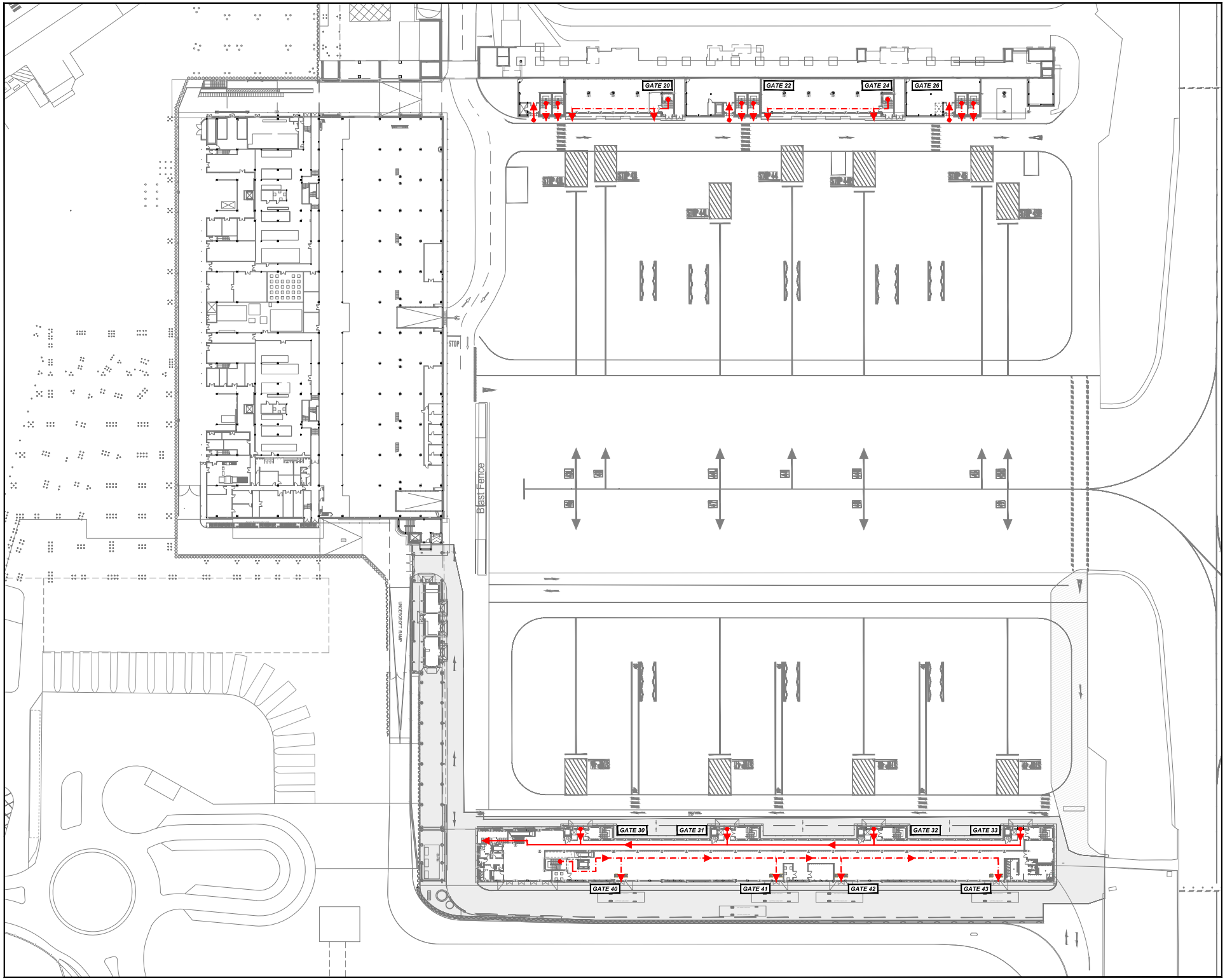
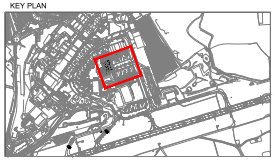


North Point

Legend

- EQUIPMENT
- PROCESS & EGRESS AREA
- QUEUING AREA
- PUBLIC SEATING
- DUTY - FREE
- RETAIL
- FOOD AND BEVERAGES
- DOMESTIC ARRIVING PASSENGERS
- DOMESTIC DEPARTING PASSENGERS
- INTERNATIONAL ARRIVING PASSENGERS
- INTERNATIONAL DEPARTING PASSENGERS

KEY PLAN



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PROJECT:

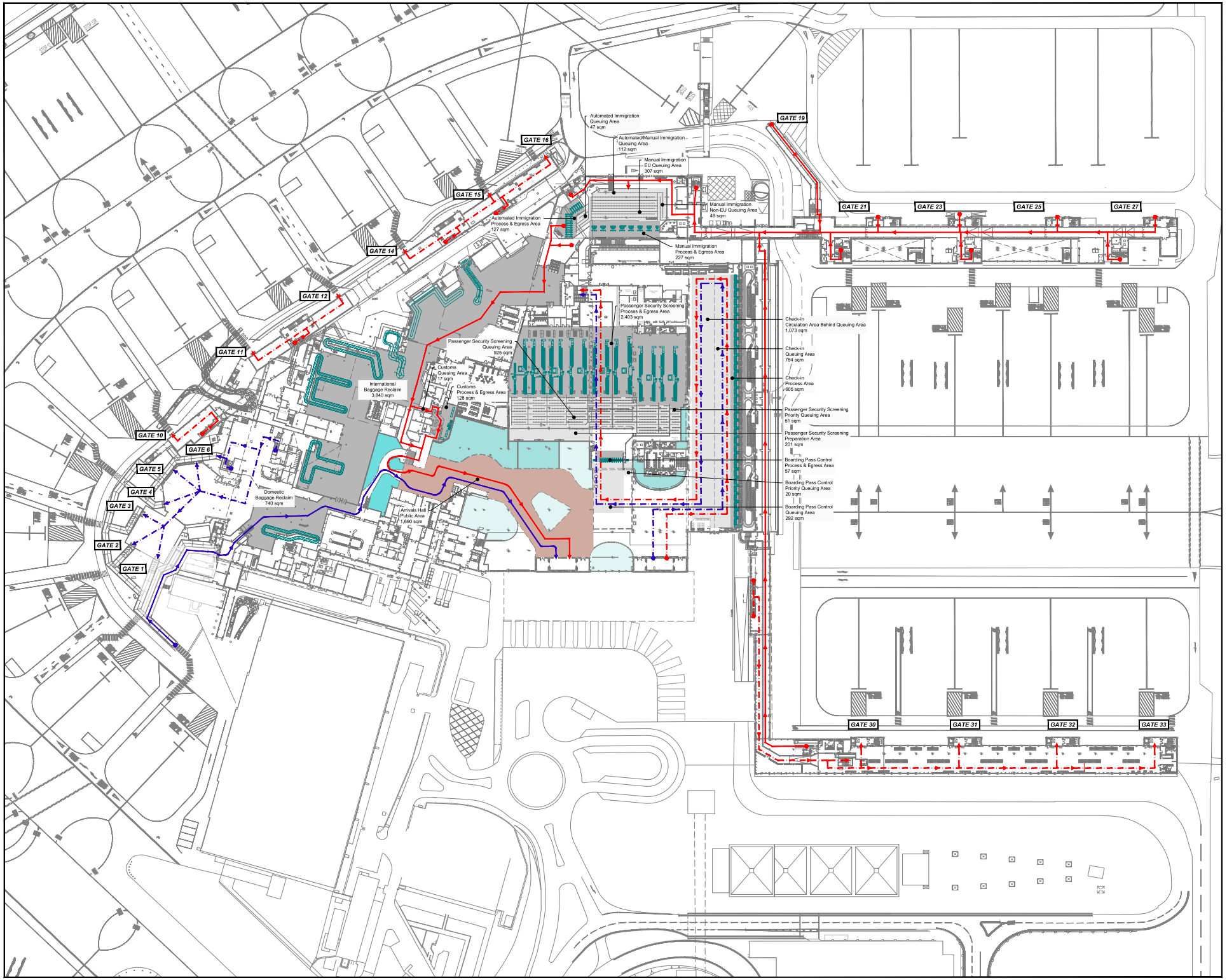
LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

Existing Passenger Terminal Building
Level 00

Date:	Sheet:	Scale:
03/07/19	A1	1:500

Drawing Nº: 21152-03-DW-102 Rev: 003

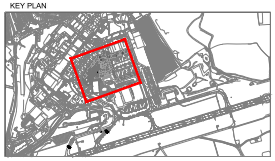


North Point

Legend

- EQUIPMENT
- PROCESS & EGRESS AREA
- QUEUING AREA
- PUBLIC SEATING & CIRCULATION
- DUTY - FREE (302 sqm)
- RETAIL (980 sqm)
- FOOD AND BEVERAGES (1,016 sqm)
- DOMESTIC ARRIVING PASSENGERS
- DOMESTIC DEPARTING PASSENGERS
- INTERNATIONAL ARRIVING PASSENGERS
- INTERNATIONAL DEPARTING PASSENGERS

KEY PLAN



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PROJECT:

LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

Existing Passenger Terminal Building
Level 10

Date:	Sheet:	Scale:
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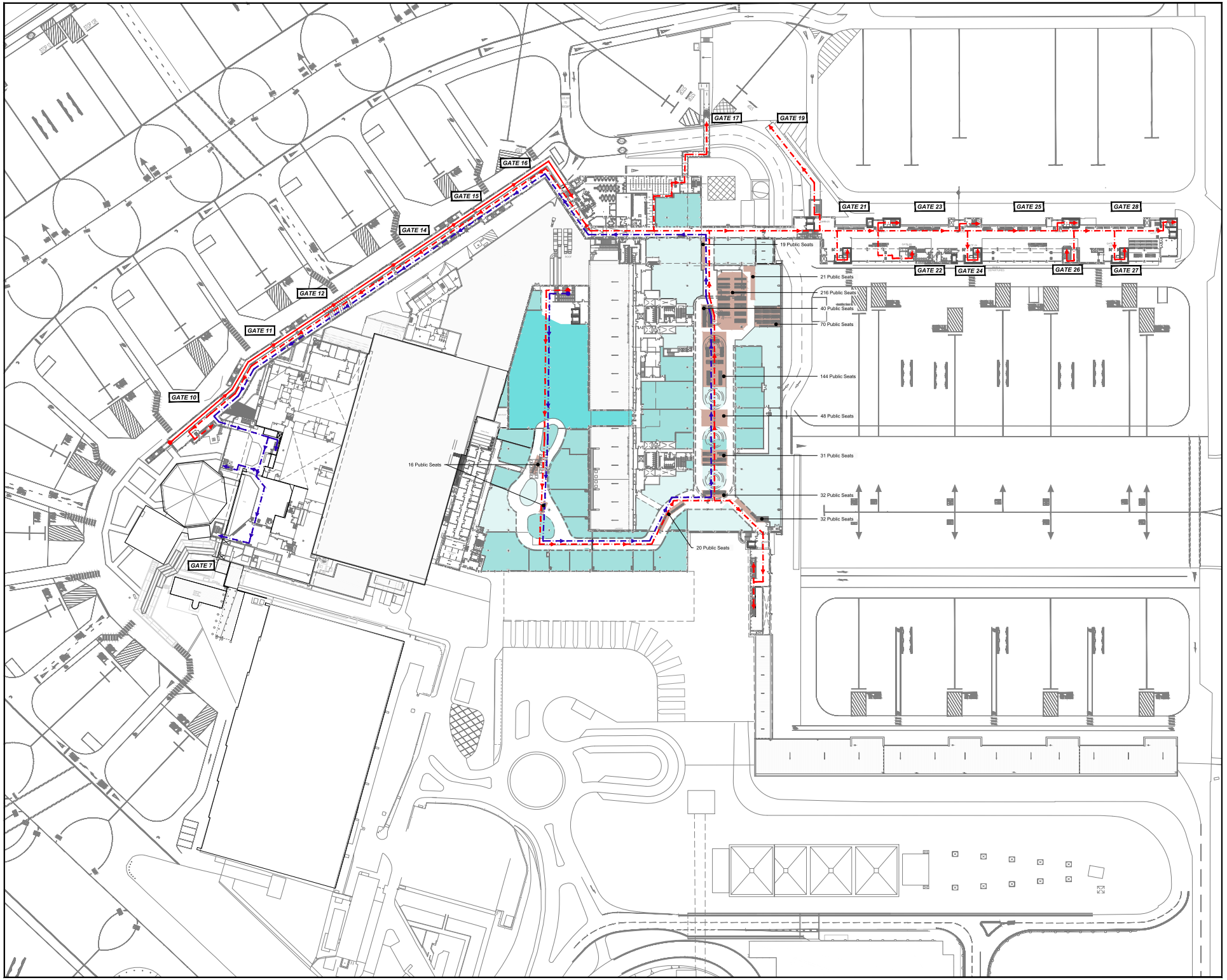

North Point

Legend

- EQUIPMENT
- PROCESS & EGRESS AREA
- QUEUING AREA
- PUBLIC SEATING (1,074 sqm)
- DUTY - FREE (1,690 sqm)
- RETAIL (4,042 sqm)
- FOOD AND BEVERAGES (3,282 sqm)
- DOMESTIC ARRIVING PASSENGERS
- DOMESTIC DEPARTING PASSENGERS
- INTERNATIONAL ARRIVING PASSENGERS
- INTERNATIONAL DEPARTING PASSENGERS

KEY PLAN

STATUS

Rev	Description	Issued By	Date
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001	Draft Report Issue	PP	03/07/19

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PROJECT:

LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

Existing Passenger Terminal Building
Level 20

Date:	Sheet:	Scale:
03/07/19	A1	1:750

Drawing Nº: 21152-03-DW-104 Rev: 003

North Point

Legend

- EXTENT OF SITE BOUNDARY
- OTHER LANDS OWNED AND OR UNDER THE CONTROL OF THE APPLICANT
- UNDER CONSTRUCTION
- PASSENGER TERMINAL BUILDING
- CTA ROAD LAYOUT
- CAR PARK
- MULTI STOREY CAR PARK BUILDING
- STANDS, TAXIWAYS, RUNWAY
- MIXED COMMERCIAL \ FBO APRON USE
- HANGAR

STATUS

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002	Draft Report Issue	PP	03/07/19

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PROJECT:

LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

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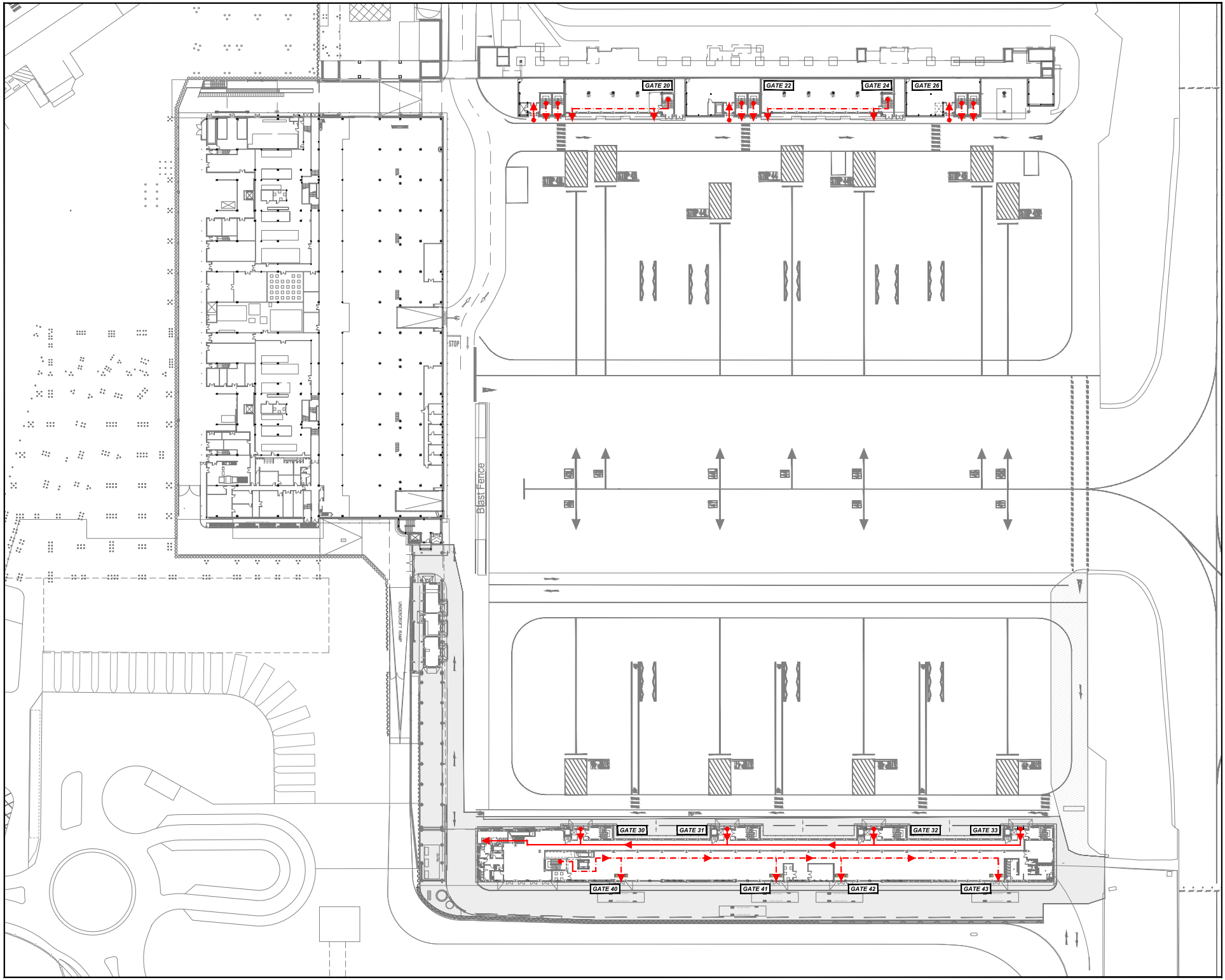
Drawing Nº: 21152-03-DW-105 | Rev: 003

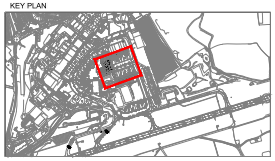


North Point

Legend

- DOMESTIC ARRIVING PASSENGERS
- DOMESTIC DEPARTING PASSENGERS
- INTERNATIONAL ARRIVING PASSENGERS
- INTERNATIONAL DEPARTING PASSENGERS

KEY PLAN



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PROJECT:

LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

Proposed Passenger Terminal Building
Level 00

Date:	Sheet:	Scale:
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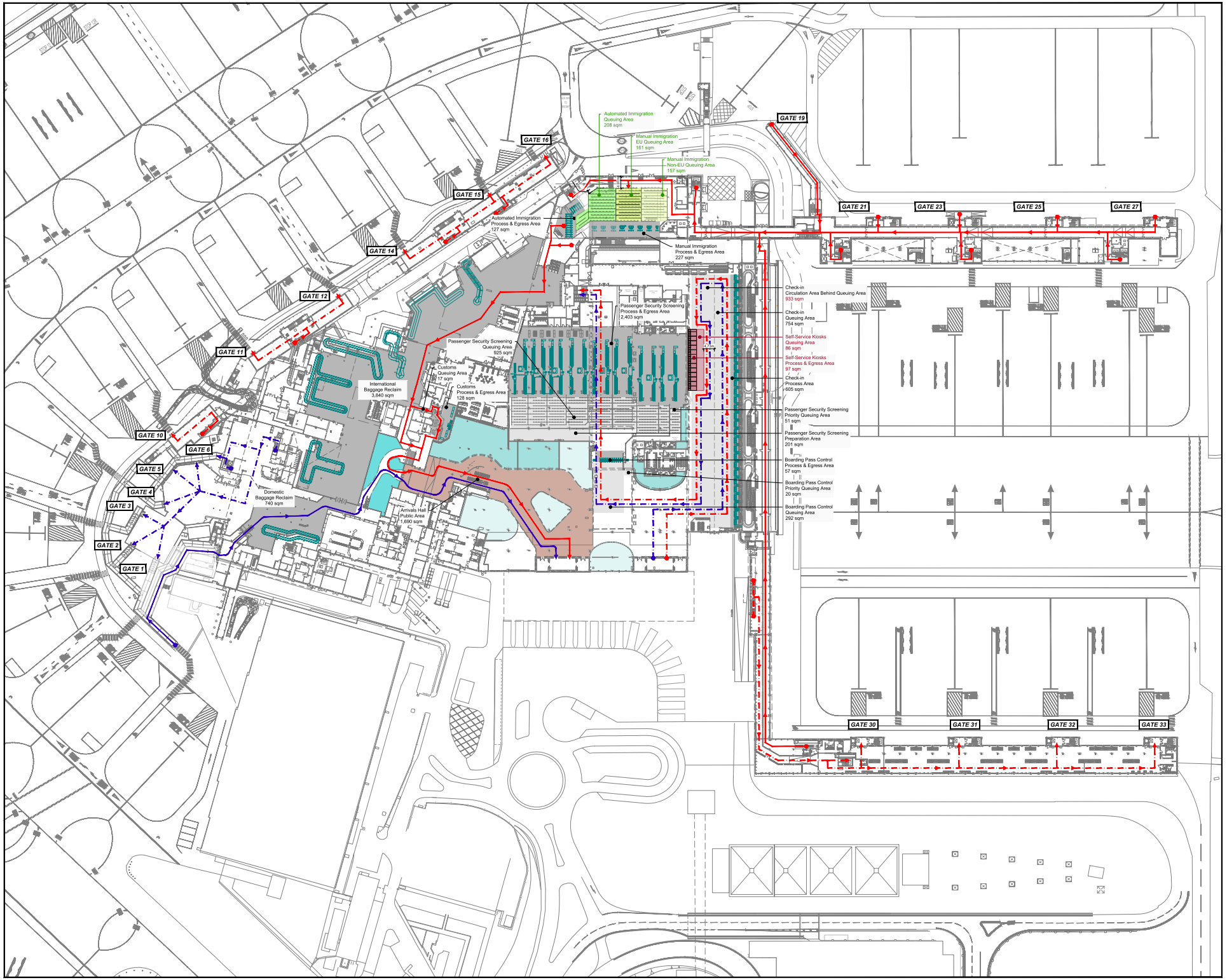
Drawing Nº: 21152-03-DW-201

Rev: 003

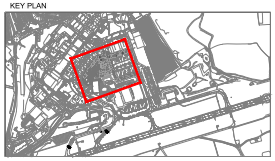


North Point

Legend

- EXISTING EQUIPMENT
- EXISTING PROCESS & EGRESS AREA
- EXISTING QUEUING AREA
- EXISTING PUBLIC SEATING & CIRCULATION
- EXISTING DUTY - FREE (302 sqm)
- EXISTING RETAIL (980 sqm)
- EXISTING FOOD AND BEVERAGES (1,016 sqm)
- PROPOSED SELF-SEVICE KIOSKS
- PROPOSED SELF-SEVICE KIOSK PROCESS
- PROPOSED SELF-SEVICE KIOSK QUEUING
- PROPOSED IMMIGRATION ACS QUEUING
- PROPOSED IMMIGRATION EU QUEUING
- PROPOSED IMMIGRATION NON EU QUEUING
- DOMESTIC ARRIVING PASSENGERS
- DOMESTIC DEPARTING PASSENGERS
- INTERNATIONAL ARRIVING PASSENGERS
- INTERNATIONAL DEPARTING PASSENGERS

KEY PLAN



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PROJECT:

LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

Proposed Passenger Terminal Building
Level 10

Date:	Sheet:	Scale:
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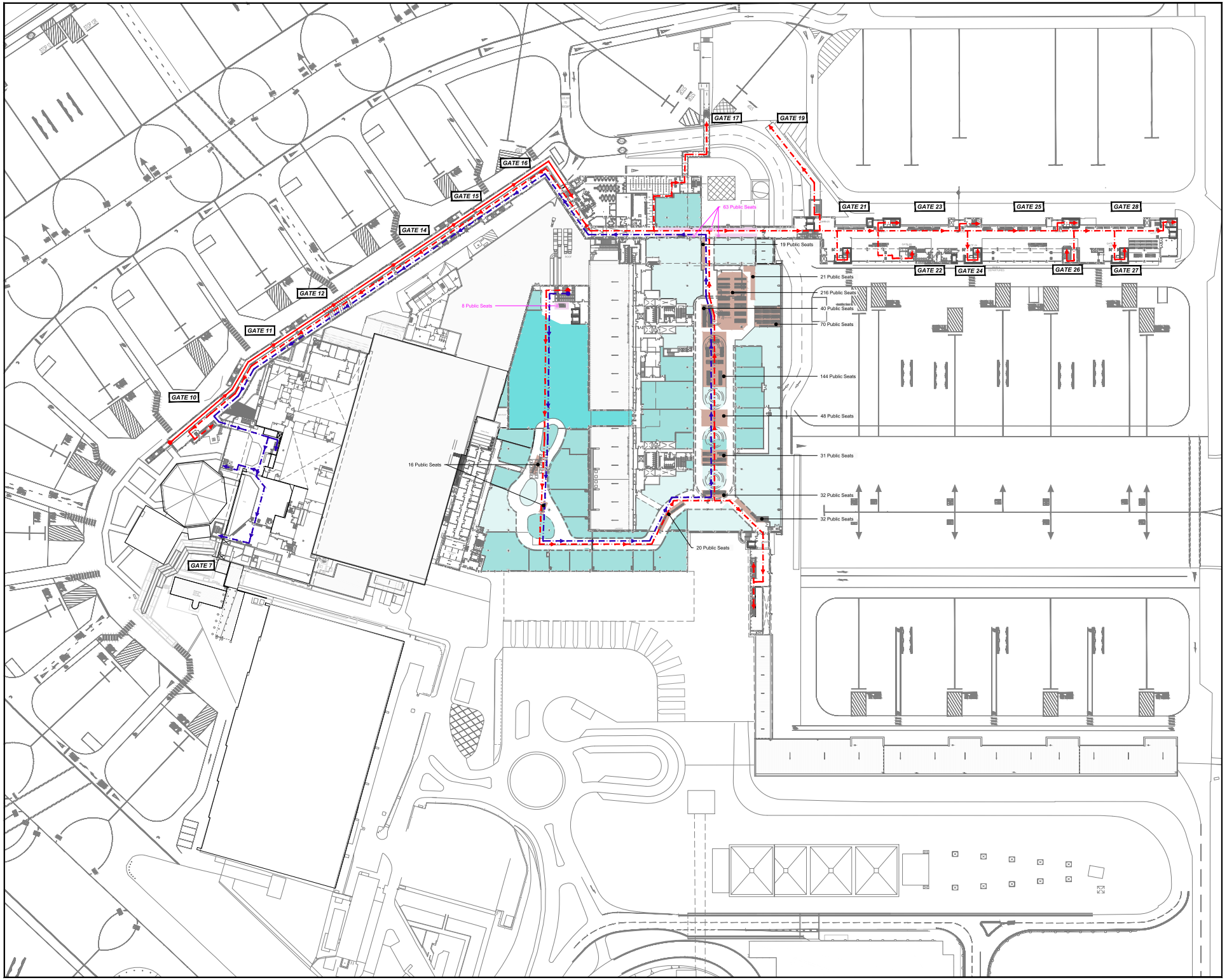
Drawing Nº: 21152-03-DW-202 Rev: 003



North Point

Legend

- EXISTING EQUIPMENT
- EXISTING PROCESS & EGRESS AREA
- EXISTING QUEUING AREA
- EXISTING PUBLIC SEATING (1,074 sqm)
- EXISTING DUTY - FREE (1,690 sqm)
- EXISTING RETAIL (4,042 sqm)
- EXISTING FOOD AND BEVERAGES (3,282 sqm)
- ADDITIONAL EXISTING PUBLIC SEATING (138 sqm)
- DOMESTIC ARRIVING PASSENGERS
- DOMESTIC DEPARTING PASSENGERS
- INTERNATIONAL ARRIVING PASSENGERS
- INTERNATIONAL DEPARTING PASSENGERS

KEY PLAN

STATUS

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PROJECT:

LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

Proposed Passenger Terminal Building
Level 20

Date:	Sheet:	Scale:
03/07/19	A1	1:750

Drawing Nº: 21152-03-DW-203 Rev: 003

North Point

Legend

- EXTENT OF SITE BOUNDARY
- OTHER LANDS OWNED AND OR UNDER THE CONTROL OF THE APPLICANT
- UNDER CONSTRUCTION
- EXISTING PASSENGER TERMINAL BUILDING
- EXISTING CTA ROAD LAYOUT
- EXISTING CAR PARK
- EXISTING MULTI STOREY CAR PARK BUILDING
- EXISTING STANDS, TAXIWAYS, RUNWAY
- EXISTING MIXED COMMERCIAL \ FBO APRON USE
- EXISTING HANGAR

STATUS

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PROJECT:

LONDON LUTON AIRPORT
MASTER PLAN 19 MPPA

TITLE:

Proposed Land Use Plan 19 mppa

Date:	Sheet:	Scale:
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Drawing Nº: 21152-03-DW-204 Rev: 003