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Leigh|Fisher

Cost and Commercial Viability: Cost and Revenue Identification Update

Gatwick Airport Second Runway

Airports Commission

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Executive Summary

This report sets out the assessment of the capital cost of developing the Gatwick Airport Second Runway scheme, updated to take account as appropriate of responses to consultation. The assessment has been carried out in accordance with the Commission's appraisal framework (see Airports Commission: Appraisal Framework). It provides the cost assumptions used in the financial analysis to assess the commercial viability and financeability of the scheme.

The scheme includes an additional runway, taxiways, and terminal infrastructure. The assessment has been undertaken in general accordance with HM Treasury's The Green Book - Appraisal and Evaluation in Central Government, which advises the adjustment of base cost estimates to include risk and optimism bias.

The revised cost estimate for the scheme, summarised in the table below, is £9.0 billion with mitigated optimism bias applied for the construction of all phases, compared to the previous estimate of £9.3 billion. Under certain demand scenarios, forecast demand does not require the construction of all phases, reducing the estimated costs to £7.1 billion.

Scenario	Pre-consultation	Post-consultation
Assessment of Need Carbon Capped	7,387	7,060
Assessment of Need Carbon Traded	9,340	8,971
Low Cost is King Carbon Traded	9,340	8,971
Global Fragmentation Carbon Capped	7,387	7,060

Total Scheme Capital Expenditure by Demand Scenario (2014 prices, £'million, including mitigated optimism bias)

The report also sets out the updated estimates of the wider costs and revenues, including the underlying airport infrastructure that would be required irrespective of the second runway investment; the ongoing maintenance and replacement of the existing and developed asset; the ongoing operational expenditure relating to the existing and developed asset; the non-aeronautical revenue the existing and developed asset would generate; and the surface access works and associated ongoing costs required to facilitate the scheme.

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Contents

1 Introduction

This report presents the revised estimate of the capital cost of developing the Gatwick Airport Second Runway scheme (hereafter "the scheme"). The report is an update to the report issued for consultation, *Appraisal Framework Module 13. Cost and Commercial Viability: Cost and Revenue Identification Gatwick Airport Second Runway* (GAL03). All costs and revenues are stated in 2014 prices.

Recognising that it is not possible to determine with accuracy a single cost estimate, and that a range of outcomes are possible, the objective was to establish a reasonable estimate to conduct the assessments within the Appraisal Framework Module 13: Cost and Commercial Viability. The estimates include separate provision for risk and optimism bias.

Section 2 of this report describes the methodology used to establish capital cost forecasts.

Responses to consultation relating to the cost estimates presented in that report were systematically considered and addressed in one of the following ways:

- *comments highlighting errors in our estimation of a specific cost element, where we have subsequently made an adjustment;*
- *comments raising issues requiring further consideration, where we have subsequently considered it appropriate to make an amendment;*
- *comments making reasonable points concerning the potential under-estimation of cost elements, where we have subsequently reviewed these and consider them to be included in the estimate and/or adequately provided for within the category risk allocation; and*
- *comments and challenges upon which we have reflected, but determined that no change to our forecasts is necessary.*

Section 3 sets out an overview of the revisions made following consultation.

The revised estimates of costs are presented in Section 4.

Details of the Scheme costs and supporting detail are presented in Appendices B and C.

In order to enable the Cost and Commercial Viability study to consider the viability of the investment in the scheme, it was necessary to understand the wider cost and revenue contexts of that investment. Therefore, assessments were also made of the following:

- *the underlying investment in airport infrastructure that would be required irrespective of the second runway investment, referred to as Core works in this report, as discussed in Appendix D;*
- *the ongoing replacement of the existing and developed asset, as also discussed in Appendix D. There are no changes to this section as a result of consultation;*
- *ongoing operational expenditure relating to the existing and developed asset, as also discussed in Appendix F;*

- *non-aeronautical revenue that the existing and developed asset would generate as discussed in Appendix G; and*
- *beyond the airport boundary, the surface access works required by the Scheme along with the operational and maintenance costs of those surface access improvements as discussed in Appendix H.*

Throughout this report a consistent colour scheme has been adopted to present the cost and revenue estimates developed for each relevant demand scenario[1]. The scenarios and their respective colours are as shown in Table 1-1:

	Scenario
	Assessment of Need Carbon Capped
	Assessment of Need Carbon Traded
	Low Cost is King Carbon Traded
	Global Fragmentation Carbon Capped

Table 1-1 Demand Scenario Reference Colours

[1] The relevant scenarios are those included in Cost and Commercial Viability: Funding and Financing

2 Methodology

2.1 Definitions

Throughout this report consistent nomenclature has been adopted. Estimates were developed for "Core" and "Scheme" costs, where the "Core" works relate to the investment in the airport irrespective of investment in the additional runway works, the additional cost of which is reported as the "Scheme" cost. The Scheme works were established from the promoter's submission to the Airports Commission as updated based on the approach set out in this report and in response to consultation.

Details of the approach to the Core works and to asset replacement are presented in Appendix D.

2.2 Scheme Capital Cost

The approach we adopted prior to consultation remains unchanged and the additional points set out in this section are solely intended to provide clarification following consultation. Our approach was to assess the reasonableness of the estimate provided by Gatwick Airport Ltd (GAL) in order to reach a view as to an appropriate estimate to be used within the Cost and Commercial Viability assessment.

This was undertaken by comparison of the provided costs, or any costs independently determined, with industry expectation. All costs were re-based as necessary to be consistently presented in 2014 values.

We took the following approach:

- *using the material provided by the scheme promoter, we determined the scope of work and disaggregated works into a level of detail reasonably possible and appropriate to this stage of analysis;*
- *for each element of the disaggregated works, we determined the effective unit rate;*
- *we assessed the unit rates to determine whether they were in accordance with our expectation of a reasonable market rate, taking into account the nature, site and location of the works;*
- *by exception we made amendments to rates and quantities as appropriate;*
- *we established the base cost, made adjustments for 'on costs' and applied risk and optimism bias as discussed below.*

'On costs' include enabling works, operational readiness, and project fees.

- *enabling works and operational readiness costs[2] were identified as separate cost line items, which we distributed in proportion across all other capital cost*

[2] The approach to the costs of enabling works and operational readiness is unchanged from the report of 5 November 2014 but these costs were not separately identified in the methodology section. This commentary is provided for additional clarity following consultation comments.

line items, with the exception of environment and community compensation costs.

- *project fees (to allow for design and project management services) were calculated at 15% base cost and were applied to all cost categories.*

Following this methodology, any change to the base costs that we have made post-consultation has a proportionate impact on the project fees and on the distribution of enabling works costs between all other cost categories (except environment and community compensation costs).

Scheme base cost estimates are shown in full in Appendix C with on costs itemised separately.

Noting the inherent nature of capital expenditure projects to exhibit risk and uncertainty, the processes and guidance of HM Treasury's The Green Book - Appraisal and Evaluation in Central Government[3], and supplementary guidance with respect to optimism bias[4] were adopted. The guidance recommends making such adjustments on the basis that there is a demonstrated, systematic tendency for project appraisers to be overly optimistic. A risk premium was applied to address the unknown engineering detail of the identified works which would be expected to lead to an under estimate of the cost despite the scope being reasonably defined. For example, geological surveys may find that the tunnels (such as for baggage or transit systems) need to be bored through much harder rock than previously expected. Risk premiums of 20% on Scheme costs were adopted to take account of the risk of the costs to deliver the identified scope of works increasing. These allowances are in line with our expectation of typical allowances at this stage of project development.

Scheme costs were assessed based upon the extent of information presented by the promoter. Engineering judgement and experience were used to assess whether the detailed item rate, or a higher aggregate planning rate, was appropriate for the element of the works, its engineering context and the operational environment within which the works would be constructed. This judgement was based upon Jacobs's experience of similar airport projects within London and within the UK.

Since there was insufficient information concerning the specific risk premiums added to each line item of capital expenditure, this approach entailed scheme promoters' costs being reduced to what we would consider to be a risk-free rate. After review to ensure that it did not result in unequal treatment of the schemes, we added a risk premium of 20% to this risk-free rate (see Section 2.3.1).

2.3 Risk and Optimism Bias

2.3.1 Risk

Based upon our expectation of a reasonable allowance at this stage of project development, a 20% risk premium was applied. We would note that this allowance could be seen as being optimistic and that a higher allowance would not be considered inappropriate. We note, however, that the individual items of work within base costs (the risk and optimism bias unadjusted costs) make due allowance for the environments in which they will be delivered and/or the complexity of the items

[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf
[4] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191507/Optimism_bias.pdf

of work. Therefore, whilst we would observe 20% to be at the lower end of an expected range for projects at this relatively early stage of development, we consider it to be a reasonable base upon which to establish a reasonable cost estimate.

2.3.2 Optimism Bias

HM Treasury's Supplementary Green Book Guidance sets out a detailed calculation method to establish the appropriate level of optimism bias to be applied taking into account a number of factors. Noting that these calculations require judgement across a range of factors, most of which are difficult to establish with accuracy from an external assessment to the organisation responsible for project delivery, and noting that those assessments are subjective in nature rather than demonstrably objective, the approach to optimism bias was to establish a reasonable allowance, rounded to the nearest 5%, applied consistently to each scheme.

For consultation, the scheme was characterised as a combination of Standard Buildings and Standard Civils, giving an unmitigated adjustment of 38%. We applied mitigation factors consistently to each scheme, recognising the absence of detailed knowledge on the capability, experience, and approach of each scheme promoter to deliver the Scheme. A mitigated adjustment of 20% was applied for consultation.

In response to consultation comments, we revisited the categorisation of Scheme capital costs and the mitigation factors applied to the derivation of mitigated optimism bias.

The revised approach involved categorising the Scheme works into Standard Buildings, Non-Standard Buildings, Standard Civils, Non-Standard Civils, and Equipment/Development. The categories not previously used (Non-Standard Buildings, Non-Standard Civils, and Engineering & Development) have higher recommended upper bound optimism bias values than Standard Buildings or Standard Civils, according to HM Treasury's Supplemental Green Book Guidance. As a result, the reassessed unmitigated optimism bias for Scheme capital expenditure is higher than the unmitigated optimism bias used at consultation. The re-categorisation of Scheme works resulted in a calculated value for unmitigated optimism bias of 45%, compared with 38% as used prior to consultation. However, the mitigation factors applying to those categories resulted in a lower value for mitigated optimism bias.

Appendix B sets out the calculation by which the value for mitigated optimism bias was derived. Following this analysis, we adopted an allowance of 15% for mitigated optimism, compared with 20% used at consultation.

The HM Treasury's Green Book Optimism Bias approach is by its nature imprecise, its purpose being to provide an appropriate cost contingency in forecasts for which there is insufficient detail and where available data lack precision. Having regard to the ranges of calculated mitigated optimism bias for Scheme capital expenditure, we have adopted a rounded figure of 15% across all three schemes.

In summary, the following adjustments for risk and optimism bias were made:

		Scheme	
		Pre-consultation	Post-consultation
Risk		20	20
Optimism Bias	**Mitigated**	20	15
	Unmitigated	38	45

Table 2-1 Summary of Risk and Optimism Bias Adjustments to the Base Costs (%)

2.4 Phasing

The Scheme cost estimate was determined in total and by build phase (see Figure 4-2 to Figure 4-5). Reference should be made to the Gatwick Airport Appraisal Module 14: Operational Efficiency Ground Infrastructure report for detail of the individual phases. For the purposes of informing the Cost and Commercial Viability assessments, the capital costs of each build phase were triggered by demand against the requirements of the following four principal demand scenarios and as shown in Figure 2-1:

- *Assessment of Need Carbon Capped*
- *Assessment of Need Carbon Traded*
- *Low Cost is King Carbon Traded*
- *Global Fragmentation Carbon Capped*

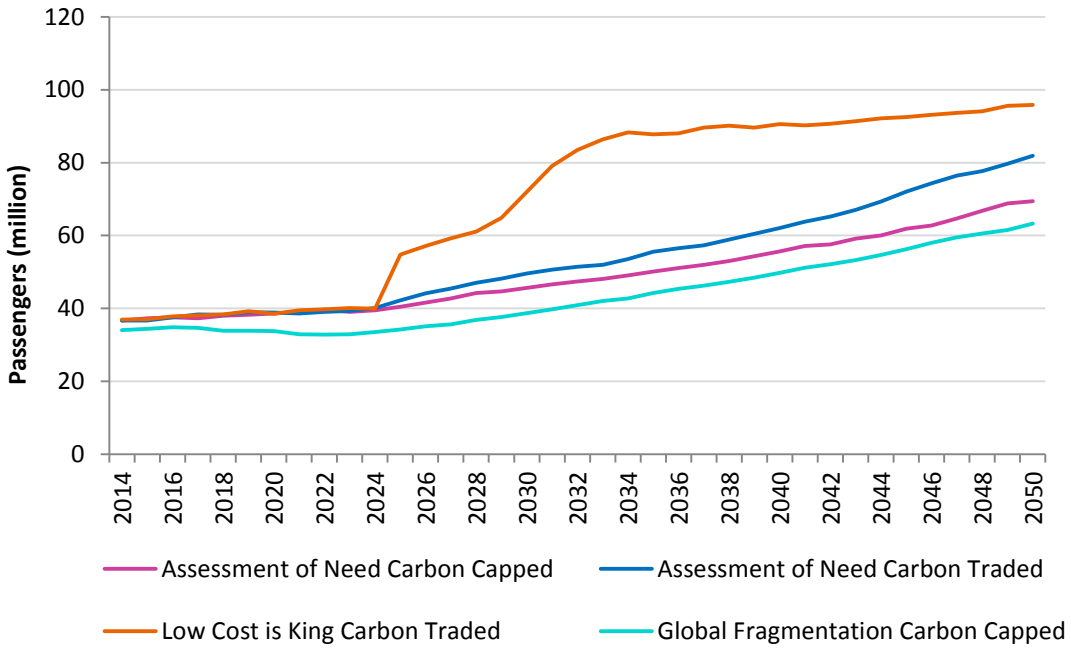

Figure 2-1 Airports Commission Demand Scenarios[5]

Opening of the second runway was driven by air transport movement (ATM) demand exceeding the current capacity irrespective of passenger demand.

[5] GAL traffic is presented in financial years, whereas the Airports Commission's demand scenarios are presented in calendar years. As shown on the chart, GAL financial year, for example, 2035/36 is shown in calendar year 2036. Consequently the runway appears to open in different years.

Although certain demand scenarios exceeded the 280,000 ATM per annum capacity of the existing runway before 2025, the earliest the second runway was assumed to be opened was 2025, based upon the Airports Commission's view of the likely timescale required for regulatory and planning processes.

Each phase was assumed to open at the end of the year before demand was forecast to exceed capacity. With reference to the Operational Efficiency Ground Infrastructure report, the following phase capacities were adopted.

Phase	Capacity (mppa)
Existing	42
Improvements	45
Phase 1	60
Phase 2	75
Phase 3	95

Table 2-2 Capacity Provision by Phase

In the years prior to opening of the phase, the estimated cost of the phase was incurred over a period of five to six years depending upon the value of expenditure, following a simplified, but typical sigmoidal curve (S-curve) profile.

3 Revisions Following Consultation

3.1 Scheme Capital Cost

Responses to consultation indicated three elements of the Scheme capital cost estimate which merited consideration and refinement. These were:

- *nodes and passenger boarding bridges for the new Midfield Terminal (see Section 3.1.1);*
- *airfield pavements (see Section 3.1.2); and*
- *the application of optimism bias (see Sections 2.3.2 and 4, and Appendix B, Figure B-2).*

The resulting revised total capital estimate is presented in Section 4.

Responses to consultation included concerns that the construction rates used were different from those proposed by the scheme promoter, or differed significantly from those adopted for the Heathrow schemes. We have reviewed the rates used for consultation and consider them to be reasonable, since:

- *we applied a consistent adjustment to GAL's rates to take account of inflation and to apply various 'on costs' that were itemised separately in GAL's submission (e.g. insurances and construction logistics)*
- *the cost methodologies adopted by scheme promoters mean that direct comparison of the rates between schemes could give misleading results; e.g. rates are in some cases based on plan area and in other cases based on gross floor area. We have reviewed the cost rates in the context of site specific factors and the level of specification of the scheme as proposed, and consider them to be reasonable.*

Other responses to consultation concerned the revised amounts for environmental costs and mitigation, community impacts, baggage handling, and airside APM costs. These were reviewed and, except as stated below, the amounts plus risk and optimism bias are considered to provide adequate budget for the respective costs. The exclusion of temporary piers was also raised. These were excluded as they were not required for the revised phasing adopted by the Commission.

Sensitivity analyses on Community Compensation are as set out in the report *Cost and Commercial Viability: Additional Analysis*. Other sensitivity analyses on costs are included in the report *Cost and Commercial Viability: Funding and Financing Update* and *Cost and Commercial Viability: Additional Sensitivities*.

Responses to consultation identified areas in which there is a risk that outturn costs could exceed forecast costs. We have reviewed these items and consider them to be adequately provided for within the risk factor.

3.1.1 Nodes and Passenger Boarding Bridges

Responses to the consultation highlighted that the total cost of nodes and passenger boarding bridges required adjustment in the cost estimate. This has been amended. The updated inclusion of these costs has a different impact depending on demand scenario:

- *Under the Assessment of Need Carbon Capped and Global Fragmentation demand scenarios, in which passenger demand is not sufficient to require the midfield terminal to be fully built out, forecast costs increase by £78 million (including project fees but excluding risk and optimism bias).*
- *Under the Assessment of Need Carbon Traded and Low Cost Is King demand scenarios, in which the proposed scheme is built out in full, forecast costs increase by £104 million (including project fees but excluding risk and optimism bias).*

3.1.2 Airfield Pavements

In response to comments received during consultation, we revisited the measurement and classification of the scheme's airfield pavement areas so as to reflect more accurately Gatwick Airport Ltd's (GAL's) own estimate. As above, the impact of this recalculation differs depending on traffic scenario.

- *Under the Assessment of Need Carbon Capped and Global Fragmentation demand scenarios, in which passenger demand is not sufficient to require the taxiway network to be fully built out, forecast costs decrease by £91 million (including project fees but excluding risk and optimism bias).*
- *Under the Assessment of Need Carbon Traded and Low Cost Is King scenarios, in which the proposed scheme is built out in full, forecast costs decrease by £104 million (including project fees but excluding risk and optimism bias).*

4 Revised Scheme Capital Expenditure Post Consultation

The revised cost is estimated to be £9.0 billion with mitigated optimism bias applied and £11.3 billion with unmitigated optimism bias. Under certain demand scenarios forecast demand does not require the construction of the final phase, reducing the estimated costs to £7.1 billion and £9.0 billion with mitigated and unmitigated optimism bias respectively.

Appendix C presents the resulting build-up of the Scheme works (including mitigated optimism bias) for all phases.

Section 4.1 summarises the forecast Scheme capital expenditure by year against each of the Airports Commission's demand scenarios considered for this scheme in the Cost and Commercial Viability assessment. As certain demand scenarios do not require the full build-out of all phases, the difference between the scenarios is both the profile of expenditure required to deliver capacity in line with the differing demand requirements and the total expenditure. The latter is dependent upon whether Phase 3 is required before 2050 or not, with the total being either £7.1 billion or £9.0 billion.

Table 4-2 to Table 4-5 in Section 4.2 present the data underlying Figure 4-2 to Figure 4-5 in the preceding sections.

In summary, for each scenario, Scheme capital expenditure is as shown in Table 4-1 with mitigated and unmitigated optimism bias.

Scenario	Pre-consultation	Post-consultation
Assessment of Need Carbon Capped	7,387	7,060
Assessment of Need Carbon Traded	9,340	8,971
Low Cost is King Carbon Traded	9,340	8,971
Global Fragmentation Carbon Capped	7,387	7,060

Table 4-1 Total Scheme Capital Expenditure by Demand Scenario (2014 prices, £'million, including mitigated optimism bias)

Note that Figure 4-1 shows each change sequentially from total scheme cost at consultation to the cost post-consultation. The individual revisions to base costs are shown including optimism bias at the rate adopted at consultation stage (i.e. 20%). The final adjustment for the revision to the optimism bias assumption (from 20% to 15%) is stated after adjustment for those individual revisions.

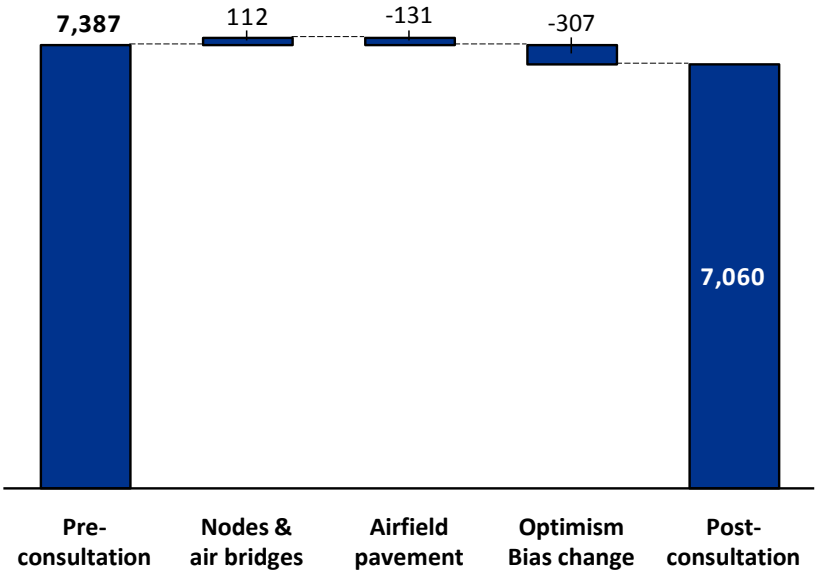

Figure 4-1 Pre-Consultation to Post-Consultation Scheme Capex Waterfall Chart (2014 prices, £'million, including mitigated optimism bias; Assessment of Need Carbon Capped)

4.1 Airports Commission Demand Scenarios: Capex Profiles

4.1.1 Assessment of Need Carbon Capped

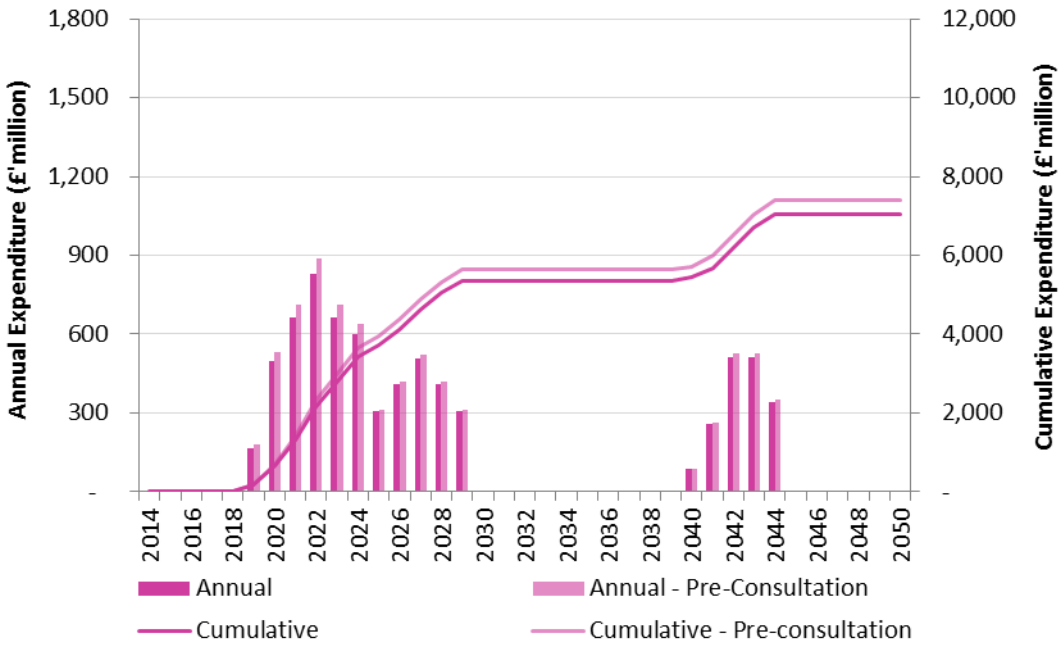

Figure 4-2 Assessment of Need Carbon Capped

4.1.2 Assessment of Need Carbon Traded

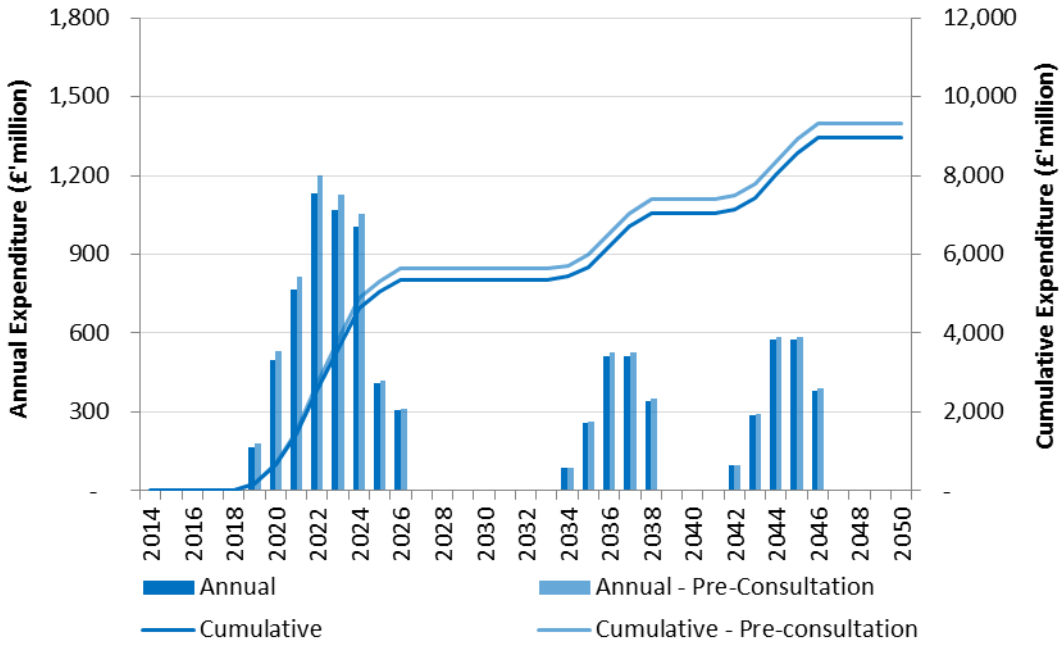

Figure 4-3 Assessment of Need Carbon Traded

4.1.3 Low Cost is King Carbon Traded

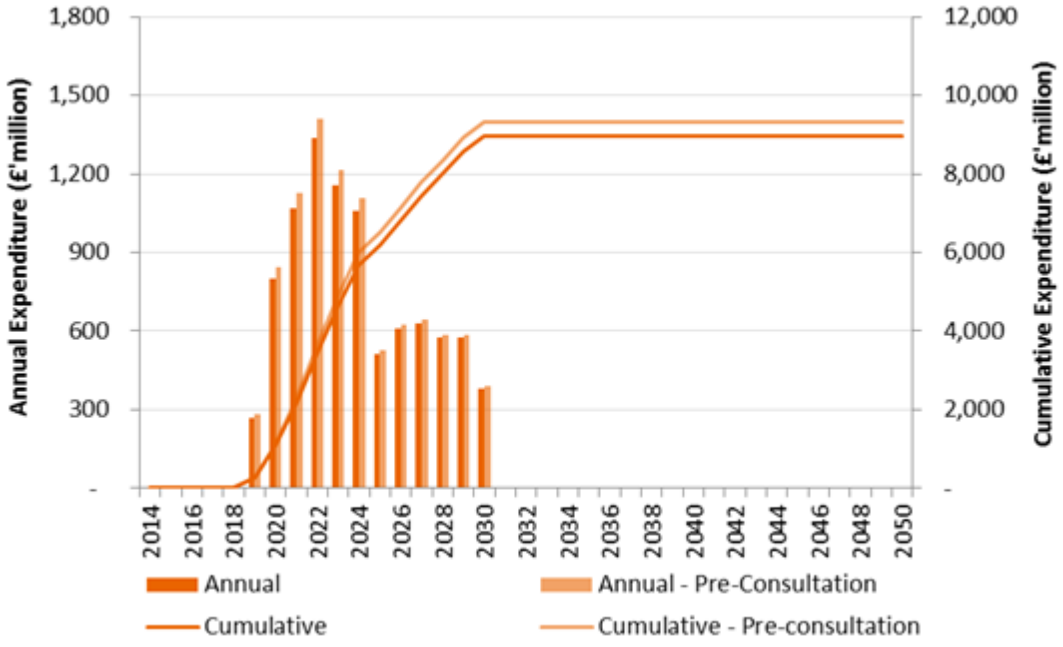

Figure 4-4 Low Cost is King Carbon Traded

4.1.4 Global Fragmentation Carbon Capped

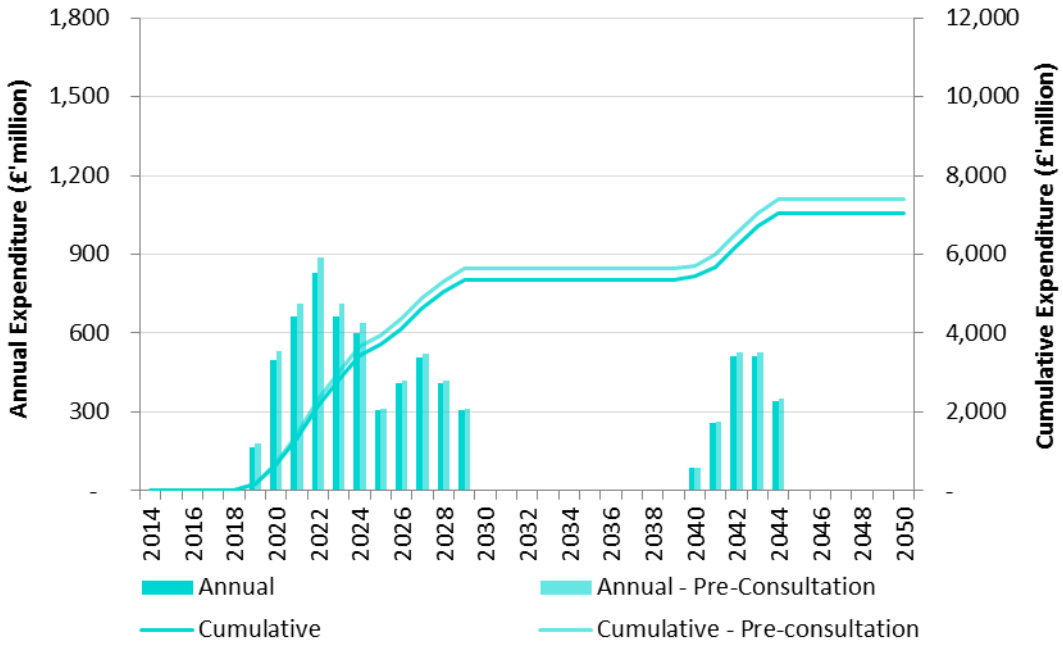

Figure 4-5 Global Fragmentation Carbon Capped

4.2 Annual Scheme Capital Expenditure Summaries

Table 4-2 to Table 4-5 on the following pages present the data underlying the previous figures with mitigated optimism bias. These tables are based upon the detailed breakdown presented in Appendix C, but, for the purpose of enabling the assessment of depreciation, summarises the total expenditure into the following headings. General costs itemised separately within the breakdown presented in Appendix C (enabling works, project management on-cost, etc.) are distributed across the headings below in proportion to their contribution to the total.

- *Terminal buildings: passenger terminal buildings including piers and satellites*
- *Plant: building plant (e.g. air conditioning, etc.) including utilities and power generation*
- *Transit systems: passenger transit systems above or below ground*
- *Runways: runway and associated instrument landing systems*
- *Taxiways and aprons: taxiways, aprons and their associated systems*
- *Equipment: mobile equipment and baggage handling installations*
- *Land: acquisition of land including commercial businesses and residential properties*
- *Airfield ancillary: other infrastructure elements, for example control tower, rescue and firefighting facilities, fencing, airside roads, etc.*
- *Car parks: all car parks whether multi-storey or surface*
- *Third party land users: provision of serviced plots for third party development*
- *Environment: river diversions and environmental compensation and mitigation*
- *Community: community impact compensation*

2014 real prices in £'million - including mitigated optimism bias

Scheme	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Terminal buildings	**1,231**	-	-	-	-	-	-	-	-	-	-	42	127	170	212	170	127	-	-	-	-	-	-	-	-	-	-	19	57	114	114	76	-	-	-	-	-	-
Plant	**298**	-	-	-	-	-	8	24	32	40	32	29	14	19	24	19	14	-	-	-	-	-	-	-	-	-	-	2	6	13	13	8	-	-	-	-	-	-
Tunnels and bridges	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transit systems	**638**	-	-	-	-	-	-	-	-	-	-	10	30	41	51	41	30	-	-	-	-	-	-	-	-	-	-	22	65	130	130	87	-	-	-	-	-	-
Runways	**127**	-	-	-	-	-	6	19	25	32	25	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiways and aprons	**644**	-	-	-	-	-	15	45	60	75	60	50	15	20	25	20	15	-	-	-	-	-	-	-	-	-	-	12	37	74	74	49	-	-	-	-	-	-
Equipment	**158**	-	-	-	-	-	0	1	1	1	1	6	14	19	24	19	14	-	-	-	-	-	-	-	-	-	-	3	9	17	17	12	-	-	-	-	-	-
Land	**1,126**	-	-	-	-	-	56	169	225	281	225	169	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Ancillary	**252**	-	-	-	-	-	8	24	31	39	31	28	12	16	20	16	12	-	-	-	-	-	-	-	-	-	-	1	2	4	4	3	-	-	-	-	-	-
Car Parks	**109**	-	-	-	-	-	-	-	-	-	-	3	8	10	13	10	8	-	-	-	-	-	-	-	-	-	-	3	9	18	18	12	-	-	-	-	-	-
Third Party Land Users	**16**	-	-	-	-	-	0	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	0	1	2	2	1	-	-	-	-	-	-
Environment	**378**	-	-	-	-	-	19	57	76	95	76	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community	**140**	-	-	-	-	-	7	21	28	35	28	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias	**921**	-	-	-	-	-	22	65	86	108	86	78	40	53	66	53	40	-	-	-	-	-	-	-	-	-	-	11	33	67	67	45	-	-	-	-	-	-
Risk	**1,023**	-	-	-	-	-	24	72	96	120	96	87	44	59	74	59	44	-	-	-	-	-	-	-	-	-	-	12	37	74	74	50	-	-	-	-	-	-
Total	**7,060**	**-**	**-**	**-**	**-**	**-**	**166**	**497**	**663**	**828**	**663**	**599**	**305**	**407**	**509**	**407**	**305**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**86**	**257**	**513**	**513**	**342**	**-**	**-**	**-**	**-**	**-**	**-**

Table 4-2 Assessment of Need Carbon Capped

2014 real prices in £'million - including mitigated optimism bias

Scheme	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Terminal buildings	**2,127**	-	-	-	-	-	-	-	42	127	170	212	170	127	-	-	-	-	-	-	-	19	57	114	114	76	-	-	-	45	134	269	269	179	-	-	-	-
Plant	**397**	-	-	-	-	-	8	24	37	54	51	48	19	14	-	-	-	-	-	-	-	2	6	13	13	8	-	-	-	5	15	30	30	20	-	-	-	-
Tunnels and bridges	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transit systems	**638**	-	-	-	-	-	-	-	10	30	41	51	41	30	-	-	-	-	-	-	-	22	65	130	130	87	-	-	-	-	-	-	-	-	-	-	-	-
Runways	**127**	-	-	-	-	-	6	19	25	32	25	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiways and aprons	**846**	-	-	-	-	-	15	45	65	90	80	70	20	15	-	-	-	-	-	-	-	12	37	74	74	49	-	-	-	10	30	61	61	40	-	-	-	-
Equipment	**281**	-	-	-	-	-	0	1	6	16	20	24	19	14	-	-	-	-	-	-	-	3	9	17	17	12	-	-	-	6	18	37	37	24	-	-	-	-
Land	**1,126**	-	-	-	-	-	56	169	225	281	225	169	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Ancillary	**252**	-	-	-	-	-	8	24	36	51	48	44	16	12	-	-	-	-	-	-	-	1	2	4	4	3	-	-	-	-	-	-	-	-	-	-	-	-
Car Parks	**168**	-	-	-	-	-	-	-	3	8	10	13	10	8	-	-	-	-	-	-	-	3	9	18	18	12	-	-	-	3	9	18	18	12	-	-	-	-
Third Party Land Users	**22**	-	-	-	-	-	0	1	1	2	2	2	1	1	-	-	-	-	-	-	-	0	1	2	2	1	-	-	-	0	1	2	2	1	-	-	-	-
Environment	**378**	-	-	-	-	-	19	57	76	95	76	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community	**140**	-	-	-	-	-	7	21	28	35	28	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias	**1,170**	-	-	-	-	-	22	65	100	148	140	131	53	40	-	-	-	-	-	-	-	11	33	67	67	45	-	-	-	12	37	75	75	50	-	-	-	-
Risk	**1,300**	-	-	-	-	-	24	72	111	164	155	146	59	44	-	-	-	-	-	-	-	12	37	74	74	50	-	-	-	14	42	83	83	55	-	-	-	-
Total	**8,971**	**-**	**-**	**-**	**-**	**-**	**166**	**497**	**765**	**1,134**	**1,070**	**1,006**	**407**	**305**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**86**	**257**	**513**	**513**	**342**	**-**	**-**	**-**	**96**	**287**	**573**	**573**	**382**	**-**	**-**	**-**	**-**

Table 4-3 Assessment of Need Carbon Traded

2014 real prices in £'million - including mitigated optimism bias

Scheme	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Terminal buildings	**2,127**	-	-	-	-	-	42	127	170	212	189	185	114	159	211	269	269	179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plant	**397**	-	-	-	-	-	13	38	51	64	53	45	13	18	23	30	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tunnels and bridges	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transit systems	**638**	-	-	-	-	-	10	30	41	51	62	96	130	130	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Runways	**127**	-	-	-	-	-	6	19	25	32	25	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiways and aprons	**846**	-	-	-	-	-	20	60	80	100	92	97	74	84	79	61	61	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	**281**	-	-	-	-	-	5	15	20	25	23	24	17	23	30	37	37	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	**1,126**	-	-	-	-	-	56	169	225	281	225	169	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Ancillary	**252**	-	-	-	-	-	12	36	48	59	48	38	4	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Car Parks	**168**	-	-	-	-	-	3	8	10	13	13	16	18	21	21	18	18	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Third Party Land Users	**22**	-	-	-	-	-	1	2	2	3	2	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Environment	**378**	-	-	-	-	-	19	57	76	95	76	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community	**140**	-	-	-	-	-	7	21	28	35	28	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias	**1,170**	-	-	-	-	-	35	105	140	174	151	138	67	79	82	75	75	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Risk	**1,300**	-	-	-	-	-	39	116	155	194	167	153	74	88	91	83	83	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**8,971**	**-**	**-**	**-**	**-**	**-**	**268**	**803**	**1,070**	**1,338**	**1,156**	**1,059**	**513**	**609**	**629**	**573**	**573**	**382**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Table 4-4 Low Cost is King Carbon Traded

2014 real prices in £'million - including mitigated optimism bias

Scheme	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Terminal buildings	**1,231**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	127	170	212	170	127	-	-	-	-	-	-	-	19	57	114	114	76	-	-	-
Plant	**298**	-	-	-	-	-	-	-	-	-	-	-	-	-	8	24	32	45	46	43	24	19	14	-	-	-	-	-	-	-	2	6	13	13	8	-	-	-
Tunnels and bridges	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transit systems	**638**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	30	41	51	41	30	-	-	-	-	-	-	-	22	65	130	130	87	-	-	-
Runways	**127**	-	-	-	-	-	-	-	-	-	-	-	-	-	6	19	25	32	25	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiways and aprons	**644**	-	-	-	-	-	-	-	-	-	-	-	-	-	15	45	60	80	75	65	25	20	15	-	-	-	-	-	-	-	12	37	74	74	49	-	-	-
Equipment	**158**	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	6	15	20	24	19	14	-	-	-	-	-	-	-	3	9	17	17	12	-	-	-
Land	**1,126**	-	-	-	-	-	-	-	-	-	-	-	-	-	56	169	225	281	225	169	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Ancillary	**252**	-	-	-	-	-	-	-	-	-	-	-	-	-	8	24	31	43	44	40	20	16	12	-	-	-	-	-	-	-	1	2	4	4	3	-	-	-
Car Parks	**109**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8	10	13	10	8	-	-	-	-	-	-	-	3	9	18	18	12	-	-	-
Third Party Land Users	**16**	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	2	2	2	1	1	1	-	-	-	-	-	-	-	0	1	2	2	1	-	-	-
Environment	**378**	-	-	-	-	-	-	-	-	-	-	-	-	-	19	57	76	95	76	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community	**140**	-	-	-	-	-	-	-	-	-	-	-	-	-	7	21	28	35	28	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias	**921**	-	-	-	-	-	-	-	-	-	-	-	-	-	22	65	86	121	126	118	66	53	40	-	-	-	-	-	-	-	11	33	67	67	45	-	-	-
Risk	**1,023**	-	-	-	-	-	-	-	-	-	-	-	-	-	24	72	96	135	140	131	74	59	44	-	-	-	-	-	-	-	12	37	74	74	50	-	-	-
Total	**7,060**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**166**	**497**	**663**	**930**	**968**	**904**	**509**	**407**	**305**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**86**	**257**	**513**	**513**	**342**	**-**	**-**	**-**

Table 4-5 Global Fragmentation Carbon Capped

Appendix A Glossary

Air passenger bridge	Moveable bridges connecting an aircraft to the passenger terminal via the “node” (see below).
Airfield pavements	Paved surfaces for the movement of aircraft (e.g. runways, taxiways, aprons).
Core	Investment in the airport irrespective of investment in the additional runway works
Demand scenarios	Please refer to the Economics and Strategic Fit Workstream for further details
GAL	Gatwick Airport Limited
Midfield terminal	Proposed new terminal constructed between the existing (northern) runway and proposed new southern runway.
mppa	million passengers per annum
Nodes	Fixed point and connection to the passenger terminal permitting connection to an aircraft via the “air passenger bridge” (see above).
Optimism bias	Please refer to Cost and Commercial Viability: Additional Analysis for further technical details and references
Post-consultation	Refers to assumptions and costing taking account of consultation responses
Pre-consultation	Refers to assumptions and costing as provided in *13. Cost and Commercial Viability: Cost and Revenue Identification*
Q6	Quinquennium 6 (2014 to 2018)
Q7	Quinquennium 7 (2019 to 2023)
Scheme	Investment in the additional runway works

Appendix B Optimism Bias

Upper bound values for combined projects

Project Type	CAPEX (%)	Upper Bound OB (%)	OB Contribution (%)	Resulting OB (%)
Standard Buildings	90	24	22	
Non-Standard Buildings	0	51		
Standard Civils	10	44	4	
Non-Standard Civils	0	66		
Equipment & Development	0	200		
Combined				**26.0**

CAPEX Contributory Factors	Standard Building optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)	Non-Standard Building optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)	Standard Civil Engineering optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)	Non-Standard Civil Engineering optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)	Equipment/ Development optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)
Procurement																				
Complexity of Contract Structure	-	0.8	-	-	1	0.8	0.8	0.2	-	0.8	-	-	-	0.8	-	-	7	0.8	5.6	1.4
Late Contractor Involvement in Design	2	0.95	1.9	0.1	2	0.95	1.9	0.1	3	0.95	2.9	0.2	-	0.95	-	-	7	0.95	6.7	0.4
Poor contractor Capabilities	9	0.95	8.6	0.5	5	0.95	4.8	0.3	-	0.95	-	-	-	0.95	-	-	4	0.95	3.8	0.2
Dispute and Claims Occurred	29	0.7	20.3	8.7	11	0.7	7.7	3.3	21	0.7	14.7	6.3	-	0.7	-	-	-	0.7	-	-
Information Management	-	0.8	-	-	-	0.8	-	-	-	0.8	-	-	-	0.8	-	-	5	0.8	4.0	1.0
Other (specify)	-	0.8	-	-	-	0.8	-	-	-	0.8	-	-	2	0.8	1.6	0.4	-	0.8	-	-
Project Specific																				
Design Complexity	1	0.9	0.9	0.1	3	0.9	2.7	0.3	-	0.9	-	-	8	0.9	7.2	0.8	10	0.9	9.0	1.0
Degree of Innovation	4	0.8	3.2	0.8	9	0.8	7.2	1.8	-	0.8	-	-	9	0.8	7.2	1.8	17	0.8	13.6	3.4
Environmental Impact	-	0.5	-	-	-	0.5	-	-	22	0.5	11.0	11.0	5	0.5	2.5	2.5	-	0.5	-	-
Other	-	0.5	-	-	5	0.5	2.5	2.5	18	0.5	9.0	9.0	-	0.5	-	-	-	0.5	-	-
Client Specific																				
Inadequacy of the Business Case	34	0.8	27.2	6.8	23	0.8	18.4	4.6	10	0.8	8.0	2.0	35	0.8	28.0	7.0	18	0.8	14.4	3.6
Funding Availability	-	0.8	-	-	-	0.8	-	-	-	0.8	-	-	5	0.8	4.0	1.0	-	0.8	-	-
Project Management Team	1	0.9	0.9	0.1	2	0.9	1.8	0.2	-	0.9	-	-	2	0.9	1.8	0.2	5	0.9	4.5	0.5
Poor Project Intelligence	2	0.8	1.6	0.4	6	0.8	4.8	1.2	7	0.8	5.6	1.4	9	0.8	7.2	1.8	4	0.8	3.2	0.8
Other - omitted (<1)	-	0.8	-	-	2	0.8	1.6	0.4	-	0.8	-	-	-	0.8	-	-	-	0.8	-	-
Environment																				
Public Relations	2	0.5	1.0	1.0	1	0.5	0.5	0.5	9	0.5	4.5	4.5	-	0.5	-	-	-	0.5	-	-
Site Characteristics	2	0.8	1.6	0.4	1	0.8	0.8	0.2	3	0.8	2.4	0.6	5	0.8	4.0	1.0	-	0.8	-	-
Permits/Consents/Approvals	-	0.8	-	-	3	0.8	2.4	0.6	-	0.8	-	-	-	0.8	-	-	-	0.8	-	-
External Influences																				
Economic	11	0.2	2.2	8.8	13	0.2	2.6	10.4	7	0.2	1.4	5.6	3	0.2	0.6	2.4	-	0.2	-	-
Legislation/Regulations	3	0.7	2.1	0.9	7	0.7	4.9	2.1	-	0.7	-	-	8	0.7	5.6	2.4	5	0.7	3.5	1.5
Technology	-	0.95	-	-	5	0.95	4.8	0.3	-	0.95	-	-	8	0.95	7.6	0.4	18	0.95	17.1	0.9
Other	-	0.5	-	-	2	0.5	1.0	1.0	-	0.5	-	-	1	0.5	0.5	0.5	-	0.5	-	-
	100			**28.6**	**101**			**29.9**	**100**			**40.6**	**100**			**22.2**	**100**			**14.7**

Adjusted Optimism Bias

Project Type	Percentage of CAPEX (%)	Mitigated OB (%)	OB contribution (%)	Resulting OB (%)
Standard Buildings	90	6.9	6.2	
Standard Civils	10	17.8	1.8	
Combined				**8.0**

Rounded to 10% for all schemes

Figure B-1 Core Works

Upper bound values for combined projects

Project Type	CAPEX (%)	Upper Bound OB (%)	OB Contribution (%)	Resulting OB (%)
Standard Buildings	56	24	14	
Non-Standard Buildings	2	51	1	
Standard Civils	25	44	11	
Non-Standard Civils	11	66	7	
Equipment & Development	6	200	12	
Combined				**44.9**

CAPEX Contributory Factors	Standard Building optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)	Non-Standard Building optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)	Standard Civil Engineering optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)	Non-Standard Civil Engineering optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)	Equipment/ Development optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)
Procurement																				
Complexity of Contract Structure	-	0.7	-	-	1	0.7	0.7	0.3	-	0.7	-	-	-	0.7	-	-	7	0.7	4.9	2.1
Late Contractor Involvement in Design	2	0.95	1.9	0.1	2	0.95	1.9	0.1	3	0.95	2.9	0.2	-	0.95	-	-	7	0.95	6.7	0.4
Poor contractor Capabilities	9	0.95	8.6	0.5	5	0.95	4.8	0.3	-	0.95	-	-	-	0.95	-	-	4	0.95	3.8	0.2
Dispute and Claims Occurred	29	0.7	20.3	8.7	11	0.7	7.7	3.3	21	0.7	14.7	6.3	-	0.7	-	-	-	0.7	-	-
Information Management	-	0.7	-	-	-	0.7	-	-	-	0.7	-	-	-	0.7	-	-	5	0.7	3.5	1.5
Other (specify)	-	0.6	-	-	-	0.6	-	-	-	0.6	-	-	2	0.6	1.2	0.8	-	0.6	-	-
Project Specific																				
Design Complexity	1	0.8	0.8	0.2	3	0.8	2.4	0.6	-	0.8	-	-	8	0.8	6.4	1.6	10	0.8	8.0	2.0
Degree of Innovation	4	0.9	3.6	0.4	9	0.9	8.1	0.9	-	0.9	-	-	9	0.9	8.1	0.9	17	0.9	15.3	1.7
Environmental Impact	-	0.5	-	-	-	0.5	-	-	22	0.5	11.0	11.0	5	0.5	2.5	2.5	-	0.5	-	-
Other	-	0.5	-	-	5	0.5	2.5	2.5	18	0.5	9.0	9.0	-	0.5	-	-	-	0.5	-	-
Client Specific																				
Inadequacy of the Business Case	34	0.7	23.8	10.2	23	0.7	16.1	6.9	10	0.7	7.0	3.0	35	0.7	24.5	10.5	18	0.7	12.6	5.4
Funding Availability	-	0.7	-	-	-	0.7	-	-	-	0.7	-	-	5	0.7	3.5	1.5	-	0.7	-	-
Project Management Team	1	0.9	0.9	0.1	2	0.9	1.8	0.2	-	0.9	-	-	2	0.9	1.8	0.2	5	0.9	4.5	0.5
Poor Project Intelligence	2	0.7	1.4	0.6	6	0.7	4.2	1.8	7	0.7	4.9	2.1	9	0.7	6.3	2.7	4	0.7	2.8	1.2
Other - omitted (<1)	-	0.6	-	-	2	0.6	1.2	0.8	-	0.6	-	-	-	0.6	-	-	-	0.6	-	-
Environment																				
Public Relations	2	0.2	0.4	1.6	1	0.2	0.2	0.8	9	0.2	1.8	7.2	-	0.2	-	-	-	0.2	-	-
Site Characteristics	2	0.5	1.0	1.0	1	0.5	0.5	0.5	3	0.5	1.5	1.5	5	0.5	2.5	2.5	-	0.5	-	-
Permits/Consents/Approvals	-	0.2	-	-	3	0.2	0.6	2.4	-	0.2	-	-	-	0.2	-	-	-	0.2	-	-
External Influences																				
Economic	11	0.2	2.2	8.8	13	0.2	2.6	10.4	7	0.2	1.4	5.6	3	0.2	0.6	2.4	-	0.2	-	-
Legislation/Regulations	3	0.7	2.1	0.9	7	0.7	4.9	2.1	-	0.7	-	-	8	0.7	5.6	2.4	5	0.7	3.5	1.5
Technology	-	0.95	-	-	5	0.95	4.8	0.3	-	0.95	-	-	8	0.95	7.6	0.4	18	0.95	17.1	0.9
Other	-	0.6	-	-	2	0.6	1.2	0.8	-	0.6	-	-	1	0.6	0.6	0.4	-	0.6	-	-
Weighted Total	**100**			**33.1**	**101**			**34.9**	**100**			**45.9**	**100**			**28.8**	**100**			**17.4**

Adjusted Optimism Bias

Project Type	Percentage of CAPEX (%)	Mitigated OB (%)	OB contribution (%)	Resultant OB (%)
Standard Buildings	57	7.9	4.5	
Non-Standard Buildings	4	17.8	0.6	
Standard Civils	25	20.2	5.1	
Non-Standard Civils	8	19.0	1.4	
Equipment & Development	7	34.7	2.3	
Combined				**14.0**

Rounded to 15% for all schemes

Figure B-2 Scheme Works

Appendix C Scheme Capital Cost Estimate Breakdown

The table on the pages C-2 to C-7 sets out the revised Scheme capital cost estimates following comments received during consultation. Total costs for all phases of construction are shown. Base costs are presented, exclusive of 'on costs', risk, and optimism bias which are itemised separately. The components of 'On costs' include enabling works (01.01.01), operational readiness (01.01.08 and 01.01.09), and project fees (01.06). Their treatment is described in Section 2.2.

As described in Section 3.1, the changes to Scheme costs are two-fold:

- *the amended cost of nodes and passenger boarding bridges is reflected in line item 01.01.04.003; and*
- *the reassessment of the airfield pavement area and associated costs, which is detailed in Table C-1 below.*

All other line items remain as forecast for consultation.

Gatwick 2R - Consultation Values				Gatwick 2R - Revised Values			Difference	
Cost Category	**Area (m2)**	**Rate (£/m2)**	**Cost (£)**	**Area (m2)**	**Rate (£/m2)**	**Cost (£)**	**Area (m2)**	**Cost (£)**
Taxiways & Aprons	**2,181,898**		**661,477,523**	**1,754,000**		**521,601,880**	**- 427,898**	**- 139,875,643**
Taxiways	984,471	292	287,731,339	769,000	292	224,755,630	- 215,471	- 62,975,709
End Around Taxiway (EAT's) Western end	113,400	276	31,315,410	67,000	276	18,502,050	- 46,400	- 12,813,360
Head of Stand roads and footway	53,340	167	8,893,912	109,000	167	18,174,660	55,660	9,280,748
Rapid exit taxiway	179,280	321	57,613,421	130,000	321	41,776,800	- 49,280	- 15,836,621
Rapid access taxiway	201,600	330	66,455,424	77,000	330	25,382,280	- 124,600	- 41,073,144
Runway crossing	30,117	420	12,658,175	26,000	420	10,927,800	- 4,117	- 1,730,375
Apron to new aircraft maintenance units	36,490	263	9,596,870	36,000	263	9,468,000	- 490	- 128,870
Code C Taxi lanes	124,200	343	42,620,472	91,000	343	31,227,560	- 33,200	- 11,392,912
Code E Taxi lanes	318,000	316	100,360,800	282,000	316	88,999,200	- 36,000	- 11,361,600
GSE Parking Areas	141,000	314	44,231,700	167,000	314	52,387,900	26,000	8,156,200
Stands	**352,000**		**132,701,120**	**481,000**		**181,482,080**	**129,000**	**48,780,960**
Code C - Midfield	120,000	365	43,761,600	156,000	365	56,890,080	36,000	13,128,480
Code E (MARS), Midfield	232,000	383	88,939,520	325,000	383	124,592,000	93,000	35,652,480
Airfield pavement	**2,533,898**		**794,178,643**	**2,235,000**		**703,083,960**	**- 298,898**	**- 91,094,683**

Table C-1 Revised Airfield Pavement Areas

As discussed in Section 4, the Assessment of Need Carbon Capped and Global Fragmentation Carbon Capped demand scenarios do not require the build-out of all phases. The final phase of works, required in the other two scenarios, includes the further development of the terminal buildings (including satellite and piers) and the associated taxiway, apron and car parking infrastructure.

Ref No	Description	Quantity	Unit	Rate	Total
GAL	Gatwick Airport (Jacobs Estimate)				8,971,342,263
01.	Investment Costs				6,500,972,654
01.01.	Airport Infrastructure Construction				4,379,399,009
01.01.01.	Enabling Works				*149,302,409*
01.01.01.0001.	Site preparation comprising topsoil strip and breaking out existing landside roads and parking areas				*45,248,193*
01.01.01.0001.0010	Site strip of soft ground and remove to spoil for reuse	6,398,000	m2	3	17,146,640
01.01.01.0001.0020	Break up and disposal Staff car parks X, V, Z overflow, R G W J	40,611	m2	21	832,932
01.01.01.0001.0030	Break up and disposal Public car parks; Long stay zones A-G & U-Z, Holiday, Courtlands & Summer special, Coach park, Valet south, including access roads	577,000	m2	21	11,834,270
01.01.01.0001.0040	Break up and disposal of paved areas in City Place Area	155,170	m2	21	3,182,537
01.01.01.0001.0050	Break up and disposal of paved areas in Lowfield Heath Place Area	102,102	m2	21	2,094,112
01.01.01.0001.0060	Break up and disposal of paved areas in Gatwick Manor Place Area	8,580	m2	21	175,976
01.01.01.0001.0070	Break up and disposal of paved areas in BCP Airparks Area at west end - approx. 350mx125m	43,750	m2	21	897,313
01.01.01.0001.0080	Break up and disposal of paved areas in Gatwick Road North Area	26,100	m2	21	535,311
01.01.01.0001.0090	Break-out and dispose of existing A23 including all associated infrastructure, 3.6km	108,000	m2	21	2,215,080
01.01.01.0001.0100	Break-out and dispose of existing Charlwood Road, 950m	5,700	m2	21	116,907
01.01.01.0001.0110	Strip Balcombe Road from Radford Road to M23 spur road – Assumption – Allowance; 1800m	10,800	m2	21	221,508
01.01.01.0001.0120	Strip Steers Lane – 600m	3,720	m2	21	76,297
01.01.01.0001.0130	Strip Antlands Lane – 550m	4,400	m2	21	90,244
01.01.01.0001.0140	Strip Peeks Brook Lane – 1200m	7,200	m2	21	147,672
01.01.01.0001.0150	Strip Church Lane – 250m	1,500	m2	21	30,765
01.01.01.0001.0160	Strip Fernihill Road – 700m	4,200	m2	21	86,142
01.01.01.0001.0170	Strip Donkey Lane – 200m	206	m2	21	4,225
01.01.01.0001.0180	Strip Bonnets Lane – 1200m	12,000	m2	21	246,120
01.01.01.0001.0190	Strip out existing utilities beneath redundant road surfaces	15,736	m	53	827,714
01.01.01.0001.0200	Allowance for disposal of contaminated material off site comprising asphalt surfaces at 33% of the road thickness	100,796	m3	45	4,486,430
01.01.01.0001.0210	Site clearance		m2	21	
01.01.01.0002.	Demolitions - within GAL boundary				*10,911,081*
01.01.01.0002.0010	22018 NT LSCP Admin Building	1	sum	28,404	28,404
01.01.01.0002.0020	20603 NT LSCP Block Park Admin Building	1	sum	14,202	14,202
01.01.01.0002.0030	22085 Summer Special Admin Building	1	sum	18,936	18,936
01.01.01.0002.0040	41209 Viking House	1	sum	260,370	260,370
01.01.01.0002.0050	20020 Building 583A	1	sum	18,936	18,936
01.01.01.0002.0060	20021 Building 583B	1	sum	28,404	28,404
01.01.01.0002.0070	20023 Building 583C	1	sum	14,202	14,202
01.01.01.0002.0080	20025 Building 583D	1	sum	23,670	23,670
01.01.01.0002.0090	20534 Bomb Defusing Building	1	sum	2,367	2,367
01.01.01.0002.0100	41208 Tinsley House	1	sum	175,158	175,158
01.01.01.0002.0110	20063 New Engineering Stores	1	sum	94,680	94,680
01.01.01.0002.0120	20238 & 20062 Marco Workshop & Admin Building	1	sum	23,670	23,670
01.01.01.0002.0130	20706 Coached Departures Building	1	sum	246,168	246,168
01.01.01.0002.0140	20222 ST Sanitation Block	1	sum	4,734	4,734
01.01.01.0002.0150	20515 Sub-station J	1	sum	52,600	52,600
01.01.01.0002.0160	20266 Sub-station L	1	sum	52,600	52,600
01.01.01.0002.0170	20331 Sub-station H	1	sum	52,600	52,600
01.01.01.0002.0180	20591 Sub-station AS	1	sum	52,600	52,600
01.01.01.0002.0190	20230 Sub-station G	1	sum	52,600	52,600
01.01.01.0002.0200	20228 Sub-station E	1	sum	52,600	52,600
01.01.01.0002.0210	22020 Sub-station BTF (BE)	1	sum	52,600	52,600
01.01.01.0002.0220	22128 Pumping Station 07	1	sum	31,560	31,560
01.01.01.0002.0230	22127 Pumping Station 06	1	sum	31,560	31,560
01.01.01.0002.0240	22204 Pumping Station 45	1	sum	31,560	31,560
01.01.01.0002.0250	22199 Pumping Station 41	1	sum	31,560	31,560
01.01.01.0002.0260	2142 Pumping Station 25	1	sum	31,560	31,560
01.01.01.0002.0270	22201 Pumping Station 42	1	sum	31,560	31,560
01.01.01.0002.0280	20229 Pumping Station 24	1	sum	31,560	31,560
01.01.01.0002.0290	22143 Pumping Station 26	1	sum	31,560	31,560

Ref No	Description	Quantity	Unit	Rate	Total
01.01.01.0002.0300	22147 Pumping Station 33	1	sum	31,560	31,560
01.01.01.0002.0310	Allowance for power diversions during demolition, alterations and relocation of sub station	1	sum	9,205,000	9,205,000
01.01.01.0002.0320	Demolition of river gates	1	sum	78,900	78,900
01.01.01.0002.0330	Demolition of steel structure over inverted syphon	1	sum	21,040	21,040
01.01.01.0003.	Demolitions - outside of GAL boundary				*26,774,452*
01.01.01.0003.0010	Domestic properties on Radford Road	44	Nr	21,040	925,760
01.01.01.0003.0020	Domestic properties on Balcombe Road	43	Nr	21,040	904,720
01.01.01.0003.0030	Industrial properties on Antlands Road	1	sum	157,800	157,800
01.01.01.0003.0040	Domestic properties on Peeks Brook Lane	28	Nr	21,040	589,120
01.01.01.0003.0050	Industrial properties on Peeks Brook Lane	1	sum	315,600	315,600
01.01.01.0003.0060	Industrial properties on Balcombe Road	1	sum	52,600	52,600
01.01.01.0003.0070	Demolish existing APM structure from South Terminal to approximately 250m North	2,000	m2	526	1,052,000
01.01.01.0003.0080	Demolish existing South Terminal APM transit station	3,000	m2	158	473,400
01.01.01.0003.0090	Demolish existing South Terminal APM transit station walkway	600	m2	158	94,680
01.01.01.0003.0100	Office Buildings at City Place (Assume 4 levels)	1	sum	3,787,200	3,787,200
01.01.01.0003.0110	Industrial Buildings at City Place	1	sum	568,080	568,080
01.01.01.0003.0120	MSCP at City Place	1	sum	284,040	284,040
01.01.01.0003.0130	Industrial Buildings at Lowfield Heath	1	sum	2,840,400	2,840,400
01.01.01.0003.0140	Travel Lodge Hotel at Lowfield Heath	1	sum	473,400	473,400
01.01.01.0003.0150	BCP Airparks Buildings	1	sum	37,872	37,872
01.01.01.0003.0160	BCP Airparks MSCP	1	sum	1,893,600	1,893,600
01.01.01.0003.0170	Gatwick Manor Buildings and Premier Inn	1	sum	378,720	378,720
01.01.01.0003.0180	TUI building adjacent to Astral Towers	1	sum	710,100	710,100
01.01.01.0003.0190	Industrial Buildings Gatwick Road North	1	sum	4,734,000	4,734,000
01.01.01.0003.0200	Residential / Farm Properties	1	sum	1,052,000	1,052,000
01.01.01.0003.0210	Premier Inn in Balcombe Road	1	sum	189,360	189,360
01.01.01.0003.0220	Allowance for disconnections or temporary diversions in relation to demolished buildings	1	sum	5,260,000	5,260,000
01.01.01.0005.	Airfield other				*66,368,683*
01.01.01.0005.0010	Cut or excavation from stockpile and fill to make levels on new airfield	5,800,235	m3	4	24,883,008
01.01.01.0005.0020	Extra over for ground stabilisation; top 300mm mixed with Lime and Cement	2,191,281	m2	12	26,470,674
01.01.01.0005.0030	Landscaping	3,500,000	m2	4	15,015,000
01.01.02.	**Airfield**				***802,147,013***
01.01.02.0001.	Runway				*51,281,155*
01.01.02.0001.0010	Runway	204,000	m2	218	44,423,040
01.01.02.0001.0020	Runway shoulders	43,326	m2	114	4,922,700
01.01.02.0001.0030	Runway extension / modification	6,847	m2	261	1,789,258
01.01.02.0001.0040	Runway shoulders	1,072	m2	136	146,156
01.01.02.0002.	Taxiways & Aprons				*521,601,880*
01.01.02.0002.0010	Taxiways	769,000	m2	292	224,755,630
01.01.02.0002.0020	End Around Taxiway (EAT's) Western end	67,000	m2	276	18,502,050
01.01.02.0002.0030	Head of Stand roads and footway	109,000	m2	167	18,174,660
01.01.02.0002.0040	Rapid exit taxiway	130,000	m2	321	41,776,800
01.01.02.0002.0050	Rapid access taxiway	77,000	m2	330	25,382,280
01.01.02.0002.0060	Runway crossing	26,000	m2	420	10,927,800
01.01.02.0002.0070	Apron to new aircraft maintenance units	36,000	m2	263	9,468,000
01.01.02.0002.0080	Code C Taxi lanes	91,000	m2	343	31,227,560
01.01.02.0002.0090	Code E Taxi lanes	282,000	m2	316	88,999,200
01.01.02.0002.0100	GSE Parking Areas	167,000	m2	314	52,387,900
01.01.02.0003.	Stands				*181,482,080*
01.01.02.0003.0010	Code C - Midfield	156,000	m2	365	56,890,080
01.01.02.0003.0020	Code E and F (MARS), Midfield	325,000	m2	383	124,592,000
01.01.02.0004.	Airfield instrumentation				*47,781,898*
01.01.02.0004.0010	Instrument Landing System (ILS) comprising 1nr localiser and 1nr glide path	4	Nr	2,445,900	9,783,600
01.01.02.0004.0020	Fibre link from MLS to new control tower	1	sum	526,000	526,000
01.01.02.0004.0030	Distance Measuring Equipment (DME)	1	Nr	3,534,720	3,534,720
01.01.02.0004.0040	Surface Movement Radar	1	Nr	4,439,440	4,439,440
01.01.02.0004.0050	Instrumented Runway Visual Range (IRVR)	4	Nr	326,120	1,304,480
01.01.02.0004.0060	VHF Receiver Aerial	1	Nr	631,200	631,200
01.01.02.0004.0070	Digitally Resolved Direction Finder	1	Nr	3,156,000	3,156,000
01.01.02.0004.0080	Landing lighting set, end of runway	3	Nr	3,261,200	9,783,600
	Runway and taxiway lighting	2,437,143	m2	6	14,622,858

Ref No	Description	Quantity	Unit	Rate	Total
01.01.03.	**Airfield Ancillary Facilities**				*149,610,842*
01.01.03.0001.	Air Traffic Control				*30,497,480*
01.01.03.0001.0010	Control Tower and ATC Facilities; height 46m	1	sum	19,356,800	19,356,800
01.01.03.0001.0050	Apron Control Centre	5,000	m2	1,262	6,312,000
01.01.03.0001.0090	Airfield Operations building	1,500	m2	3,219	4,828,680
01.01.03.0002.	Security				*15,234,897*
01.01.03.0002.0010	Remove existing perimeter RZ fencing	5,190	m	26	136,497
01.01.03.0002.0020	New perimeter RZ fencing	10,164	m	600	6,098,400
01.01.03.0002.0030	External Security gate / control point	3	Nr	3,000,000	9,000,000
01.01.03.0003.	Rescue & Fire Fighting				*4,734,000*
01.01.03.0003.0040	Fire Crash & Rescue (FCR) station	2,500	m2	1,894	4,734,000
01.01.03.0004.	Fuel Systems				*0*
01.01.03.0005.	De-Icing & Snow Clearance				*29,317,850*
01.01.03.0005.0030	De-icing facility	1	sum	24,000,000	24,000,000
01.01.03.0005.0040	New Mid-Field Snow Base	2,500	m2	2,127	5,317,850
01.01.03.0006.	Serviced areas for ancillary facilities e.g. Hotels, Offices, Cargo Buildings, Hangars, etc				*18,263,300*
01.01.03.0006.0080	Serviced areas for ancillary facilities e.g. Hotels, Offices, Cargo Buildings, Hangars, etc	182,633	m2	100	18,263,300
01.01.03.0007.	Surface Water Drainage				*33,845,218*
01.01.03.0007.0010	Drainage	2,191,281	m2	5	10,583,887
01.01.03.0007.0020	Replacement of pumping stations	9	Nr	526,000	4,734,000
01.01.03.0007.0030	NW Zone balancing ponds for clean and contaminated; 564,500m3 capacity	1	sum	10,520,000	10,520,000
01.01.03.0007.0040	Gravity main connection connecting to network for Pond D and TWSTP	800	m	126	100,992
01.01.03.0007.0050	Underground attenuation at east side, 144,000m3 capacity	1	sum	6,854,339	6,854,339
01.01.03.0007.0060	Water quality monitoring station	1	sum	1,052,000	1,052,000
01.01.03.0008.	Noise control				*17,718,097*
01.01.03.0008.0010	Concrete Noise Wall	308	m	6,312	1,944,096
01.01.03.0008.0020	Earth bund	2,849	m	5,537	15,774,001
01.01.04.	**Terminal Buildings**				*2,031,973,295*
01.01.04.0001.	Terminals				*1,063,614,067*
01.01.04.0001.0010	New Terminal	228,385	m2	4,583.47	1,046,795,796
01.01.04.0001.0020	New Terminal - fitout ONLY	228,385	m2	73.64	16,818,271
01.01.04.0001.0030	Remote Pier (temporary facility)		m2	2,893	0
01.01.04.0002.	Piers & Satellites				*839,416,215*
01.01.04.0002.0010	Contact Pier	51,325	m2	5,035	258,420,349
01.01.04.0002.0020	Remote Pier	118,008	m2	4,923	580,995,867
01.01.04.0003.	Fixed Links, VCC, Rotunda/Nodes, PCA and Airbridges				*128,943,013*
01.01.04.0003.0030	Fixed links	67	Nr	368,200	24,669,400
01.01.04.0003.0040	Nodes (Rotunda)	67	Nr	731,994	49,043,613
01.01.04.0003.0050	Passenger Boarding Bridge (PBB)	105	Nr	526,000	55,230,000
01.01.05.	**Airside Infrastructure**				*403,227,038*
01.01.05.0001.	Access Roads				*30,490,546*
01.01.05.0001.0010	Airside Roads	5,000	m	4,000	20,000,000
01.01.05.0001.0020	Airside Roads - Perimeter Security Road	10,450	m	1,004	10,490,546
01.01.05.0010.	Airside APM				*372,736,492*
	Sub-surface APM New Terminal and Remote Pier				
01.01.05.0010.0010	Cut and cover tunnel, excluding fit out	1,855	m	30,929	57,372,924
01.01.05.0010.0020	Guideway system and fit out	1,855	m	42,922	79,619,568
	Station construction	2	Nr	50,000,000	100,000,000
01.01.05.0010.0030	Station fit out	2	Nr	30,000,000	60,000,000
01.01.05.0010.0040	Sub-surface maintenance facility remote pier	1	sum	25,248,000	25,248,000
01.01.05.0010.0050	Rolling stock; 4 cars each per set	32	each	1,578,000	50,496,000
01.01.06.	**Landside Infrastructure**				*541,424,812*
01.01.06.0001.	Landside APM - Continuous system from NT to MFT				*174,850,034*
	North Terminal to South Terminal				
01.01.06.0001.0010	Extend existing NT Transit station to accommodate new train length	270	m2	4,208	1,136,160
01.01.06.0001.0020	Upgrade existing retained station systems	1	Nr	1,683,200	1,683,200
01.01.06.0001.0030	Upgrade existing retained guidance system	1,070	m	11,572	12,382,040
01.01.06.0001.0040	New sub-structure supports	5	Nr	105,200	526,000
01.01.06.0001.0050	Realign existing bridge deck units to new continuous APM alignment South Terminal to Mid-field Terminal	1	sum	526,000	526,000
01.01.06.0001.0060	New elevated APM guideway connecting new Terminal to South Terminal	500	m	29,231	14,615,285

Ref No	Description	Quantity	Unit	Rate	Total
01.01.06.0001.0070	New at grade APM guideway connecting existing system North of ST to new Terminal	1,400	m	6,733	9,425,920
01.01.06.0001.0080	Guideway system and fit out	1,900	m	33,138	62,962,200
01.01.06.0001.0090	VCC ST Railway Station to APM ST Station: Lifts	6	Nr	263,000	1,578,000
01.01.06.0001.0100	VCC ST Railway Station to APM ST Station: Escalators	6	Nr	105,200	631,200
01.01.06.0001.0110	New APM Station, 75m x 18m = 1,350m2 each	2	Nr	5,680,800	11,361,600
01.01.06.0001.0120	Station fit out	2	Nr	6,919,214	13,838,429
01.01.06.0001.0130	Rolling stock; 4 cars each per set	28	Nr	1,578,000	44,184,000
01.01.06.0002.	**Car Parks**				*144,055,620*
01.01.06.0002.0010	Car Park - Surface Parking	49,350	Spaces	1,578	77,874,300
01.01.06.0002.0020	Car Park - Surface Parking - EO for Decking	5,520	Spaces	526	2,903,520
01.01.06.0002.0030	Multi Storey Car Park	3,500	Spaces	12,624	44,184,000
01.01.06.0002.0040	Staff car parking - replacement of X, V, Z OVERFLOW, R, G, W, & J	12,100	Spaces	1,578	19,093,800
01.01.06.0003.	**Power Generation**				*84,160,000*
01.01.06.0003.0010	New Energy Centre, 37MW	1	sum	52,600,000	52,600,000
01.01.06.0003.0020	Anaerobic Digestion Plant	1	sum	21,040,000	21,040,000
01.01.06.0003.0030	District Heating Pipework from Energy Centre to New Midfield Terminal and Satellite, including service tunnel below railway line	1	sum	10,520,000	10,520,000
01.01.06.0004.	**Utilities**				*41,238,400*
01.01.06.0004.0010	Upgrade sub station AF	1	sum	10,520,000	10,520,000
01.01.06.0004.0020	Upgrade sub station BF	1	sum	12,624,000	12,624,000
01.01.06.0004.0030	Water provision to new terminal	1	sum	1,052,000	1,052,000
01.01.06.0004.0040	Reinstatement of electrical capacity previously handed back to UKPN	1	sum	12,624,000	12,624,000
01.01.06.0004.0050	Gas connection to site and on site distribution to new terminal	1	sum	1,052,000	1,052,000
01.01.06.0004.0060	Telecoms to new terminal	1	sum	1,052,000	1,052,000
01.01.06.0004.0070	Alterations to existing sub-stations	1	sum	210,400	210,400
01.01.06.0004.0080	Foul drainage network from New Terminal and Piers to Thames Water WwTW East of Railway	1	sum	2,104,000	2,104,000
01.01.06.0006.	**Airport Roads (GAL)**				*10,772,480*
01.01.06.0006.0010	Landside Road Tunnels - car park connections beneath A23	2	Nr	3,682,000	7,364,000
01.01.06.0006.0020	Services road to New Terminal	1,800	m2	1,894	3,408,480
01.01.06.0007.	**Facilities**				*31,328,560*
01.01.06.0007.0010	Public transport interchange (PTI)	1	sum	13,150,000	13,150,000
01.01.06.0007.0020	Landside / Airside vehicle control point	3	Nr	1,052,000	3,156,000
01.01.06.0007.0030	Transport Maintenance Base	1,500	m2	1,473	2,209,200
01.01.06.0007.0040	Taxi Feeder	1,500	m2	126	189,360
01.01.06.0007.0050	ST Consolidated Car Rental Facility	1,000	Spaces	12,624	12,624,000
01.01.06.0008.	**Principle Water Course Permanent Diversions**				*55,019,718*
01.01.06.0008.0010	Water Courses - Crawters Brook	2,551	m	4,301	10,970,780
01.01.06.0008.0020	Water Courses - River Mole	3,700	m	7,408	27,410,266
01.01.06.0008.0030	Allowance for structural shoulders	1	sum	526,000	526,000
01.01.06.0008.0040	Re-use of excavated material to infill disused river beds	47,700	m3	2.1	100,170
01.01.06.0008.0050	Allowance for habitat reprovisions	1	sum	2,104,000	2,104,000
01.01.06.0008.0060	Allowance for contribution to Ifield Lake project	1	sum	5,260,000	5,260,000
01.01.06.0008.0070	Disposal of excavated material off site surplus to requirement; assume inert	818,061	m3	11	8,606,002
01.01.06.0008.0080	Stop-off ends of existing River Mole Culvert	12	m2	473	5,681
01.01.06.0008.0090	Filling shaft to inverted syphon	500	m3	74	36,820
01.01.07.	**Equipment**				***240,697,600***
01.01.07.0001.	**De-Icing & Snow Clearance Equipment**				*6,312,000*
01.01.07.0001.0010	Snow clearing and de-icing plant	15	Nr	420,800	6,312,000
01.01.07.0002.	**Rescue & Fire Fighting**				*2,945,600*
01.01.07.0002.0020	Fire Engines	8	Nr	368,200	2,945,600
01.01.07.0003.	**Baggage Handling Systems**				*231,440,000*
01.01.07.0003.0010	Centralised baggage handling system - Mid Field	1	sum	231,440,000	231,440,000
01.01.08.	**Operational Commissioning**				***39,976,000***
01.01.08.0001.	**M&E services**				*18,410,000*
01.01.08.0001.0010	Comprising: Electrical, Mechanical, Comms & Operations	1	sum	18,410,000	18,410,000
01.01.08.0002.	**Airfield**				*4,208,000*
01.01.08.0002.0010	Comprising: Runway, Taxi ways & Stands	1	sum	4,208,000	4,208,000
01.01.08.0003.	**Baggage**				*2,104,000*
01.01.08.0003.0010	Comprising: Automated BHS & Operations	1	sum	2,104,000	2,104,000
01.01.08.0004.	**APM**				*1,052,000*
01.01.08.0004.0010	Comprising: APM airside & APM landside	1	sum	1,052,000	1,052,000

Ref No	Description	Quantity	Unit	Rate	Total
01.01.08.0005.	Passenger flow and security				*3,682,000*
01.01.08.0005.0010	Comprising: Terminal & Piers	1	sum	3,682,000	3,682,000
01.01.08.0006.	Flight systems				*10,520,000*
01.01.08.0006.0010	Comprising: Network testing by GAL & Third party ICS testing	1	sum	10,520,000	10,520,000
01.01.09.	**Operational Handover**				***21,040,000***
01.01.09.0001.	Proving trials by area				*21,040,000*
01.01.09.0001.0010	BHS, Terminals, Piers, Aprons & Runway	1	sum	21,040,000	21,040,000
01.02.	**Purchase of Land & Existing Infrastructure**				**877,740,930**
01.02.01.	**Purchase of Land & Existing Infrastructure**				***877,740,930***
01.02.01.0001.	Land Purchase				*846,023,130*
01.02.01.0001.0010	PCE, as advised by Deloitte	1	sum	846,023,130	846,023,130
01.02.01.0009.	Reprovision of removed facilities				*31,717,800*
01.02.01.0009.0010	22018 NT LSCP Admin Building	1	sum	1,136,160	1,136,160
01.02.01.0009.0020	20603 NT LSCP Block Park Admin Building	1	sum	568,080	568,080
01.02.01.0009.0030	22085 Summer Special Admin Building	1	sum	757,440	757,440
01.02.01.0009.0040	20020 Building 583A	1	sum	757,440	757,440
01.02.01.0009.0050	20021 Building 583B	1	sum	1,136,160	1,136,160
01.02.01.0009.0060	20023 Building 583C	1	sum	568,080	568,080
01.02.01.0009.0070	20025 Building 583D	1	sum	946,800	946,800
01.02.01.0009.0080	41208 Tinsley House	1	sum	7,006,320	7,006,320
01.02.01.0009.0090	20063 New Engineering Stores	1	sum	3,787,200	3,787,200
01.02.01.0009.0100	20238 & 20062 Marco Workshop & Admin Building	1	sum	946,800	946,800
01.02.01.0009.0110	20706 Coached Departures Building	1	sum	9,846,720	9,846,720
01.02.01.0009.0120	20222 ST Sanitation Block	1	sum	1,052,000	1,052,000
01.02.01.0009.0130	20515 Sub-station J	1	sum	157,800	157,800
01.02.01.0009.0140	20266 Sub-station L	1	sum	1,209,800	1,209,800
01.02.01.0009.0150	20331 Sub-station H	1	sum	157,800	157,800
01.02.01.0009.0160	20591 Sub-station AS	1	sum	157,800	157,800
01.02.01.0009.0170	20230 Sub-station G	1	sum	1,209,800	1,209,800
01.02.01.0009.0180	20228 Sub-station E	1	sum	157,800	157,800
01.02.01.0009.0190	22020 Sub-station BTF (BE)	1	sum	157,800	157,800
01.04.	**Environmental Compensation & Mitigation**				**274,086,855**
01.04.01.	**Environmental Compensation & Mitigation**				***274,086,855***
01.04.01.0001.	Environmental Compensation & Mitigation				*250,000,000*
01.04.01.0001.0010	Environmental Compensation & Mitigation	1	sum	250,000,000	250,000,000
01.04.01.0007.	Archaeology/ Ecology / Heritage				*5,786,000*
01.04.01.0007.0010	Archaeology	1	sum	2,104,000	2,104,000
01.04.01.0007.0020	Ecology	1	sum	2,630,000	2,630,000
01.04.01.0007.0030	Architectural Heritage	1	sum	1,052,000	1,052,000
01.04.01.0008.	Obstacle clearances				*18,300,855*
01.04.01.0008.0010	High trees for new flight path outside of land take	1	sum	526,000	526,000
01.04.01.0008.0020	Removal of Feeder Park wood	23,400	m2	5	123,084
01.04.01.0008.0030	Removal The Grove wood	9,350	m2	5	49,181
01.04.01.0008.0040	Removal Horleyland wood	90,000	m2	5	473,400
01.04.01.0008.0050	Removal Allens wood	85,100	m2	5	447,626
01.04.01.0008.0060	Removal Furze Fields wood	68,000	m2	5	357,680
01.04.01.0008.0070	Allowance for re provision of woodland at 2 times the area removed	1,051,700	m2	11	11,063,884
01.04.01.0008.0080	Allowance for other heritage and nature conservation	1	sum	5,260,000	5,260,000
01.05.	**Community Impacts**				**121,792,905**
01.05.01.	**Community Impacts**				***121,792,905***
01.05.01.0001.	Compensation/Blight				*25,460,168*
01.05.01.0001.0010	HoSS, as per Deloitte report	1	sum	2,076,200	2,076,200
01.05.01.0001.0020	Allowance for Blight, Property Market Bond Scheme, etc.	1	sum	23,383,968	23,383,968
01.05.01.0002.	Levies & 106 Agreements				*61,332,737*
01.05.01.0002.0010	Section 106 & 278	1	sum	44,053,398	44,053,398
01.05.01.0002.0020	Section 60	1	sum	11,013,349	11,013,349
01.05.01.0002.0030	Building regulations and planning control	1	sum	6,265,990	6,265,990
01.05.01.0003.	Other Community				*35,000,000*
01.05.01.0003.0010	Other Community	1	sum	35,000,000	35,000,000
01.06.	**Project / Design Team Fees**				**847,952,955**
01.06.01.	**Project / Design Team Fees**				*847,952,955*
01.06.01.0001.	Project Team Fees	15%			*847,952,955*
01.06.01.0001.0010	Project / Design Team Fees on 01.01				656,909,851
01.06.01.0001.0020	Project / Design Team Fees on 01.02				131,661,140
01.06.01.0001.0030	Project / Design Team Fees on 01.03				0
01.06.01.0001.0040	Project / Design Team Fees on 01.04				41,113,028

Ref No		Description	Quantity	Unit	Rate	Total
	01.06.01.0001.0050	Project / Design Team Fees on 01.05				18,268,936
03.		**Risks & Optimism Bias**				**2,470,369,609**
03.01.		**Risks (Design, Construction & Employer Risk)**				**1,300,194,531**
03.01.01.		Risks (Design, Construction & Employer Risk)				*1,300,194,531*
03.01.01.0001.		Risks (Design, Construction & Employer Risk)	20%			*1,300,194,531*
	03.01.01.0001.0010	Risk Contingency on 01.01				1,007,261,772
	03.01.01.0001.0020	Risk Contingency on 01.02				201,880,414
	03.01.01.0001.0030	Risk Contingency on 01.03				0
	03.01.01.0001.0040	Risk Contingency on 01.04				63,039,977
	03.01.01.0001.0050	Risk Contingency on 01.05				28,012,368
03.02.		**Optimism Bias**				**1,170,175,078**
03.02.01.		Optimism Bias				*1,170,175,078*
03.02.01.0001.		Optimism Bias	15%			*1,170,175,078*
	03.02.01.0001.0010	Optimism Bias on 01.01				906,535,595
	03.02.01.0001.0020	Optimism Bias on 01.02				181,692,373
	03.02.01.0001.0030	Optimism Bias on 01.03				0
	03.02.01.0001.0040	Optimism Bias on 01.04				56,735,979
	03.02.01.0001.0050	Optimism Bias on 01.05				25,211,131

Appendix D Approach to Core and Asset Replacement Capital Expenditure

D.1 Core Works

The approach to the Core works and Asset Replacement estimates was based upon the estimates provided by GAL. This approach recognised that GAL has greater knowledge relating to the condition of the current assets and the detail of its plans in the absence of the second runway Scheme works. However, recognising The Green Book guidance to correct for the systematic tendency for project appraisers to be overly optimistic, GAL's estimates were adjusted for optimism bias.

In response to consultation comments, we have revisited the categorisation of Core capital costs and the mitigation factors applied to the derivation of mitigated optimism bias.

For consultation, Core works were categorised as 50% Standard Buildings and 50% Standard Civils. Following consultation, the works have been reassessed and categorised as 90% Standard Buildings and 10% Standard Civils.

As a result, the mitigated optimism bias for Core capital expenditure following the Q6 period (rounded to the nearest 5%) has reduced to 10% from 15% previously used. The detailed calculation is shown in Appendix B.

Unmitigated optimism bias is unchanged at 15% for all schemes.

The HM Treasury's Green Book Optimism Bias approach is by its nature imprecise, its purpose being to provide comfort in forecasts for which there is insufficient detail and where available data lack precision. Having regard to the ranges of calculated mitigated optimism bias for Core capital expenditure, we have adopted a rounded figure of 10% across all three schemes.

D.2 Asset Replacement

The allowance for asset replacement sought to cover expenditure relating to:

- *routine maintenance of asset condition and capacity;*
- *periodic major investment to restore the assets deteriorated condition and capacity; and*
- *investments in improvements to condition and capacity of the existing infrastructure.*

In line with the approach taken for consultation, Asset Replacement expenditure following the Q6 period is treated similarly to Scheme capital expenditure with regard to risk and optimism bias. Therefore, asset replacement costs are adjusted by 20% for risk and by 15% for mitigated optimism bias or 45% for unmitigated optimism bias.

Appendix E Core and Asset Replacement Capital Expenditure Summary

The tables on the following pages summarise the annual capital expenditure relating to the Core and Asset Replacement works under each of the demand scenarios set out in Figure 2-1. The summaries are presented with mitigated optimism bias applied.

2014 real prices in £'million - including mitigated optimism bias

Core	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Terminal buildings	**2,435**	115	129	153	118	93	85	89	104	105	91	59	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Plant	**286**	14	15	18	14	11	10	10	12	12	11	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Tunnels and bridges	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transit systems	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Runways	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiways and aprons	**143**	7	8	9	7	5	5	5	6	6	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Equipment	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Ancillary	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Car Parks	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Third Party Land Users	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Environment	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias	**240**	-	-	-	14	11	10	10	12	12	11	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Risk	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**3,104**	**136**	**151**	**180**	**153**	**120**	**110**	**115**	**134**	**136**	**118**	**76**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**

Asset Replacement	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Asset Replacement	**3,112**	49	55	65	64	66	66	67	67	69	68	68	70	72	74	76	77	79	81	82	83	85	87	88	90	92	94	96	99	99	102	104	107	108	112	115	119	120
Risk	**589**	-	-	-	13	13	13	13	13	14	14	14	14	14	15	15	15	16	16	16	17	17	17	18	18	18	19	19	20	20	20	21	21	22	22	23	24	24
Optimism Bias	**530**	-	-	-	12	12	12	12	12	12	12	12	13	13	13	14	14	14	14	15	15	15	16	16	16	16	17	17	18	18	18	19	19	20	20	21	21	22
Total	**4,231**	**49**	**55**	**65**	**89**	**91**	**91**	**92**	**93**	**95**	**93**	**94**	**97**	**99**	**102**	**105**	**106**	**109**	**111**	**113**	**115**	**117**	**119**	**122**	**124**	**126**	**129**	**133**	**136**	**137**	**141**	**143**	**148**	**150**	**154**	**159**	**164**	**165**

Table E-1 Assessment of Need Carbon Capped

2014 real prices in £'million - including mitigated optimism bias

Core	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Terminal buildings	**2,435**	115	129	153	118	93	85	89	104	105	91	59	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Plant	**286**	14	15	18	14	11	10	10	12	12	11	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Tunnels and bridges	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transit systems	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Runways	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiways and aprons	**143**	7	8	9	7	5	5	5	6	6	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Equipment	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Ancillary	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Car Parks	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Third Party Land Users	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Environment	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias	**240**	-	-	-	14	11	10	10	12	12	11	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Risk	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**3,104**	**136**	**151**	**180**	**153**	**120**	**110**	**115**	**134**	**136**	**118**	**76**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**

Asset Replacement	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Asset Replacement	**3,406**	49	55	65	66	66	67	67	67	67	68	69	73	76	78	81	83	86	88	89	90	93	96	98	99	102	104	107	110	113	116	120	125	128	132	134	138	141
Risk	**647**	-	-	-	13	13	13	13	13	13	14	14	15	15	16	16	17	17	18	18	18	19	19	20	20	20	21	21	22	23	23	24	25	26	26	27	28	28
Optimism Bias	**583**	-	-	-	12	12	12	12	12	12	12	12	13	14	14	15	15	15	16	16	16	17	17	18	18	18	19	19	20	20	21	22	22	23	24	24	25	25
Total	**4,636**	**49**	**55**	**65**	**91**	**91**	**93**	**93**	**92**	**93**	**94**	**96**	**101**	**105**	**108**	**112**	**115**	**118**	**121**	**123**	**124**	**128**	**132**	**135**	**137**	**140**	**144**	**148**	**152**	**156**	**160**	**165**	**172**	**177**	**182**	**185**	**190**	**195**

Table E-2 Assessment of Need Carbon Traded

2014 real prices in £'million - including mitigated optimism bias

Core	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Terminal buildings	**2,435**	115	129	153	118	93	85	89	104	105	91	59	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Plant	**286**	14	15	18	14	11	10	10	12	12	11	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Tunnels and bridges	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transit systems	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Runways	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiways and aprons	**143**	7	8	9	7	5	5	5	6	6	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Equipment	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Ancillary	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Car Parks	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Third Party Land Users	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Environment	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias	**240**	-	-	-	14	11	10	10	12	12	11	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Risk	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**3,104**	**136**	**151**	**180**	**153**	**120**	**110**	**115**	**134**	**136**	**118**	**76**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**

Asset Replacement	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Asset Replacement	**4,461**	49	55	65	66	66	68	67	68	69	69	69	95	99	102	106	112	124	137	144	149	152	152	152	155	156	155	157	156	157	158	159	160	161	162	163	165	166
Risk	**859**	-	-	-	13	13	14	13	14	14	14	14	19	20	20	21	22	25	27	29	30	30	30	30	31	31	31	31	31	31	32	32	32	32	32	33	33	33
Optimism Bias	**773**	-	-	-	12	12	12	12	12	12	12	12	17	18	18	19	20	22	25	26	27	27	27	27	28	28	28	28	28	28	28	29	29	29	29	29	30	30
Total	**6,092**	**49**	**55**	**65**	**91**	**91**	**93**	**92**	**94**	**95**	**96**	**95**	**131**	**136**	**141**	**146**	**155**	**172**	**189**	**199**	**206**	**210**	**209**	**210**	**214**	**215**	**214**	**216**	**215**	**216**	**218**	**220**	**221**	**222**	**223**	**224**	**228**	**229**

Table E-3 Low Cost is King Carbon Traded

2014 real prices in £'million - including mitigated optimism bias

Core	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Terminal buildings	**1,937**	115	129	153	118	93	-	-	-	-	-	-	-	-	-	-	85	89	104	105	91	59	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Plant	**228**	14	15	18	14	11	-	-	-	-	-	-	-	-	-	-	10	10	12	12	11	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Tunnels and bridges	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transit systems	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Runways	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiways and aprons	**114**	7	8	9	7	5	-	-	-	-	-	-	-	-	-	-	5	5	6	6	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Equipment	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Ancillary	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Car Parks	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Third Party Land Users	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Environment	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias	**181**	-	-	-	14	11	-	-	-	-	-	-	-	-	-	-	10	10	12	12	11	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Risk	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**2,460**	**136**	**151**	**180**	**153**	**120**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**110**	**115**	**134**	**136**	**118**	**76**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**

Asset Replacement	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Asset Replacement	**2,766**	49	55	65	60	59	59	58	57	57	57	58	59	61	62	64	65	67	69	71	73	74	76	78	80	82	84	86	88	90	92	94	97	100	103	105	106	109
Risk	**519**	-	-	-	12	12	12	12	11	11	11	12	12	12	12	13	13	13	14	14	15	15	15	16	16	16	17	17	18	18	18	19	19	20	21	21	21	22
Optimism Bias	**468**	-	-	-	11	11	11	11	10	10	10	10	11	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16	16	17	17	18	18	19	19	19	20
Total	**3,753**	**49**	**55**	**65**	**83**	**81**	**81**	**81**	**78**	**78**	**78**	**80**	**82**	**84**	**85**	**88**	**90**	**92**	**95**	**98**	**100**	**102**	**105**	**108**	**110**	**113**	**116**	**119**	**122**	**124**	**127**	**130**	**134**	**138**	**142**	**144**	**147**	**151**

Table E-4 Global Fragmentation Carbon Capped

Appendix F Operational Expenditure

F.1 Introduction

This appendix sets out the changes made to the independent forecast of operational expenditure for the period 2014 to 2050 for the Gatwick Airport Second Runway scheme following consultation (see Table F-3).

F.2 Revisions to Operating Cost Forecasts

Further to consultation, modelling refinements have been made, resulting in the following minor changes to operational expenditure forecasts:

- *for all demand scenarios, unmitigated optimism bias has been amended from 40% to 41%. The impact of this is seen only on unmitigated costs;*
- *for the Low Cost Is King Carbon Traded scenario, the operational expenditure for the Q6 period has been adjusted for consistency with the other demand scenarios; and*
- *a correction has been made to ensure that no optimism bias on Scheme costs is incurred before new Scheme infrastructure has come into operation.*

The cumulative impact of these refinements does not exceed 1% of total operational expenditure.

Responses to consultation noted that our modelling approach uses a combination of elasticities to passenger growth and elasticities to increases in terminal area and therefore overstates operational expenditure. We have reviewed our approach to ensure that it makes adequate provision for the increases in fixed costs associated with opening new infrastructure (modelled using terminal area as a driver) and handling increased numbers of passengers (modelled using traffic growth as a driver) and are content that the forecasts developed are reasonable.

Other consultation comments concerned the 'frontier shift' principle according to which organisations are expected to become more efficient over time. Having reviewed this comment, we consider that our elasticity-based approach, coupled with the efficiency factors that apply to the majority of cost categories until 2030, adequately addresses the 'frontier shift' principle.

F.3 Treatment of Risk and Optimism Bias

Following consultation, we have reviewed the treatment of risk for operational expenditure, which is calculated using a compound real growth of 0.5% per annum from 2019 onwards. We consider this a reasonable allowance for unforeseen cost escalation at this stage.

In response to comments received during consultation, we have revisited the mitigation factors applied to the derivation of the mitigated optimism bias allowance for operational expenditure.

As before, all works are categorised under Outsourcing, following the guidance set out in HM Treasury's Green Book.

The HM Treasury's Green Book Optimism Bias approach is by its nature imprecise, its purpose being to provide an appropriate cost contingency in forecasts for which there is insufficient detail and where available data lack precision. Having regard to the ranges of calculated mitigated optimism bias for Scheme capital expenditure, we have adopted a rounded figure of 15% across all three schemes.

Table F-1, below, sets out the revised calculation used to derive an appropriate level of mitigated optimism bias used consistently for all schemes.

OPEX Contributory Factors	Outsourcing optimism bias (%)	Mitigation Factor (0<x<1)	Reduction in optimism bias	Mitigated optimism bias (%)
Procurement				
Late Contractor Involvement in Design	5	0.95	4.8	0.3
Poor contractor Capabilities	15	0.95	14.3	0.8
Project Specific				
Design Complexity	5	0.8	4.0	1.0
Degree of Innovation	5	0.8	4.0	1.0
Client Specific				
Project Management Team	20	0.9	18.0	2.0
Poor Project Intelligence	10	0.7	7.0	3.0
Environment				
Site Characteristics	5	0.5	2.5	2.5
External Influences				
Economic	20	0.2	4.0	16.0
Legislation/Regulations	15	0.5	7.5	7.5
Weighted Total	**100**			**34.0**
Adjusted Optimism Bias = 34.0 x 41% Upper Bound				**14%**

Table F-1 Revised Optimism Bias Mitigations

F.4 Summary of Adjustments

In summary, the following adjustments for risk and optimism bias were made:

		Scheme	
		Pre-consultation	**Post-consultation**
Risk		20	20
Optimism Bias	**Mitigated**	20	15
	Unmitigated	41	41

Table F-2 Summary of Risk and Optimism Bias Adjustments to the Base Costs (%)

F.5 Revised Independent Operational Expenditure Forecast

This section presents graphical outputs of the revised independent operating cost model and summary tables.

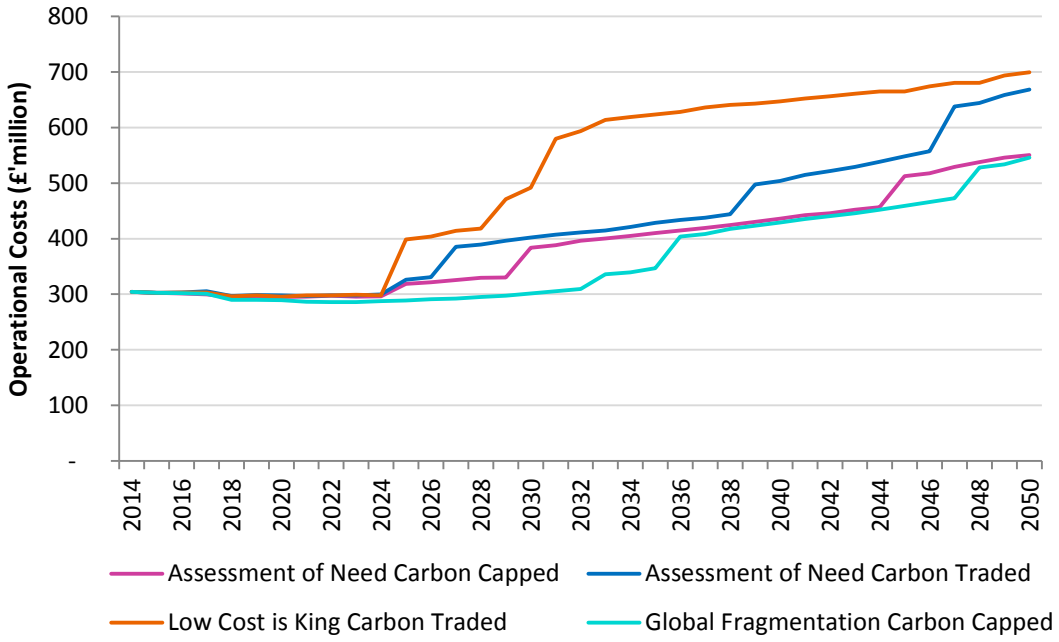

Figure F-1 Gatwick Airport Second Runway Scheme Forecast Operating Expenditure (Risk Adjusted and Mitigated Optimism Bias)

Figure F-2, below, illustrates forecast operating costs on a per passenger basis.

Temporary increases occur during the period following the opening of new infrastructure. When new terminal buildings open, there is a marked increase in fixed costs. Over time, as passenger numbers increase to fill the terminal buildings, costs become more efficient on a per passenger basis.

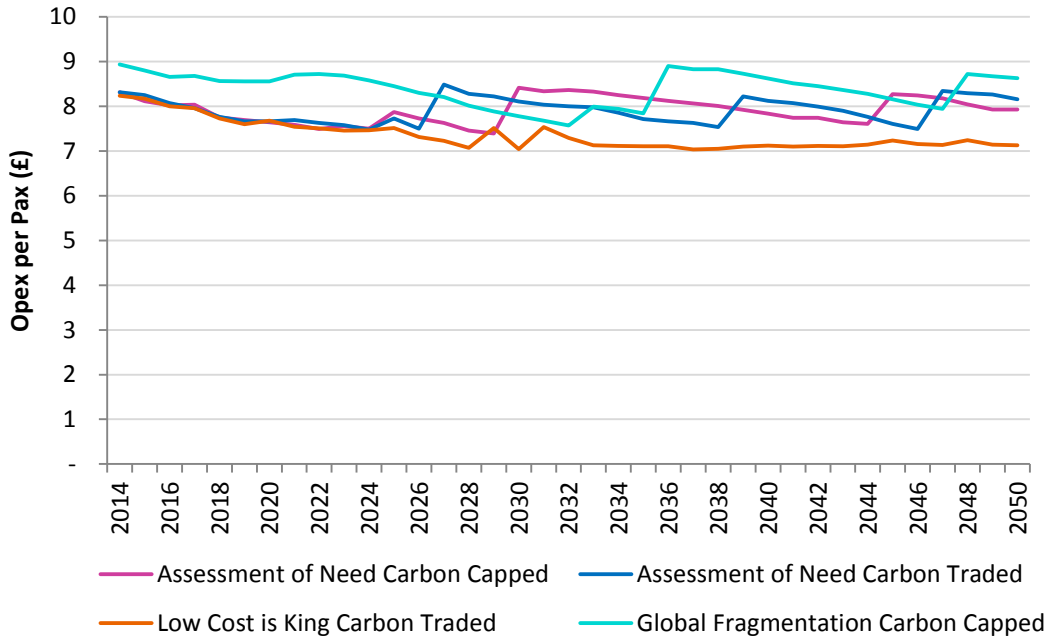

Figure F-2 Gatwick Airport Second Runway Scheme Forecast Operating Expenditure per Passenger (Risk Adjusted and Mitigated Optimism Bias)

2014 real prices in £'million - mitigated optimism bias

Assessment of Need Carbon Capped	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Staff	5,207	147	140	133	130	121	120	119	118	118	116	116	121	121	121	122	121	137	139	140	140	142	143	144	145	146	147	149	151	151	153	154	170	170	173	175	177	178
Routine maintenance	1,051	39	34	29	26	24	24	24	24	24	23	23	23	23	24	25	24	25	25	28	28	29	29	29	29	29	30	30	30	30	31	31	31	31	35	35	36	36
Utilities	1,320	21	24	26	31	33	32	32	32	31	31	31	32	32	32	31	31	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	44	45	45	45	45	45
Rent and rates	1,577	30	30	30	31	32	32	32	32	32	32	32	38	38	38	38	38	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	56	56	56	56	56	56
Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	3,820	67	75	83	82	85	85	86	86	87	86	86	92	93	94	95	95	105	106	107	107	108	109	110	111	112	113	114	115	115	117	117	127	128	129	131	132	133
Opex	**12,975**	**305**	**302**	**301**	**300**	**294**	**293**	**292**	**291**	**291**	**288**	**287**	**306**	**307**	**309**	**310**	**310**	**352**	**355**	**360**	**361**	**364**	**366**	**368**	**370**	**372**	**375**	**378**	**381**	**382**	**386**	**387**	**428**	**430**	**437**	**441**	**446**	**447**
Opex (incl. Risk & OB)	**14,402**	**305**	**302**	**301**	**300**	**294**	**295**	**295**	**296**	**297**	**295**	**296**	**319**	**321**	**326**	**330**	**330**	**384**	**389**	**397**	**400**	**405**	**410**	**415**	**419**	**424**	**430**	**436**	**442**	**446**	**452**	**457**	**512**	**518**	**529**	**538**	**546**	**550**
Opex/pax (£)		8.31	8.12	8.02	8.04	7.75	7.70	7.64	7.58	7.49	7.56	7.50	7.88	7.73	7.63	7.46	7.39	8.42	8.33	8.36	8.33	8.25	8.18	8.12	8.07	8.01	7.92	7.84	7.74	7.74	7.65	7.61	8.27	8.24	8.18	8.05	7.93	7.93

Assessment of Need Carbon Traded	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Staff	5,640	147	140	134	132	122	122	120	119	118	117	117	124	125	141	142	142	143	144	145	146	148	150	151	152	154	169	171	173	174	176	179	182	184	207	208	210	213
Routine maintenance	1,132	39	34	29	27	25	25	24	24	24	24	24	24	24	25	25	29	29	29	29	29	30	30	30	31	31	31	32	35	35	36	36	37	37	38	38	42	43
Utilities	1,421	21	24	26	31	33	32	32	32	31	31	31	32	32	39	38	38	38	38	38	38	38	38	38	38	38	45	45	45	45	45	45	45	45	54	54	54	54
Rent and rates	1,708	30	30	30	31	32	32	32	32	32	32	32	38	38	47	47	47	47	47	47	47	47	47	47	47	47	56	56	56	56	56	56	56	56	69	69	69	69
Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	4,128	67	75	84	85	86	87	87	87	87	87	88	94	96	106	108	109	110	111	112	112	113	115	116	117	118	127	129	130	131	133	134	137	138	152	153	154	156
Opex	**14,030**	**305**	**302**	**303**	**305**	**297**	**297**	**295**	**293**	**292**	**291**	**291**	**312**	**315**	**358**	**360**	**364**	**367**	**370**	**372**	**373**	**376**	**381**	**383**	**385**	**388**	**428**	**432**	**438**	**441**	**445**	**450**	**456**	**460**	**519**	**521**	**530**	**534**
Opex (incl. Risk & OB)	**15,750**	**305**	**302**	**303**	**305**	**297**	**298**	**298**	**297**	**298**	**298**	**300**	**326**	**331**	**385**	**390**	**396**	**402**	**407**	**411**	**415**	**421**	**429**	**434**	**438**	**444**	**497**	**504**	**515**	**522**	**529**	**538**	**548**	**557**	**638**	**644**	**659**	**668**
Opex/pax (£)		8.31	8.25	8.07	7.96	7.76	7.66	7.67	7.69	7.63	7.58	7.48	7.73	7.50	8.49	8.28	8.22	8.11	8.03	8.00	7.98	7.86	7.71	7.66	7.63	7.53	8.22	8.12	8.07	7.99	7.90	7.76	7.60	7.49	8.34	8.29	8.27	8.16

Low Cost is King Carbon Traded	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Staff	6,725	147	140	134	131	121	121	119	119	118	118	116	153	154	155	169	172	179	207	211	214	216	216	216	217	218	217	218	218	218	219	220	220	221	221	222	223	223
Routine maintenance	1,367	39	34	29	26	24	24	24	24	24	24	23	27	27	32	32	32	37	38	39	44	44	44	44	45	45	45	45	45	45	45	45	45	45	45	45	46	46
Utilities	1,654	21	24	26	31	33	32	32	32	31	31	31	39	39	39	45	44	45	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
Rent and rates	1,970	30	30	30	31	32	32	32	32	32	32	32	46	46	46	54	54	54	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	4,845	67	75	83	84	86	87	86	87	87	87	87	113	115	117	126	129	135	152	155	157	158	158	158	159	160	159	160	160	160	161	161	161	162	162	163	164	164
Opex	**16,560**	**305**	**302**	**303**	**303**	**296**	**296**	**293**	**294**	**292**	**292**	**289**	**378**	**381**	**387**	**426**	**431**	**449**	**516**	**525**	**535**	**539**	**538**	**539**	**542**	**543**	**542**	**544**	**543**	**544**	**545**	**547**	**547**	**548**	**549**	**550**	**553**	**553**
Opex (incl. Risk & OB)	**18,921**	**305**	**302**	**303**	**303**	**296**	**298**	**296**	**298**	**298**	**299**	**298**	**403**	**409**	**419**	**468**	**477**	**501**	**586**	**600**	**615**	**623**	**624**	**628**	**635**	**640**	**642**	**647**	**649**	**653**	**658**	**664**	**667**	**672**	**677**	**681**	**691**	**695**
Opex/pax (£)		8.24	8.17	8.00	7.96	7.73	7.60	7.68	7.55	7.51	7.46	7.47	7.36	7.15	7.08	7.65	7.36	6.96	7.41	7.18	7.12	7.05	7.11	7.13	7.09	7.09	7.16	7.14	7.19	7.20	7.20	7.20	7.21	7.22	7.23	7.24	7.22	7.24

Global Fragmentation Carbon Capped	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Staff	4,936	147	140	134	130	119	118	117	114	113	112	112	111	111	111	111	111	113	114	115	122	123	125	141	143	144	145	147	149	150	151	153	154	156	158	173	174	176
Routine maintenance	997	39	34	29	26	24	24	23	23	23	23	22	22	22	22	22	22	23	23	23	23	24	25	25	26	29	29	30	30	30	30	31	31	31	32	32	32	36
Utilities	1,245	21	24	26	31	33	32	32	32	31	31	31	30	30	30	30	29	29	29	29	31	31	31	38	38	38	38	38	38	38	38	38	38	38	38	45	45	45
Rent and rates	1,444	30	30	30	31	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	38	38	38	47	47	47	47	47	47	47	47	47	47	47	47	56	56	56
Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	3,610	67	75	83	83	83	83	83	82	82	82	83	83	84	85	86	87	88	89	90	95	96	97	107	108	109	110	111	113	113	114	116	117	118	120	129	129	131
Opex	**12,232**	**305**	**302**	**302**	**301**	**290**	**288**	**286**	**282**	**280**	**279**	**279**	**279**	**280**	**279**	**281**	**281**	**284**	**286**	**289**	**309**	**311**	**316**	**359**	**361**	**367**	**370**	**373**	**376**	**379**	**381**	**384**	**388**	**392**	**395**	**435**	**437**	**444**
Opex (incl. Risk & OB)	**13,491**	**305**	**302**	**302**	**301**	**290**	**290**	**289**	**287**	**286**	**286**	**287**	**289**	**291**	**292**	**295**	**297**	**301**	**305**	**310**	**336**	**340**	**347**	**404**	**408**	**418**	**423**	**429**	**436**	**440**	**446**	**452**	**459**	**466**	**473**	**528**	**534**	**546**
Opex/pax (£)		8.94	8.80	8.66	8.68	8.56	8.56	8.56	8.71	8.72	8.69	8.58	8.45	8.30	8.21	8.01	7.89	7.78	7.68	7.57	8.00	7.94	7.84	8.90	8.83	8.83	8.73	8.62	8.51	8.45	8.37	8.28	8.16	8.04	7.95	8.72	8.67	8.63

Table F-3 Operational Expenditure Forecasts

Appendix G Non-Aeronautical Revenue

G.1 Introduction

This appendix sets out the changes made to the independent forecast of non-aeronautical revenues for the period 2014 to 2050 for the Gatwick Airport Second Runway scheme following consultation.

G.2 Revisions to Non-Aeronautical Revenue Forecasts

During consultation, modelling refinements have been made, resulting in the following changes to non-aeronautical revenue forecasts:

- *certain non-aeronautical revenue categories have been amended so that uplifts are triggered in line with phases of terminal development. This has resulted in the following impacts*
  - *Assessment of Need Carbon Capped: no effect.*
  - *Assessment of Need Carbon Traded: increase in 2027-2029 and 2039-2044.*
  - *Low Cost Is King Carbon Traded: increase in 2025-2044.*
  - *Global Fragmentation Carbon Capped: decrease in 2030-2035 and 2045-2047*
- *GDP growth now has an in-year effect on revenue per passenger in certain categories, rather than being delayed by one year.*
- *in the Low Cost Is King Carbon Traded scenario, a correction to passenger numbers has been made for the Q6 period.*

The cumulative impact of these refinements ranges from a decrease in estimated revenues by 1.2% in the Global Fragmentation Carbon Capped scenario, to an increase by 3.0% in the Low Cost Is King Carbon Traded scenario over the forecast period.

G.3 Revised Independent Non-aeronautical Revenue Forecasts

This section presents graphical outputs of the revised independent non-aeronautical revenue model (Figure G-1 and G-2) and summary tables (Table G-1). We assumed a reduction in the real compounded growth rate of 0.25% per year for risk and a similar reduction of 0.25% for optimism bias.

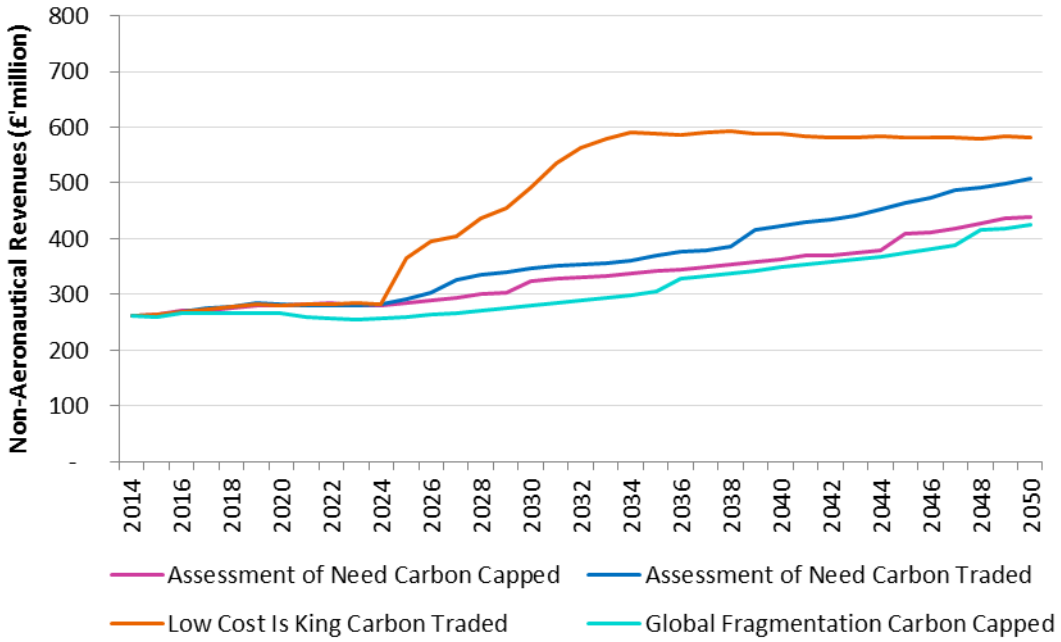

Figure G-1 Gatwick Airport Second Runway Scheme Forecast Non-Aeronautical Revenue (Risk Adjusted and Optimism Bias)

Figure G-2, below, illustrates forecast non-aeronautical revenues on a per passenger basis.

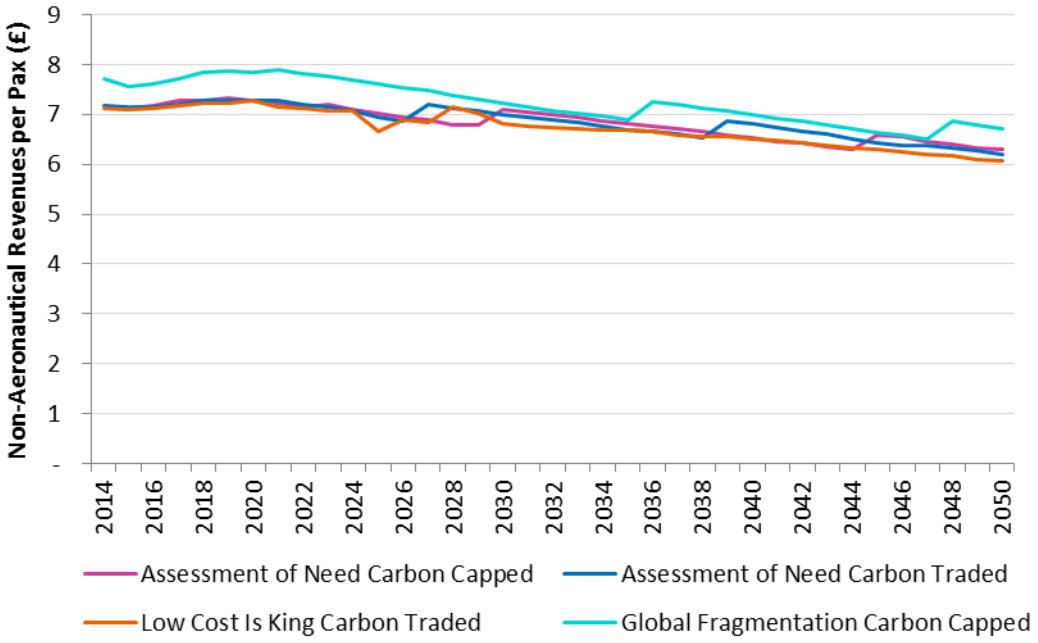

Figure G-2 Gatwick Airport Second Runway Scheme Forecast Non-Aeronautical Revenue per Passenger (Risk Adjusted and Mitigated Optimism Bias)

The table on the following page sets out the independent forecasts for each demand scenario.

2014 real prices in £'million

Assessment of Need Carbon Capped	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Car parking	2,058	49	49	50	49	49	49	50	50	50	50	49	50	50	51	52	53	53	54	55	55	56	56	57	57	58	59	59	60	61	61	62	63	64	65	66	68	69
Total retail	7,548	137	139	141	141	143	145	147	148	151	150	151	155	159	164	169	172	191	195	199	202	207	212	216	220	225	231	237	243	245	251	255	284	289	297	306	314	318
Duty and tax-free	*2,827*	*48*	*49*	*50*	*50*	*51*	*51*	*52*	*53*	*54*	*54*	*54*	*56*	*57*	*59*	*61*	*63*	*71*	*73*	*74*	*76*	*78*	*80*	*82*	*83*	*85*	*88*	*90*	*93*	*94*	*96*	*98*	*110*	*113*	*115*	*119*	*123*	*125*
Other retail	*3,530*	*67*	*68*	*69*	*69*	*70*	*70*	*71*	*72*	*73*	*72*	*73*	*75*	*77*	*79*	*81*	*82*	*90*	*92*	*93*	*95*	*97*	*99*	*101*	*102*	*104*	*107*	*109*	*112*	*113*	*116*	*117*	*129*	*131*	*134*	*138*	*142*	*143*
Food and beverage	*1,191*	*22*	*22*	*23*	*23*	*23*	*23*	*23*	*24*	*24*	*24*	*24*	*24*	*25*	*26*	*27*	*27*	*30*	*31*	*31*	*32*	*33*	*33*	*34*	*34*	*35*	*36*	*37*	*38*	*38*	*39*	*40*	*45*	*46*	*47*	*49*	*50*	*51*
Property rental	1,006	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29
Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other revenue	2,724	51	51	53	55	58	61	62	62	63	62	63	64	65	66	68	68	72	73	74	74	75	76	77	78	79	81	82	84	84	86	86	91	91	93	96	98	98
Non-aero	**13,337**	**263**	**265**	**270**	**271**	**276**	**282**	**284**	**286**	**290**	**288**	**289**	**295**	**301**	**308**	**316**	**320**	**344**	**350**	**355**	**360**	**366**	**372**	**378**	**384**	**390**	**398**	**406**	**414**	**418**	**425**	**431**	**467**	**474**	**484**	**496**	**509**	**514**
Non-aero (incl. Risk & OB)	**12,302**	**263**	**265**	**270**	**271**	**276**	**281**	**281**	**282**	**284**	**281**	**281**	**285**	**289**	**294**	**300**	**303**	**324**	**328**	**331**	**334**	**337**	**342**	**346**	**349**	**353**	**358**	**363**	**369**	**371**	**375**	**379**	**408**	**412**	**418**	**427**	**436**	**438**
Non-aero/pax (£)		7.18	7.11	7.18	7.27	7.27	7.33	7.28	7.23	7.16	7.19	7.11	7.03	6.95	6.88	6.79	6.78	7.10	7.04	6.99	6.94	6.87	6.81	6.76	6.71	6.65	6.59	6.54	6.46	6.44	6.35	6.31	6.59	6.56	6.46	6.39	6.33	6.31

Assessment of Need Carbon Traded	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Car parking	2,233	49	48	49	50	49	50	50	50	49	49	50	51	53	55	56	57	58	59	59	60	60	62	63	63	64	65	66	67	69	70	71	73	75	77	78	79	80
Total retail	8,421	137	138	140	144	145	147	148	147	149	150	153	160	168	188	195	200	206	211	215	218	224	232	238	242	248	278	285	293	299	307	316	328	338	348	354	362	371
Duty and tax-free	*3,185*	*48*	*48*	*49*	*51*	*51*	*52*	*53*	*53*	*53*	*54*	*55*	*57*	*60*	*69*	*72*	*74*	*77*	*79*	*81*	*82*	*84*	*88*	*90*	*92*	*95*	*108*	*111*	*114*	*117*	*120*	*123*	*128*	*133*	*136*	*139*	*142*	*146*
Other retail	*3,896*	*67*	*67*	*69*	*70*	*70*	*71*	*72*	*71*	*72*	*73*	*74*	*77*	*81*	*89*	*92*	*94*	*96*	*99*	*100*	*101*	*104*	*108*	*110*	*112*	*115*	*126*	*129*	*132*	*135*	*138*	*143*	*148*	*152*	*156*	*158*	*162*	*166*
Food and beverage	*1,340*	*22*	*22*	*23*	*23*	*23*	*23*	*23*	*23*	*24*	*24*	*24*	*25*	*27*	*30*	*31*	*32*	*33*	*34*	*34*	*34*	*35*	*37*	*37*	*38*	*39*	*44*	*45*	*46*	*48*	*49*	*50*	*52*	*54*	*56*	*57*	*58*	*60*
Property rental	1,025	26	26	26	26	26	26	26	26	26	26	26	26	26	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	31	31	31	31	31
Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other revenue	2,931	51	51	53	56	59	62	62	62	62	63	63	66	68	72	74	75	76	77	78	79	80	82	83	84	85	89	91	93	94	96	98	101	103	108	110	112	114
Non-aero	**14,611**	**263**	**262**	**269**	**276**	**279**	**285**	**286**	**285**	**286**	**288**	**292**	**303**	**315**	**342**	**352**	**360**	**368**	**375**	**380**	**384**	**392**	**404**	**412**	**417**	**425**	**461**	**471**	**482**	**491**	**501**	**515**	**531**	**546**	**563**	**572**	**583**	**596**
Non-aero (incl. Risk & OB)	**13,440**	**263**	**262**	**269**	**276**	**279**	**284**	**283**	**281**	**281**	**281**	**284**	**293**	**302**	**327**	**335**	**340**	**346**	**351**	**354**	**356**	**362**	**371**	**376**	**379**	**385**	**415**	**422**	**429**	**435**	**442**	**452**	**464**	**474**	**487**	**492**	**499**	**508**
Non-aero/pax (£)		7.18	7.16	7.16	7.19	7.28	7.29	7.28	7.26	7.19	7.15	7.07	6.94	6.85	7.20	7.11	7.06	6.98	6.93	6.89	6.85	6.76	6.67	6.65	6.61	6.53	6.86	6.80	6.73	6.67	6.60	6.52	6.44	6.38	6.37	6.34	6.26	6.20

Low Cost Is King Carbon Traded	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Car parking	2,904	49	49	50	50	49	50	50	50	50	50	50	59	69	71	73	75	81	88	94	98	100	100	99	99	99	98	98	97	96	96	96	96	95	95	95	95	95
Total retail	11,178	137	138	140	142	143	146	146	148	150	152	152	210	230	239	268	283	311	341	364	378	389	390	392	399	403	403	407	407	408	411	414	416	418	421	423	428	430
Duty and tax-free	*4,316*	*48*	*48*	*49*	*50*	*51*	*52*	*52*	*53*	*54*	*54*	*55*	*74*	*86*	*89*	*102*	*107*	*118*	*131*	*141*	*147*	*152*	*154*	*154*	*157*	*159*	*160*	*161*	*162*	*162*	*163*	*164*	*165*	*166*	*167*	*168*	*170*	*171*
Other retail	*5,051*	*67*	*67*	*68*	*69*	*70*	*71*	*71*	*72*	*73*	*73*	*73*	*101*	*107*	*111*	*122*	*129*	*141*	*154*	*163*	*169*	*173*	*173*	*174*	*177*	*178*	*178*	*180*	*180*	*181*	*182*	*183*	*184*	*185*	*186*	*187*	*189*	*190*
Food and beverage	*1,811*	*22*	*22*	*23*	*23*	*23*	*23*	*23*	*24*	*24*	*24*	*24*	*35*	*37*	*39*	*44*	*47*	*52*	*57*	*60*	*62*	*64*	*64*	*64*	*65*	*65*	*65*	*66*	*65*	*66*	*66*	*67*	*67*	*67*	*68*	*68*	*69*	*69*
Property rental	1,069	26	26	26	26	26	26	26	26	26	26	26	28	28	28	29	29	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other revenue	3,613	51	51	53	56	58	62	61	62	63	63	63	81	84	86	90	94	101	111	116	118	120	120	120	121	122	121	122	122	122	123	124	124	125	125	126	127	127
Non-aero	**18,763**	**263**	**263**	**269**	**274**	**277**	**285**	**283**	**287**	**289**	**291**	**291**	**378**	**410**	**423**	**460**	**481**	**521**	**572**	**604**	**625**	**639**	**640**	**641**	**649**	**654**	**653**	**657**	**656**	**657**	**660**	**664**	**666**	**669**	**672**	**674**	**681**	**683**
Non-aero (incl. Risk & OB)	**17,213**	**263**	**263**	**269**	**274**	**277**	**283**	**280**	**282**	**283**	**284**	**282**	**365**	**394**	**405**	**438**	**455**	**491**	**536**	**563**	**580**	**590**	**588**	**586**	**590**	**592**	**588**	**589**	**585**	**582**	**582**	**583**	**582**	**582**	**581**	**580**	**583**	**582**
Non-aero/pax (£)		7.11	7.10	7.12	7.18	7.23	7.23	7.28	7.15	7.13	7.08	7.07	6.66	6.89	6.83	7.16	7.02	6.82	6.77	6.75	6.71	6.68	6.70	6.65	6.59	6.57	6.56	6.50	6.48	6.42	6.37	6.33	6.29	6.24	6.20	6.16	6.10	6.07

Global Fragmentation Carbon Capped	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Car parking	1,822	49	45	46	45	44	44	44	43	42	41	41	42	43	43	44	45	45	46	47	48	48	49	50	51	52	52	53	54	55	56	56	57	59	60	61	61	62
Total retail	7,054	137	138	140	141	139	139	139	137	136	137	139	142	145	148	153	157	161	166	171	175	179	185	206	211	216	222	228	234	239	244	249	256	263	270	299	304	311
Duty and tax-free	*2,625*	*48*	*48*	*49*	*50*	*49*	*49*	*49*	*49*	*48*	*49*	*49*	*51*	*52*	*53*	*55*	*57*	*59*	*60*	*62*	*64*	*66*	*68*	*78*	*80*	*82*	*84*	*87*	*89*	*91*	*93*	*95*	*98*	*101*	*104*	*117*	*119*	*121*
Other retail	*3,323*	*67*	*68*	*68*	*68*	*67*	*68*	*68*	*66*	*66*	*67*	*68*	*69*	*71*	*72*	*74*	*76*	*78*	*79*	*82*	*84*	*85*	*88*	*97*	*99*	*101*	*103*	*106*	*108*	*110*	*112*	*115*	*118*	*121*	*124*	*135*	*137*	*140*
Food and beverage	*1,106*	*22*	*22*	*23*	*22*	*22*	*22*	*22*	*21*	*21*	*21*	*22*	*22*	*23*	*23*	*24*	*24*	*25*	*26*	*26*	*27*	*28*	*29*	*32*	*33*	*34*	*35*	*35*	*36*	*37*	*38*	*39*	*40*	*41*	*42*	*47*	*48*	*50*
Property rental	993	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29
Rail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other revenue	2,608	51	51	53	55	57	60	59	58	58	58	59	60	61	61	63	64	65	66	67	69	70	71	75	76	77	78	80	81	82	84	85	87	89	91	94	95	97
Non-aero	**12,477**	**263**	**260**	**266**	**267**	**266**	**268**	**268**	**264**	**262**	**262**	**265**	**270**	**275**	**279**	**285**	**291**	**297**	**304**	**311**	**318**	**323**	**331**	**359**	**366**	**373**	**380**	**389**	**397**	**403**	**410**	**418**	**428**	**439**	**448**	**482**	**489**	**499**
Non-aero (incl. Risk & OB)	**11,506**	**263**	**260**	**266**	**267**	**266**	**267**	**265**	**260**	**257**	**256**	**258**	**260**	**264**	**266**	**272**	**276**	**280**	**285**	**290**	**295**	**298**	**304**	**328**	**333**	**337**	**342**	**348**	**354**	**358**	**362**	**367**	**374**	**381**	**388**	**415**	**418**	**425**
Non-aero/pax (£)		7.71	7.57	7.62	7.72	7.84	7.88	7.85	7.89	7.83	7.77	7.69	7.62	7.53	7.48	7.37	7.32	7.23	7.16	7.08	7.03	6.98	6.88	7.24	7.19	7.13	7.06	7.00	6.92	6.87	6.79	6.72	6.64	6.57	6.51	6.86	6.80	6.71

Table G-1 Non-Aeronautical Revenue Forecasts

Appendix H Surface Access Capital Expenditure, Operational Expenditure and Maintenance Costs

There are no changes to forecasts set out in Tables H-1 and H-2 for surface access capital expenditure, operational expenditure, or maintenance costs following consultation. There are also no changes to the levels of risk and optimism bias applied.

GAL Highway/Local Road/Rail	Route	Length (km)	Unit Cost (£'million per km)	Estimated Cost (£'million)	Risk	Optimism Bias	Total (£'million)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Highway	M23 junction 9	1	42.5	42.5	-	19	61										21	21																					
Highway	M23 junction 9	1	35	35	-	15	50										18	18																					
Highway	M23 9 to 9a road widening	0.75	30	22.5	-	10	32										11	11																					
Local Road	Airport Way	1.25	30	37.5	-	17	54										19	19																					
Local Road	A23 re-alignment	5.5	25	137.5	-	61	198					69	69																									
Local Road	A23 re-alignment	1.75	35	61.25	-	27	88					31	31																									
Local Road	Long-term parking		5	5	-	2	7										3	3																					
Local Road	Industrial zone		5	5	-	2	7										3	3																					
Local Road	North Terminal access		5	5	-	2	7										3	3																					
Local Road	North Terminal access	0.6	35	21	-	9	30										11	11																					
Local Road	New Terminal access	1.3	25	32.5	-	14	47										16	16																					
Local Road	New Terminal access	1.3	35	45.5	-	20	66										23	23																					
Local Road	South Terminal access		5	5	-	2	7										3	3																					
Local Road	Longbridge Roundabout		1	1	-	0	1										1	1																					
Local Road	Gatwick Road		5	5	-	2	7					3	3																									
Local Road	Balcombe Road	3.25	15	48.75	-	21	70					24	24																									
Total				**510**	-	**224**	**734**	-	-	-	-	**182**	**182**	-	-	-	**185**	**185**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Highway Maintenance	Source: Highways Agency website inflated from 2011/12	2.75	0.046	0.13																																	
Local Road Maintenance	Source: Highways Agency website inflated from 2011/12	14.95	0.056	0.84																																	
Total Road Maintenance /year				**23.18**	-	**10.20**	**33.38**	-	-	-	-	-	-	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**
Highway Opex	Source: DfT COBA (2006), road type 11, inflated from 2002 to 2014	2.75	0.045	0.12																																	
Local Road Opex	Source: DfT COBA (2006), road type 6, inflated from 2002 to 2014	14.95	0.03	0.45																																	
Total Road Opex /year				**13.59**	-	**5.98**	**19.57**	-	-	-	-	-	-	**0.45**	**0.45**	**0.45**	**0.45**	**0.45**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**	**0.82**
Rail Maintenance /year	Source: LeighFisher analysis	**-**	**-**	**-**	-	**-**	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rail Opex /year	Source: LeighFisher analysis	**-**	**-**	**-**	-	**-**	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GRAND TOTAL (£'million)							**787.35**	-	-	-	-	**181.8**	**181.8**	**1.3**	**1.3**	**1.3**	**186.7**	**186.7**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**

Table H-1 Summary Costs

Gatwick	Total 2014-50	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Roads																																						
Capex	**510.0**	-	-	-	-	-	-	-	-	-	126.3	126.3	-	-	-	128.8	128.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asset Replacement Capex	**23.2**	-	-	-	-	-	-	-	-	-	-	-	0.6	0.6	0.6	0.6	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Opex	**13.6**	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Rail																																						
Capex	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asset Replacement Capex	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Opex	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Risk on Capex	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias on Capex	**234.6**	-	-	-	-	-	-	-	-	-	55.6	55.6	0.3	0.3	0.3	56.9	56.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Risk on Opex	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias on Opex	**6.0**	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Capex (inc. Risk & OB)	**767.8**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**181.8**	**181.8**	**0.8**	**0.8**	**0.8**	**186.2**	**186.2**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**
Total Opex (inc. Risk & OB)	**19.6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**

Table H-2 Summary Outputs