Dublin Airport Capital Expenditure Assessment

Report to the Commission for Aviation Regulation

26 May 2014

Building a better working world

Contents

Appendices

Version control details				
Version	Status	Date	Author	Description of material changes
Draft report	Submitted	25 April	EY TPS	
Draft report v2	Submitted	26 May	EY TPS	Report updated following comments from CAR. IT projects included.
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Authors	EY TPS	20 May 2014
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Reviewed by		

Section 1

Executive summary

Summary

Scope of work

- The Commission for Aviation Regulation (CAR) has requested EY to review the projected cost of Dublin Airport Authority's (DAA) capital expenditure plan, for 2015–2019.
- This assessment reviews the cost of the projects in the Capital Investment Programme (CIP) to determine whether or not the DAA's proposed costs are reasonable as described in the CIP.
- The CIP comprises 54 individual projects. An assessment was required for the cost of each project.
- Our analysis does not examine the *rationale* for any individual projects within the CIP, rather it focuses only on the *appropriateness* of cost estimates as per the projects described.

Approach

The level of detail of the assessment depends on and is commensurate with level of information available, the number of projects and the timescale available.

Key information included in the CIP document was:

- The estimated capital expenditure value of the individual projects
- Project timing
- Project type in terms of facility and/or type of infrastructure development

Independent assessments of project costs for each project were conducted, applying the following principles:

- Cost benchmarks were used to ensure comparability of data, taking account of geographic location, inflation and exchange rates
- As agreed with CAR, no inflationary allowances were included in any of the CIP projects over the lifetime of the programme

In the case of infrastructure and construction projects, the basis for reviewing the projects is to use the overall cost/m2 or cost/functional unit. Where this method is inappropriate the proposed CIP costs have been reviewed against the output proposed.

The basis for reviewing IT projects is to benchmark hardware and software costs and professional fees, where available.

Where assessments of project costs resulted in variances of greater than 10% of the proposed cost in the CIP, an explanation is included in the individual project assessments sheets contained in Appendix A.

Key findings

- DAA total CIP value is €848m compared to the EY/TPS assessment of €879m.
- This amounts to an overall variance of 3.6% (€30.7m)
- It was found that of the 54 DAA CIP projects, 30 had a higher cost estimate than expected, resulting in a total negative variance of €49.3m. One project was estimated at the same cost.
- The remaining 23 projects were found to have a lower cost estimate than expected with a total positive variance of €79.9m.
- The ten largest project-level variances account for around 75% of total absolute variance.

Section 2

Introduction

The DAA's Capital Investment Programme contributes to determination of airport charges at Dublin Airport for 2015–2019

Capital Investment Programme

The Commission for Aviation Regulation (CAR) is responsible for setting a price cap limiting the total revenues per passenger that the Dublin Airport Authority (DAA) can collect from airport charges. The price cap is derived from a series of inputs known as the 'regulatory building blocks'. One of these building blocks is the Capital Investment Programme (CIP) which is prepared by DAA. The CIP presents DAA's proposals for capital investment at Dublin Airport for the period 2015-2019.

DAA Capital Investment Programme 2015 – 2019

CIP 2015 – 2019 classification

The proposed programme for the 2015 – 2019 CIP is divided into three tranches:

- Tranche 1: Operational projects comprises the stated level of minimum investment needed to maintain existing assets. This spend will allow the current level of service to match the existing levels of traffic at the airport. The total proposed investment in this area is €191m (including costs of €5m incurred relating to these projects to date).
- Tranche 2: Business development projects represent the proposed investment required for the acquisition of new assets at the airport. These new assets will provide additional capacity and/or commercial revenue and/or increased efficiency. The total proposed investment in this area is €183m.
- Tranche 3: Enabling projects represent the spend required to enable future growth at Dublin Airport and include minor projects and specific projects which would be triggered by circumstances such as achievement of defined passenger growth numbers. The overall value of Tranche 3 projects is €108m which comprises €22m for 'Other' projects and €86m for Trigger projects.
- Total excluding triggered projects – €396m
- Total including triggered projects – €482m
- Additional Trigger projects, which are not expected to be triggered in 2015-2019 (15.6.12 Runway 10-28 Extension, 15.6.028 Runway 10-28 Extension and Addition of Line-up Points, 15.6.051 Northern Runway), have a total value of €366m.

Projects are classified into eight groups in the CIP. These are:

Airfield maintenance Terminal and landside maintenance IT	Tranche 1
Revenue Business Development Other	Tranche 2
Trigger projects Additional Trigger projects	Tranche 3

Scope of work

- The CAR has requested EY/TPS to review the associated cost of DAA's capital expenditure plan for 2015–2019.
- This assessment reviewed the CIP project costs to determine whether or not the DAA's proposed costs are reasonable as described in the CIP. Specifically the following two areas were to be considered:
  - Double counting across projects
  - Projects that are over- or under-specified given the proposed output
- DAA issued the final CIP on the 9 April 2014. All costs within this assessment are based on this version.
- This review is a key element of the process in determining the airport charges at Dublin Airport that will take effect on expiry of the existing determination at the end of 2014.

Information provided

- The information available on each individual project is included in the DAA CIP document.
- Key information within the CIP document focused on:
  - The estimated capital expenditure value of the individual projects
  - Project timing
  - Project type in terms of facility and/or type of infrastructure development
- We also requested further clarification from the DAA on the information provided during the assessment period.
- Project data sheets which detail the cost build up identified within each individual project where supplied by DAA in response to clarifications.
- Detailed information was provided on two of the IT projects in CIP IT Investment 2015-2019 and responses were also received to questions raised by EY/TPS.

Accurate estimation of efficiently incurred capital expenditure is key to the setting of maximum charges at Dublin Airport

Regulated charges at Dublin Airport

- CAR regulates the following charges at Dublin Airport (other airport functions are either regulated elsewhere or provided by a competitive market):
  - Charges for taking off, landing and parking aircraft.
  - Charges for the use of air bridges.
  - Charges for arriving and departing passengers.
  - Charges for the transportation of cargo.
- CAR uses price cap regulation based on the 'single till' approach.
- CAR advocates and implements the economic concepts of productive, allocative, and dynamic efficiency.

CAR's statutory objectives

- To facilitate the efficient and economic development of Dublin Airport which meets the requirements of current and prospective users of Dublin Airport.
- To protect the reasonable interests of current and prospective users of Dublin Airport in relation to Dublin Airport.
- To enable the Dublin Airport Authority to operate and develop Dublin Airport in a sustainable and financially viable manner.

Regulatory building blocks used to set price cap

- An estimate of efficiently incurred future operating expenditures.
- Plus a return on an efficient capital stock.
- Plus a depreciation allowance on capital stock.
- Less an estimate of future commercial revenues.

Forecast annual passenger numbers

This requires CAR to assess DAA's capital investment plan.

Each year's annual price cap is approximately equal to the sum of the building blocks divided by forecast annual passenger numbers.

Section 3

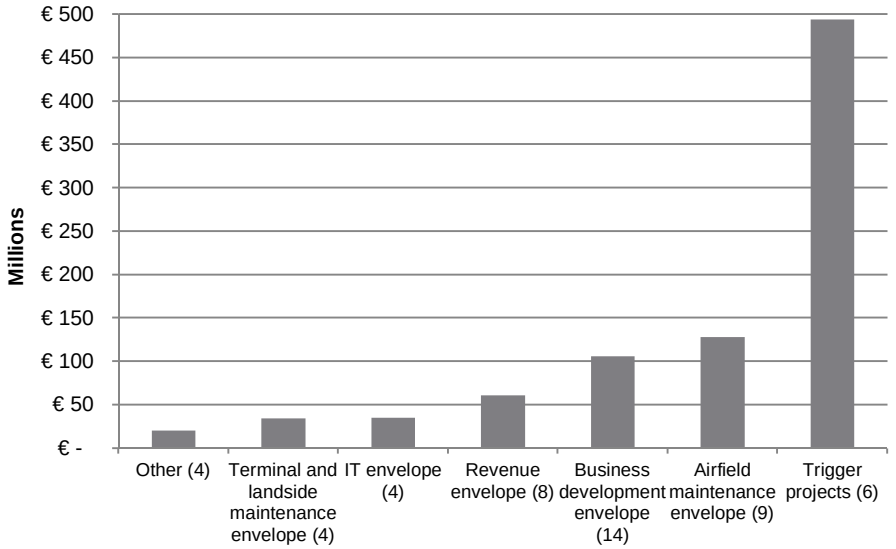
Approach

The assessment covered 54 projects which were classified into eight groups in the Capital Investment Programme

Projects assessed

In total the assessment covered 54 projects with a value estimated by EY/TPS of €896m. Projects ranged in value from €300k to €300m and were assessed against the latest information presented by the DAA on the 9 April 2014. The projects were classified into 8 different groups in the CIP, listed below. The value of each group, according to figures in the CIP, is illustrated in the table opposite.

- Airfield maintenance envelope
- Terminal and landside maintenance envelope
- Revenue envelope
- Business development envelope
- IT envelope
- Other (Programme Management, Minor Works, North Runway facilitation works)
- Trigger projects
- Additional trigger projects

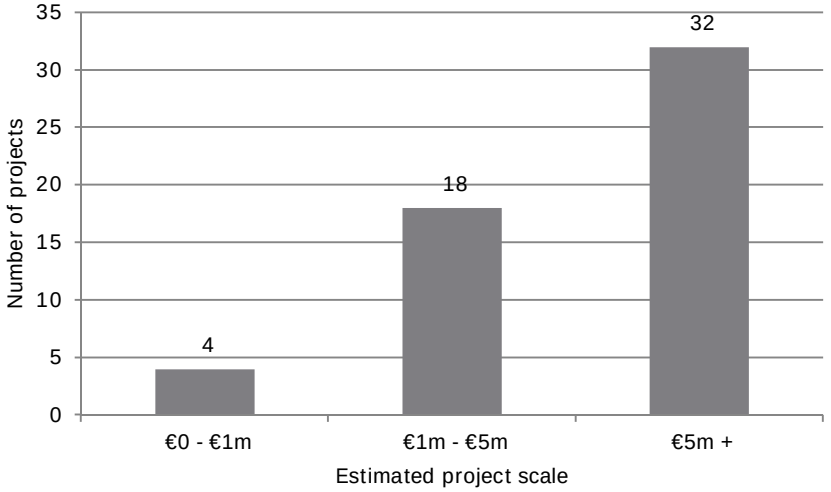


Information received and assessed

As part of the CIP assessment an individual project sheet and data sheet for each project were issued for review. These two documents detail the scope of work to be carried out, the capital budget required and the financial assumptions and calculations made to establish the estimate. Clarification questions were also raised and responses have been provided by DAA.

CIP IT Investment 2015-2019, a document provided by DAA, covered two of the four IT projects. Queries were submitted to DAA on projects and responses received.

As with all capital programmes, some elements are further developed than others. Where the projects are further developed and planning more advanced, more in-depth information was included in the project and data sheets. This is the case for projects that have been moved from the 2010–2014 CIP. As a result, these projects can be more accurately estimated.



We structured our approach to provide an iterative and robust assessment

Approach summary

1. **Project kick-off, initial data gathering and analysis**
   - Clarify scope and approach
   - Confirm the projects to be reviewed
   - Set up project administration
   - Set up project data flows and data requests for follow up queries with DAA
2. **Identify full list of key projects**
3. **Review scope of each project**
   - Review details of information provided, covering issues such as capital expenditure timing, definitions, level of contingencies
   - Develop questions for submission to DAA via CAR
4. **Quantify scope of project**
   - Identify suitable benchmarks, e.g., previous projects and published data at unit cost level (€/m2)
5. **Develop cost estimate against quantified scope**
   - Based on our benchmarks and experience, develop independent cost estimates for each selected project
   - Compare with DAA forecasts
6. **Compare cost estimate against DAA capex forecast**
   - Identify cost variances between our independent estimates and DAA estimates
7. **Review projects with material variance in estimates**
   - Determine material differences on a per project basis
   - Develop explanations and rationale as to the reasons for differences
8. **Confirm reasonableness of DAA unit costs**
   - Where material differences exist, undertake additional analysis to re-examine our estimate
   - Finalise the analysis
9. **Draft report**
   - Finalise our report
   - Submit report to CAR in draft
   - Finalise report
   - CAR issue report alongside the draft determination
10. **Finalise assessment**

We adjusted our cost benchmarks to ensure comparability of data, taking account of geographic location, inflation and exchange rates

Methodology

An important step in the process of cost estimation is selecting appropriate benchmarks for the projects under consideration. Because these are not always located in the same regions, denominated in the same currency or delivered in the same market conditions, an appropriate adjustment factor must be determined in order to provide a like-for-like comparison. The graphic opposite illustrates the steps involved in this adjustment process.

In addition, published benchmarks are often only available for particular periods, so a careful approach is required in interpreting and applying conversion factors.

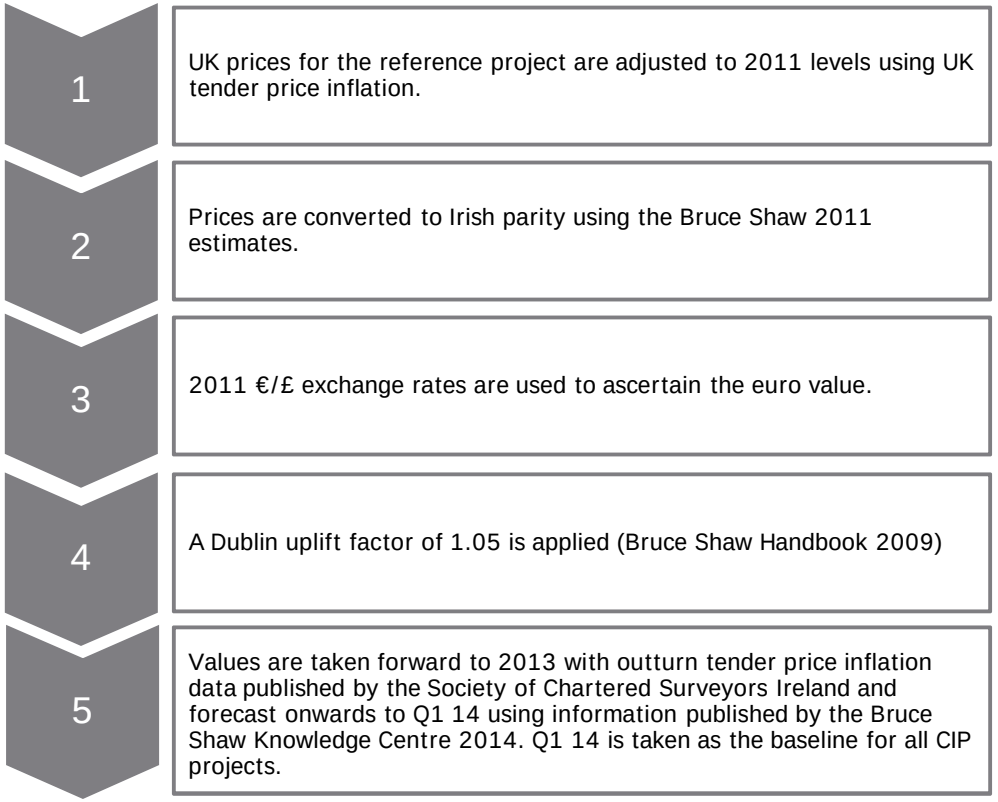
The Bruce Shaw Handbook 2012 benchmarks a range of international construction costs indices. The indices are expressed as a range, not a single figure. In order to calculate our assessment a single figure is required. The practical approach of using the mid-point to convert from the UK to Ireland has therefore been taken.

UK data on relevant project costs is available in most cases. We used the latest estimates from 2011 to convert this information to Irish values. Data from Bruce Shaw (2012) shows estimates of this in a range of 88-96 to 101-116 of UK costs. A conversion factor of 0.847 is arrived at by taking the mid-point of these estimates.

In some cases it is necessary to adjust the reference project to 2011 UK values where projects have been delivered before or after this date. This is done by applying UK tender price inflation (sourced from Building Cost Information Service) to price estimates.

The 2011 average sterling exchange rate is used to convert to euro values and an uplift factor of 1.05 is used to account for price divergences in Dublin vis-à-vis the national average to reflect higher costs in Dublin (as recommended in the Bruce Shaw Handbook 2009) . These figures are then uplifted to the Q1 2014 forecast which is the baseline for all projects within the CIP.

No inflationary allowances have been included in any of the CIP projects over the lifetime of the programme, as per CAR requirements.



A review of the contingency, fees and abnormal costs has been carried out for each project

Level of assessment

The level of detail of the assessment was in accordance with the level of information available, the number of projects and the timescale available.

The basis for reviewing each CIP is to use the overall cost/m2 or cost/functional unit. Where this method is inappropriate (e.g., Programme Management 15.8.200) the proposed CIP costs have reviewed against the output proposed.

Variances

Variances of greater than plus or minus 10% of the cost included in the CIP were considered material.

- Where variation is within 10%, projects are deemed to be 'of the right magnitude' in the individual project assessment sheets.
- Where variation is greater than plus or minus 10% project costs are deemed to be 'higher than expected' or 'lower than expected'. Further assessment is provided in these cases in the relevant project assessment sheets.

Fees

- Fees included within each project account for professional design, management and cost control. The level applied varies depending on project type, value, risk, complexity and location. For airside projects the fees are generally set at 6% and for construction projects a 12% fee applies. This is to cover the costs associated with additional professional services required. For landside projects the fees are generally set at 10% but vary depending on the perceived level of risk and professional services required. Any deviations from these default rates is stated and justified on the individual project assessment sheets.

Contingency

- As with fees, contingency rates vary according to the nature, value, risk and complexity of the each project. A general rate of 15% has been applied however it is adjusted where appropriate depending on the level of detail included in the CIP. Any deviations from these default rates are stated and justified on the individual project.

Airport restrictions

- Additional costs are incurred for airside construction activities due to restrictions in place in those areas. These have been accounted for separately where specific projects warrant the allowance. This has generally been included at 10%.

Sources of comparable cost information

The cost information used in the assessment has been taken from the following sources:

- Various estimates, cost plans and projects at UK airports provided by our own TPS QS staff
- Individual projects from TPS Aviation's portfolio of airport redevelopments
- Davis and Langdon Cost Models for Airports and Airport Terminals 1999, 2008 and 2009
- Davis and Langdon Cost Model for Car Parks 2007
- Gardiner & Theobold International Construction Cost Survey 2008
- Building Cost Information Service - Cost Analyses (The cost information service provided by the Royal Institution of Chartered Surveyors)
- The Bruce Shaw Handbook 2012 and Knowledge Centre 2013
- Costs/m2 and costs per functional units from published sources
- National Roads Authority Schedule of Rates 2013
- Specific costs obtained from specialist suppliers or contractors
- The Society of Chartered Surveyors Ireland
- Davis and Langdon Ireland Annual Review 2013

All source information has been updated to Q1 14 in line with the CIP cost information.

Detailed cost assessments of each of the 54 projects contained in the CIP are included in Appendix A.

For IT projects, our approach to cost assessment needed to be modified

Overview

Four IT projects, listed below, with a combined estimated cost of €41m for the period 2015-2019, are included in the CIP. The projects range in nature from IT maintenance (hardware replacement due to lifecycle management, renewal of existing software licences, upgrades of existing systems), to development and business innovation projects.

- 15.5.002 Retail IT (€1.6m)
- 15.8.008 DAA Technology Operations and Lifecycle Management (€15.8m)
- 15.8.009 DAA Business Systems Investment Plan (€15.6m)
- 15.9.009c Business Innovation Investment (€8m)

Methodology

Project information contained in the CIP was of a high level. Additional, more detailed information, was provided by the DAA in relation to some of the projects and their component sub-projects. Where comprehensive information on sub-projects, including technical specifications required was available, these were benchmarked against market prices and industry specific costs were compared with costs at other airports. Where projects and elements of projects were at an earlier stage of planning, the DAA approach to cost assessment was evaluated.

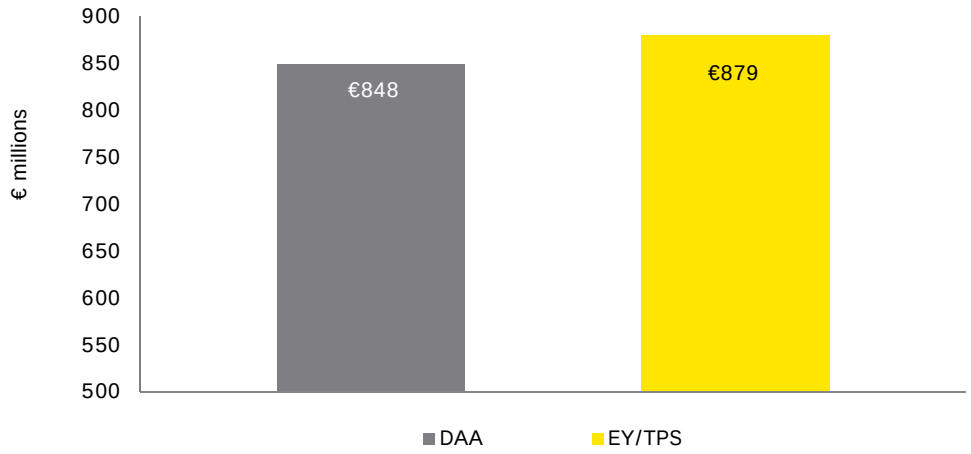
1	The DAA IT projects within the CIP were reviewed. Additional detailed information was requested from DAA to provide a further breakdown of hardware, software, equipment and professional services costs
2	Hardware and software price estimates were checked against retail prices and publicly available data where detailed technical specifications were provided.
3	Price estimates for airport-specific IT products were benchmarked against similar projects in other European airports.
4	In cases where it was not possible to provide technical specifications, the approach and assumptions made by the DAA to generate their estimates were assessed to determine their validity
5	Daily rates used for professional fees were assessed against industry norms
6	No allowance was made by DAA for contingency for IT projects. 15% contingency was added with respect to professional fees

Section 4

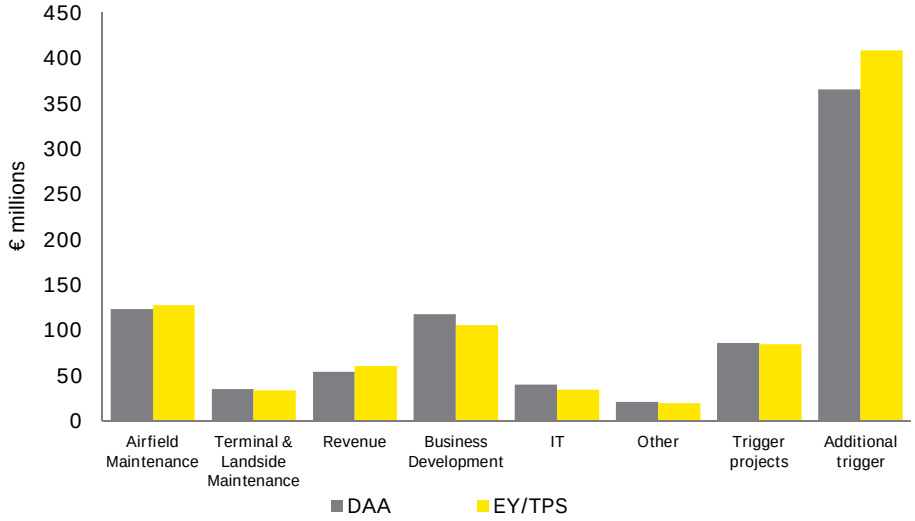
Analysis and findings

DAA CIP costs are within 4% of our independent assessment, however variation is greater at group level

Comparison of total capex costs



Comparison of costs by group



Analysis

- DAA total CIP value is €848m compared to the EY/TPS assessment of €879m.
- This amounts to an overall variance of 3.6% (€30.7m)
- It was found that of the 54 DAA CIP projects 30 had a higher cost estimate than expected, resulting in a total negative variance of €49.3m. One project had the same cost estimate.
- The remaining 23 projects were found to have a lower cost estimate than expected with a total positive variance of €79.9m.

Group level variance

- At group level, higher variances in cost estimates can be observed.

Group	Variance
Airfield Maintenance	3%
Terminal & Landside Maintenance	-4%
Revenue	11%
Business Development	-10%
IT	-14%
Other	-7%
Trigger projects	-2%
Additional trigger projects	12%

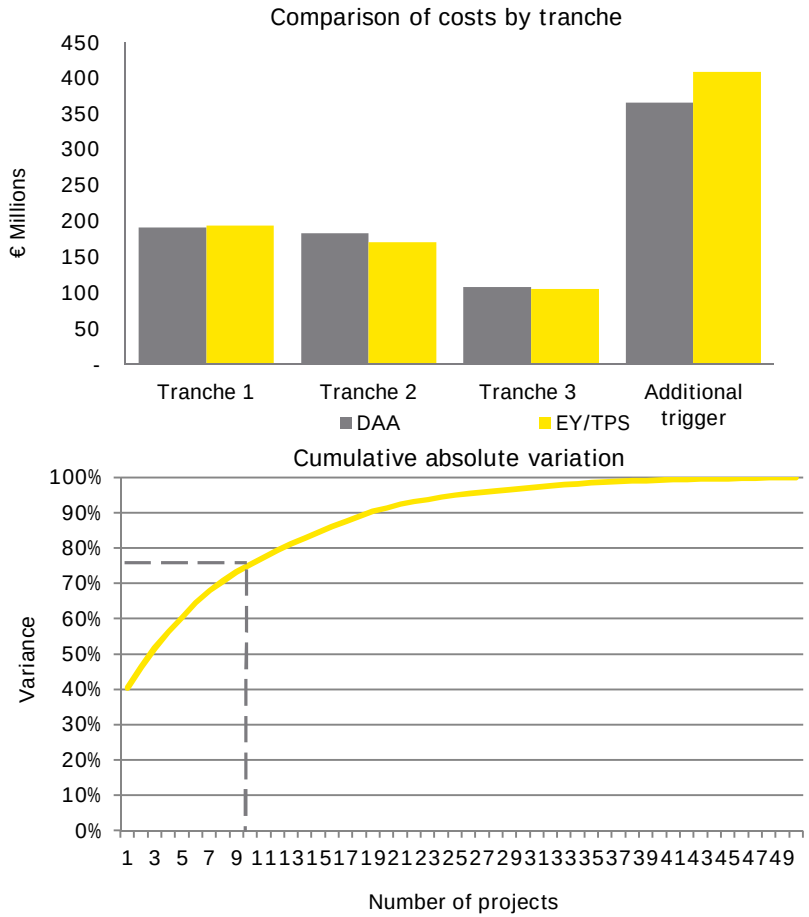
- Material variances were found between DAA's CIP costs and the EY/TPS estimates for Revenue, Business Development, IT and Additional Trigger Projects.
- In most cases, this is largely accounted for by a substantial variance in the cost of a single project.
- In Revenue, the EY/TPS estimate for project 15.5.001 Retail Refurbishments was €5.4m higher than the DAA CIP cost.
- In IT, costs for project 15.8.009c Business Innovation Investment were higher than expected due to a lack of projects presented to account for €6.25m of €8m budgeted.
- In Additional Trigger Projects, the forecast cost of 15.6.051 Northern Runway, the largest single project contained in the CIP, was €53.2m lower than expected.
- In Business Development, overall variance was driven by three project assessments which showed DAA CIP costs to be higher than expected; 15.6.007 Airfield Infrastructure Upgrades for New Large Aircraft (by €4.5m), 15.6.047 New Apron Development (by €2.1m) and 15.7.117 Transfer Facility (by €2.8m).

Overall variance is driven by material variances for a small number of large projects

- At tranche level, our assessment is within 1.4% of the DAA's CIP cost estimate for Tranche 1 projects, within 7% for Tranche 2 projects and 3% for Tranche 3.
- A material variance of 12% was found between EY/TPS cost estimates and the DAA CIP cost for trigger projects. This is largely accounted for by the lower than expected cost associated with the construction of project 15.06.051 Northern Runway, the largest single project contained in the CIP.
- For the Northern Runway, in arriving at our calculation, we used a higher cost per metre of €76,500/m2 (excluding fees and contingency) based on our experience of similar projects at other airports, resulting in a price difference of €53m.

Detailed below are ten largest project-level variances account for around 75% of total absolute variance, as illustrated in the figure opposite.

Project	% Variance	Absolute variance
!6.6.051 Northern Runway	41%	€53,232,500
15.6.017 Runway 10-28 Overlay	47%	€7,255,000
15.8.009c Business Innovation Investment	52%	-€6,100,000
15.5.001 Retail Refurbishments	56%	€5,397,034
15.6.012 Runway 10-28 Extension	60%	-€5,387,000
15.6.028 Runway 10-28 Extension and Addition of Line-up Points	64%	-€4,844,000
15.7.116 Pier 3 Flexibility	67%	-€4,455,000
15.2.006 T2 MSCP Phase 2	70%	€3,540,000
15.6.055 Airfield Taxiway Rehabilitation	72%	-€3,452,000
15.7.117 Transfer Facility	75%	-€2,810,000



Project duplication occurs between three projects listed in the CIP relating to Runway 10-28

Project 15.6.028 Runway 20-28 Extension and Addition of Line-up Points, categorised as an additional trigger project (DAA €74.4m, EY/TPS €69.6m) is an amalgamation of Projects 15.6.012 Runway 10-28 Extension (Other, Tranche 3, DAA, €55m, EY/TPS €49.6m) and Project 15.6.013 Additional Line-up Points on Runway 10-28 (Additional Trigger Projects, DAA €30, EY/TPS €27.8). This reflects the options available to DAA to respond to demand. Delivering projects 15.6.012 and 15.6.013 together will result in economies of scale. This is reflected by a lower price of project 15.6.028.

IT projects represent 4.8% of the overall CIP cost where a material variance was found

Assessment of IT projects

At €41m (4.8% of the CIP total) the level of IT Capex is substantial, however it includes both IT maintenance and upgrades of existing hardware and software systems as well as development and business innovation projects. IT capital expenditure is characterised by having additional costs associated with business readiness and change, programme management and systems integration projects. Many of the IT projects assessed include for costs of systems integration and professional fees. DAA's operating expenditure may also allow for IT-related projects.

Unit prices

Where detailed specifications for hardware and software components were provided EY/TPS assessed the DAA's CIP unit cost against market prices and these were deemed reasonable.

Fees

- Fees for professional services, where documented, account for €7.3m or 18% of total project costs.
- The DAA has explicitly taken external professional fees and integration into account in costing some projects. Benchmarking of daily rates against industry norms indicated these were reasonable.

Contingency

- No contingency was allowed for by DAA for these projects.
- In our view, adequate contingency has not been allowed for potential complexities in project implementation. We have allowed a 15% contingency in respect of professional fees to account for this, based on the range of complexity of sub-projects within the IT projects.

Variance

Total variance across IT projects amounted to €5.9m. The single largest contributory factor was the lower than expected cost estimation for project 15.8.009c Business Innovation Investment. A budget of €8m is proposed for this project in the CIP. However, when requested, DAA provided justification for sub-projects with a combined cost of just €1.75m. In the absence of sufficient justification for proposed spend for the remaining €6.25m EY/TPS were not in a position to evaluate budgeted expenditure not accounted for, and we therefore assessed the cost of the project at €1.75m.

Potential cost efficiencies

Our assessment has indicated that cost efficiencies could gained though:

1. Procurement of the four resurfacing projects contained in the CIP collectively to benefit from economies of scale. The projects concerned are: 15.3.006 Long Term Car Park Resurface, 15.2.009 Consolidated Car Rental Centre, 15.2.006 T2 MSCP Phase 2 and 15.2.017 Consolidated Staff Car Park.

2. Advance planning of Minor Projects 15.8.001, which consists of general refurbishment, allowing many of these to be incorporated into capital works being carried out.

3. More cost effective solutions for software upgrades and licensing agreements such as Enrolment for Application Platform agreement or Software Assurance, delivering potential savings in project 15.8.008 DAA technology Operations and Lifecycle Management.

Variations in cost are observed across different project types

Cost variance

The total variance between the DAA's CIP costs and the EY/TPS assessment is just over €30.7m, corresponding to 3.6% of total CIP costs. Variances according to project type are set out in the table opposite.

Variances by project type

Our assessment found that costs for the following project types were underestimated to the greatest degree:

- Revenue Projects 20%
- Future parallel runway related projects 15%
- Airfield Compliance 12%
- Vehicles 6%

Our assessment found that the following project types were overestimated to the greatest degree:

- IT Innovation –76%
- Terminal Capacity –15%
- Apron Capacity -10%
- Landside Maintenance –9%
- Runway Capacity -9%
- Airfield Lighting –8%

Project type	Projects reference (CIP)	DAA's proposed cost (€)	EY/TPS Estimate (€)	% Variance between EY/TPS and DAA estimate	Value of variance
Airfield and Apron Rehabilitation	15.6.001, 15.6.002, 15.6.006, 15.6.055, 15.6.017	€ 85,300,000	€87,643,800	3%	€2,343,800
Airfield Compliance	15.9.022	€20,000,000	€22,450,000	12%	€2,450,000
Airfield Lighting	15.6.004, 15.6.009	€13,000,000	€11,945,000	-8%	-€1,055,000
Vehicles	15.4.001, 15.4.002	€7,900,000	€8,351,975	6%	€451,975
Landside Maintenance	15.3.004, 15.3.035, 15.3.001	€11,100,000	€0,083,000	-9%	-€1,017,000
Maintenance IT	15.8.008, 15.8.009	€31,400,000	€31,590,000	1%	€190,000
Terminals Maintenance	15.7.102, 15.4.005, 15.4.006, 15.7.104	€22,400,000	€21,738,100	-3%	-€661,900
Apron Capacity	15.6.047, 15.6.007	€19,700,000	€17,725,000	-10%	-€1,975,000
Terminal Capacity	15.7.116, 15.7.120, 15.4.004, 15.7.117	€61,400,000	€52,380,000	-15%	-€9,020,000
Terminal -Customer/Efficiency Improvements	15.7.122, 15.7.121, 15.7.119, 15.7.103	€12,170,000	€12,140,700	0%	-€29,300
Revenue Projects	15.5.001, 15.5.002, 15.2.005, 15.2.007, 15.2.010, 15.2.013	€27,480,000	€32,897,534	20%	€5,417,534
IT Innovation	15.8.009c	€8,000,000	€1,900,000	-76%	-€6,100,000
Screening	15.6.021, 15.6.022	€2,550,000	€2,574,000	1%	€24,000
Car Parks	15.3.006, 15.2.009, 15.2.006, 15.2.017	€30,500,000	€31,568,000	4%	€1,068,000
Contingent Projects	15.4.003, 15.7.111, 15.6.023, 15.7.101	€77,500,000	€76,831,200	-1%	-€668,800
Runway Capacity	15.6.012, 15.6.013	€85,000,000	€77,498,000	-9%	-€7,502,000
Other projects	15.8.001, 15.8.200	€13,540,000	€13,961,000	3%	€421,000
Future parallel runway related projects	15.6.051, 15.6.028, 15.6.018, 15.6.019	€319,450,000	€365,850,500	15%	€46,400,500
Total		€848,390,000	€879,127,809	3.6%	€30,737,809

Largest project level percentage and cost variances

The table below identifies projects where the EY/TPS assessment has established costs with a greater than 30% absolute variance in comparison to the DAA's CIP estimate.

CIP reference	Project name	% variance	Value of variance
8.009c	Business Innovation Investment	-76.25%	-€6,100,000
6.019	North Runway Advance House Purchase	-46.78%	-€1,988,000
3.004	Car Parks	-40.29%	-€1,813,000
2.010	Digital Advertising Pods	-38.20%	-€191,000
7.104	HVAC / BMS Upgrades and Replacements T1	-34.74%	-€2,571,000
6.017	Runway 10-28 Overlay	32.53%	€7,255,000
4.006	T1 Critical Equipment Upgrades	32.78%	€1,967,000
2.005	Commercial Hangars Infrastructure	37.38%	€235,500
5.001	Revenue Projects Retail Refurbishments	44.60%	€ 5,397,034

The table below identifies the project with a greater than €4m absolute variance

CIP reference	Project name	% variance	Value of variance
8.009c	Business Innovation Investment	-76.25%	-€6,100,000
6.012	Runway 10-28 Extension	-9.79%	-€5,387,000
6.028	Runway 10-28 Extension and Addition of Line-up Points	-6.51%	€4,844,000
7.116	Pier 3 Flexibility	-29.70%	-€4,455,000
5.001	Revenue Projects Retail Refurbishments	44.60%	€5,397,034
6.017	Runway 10-28 Overlay	32.53%	€7,255,000
6.051	Northern Runway	22.48%	€53,232,500

Further to the above tables the in-depth review for all 54 projects contained in the CIP can be found in Appendix A.

Appendix A

CIP reference: 15.4.001 Airfield Vehicles and Equipment

Information from CIP	
Cost included in CIP	€5,700,000

Comparative cost information	
Overaasen with new tractor units (2No.) – not to be replace within the next 5 years	€480,000
Schmidt Unimog Snow Blower	€54,450
Mercedes Glycol Sweeper ASC 990	€350,900
Fuel Bowser	€45,000
De-icer Mini Gritter (3No.) 1 No. not to be replaced within the next 5 years	€60,000
De-icer Bunce Epoke Spreader	€125,000
WSP 6000ltrs Sprayer	€121,000
Hino Tipper Truck	€70,000
Mercedes Truck Sprayer De-icer	€50,250
Isuzu NPR 69 Kr Truck – not to be replaced within the next 5 years	€42,350
Incident control Room	€80,000
Dennis Fire Tender (2No.)	€338,800
Sides Fire Tender (3No.)	€1,000,000
Schmidt GRV	€260,150
Johnston Beam Sweeper C1 – not to be replaced within the next 5 years	€350,000
Johnston C201Compact sweeper	€70,200
Schmidt SK700 GRV	€164,000

Comparative cost information	
Paint machine – not to be replaced with the next 5 years	€260,000
Hoist	€22,000
Forklift (3No.) – 2No. - not to be replaced within the next 5 years	€25,000
Telehandle for winter operation – not to be replaced within the next 5 years	€50,000

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	0%
Contingency allowance:	A 10% allowance has been included to allow for specific equipment options (bespoke plough, fork, other options) which manufacturers will design specifically for the vehicle following discussion with the client.
Abnormal costs:	No additional abnormal costs have been included

€5,804,415 (EY/TPS estimate) v €5,700,000 (DAA estimate)	
Snow, Fire and Heavy vehicles	€5,277,650
	€5,277,650
Fees 0%	€0
	€5,277,650
Contingency 10%	€527,765
	€5,804,415
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.6.001 Runway 16/34 Pavement Rehabilitation

Information from CIP	
Cost included in CIP	€24,300,000 (€2.8m pre 2015)
▸ Runway reconstruction	8,000 m2
▸ Runway rehabilitation	124,000 m2
Contingency costs	14%/€2,670,000
Fee allowance	7.5%

Comparative cost information - cost/m2	
Reconstruction & Rehabilitation	
From previous projects	€110 - 450
From Davis Langdon & Everest (DL&E) Airport Cost Model	€90 - 190
Published price data	€95 - 180
Other sources	€200

The range of costs above can be narrowed down by our knowledge of similar projects at other airports. The cost of the new runway will be in the region of €450/m2 for runway reconstruction and €110/m2 for runway rehabilitation.

Assumptions made during the cost assessment:

The notes in the CIP make no reference to Airfield Ground Lighting (AGL), so none is included in this assessment hence the reduction in cost per m2 compared to CIP 6.055 and 6.017. Drainage works do not include work to the wider drainage system such as additional interceptors, tanks or manholes.

Runway reconstruction costs have been estimated on the basis that 700mm of pavement will be broken out and replaced with 500mm Dry Lean Concrete overlaid by 200mm Marshall Asphalt.

The runway rehabilitation has been estimated on the basis that 200mm will be planed off and 200mm of Marshall Asphalt will be inlaid.

Assumptions made during the cost assessment:

Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

DAA has used historical rates from a previous apron rehabilitation project to estimate the value of this project which is a reasonable method of establishing the cost. However, as this information was not available during the assessment, EY/TPS have carried out a full review using previous project costs and published information to provide an independent cost assessment.

The variance in cost estimates arises from the fact that a lower premium rate of 20% (versus 25% by DAA) has been used for night shifts, rehabilitation of secondary runway can be done by day and lower costs were quoted for drainage and line markings. We have not included an allowance for AGL works.

€21,566,000 (EY/TPS estimate) v €24,300,000 (DAA estimate)	
Runway Reconstruction	€3,600,000
Runway Rehabilitation	€13,640,000
Drainage	€330,000
Reinstate markings	€121,000
	€17,691,000
Fees 6%	€1,062,000
	€18,753,000
Contingency 15%	€2,813,000
	€21,566,000

Our assessment suggests that the cost in the CIP is higher than would be expected.

CIP reference: 15.6.002 Apron Rehabilitation

Information from CIP	
Cost included in CIP	€21,000,000
Functional units	
▸ Apron replacement	84,000 m2
Cost per m2 (including fees and contingency)	€250 m2
Contingency costs	12%/€2,112,000
Fee allowance	7%

Comparative cost information - cost/m2	
From previous projects	€230
From DL&E Airport Cost Model	€95-190
Published price data	€95-185
Other sources	€200
The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of the new aprons will be in the region €180/m2	

Assumptions made during the cost assessment:
CIP refers to reinstatement of Airfield Ground Lighting (AGL) – assessment includes working around AGL, not any new AGL.
This estimate is based on 450mm Pavement Quality Concrete (PQC) over 150mm Dry Lean Concrete for a Code E stand and 350mm PQC over 150mm Dry Lean Concrete for a Code C stand.
Service rates include provision for reconfiguration and diversion of services associated with minor stand reconfiguration.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

€22,305,000 (EY/TPS estimate) v €21,000,000 (DAA estimate)	
Apron replacement	€15,120,000
Underground services	€3,000,000
Reinstatement of AGL	€150,000
Reinstate markings	€25,000
	€18,295,000
Fees 6%	€1,100,000
	€19,395,000
Contingency 15%	€2,910,000
	€22,305,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.6.004 Airfield Lighting Upgrade (Runway 10-28)

Information from CIP	
Cost included in CIP	€9,100,000
Functional unit:	
► Trenching	10km
► Duct and cable	75km
► Manholes	300
Cost per m2 (including fees and contingency)	n/a
Contingency costs	14%/€1,055,000
Fee allowance	7%

Comparative cost information - costs as stated	
The approach lights for Runway 10 will be inset and lights on Runway 28 will be elevated only. The price for the approach light includes lights fittings couplings, transformers, base plates and ADB (labour).	
► Inset approach lights	€10,900
► Elevated approach lights	€71,400
► Inset supplement approach lights	€54,500
► Elevated sup approach lights	€49,600
For the 381 No. elevated lights a 1500mmx1500mmx1000mm concrete base will be required.	
450 No. LED lights for the taxiway	

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.
As part of the this CIP assessment it has been assumed that part of the approach lights can be installed on day shift and the rate we have selected allows for this mix of night and day shift installation. This adjustment would account for the difference in estimates.	

€8,325,000 (EY/TPS estimate) v €9,100,000 (DAA estimate)	
Lights	€425,000
Trenching	€750,000
Ducts	€750,000
Cables	€900,000
Mast	€250,000
Manhole/access chambers	€1,254,000
Labour	€2,500,000
	€6,829,000
Fees 6%	€410,000
	€7,239,000
Contingency 15%	€1,086,000
	€8,325,000
Our assessment suggests that the cost in the CIP is of the right magnitude	

CIP reference: 15.6.006 Airfield and Apron Roads

Information from CIP	
Cost included in CIP	€1,700,000
Functional units	
▸ Apron/perimiter road replacement	8,000 m2
Cost per m2 (including fees and contingency)	€212.50 m2
Contingency costs	15%/€199,000
Fee allowance	7%

Comparative cost information - cost/m2	
From previous projects	€180
From DL&E Airport Cost Model	€260 - 330
Published price data	€160 – 200
From previous projects – 40mm SMA + 160mm DBM	€160
From previous projects – 300 PQC + 150 Dry Lean Concrete (DLC)	€140
From previous projects – 40mm SMA + 160 DBM + 500mm Crushed stones	€240

The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of the new roads will be in the region of €170/m2.

Assumptions made during the cost assessment:

CIP Project sheet refers to 8,000 m2 of apron and perimeter road rehabilitation and this is what our assessment is based on. It should be noted that the detailed build up to the CIP total includes only 7,010 m2.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	No change has been made to the CIP allowance
Abnormal costs:	No additional abnormal costs have been included

€1,669,800 (EY/TPS estimate) v €1,700,000 (DAA estimate)	
New roads	€1,360,000
Pavement inspection	€9,500
	€1,370,000
Fees 6%	€82,000
	€1,452,000
Contingency 15%	€217,800
	€1,669,800

Our assessment suggests that the cost in the CIP is of the right magnitude.

CIP reference: 15.6.009 Taxiway Airfield Ground Lighting (AGL) Upgrade

Information from CIP	
Cost included in CIP	€3,900,000
Functional unit	
► Taxiway centreline lights	400 No.
► Cabling	50km
► Ducting	25km
Cost per light (including fees and contingency)	€9,750
Contingency costs	20%/€600,000
Fee allowance	7%

Assumptions made during the cost assessment:
There are 400 No. lights and for costing purposes it is estimated that 15m secondary cable is required per light.
The length of earth cable is estimated at 25% of the primary cable length
The length of trench is estimated to be 50% of the ducting length, about 12.5km.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

€3,620,000 (EY/TPS estimate) v €3,900,000 (DAA estimate)	
Lights	€215,000
Trenching	€875,000
Ducting	€250,000
Cabling	€600,000
Connection kit	€34,000
CCRs	€203,000
Manhole/access chambers	€814,000
	€2,991,000
Fees 6%	€179,500
	€3,170,500
Contingency 15%	€445,500
	€3,620,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.6.017 Runway 10-28 Overlay

Information from CIP	
Cost included in CIP	€22,300,000 (€0.3m pre 2015)
Functional unit	
► Overlay runway	177,000 m2
Cost per m2 (including fees and contingency)	€131 m2
Contingency costs	10%/€1,920,000
Fee allowance	5.5%

Comparative cost information - cost/m2	
From previous projects	€70
From DL&E Airports Cost Model	€95 - 200
Published price data	€100 - 190
Other Sources	€130 - 170
	€135 – 150

The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of the rehabilitated runway will be in the region of €130/m2.

Assumptions made during the cost assessment:
Assessment excludes any replacement slabs.
The assessment includes 50mm planning out , 200mm nominal Marshall Asphalt overlay and grooving of the new surface.
This project counts 7,000m of pavement edge. 40% of the length may need drainage replacement with 500mm diameter slot drain, 10 No. catchpits and outlets plus contingency for outlet pipes.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

A higher rate compared to CIP project 15.6.001 and 15.6.055 has been used for overlay of the main runway to reflect lower productivity resulting from access being more constrained than for the secondary runway.

€29,555,000 (EY/TPS estimate) v €22,300,000 (DAA estimate)	
Runway overlay	€23,010,000
Drainage replacement	€320,000
Reinstatement of AGL	€800,000
Reinstate markings	€115,000
	€24,245,000
Abnormal costs allowance	€0
	€24,245,000
Fees 6%	€1,455,000
	€25,700,000
Contingency 15%	€3,855,000
	€29,555,000

Our assessment suggests that the cost in the CIP is lower than would be expected.

CIP reference: 15.6.055 Airfield Taxiway Rehabilitation

Information from CIP	
Cost included in CIP	€16,000,000 (€2m pre 2015)
Functional units	
▸ Rehabilitated taxiways	70,200 m2
Cost per m2 (including fees and contingency)	€230 m2
Contingency costs	13%/€1,680,000
Fee allowance	5.5%

Comparative cost information - cost/m2	
From previous projects	€70
From DL&E Airport Cost Model	€95 – 200
Published price data	€100 – 190
Other sources	€130 - 170
	€135 - 150

The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of the rehabilitated taxiways will be in the region of €140/m2.

Assumptions made during the cost assessment:

Survey (for 90,000m2) is estimated for night work at €3,000/week/surveyor + 10% expenses for 3.5 weeks.

The pavement is for Code E trafficked for 450mm PQC (Pavement Quality Concrete) and 150mm Dry Lean Concrete.

An allowance for drainage is required. A provision for 900m of 400mm Dia. slot drain with 7 No. of catch-pits and outlets.

Assessment includes AGL (Airfield Ground Lighting) costs of 50% of complete new installation to allow for rehabilitation of critical AGL – Estimate 70 No. lights with 2.000m of cabling.

Assumptions made during the cost assessment:

Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

As the method of construction for a taxiway is different compared to pavement rehabilitation (6.001) and runway overlay (6.017), it requires a different rate. The taxiway rate is higher because the rehabilitation of taxiway requires more material per m2 and the construction costs are higher because less linear work results in lower productivity rates.

The variance in costs arises from higher unit costs used by DAA for AGL and pavements works.

€12,548,000 (EY/TPS estimate) v €16,000,000 (DAA estimate)	
Taxiway rehabilitation	€9,828,000
Survey	€25,000
Pavement evaluation	€12,500
Temporary work	€200,000
Reinstatement of critical AGL	€120,000
Drainage	€98,000
Reinstate markings	€10,000
	€10,294,000
Fees 6%	€617,000
	€10,911,000
Contingency 15%	€1,637,000
	€12,548,000

Our assessment suggests that the cost in the CIP is higher than would be expected.

CIP reference: 15.9.022 Airfield Pollution Control

Information from CIP	
Cost included in CIP	€20,000,000
Functional unit	
► Underground storage tanks	63,000 m3
► Glycol tanks	50 m3
Cost per m3 (including fees and contingency)	€317 m3
Contingency costs	15%/€2,436,000
Fee allowance	7%

Comparative cost information – previous projects cost	
Underground Tanks	€210 m3
Pipework 300mm: 600mm	€60 m; €80m
Pipe jacking 300mm: 600mm	€760m; €920m
Penstocks, chambers and controls (complete)	€110,000 each
Manholes	€5,700 each

Assumptions made during the cost assessment:.	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	No change has been made to the CIP allowance
Abnormal costs:	No additional abnormal costs have been included
The main difference is down to pipework and pipejacking. As there is no length advised the proposed pipe length from the previous CIP has been used.	

€22,450,000 (EY/TPS estimate) v €20,000,000 (DAA estimate)	
Tanks	€13,230,000
Pipework	€294,000
Pipe jacking	€3,528,000
Penstocks, chambers and controls	€1,100,000
Manholes	€268,000
	€18,420,000
Fees 6%	€1,100,000
	€19,520,000
Contingency 15%	€3,930,000
	€22,450,000
Our assessment suggests that the cost in the CIP is lower than would be expected.	

CIP reference: 15.3.001 Landside Infrastructure Utilities

Information from CIP	
Cost included in CIP	€4,600,000
Contingency costs	15%/€544,577
Fee allowance	7.5%

Comparative cost information	
HVAC MTHW	€300m2
CHP 3 (2.7Mw)/Boiler (5Mw + 7.5Mw)	€2,545,000
Sustainable Energy projects	€800,000

Additional data within the Project data sheet	
Due to the early stages of design there has been insufficient information within the CIP to establish the area (m2) for this specific project. The allowance included within the CIP for HVAC and MTHW works would facilitate works to an area of circa 900m2.	900m2
Due to the lack of information within the CIP relating to the Energy Projects, (this element is still under assessment) the allowance within the CIP has been included in the cost analysis.	€800,000

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Fee allowance:	10% allowance has been included to account for the M&E (mechanical and electrical) design element and the building works design where alterations are required.
Contingency allowance:	No change has been made to the CIP allowance.
Abnormal costs:	An allowance for Airport restrictions of 10% has been included.

€5,034,000 (EY/TPS estimate) v €4,600,000 (DAA estimate)	
HVAC MTHW	€273,000
CHP 3 (2.7Mw)/Boiler (5Mw + 7.5Mw)	€2,545,000
Sustainable Energy projects	€800,000
	€3,618,000
Abnormal costs allowance	€362,000
	€3,980,000
Fees 10%	€398,000
	€4,378,000
Contingency 15%	€656,000
	€5,034,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.3.004 Landside Infrastructure Car Parks

Information from CIP	
Cost included in CIP	€4,500,000
Contingency costs	15%/€639,405
Fee allowance	7.5%

Comparative cost information	
Published price data – car park works	€102m2
Published price data – lighting works	€2,240 each
Specialist Dublin provider - car park equipment works	€12,000 average cost each

Additional data within the Project data sheet	
Car park repairs – electrical works	€50,000
Alterations to wiring	€150,000
Refurbishment to existing masts	€50,000
Reconfigure layouts/routes	€150,000

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Fee allowance:	A 10% allowance has been included to account for the M&E design element and the building works required
Contingency allowance:	No change has been made to the CIP allowance
Abnormal costs:	No additional abnormal costs have been included

The primary difference between the EY/TPS assessment and the DAA estimate is the value of the car park equipment. Based on the details submitted within the CIP two Dublin suppliers provided quotes which form the basis of the DAA's assessment. The variance in equipment costs is greater than €1.1m.

€2,687,000 (EY/TPS estimate) v €4,500,000 (DAA estimate)	
Car park works	€511,000
Lighting works	€449,000
Car park equipment works	€1,292,000
	€2,252,000
Fees 10%	€85,000
	€2,337,000
Contingency 15%	€350,000
	€2,687,000

Our assessment suggests that the cost in the CIP is higher than would be expected.

CIP reference: 15.3.035 Landside Infrastructure External Roads

Information from CIP	
Cost included in CIP	€2,000,000
Functional unit	22,500 m
Cost per m2 (including fees and contingency)	€89 m2
Contingency costs	13%/€212,875
Fee allowance	7.5%

Comparative cost information - cost/m2	
Published price data – full depth construction	€215
Published price data – overlay	€28

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Fee allowance:	A 5% fee allowance has been included as there is limited design input required
Contingency allowance:	A 10% allowance has been included. This equates to circa 50% additional overlay works or 13% full depth construction works
Abnormal costs:	No additional abnormal costs have been included

€2,362,000 (EY/TPS estimate) v €2,000,000 (DAA estimate)	
Full depth reconstruction	€1,620,000
Overlay	€425,000
	€2,045,000
Fees 5%	€102,000
	€2,147,000
Contingency 10%	€215,000
	€2,362,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.4.002 Light Vehicle Fleet (1 of 2)

Information from CIP	
Cost included in CIP	€2,200,000

Manufacturer	Model	Min (€)	No.	Min (€)
Citroen	Berlingo (Not replaced within 5 years)	€30,250	1	€30,250
Dacia	Duster (Not replaced within 5 years)	€19,965	1	€19,965
Fiat	Ducato (2 No. not replaced within 5 years)	€20,000	13	€260,000
Fiat	Doblo (1 No. not replaced within 5 years)	€18,150	12	€217,800
Ford	Transit (3 No. not replaced within 5 years)	€30,250	5	€151,250
Ford	Ranger (2 No. not replaced within 5 years)	€38,720	5	€193,600
Ford	Connect (1 No. not replaced within 5 years)	€38,720	3	€116,160
Ford	S	€27,830	1	€27,830
Isuzu	D-Max	€35,000	1	€35,000
Landrover	Defender (Not replaced within 5 years)	€80,000	1	€80,000
Landrover	Discovery (Not replaced within 5 years)	€87,120	1	€87,120
Mercedes	Vito	€38,720	2	€77,440
Mercedes	Viano (2 No. not replaced within 5 years)	€48,400	3	€145,200

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	No change has been made to the CIP allowance
Contingency allowance:	A 10% allowance has been included. The 10% contingency allow for specific equipment options (roof mounts, floodlights, retro reflective decals, toe bars, specialist equipment installation) which manufacturers will design specifically for the vehicle after discussion with the client. This accounts for the variance in costs.
Abnormal costs:	No additional abnormal costs have been included

Manufacturer	Model	Min (€)	No.	Min (€)
Mitsubishi	L200 (2 No. not replaced within 5 years, 7 No. replaced twice)	€30,250	13	€393,250
Mitsubishi	Pajero (2 No. replaced twice)	€40,000	3	€105,000
Mitsubishi	Outlander	€36,300	4	€145,200
Opel	Zafira	€25,000	1	€25,000
Renault	Tipper (Not replaced within 5 years)	€48,400	1	€48,400
Renault	Kangoo (5 No. not replaced within 5 years)	€24,200	18	€435,600
Renault	Master	€44,770	1	€44,770
Skoda	Octavia	€24,200	1	€24,200
Toyota	Landcruiser	€84,700	1	€84,700
Toyota	Hiace	€35,000	2	€70,000
Toyota	Dyna	€20,570	1	€20,570

CIP reference: 15.4.002 Light Vehicle Fleet (2 of 2)

Information from CIP	
Cost included in CIP	€2,200,000

€2,547,560 (EY/TPS estimate) v €2,200,000 (DAA estimate)	
Light fleet vehicles	€2,315,960
	€2,315,960
Fees 0%	€0
	€2,315,960
Contingency 10%	€231,596
	€2,547,560
Our assessment suggests that the cost in the CIP is lower than would be expected.	

CIP reference: 15.4.005 T1 Baggage Reconciliation System

Information from CIP	
Cost included in CIP	€1,100,000
Contingency costs	11%/€118,000
Fee allowance	7%

Comparative cost information	
Handhelds	€2,000
Screens	€40,000
Service upgrade	€50,000
Software changes and development	€200,000
WIFI coverage	€125,000
BHS interface	€390,000

Additional data:

Our high level review indicates that hardware costs are appropriate. In comparison the associated costs for the software development and BHS interface are considerable, but the extent is unquantified. As such the CIP allowances of €200,000 and €390,000 cannot be objectively assessed and are included in this assessment at the same rate.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 10% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

€1,170,100 (EY/TPS estimate) v €1,110,000 (DAA estimate)	
Handhelds	€80,000
Screens	€80,000
Service upgrade	€50,000
Software changes and development	€200,000
BHS interface	€390,000
WIFI coverage	€125,000
	€925,000
Fees 10%	€92,500
	€1,017,500
Contingency 15%	€152,600
	€1,170,100
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.4.006 T1 Critical Equipment Upgrades

Information from CIP	
Cost included in CIP	€6,000,000
Contingency costs	12%/€733,005
Fee allowance	5%

Comparative cost information	
Replacement of emergency lighting	€40
Replacement of fire alarm devices	€275 each
Replacement of secondary cable to FA	€82 each
Replacement of fire and smoke dampers	€100,000
Engine for baggage PLC (Programmable Logic Controller) system	€4,500 unit

Assumptions made during the cost assessment
Goods lift assumed to be 2,000kg capacity
Assumed 380 No. engines for 8 No. bays and 285 No. engines for 6 No. bays

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included
The variance in cost estimation is mainly accounted for by the higher cost of the PLC system.	

€7,967,000 (EY/TPS estimate) v €6,000,000 (DAA estimate)	
Replacement of emergency lighting	€1,650,000
Replacement of fire alarm devices	€550,000
Replacement of fire and smoke dampers	€100,000
Replacement of secondary cable to fire alarm	€575,000
Lifts	€660,000
Baggage PLC system	€3,000,000
	€6,535,000
Fees 6%	€392,000
	€6,927,000
Contingency 15%	€1,040,000
	€7,967,000
Our assessment suggests that the cost in the CIP is lower than would be expected.	

CIP reference: 15.7.102 T1 Roof Upgrades

Information from CIP	
Cost included in CIP	€7,900,000
Functional unit – roof covering	23,496 m2
Cost per m2 (including fees and contingency)	€335 m2
Contingency costs	15%/€971,851
Fee allowance	5%

Comparative cost information - cost/m2	
Published price data – roof membrane and structure	€204 - 277

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 15% allowance has been included. This is to cover all survey works and additional inspections during the works.
Contingency allowance:	A 10% allowance has been included. Based on the survey work already carried out no more than 10% additional works should be added to the scope of works.
Abnormal costs:	An allowance for Airport restrictions of 10% has been included.

€7,772,000 (EY/TPS estimate) v €7,900,000 (DAA estimate)	
Replace roof coverings – all areas	€5,585,000
	€5,585,000
Abnormal costs allowance	€588,000
	€6,143,000
Fees 15%	€922,000
	€7,065,000
Contingency 10%	€707,000
	€7,772,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.7.104 HVAC/BMS Roof Upgrades and Replacement T1

Information from CIP	
Cost included in CIP	€7,400,000
Functional unit	10,744m2
Cost per m2 (including fees and contingency)	€689 m2
Contingency costs	10%/€637,505
Fee allowance	5%

Comparative cost information - cost/m2	
Pier 2	€191 - 375
	€159 - 312
Pier 3	€159 - 312
BMS and alteration	€90

Additional data within the Project data sheet	
Fire alarm system alterations	€150,000

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP Project data sheet
Fee allowance:	A 10% allowance has been included. This is to cover all M&E (mechanical and electrical) design works as well as architectural works.
Contingency allowance:	A 15% allowance has been included. Due to the refurbishment works the contingency has been increased.
Abnormal costs:	An allowance for Airport restrictions of 10% has been included.

The variance between the EY/TPS assessment and the DAA estimate is specific to the rate used for the HVAC system. The DAA have used an average of the tender returns from 2006 and adjusted this by 20%. They have used this figure for both new system and upgrading the existing. EY/TPS have separated the areas of works and developed a specific costs per m2 for each area using published price data.

€4,829,000 (EY/TPS estimate) v €7,400,000 (DAA estimate)	
Pier 2	€1,300,000
Pier 3	€1,215,000
BMS and alteration	€950,000
	€3,465,000
Abnormal costs allowance 10%	€350,000
	€3,815,000
Fees 10%	€574,000
	€4,389,000
Contingency 15%	€440,000
	€4,829,000

Our assessment suggests that the cost in the CIP is higher than would be expected.

CIP reference: 15.2.017 Consolidated Staff Car Park

Information from CIP	
Cost included in CIP	€1,500,000
Functional unit – Number of car spaces	2,000
Cost per m2 (including fees and contingency)	€750 m2
Contingency costs	0%/€0
Fee allowance	0%

Comparative cost information - cost/m2	
Published price data	€1,192 -2,100
Cost build up using published price data	€749
The range of costs above can be narrowed down by our knowledge of the project at other airports and locations. Due to the level of work required, traditional costs per car space are based on a higher level of works than is required here. Therefore, relevant elements of these costs were taken to build up a suitable cost comparison.	

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Fee allowance:	A 5% allowance has been included. This is to allow for the redesign of the proposed location, M&E works and bus shelter design.
Contingency allowance:	A 5% allowance has been included. It is prudent to have an allocation of contingency on all construction works to account for unknown items (e.g., ground conditions).
Abnormal costs:	No additional abnormal costs have been included

€1,645,000 (EY/TPS estimate) v €1,500,000 (DAA estimate)	
2,000 car spaces	€1,500,000
	€1,500,000
Fees 5%	€75,000
	€1,575,000
Contingency 5%	€79,000
	€1,654,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.4.003 T2 HBS Standard 3

Information from CIP	
Cost included in CIP	€13,000,000
Contingency costs	20%/€2,000,000
Fee allowance	8%

Comparative cost information – cost	
Mechanical conveyors return tray	€150,000 unit
Standard 3 EDS Screening Machines	€1,200,000

Assumptions made during the cost assessment

Extent of construction/structural works to allow for new larger and heavier machines is undefined. As such the allowance in the CIP of €1m cannot be objectively assessed and is included in this assessment at the same rate:

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	Allowances of 12% of construction and 6% for machines have been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

€12,260,000 (EY/TPS estimate) v €13,000,000 (DAA estimate)	
HBS Machines	€6, 000,000
Mechanical Conveyors	€3,000,000
Construction/structural works	€1,000,000
	€10,000,000
Fees of 12% for construction and 6% on the machines	€660,000
	€10,660,000
Contingency 15%	€1,600,000
	€12,260,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.4.004 Central Search Area – New Technologies

Information from CIP	
Cost included in CIP	€11,600,000
Functional unit	3,375 m2
Cost per m2 (including fees and contingency)	€3,340 m2
Contingency costs	10%/€988,000
Fee allowance	7%

Comparative cost information – other items	
Automated lanes	€130,000
LAGS Equipment type C	€75,000
LAGS Equipment Type B	€57,000
Explosive trace Detection	€55,000
Digital Signage	€40,000
Networking	
Socket	€75
Layer Switch (1 unit for 24 sockets)	€3,000
Access Point (1 unit for 300m2)	€360

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.

€11,142,000 (EY/TPS estimate) v €11,600,000 (DAA estimate)	
Automated lanes	€4,160,000
LAGS Equipment	€2,860,000
ETD	€1,100,000
Digital Signage	€800,000
Networking	€450,000
	€9,370,000
Abnormal costs allowance	€0
	€9,370,000
Fees 6%	€562,200
	€9,932,200
Contingency 15%	€1,489,800
	€11,142,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.6.007 Airfield Infrastructure Upgrades for New Large Aircraft

Information from CIP	
Cost included in CIP	€1,500,000
Functional unit	
- Taxiway fillets	3,000 m2
Cost per m2 (including fees and contingency)	€500 m2
Contingency costs	13%/€159,000
Fee allowance	7%

Comparative cost information - cost/m2	
From previous projects	€230
From DL&E Airports Cost Model	€95 - 190
Published price data	€95 – 180
Other Sources	€200
The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of the new aprons will be in the region of €380/m2.	

Assumptions made during the cost assessment
Typical costs of €380/m2 will need to be adjusted given that this work will be carried out in very small quantities at different locations. The premium for this could be in the region of 25%.
There is also a requirement for temporary works to be carried out at night, allowing movement on the runway from 06.00 to 23.00.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.

€1,585,000 (EY/TPS estimate) v €1,500,000 (DAA estimate)	
New Taxiway fillets	€1,140,000
Drainage	€85,000
AGL, signs and electrical manholes	€30,000
Temporary work	€45,000
	€1,300,000
Fees 6%	€78,000
	€1,378,000
Contingency 15%	€207,000
	€1,585,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.6.021 Cargo Gate Redevelopment

Information from CIP	
Cost included in CIP	€1,800,000
Contingency costs	15%/€217,000
Fee allowance	7%

Comparative cost information - cost/m2	
New staff facilities building	€1,650
New roads/lanes	€220
Canopies	€275
New Barriers	€11,000 – 16,000

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	12% allowance has been included.
Contingency allowance:	No change has been made to the CIP allowance.
Abnormal costs:	No additional abnormal costs have been included.

€1,712,000 (EY/TPS estimate) v €1,800,000 (DAA estimate)	
Demolition	€30,000
New staff facilities building	€495,000
New roads/lanes	€162,000
Canopies	€187,000
New barriers	€30,000
Alterations to fencing, barriers and islands	€100,000
Temporary Security Accommodation	€75,000
Phased Construction	€250,000
	€1,329,000
Fees 12%	€150,000
	€1,489,000
Contingency 15%	€223,000
	€1,712,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.6.022 Airport Screening Centre

Information from CIP	
Cost included in CIP	€750,000
Functional unit	2 cargo screening lines
Contingency costs	15%/€87,000
Fee allowance	7%

Comparative cost information - cost	
Loading bay/screening area alterations	€250
New toilet/office accommodation	€500
Cargo screening equipment	€270,000 unit

Additional data within the Project data sheet
Cost/m2 for loading bay/screening alterations has been included at a nominal €250/m2.
Cost/m2 for new toilet/office accommodation has been included at a nominal €500/m2.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	No change has been made to the CIP allowance.
Abnormal costs:	No additional abnormal costs have been included.
EY/TPS have assumed a lower cost for the cargo screening equipment. This accounts for the variance in estimates.	

€862,000 (EY/TPS estimate) v €750,000 (DAA estimate)	
Loading bay/screening area alterations	€137,500
New toilet/office accommodation	€30,000
New screening equipment	€540,000
	€707,500
Fees 6%	€42,500
	€750,000
Contingency 15%	€112,000
	€862,000
Our assessment suggests that the cost in the CIP is lower than would be expected.	

CIP reference: 15.6.023 New Apron Development 300R

Information from CIP	
Cost included in CIP	€8,200,000
Functional unit – new apron	28,585 m2
Cost per m2 (including fees and contingency)	€287 m2
Contingency costs	11%/€759,000
Fee allowance	7%

Comparative cost information - cost/m2	
From previous projects	€230
From DL&E Airports Cost Model	€95 - 190
Published price data	€95 - 185
Other Sources	€200

The range of costs above can be narrowed down by our knowledge of projects at other airports. The cost of the new aprons will be in the region €200/m2.

Additional data within the Project data sheet

Survey (for 40,000m2) is estimated for night work at €3,000/week/surveyor + 10% expenses for 1.5 weeks

The pavement is for Code E trafficked (Taxiways) with an allowance for 450mm PQC and 150mm Dry Lean Concrete and with an allowance for Code C stands for 350mm PQC and 150mm Dry Lean Concrete. The work will be executed by nights.

Allowance for drainage is required. A provision made for 700m of 400mm diameter slot drain with 5 No. of catchpit and outlets.

For the AGL it can be estimated that 50 No. lights with 200m of cabling will be required with 7 pits 600x600.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.

The access to Apron 300R is more constrained than to Apron 5G (6.047), which leads to lower productivity and a higher unit rate.

€7,470,000 (EY/TPS estimate) v €8,200,000 (DAA estimate)	
New Apron	€5,720,000
AGL	€70,000
Drainage	€55,000
Power/lighting per stand	€250,000
New markings	€30,000
	€6,125,000
Fees 6%	€370,000
	€6,495,000
Contingency 15%	€975,000
	€7,470,000

Our assessment suggests that the cost in the CIP is of the right magnitude..

CIP reference: 15.6.047 Apron Development 5G

Information from CIP	
Cost included in CIP	€18,200,000
Functional unit	
- Aircraft parking	66,160m2
Cost per m2 (including fees and contingency)	€275 m2
Contingency costs	12%/€1,893,000
Fee allowance	7%

Comparative cost information - cost/m2	
From previous projects	€230
From DL&E Airports Cost Model	€95 - 190
Published price data	€95 - 180
Other Sources	€200

The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of the new aprons will be in the region of €180/m2 .

Additional data within the Project data sheet

It can be estimated that an allowance of €1,000 per stand of paint marking will be required and a allowance of €10,000 for the taxiway.

This estimate is based on:

i. 450mm PQC over 150mm Dry Lean Concrete for a Code E stand

ii. 400mm PQC over 150mm Dry Lean Concrete for a Code D stand

iii. 350mm PQC over 150mm Dry Lean Concrete for a Code C stand

An allowance for drainage of €500,000 is required for this project.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.

The difference in cost per m2 between 6.047 and 6.023 (Apron 300) is due to higher productivity levels on the Apron development 5G works because access to this area is less constrained compared to the Apron 300, which in turn results in the lower rate/m2.

TPS have not allowed for 6.5 % inflation which the DAA have included. From previous project data TPS estimated the pavement (services included) at €210/m2 against €244/m2 by DAA.

€16,140,000 (EY/TPS estimate) v €18,200,000 (DAA estimate)	
New aircraft parking	€11,910,000
AGL	€600,000
Power/lighting	€650,000
Drainage	€500,000
Markings	€50,000
	€13,210,000
Fees 6%	€825,000
	€14,035,000
Contingency 15%	€2,105,000
	€16,140,000

Our assessment suggests that the cost in the CIP is higher than would be expected.

CIP reference: 15.7.103 Fixed Electrical Ground Power T1

Information from CIP	
Cost included in CIP	€1,500,000
Functional unit	
- 400 Hz FEGP Units	17 No.
Cost each (including fees and contingency)	€88,200
Contingency costs	13%/€166,000
Fee allowance	7%

Comparative cost information	
Unit only (supplied and installed) with a 24m 'Crocodile' connector	€50,000
Switch gear	€40,000
Barriers	€480
Billing system	€96,000

Assumptions made during the cost assessment

Answers to queries referred to a budget of €1.45m for Pier 2 and €1.4m for Pier 3. Assuming these budgets were prepared in the same way as for Pier 1, we would expect our assessment to be marginally less than these figures.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.

€1,579,000 (EY/TPS estimate) v €1,500,000 (DAA estimate)	
Unit and connector	€816,000
Builders' work in connection with installation	€150,000
Switch gear	€160,000
Barriers	€48,000
Billing system	€96,000
Installation	€25,000
	€1,295,000
Fees 6%	€78,000
	€1, 373,000
Contingency 15%	€206,000
	€1,579,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.7.116 Pier 3 Flexibility

Information from CIP	
Cost included in CIP	€15,000,000
Contingency costs	17%/€2,49,000
Fee allowance	8%

Comparative cost information	
Refurbishment of a pier area and creation of a node with fixed link and triple airbridge to handle an A380 stand.	€6,650,000
Refurbishment of a pier	€450 m2 – 930 m2
Airbridge (6 No.)	€600,000
Node building	€500,000
Fixed link (3 No. On multiple storey)	€150,000
Baggage reclaim belt	€200,000
External work (demolition – façade – stand reconfiguration (HoS kit)	€2,000,000

Assumptions made during the cost assessment
The refurbishment of 1,230 m2 is estimated at €800/m2.
Node, airbridges and fixed links are new purchase

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.
The main difference is the estimation for the airbridge and pier refurbishment.	

€10,545,000 (EY/TPS estimate) v €15,000,000 (DAA estimate)	
Refurbishment	€1,600,000
Airbridge, node and fixed link	€4,850,000
Baggage reclaim	€200,000
External work	€2,000,000
	€8,650,000
Fees 6%	€520,000
	€9,170,000
Contingency 15%	€1,375,000
	€10,545,000
Our assessment suggests that the cost in the CIP is higher than would be expected.	

CIP reference: 15.7.117 Transfers Facility

Information from CIP	
Cost included in CIP	€21,500,000
Functional unit – Transfer Facility	5,184 m2
Cost per m2 (including fees and contingency)	€4,150 m2
Contingency costs	20%/€2,923,000
Fee allowance	10%

Comparative cost information - cost/m2	
Refurbishment	€450 - 930
New Build	€2,200 - 2,700
Given the piecemeal nature of these works it is likely that the costs will be at the top of the range of the figures above. We have used €900/m2 for refurbishment and €2,700/m2 for new build in this assessment.	

Comparative cost information – other items	
Automated lanes	€130,000
LAGS Equipment type C	€75,000
LAGS Equipment Type B	€57,000
Explosive trace Detection	€43,000
Networking	
Socket	€75
Layer Switch (1 unit for 24 sockets)	€3,000
Access Point (1 unit for 300m2)	€360

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.

CIP refers to overall area of 5,184 m2. Response to query TPS 045 referred to 536m2 refurbishment and 3,737 m2 new build. For this assessment we have used 536m2 refurbishment and 5,184 less 536 = 4,648m2 new build.

The allowance allocated for equipment is lower (price for automated lanes, networking and boarding card check gate were lower than in the CIP). Professional fees and contingency allowances are also reduced compared with the CIP.

€18,690,000 (EY/TPS estimate) v €21,500,000 (DAA estimate)	
Refurbishment	€482,000
New build	€12,550,000
Equipment	€2,300,000
	€15,332,000
Fees 6%	€920,000
	€16,252,000
Contingency 15%	€2,438,000
	€18,690,000
Our assessment suggests that the cost in the CIP is higher than would be expected.	

CIP reference: 15.7.119 T1 Façade Works

Information from CIP	
Cost included in CIP	€670,000
Functional unit – Façade works	1,600 m2
Cost per m2 (including fees and contingency)	€394 m2
Contingency costs	20%/€100,725
Fee allowance	8%

Comparative cost information	
Published price data - Fins	€277
Published price data - Louvres	€284
Published price data -Metal work	€51

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet.
Fee allowance:	10% allowance has been included. This is to allow for the additional design work required in the refurbishment works as limited or no survey work has been carried out.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	An allowance for Airport restrictions of 10% has been included.

EY/TPS have assumed a lower rate to paint the fins. This has resulted in a lower cost estimate even though the EY/TPS estimate includes a structural survey, which DAA have not included.

€510,700 (EY/TPS estimate) v €670,000 (DAA estimate)	
Façade works	€367,000
	€367,000
Abnormal costs allowance 10%	€36,700
	€403,700
Fees 10%	€40,400
	€444,100
Contingency 15%	€66,600
	€510,700

Our assessment suggests that the cost in the CIP is higher than would be expected.

CIP reference: 15.7.120 T2 Bus Lounge Facilities

Information from CIP	
Cost included in CIP	€13,300,000
Functional unit	2,500 m2
Cost per m2 (including fees and contingency)	€4,877 m2
Contingency costs	20%/€2,211,714
Fee allowance	10%

Comparative cost information	
Published price data – bus station	€840 – 1,800
High quality office	€1,500 – 1,850

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet.
Fee allowance:	No change has been made to the CIP allowance.
Contingency allowance:	15% allowance has been included. This is a reduction on the DAA allowance. As airport working restrictions are covered elsewhere and the construction of the proposed facility is of relatively low complexity the contingency could be reduced.
Abnormal costs:	An allowance for Airport restrictions of 10% has been included.

EY/TPS have assumed a lower rate than DAA for structural works. This accounts for the cost variance.

€12,003,000 (EY/TPS estimate) v €13,300,000 (DAA estimate)	
Enabling works	€426,000
New structure	€6,703,000
Fit-out	€873,000
External works	€278,000
Section 48 contribution	€345,000
	€8,625,000
Abnormal costs allowance 10%	€863,000
	€9,488,000
Fees 10%	€949,000
	€10,437,000
Contingency 15%	€1,566,000
	€12,003,000

Our assessment suggests that the cost in the CIP is higher than would be expected.

CIP reference: 15.7.121 T1 Arrivals

Information from CIP	
Cost included in CIP	€8,900,000
Functional unit	3,169 m2
Cost per m2 (including fees and contingency)	€2,808 m2
Contingency costs	15%/€1,302,571
Fee allowance	10%

Comparative cost information - cost/m2	
From Bruce Shaw	€1,300 – 1,600
Published price data	€1,200 – 2,650
The range of costs above can be narrowed down to the higher end of the range by the information presented in the CIP and the nature and location of the work being carried out.	

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet.
Fee allowance:	15% allowance has been included. This is to account for variations in the specification due to nature of the works as this is an aesthetically important area.
Contingency allowance:	No change has been made to the CIP allowance.
Abnormal costs:	An allowance for Airport restrictions of 10% has been included.

€8,831,000 (EY/TPS estimate) v €8,900,000 (DAA estimate)	
Arrivals refurbishment	€6,070,000
	€6,070,000
Abnormal costs allowance	€911,000
	€6,981,000
Fees 10%	€698,000
	€7,679,000
Contingency 15%	€1,152,000
	€8,831,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.7.122 Pier 1 Enclosed Gate Rooms

Information from CIP	
Cost included in CIP	€1,100,000
Functional unit – Enclosed gates	2,250 m2
Cost per m2 (including fees and contingency)	€490 m2
Contingency costs	20%/€186,000
Fee allowance	10%

Comparative cost information - cost/m2	
From previous projects	€450

Assumptions made during the cost assessment
Refurbishment includes new partitions, doors, rails, finishes and amendments to M&E services
CIP excludes automated boarding card check in with turnstile, so this assessment does as well.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.

€1,220,000 (EY/TPS estimate) v €1,100,000 (DAA estimate)	
Refurbishment	€1,000,000
	€1,000,000
Fees 6%	€60,000
	€1,060,000
Contingency 15%	€160,000
	€1,220,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.5.002 Retail IT

Information from CIP	
Cost included in CIP	€1,550,000
Contingency costs	0%/€0
Fee allowance	0%

Comparative cost information

DAA unit prices for retail hardware and software were benchmarked against market prices.

In establishing costs for maintenance and upgrades for existing systems DAA's approach was based on current contractual prices known to them. As these could not be verified, DAA allowances have been included in the cost analysis.

Additional information

- EPOS unit cost (incl. hardware, peripherals, OS, configuration and installation) €6,000
- Combined professional fees for all project work was an estimated €200,000 (13% of project total).

Project assessment:

- DAA estimates for till replacement (incl. configuration and installation) are in line with market benchmarks and publicly available pricing.
- DAA estimates for the major components of this project are based on existing contracts and discussions with the existing provider. DAA has assumed that the existing provider will continue to provide development and maintenance services. No indication has been given if the DAA intend to perform contract reviews and procurement exercises to obtain future cost savings.
- No allowance has been made by DAA for contingency. A 15% allowance has been added to costs relating to professional fees to account for potential overruns in implementation, systems integration and project management, which have not been adequately considered.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP IT Investment 2015-2019
Contingency allowance:	15% in respect of professional fees
Abnormal costs:	No additional abnormal costs have been included

€1,580,000 (EY/TPS estimate) v €1,550,000 (DAA estimate)	
Hardware, software and maintenance	€1,350,000
Fees 13%	€200,000
	€1,550,000
Contingency (applied to fees only) 15%	€30,000
	€1,580,000

Our assessment suggests that the cost in the CIP is of the right magnitude.

CIP reference: 15.8.008 DAA Technology Operation and Lifecycle Management (1 of 2)

Information from CIP

Cost included in CIP	€15,800,000
Contingency costs	0%/€0
Fee allowance	0%

Comparative cost information

DAA prices were benchmarked against market prices from suppliers where sufficient technical specification was available.

Additional data within CIP IT Investment 2015-2019

- DAA's original CIP budget estimate was €15.8m. This was revised downwards to €15,208,200 by the DAA following the queries raised by EY/TPS during the course of this analysis.
- CIP IT Investment 2015-2019 broke down this project into 16 sub-projects ranging in cost from €50,000 to €50,000.
- Professional fees for all sub-projects combined were €2.1m or 13% of project costs.

Assumptions made during the cost assessment:

As certain sub-projects are at an early stage of the project cycle, detailed requirements have not yet been established. In these cases prices could not be benchmarked. However where assumptions were made by the DAA in establishing cost assessments these were validated.

The variance between the DAA estimate (as provided in the CIP IT Investment 2015-2019 document) and the EY/TPS assessment is accounted for by the contingency allowance added to cost relating to professional fees.

Assumptions made during the cost assessment:

Information received:	CIP project sheet, CIP IT Investment 2015-2019, responses to additional queries
Contingency allowance:	15% in respect of professional fees
Abnormal costs:	No additional abnormal costs have been included

Project assessment:

DAA pricing for professional fees and unit prices for hardware and software were found to be in line with market prices where detailed specifications were available allowing comparison. At this stage of project planning it is not unreasonable that specifications for some items are undetermined.

In establishing costs for ongoing projects (upgrades, maintenance, further development of existing initiatives), DAA's cost estimate was based on current contractual and software prices known to them. As this is a reasonable approach, DAA allowances have been included in the cost analysis.

Software licensing prices vary depending on agreements with providers. DAA prices are in range, however industry knowledge suggests that more cost-effective solutions may be found, e.g., Enrolment for Application Platform agreements and purchase of software assurance.

Where technical details were not available, DAA's approach to cost estimates was assessed and deemed to be reasonable.

No allowance has been made by DAA for contingency in budgeting for this project. Best practice dictates that 10-20% rate should be applied depending on degree of risk involved. This project consisted mainly of sub-projects relating to upgrades and maintenance of existing equipment, systems and software which are low-risk in nature. We are therefore disinclined to add further contingency in this regard. However, 15% contingency has been added to costs relating to professional fees to account for potential overruns in implementation, systems integration and project management, which have not been adequately considered.

CIP reference: 15.8.008 DAA Technology Operation and Lifecycle Management (2 of 2)

€15,519,000 (EY/TPS estimate) v €15,800,000 (DAA estimate)	
Hardware and software	€13,137,000
Fees 13%	€2,071,000
	€15,519,000
Contingency (applied to fees only) 15%	€311,000
	€15,519,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.8.009 DAA Business Systems Investment Plan

Information from CIP

Cost included in CIP	€15,600,000
Contingency costs	0%/€0
Fee allowance	0%

Comparative cost information

Manufacturers of airport technological equipment were contacted in order to verify DAA unit prices.

Additional data within CIP IT Investment 2015-2019

- CIP IT Investment 2015-2019 broke down this project into 25 sub-projects ranging in cost from €25,000 to €1.6m.
- Sub-projects range in complexity from the purchase of technological airport equipment to implementation of an airport-wide GIS system to allow for asset tracking.
- The combined total of professional fees for all project work was €4.97m or 32% of project costs.

Assumptions made during the cost assessment:

Information received:	CIP project sheet, CIP IT Investment 2015-2019, responses to queries raised.
Contingency allowance:	15% in respect of professional fees
Abnormal costs:	No additional abnormal costs have been included

Project assessment:

No allowance has been made by DAA for contingency in budgeting for this project. Best practice dictates that 10-20% rate should be applied depending on degree of risk involved. As the majority of cost components were established based on market prices we are disinclined to add contingency with respect to these. However, 15% contingency has been added to costs relating to professional fees to account for implementation, systems integration and project management, which have not been adequately considered.

Verified costs for airport specific technology found that DAA prices were in line with market prices.

Professional fees of 32% for this project are appropriate. This is due to the nature of planned activities in sub-projects which require a higher degree of systems integration other IT projects which are principally based on maintenance and upgrades.

Duplication was found between sub-project related to car parks and project 15.3.004 Landside Infrastructure Car Parks. The sub-project was therefore eliminated from the project cost assessment.

€16,071,000 (EY/TPS estimate) v €15,600,000 (DAA estimate)

Hardware and software	€10,352,000
Fees %	€4,973,000
	€15,325,000
Contingency 15% (for fees)	€746,000
	€16,071,000

Our assessment suggests that the cost in the CIP is of the right magnitude.

CIP reference: 15.8.009c Business Innovation Investment

Information from CIP

Cost included in CIP	€8,000,000
Contingency costs	0%/€0
Fee allowance	0%

Comparative cost information

Where applicable manufacturers of airport technology were contacted to benchmark DAA unit prices.

Additional information received from DAA

DAA provided cost breakdowns for five sub-projects planned for 2015-2016 totalling €1.75m. No information was provided to account for the remainder of the requested €8m.

Project assessment:

- While the nature of innovation is such that it is not foreseeable at this juncture what the project will entail over the period 2015-2019, in the absence of any information on planned projects to account for the remainder of the budgeted €6.25m EY/TPS is not in a position to evaluate this spend. The EY/TPS assessment is therefore based on an assessment of sub-projects worth €1.75m on which information was provided.
- DAA unit price for self-service bag drop technology was lower than expected based on prices quoted by manufacturers.

Assumptions made during the cost assessment:

Information received:	CIP project sheet, information provided in response to queries
Fee allowance:	No change has been made to the CIP allowance.
Contingency allowance:	No change has been made to the CIP allowance.
Abnormal costs:	No additional abnormal costs have been included.

The variance between the DAA estimate and the EY/TPS assessment is primarily due to the exclusion of €6.25 of budget for which no projects were provided.

€1,900,000 (EY/TPS estimate) v €8,000,000 (DAA estimate)

Fees	€0
Contingency 0%	€0
	€1,900,000

Our assessment suggests that the cost in the CIP is higher than would be expected.

CIP reference: 15.2.005 Commercial Hangars Infrastructure

Information from CIP	
Cost included in CIP	€630,000
Contingency costs	15%/€75,000
Fee allowance	10%

Comparative cost information	
Hangar structure span of 35-40m for 50m long excluding slab and external work.	€480,000/hanger
Excluded from the project	
Demolition	€12,000/hanger
Services	€140,000/hanger
Slab	€125,000/hanger
Sources manufacturer and "Guide to World War II Hangar 02_Type T2 Hangars" published in 1995.	

Additional data within the Project data sheet	
Car park repairs – electrical works	€50,000

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

€865,500 (EY/TPS estimate) v €630,000 (DAA estimate)	
Slab	€375,000
Services (3 No. adjacent slabs)	€300,000
Demolition	€35,000
	€710,000
Fees 6%	€42,600
	€752,600
Contingency 15%	€112,900
	€865,500
Our assessment suggests that the cost in the CIP is lower than would be expected.	

CIP reference: 15.2.006 T2 MSCP Phase 2

Information from CIP	
Cost included in CIP	€12,300,000
Functional unit – car spaces	756 spaces
Cost per m2 (including fees and contingency)	€16,270
Contingency costs	10%/€803,332
Fee allowance	10%

Comparative cost information - cost/car space	
From Bruce Shaw	€8,200 - 16,500
Published price data	€9,900 - 14,100
As the above ranges deliver the same quality of works and are in the same price range an average of the costs has been used.	

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Fee allowance:	No change has been made to the CIP allowance
Contingency allowance:	A 15% allowance has been included. Due to the complexity of including additional floors to the existing structure the contingency level have been increased.
Abnormal costs:	No additional abnormal costs have been included
Planning levies under Sections 48 and 49 of the Planning and Development Act 2000 have been included in line with DAA costs.	
The EY/TPS estimate has been calculated by assuming the rate cost/car space derived from comparative cost information to arrive the car park cost, and adding to this the cost of the planning levies. This has resulted in a higher estimate than DAA. As the unit rate in the CIP includes levies.	

€15,840,000 (EY/TPS estimate) v €12,300,000 (DAA estimate)	
Car park additional 2 floors	€10,048,000
Planning and metro levies	€2,721,000
	€12,769,000
Fees 10% (excludes planning and metro levies)	€1,005,000
	€13,774,000
Contingency 15% (excludes planning and metro levies)	€2,066,000
	€15,840,000
Our assessment suggests that the cost in the CIP is lower than would be expected.	

CIP reference: 15.2.007 Cargo Terminal Development and Office Accommodation

Information from CIP	
Cost included in CIP	€2,220,000
Functional unit	
▸ Refurbished office space	1,000m2
Contingency costs	20%/€340,000
Fee allowance	6%

Comparative cost information - cost/m2	
Current commercial projects	€930
External wall over cladding (unit quantity)	€220

Assumptions made during the cost assessment

Internal refurbishment would comprise of demolition and alterations to allow new internal layout with new partitions and doors, new internal finishes, new M&E (mechanical and electrical) installations and repairs to roof coverings.

External wall over cladding would comprise of new lightweight cladding to existing structure to improve appearance, repair work to existing windows and new main external doors. The assessment includes the overcladding of the front elevation and both end elevations.

NB: 1,000m2 of office space is a smaller area than the overcladding to the external façade, i.e., parts of the building which will be overclad will not be refurbished internally

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 12% allowance has been included
Contingency allowance:	A 15% allowance has been included. DAA contingency of 20% was considered too high for this project.
Abnormal costs:	No additional abnormal costs have been included
The variance between the estimates occurs because EY/TPS have assumed a lower rate for office refurbishment than DAA.	

€1,725,000 (EY/TPS estimate) v €2,220,000 (DAA estimate)	
Office refurbishment	€930,000
Refurbishment of external façade	€410,000
	€1,340,000
Fees 12%	€160,000
	€1,500,000
Contingency 15%	€225,000
	€1,725,000
Our assessment suggests that the cost in the CIP is higher than would be expected.	

CIP reference: 15.2.009 Consolidated Car Rental Centre

Information from CIP	
Cost included in CIP	€10,000,000
Contingency costs	0%/€0
Fee allowance	0%

Comparative cost information	
New build area	€1,200 – 1,350/m2
Parking spaces	€1,135 – 2,000/space
Preparation area	€925 – 1,400/m2

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP Project data sheet
Fee allowance:	A 10% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included
This project is described at a very high level in the CIP. Using information provided by DAA through queries, EY/TPA were able to calculate the cost more accurately.	

€7,945,000 (EY/TPS estimate) v €10,000,000 (DAA estimate)	
New build area	€2,140,000
Parking spaces	€1,530,000
Preparation area	€2,610,000
	€6,280,000
Fees 10%	€628,000
	€6,908,000
Contingency 15%	€1,037,000
	€7,945,000
Our assessment suggests that the cost in the CIP is higher than would be expected.	

CIP reference: 15.2.010 Digital Advertising Pods

Information from CIP	
Cost included in CIP	€500,000
Contingency costs	15%/€127,500
Fee allowance	0%

Comparative cost information	
Other Sources – Single pods	€1,800
Other Sources – Double pods	€2,400

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Fee allowance:	A 5% allowance has been included. This is to cover the design for alteration and M&E items.
Contingency allowance:	A 10% contingency included as this is a low risk items with a fixed quantity of units to be installed.
Abnormal costs:	An allowance for Airport restrictions of 10% has been included
The variance in estimates occurs because EY/TPS calculated the cost of single and double pods separately and assumed lower unit costs for each type.	

€309,000 (EY/TPS estimate) v €500,000 (DAA estimate)	
Other Sources – Single pods (100)	€182,500
Other Sources – Double pods (50)	€122,000
Alteration/software and networking	€182,000
	€486,500
Abnormal costs allowance 10%	€49,000
	€535,000
Fees 5%	€27,000
	€562,500
Contingency 10%	€56,000
	€618,000
50% of work to be included in 2014 - 2019	€309,000
Our assessment suggests that the cost in the CIP is higher than would be expected as this work is split across the 2010-2014 and 2015-2019 CIPs.	

CIP reference: 15.2.013 Commercial Property Refurbishment

Information from CIP	
Cost included in CIP	€10,500,000
Functional unit – Property refurbishment	11,100 m2
Cost per m2 (including fees and contingency)	€946 m2
Contingency costs	0%/€
Fee allowance	7.5%

Comparative cost information - cost/m2	
From Buildcost Chartered Quantity Surveyors	
► Minor Refurbishment	€250 - 500
► Medium Refurbishment	€500 - 900
► Major Refurbishment	€800 - 1,200
From AECOM	
► Minor Refurbishment	€310 - 460
► Medium Refurbishment	€460 - 720
► Major Refurbishment	€720 - 1,100

From the various comparative cost data above, the cost of refurbishment is in the range of €250 – 1,200/m2. This is a very wide range and reflective of the different levels and extent of refurbishment. Referring to the Buildcost Chartered Quantity Surveyors Cost Model, the aim of a major refurbishment is to deliver a top grade space while maintaining the building's advantages such as a distinctive façade which we deem to be in excess of Dublin Airport's requirements. In effect this reduces the applicable range to €250 - 900/m2.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Fee allowance:	No change has been made to the CIP allowance which is considered appropriate.
Contingency allowance:	A 10% allowance has been included. This is to allow for any variance in the future scope of works as no defined scope is available.
Abnormal costs:	No additional abnormal costs have been included.

€10,921,000 (EY/TPS estimate) v €10,500,000 (DAA estimate)	
Commercial Property refurbishment - Terminal	€6,375,000
Commercial Property refurbishment - Campus	€2,860,000
	€9,235,000
Abnormal costs allowance	€0
	€9,235,000
Fees 7.5%	€693,000
	€9,928,000
Contingency 10%	€993,000
	€10,921,000

Our assessment suggests that the cost in the CIP is of the right magnitude.

CIP reference: 15.3.006 Long Term Car Park Resurface

Information from CIP	
Cost included in CIP	€6,700,000
Functional unit – car park surface	224,500 m2
Cost per m2 (including fees and contingency)	€30m2
Contingency costs	15%/€915,000
Fee allowance	0%

Comparative cost information - cost/m2	
Published price data – site preparation, surfacing and line marking	€24

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Fee allowance:	A 10% allowance has been included. This is to cover the redesign of the car park, surface specifications and marking layout.
Contingency allowance:	A 5% allowance has been included. As the area of the works is fixed and the operations are low-risk a reduced contingency can be applied.
Abnormal costs:	No additional allowance has been included

€6,129,000 (EY/TPS estimate) v €6,700,000 (DAA estimate)	
Site preparation, surfacing and line marking	€5,307,000
	€5,307,000
Fees 10%	€530,000
	€5,837,000
Contingency 5%	€292,000
	€6,129,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.5.001 Retail Refurbishments

Information from CIP	
Cost included in CIP	€12,100,000
Contingency costs	0 - 20%/€672,000
Fee allowance	0 %

Comparative cost information - cost/m2	
Published price data and Arcadis building cost guide - Terminal 2 refurbishment	€1,114 – 2,650
Published price data and Arcadis building cost guide - Terminal 2 redevelopment	€2,106 – 2,388
Published price data and Arcadis building cost guide - Terminal 1 refurbishment	€1,114 – 2,650
Published price data and Arcadis building cost guide - Terminal 1 arrivals shop	€1,114 – 2,650
Pier 4 redevelopment	€1,114 – 2,650
General maintenance work	€3,100,000

Assumptions made during the cost assessment

The details within the CIP does not allow for a cost for the general maintenance work to be established. However the allowance will provide the following:

- 600/m2 of refurbishment of concession shell and core costs
- 42/m2 of Direct space refurbishment
- €170,000 or 340/m2 for failure of capital equipment

It is assumed that design fees will be required to facilitate the proposed works being carried out.

Contingency has been allowed for all projects at a level of 15%.

An airport restriction allowance has been included to account of phasing of works and general restrictions.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, Aer Rianta International presentation
Fee allowance:	A 10% allowance has been included. This is to account for all design work for new build and refurbishment works.
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	An allowance for airport restrictions of 10% has been included.

The variance between the DAA estimate and EY/TPS assessment can be accounted for by the contingency allowances.

€17,497,034 (EY/TPS estimate) v €12,100,000 (DAA estimate)	
Terminal 2 refurbishment	€1,966,954
Terminal 2 redevelopment	€2,945,527
Terminal 1 refurbishment	€3,512,417
Terminal 1 arrivals shop	€725,095
Pier 4 redevelopment	€325,042
General maintenance work	€3,100,000
	€12,575,034
Abnormal costs allowance 10%	€1,257,000
	€13,832,034
Fees 10%	€1,383,000
	€15,215,034
Contingency 15%	€2,282,000
	€17,497,034

Our assessment suggests that the cost in the CIP is lower than would be expected.

CIP reference: 15.6.018 North Runway Fees and Planning

Information from CIP	
Cost included in CIP	€4,000,000
Contingency costs	0%/€0
Fee allowance	0%

Comparative cost information

This CIP proposal is for the redevelopment of a new planning permission document. Planning approval was granted however the associated conditions were unfavourable. It is therefore necessary to redevelop the proposal to secure suitable planning permission.

This fee is required to cover consultancy services associated with the preparation and lodgement of a new planning application, including any oral hearings. Planning, cost and design fees would account for up to 30% of the fees, whilst the balance would cover areas including noise, surface access, socio-economic and environmental impact studies. The fees are based on historic tender sums, in addition to the further items which now require to be incorporated and or updated as a result of legislative and policy changes, particularly in the areas environment, noise and surface access.

Based on our knowledge of the planning process, a planning permission preparation fee of circa €5m would be expected. In this case as some of the work has previously been carried out the reduced figure of €4m is reasonable.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	No change has been made to the CIP allowance
Contingency allowance:	No change has been made to the CIP allowance
Abnormal costs:	No additional abnormal costs have been included

€4,000,000 (EY/TPS estimate) v €4,000,000 (DAA estimate)	
Planning preparation fees	€4,000,000
	€4,000,000
Fees 0%	€0
	€4,000,000
Contingency 0%	€0
	€4,000,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.6.019 North Runway Advance House Purchase

Information from CIP	
Cost included in CIP	€4,250,000
Contingency costs	0%/€0
Fee allowance	0%
Advance house purchase	10 No.

Comparative cost information	
Average property price proposed by DAA	€377,027
Total number of properties required	37
Proposed % of advance properties versus total required	27%
Current number of properties in the specific affected area on the market	1
Based on the current availability of houses for sale, the proposed number of advance property purchases should be revised down to circa 15% of the total required.	

Additional data within the Project data sheet	
Acquisitions costs	€100,000

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP data sheet, O Buachalla property report.
Fee allowance:	No allowance has been included.
Contingency allowance:	No allowance has been included.
Abnormal costs:	No allowance has been included.
The EY/TPS estimate is lower than the DAA estimate because it is based on the purchase of six rather than ten houses.	

€2,360,000 (EY/TPS estimate) v €4,250,000 (DAA estimate)	
6 properties – using average price	€2,262,000
	€2,262,000
Our assessment suggests that the cost in the CIP is higher than would be expected.	

CIP reference: 15.8.001 Minor Projects

Information from CIP	
Cost included in CIP	€10,000,000
Median allowance per sub-project	€33,042
This allocation is to fund numerous small value projects (<€75k) that arise on a short time horizon on an annual basis.	

Comparative cost information - cost
Given that this CIP is to cover reactive minor works the most suitable means to assess the allowance is to review the historical spend presented and compare this to the proposed budget.
Based on the information presented in the CIP the previous value for Minor Project spent between 2010 – 2012 is circa €6,500,000. This equates to €2,166,000 per year or €36,111 per project for the period stated.
The information presented within the CIP states on average 60 minor works projects are carried out each year.
The cost of the majority of sub-projects is under €75,000.
The 90 sample sub-projects issued have a median value of €33,042. This is a sample of projects across the 2010–2014 CIP only.
To calculate a more accurate forecast the total number of projects and the total value would be required.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, 90 sample sub-projects, CIP Project data sheet
Fee allowance:	No allowance has been included
Contingency allowance:	As this is a reactive budget the nature of the funds is a contingency and no additional allowance has been included
Abnormal costs:	No additional abnormal costs have been included

€10,833,000 (EY/TPS estimate) v €10,000,000 (DAA estimate)	
60 projects PA – average value €36k	€2,166,000
5 year programme	€10,833,000
	€10,833,000
Fees 0%	€0
	€10,833,000
Contingency 0%	€0
	€10,833,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.8.200 Programme Management

Information from CIP	
Cost included in CIP	€3,540,000
Functional unit 5 + 2 FTE	7 FTE
Average cost per FTE	€100,00 PA

Comparative cost information – Day rate	
Senior Technical staff	€480
Support staff	€160

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP estimate project sheet
Assumptions	The 5 FTE Senior Technical staff and the 2 Support staff are external consultants

€3,128,000 (EY/TPS estimate) v €3,540,000 (DAA estimate)

If we assume an average level of salary of €65,000 per Senior Technical staff and €31,000 per Support staff plus an allowance for salary burden, overheads and profits, the typical cost per person could be €162,500 (Technical staff) and €124,000 (Support staff) per person per annum.

5 FTE - Senior Technical (5 Years)	€2,760,000
2 FTE Support staff (5 Years)	€368,000
	€3,128,000
Fees 0%	€0
	€3,128,000
Contingency 0%	€0
	€3,128,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.6.012 Runway 10-28 Extension

Information from CIP	
Cost included in CIP	€55,000,000
Functional unit – runway extension	34,800 m2
Cost per m2 (including fees and contingency)	€1,580 m2
Contingency costs	10 and 20%/€7,920,000
Fee allowance	7%

Comparative cost information	
From Specific new runway projects	
SWK Cost Plan Dublin	€85,200/m
Stansted 2nd Runway	€65,000/m
Manchester Runway 2	€88,000/m
East Midland RESA extension	€900/m2
From previous projects – runway reconstruction	€250/m2
From DL&E Airports Cost Model – runway reconstruction	€190/m2
Published price data – runway reconstruction	€180/m2
Other Sources – runway reconstruction	€200/m2
The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of a runway extension will be in the region of €1000/m2.	
Survey	€2,500/wm
Demolition and excavation (1m deep)	€10/m2
Paint markings	€12/m2
Drainage	€420/m
Trench, ducting and cables	€90/m
AGL Lights	€530/unit

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included
From previous project data, TPS estimated the runway extension at €1,425/m2 against €1,580/m2 for DAA.	
The EY/TPS estimate is lower than DAA's because lower unit rates have been assumed.	

€49,613,000 (EY/TPS estimate) v €55,000,000 (DAA estimate)	
New Runway Extension	€34,800,000
Drainage	€250,000
AGL lights/paint markings	€250,000
Inlay to curve at 28/34 junction	€5,400,000
	€40,700,000
Fees 6%	€2,442,000
	€43,142,000
Contingency 15%	€6,471,000
	€49,613,000
Our assessment suggests that the cost in the CIP is higher than would be expected.	

CIP reference: 15.6.013 Additional Line-up Points on Runway 10-28

Information from CIP	
Cost included in CIP	€30,000,000
Contingency costs	16%/€3,800,000
Fee allowance	8%

Comparative cost information - cost/m2	
From previous projects for runway reconstruction	€230
From DL&E Airports Cost Model for runway reconstruction	€95 – 190
East Midland RESA extension	€900
Published price data for runway reconstruction	€95 – 185
Other Sources for runway reconstruction	€200
East Midland RESA extension	€900

The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of the new parallel feeds will be in the region of €440/m2.

Additional data within the Project data sheet

Assessment is based on 50,000m2 of new taxiway

Earthwork can be assessed at 65,000m2 to be dug over 1,000mm

The AGL approach lights are not included in this CIP as it is part of CIP 6.004. However additional AGL items are required for:

- AGL centreline lights
- AGL edge lights
- Threshold lights
- New stop bar positions
- Transformers in manholes 750x750
- Trench for primary and secondary cables

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

€27,885,000 (EY/TPS estimate) v €30,000,000 (DAA estimate)	
New Taxiways (area paved to be confirmed by DAA) and earthwork	€22,000,000
AGL	€500,000
Drainage	€265,000
Temporary works	€60,000
Markings	€50,000
	€22,875,000
Fees 6%	€1,372,500
	€24, 247,500
Contingency 15%	€3,637,500
	€27,885,000

Our assessment suggests that the cost in the CIP is of the right magnitude.

CIP Reference 15.6.028: Runway 10-28 Extension and Additional Line-up Points

Information from CIP	
Cost included in CIP	€74,400,000

Comparative cost information	
From previous projects	€230
From DL&E Airports Cost Model	€95 - 190
Published price data	€95 – 185
Other Sources	€200
The range of costs above can be narrowed down by our knowledge of the project at other airports. The cost of the new aprons will be in the region €230/m2.	
From Specific previous projects:	
SWK Cost Plan Dublin	€85,200
Stansted 2nd Runway	€65,000
Manchester Runway 2	€88,000

Assumptions made during the cost assessment
Assessment is based on 70,000m2 of new pavement – 29,600m2 of runway and 40,400m2 of taxiway.
For a runway extension of this size we have used rates taken from new runway projects. Given the nature of the works we have used the rates at the upper end of the range.
The earthworks can be assessed at 70,000m2 to an average depth of 1 metre. The pavement allowance is for a 300mm DLC with 500mm Marshal Asphalt overlaid. The AGL approach lights are not included in this CIP as it is part of CIP 6.004.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included.

€69,566,000 (EY/TPS estimate) v €74,400,000 (DAA estimate)	
Runway pavement (services and excavation included)	€42,920,000
Taxiway pavement – Rapid exit (services and excavation included)	€14,140,000
	€57,060,000
Fees 6%	€3,423,600
	€60,483,600
Contingency 15%	€9,072,400
	€69,556,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP Reference 15.6.051: Northern Runway

Information from CIP	
Cost included in CIP	€236,800,000
Functional unit - new runway	3,110m
Cost per m2 (including fees and contingency)	€76,000/m2

Comparative cost information - cost/m2	
From Specific previous projects:	
SWK Cost Plan Dublin	€85,200
Stansted 2nd Runway	€65,000
Manchester Runway 2	€88,000

Assumptions made during the cost assessment
Given the scale of this project we have used a range of new runway costs from €65,000 to €88,000/m2.
Using this range gives a total cost assessment of between €246.5m and €333.6m.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included
The EY/TPS estimate is higher than DAA's because it assumes higher unit rates.	

€290,032,500 (EY/TPS estimate) v €236,800,000 (DAA estimate)		
	Low range	Upper range
New Runway Extension	€202,150,000	€273,680,000
	€202,150,000	€273,680,000
Fees 6%	€12,150,000	€16,420,000
	€214,300,000	€290,100,000
Contingency 15%	€32,150,000	€43,515,000
	€246,450,000	€333,615,000
Our assessment suggests that the cost in the CIP is lower than would be expected. An average over the above range will be taken forward for overall assessment.		

CIP reference: 15.7.101 T1 Check-in and Security

Information from CIP	
Cost included in CIP	€38,300,000
Contingency costs	20%/€5,756,000
Fee allowance	10%

Comparative cost information - cost/m2	
Extension of existing mezzanine	€1,50
Strengthening of existing mezzanine	€1,000,000
Refurbishment of existing check in	€500
New check in	€1,000

Comparative cost information	
Automated lanes	€130,000/unit
LAGS equipment Type C	€75,000/unit
LAGS equipment Type B	€57,000/unit
Explosive Trace Detection	€55,000/unit
Networking (socket -€75/Layer switch (1/24) - €3,000/access point - €360/300m2	€15,000
Boarding Car check/by pass gate	€45,000/unit

Assumptions made during the cost assessment
Strengthening of existing mezzanine is an unknown. It is a relatively small part of this project and has been included in this assessment in the nominal sum of €1m.

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet
Fee allowance:	A 6% allowance has been included
Contingency allowance:	A 15% allowance has been included
Abnormal costs:	No additional abnormal costs have been included

€38,136,000 (EY/TPS estimate) v €38,300,000 (DAA estimate)	
Extension of existing mezzanine	€1,350,000
Strengthening of existing mezzanine	€1,000,000
Refurbishment of existing check in	€4,925,000
New check in	€21,850,000
Equipment	€2,160,000
	€31,285,000
Fees 6%	€1,877,000
	€33,162,000
Contingency 15%	€4,974,000
	€38,136,000
Our assessment suggests that the cost in the CIP is of the right magnitude.	

CIP reference: 15.7.111 Pier 2 Segregation

Information from CIP	
Cost included in CIP	€18,000,000
Contingency costs	20%/€3,005,000
Fee allowance	10%

Comparative cost information – cost/m2	
New extension	€2,200 – 2,700
Refurbishment of Pier 200	€1,000

Assumptions made during the cost assessment:	
Information received:	CIP project sheet, CIP project data sheet.
Fee allowance:	6% allowance has been included.
Contingency allowance:	15% allowance has been included.
Abnormal costs:	No additional abnormal costs have been included.

€18,965,200 (EY/TPS estimate) v €18,000,000 (DAA estimate)	
New extension	€405,000
Refurbishment of pier 200	€2,703,000
Lifts, escalators and stairs	€300,000
Equipment	€12,150,000
	€15,558,000
Fees 6%	€933,500
	€16,491,500
Contingency 15%	€2,473,700
	€18,965,200
Our assessment suggests that the cost in the CIP is of the right magnitude.	

Appendix B

Project level DAA CIP values compared to EY/TPS assessment (1 of 3)

DAA's Capital Investment Plan				EY/TPS assessment of CIP values	
Project group	CIP reference	Project name	CIP value	EY/TPS value	value of variance
Airfield and Apron Rehabilitation	15.6.001	Runway 16/34 Pavement Rehabilitation	€24,300,000	€21,566,000	-€2,734,000
	15.6.002	Apron Rehabilitation	€21,000,000	€22,305,000	€1,305,000
	15.6.006	Airfield and Apron Roads	€1,700,000	€1,669,800	-€30,200
	15.6.055	Airfield Taxiway Rehabilitation	€16,000,000	€12,548,000	-€3,452,000
	15.6.017	Runway 10-28 Overlay	€22,300,000	€29,555,000	€7,255,000
Airfield Compliance	15.9.022	Airfield Pollution Control	€20,000,000	€22,450,000	€2,450,000
Airfield Lighting	15.6.004	Airfield Lighting Upgrade (Runway 10/28)	€9,100,000	€8,325,000	-€775,000
	15.6.009	Taxiway Airfield Ground Lighting (AGL) Upgrade	€3,900,000	€3,620,000	-€280,000
Vehicles	15.4.001	Airfield Vehicles and Equipment	€5,700,000	€5,804,415	€104,415
	15.4.002	Light Vehicle Fleet	€2,200,000	€2,547,560	€347,560
Landside Maintenance	15.3.004	Car Parks	€4,500,000	€2,687,000	-€1,813,000
	15.3.035	Landside Infrastructure External Roads	€2,000,000	€2,362,000	€362,000
	15.3.001	Utilities	€4,600,000	€5,034,000	€434,000
Maintenance IT	15.8.008	DAA Technology Operation and Lifecycle Management	€15,800,000	€15,519,000	-€281,000
	15.8.009	DAA Business Systems Investment Plan	€15,600,000	€16,071,000	€471,000
Terminals Maintenance	15.7.102	T1 Roof Upgrades	€7,900,000	€7,772,000	-€128,000
	15.4.005	T1 Baggage Reconciliation System	€1,100,000	€1,170,100	€70,100
	15.4.006	T1 Critical Equipment Upgrades	€6,000,000	€7,967,000	€1,967,000
	15.7.104	HVAC / BMS Upgrades and Replacement T1	€7,400,000	€4,829,000	-€2,571,000

Project level DAA CIP values compared to EY/TPS assessment (2 of 3)

DAA's Capital Investment Plan				EY/TPS assessment of CIP values	
Project group	CIP reference	Project name	CIP value	EY/TPS value	value of variance
Apron Capacity	15.6.047	Apron Capacity Apron Development 5G	€18,200,000	€16,140,000	-€2,060,000
	15.6.007	Airfield Infrastructure Upgrades for New Large Aircraft	€1,500,000	€1,585,000	€85,000
Terminal Capacity	15.7.116	Pier 3 Flexibility	€15,000,000	€10,545,000	-€4,455,000
	15.7.120	T2 Bus Lounge Facilities	€13,300,000	€12,003,000	-€1,297,000
	15.4.004	Central Search Area – New Technologies	€11,600,000	€11,142,000	-€458,000
	15.7.117	Transfers Facility	€21,500,000	€18,690,000	-€2,810,000
Terminal – Customer/Efficiency Improvements	15.7.122	Pier 1 Enclosed Gate Rooms	€1,100,000	€1,220,000	€120,000
	15.7.121	T1 Arrivals	€8,900,000	€8,831,000	-€69,000
	15.7.119	T1 Façade Works	€670,000	€510,700	-€159,300
	15.7.103	Fixed Electrical Ground Power T1	€1,500,000	€1,579,000	€79,000
Revenue Projects	15.5.001	Revenue Projects Retail Refurbishments	€12,100,000	€17,497,034	€5,397,034
	15.5.002	Retail IT	€1,550,000	€1,580,000	€30,000
	15.2.005	Commercial Hangars Infrastructure	€630,000	€865,500	€235,500
	15.2.007	Cargo Terminal Development and Office Accommodation	€2,200,000	€1,725,000	-€475,000
	15.2.010	Digital Advertising Pods	€500,000	€309,000	-€191,000
	15.2.013	Commercial Property Refurbishments	€10,500,000	€10,921,000	€421,000
IT Innovation	15.8.009c	Business Innovation Investment	€8,000,000	€1,900,000	-€6,100,000
Screening	15.6.021	Cargo Gate Redevelopment	€1,800,000	€1,712,000	-€88,000
	15.6.022	Airport Screening Centre	€750,000	€862,000	€112,000

Project level DAA CIP values compared to EY/TPS assessment (3 of 3)

DAA's Capital Investment Plan				EY/TPS assessment of CIP values	
Project group	Project ref	Project name	CIP value	EY/TPS value	value of variance
Car Parks	15.3.006	Long Term Car Park Resurface	€6,700,000	€6,129,000	-€571,000
	15.2.009	Consolidated Car Rental Centre	€10,000,000	€7,945,000	-€2,055,000
	15.2.006	T2 MSCP Phase 2	€12,300,000	€15,840,000	€3,540,000
	15.2.017	Consolidated Staff Car Park	€1,500,000	€1,654,000	€154,000
Contingent Projects	15.4.003	T2 HBS Standard 3	€13,000,000	€12,260,000	-€740,000
	15.7.111	Pier 2 Segregation	€18,000,000	€18,965,200	€965,200
	15.6.023	New Apron Development 300R	€8,200,000	€7,470,000	-€730,000
	15.7.101	T1 Check-in and Security	€38,300,000	€38,136,000	-€164,000
Runway Capacity	15.6.012	Runway 10-28 Extension	€55,000,000	€49,613,000	-€5,387,000
	15.6.013	Additional Line-up Points on Runway 10-28	€30,000,000	€27,885,000	-€2,115,000
Other	15.8.001	Minor Projects	€10,000,000	€10,833,,000	€833,000
	15.8.200	Programme Management	€3,540,000	€3,128,000	-€412,000
Future parallel runway related	15.6.019	North Runway Advance House Purchase	€4,250,000	€2,262,000	-€1,988,000
	15.6.018	Planning and design fees	€4,000,000	€4,000,000	€0
	15.6.028	Runway 10-28 Extension and Additional Line-up Points - which proposes the amalgamation of CIP 15.6.012 and CIP 15.6.013.	€74,400,000	€69,556,000	-€4,844,000
	15.6.051	Northern Runway	€236,800,000	€290,032,500	€53,232,500
Total			€848,390,000	€879,121,809	€30,737,809

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