Private and Confidential

COMMERCIAL IN CONFIDENCE

LONDON LUTON AIRPORT LTD

FINAL BUSINESS CASE

FOR THE DIRECT AIR RAIL TRANSIT

(Luton DART)

(Version 6)

VERSION CONTROL

Version	Date	Purpose / Description of Changes	Authorised By
1.0	27.06.17	Preliminary draft of final version of FBC	GC
2.0	15.08.17	Second version for comment	GC
3.0	18.08.17	Third version for T&F	GC
4.0	19.09.17	Draft version for LLAL Board	GC
5.0	22.09.17	Revised draft version for LLAL Board	GC
6.0	27.09.17	Revised draft version for LLAL Board	GC

Private and Confidential

CONTENTS

EXECUTIVE SUMMARY **4**

1. INTRODUCTION 5

2. THE STRATEGIC CASE 7
2.1. The Business Need 7
2.2. Passenger Demand Forecasts 9
2.3. Do Nothing 10
2.4. Project Scope 11
2.5. Aims & Objectives 11
2.6. Shareholder & Stakeholder Support 12
2.7. Benefits 12
2.8. Success Factors 13
2.9. Planning and Environmental Impacts 13
2.10. Curium Planning Conditions 14
2.11. Stakeholder Management & Communications 14
2.12. Revenue Protection 14

3. THE ECONOMIC CASE 14
3.1. System & Route Feasibility Studies 14
3.2. Preferred System Option 15
3.3. Preferred Route Alignment 16
3.4. Specification Definition & Design 20
3.5. System Requirements & Performance Criteria 20

4. THE COMMERCIAL CASE 24
4.1 Procurement Strategy 24
4.2 Key Construction Risk 29
4.3 Market Engagement 33
4.4 Procurement Route 33
4.5 Tender Results 34
4.6 Contractual Arrangements Overview 36
4.7 Contracting Strategy 36
4.8 Key features of each contract 37
4.9 Key risks retained by LLAL 38

5. THE FINANCIAL CASE 39
5.1. Whole Life Cost 39
5.2. Capital Costs 39
5.3. Operating Costs 40
5.4. Other Operating Costs 42
5.5. Commercial Strategy 42
5.6. LLAL Investment 43
5.7. Return on Investment 43
5.8 Financial Appraisal 43
5.9 Taxation and Accounting Implications 44

6. THE MANAGEMENT CASE 46
6.1. Governance Structure 46
6.2. Project Team 46

Private and Confidential

6.3. The Engineer Role 47
6.4. Project Management 47
6.5. Project Programme 48
6.6. Project Delivery Resources & Budget 48
6.7. Contingency Plans 49

APPENDIX

A. Pragma Research
B. EasyJet Letter
C. PWC London Luton Airport DART FBC
D. Programme Board Terms of Reference

ANNEX (Not Attached - Available for inspection at LLAL office at the Town Hall)

1. Passenger Demand Forecasts
2. LLAL/LLAOL MPT Heads of Terms
3. Planning and Engagement Strategy
4. Risks, Assumptions, Issues & Dependencies Log (RAID)
5. Concept Design Report
6. Concept Stage Cost Plan & Assumptions
7. 30 & 60 Year whole Life Cost Estimates
8. Financial Appraisal
9. PWC Accounting Advice and Valuation Summary

Private and Confidential

EXECUTIVE SUMMARY

London Luton Airport (LTN) has the potential to become the airport of choice for north London and England's economic heartland. There is an opportunity for LTN to play a substantially bigger role in the UK aviation market. To do this, LTN needs to be able to improve its links from train to plane.

The current bus transfer arrangements from Luton Airport Parkway Station to the Central Terminal Area are considered to be a service weakness. It provides a relatively poor experience for passengers arriving by train when compared to other London Airports (all of which have direct train links). The current arrangements will be progressively put under increasing strain as the airport grows, passenger numbers increase and there is a resulting increase in the number of passengers arriving by train.

There is planning consent to increase the Airport's capacity to 18 million passengers per annum (mppa). This consent requires that there is a significant modal shift to public transport. Passenger growth has accelerated significantly in the last 36 months, with expectations to reach 18 mppa by 2021. The percentage of Airport passengers using Luton Airport Parkway Station is due to increase to 30% during the 2020s. This translates to about five million passengers per annum compared to roundly two million at present. It is estimated that during the busiest hours about 1500 passengers per hour (per direction) would be arriving and departing by train.

The capacity of the current bus transfer arrangements cannot be sufficiently increased and the system effectively operated, to handle such an increase in demand. A more effective method of transferring passengers from Parkway Station to the Central Terminal Area (CTA) at the Airport is therefore required. A Mass Passenger Transit (MPT) System is therefore proposed to replace the current transfer arrangements, which will be known as the Luton DART (Direct Air Rapid Transit).

After consideration of the options available, a preferred route for the Luton DART system has been identified with terminals at Bartlett Square (adjacent to Luton Airport Parkway railway station) and the CTA, with scope for an extension and stop at the mid stay car park should either be required at a point in the future long term development of the airport. With regards to the Luton DART system itself, extensive consideration has been given to the options available in relation to waiting times, travel times, operational expenses and performance. The preferred option has been identified as an Automated People Mover (APM); fully automated, driverless vehicles operating on fixed guideways along a segregated right of way.

A key part of the system selection process has been future proofing the system which can be extended to meet the needs of the passengers and airport as it may expand over time up to the hypothetical maximum capacity of the single runway of 36mppa with the Luton DART having 36% of the modal split.

Planning approval was secured on the 21st June 2017 from Luton Borough Council and 7th July 2017 from Central Bedfordshire Council.

The works are to be delivered in two packages, Civils and Systems. This approach is in line with market capability and was endorsed by the market feedback exercise. It also allows LLAL to manage the risk of the interface between the two suppliers, which if not properly managed may result in programme delay. Both contracts are to be let on a design and build basis, with a ten year period of maintenance and operation (5 years with an optional 5 year extension) included within the Systems package.

The procurement has been through an OJEU competitive dialogue procedure so as to maintain competition through to contract award.

The total cost of the Luton DART is within the set budget of £225m as set at the Outline Business Case, originally comprising Stage 1 [redacted] and Stage 2 (new over-rail concourse at Luton Airport Parkway railway station, a building to link the station to the Bartlett Square terminus and a contribution towards the re-provisioning of car parking spaces at the airport lost to the route of the Luton DART and the CTA terminus) [redacted] and confirmed as on budget, post tender for the civil and systems works, albeit that the allocation between the two has altered over time .

Private and Confidential

The estimated annual operational cost (Op Ex) when allowing for contingencies, repairs and renewals and depreciation remains at [redacted], although this will be refined further in the period leading up to the commencement of operations in 2021, and it is expected that it will be possible to make some savings. The Op Ex cost will be offset against revenue from fees and from advertising opportunities.

Private and Confidential

1. INTRODUCTION

London Luton Airport (LTN) has the potential to become the airport of choice for north London and England's economic heartland. There is an opportunity for LTN to play a substantially bigger role in the UK aviation market. In 2015 the economic activity supported by London Luton Airport contributed some £1.5 billion to UK GDP. Just under £500 million of this came directly from the activities of the airport itself.

Each additional million passengers at LTN adds:

- circa 800 new jobs to the region, a third of which are higher rate of tax payers;
- circa £3m to LLAL's revenue;
- circa £76m to the regional economy and £118m to UK GDP;
- circa £100m to the value of the asset; and
- circa £7 million in Airport Passenger Duty.

By 2020 LTN is set to reach nearly 18m passengers and will contribute £2bn to the UK economy with over £1bn of Tax Revenue; it will support 13,000 jobs directly at the airport and in total 38,000 jobs.

Improving passenger experience and addressing shortfalls in the last one-mile travelled to arrive at the airport are crucial to LTN securing its strong loyalty and support from existing airline carriers and to begin to meet the wider aspirations for the airport. Continued strong economic performance of the airport will underpin the establishment of the London Luton Airport Enterprise Zone.

At present passengers arriving by train have to take a bus from Luton Airport Parkway Station to the terminal building, which utilises a combination of public highway and a short stretch of dedicated road. This system is considered by the airlines to be a service weakness for the Airport and they believe it damages their overall service offer. To overcome this weakness, it is proposed to replace the current bus transfer arrangements with a form of Mass Passenger Transit (MPT), which will be known as the Luton DART (Direct Air Rapid Transit).

The Outline Business Case (OBC) for the project was approved by the Board of Directors of LLAL on 3rd October 2016.

Significant progress has been made to progress the delivery of the project:

- Future proofed route has been identified and agreed with LLAOL in line with OBC route plan.
- Detailed planning permission has been approved for the Stage 1 scheme and outline planning achieved for the Stage 2 scheme (21st June 2017 from Luton Borough Council and 7th July 2017 from Central Bedfordshire Council).
- Detailed cost plans for the project demonstrate that the project remains within the overall budget.
- A full OJEU procurement process has been completed through a negotiated dialogue route for both the Civil and the Systems/Operational and Maintenance contract.
- A package of enabling works have been brought forward for delivery through framework agreements (from LBC and LLAOL) to enable access to a clean site and the give smooth transition for commencement of the works. The enabling works allow the overall timescales of the project to be met and are funded from within the project budget of £225m.
- Early works have begun to move relevant boundaries so construction works largely fall landside so as to minimise disruption to the operation of the airport.
- Site visits to reference projects for the Systems bidders were undertaken to satisfy experts and stakeholders around the suitability of their solutions both in the short and longer term.
- Through competition, the technology solution for the provision of the Luton DART was established as cable drawn. Both Systems bidders proposed modern cable drawn solutions that exceeded the passenger transfer capacity requirements and reliability criteria, deliver energy efficient consumption and provided modern design led cost effective solutions capable of meeting current and future needs.
- Indicative programmes and bidders construction and commissioning timetables demonstrate an ability to reach or exceed the target operational date of March 31st 2021.

Private and Confidential

- A submission for European Funding of [redacted] has been made to attract additional funding to secure modal shift to Rail. This is not included in the budget estimate and if not secured the budget would remain at £225m as per the Outline Business Case.
- Discussions with third parties to secure access to the sites as necessary have been agreed in principle.
- [redacted]
- [redacted]
- [redacted]
- Formal tenders for the major works have been received, evaluated and secured with the project budget. The outcomes from this work are detailed further in the business case.

Through the development of this document, the Final Business Case shows that:

- The strategic case for the Luton DART remains unchanged since 2016 Outline Business Case and that the solutions for the Civil and System contracts fit with the strategy.
- The economic case for the Luton DART remains substantially the same.
- The financial case for the project is in line with scheme budgets having completed the full procurement route and undertaken evaluation and due diligence on both successful preferred bidders.
- The management case demonstrates that arrangements are in place to manage the award of contracts and oversee the delivery of the project and the ongoing operation of the Luton DART.

The Final Business Case is not a stand-alone document and is part of a suite of documents that have been approved throughout the ongoing development of the project. It is however the most significant of the documents and its prime purpose is to obtain LLAL Board approval to enter into contract for the construction and operation of the Luton DART, and to meet the requirements of shareholders with regard to the release of debenture loans, which were approved in principle by the Executive of LBC at its meeting held on 17th October 2016.

2. THE STRATEGIC CASE

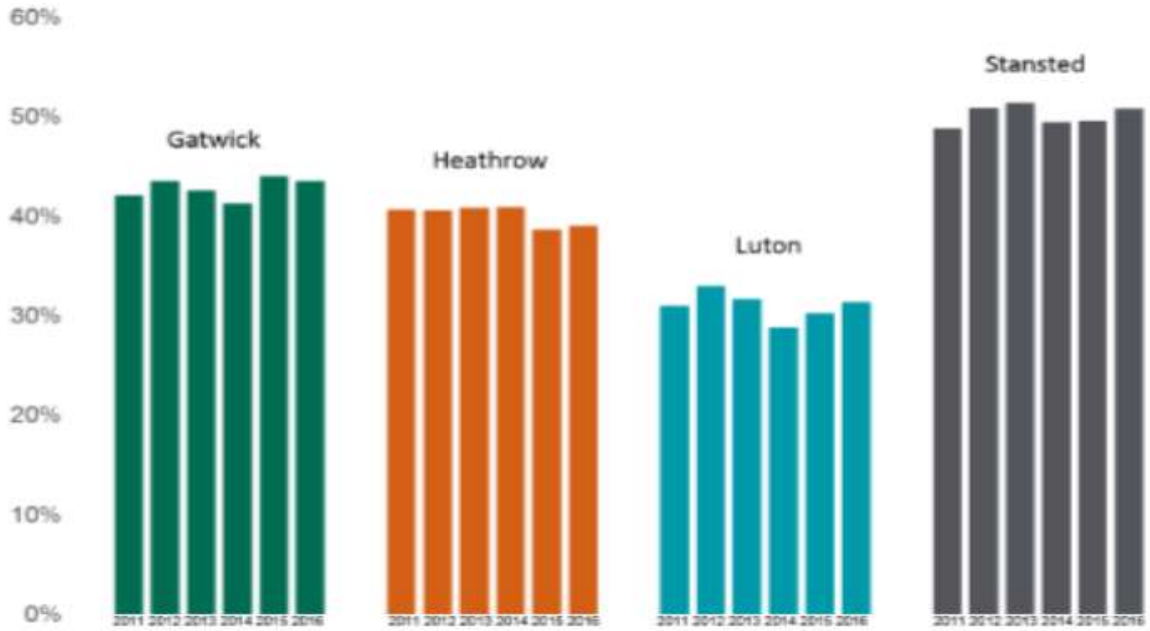
2.1. The Business Need

LLAOL have planning consent to increase the Airport's capacity to 18 mppa. The Airport has the ability to grow beyond 18 million (it is estimated that the capacity of the existing single runway, if improved and with the building of additional terminal facilities, would allow for 36 mppa) but this would be subject to obtaining further planning consent at a national level. The current consent was given in the context that there is a modal shift to public transport, and that an increase in rail usage by Airport passengers would be achieved. This will progressively increase the percentage of the Airport's passengers using Luton Airport Parkway Station to at least 30%.

At present, about 31% of airport passengers use public transport to get to the airport. How this compares to other London airports is show below.

Private and Confidential

Figure 1 - Passengers arriving by public transport at London Airports 2011 – 2016 (DFT July 2017)



In terms of rail use, the latest Surface Access Strategy notes that public transport use has not kept pace with passenger number growth. In the OBC, rail use was reported as 19% (equating to c2.2m people) with approximately 660 (peak hour per direction) using the station during any peak hour with these passengers having to take a bus from Luton Airport Parkway Station to the terminal building (or vice versa). The latest position is 15.7%, which because of the increased passenger numbers, represents c2.35m passengers p.a.

This method of transportation provides a relatively poor experience for rail passengers when compared to other London Airports (all of which have direct train links); and to a large extent prevents Luton being regarded as a major international airport, despite it being the fifth largest and the fastest growing airport in the UK.

The objectives and a summary of the key findings of a research study on passenger experience of the bus transfer arrangements (undertaken by Pragma, an independent research company) is provided at Appendix A. Two of the most significant findings of this study were that 62% of respondents said that a mass passenger transit system was preferable to the current transfer arrangements and a significant number of people said that they would consider using Luton more if one were introduced. This research was supplemented by pre planning application consultation carried out by LLAL in November 2016. In the two public events held 87% of people said they would consider using a transit system in the future. Additional consultation at the airport (landside departures) had 92% of respondents supporting the Luton DART with 80% saying they would consider using it in the future.

Respondents also expressed concern about the train service itself, with particular concerns about there being only one direct fast service per hour and the relatively slow journey time of the other train services. This chimes with LLAL's own findings and the increased lobbying that has been undertaken by LLAL and LLAOL in order to ensure that the new East Midlands rail franchise, which will come into operation in 2018 includes more direct fast services. Increasing the number of fast train services that stop at Luton Airport Parkway to four per hour represents a huge opportunity to create an end-to-end integrated transport hub, connecting the national air, rail and road networks. This simple timetable amendment in the new franchise would improve the experience for passengers and help meet demand for air travel while also boosting the local, regional and national economy. Disappointingly, the 'Future of East Midland rail franchise' consultation document issued on the 20th July 2017 contains options that would reduce the number of intercity services serving the airport. This is viewed at odds with the call for evidence for the new aviation strategy for the UK which acknowledges the critical importance of surface access to the success of UK airports.

It is important to note that modal shift is not predicated on four fast trains an hour and as such the business model remains valid even if the recent consultation proposals were to be implemented. That said, LLAOL, LBC and

LLAL will be responding robustly to the franchise consultation seeking no reduction in services and maintaining the proposition that four fast trains would bring significant benefits to LTN and is achievable.

By 2021, Luton Airport is expected to handle 18 million passengers per annum with the number of passengers using the station each year at over five million. This translates to more than 1500 passengers arriving during the busy hour with c 160 people per LUTON DART during the peak surge. At 2020+ and assuming additional build-out of the current single terminal to its maximum capacity (i.r.o.22 million), demand would be around 1900 during the busy hour with around 2300 people using the LUTON DART during the peak surge. Assessments of the single runway at the Airport calculate a hypothetical 36 million passengers per annum capacity. At this level demand would be around 2700 during the busy hour to meet the needs of an expanded airport. The capacity has been calibrated against passenger flows during the peak hour of the 30th busiest operational day at the airport.

The capacity of the current bus transfer arrangements cannot be sufficiently increased and effectively operated, to handle such an increase of demand at 18 million and the arrangements will progressively be put under increasing strain as passenger numbers begin to increase beyond the current level. This is exponentially worsened in the event that growth beyond 18 million passengers occurs.

Delivery of an efficient and effective mass passenger transfer system is therefore a critical factor in the Airport being able to grow to, and effectively service up to 18 million passengers per annum. It will also be necessary to ensure that the system introduced has the ability to cope with any increase in passenger numbers for which the Airport might obtain planning consent in the longer term. A fast and efficient transfer arrangement would also have the added benefit of improving passenger experience and enhancing the image and perception of the Airport; and make it easier to attract airlines to use the Airport.

[redacted]

The UK Airport Operators Association published its 'Connecting the UK's Economy' Report in November 2016. The modelling within the report shows that a 5% improvement in average journey times to/from airports can deliver a 2.7% increase in passenger numbers. It noted that London Luton Airport is 'the only London airport without a direct rail link [and] requires greater investment in surface access'.

2.2 Passenger Demand Forecasts

Following the introduction of the Luton DART, it is expected that the modal share will progressively increase to 36% by 2040+ (which benchmarks with Gatwick Airport currently). In order to ensure that there is sufficient capacity in the system from day one, it has been designed to take a rail mode share of 30% reflecting completion of the Thameslink Programme in 2018. Progressively over the next 10 years, with an extended rail network, 24 hour trains linked to the Luton DART, targeted marketing, increasing levels of customer satisfaction, and improved consumer awareness of LTN we will be actively seeking a mode share increase to 33%; with the opportunity for further growth in subsequent years. The peak and off peak demand estimates are set out in the table below. These numbers also include staff and Luton DART users from Bartlett Square. In addition to these numbers it is expected that there will be some small additional usage e.g. by "meeters and greeters". It is to be noted that more prudent estimates of the modal shift to rail usage have been adopted in estimating the revenue generated.

Private and Confidential

[redacted]

The Passenger Demand Forecast Report is provided at Annex 1

The underlying long term passenger forecasts have not changed since the OBC and are broadly in line with those set out in the table above. Through design development of the cable haul solutions, transfer times have reduced resulting increasing the opportunity to deliver higher peak hour demand. In the longer term, the rate of growth may be influenced by decisions taken regarding the provision of an additional runway to serve London, as well as the submission of further planning applications to take the Airport's capacity above 18 mppa.

In the short to medium term, growth at the Airport is underpinned by the strength of the core carriers providing services at the Airport, particularly [redacted] which in combination accounted for almost [redacted] of passengers in 2016, with [redacted] alone accounting for [redacted] of passengers and [redacted] of passengers. All The three airlines are amongst Europe's most profitable and have plans for growth, although the implications of Brexit may impact to some degree on the precise routes which they choose to operate. All of the airlines have new aircraft on order creating opportunities for Luton. Significantly, the Airport is now seeing growth by other airlines, for example [redacted], which is part of the [redacted]. Such growth is expected to continue, provided the Airport delivers an appropriate high quality product, particularly in the circumstance of continued capacity constraint at the other London airports that will persist for a decade or more.

Overall, the projected growth which underpins this Business Case is considered to be prudent and robust and underpinned by a high level of commitment from the existing customer base, in particular [redacted] which has indicated an intention to continue growth subject to the Luton DART being provided**.**

2.3 Do Nothing

As part of the development of the OBC, LLAL considered the option to do nothing. Were the Luton DART not invested in, LLAL would lobby for better and more frequent buses to transport passengers to the terminal. Given the number of passengers expected to alight at the train station in order to deal with 1600 busy hour passengers it would require 11 buses making the transfer journeys between points. This conservatively assumes transfer times of 12 minutes on the route at its busiest time and a loading time of 4 minutes for 50 passengers and suitcases per bus and collection of fares. This increases to 13 buses if a more realistic load time is 5 minutes. Assuming a waiting time of 10 minutes, this equates to a 30 minute transfer. For trains where alighting passengers combine to more than 50 at any one time, there would be a significant shortfall in terms of immediate capacity and waiting times. In such circumstance, the transfer would exceed passenger expectations, resulting in reputational damage and unacceptable delay in the last 1 km of the journey to the airport.

If the Luton DART is not provided, the project to enable growth to 18 million passengers per annum (Project Curium) would continue but the rate of passenger growth would be slower and significantly more difficult to achieve within the bounds of an acceptable impact on the environment and surround road network. As noted earlier [redacted] has identified that its growth plans for its fleet based in Luton would be adversely affected were the current bus transfer arrangements to remain. Also as noted earlier the existing bus transfer arrangements would progressively be put under increasing strain resulting in a poorer customer experience. Both of these contribute to a significant risk that the target of 18 million passengers per annum may in fact not being achieved.

Private and Confidential

2.4 Project Scope (the do something option)

The project will provide a mass passenger transit system with the following elements;

- A fully automated fixed guideway people mover system
- A terminal station on Bartlett Square.
- A connection to Luton Airport Parkway Station to enable the safe and effective transfer of passengers from the Station to the LUTON DART Terminal
- A terminal Station at the Airport (Central Terminal Area) with a parasol cover.
- Provision for a future stop at the mid-term car park (not constructed at this time).
- A safe and effective means for the transfer of passengers from the LUTON DART station to the Airport terminal.

The drop-off zone (DOZ) will be relocated (with an improved design) and the CTA area road layout will be amended to create the space for the CTA terminus. There will be a permanent loss of car spaces in both the Mid Term Car Park (790 approx) and in the CTA car park (896). This loss will be addressed through the provision of a new multi-storey car park (MSCP2) of up to 2040 spaces to be developed at the CTA to re-provide the 1690 permanently lost spaces due to the MPT route alignment and the location of the MPT station adjacent to the Central Terminal Area. It will also address the 350 spaces temporarily lost during construction through to 2021 and required via planning to be provided prior to accessing the route through the medium term car park. Once restored, the additional spaces provide an opportunity to offset some of the car park revenue lost to LLAOL through car parking spaces affected by the route. MSCP2 will also be sufficient to provide for the permanent location of the Drop off Zone (DOZ) at grade within it.

The estimated cost of this work, together with the relevant risk provision is calculated currently pre-contract at [redacted] and is within the overall project budget.

LLAOL will take responsibility for the design, procurement and delivery of the MSCP2 and associated developments noted above with [redacted] brought in to project manage MSCP2 and to independently assess costs claimed. Given the value of the works, MSCP2 will be subject to OJEU. LLAOL aims to re-provide a temporary DOZ by 15th May l 2018 to enable contractor access to the CTA to commence work on the CTA Station and complete the MSCP2 works to by June 2019 in order that the contractor can then access the mid-term car park to complete the route.

A new over rail bridge is to be provided at Luton Parkway Station to enable passenger circulation to be effectively managed within the Station. The design and construction costs of this concourse are covered within this Final Business Case but it is to be treated as a discrete phase with Network Rail taking responsibility for procurement and delivery. [redacted]

2.5 Aims & Objectives

The Luton DART will provide a significantly better link for public transport users to access the Airport. It is a key enabler for and essential to:

- Improving the passenger journey experience.
- Growing Airport passenger numbers.
- Increasing rail modal share.
- The Airport operating effectively during its permitted hours of operation.

Private and Confidential

The prime objectives are:

- To provide a "seamless" journey for rail passengers and reduce the overall journey time of airport passengers.
- To provide a mass passenger transit system that transfers people from Luton Airport Parkway Station and Bartlett Square to the main Airport complex in a fast, robust and efficient way.
- To ensure that the system has a sustainable future in terms of the environment and "Life Costs".

- To ensure that the terminus is integrated into the Bartlett Square development such that airport passengers have a "sense of arriving" at the Airport itself when transferring from Luton Airport Parkway Station to the Luton DART.
- That the Luton DART system and associated infrastructure are designed, operated and maintained in keeping with a modern international airport and provides passengers with an experience that meets their needs and expectations.
- Provide an improved future proof solution to enable 36% of passengers to arrive at the airport terminal via rail transfer without creating further infrastructure congestion.
- Invest in an infrastructure asset that provides additional value in terms of the concession.

2.6 Shareholder & Stakeholder Support

LLAOL is fully engaged with the Luton DART as is Network Rail. Agreements are in place with both covering the parties' obligations, roles and responsibilities. [redacted].

Govia Thameslink Rail (GTR) and East Midland Train Services also view the introduction of the Luton DART as a positive development. Both Network Rail and GTRs asset teams have been involved in developing the project [redacted].

The project has the full support of both the LLAL [redacted] shareholders.

The project was subject to extensive pre planning application consultation (two main events and website) which showed that 87% of people said they would consider using the Luton DART and the MPs for Luton South and South West Bedfordshire are supportive of the project.

Passenger consultation was undertaken at the airport in November 2016 and 92% said they supported the Luton DART whilst 80% said they would consider using it.

[redacted]

Following the selection of a cable haul system, the Office of Rail Regulation (ORR) has confirmed that the project does not fall within the scope of the Railways and Other Guided Transport Systems (Safety) Regulations and as such the appointment of a "Competent Person" is not required. The project now falls under 'Cableway Regulations' which requires the main systems contractor to apply for authorisation to the Department for Transport. [redacted].

Private and Confidential

2.7 Benefits

The introduction of a mass passenger transit system will:

- Facilitate the growth of the airport thereby increasing shareholder value and income.
- Provide the anchor for the development of Bartlett Square which in turn will be an important gateway and a key marker in the regeneration of this part of Luton.
- Along with the development of Bartlett Square contribute to the substantial and sustained growth in Luton based jobs and businesses and increase the extent of business rates derived by Luton Borough Council.
- Enhance the Airport's and Luton's brand image and reputation, regionally, nationally and internationally.
- Provide an environmentally friendly alternative mode of travel.
- Deliver a high social value return on investment through the delivery of the contracts by:
    - Engaging and developing the local supply chain to deliver parts of the contract
    - Supporting local jobs growth
    - Securing skills development opportunities across local communities in Luton
- Provide a platform for significant inward investment in line with the Luton Investment Framework.

2.8 Success Factors

The project will be considered a success if:

- Objectives and business outcomes are achieved or exceeded as compared to the OBC.
- The required modal shift in transport usage is achieved and maintained.
- The system provides effective and efficient passenger transfer on introduction and in the future as passenger numbers grow.
- The system is modern, attractive and easy to use.
- The system is operational by Q1 2021; is delivered within budget and is operationally affordable.
- The carbon footprint is reduced and the system is environmentally sustainable.
- Operational performance is fully in accordance with required operational standards and parameters.
- Passenger behaviours and responses demonstrate acceptance of the system.
- It enables Luton to be more of an Airport of "1st Choice" for passengers.
- There is alignment of O&M expiry with concession renewal, fitting with wider business objectives for airport

2.9 Planning and Environmental Impacts

Planning applications for the Luton DART were submitted in February 2017 to Luton and Central Bedfordshire Councils after extensive pre-application consultation. The applications were in detail for the Stage 1 of the LUTON DART and in outline for the new Network Rail over bridge and link building.

Planning permission for the Luton DART was approved by LBC planning committee on the 21st June 2017 and by Central Bedfordshire Council on 7th July 2017. As part of the planning process, the project was assessed in terms of the possible impacts on the environment. The planning decision notices contains conditions that must be discharged, none of which are considered onerous. Most of these relate to the construction phase and will fall to the contractor whilst some relate more to operations and will fall on the O&M provider. The key conditions have been identified as follows

Private and Confidential

Condition Summary	Commentary
Provide details of the new pedestrian overbridge	A Reserved Matters application has been submitted for consideration and is due for determination in October.
Provision of a new Drop Off Zone at the airport	The CTA terminus is built at the present DOZ. A new one is being located temporarily on the short term car park and then subsumed into MSCP2
Provision of an archaeological investigation to and approved in writing by the Local Planning Authority	Passed to the Civil contractor.
Externally mounted ancillary plant, equipment and servicing shall achieve a rating level of 10dB below the typical background	Passed to the Civil and Systems contractors and to be specifically monitored by the project Engineer (LLAL project manager).
Operational Noise limits must not exceed specified amounts as per British Standard, BS8233:2014 and WHO Guidelines On Community Noise.	Passed to the Civil and Systems contractor. Cable Haul systems are not expected to reach these levels but will be monitored specifically by LLAL.
Submission of a scheme that protects the principal aquifer.	Passed to the Civil contractor.
If previously unidentified contamination is found, works will stop pending a remediation strategy being agreed.	Passed to the Civil contractor.

The project is required to develop a Construction Environmental Management Plan to ensure impacts of the scheme are localised and can be minimised through appropriate design, surveys and proposed mitigation measures. This requirement has been passed onto the civils contractor.

2.10 Curium Planning Conditions

LLAOL is currently undertaking the necessary infrastructure improvements (Project Curium) to enable the planned increase in capacity to 18 mppa. The impact of the Luton DART project on Project Curium's planning conditions is limited to any alterations on the airport's surface water drainage strategy and potential contamination.

With regard to road traffic, construction will not represent a risk of additional disruption as two lanes in and out will be maintained at all times as will traffic circulation around the CTA. The construction of a second multi storey car park by LLAOL is to be completed under permitted development on the basis that it is re-providing and consolidating existing car spaces within the red line.

2.12 Stakeholder Management & Communications

A Planning and Engagement Strategy (the Strategy) has been prepared and this is attached as Annex 3. This Strategy is part of and compliments the wider Stakeholder Management Strategy and Communications Plan to be implemented for the whole LLAL Development Programme. The prime objective of the Strategy was to ensure that planning consent is achieved for the construction and operation of the Luton DART and ensure that it can proceed, widely supported and accepted, to a successful, positive conclusion.

2.13 Revenue Protection

Revenue protection is a high priority for both LLAL and the train operating companies. Principles for gate lines locations and numbers of gates have been discussed at length and agreed. There will be no gate line between the Luton DART and rail station. Gate lines will exist at the entrance from Bartlett Square and at the CTA terminus. The need to ensure travellers buy the right train ticket first time including the price of the Luton DART has been considered. At present 17% of people using the bus buy a ticket at the bus stop. Network Rail, the train operating companies and LLAL officers are working through the process of changing the name of Luton Airport Parkway station to Luton Parkway station, leaving only LTN as the only destination with airport in the title.

Private and Confidential

3. THE ECONOMIC CASE

3.1 System & Route Feasibility Studies

System and route alignment feasibility studies were undertaken at the beginning of the project. The outcomes of these were reported to the LLAL Board and Board approval obtained to proceed to more detailed option evaluation. A summary of the feasibility work that was undertaken is provided below.

a) System Options Considered

The system feasibility study assessed the following systems/modes:

- Travelator / Moving walkway
- Conventional bus (including segregated busways)
- Guided bus
- Light Rail / Tram
- Automated People Mover
- Cable powered people mover
- Maglev (vehicle on a cushion of magnetic levitation)
- Surface Personal Rapid Transit (PRT)
- Suspended monorail
- Supported monorail
- Heavy Rail
- Underground Passenger Rapid Transit
- Cable car / Gondolas

The study provided the key performance characteristics and passenger capacities of the various systems together with provisional estimates of the capital and operational costs.

b) System Options Shortlisted

From the feasibility study, the following system/mode options were taken forward for more detailed appraisal

- **An Automated People Mover (APM)** A fully automated, driverless vehicles operating on fixed guideways along a segregated right of way.
- **A Light Rail Transit System (LRT)** A system similar to the Docklands Light Railway in London
- **A Bus Rapid Transit System (BRT)** A system that achieves efficiency and high service frequency through being allocated priority on-road, which may comprise of a number of measures, such as dedicated busway lanes, signal priority etc.

A limited feasibility study, considering potential heavy rail options, was undertaken [redacted]. From this study it was established that heavy rail would be significantly more costly than the alternatives, require additional land acquisition and could not be delivered in an acceptable timescale. However, in the much longer term (e.g. 30 years plus) airport passenger demand might be high enough to warrant the substantial investment needed for "heavy rail" and therefore, it cannot be entirely dismissed as an option in the very long term. It should be noted that a heavy rail link would require a new and separate civils infrastructure to that for the Luton DART.

The "heavy rail" option was not considered further by this project team at this point largely because of the issues outlined above together with the difficult engineering issues associated with this location. Heavy rail systems cannot climb gradients of more than 3%, and negotiate curves of less than 200 metres. Both of these limits would be exceeded and would need to be overcome if a link was created from Luton Airport Parkway Station to the Airport.

c) Route Options Considered

A "long list" of route options was initially established based on the assumptions that:

- The route could be used by any of the three technologies being considered.
- Existing topographical data was correct.
- The proposed horizontal and vertical alignments were achievable.
- Existing utilities in the line of any route would be capable of being satisfactorily dealt with.
- Soil conditions were suitable.
- Construction under the operational airport taxiway was permissible.

Private and Confidential

The "long list" included:

- 9 potential routes at the Luton Airport Parkway Station end.
- 5 potential routes at the existing terminal end.
- 5 potential route options between Luton Airport Parkway Station and the existing terminal.
- The potential MPT terminal layouts.

A short list of three potential complete routes was agreed for more detailed appraisal. The preferred route resulting from the detailed appraisal is illustrated on page 18.

3.2 Preferred System Option

Earlier iterations of the business case established that of the three systems shortlisted, the Automated People Mover (APM) System was considered to be the system that is best suited to the meeting the requirements. This Final Business Case is predicated on this previously agreed basis.

APMs are fully automated, driverless vehicles operating on fixed guideways along a segregated right of way. They are classified into two major categories depending on the nature of the propulsion technology – cable hauled and self-propelled. Both categories can have rubber tyres or steel-wheels (although for the purpose of LLAL's design and route, steel wheels would not be well suited due to the route steep gradient). APMs are standard for many airports, both for internal movements and also for movement between stations and terminals.

The prime strengths of an APM system, in relation to the Luton requirements, are that:

- It can achieve the required performance frequencies and passenger capacities.
- It is flexible enough to cope with future increases in passenger numbers.
- It is extendable and able to serve a second location should there be a future requirement to do so.
- It is a tried and tested technology offered by a number of manufacturers and used in other airports.
- The route can be created with minimal land take across difficult topography.
- It can accommodate steep gradients.
- Additionally, it is suitable for serving car parks.

Although light rail systems generally share most of these advantages, the infrastructure costs are significantly higher than for an APM and "on-board" personnel would be required, thereby adding to the cost of operations.

The Bus Rapid Transit (BRT) System, although operationally feasible, has some significant disadvantages e.g.:

- A BRT system would not be able to effectively and efficiently handle the passenger numbers alighting from a train during a peak period.
- A BRT could not provide the capacity required for increased passenger numbers in the future.
- Users do not perceive that they are travelling on an integrated airport transport system.
- Passengers do not view bus links as being a high quality transport system.
- Passengers need to be seated as horizontal forces tend to be greater causing increased risk of falls.
- Dwell times are longer due to delays loading and unloading luggage.
- BRT solutions do not address the additional congestion on the road surface infrastructure.

APM Systems are typically configured in 2 ways, cable-drawn or self-propelled. Both of these systems are considered appropriate for the project, providing high reliability and availability:

- In a cable drawn system, a central station powers the system, with the train attached to a cable. The system propels, accelerates, decelerates and brakes the train. These systems typically have greater flexibility in vehicle design and have significantly lower energy costs given their weight advantage. Passenger comfort levels are high with typically smooth quiet rides. Design and build costs for cable drawn solutions are typically lower than self-propelled systems over distances of less than 3 km.

Private and Confidential

- A self-propelled system uses an electrified track and motors on-board the trains. This system can be designed to achieve higher maximum speeds (~70kmph vs 50kmph) and have more flexible configurations (albeit significant engineering works may be required to extent routes). Note that [redacted] modelling of the proposed route at Luton suggests that this speed advantage is relatively negligible, given the short length of the route.

At the initial stages of the project, a self-propelled system was attractive due to their slightly higher speed, perceived technological advancement and ease of route expansion. The cost differential between the two systems and the markets willingness to supply such a small system was perhaps not fully realised during the initial stages of the project. Given the specifics of the Luton project the advantages of a self-propelled system's higher speeds and relative ease of expansion, are unlikely to convey significant benefit and therefore justify the additional expenditure. Supporting this view is the implementation of cable-drawn systems at a number of comparable airports (comparable passenger volumes and transport system length) including Oakland Airport, Pisa Airport and Cairo Airport within the last decade. In addition cable-drawn systems are the systems of choice at other major airports such as Miami, Doha etc.

Although the tendering process was opened to both self-propelled and cable-drawn system providers, only cable haul providers submitted a PQQ [redacted]

The cable drawn system was therefore considered to be an appropriate solution for the project. Specific advantages to the project include the increased energy efficiency, availability and customisable configuration of the train vehicles. In addition it has been demonstrated that although cable haul is slightly slower, passenger capacities and frequency of passenger transfers exceed Employer Requirements for transfers. The journey time is comparable, produces less CO2 and the ability to extend has been demonstrated in tender submissions.

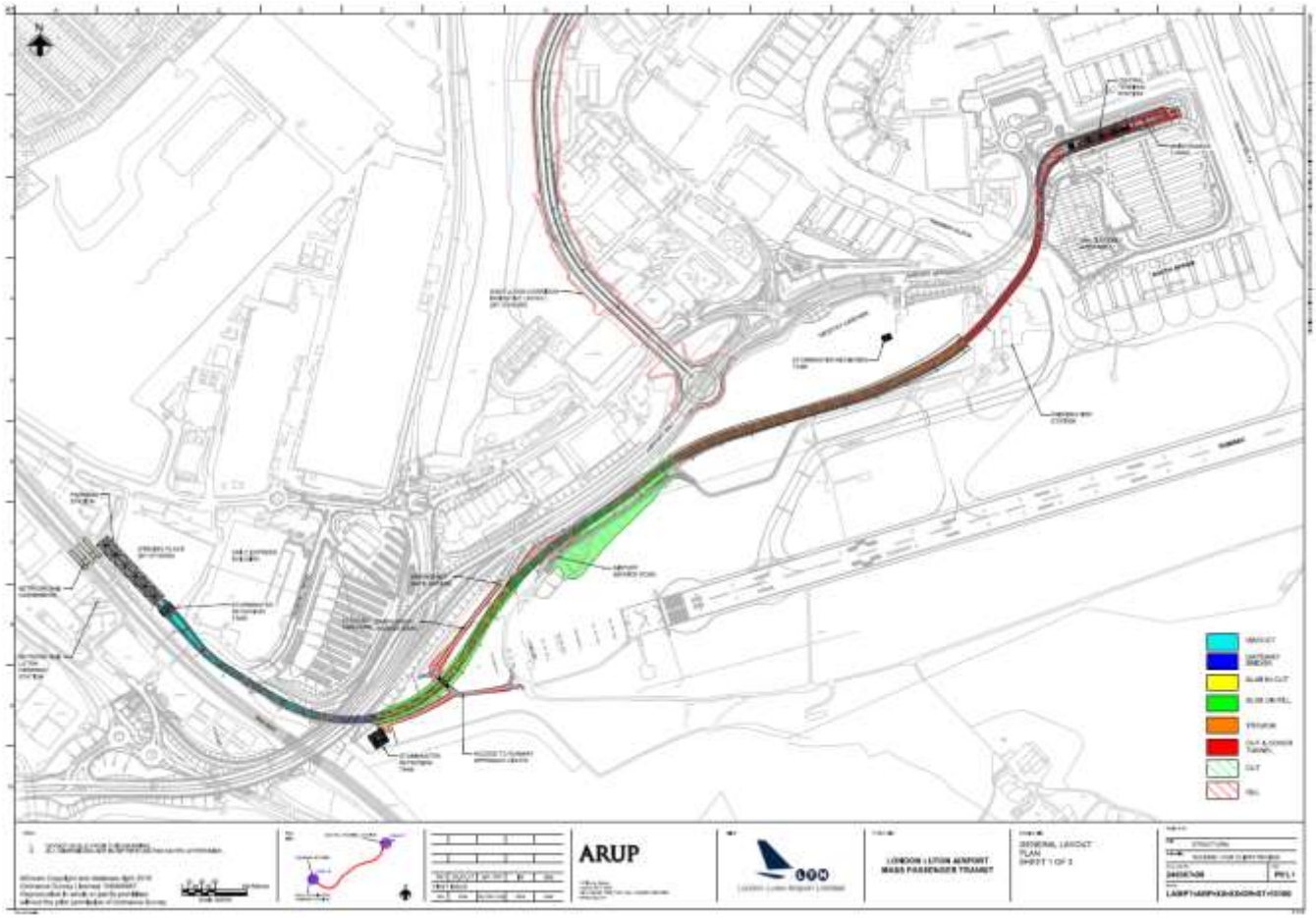
3.3 Preferred Route Alignment

The preferred route alignment is contained within the Concept Design Report at Annex 5. This was selected as the preferred route because:

- The alignment is suited to an APM system.
- It is deliverable from an engineering/technical perspective.
- The land required for the route is largely under LLAL ownership some of which falls within the Airport boundary.
- The route alignment minimises the need for expensive excavations.
- The route has obtained detailed planning consent.
- No objections to this route have been raised by the CAA or by LLAOL.
- The alignment allows for the Bartlett Square terminus to be positioned adjacent and close to the Network Rail Station enabling easy and safe transfer for passengers.
- The system can be easily integrated into the Bartlett Square development enabling a "sense of arrival" at the Airport to be created.
- The alignment provides the opportunity for the system to serve the mid-term car park should this be required at a future point.
- The position of the terminus and the alignment at the CTA enables the system to be extended in the future.

Private and Confidential

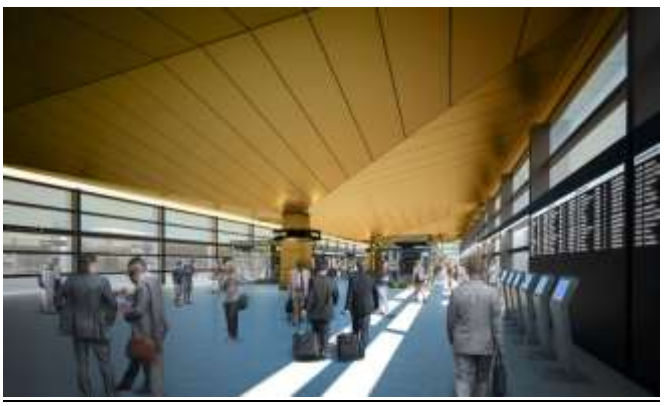
Luton MPT Route



A new Luton DART terminus will be located at Bartlett Square on the north-east side of the existing rail lines. The Bartlett Square terminus will be a landmark building providing a gateway to London Luton Airport, helping to regenerate the local urban environment and co-ordinating with the Bartlett Square redevelopment. The station will be constructed on two levels, with spacious, open and light concourses.

Illustration of the Bartlett Square terminus





From the Bartlett Square terminus the route will be elevated and will run south, parallel to the existing rail line until it reaches the A1081 where it will cross the A1081 (Airport Way) via a new bridge. The bridge has been designed and is considered a 'gateway' to London Luton Airport.

Due to the changing topography within the locality, the bridge will be visible from a number of viewpoints. For those on public transport, the bridge will be seen in conjunction with the viaduct, as well as the Parkway and proposed MPT stations. For motorists approaching along Airport Way, the bridge will be visible in distant views and will help to navigate road users towards the airport. The bridge will make use of subtle lighting facing downwards to meet lighting requirements near the operational airport.

Gateway Bridge

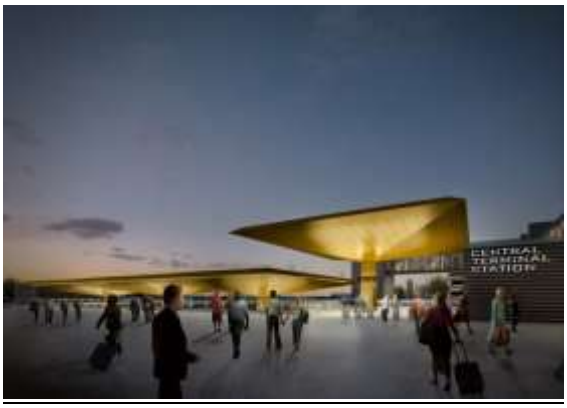




The CTA terminus will provide a seamless connection into the airport, integrating with other passenger flows and helping to reinforce a cohesive identity appropriate for a modern international airport. The station will be located to the south of the airport terminal so as to facilitate effective passenger interchange. The station building will be below ground level and will have an open top to enable daylight penetration. The canopy/roof structure has been designed using a common architectural language which is repeated across the wider development.

Day projection of the CTA terminus





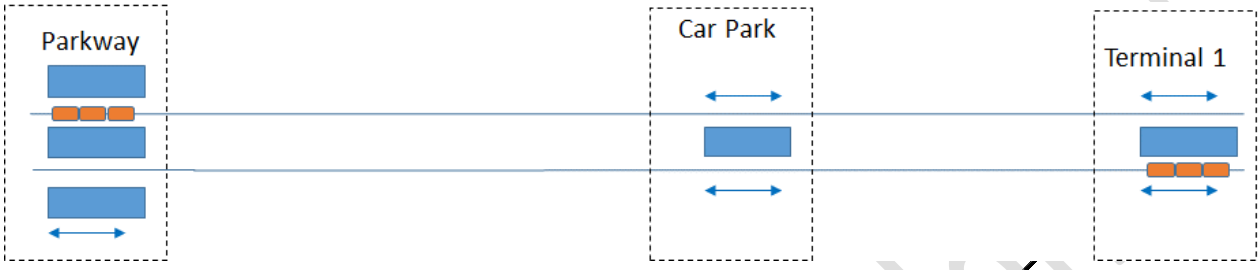
Within the station itself, escalators and lifts will direct passengers towards the airport terminal and on to the new entrance. When arriving passengers leave the airport terminal, they will see the large parasols rising above the open CTA terminus, acting as beacons. An accessible environment for all users will be provided in and around the terminus.

3.4 Specification Definition & Design

a) Operational Configurations

At OBC stage, two operational configurations were identified, Pinched Loop and Double Shuttle, both of which would meet future proofed passenger number targets. However, during the design finalisation process for the Central Terminal Area, the position of the terminal station was adjusted to enable the realignment of the road and pedestrian crossing at grade from the DOZ. This meant that pinched loop was no longer a viable option.

Double Shuttle Configuration



In the double shuttle configuration the expected journey time (based on [redacted] modelling) is presented below compared to the two systems bidders:

	[redacted] journey time modelling*	Bidder A journey time**	Preferred Bidder journey time***
Journey time (train start to stop)	4:17	[redacted]	[redacted]
Max Wait time	4:57 max (2:29 average)	[redacted]	[redacted]
Total transfer time	8:00 max	[redacted]	[redacted]

* Approximate figures, 75pax vehicles (5-10% seating).

** [redacted]

*** [redacted]

Both bidders proposed a Transport System that consists of 2 guideways carrying a number of vehicles in a double shuttle configuration. The vehicles operate 24hrs per day, and meet the minimum requirements of a maximum 8 minute transfer time during peak time. The Transport system will run peak and off-peak times. The Peak is from 4.30am until midnight and off-peak from midnight to 4.30am. The Transport System will operate automatically under the remote supervision of an operations controller based in the Bartlett Square terminus; this is part of the operation and maintenance contract.

3.5 System Requirements and Performance Criteria

The parameters and performance criteria for the MPT system are as follows:

Operating Hours

The Luton DART is designed to operate 24 hours per day (to allow for passengers arriving early and to maintain a public transport route for staff working at the airport) as indicated in the table below. The table has been simplified since the OBC which had initially divided the operational day into four periods with a second off peak in the middle of the day. However, this would have meant travellers arriving then would have received a lesser service which is not consistent with our aspirations for customer service. Both Transport System providers and their O&M companies confirm that there is adequate time for system maintenance if adopted only during an

Private and Confidential

overnight period. This is advantageous to LLAL and will enable a high level of passenger service to be maintained during the core airport operating hours. The proposed operating regime is presented in the table below:

Period	Start	End	Service
Peak	04.30	23:59	Full service
Off-Peak	00.00	04:29	Service runs at 50%

Base System Requirements

The base requirements of the system are as follows:

- The System has been designed with two stations at opening (Bartlett Square and the Central Terminal Area) with an option for future provision in the mid-term car park. The design is future proofed to allow a future extension beyond the CTA.
- At opening the system will be able to cope with a minimum of 2369pphd passengers per hour during any peak period, and be capable of being extended to meet 4834pphd passengers per hour during any peak period demand at a future date.
- The total time taken for passengers to travel from Bartlett Square terminus to the CTA terminus in peak operation, including wait time, shall not exceed 8 minutes.
- Only a proportion of passengers require to be seated during the journey. Adequate seating provision has been made for passengers with reduced mobility.
- Standing passengers shall not be subjected to sudden changes in motion which could cause them to fall.
- Passenger comfort shall be maintained along the alignment, including on sections with steep gradients.
- The Luton DART terminus at Bartlett Square will be integrated with the airport branding so that users feel that they are in the airport as soon as they enter.
- The system shall be fully automated and compatible for operating with platform screen doors.
- The platform and carriages shall allow step free boarding and alighting.
- The system will be constructed whilst the airport is operational and shall not impede Airport operations.
- The Luton DART has been designed with assistance of Network Rail and GTR to safeguard revenue protection. One gate line will be in each terminal but there will be no gate line between the Luton DART and Luton Airport Parkway station.

Civil Engineering Requirements

In order to accommodate the new Luton DART system the following civil engineering works are required:

1. Civils works (other than track, vehicles and other transport system infrastructure):

- Ground investigations
- Civil works package including:
  - MPT Viaduct structure
  - Gateway Bridge structure
  - Civils works along the proposed route from Parkway station to the Central Terminal Station

2. Construction of 2 stations:

- Bartlett Square Terminus
  - Stage 1 includes construction of the new Station building, adjacent to the mainline station.
  - Stage 2 is dependent on Network Rail's decision to construct a footbridge from the mainline platforms, into the Luton Airport Parkway Station. If Network Rail proceed with this option, an extension is required to the original Luton Airport Parkway Station to accommodate the additional access infrastructure.
- CTA Terminus

Private and Confidential

3. Power Infrastructure

- The system requires a significant power supply for traction power and was initially estimated at [redacted].
- On this basis an order has been placed with UK Power Networks (UKPN) at a cost of £[redacted].
- The traction power system will be fed [redacted] from the UKPN feed. Each supply feeds into a separate transformer so that high availability can be provided.
- The cost of the connection from UKPN supply at the sub-station to the Parkway Station terminal is estimated to be in the region of £[redacted] and is being procured by LLAL through the LBC Fixed Assets team. These costs are not part of the project budget but are contained within the provision for Bartlett Square.
- If the Luton DART is extended, the present supply will need to be supplemented with a second sub-station closer to the Airport end of the system post 2031.

4. Project Enabling Works

In order to reduce risk and the time, a number of project enabling works have been commissioned.

PEW1 – Gas main diversion adjacent to the viaduct

- A 315mm gas main located between chainage 120 and 130 will be diverted to the North of the proposed MPT viaduct pier at this location, to avoid the extent of the permitted pier location.

PEW3 – Airport perimeter road diversion and associated works

- The purpose of the airport perimeter road diversion is to enable a new airside perimeter fence to be installed, allowing the Luton DART corridor construction to be undertaken in a 'landside' condition.
- The airport perimeter road will be relocated to the South of the construction corridor and a new airside road will be constructed to connect the new airside perimeter temporary fence with the existing airside perimeter road.
- An existing surface drainage water sewer carrying runway run-off which crosses the construction corridor will be lowered and electrical services which supply the landing lights will be diverted into the new perimeter road.

PEW7 – Airport equipment move works

- Construction of new vehicle parking and cleaning facilities.
- Relocate existing airside Gate 6.
- Construction of new airside road including turning area for coaches and snow fleet.
- Relocate ancillary equipment facilities.

5. Car Park Reconfiguration

- Reconfiguration of CTA access approach to DOZ and car parking
- Construction of temporary DOZ to enable access to DART contractor to construct CTA terminal station
- New MSCP2 with up to 2040 spaces and providing permanent location of DOZ. This will consolidate all short stay car parking at the CTA together with the spaces affected in Mid Term. Notification of this as permitted development of the MSCP2 has been submitted.
- Reconfigure Mid Term car park to take account of final DART completion of route

System Designs

The design of the transport units have been subject of a number of workshops and the latest design for the preferred bidder are shown below

Private and Confidential





Constructability

LLAL's technical consultant [redacted] undertook a thorough constructability review of the project as part of the project concept report. This included consideration of construction methodologies that maintain existing airport and highway operations.

The civil works can be delivered within the proposed timescales but needs to be split into 4-sections with each section being constructed in parallel. The civil construction works have a number of significant interfaces which include: Construction adjacent to network rail corridor; impact of the elevated viaduct construction works has been minimised by setting the alignment away from the railway and overhead electric power line, and through the use of offsite prefabricated components for the deck structure;

- Construction over a live highway; the gateway bridge structure is proposed to be assembled offline on a temporary platform East of the Airport Way and then slid into its final position to minimise disruption to the highway;
- Construction within an airside environment and adjacent to operational taxiway/runway; In particular, a construction sequencing of the tunnel beneath Taxiway Alpha which accommodates current airfield operations has been developed;
- Construction in front of the terminal building and car parking (interface with passengers); a construction sequencing of the tunnel beneath Airport Approach Roads which maintain 2 lanes in and 2 lanes out has been developed;
- Existing utilities; surveys have been undertaken to identify the locations of supply in the project area. This has aided design and reduces risks associated with the project.

The proposed methods of construction are common methods that are regularly employed within the UK construction sector. A coordinated construction logistics strategy will be developed to guide main contractor and to define the acceptable standards for materials deliveries, construction traffic and construction access.

The view of the transport system preferred bidder is that there are no significant construction issues with the project and as such it is forecasting installation and testing to be completed with 96 days of project float.

The view of the preferred bidder for civil engineering is that it is the environment that makes the project complex, not the actual construction. Their main concern is securing CAA approvals for the cut and cover tunnel under the taxiway but they have given themselves a six months window to secure this. Changes to the access date for their works at the Mid Stay car park are caused by a delay in the intended completion date and operation of MSCP2. This will have a knock on delay in relation to the handover of the site to the System bidder. Work during the preferred bidder phase will be done to marry the timescales together to achieve the overall aim of 31st March 2021.

Private and Confidential

Suppliers

Each of the preferred bidders have developed their own suppliers strategy which is summarised below

Civils contractor

[redacted]

The civils contractor has committed to the following KPIs:

[redacted]

Transport system contractor

The Transport System contractor is expecting that its key suppliers for the manufacturing of the travel system to be from [redacted] these are likely to include:

[redacted]

The contractor's bearings are normally procured from [redacted]

The contractor has also committed in their bid to [redacted].

Private and Confidential

4. THE COMMERCIAL CASE

4.1 Procurement Strategy

The Luton DART Project Team developed a procurement strategy for the project. At the core of the work, procurement workshops took place with key representatives from the Project Team – LLAL, [redacted]. The conclusion of the workshop process is the procurement approach presented in the table below:

Procurement Route	Packaging strategy	Procurement stages	EU Procurement procedure	Contracting strategy
Design, Build, Maintain and Operate	Two packages 1. Civils[1] – Design and Build 2. Transport System[2] Design, Build, Maintain and Operate for 3 years (to be let as separate contracts)	Single stage procurement for both packages	Competitive Dialogue	Civils – FIDIC Yellow Book Systems (works) - FIDIC Yellow Book, O&M - Bespoke

[1] Civils includes works associated with the MPT structure, stations and connection to existing NR over bridge.
[2] Systems include M&E, rolling stock, 3 years of operation and maintenance.

The project has been split into two contracts. This includes a "Civil works contract" and a "Transport System contract". The procurement has been conducted through the OJEU procurement process and a competitive dialogue procedure was selected to enable a greater degree of engagement with the potential suppliers during the tender process. This was considered to be advantageous to the project and would enable the interface risk between Civils and Transport System to be discussed extensively.

As part of this process LLAL are awarding one contract for the Civil works which will be contracted under the FIDIC yellow book on a single contract lump sum basis (Civils). LLAL are also awarding a second package for the design, build and operation and maintenance of the transport system (Transport System). This will be through two contracts, one a FIDIC contract for the design and build of the system and then secondly an operations and maintenance contract to run and maintain the System..

Following the approval of the procurement strategy by the LLAL Board on the 31st March 2016, a Prior Information Notice (PIN) was issued in April 2016 for the purposes of soft market testing. A second PIN was issued in February 2017, formally engaging with the market to discuss the project and obtain market response to the proposals. In parallel with the market engagement exercise, work was undertaken to prepare concept designs and pre-tender estimates for the system

The competitive dialogue process has included detailed briefings, site visits, workshops, meetings, etc. to arrive at a sound basis for understanding the tender prior to awarding a contract in October 2017.

Civils works

Scope

LLAL wishes to appoint a Civils contractor to design (based on [redacted] reference design) and construct a 2.1km mass passenger transit scheme and to work alongside a successful transport system contractor (to be appointed to design, deliver and operate the Luton DART system for a period of up to 10 years).

The Civils works will be split into 2 stages as detailed below, with stage 2 as an option that can be exercised by LLAL before a predetermined date. These works are described below:

Stage 1 Works

All associated civils works including:

- Ground investigations and other surveys
- Bartlett Square terminus including platforms, buildings, mechanical, electrical and public health (MEP), fit-out and finishings together with back-of-house areas including connection to existing Luton Airport Parkway station
- CTA terminus including platforms, buildings, MEP, fit-out and finishings together with maintenance area
- Track slabs, plinths and line wide MEP
- Civil and line wide works between stations including:
  - areas in open cut, embankments, creating cut and cover tunnel box,
  - viaducts, gateway bridge (over A1081 dual carriageway public highway)
- Temporary re-routing of an operational airport taxi way (airside)
- Highway works e.g. alignment changes of airport access roads
- Provision of utilities and utility diversions
- Making good to car park and compound areas
- Surface water drainage
- Fire, health and safety and security requirements
- Construction, Design and Management (CDM)/Principal Designer

Private and Confidential

Stage 2 Works included as an option in the ITT

2a Works: Further works at Bartlett Square terminus and ancillary works which, depending on timing, may be included in the contract. These works will follow on from Network Rail's construction of a pedestrian bridge over the main railway line i.e. forming the last section of the terminus.

2b Works: Construction of a pedestrian foot bridge over the main railway line to connect with the Bartlett Square. These works will be carried out by Network Rail directly.

Transport System

Scope

The Transport System contractor will design, construct and deliver a 2.1km MPT scheme (and to be appointed to operate the system for a period of 5 years, with an option for LLAL to extend this by a further 5 years) and to work alongside a successful Civils contractor. It is envisaged that the two successful contractors (Civils and Transport System) will work together to co-ordinate their designs and construction to deliver the overall project on time and within budget without disrupting airport operations. As part of this contract the successful bidder will be responsible for operating and maintaining the system for 5 years (with an option for LLAL to extend) post completion of the works.

Design and Construction of the following:

- Vehicles, interior and exterior
- Guiding rails.
- Signalling and train control (including on board computers and software, sensor equipment and connections with control centre).
- Power provision – transformers, rectifiers, associated panels and switchgear.
- Operations control centre.
- Communications.
- Track crossovers.
- Rolling stock.
- Platform screen doors at stations.
- Associated mechanical and electrical services.
- Fire, health and safety and security requirements.
- CDM.

Core elements of the operation and maintenance works to be delivered:

- Controlling the daily operational delivery of the Luton DART service to a scheduled timetable.
- Maintenance of all transport system works (tracks, signalling equipment, rolling stock, etc. and mechanical and electrical services (IT systems, lighting, communications, etc.).
- Preventative maintenance in accordance with O&M manuals (including emergency and control systems)
- Programmed/routine maintenance.
- Reactive/condition based maintenance as and when required.
- Corrective maintenance.
- Annual/monthly/weekly inspections in accordance with the O&M manuals.
- Spare parts and warehouse management (replenishment of spares).
- Specialist technical support.
- Operational staff at stations and in control centre.

Private and Confidential

Interface Management

Introduction

[redacted]

Purpose and Intent

[redacted]

Managing the interface

[redacted] le for the co [redacted]

[redacted]

Scope

[redacted]

- [redacted]

Principal Contractor / Principal Designer

The Civils Contractor shall be both Principal Contractor and Principal Designer for the duration of the Project. The Transport Systems Contractor shall support and provide all the necessary information and services to the Principal Contractor and Principal Designer.

This does not relieve the Transport System Contractor from his duties and responsibilities including adequacy and safety for his works. The Transport System Contractor shall follow any site procedure instigated by the Principal Contractor and shall liaise on all matters of access for deliveries, crane use, security, area release etc.

4.2 Key Construction Risks

The Project has a risk register encompassing all the currently foreseen risks for the Project. In addition, the Preferred Bidders have identified risks and these will be reviewed and negotiated during the preferred bidder stage. The risk register will continue to be reviewed and updated to reflect the procurement process before being included in the contract documentation.

Prior to the appointment of preferred bidder the top 5 risks envisaged on the project are summarised in the table below, these had an Expected Most Likely Value (EMV) of approximately £[redacted]m. [redacted]

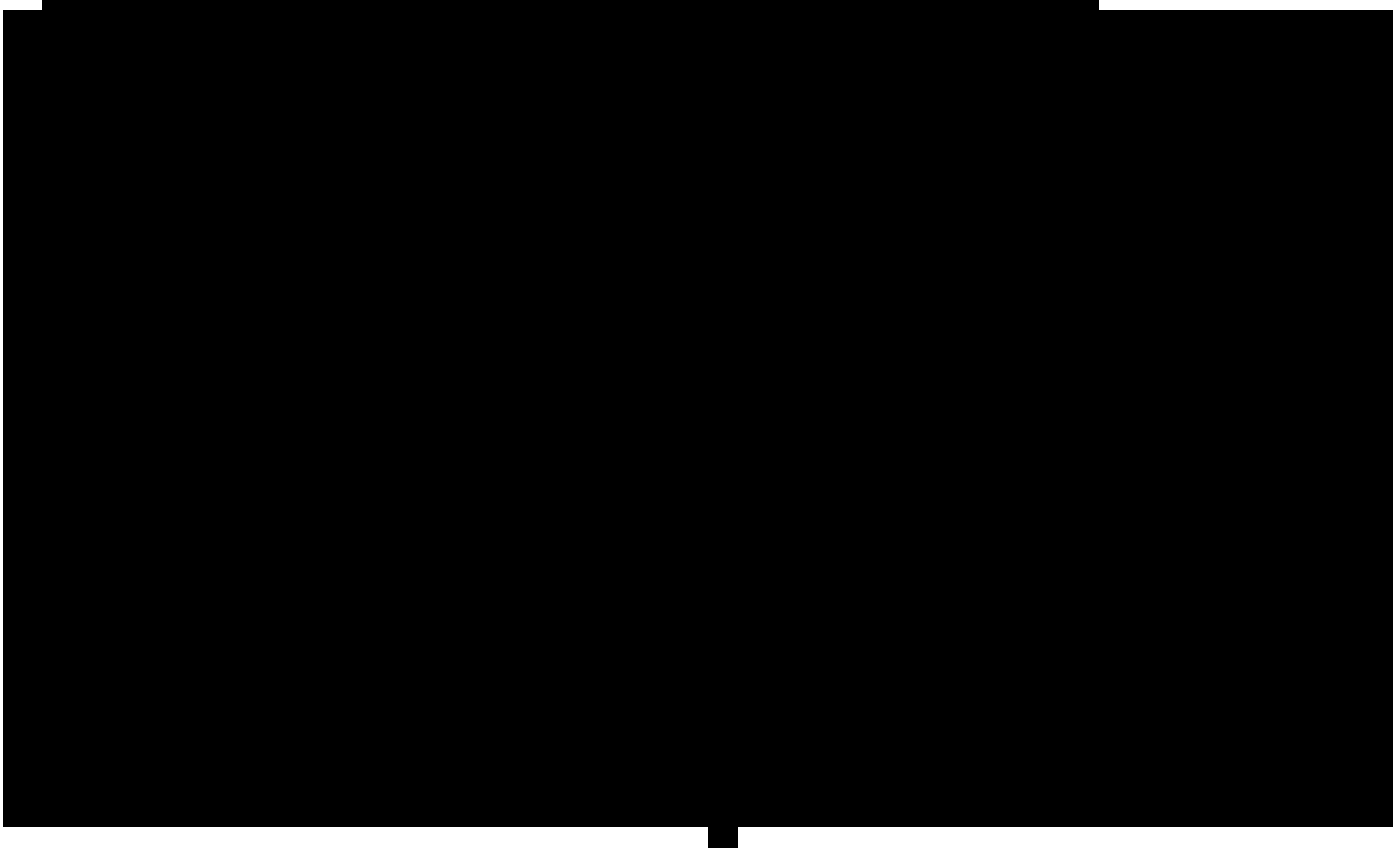
[redacted]

[redacted]



[redacted]

[redacted]



Confidential

[redacted]

- [redacted]

Delivering Social Value Outcomes as part of a Contract

The Luton DART project presented an opportunity to generate high impact social value outcomes for the communities and businesses of Luton and the surrounding area. By requiring contractors to work in partnership with LLAL and with LBC in contributing to our wider strategic objectives, it is possible to ensure that the project generates tangible and measurable outcomes across four social value workstreams that were the subject of evaluation common to both competitions:

- Engage and develop the local supply chain
- Support jobs growth within the local labour market
- Secure skills development opportunities across local communities
- Invest and secure added economic value for Luton.

[redacted]

Market Engagement Plans and Programmes that supported how these activities would take place were informed through work with LBC'S Economic Development team, [redacted]. There was an emphasis on reducing barriers for local businesses to engage with large capital projects and a clear understanding of how to develop supply chain partners to be fit for Luton DART business. [redacted]

Proposals for supporting growth in the local labour market brought forward targets for:

- 80% and 100% of unskilled workers coming from within 20 miles of Luton (civil and system respectively)
- 80% of skilled labour sourced within an hour from Luton

Pre-employability sessions will be held to assist those out of employment for a longer period or NEET. LET'S fairs targeted at DART opportunities and then more widely at opportunities in relation to engineering and technology will be supported and sponsored by the Contractors. All jobs will first be advertised for local people.

Exciting proposals for wider skills development opportunities in Luton focus on:

[redacted]

Private and Confidential

[redacted]

Proposals to inward invest in Luton recognise that Luton is undergoing significant change and that a strategic partnership approach brought about through the delivery of the Luton DART provides a unique opportunity to integrate requirements to deliver high social values for Luton's communities as part of the development of a significant infrastructure project.

[redacted]

A Steering Group will be put in place to oversee the delivery of the programme and to work alongside the coordinators that both contractors intend to recruit. Options to use local groups to realign the programme progressively will be accepted, [redacted].

By making the Social Values Outcomes 20% of the contract award, LLAL has been successful in delivery a basket of measures and actions that will deliver not only outstanding results for Luton but also produce two excellent partners to support Luton's investment journey.

4.3. Market Engagement

In April 2016 an initial PIN notice was issued to alert the market to the project and facilitate consultation with potential suppliers. A total of 39 companies responded to the notice, consisting of a civil, rail system and other suppliers, e.g. project management and engineering companies. A project open day was held in May 2016 attended by 29 companies. An overview of the project was provided at the open day and the opportunity taken for LLAL/[redacted] to consult the market regarding specific design and procurement proposals. A questionnaire was subsequently issued to gain a more structured response to some of the main queries, to which 24 responses were obtained. A second PIN was issued in February 2017 to enable further engagement with the market throughout July and August 2016. The market response showed the project was both attractive to the market and one that would be competitive.

Private and Confidential

4.4. Procurement Strategy & Route

a) Procurement of the LUTON DART System

Procurement Strategy – [redacted].

Procurement Route - [redacted] Essential parts of the

PQQ - The PQQ process for both Civil Engineering and Transport Systems was scored on the following basis

Civil Engineering PQQ	Transport System PQQ
Section A Core Questions -Pass/Fail criteria	Section A Core Questions -Pass/Fail criteria
Section B Supplementary -Pass/Fail criteria	Section B Supplementary -Pass/Fail criteria
Section C Experience and quality 47.5%	Section C Experience and quality 25%
Section C Contracting and coordination 22.5%	Section C Contracting and coordination 17.5%
	Section C Operation and maintenance 25%
Section C -Innovation and costing 30%	Section C Innovation and costing 32.5%
Section D -Declarations	Section D Declarations

*Social Values is part of the Contracting and co-ordination

Each PQQ was evaluated separately by allocated work stream staff, who then held a combined moderation session to produce the overall score. All scores were recorded and then all work stream leads held a combined formal review and validation session for all PQQ submissions. This session was attended by [redacted] to ensure consistency and fairness.

For the civil engineering works, 10 companies made submissions. Four companies were invited to participate in competitive procedure. All unsuccessful companies have been informed and those that requested feedback have been given it. The four successful companies were

Company	Status
[redacted]	

[redacted]

Private and Confidential

[redacted]The two successful companies were

Company	Status
[redacted]	[redacted]
[redacted]	[redacted]

The cable-pulled systems each provide a solution that can be adopted in Luton and can provide for future capacity without extensive periods of unavailability or expense. [redacted] Cable pull has the added advantage of being a highly energy efficient solution. [redacted] a parallel procurement route that allows for communication and negotiation with tenderers was adopted. The scoring was based on the following

4.5. Tender Results

Tenders were received on programme by all bidders and all were assessed to be compliant. They were assessed in accordance with the following criteria

Civil Engineering ITPD	Transport System ITPD
Cost 35%	Cost 30%
Technical 27.5%	Technical 27.5%
Social Values 20%	Social Values 20%
Legal 10%	Legal 15%
Deliverability 7.5%	Deliverability 7.5%

Each theme had an evaluation lead who chaired evaluation team meetings to produce an evaluated score against set criteria. Bidders were asked to respond quickly to a series of clarification questions relating to their bid. The responses were taken into account in the scoring. Once the evaluation team reached a score in line with the published evaluation plan, a process of calibration by workstream took place, i.e. it was presented and challenged by representatives of LLAL, [redacted] who had been independent from the evaluation team but part of the overall dialogue process. Following those discussions, Evaluation leads reviewed their scores with their evaluation teams further and submitted final scores. A number of scores were revised by Evaluation leads as part of the calibration process.

Once finalised, scores were subject to an independent Moderation process involving [redacted] The Moderation panel required attendance by each evaluation lead to present their reports and particular focus was paid to those scores where initially evaluators had a wide variance on views or on any changes that had been made following discussion as part of the calibration process. [redacted] also attended to ensure consistency and fairness. Following an appropriate and thorough degree of challenge, the moderation panel agreed the scores as follows

Private and Confidential

Civil Engineering

Criteria	[redacted]
Cost	
Technical	
Social Values	
Legal	
Deliverability	
Total	

Transport System

Criteria	[redacted]
Cost	
Technical	
Social Values	
Legal	
Deliverability	
Total	

These results were reported to the Programme Board on 20th September. After a detailed consideration of the process and results, the Programme Board selected their preferred bidders as identified below.

- Civils Engineer – [redacted]
- Transport System – [redacted]

Summary of [redacted]

The successful Civil Engineering bidder, [redacted] has a track record of delivering projects successfully in the Luton area. [redacted]

Summary of [redacted]

[redacted], the successful Systems bidder is the world's largest cable haul supplier and submitted an outstanding bid t[redacted]

[redacted]

4.6 Contractual arrangements overview

[redacted]



4.7 Contracting strategy

[redacted]

[redacted]

[redacted]

[redacted]

4.9 Key risks retained by LLAL

[redacted]

Whilst all bus users will migrate to the Luton DART when operational and [redacted] stops the bus service, the increase in numbers is dependent not only on overall airport passenger numbers increasing but also on the less controllable modal shift. If the modal shift does not happen, the income would cover the cost of operation although only at break even. To encourage the move from car to train, key actions in promoting the Luton DART will be put in place for example

- Major publicity at key stages of development aimed at delivering national media coverage
- Promotion in airlines literature (easyjet has already run an article)
- Links on key websites of LLAOL and airlines
- Promotion through social media campaigns
- Work with Network Rail, operating companies and national travel agents including web based
- Promotion at motorway service stations
- Promotion in the airport itself as construction progresses
- Advertising in key media such as daily papers including the London Evening Standard
- Announcements on trains
- Advertising at mainline rail stations
- Promotion on the bus transfer service which currently operates
- Passenger travel analysis (cars) and use of advertising hoardings along key routes

5. THE FINANCIAL CASE

5.1 Whole Life Cost

[redacted]

5.2 Capital Costs (CAPEX)

Capital Costs

[redacted]

LLAL development budget

As the project has developed since the OBC stage the risk and optimism bias assumptions have continued to be revisited. This is standard practice as the level of certainty concerning the technical/physical solution has increased.

In advance of the tender process and based on the [redacted] pre-tender estimate, LLAL re-allocated the overall [redacted] pre-tender estimates (stage 1 and stage 2) based on the likely allocation of costs across the number of work packages.

[redacted]

Taking into account of the preferred bidders submissions, LLAL's development budget is shown in the table below.

Private and Confidential

Item	£ OBC	£ recommended preferred bidders
Stage 1 Civil engineering works	[redacted]	[redacted]
Stage 1Transport System		
LLAL project risk provision		
Pre – enabling works		
Professional fees		
Stage 2 Over Bridge and Link Building.		
Car Parking and CTA area		
Inflation		
Project Insurance		
Total		

Notes

[redacted]

[redacted]

5.3 Operating Costs (OPEX):

The preferred bidder operating costs are summarised in the table below. Other necessary operating expenditure is identified in section 5.3.

a) Staffing Costs

[redacted]

b) Power Costs:

The preferred bidder has assumed [redacted] KWh of energy consumption per annum. Based on the assumed price per KWh the expected costs (at 2017 prices) are £[redacted]k.

[redacted]

c) Operation & Maintenance Costs:

The cost of annual maintenance has been calculated based on the proportion of CAPEX for each item, considering rolling stock, system, and infrastructure. This is a typical approach to apply for a high level assessment.

[redacted]

Total Annual MPT OPEX Estimate:

The table below summarises the costs that are expected to be included in the Transport System O&M contract (excl. lifecycle costs):

[redacted]

5.4 Other Operating Costs (excluded from the Transport System O&M contract)

[redacted]

The general management of the station, covering above activities will be delivered through a separate facilities management (F&M) contract, which will be subject to competition in due course. The F&M contractor will be responsible for day to day working with [redacted] to ensure service standards are maintained. It has a very important role to play in making sure that revenue protection works. The reason for this separation is to enable the systems operator to focus on running the service and meeting performance standards.

5.5. Commercial Strategy

a) Fares & Charges

- The operating costs of the system will be recovered though charging for the use of the system i.e. it will not be free to use.
- The revenue related to travel to/from Bartlett Square terminus will be received by LLAL (who will make contractual payments to the operator) and that related demand/revenue risk will be with LLAL.
- [redacted]
- [redacted]
- [redacted]
- Subject to final agreement with the Train Operating Companies (TOCs) the fare for the MPT for rail passengers will be collected as part of the ticket price for the Network Rail journey and recovered from the TOC. All other passengers travelling to/from Parkway (other than season tickets if implemented) will be required to purchase an appropriate ticket or have made the appropriate payment prior to travel. A penalty fare system will be operated for passengers deliberately avoiding payment.
- Easy fare payment systems will be introduced e.g. credit/debit card touch systems and self-service MPT ticket machines will be made available for the purchase of tickets at Parkway and the Airport Terminal.

b) Sponsorship, Advertising & Branding

- The sponsorship of the Luton DART system and advertising revenue from advertising in the terminals at Bartlett Square and the Airport; and on the rolling stock itself, will be LLAL revenue.
- The Luton DART will be branded as London Luton Airport consistent with the Airport operator's branding strategy. However, sponsorship branding will be considered subject to the level of sponsorship funding that might be offered. There will be an opportunity at the Bartlett Square terminus to introduce the "Luton" branding and to provide facilities for showcasing the aspirations for Luton of the Council and its partners. This will be provided in a prominent position readily accessible to arriving and departing passengers.

Private and Confidential

c) Retail

- [redacted]

[redacted]

5.6 LLAL Investment

The LLAL budgeted investment for the Luton DART is £225m. [redacted].

5.7 Return on Investment

[redacted]

5.8 Financial Appraisal

[redacted]

Luton Confidential

[redacted]

[redacted]

[redacted]

Interest deductibility

[redacted]

Private and Confidential

6. THE MANAGEMENT CASE

6.1. Governance Structure

The LLAL Board are the ultimate decision making body for the project. The project will be overseen on behalf of the LLAL Board by the Mass Passenger Transit & Bartlett Square Programme Board. The Programme Board is as follows:

Luton DART/BARTLETT SQUARE PROGRAMME BOARD		
NAME	**ORGANISATION**	**ROLE / RESPONSIBILITY**
[redacted]	[redacted]	LLAL Senior Responsible Owner & Chair
		[redacted]Senior Responsible Owner
		LBC Director of Place & Infrastructure
		Financial Assurance
		Legal Assurance
		[redacted]Procurement Director
		LLAL Shareholder Representative
		[redacted]Project Director
		[redacted]Project Director
		Programme Assurance

Critical programme/project recommendations made by the Programme Board will be subject to the approval of the LLAL [redacted] and their respective Shareholders. The decisions to be taken by the Boards and Shareholders and the authority delegated to the Programme Board is defined in the Terms of Reference attached as Appendix D. In summary, the Programme Board will:

- Direct and exercise effective control of the project such that the eventual outcomes are fully compliant with the LLAL [redacted] business requirements and their Shareholders' expectations.
- Ensure that the business integrity of the projects is maintained as external influences impact upon project direction and delivery.
- Ensure that the project resources and necessary funding are made available.
- Provide visible and sustained support for the Project Director.
- Ensure that there is effective communication within the Programme, between the projects and with external stakeholders.

6.2. Project Team

PROJECT TEAM		
NAME	**ORGANISATION**	**ROLE / RESPONSIBILITY**
[redacted]	[redacted]	Project Director
		Financial Appraisal & Modelling
		Commercial Director
		Director of Planning and Development
		Project Lead [redacted]
		Project Director (Design)
		Procurement
		Project Director (Planning)
		[redacted]
		[redacted]roject Director (Bartlett Square)
		Procurement Workstream Lead
		Legal Advice & Assurance
		LLAL Stakeholder Management & Communications

te and confidential

[redacted]

6.3. The Engineer Role

[redacted]

6.4 Project Management

[redacted]

Private and confidential

[redacted]

6.5. Project Programme

The delivery programme key dates as extracted from the preferred bidders are as follows:

[redacted]

6.6. Project Delivery Resources & Budget

[redacted]

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]		

[redacted]

Table 2

ITEM	DESCRIPTION	ESTIMATE (£)
1	[redacted]	[redacted]
2		
3		
4		
5		
6		
7		

*[redacted]

Private and Confidential

6.7. Contingency Plans

Should the LUTON DART be closed after it opens e.g. breakdown, planned maintenance, the systems operator is required to put in place an alternative bus service. This will be serviced through the Bartlett Square development which is being designed with a circulation route.

[redacted]

Private and Confidential

APPENDIX A

SYNOPSIS OF PRAGMA TRAIN TO AIRPORT SHUTTLE BUS RESEARCH

[redacted]

Private and Confidential

APPENDIX B

easyJet plc
Hangar 89, London Luton Airport
Luton, Beds LU2 9PF, United Kingdom

[redacted]

[redacted]

Registered in England, registered no. 3034606. Registered office: Hangar 89, London Luton Airport, Luton, Beds LU2 9PF United Kingdom

europe by easyJet

easyJet plc
Hangar 89, London Luton Airport
Luton, Beds LU2 9PF, United Kingdom

[redacted]

APPENDIX C PWC London Luton Airport DART FBC

[redacted]

APPENDIX D Luton DART & BARTLETT SQUARE PROGRAMME BOARD

[redacted]

Private & Confidential

[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Private and Confidential

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

Private & Confidential