

**Aer Rianta Submission in
Response to the Public Consultation
Notice of June 4th 2003**

On

**A Review of the Determination on the
Maximum Levels of Airport Charges**

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Appendix 1: Review of the IMG Benchmarking Exercise undertaken on behalf of the Commission for Aviation Regulation for the Purposes of its Determination on the Maximum Levels of Airport Charges

1 Introduction

Aer Rianta makes this submission to the Commission for Aviation Regulation following its invitation of the 4 June 2003 to set out the grounds supporting a review of its Determination of 26th August, CP7/2001 and its varied Determination of the 9th February, CP2/2002.

Aer Rianta believes that many significant developments have occurred in the period since August 2001 which provide substantial grounds for a review of the Determination on the Maximum Levels of Airport Charges applying to Dublin, Shannon and Cork airports.

Airport charges are a very small element of the airlines overall cost structure as confirmed by the Doganis Report to Government and in the case of the Irish Airports, it is well documented that airport charges are unquestionably low. Therefore the provision of long-term airport infrastructure should not be delayed because of short-term airline industry focus. Delaying necessary airport capacity results in low passenger service levels, chronic congestion and safety issues, and inevitably a slowdown in future growth of the airports.

A review of CP/7 2001 is necessary at this time, as the existing Determination on Maximum Airport Charges no longer properly reflects the economics of Dublin Airport, in particular, in the context of:

- A short-term falloff in air traffic as a result of the global economic downturn, September 11th 2001, war in Iraq, the outbreak of SARS and Foot and Mouth. However, forecasts predict strong growth in air traffic in the future
- Major change in airline customer market and in particular a significant refocus by Aer Lingus of its operational model to quick turnaround in its short-haul operations
- Demand from all airlines at Dublin for contact stands and plans by major carriers to remove bussing operation
- The need to provide for increasing competition between major low cost carriers
- A new dividend policy by the Department of Finance
- Recent capacity studies regarding Dublin Airport facilities conclude that the current operation at peak periods is varying between IATA level of service standards C and F. There is therefore an urgent need for investment at Dublin Airport to deliver IATA level of service standard B adopted in CP7/2001
- The trend elsewhere is to increase airport charges in light of urgent need for investment and funding of airport infrastructure capacity in Europe. For example, the recent UK Determination on airport charges provided for an annual increase of RPI +6.5% at Heathrow and RPI at Stansted and Gatwick for 2003-2008

We believe that the substantial grounds for a review of CP7/2001 and CP2/2002 are:

- The level of capital expenditure provided for in CP7/2001 and CP2/2002 falls short of the required investment necessary to deliver IATA level of service standard B facilities and capacity for projected growth at the three Aer Rianta airports
- The exclusion from the Aer Rianta regulatory asset base of a portion of Pier C at Dublin Airport, six aircraft stands at Dublin Airport, a portion of the Shannon terminal building and the exclusion of a portion of capital expenditure for the first nine months of 2001.
- The impact of the slowdown in the world economy, 9/11 and other events on Aer Rianta's traffic performance in the period since August 2001 and its financial implications for the company
- The cost implications of the enhanced security measures, insurance premiums, regulatory and restructuring costs which have arisen since CP7/2001 and CP2/2002
- The unrealistic assumptions used in projecting forward commercial revenues in CP7/2001 and CP2/2002
- The financial inaccuracies underpinning CP7/2001 and CP2/2002
- The significant computational errors and errors of principle in the IMG benchmarking analysis used to determine the efficiency factors set for Dublin and Shannon airports in CP7/2001 and CP2/2002
- The assumptions underpinning the subcap on off peak runway movements at Dublin Airport included in CP7/2001 and CP2/2002 and the categorisation of aircraft types for the purpose of this off peak subcap on runway movements at Dublin Airport
- The need for the regulation of the three Aer Rianta airports as a group

This document assesses the key issues arising under each of the above grounds to demonstrate that a review of CP7/2001 and CP2/2002 under Section 32 (14) of the Aviation Regulation Act is necessary.

Other Regulatory Issues

There are a number of other substantial issues relating to the following matters

- The valuation of the regulatory asset base
- The definition of the regulatory till
- The derivation of the WACC

However, as these issues are matters of detailed principle, Aer Rianta has not included them as grounds for the purpose of this review.

As is evident from recent media comment, there are a number of possible options being proposed for consideration regarding the future of Aer Rianta. At present, it is unclear what the outcome will be. However, any shareholder decision regarding the structure of Aer Rianta or the ownership of future airport infrastructure should have no bearing on the Commission's review of the appropriate price caps for airport charges, or indeed its powers as set out in the Aviation Regulation Act, 2001.

2 Capital Expenditure

In the original and varied Determinations CP7/2001 and CP2/2002, €346 million was allowed in recoverable capital expenditure for the Aer Rianta airports over the 5 year regulatory period. This amounted to an allowance of circa €3 per passenger. This is considerably below the industry average and it is insufficient to meet the capital investment requirements of the three airports going forward.

There are significant factors as outlined below affecting the need for increased investment in capacity at Dublin and Cork Airports and for an adjustment of the recoverable capital expenditure provided for in the Determination of the Maximum Levels of Airport Charges for Dublin, Shannon and Cork airports.

Market Issues

Passenger numbers at the three airports increased by 4.3% last year. Even though traffic is growing at less than the rate forecast, total Aer Rianta traffic continued to show growth in the aftermath of the September 11th attacks in the US. All three airports have extensive route networks and serve a significant number and range of carriers – low cost, full service, charter and cargo operators. In 2002, 14 new routes were opened from the 3 airports and the three airports catered for approximately 83 airlines serving 138 routes.

Aer Rianta is fully committed and statutorily obliged to develop the airports at Dublin, Shannon and Cork. Aer Rianta's objective is to put in place airport infrastructure; runways, terminals, roads, services, communications, ancillary support infrastructure-offices, hangars, maintenance facilities to meet current and future demand for air travel by existing and new carriers in and out of Ireland.

Safety, Regulatory & Security

The Gulf war, 9/11 attack and the war in Iraq have contributed to a significant increase in safety, regulatory and security requirements on airport authorities. Customs, Immigration, Agriculture and Health authorities requirements have increased as a result of increased migratory flows, the recent outbreaks of Foot and Mouth disease and SARS. Significant investment has been required to install 100% hold baggage screening at all 3 airports to be operational from 1 January 2003 and the airports have increased screening facilities for staff and passengers, which in turn required a significant increase in the number of Airport Search Unit staff needed.

Airline Strategies

70 % of business at Dublin Airport is now carried out by airlines with quick turnaround/low cost strategies. Low cost for airlines frequently translates into high cost facilities on stands and piers due to the space requirements of quick turnaround operations. This type of business requires contact stands. Bussing is not acceptable to the airlines.

Airlines are now increasingly demanding that they be allowed to consolidate their facilities within the airport complex. This consolidation reduces flexibility of facilities and can only be satisfied by provision of additional space.

Transport Policy / Statutory Functions

Airports are a major part of the transport infrastructure and airport development is of crucial importance for the long-term growth of the economy and vitality of the travel and tourism industry. Aer Rianta's statutory functions are to provide for the proper planning and phasing, management and development of airport infrastructure and facilities at the three airports to cater for continuing growth in air travel demand for passengers and cargo. Failure to provide sufficient airport capacity at the three airports will have a significantly detrimental impact on Irish economic development, impacting directly on the tourist sector.

Airports are vital elements of national infrastructure and are gateways into the country. The adoption of a long-term view is critical to ensure that there is proper operation and planning of airport development.

Aer Rianta has an obligation to comply with the Department of Transport's strategy in regard to the airports. The Department of Transport's strategy is to ensure that the principal gateway airports of the State are in a position to provide cost competitive and appropriate infrastructure to meet the needs of airline and other aviation companies; consistent with a commercial mandate; to assist in optimising the contribution of the country's network of regional airports to balanced regional development.

Service Levels

A detailed baseline study carried out as part of the Master Planning exercise at Dublin Airport found that several facilities fall well below IATA level of service standard B resulting in passengers experiencing reduced service levels.

Cargo Development

There is no further scope for expansion of the cargo facilities at Dublin Airport. Early indications from the Master Planning process show that further development of the primary passenger facilities will adversely impact on the cargo complex. It is an imperative that the expansion of cargo facilities at Dublin Airport will adequately address the requirements of cargo operators. Capacity shortfalls could have adverse effects particularly for the high technology sector industries which are intense users of air cargo.

Public Transport

Aer Rianta, as a member of the technical group reporting into the Public Transport Partnership Forum, is committed to a best in class modal split at Dublin Airport. The aggressive targets set by the Forum and the Dublin Transportation Office require proper integration of all modes of public transport. At present there are approximately 750 bus movements in and out of Dublin Airport daily and taxi movements average approximately 2,000 movements per day. Demand for facilities for public and private transport is continually increasing with ongoing investment requirements for internal roads, kerbside, parking areas, bus shelters, etc. All of these facilities require investment at the airports, for which detailed requirements are currently being developed in the context of the

masterplan for Dublin Airport. The investment requirement for these facilities will be significantly greater than the amount allowed in the Determination.

In addition, Government policy supporting a metro connection from the centre city to Dublin Airport and onwards requires the commitment of significant investment in an inter modal interchange at the airport to conform to the targets referred to above.

Environment

Environmental issues are assuming greater significance in the Airport context. Local Authorities are imposing stringent requirements for all forms of development with consequent impact on the capital investment required. Issues which have to be dealt with range from complex water retention systems and de-icing fluid controls to noise mitigation and the measures to mitigate impact on flora on the airfield.

In addition, it is now evident that Local Authorities intend to impose severe levies on any project to ensure contribution to the support of county development infrastructure. On receipt of planning permission for the proposed Pier D project, a special development levy of €2 million was unexpectedly imposed.

Pier D

Under the Determination, an allowance of €71.7 million¹ was included for a number of projects including a new pier at Dublin Airport. In January 2002, Professor Rigas Doganis in his report, *Consultancy Advice on Aviation Issues for the Department of the Taoiseach*, supported the view that a pier, Pier D, should be built at Dublin Airport.

The original Pier D design was not appropriate in the changed traffic, security and regulatory context of 2002. This design could not deliver on capacity, security and segregation requirements, satisfactory aircraft stand areas, adequate gate lounge areas and other operational requirements. In addition, this view was supported when the Department of Justice stated that the segregation of all arriving and departing passengers was necessary and EU originating passengers should be segregated from International arriving passengers for presentation to Immigration Authorities.

The brief for a new Pier D was developed by specialist airport development consultants in conjunction with airlines, groundhandlers, the Irish Aviation Authority, Customs & Immigration Authorities, the Gardai, the Department of Transport and other Government departments. Individual stakeholders such as FLS Aerospace and the fuel companies were also intensively involved. Various options of Pier configuration were presented. The final agreed option was a two storey pier which met the requirements of airlines and regulatory authorities.

The only suitable site which would allow the Pier to be delivered within the desired timeframe was a site north of the Old Central Terminal Building (OCTB). As the airlines are against bussing and the OCTB has inadequate capacity for passenger flows and is a listed building that cannot be altered, the only options available to allow passengers to walk to and from the Terminal building were by tunnel or high level walkway. Following exhaustive consultation, the combination of a

¹ It is not possible to isolate precisely how much the Commission allowed for a new pier at Dublin since, as the pier is included with number of other projects, which in total are allocated €71.7m in the recoverable capex

twelve gate segregated two storey pier, accessed by a high level walkway from the main terminal, skirting the OCTB, proved to be the only cost effective way to provide walk on, walk off facilities for passengers.

The resulting design including access is significantly more expensive than that allowed for in the Determination. Extensive value engineering exercises have been carried out on the project in the context of the foregoing and to ensure efficient life cycle costing.

Construction was planned to commence early in 2003 for completion by the summer season of 2004. However, a series of planning appeals considerably extended the proposed time frame. The appeal process has now been exhausted with planning permission being granted in March 2003, and the project is currently in a tender process.

The decision to grant planning permission is now the subject of a judicial review application.

Dublin Airport Master Plan

Aer Rianta is currently consolidating its Master Planning process and other parallel studies including internal transportation, road access and car parking, into a revised capital expenditure programme which will identify the requirements and the timing of capital expenditure necessary to meet the needs of all airport users. The following outline indicates the scope of the work and highlights issues that will significantly impact phased capital expenditure. These intensive studies confirm that the level of capital expenditure provided for in CP7/2001 and CP2/2002 falls short of the required investment necessary to deliver IATA level of service standard B facilities and capacity for projected growth at Dublin Airport.

The process began in January 2002 and will conclude in Autumn 2003. The output will consist of a series of integrated studies and options for terminal expansion incorporating appropriate capacity analysis and flow requirements with an emphasis on delivery of a significantly improved finished product to meet the requirements of all stakeholders.

Using broad precepts such as site maximisation, flexibility to accommodate different scenarios, balanced development, co-ordination with ground access systems, support of all business sectors and phased implementation to meet demand, up to 30 high level options have been reduced to four options for detailed examination and costing.

To ensure all options being examined conform to the stated flexibility precept, three possible business scenarios are considered for each option:

- Traffic will grow in the same proportion as exists at present
- Low cost carrier business will grow and become a major proportion of traffic
- Dublin Airport will become a major hub

Capital cost estimation and phasing is being prepared for each option.

The process has been preceded by the development of a baseline study for Dublin Airport based on 2002 operating characteristics and updated to reflect the changed 2003 operating environment. This study served to highlight capacity constrained areas within the existing system.

A major section of the baseline study concentrates on capacity analysis. A significant finding of the study is that the existing terminal facilities will be capacity constrained earlier than expected. The capacity analyses carried out on all main processors within the Dublin terminal complex clearly indicate that the terminal is operating below IATA level of service standard B for most of the main processors.

The theoretical capacity calculated for each of the main areas and processors have been “de-tuned” to realistically reflect the varying effects of building shape and passenger behaviour dictated by physical layout and airline functional operation. Once this detuning process is allowed for the estimated capacity of the system is 16 to 17 million passengers per annum.

Proposals for a terminal expansion have therefore become an urgent requirement with consequent impact on the phasing and requirements of capital expenditure.

This clearly demonstrates that the capacity and facilities at Dublin Airport are significantly below IATA level of service standard B and need significant investment to bring them up to the agreed IATA level of service standard B.

In the context of the above issues, now clearly identified in the masterplanning carried out to date, the allowable capex in CP7/2001 of €203 million for Dublin Airport over the regulatory period is inadequate to support the development of facilities to satisfy demand at an appropriate service standard going forward. A failure to address this for the remainder of the regulatory period would lead to a serious deficiency in capacity at Dublin Airport and would restrict the ability of the company to meet its statutory requirements under the Air Navigation and Transport (Amendment) Act, 1998.

Cork Airport

In 1999 a firm of airport consultants, Scott Wilson Kirkpatrick (SWK), were appointed to identify the requirements for the development of the Cork airport system to enable the airport to deliver capacity for up to 3 million passengers per annum in the mid term and 5 million passengers per annum in the long term in line with projected passenger growth.

SWK concluded in 1999 that given traffic levels the terminal at Cork Airport was at that time operating close to its maximum capacity based on IATA level of service standard B and therefore there was no margin for significant traffic growth, no opportunity for improvement in airline facility standards and no significant gains in capacity were possible based on the reorganisation of operations within the existing terminal building.

SWK recommended that, initially, terminal facilities at Cork Airport should be extended to add the additional apron, passenger processing capacity and airbridge served stands necessary to provide capacity for 2 million passengers per annum (anticipated to be reached in 2005). This was to be followed in the medium term by the construction of a new terminal facility to the north of the existing facility with a capacity of 3.5 million passengers per annum.

In 2001, Aer Rianta appointed a consortium led by Jacobs Engineering and including international airport architects HOK to review the 1999 master planning study and to prepare options for expanding the airport's capacity.

A more detailed assessment of SWK's proposed first phase i.e. the extension of the existing terminal, unveiled a series of complex and costly projects that would have had to be implemented to facilitate the development as originally mooted. The analysis required to progress such projects delayed the overall process and in the meantime passenger traffic continued to grow at a rapid rate – year on year percentage growth of 14% was experienced in 1999 with almost 12% growth delivered in 2000. Given the rate of growth it became clear that it was no longer appropriate to implement SWK's phase one solution.

A capacity study for Cork Airport concluded that the existing terminal is currently operating at IATA level of service standard F, this is described as an unacceptable level of service, a condition of cross flows, system breakdown, unacceptable delays and an unacceptable level of comfort. The study indicated that given the current unbalanced service levels at the airport, future passenger increases would have a further detrimental effect on services standards within the terminal.

Intensive stakeholder consultation informed the high level decision making, scoping and detailed design processes for the development now being undertaken at Cork Airport. The final design concept was in effect a modified version of the intermediate phase of development proposed by SWK in its 1999 study. The development also incorporates other projects identified as necessary in the SWK report, including the fire station, multi-storey car parking and control tower. The design capacity of the terminal is 3 million passengers per annum, this represents an appropriate balance between capital cost and the provision of capacity for a reasonable period of forecast growth. The design is highly flexible and easily scaleable to deliver growth from 3 to 5 million passengers per annum.

CP7/2001 allowed €52.6 million in the recoverable capital expenditure programme for a terminal extension at Cork Airport. Following a review of the development of Cork Airport in the context of master planning requirements, a new terminal development project, multi-storey car park, fire station, internal roads and ancillary infrastructure for Cork Airport with a capital expenditure requirement of c. €150 million is necessary. The development comprises a 25,000 square meter terminal building with a capacity of three million passengers per annum. This project also includes the development of associated infrastructure and car parking works comprising a central utilities building, services upgrade, a new road network, a 600 space multi-storey car park and additional surface car parking.

On this basis we believe that there are substantial grounds for a review of the recoverable capital expenditure allowed in CP7/2001 for Cork Airport.

3 Stranded Assets

In CP7/2001 a portion of the cost of Pier C at Dublin Airport, six stands at Dublin Airport and a portion of the capacity of the Shannon terminal project were disallowed from the RAB. The basis

for disallowance of an element of the cost of these assets is mathematically incorrect and we believe should be reviewed as part of the review of CP7/2001.

The following additional information is relevant:

Pier C, Dublin Airport

- This facility had to be constructed in the current location as a single sided pier to avoid encroaching on the obstruction limitation surfaces. For this reason it is a tightly designed pier, kept deliberately narrow to account for the single loading.
- Construction of the facility is not out of line with other similar structures. The costs per square meter in this case are neither out of line with similar facilities elsewhere whose costs are driven by the particular location, difficult site levels and expensive site preparation, the requirement to link with a complex terminal facility (terminal west extension), complex security arrangements and a less than ideal ratio of perimeter length to enclosed area driven by the nature of the building required.
- There is no over provision of space in this pier. It has been calculated that with maximum achievable gate lounge space of 282 square metres for a wide body aircraft, the level of service achievable is less than IATA level of service standard C.
- This is the best performing pier at Dublin Airport in terms of turnarounds per day. The performance of the pier has achieved 11.2 aircraft turnarounds per day on average relative to the industry average of 10.

Dublin Parking Stands

- In the IMG study their base line stands were 65, this is only correct in a maximum narrow body mode situation. Given that the apron contains MARS configurations at Pier C, South Apron, Cargo Apron, Remote Central Apron and part of Pier A, once wide body aircraft are introduced into the mix, the stand capacity at Dublin Airport can range between 57 and 65. If maximum combined mode is adopted the apron capacity is 19 wide body plus 38 narrow body (total 57).

Existing Stands 2001			
Location	COMBINED MODE		MAX NARROW
	MAX WIDE	REMAINING NARROW	
CARGO	1	3	5
PIER C	3	0	6
SOUTH APRON	3	6	11
PIER B	5	4	9
PIER A	0	15	15
REMOTE	7	7	16
NORTH	0	3	3
Total	19	38	65

- At Dublin Airport peak demand for stands in the morning is not created from peak hour operations but from the home based fleet (overnight parking) and thus Dublin Airport has consistently had the most amount of aircraft parked between the hours of 05.00 and 07.00.
- Previous apron extensions provided apron taxiways and new taxi routes as well as stands to cater for planned Pier developments. These planned pier developments consume large areas of apron (stands and taxi routes) in both their footprint and provision of aircraft access to same. It would be prudent airside planning to have the required apron extensions in place prior to any pier development commencing thus not drastically affecting the overall airside capacity or vital taxi routes when pier development commences.
- Inevitably the construction of new stands and new taxi routes temporarily withdraws from service existing taxi routes and stands to facilitate construction, and therefore, extra stands must be included in order not to have a deficit during the construction phase. It is prudent to minimise disruption by constructing say 3 or more stands at a time rather than 1 each time it is required.

In doing so, apart from minimising disruption, better economies of scale are obtained and given that the design, tendering and construction period can take up to eighteen months, the rates of handover have to stay ahead of demand.

- Likewise the essence of good airside planning is to fully develop each available location before moving on to the next location. This will obviously take cognisance of current and future aeronautical restrictions at each available new stand location, the result of this is that the rate of stands coming online will be slightly different to the theoretical stands to be built each year.
- Stands must be provided to cater for operational flexibility i.e. cater for a number of unexpected (unscheduled) aircraft, technical delays, new operators, aircraft missing slots, Low Visibility Procedures being declared, existing operators up gauging aircraft type etc.
- From time to time existing stands are required to be withdrawn from service to facilitate maintenance and repair of existing apron concrete areas. Typically in the case of contact stands at Pier A, parts of this pavement are in excess of 50 years old and stands are frequently withdrawn to facilitate repair.
- All reports prepared for Government since 1999 conclude that additional stand capacity is required at Dublin Airport, it is therefore appropriate that the disallowance of investment on six stands at Dublin Airport form part of this review.

Shannon Terminal Extension

The Determination on the maximum level of airport charges adjusted downwards the net book value of the terminal extension at Shannon Airport.

The terminal development, associated road realignment and car parking developments have all proved to be necessary, were provided to a specification agreed with all relevant users and in a cost effective manner based on a transparent public tendering process.

Should the Commission decide to carry out an interim review, Aer Rianta would welcome the opportunity to further clarify this project during the review, with particular emphasis on calculated areas and capacity analysis. The project has been proven to have delivered cost effective, flexible and efficient terminal facilities at Shannon Airport.

4 Traffic Performance

CP7/2001 was based on the Aer Rianta Centreline 2000 Traffic Forecast which was submitted to the Commission in February 2001. However, air traffic in the majority of airports in Europe has been impacted by a series of events since 2001. The slowdown in the world economy led by the IT sector, the September 11th terrorist attacks, the conflict in the Middle East, the outbreak of Foot and Mouth in the UK and SARS have all contributed to lower than anticipated growth in air traffic.

While performing significantly better than most European Airports in terms of growth since September 11th 2001, traffic at Dublin Airport is still falling short of the traffic forecast underpinning CP7/2001. Actual traffic performance for the years 2001 – 2003 for Dublin Airport is compared against forecast performance for each of these years in the table below.

Dublin Airport				
Year	Forecast 2000	Actual/Budget	Variance	Variance %
2001	15,192	14,334	(858)	-6%
2002	16,070	15,085	(985)	-6%
2003	16,931	15,779*	(1,152)	-7%
Total	48,193	45,198	(2,995)	

* Budgeted traffic for 2003

As the table illustrates the shortfall in traffic at Dublin Airport in the 2003 calendar year compared to the Aer Rianta 2000 centreline forecast is expected to be close to 1.2 million passengers. The rate of growth which is now anticipated for the remainder of the regulatory period is lower than previously forecast and this lower growth rate is being applied to a lower traffic base in 2003. The combined impact is such that in the regulatory year 2005/06, the passenger base from which the price cap is derived will be on average circa 1.5 million passengers per annum less than that provided for in CP7/2001 for Dublin Airport.

This shortfall in passenger traffic numbers has direct implications for the price cap applied at Dublin airport, whereby the price cap is a function of the maximum allowable revenues divided by the forecast number of passengers. It follows that where the forecast passenger numbers are too high the price cap per passenger will be too low. This is precisely what has happened at Dublin Airport. If the maximum allowable revenues as set out in CP2/2002 were divided by the actual passenger numbers the price cap for Dublin Airport would have been €0.35 higher in that first regulatory year. Aer Rianta believes that the shift in traffic forecasts for the aviation industry since CP7/2001 was issued and its implications for the derivation of the price cap at Dublin airport forms a substantial ground for review.

5 Security Costs

Aer Rianta's regulatory obligations in relation to security have increased substantially in the period since August 2001. In the immediate aftermath of September 11th, Aer Rianta was obliged to implement a series of measures identified by the National Civil Aviation Security Committee (NCASC).

European Regulations 2320/2002 and 622/2003 have come into force establishing common basic standards in the field of aviation security based on the current edition of the European Civil Aviation Conference Document 30. These European Regulations have laid down security requirements for the airports in the following areas:

- Airport planning
- Access control
- Screening of passengers and staff
- Separation of passengers
- Screening of cabin baggage, items carried and vehicles
- Hold Baggage Screening
- Physical security and patrols

As a result of these increased regulatory requirements, Aer Rianta has been obliged to implement certain unforeseen additional security measures at its three airports in the period since August 2001.

These include the following provisions:

- Enhanced screening of passengers and baggage
- Accelerated introduction of Hold Baggage Screening at the three airports for operation by January 2003

- Introduction of extended staff screening at airside terminal entrances to security restricted areas
- Screening of all materials and goods at airside terminal entrances to security restricted areas
- Enhanced background checks on all persons gaining unescorted access to security areas
- Upgrading and replacement of parts of perimeter fence
- Vehicle checkpoints
- Required introduction of an integrated access control system
- Improved CCTV coverage, in particular in the security restricted areas
- Enhanced patrols and inspections of perimeter fencing, restricted area, terminal areas, navigational aids and facilities and all remote areas
- Enhanced training for aviation security personnel
- Acquisition of additional x-ray equipment for the passenger screening process

These additional security requirements have necessitated both new and additional capital investment and increased operational expenditure. In terms of capital expenditure, Aer Rianta has implemented Hold Baggage Screening, in compliance with regulatory requirements and undertaken works in the area of airport perimeter fencing, staff screening, aer access, CCTV and X ray equipment. €16 million capital expenditure has been undertaken in this area from 2001 to date, and further investment is required to meet imposed regulatory requirements. In addition Aer Rianta has also recruited additional Airport Security Unit staff for passenger screening / boarding card checks in this period. The company intends to recruit further staff in this area in order to satisfy security requirements while maintaining appropriate service standards. Aer Rianta believes that the impact of new and expanded security measures since CP7/2001 forms a substantial ground for a review of the Determination.

6 Operating Costs

The fundamental assumption underpinning CP7/2001 and CP2/2002 with respect to operating costs is that these costs are projected to grow in line with growth in passenger numbers plus inflation². For reasons outlined below growth in certain cost categories has far exceeded inflation and actual passenger growth over the past three years.

² The amount allowed in CP7/2001 reflects the application of centreline 2000 traffic forecasts. Any downward adjustment to traffic forecasts for the remainder of the period will, based on the current regulatory assumptions result in a downward adjustment to the level of operating expenditure allowed in deriving the maximum yield.

Security Costs

The operating costs for security and safety at the airports have increased by more than 50% since 2000. This increase is a net increase after allowance for restructuring and productivity improvements. Were it not for these productivity gains which are already captured in the X factor applied in the Determination, the increase in costs would have been significantly higher. Underlying the cost increases are net increases in staff numbers since 2000 of close to 30% in the areas of security screening and the provision of dedicated staff screening entrances to airside areas. Increases in payroll security costs also reflect the application of national wage agreements, mandatory for Aer Rianta. Pay increases under national wage agreements in Ireland over the past number of years have exceeded inflation and are forecast to continue to do so over the remaining regulatory period.

Insurance

Similar to other companies, there has been phenomenal increases in Aer Rianta's insurance premiums in the period following September 11th 2001. Again this is a cost category where costs far exceed inflation plus actual passenger growth. For example, insurance costs over the period 2000 to 2003 have increased by €6.7 million (+356%). The projection for insurance assumed in CP2/2002 was c. €3.4 million for the regulatory year 2001/02. In fact Aer Rianta's actual cost for the same period was over €6 million.

Restructuring Provision

As part of the ongoing process of adapting to change in the aviation industry Aer Rianta made a one off provision in its 2001 accounts of €28.5 million to meet restructuring costs including a voluntary severance scheme. This provision, necessary to ensure that Aer Rianta adapts to changing economic and regulatory conditions should in Aer Rianta's view be taken into account in the figures underpinning the price cap calculations. The need to reflect this provision in itself forms a substantial ground for review.

7 Commercial Revenues

In CP7/2001, revenues from Aer Rianta's commercial activities including airport retailing, concession, car parking and rental revenues for the first six months of 2001 were projected forward for the Determination period on the basis of Aer Rianta's forecast traffic growth further inflated by CPI. These projections for commercial revenues were based on the assumption that all commercial revenues are directly correlated with passenger traffic volumes on a one to one basis. This is not a realistic assumption and actual performance to date confirms that in fact growth in commercial revenues is less than passenger growth. In the period 2000 – 2002 passengers increased by approximately 8%, while commercial revenues increased by only 5%. While growth in passenger numbers is a driver of retail and car parking revenues, there is no evidence to support the assumption that growth in passenger numbers will generate a corresponding growth in property and rental revenue streams.

The driver of increases in the rental revenue stream is the periodic review of leases/renewals and/or the addition of new capacity. To Aer Rianta's knowledge, there was little or no provision in the Recoverable Capital expenditure programme for additional commercial property that would generate additional rental revenue streams. Furthermore the base figures used for projecting commercial revenues included unrealised exchange gains which have not materialised in

subsequent periods. These assumptions have resulted in an assumed level of contribution from commercial revenues which when combined with traffic forecasts that exceeded actual traffic figures over the past three years has not been realistic nor is likely to be going forward over the remainder of the regulatory period.

For the regulatory year 2001/2, the gross commercial revenues assumed in the Determination, CP7/2001, were €56 million more than those actually achieved by Aer Rianta, as reflected in Aer Rianta's audited regulated entity accounts provided to the Commission. Aer Rianta therefore believes that in the context of the application of the single till principle in calculating maximum levels of airport charges, the underlying assumptions for commercial revenues need to be reviewed and form a substantial ground for review of CP7/2001 and CP2/2002.

8 Financial Errors

From various dealings between the parties which have taken place since CP7/2001 and CP2/2002 were issued, a number of financial inaccuracies in the financial model underpinning the price cap have come to light. The existence of these inaccuracies in Aer Rianta's view forms substantial grounds for review of the Determination.

9 Benchmarking of Operating Expenditure

Following the publication of CP7/2001, Aer Rianta carried out an analysis of the IMG benchmarking study as set out in CP8/2001. Aer Rianta carried out a similar benchmarking exercise, using the same IMG "peer" airports, data sources and methodology as IMG. Aer Rianta's analysis highlights significant errors in the IMG benchmarking. Since the IMG benchmarking report supported the conclusion in the Determination on the scope for improving operating efficiencies at Dublin and Shannon airports, Aer Rianta believes that the basis used in CP7/2001 for estimating the scope for future operating efficiencies was fundamentally flawed.

A critical flaw in IMG's approach is that the comparisons used in the analysis did not compare like with like. IMG failed to adjust for the differences in the activities carried out by the airports. For example, Aer Rianta operates a number of activities (notably car parking and retailing) directly, whereas these are outsourced at many of the comparator airports. Similarly, Aer Rianta does not provide groundhandling services as many of its comparator airports do. If Aer Rianta operates a non-aeronautical activity (e.g. car parking) in-house, then both the associated costs and revenues will appear in its accounts. If a comparator airport outsources the activity, then the comparator airport's accounts will only include the net revenues from the concession fee. Unless these differences are adjusted for, the comparison of the cost accounts of the two airports is meaningless.

The IMG analysis also contains a number of calculation errors.

- Cargo throughput figures for Dublin airport are not included in the number of Work Load Units for Dublin but are included for all peer airports
- Group Head Office costs for Aer Rianta have been included in the cost base for Dublin Airport, but related employee numbers have been excluded
- Cost of sales for retail goods are included as part of airport operational costs

In Aer Rianta's analysis, checked by the firm of Economic Consultants, NERA, adjustments were made to ensure that the airports analysis compared like with like, in terms of the range of activities undertaken and the costs/revenues associated with same, viz:

- Figures relating to Aer Rianta were adjusted for those activities not performed directly by the majority of the "peer" airports i.e. retailing, catering, fuel and the operation of car parks
- The errors made by IMG in relation to employee numbers and cargo throughput figures were corrected.

From the corrected analysis, it is clear that the performance of the Irish airports is substantially better than suggested by IMG's report. In the adjusted outcome, the main indicator that was relied upon by IMG in analysing Aer Rianta's efficiency levels i.e. Operating Expense per Work Load Unit emerges as follows:

	Operating Expense per WLU- Dublin	Operating Expense per WLU- Cork	Operating Expense per WLU- Shannon
Amended Results	€5.1	€4.8	€9.8
IMG's Results	€10.5	€8.2	€20.6
Average of "Peer" Airports (per IMG) ³	€7.34	€13.6	€13.6

- When compared to the average of €7.34 per Work Load Unit for IMG's defined "Best of Peers", Dublin's operating expenditure per Work Load Unit at €5.1 is over 30% lower. This contrasts sharply with IMG's assertion that Dublin's operating expenditure per Work Load Unit is 29% higher than the average of its "best of peers", or 35% if Oslo were excluded from this group.
- Shannon and Cork compare very favourably to the IMG average of the "peer" airports, which is €13.6 per Work Load Unit. Shannon's operating expense per Work Load Unit at €9.8 is 28% below the average of the "peers"; Cork's operating expense per workload unit at €4.8 is 65% below the peer group average. This shows that IMG's conclusions in regard to Shannon and Cork's operating costs were incorrect.
- The adjusted employee related measures also demonstrate the inaccuracies in the IMG report. For example, the adjusted labour cost per employee at €35,876 for Dublin Airport is 14% lower than the IMG figure of €41,869. Work load units per employee are significantly higher at all Aer Rianta airports than was portrayed by the IMG analysis and IMG's operating expenses per employee indicator was also found to be inaccurate as demonstrated below:

³ In the case of Dublin, the comparative average is calculated using IMG's results for the "Best of Peers" as defined by IMG

	Dublin	Shannon	Cork
Amended Results			
WLU's per Employee	11,571	8,308	12,797
Operating Expenses per Employee	€59,102	€81,134	€61,963
IMG's Results			
WLU's per Employee	10,248	3,591	10,452
Operating Expenses per Employee	€106,086	€74,026	€86,196

It is clear that the IMG Benchmarking results were inaccurate. This results in Aer Rianta being incorrectly identified as not performing as well as peer airports and is therefore portrayed as being inefficient which is very damaging for the company. There is therefore a need for a review of the basis used in assessing the scope for Aer Rianta's future operating cost efficiencies. Aer Rianta will provide the Commission with a report detailing the correction of the benchmarking analysis which has been reviewed and supported by International Economic Consultants, National Economic Research Associates (NERA)

As the operating efficiencies applied to Dublin and Shannon airports are substantially incorrect, we believe that this forms a substantial ground for review of CP7/2001.

10 The Sub-Cap on Runway Movement Charges

In CP7/2001 and CP2/2002 a sub-cap on off-peak runway charges at Dublin Airport was introduced for the purpose of encouraging the efficient use of airport infrastructure. However Aer Rianta contends that this price cap structure is flawed as the empirical analysis supporting the structure and levels of the caps and the specification of the off-peak periods used were incorrect and incomplete. The introduction of this sub-cap has restricted Aer Rianta's ability to manage its business effectively.

There is no recognition in the analysis used to support the sub-cap off peak on runway movement charges that efficient prices may be different from marginal costs. Whether efficient prices are above or below marginal costs depends upon the nature of cost conditions (whether there are increasing or decreasing returns to scale) and on whether the airport is regulated on a single or dual till basis.

The level of the sub-cap on off-peak runway movements implemented is said to reflect only the short run marginal costs of use falling on Aer Rianta. This definition of marginal cost therefore excludes important cost impacts of aircraft noise and congestion, which should be included in efficient charges that reflect marginal social costs. Furthermore there is no consideration as to whether or not off peak runway operations may impose additional marginal costs on other elements of the airport system.

In the aircraft categorisation used to support the level of off peak runway movement charges, certain aircraft with similar numbers of passenger are included in widely different categories, this may have the effect of discriminating between airlines competing at the airport encouraging the users of one aircraft type over another. Furthermore no adjustment is made to take into account

the fact that larger aircraft are more efficient in terms of numbers of passengers carried than smaller aircraft and as such the measure could promote inefficient use of the airfield.

There is insufficient evidence to support the specification of the off-peak periods set in the original and varied Determination CP7/2001 and CP2/2002. The analysis is based on traffic patterns on two particular days (the fifteenth busiest days of the summer and winter scheduling periods), selected according to rigid pre-determined criteria. The analysis assumed that the distribution of demand for capacity in 2006 would be similar to the distribution of demand in 2001. There is no support for this assumption, such as an analysis of traffic distribution patterns over the past 5 years. Nor does the analysis address the issue of how differential charges might alter the pattern of demand, resulting in peak shifting and the appearance of congestion in a designated off-peak period. The creation of a large number of off peak daily periods leading to a thirty minute peak in one case, is extremely cumbersome from an administrative perspective. This latter cost has not been factored into the marginal cost for off-peak operations.

11 Regulation of the Aer Rianta Airports as a Group

Aer Rianta believes strongly that Dublin, Cork and Shannon airports should be regulated as a group. This is consistent with the company's strategy as submitted to the Government in 1999. This approach to regulation would best allow the company to achieve its statutory obligations as set out in the Air Navigation and Transport (Amendment) Act, 1998.

Regulation as a group would ensure that demand for additional capacity and capital expenditure at the three airports are balanced in an economically efficient manner. There are exceptionally high costs associated with the development of new airport capacity as the sector is characterised by the lumpiness of its investment. Dublin, Cork and Shannon airports are currently at different stages in their development cycles, therefore the investment requirement at each airport differs considerably. For example, Cork Airport currently requires significant capital investment in order to deliver increased terminal capacity.

If the capital expenditure requirement at each airport is directly related to the revenue derived from each airport under individual price caps, investment will be constrained at the individual airports. Therefore regulation of the airports on an individual basis restricts capital investment at the individual airports and reduces the ability of the airports to meet their long-term capacity requirements in line with traffic forecasts. Regulation as a group would greatly assist Aer Rianta in balancing the capital expenditure requirements across the three airports with respect to the investment cycles of the individual airports.

The airport industry is characterised by economies of scope and scale where airports can spread their corporate functions, compliance and regulatory costs and other overheads across a number of aeronautical and non-aeronautical related functions. The management of the three Aer Rianta airports as a group gives rise to cost efficiency gains through the pooling of resources in areas such as human resources, retailing, property, finance, compliance/regulation, information technology marketing, procurement and technical/engineering. The regulation of the airports as a group would present greater opportunities for maintaining these benefits derived from economies of scale, scope and density.

CP7/2001 provided for a price cap on the maximum average revenues per passenger at Dublin Airport and at the Aer Rianta airports. In CP6/2002, a price cap of €5.26 was set for Dublin airport and €6.99 across the three airports for the current regulatory year 2002/03. Full implementation of this price determination would have resulted in an average maximum airport charge per passenger for Cork and Shannon airports of €13.27 in 2002/03. Such a differential in charges between the two airports and Dublin would damage the comparative competitiveness of Cork and Shannon airports with regard to Dublin. Aer Rianta estimates that the resulting loss in traffic at the two regional airports combined could amount to 500,000 passengers per annum. Even though the Determination is cost related, Aer Rianta is currently foregoing significant revenue by not pricing up to the maximum cap at Cork and Shannon Airports, in order to allow them to compete effectively with respect to Dublin. This charging policy has financial implications for the company and is therefore not sustainable in the medium term. Regulation of the three airports as a group would ensure long-term competitiveness and sustainable growth for Cork and Shannon airports. A continuation of the present approach will have consequences for regional development in Ireland and is contrary to aspirations set out in the National Development Plan.

12 Conclusion

Given the substantial developments which have occurred in the period since August 2001, it is necessary that there is a review of CP7/2001 and CP2/2002 under Section 32(14) of the Aviation Regulation Act, 2001. Aer Rianta is willing to engage with and provide whatever information is required in relation to each of the substantial grounds above to support the review process.

Review of the IMG Benchmarking
Exercise undertaken on behalf of the
Commission for Aviation Regulation
for the purposes of its Determination on
the Maximum Levels of Airport Charges

AerRianta

in conjunction with

n/e/r/a

National Economic Research Associates
Economic Consultants

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1. EXECUTIVE SUMMARY

IMG, consultants to the Commission for Aviation Regulation (“The Commission”), carried out a benchmarking exercise comparing Aer Rianta airports to a range of European airports. IMG’s report is contained in Appendix VII to CP8/2001 *“Report on the Determination of Maximum Levels of Airport Charges”*.

The report is used by the Commission to support its conclusion that there is scope for improving operating efficiencies at Dublin and Shannon airports and is the basis for incorporating extremely challenging operating efficiency factors into the price cap. Aer Rianta carried out a similar benchmarking exercise, using the same “peer” airports, data sources and methodology as IMG. The analysis identified serious inaccuracies in IMG’s benchmarking methodology and results, which mean that it is a fundamentally flawed basis for estimating the scope for future operating efficiencies for Aer Rianta.

Aer Rianta’s analysis has been reviewed and confirmed by National Economic Research Associates (NERA). NERA is a leading international economic consultancy with offices in London, Brussels, Madrid, Sydney and across the United States. It specialises in the application of microeconomics to regulation and competition issues, policy evaluation and business strategy. It is now a leading adviser on regulation, helping many companies, governments and regulatory bodies throughout the world. It is currently advising the UK Competition Commission in the context of determining airport price caps in the UK and has recently advised the UK Civil Aviation Authority, the body responsible for the economic regulation of airports in the UK, on the applicability of benchmarking in setting airport price caps.

Deficiencies in the IMG Report

IMG based its entire analysis on simple partial productivity comparisons, usually dividing a type of cost or input (e.g. operating expenditure) by a type of output (e.g. work load units) or vice versa. Due to the problems associated with partial productivity measures, they cannot be relied on as a valid measure of airport efficiency. Benchmarking work in other regulated sectors has generally employed much more sophisticated statistical approaches than the simple comparisons used by IMG.

A critical flaw in IMG’s approach is that they did not compare like with like. They failed to adjust for the differences in the degree of outsourcing of non-core activities between airports. For example, Aer Rianta operates a number of activities (notably car parking and retailing) itself, whereas these are outsourced at many of the comparator airports. Similarly, Aer Rianta does not engage in groundhandling to the same extent as many of the comparator airports do. If Aer Rianta operates a non-core activity (e.g. car parking) in-house, then both the associated costs and revenues will appear in its accounts. If a comparator airport outsources the non-aeronautical activity, then the comparator airport’s accounts will

only include the revenues from the concession fee. Unless these differences are adjusted for, any comparison of the cost accounts of the two airports will be meaningless.

The IMG analysis also contains a number of serious calculation errors.

- Group Head Office costs for Aer Rianta have been included in the analysis for Dublin Airport, but related employee numbers have been excluded.
- Cargo throughput figures for Dublin airport are not included in the number of Work Load Units for Dublin.

The impact of these errors is that Aer Rianta has been incorrectly portrayed as not performing as well as peers.

Result of Adjusted Analysis

Aer Rianta made adjustments to ensure that its airports analysis compared like with like, in terms of the range of activities undertaken and the costs/revenues associated with same, viz

- Adjustments were made for those activities not performed directly by the majority of the “peer” airports i.e. direct retailing, and where applicable, catering, fuel and the operation of car parks
- The errors made by IMG in relation to employee numbers and cargo throughput figures were corrected.

As a result, the performance of the Irish airports is substantially better than suggested by IMG’s report.

In the adjusted outcome, the main indicator that was relied upon by IMG in analysing Aer Rianta’s efficiency levels i.e. *Operating Expense per Work Load Unit* changes dramatically, as follows:

	Operating Expense per WLU- Dublin	Operating Expense per WLU- Cork	Operating Expense per WLU- Shannon
Aer Rianta’s Results	€5.1	€4.8	€9.8
IMG’s Results	€10.5	€8.2	€20.6
Average of “Peer” Airports (per Aer Rianta) ¹	€6.80	€13.3	€13.3

- When compared to the average of €6.80 per Work Load Unit for IMG’s defined “Best of Peers” (as calculated by Aer Rianta), Dublin’s operating expenditure per Work Load

¹ In the case of Dublin, the comparative average used is the “Best of Peers” as defined by IMG

Unit at €5.1 is **almost 20% lower**. This contrasts sharply with IMG’s assertion that Dublin’s operating expenditure per Work Load Unit is 29% **higher** than the average of its “best of peers”, or 35% if Oslo were excluded from this group.

- Shannon and Cork compare very favourably to the average of the “peer” airports, which is €13.3 per Work Load Unit. Shannon’s operating expense per Work Load Unit at €9.8 is 25% **below** the average of the “peers”; Cork’s operating expense per work load unit at €4.8 is no less than 60% **below** the peer group average. This shows that IMG’s conclusions in regard to Shannon and Cork’s operating costs were based on a completely inaccurate analysis.
- The adjusted *employee related measures* also demonstrate the inaccuracies in the IMG report. For example, the adjusted labour cost per employee at €35,876 for Dublin Airport is 17% **lower** than the IMG figure of €41,869. Work load units per employee are significantly higher at all Aer Rianta airports than was portrayed by the IMG analysis and IMG’s operating expenses per employee indicator was also found to be inaccurate see below:

	Dublin	Shannon	Cork
Aer Rianta’s Results			
WLU’s per Employee	11,571	8,308	12,797
Operating Expenses per Employee	59,102	81,134	61,963
IMG’s Results			
WLU’s per Employee	10,248	3,591	10,452
Operating Expenses per Employee	106,086	74,026	86,196

It is clear that the conclusions drawn by IMG (and the Commission) were based on data which was inaccurate/incomplete and/or incomparable across the selected airports. The IMG report is an unfit basis on which to estimate the scope for future operating efficiencies for Aer Rianta.

Conclusion

Even when regulators have tried to estimate airport efficiency using sophisticated statistical benchmarking techniques, they have generally been unable to derive sufficiently robust results, due to the differences that exist between airports. In its recent review of regulated airport charges in the UK, the Civil Aviation Authority commissioned NERA and TRL to carry out a detailed benchmarking study. NERA was not able to derive results that were sufficiently robust to provide a reliable assessment of relative efficiency. The CAA subsequently employed the Department of Spatial Economics, Free University of Amsterdam to expand NERA and TRL’s dataset and attempt to derive useable results, but it also failed to generate results that were sufficiently reliable to be useful to CAA. In addition, where regulators in other sectors have used benchmarking results, they have always used

them together with other indicators on the scope for efficiency improvements. The Commission's reliance on one measure (*Operating Expenditure per Work Load Unit*) to determine the scope for efficiency improvements at the Aer Rianta airports is therefore entirely inappropriate.

2. INTRODUCTION

As consultants to the Commission for Aviation Regulation (the Commission), IMG have carried out a benchmarking exercise comparing the Aer Rianta airports with other European “peer” airports. The report produced by IMG, setting out the methodology and results of this exercise, is contained in Appendix VII to CP8/2001, Report on the Determination of Maximum Levels of Airport Charges. In the original Determination this analysis formed the basis for very challenging operating efficiency targets of 3.5% per annum at Dublin and 4% per annum at Shannon for the five year period of the Determination. These targets were subsequently made even more rigorous in the Revised Determination published on 9th February 2002 – cumulative efficiency improvements of 18.76% and 21.66%² respectively for Dublin and Shannon, spread over 3 rather than 5 years. These efficiency factors in turn lead to an X factor of 7.8 for Dublin for the regulatory years 2002/03, 2003/04 and an overall Aer Rianta X factor of 6.2 for the same period. Such X factors are far higher than those imposed by virtually any other regulatory body that we are aware of.

In its response to the Draft Determination (CP6/2001, Section 1.8), Aer Rianta pointed out the flaws in IMG’s analysis viz:

- IMG’s analysis failed to take account of the differences between the activities that airports undertake directly.
- The use of the partial performance measures selected by IMG was subjective and non-robust.
- IMG has ignored a number of potential other comparator airports and the inclusion of these airports would significantly change the results.

Aer Rianta subsequently carried out a review of IMG’s benchmarking exercise, using the same basic methodology and data sources as IMG, and has corrected the main errors in IMG’s analysis. IMG’s analysis for Dublin, Shannon and Cork airports has been reproduced. However, IMG’s comparisons between Aer Rianta as a group and the major European airports has not been reproduced, as it was not relied on by the Commission in its Determination.

² Aer Rianta has found that these cumulative percentages have been incorrectly calculated.

This report comments on IMG's methodology and presents the results of a revised benchmarking exercise. The remainder of this report is structured as follows:-

- Section 3 sets out IMG's methodology and the problems associated with it;
- Section 4 discusses Aer Rianta's approach to revising the benchmarking exercise;
- Section 5 presents the results

3. IMG'S METHODOLOGY AND ANALYSIS

3.1. IMG's Methodology

The IMG benchmarking study was undertaken by calculating a range of simple partial productivity measures for a number of comparator airports to both Dublin and Cork/Shannon. Initially, a number of comparator airports with similar characteristics to the Irish airports were identified and after a first selection, most of these airports were contacted by IMG with a request to supply data. The airports that responded were included in the final sample. The final sample consisted of 13 comparator airports to Dublin³ and 6 comparator airports to Shannon and Cork⁴. Of the Dublin comparator group, three airports were US airports. Due to the large differences between US and European airports, the US airports were included for reference only. Figures were based as far as possible on calendar year 1999.

IMG selected a total of 11 partial performance indicators, divided into three main groups. The indicators that IMG used are shown below.

Main category	Indicator
Cost Efficiency	<i>Operating Expense per Work Load Unit</i>
	<i>Maintenance Expense per Work Load Unit</i>
	<i>Operating Expense per Employee</i>
	<i>Labour Expense per Employee</i>
Revenue effectiveness	<i>Operating Revenue per Work Load Unit</i>
	<i>Aeronautical Revenue per Work Load Unit</i>
	<i>Percentage of Revenue from Non-Aeronautical Revenue Sources</i>
	<i>Concession Revenue per Enplaned Passenger</i>
	<i>Operating Income (Revenue minus Expenditure) per Work Load Unit</i>
Service efficiency	<i>Average Work Load Unit per Employee</i>
	<i>Average Work Load Unit per Aircraft Movement</i>

Note: A Work Load Unit is equivalent to one passenger or 100 kgs (0.1 tonnes) of cargo

Note: The Commission has relied on only one indicator in formulating its conclusions i.e. the Operating Expense per Work Load Unit measure

³ Birmingham, Glasgow, Manchester, Stansted, Brussels, Copenhagen, Dusseldorf, Munich, Oslo, Vienna, Baltimore/Washington, Fort Lauderdale, Honolulu

⁴ Basel, Bristol, Cardiff, London Luton, Southampton, Leeds Bradford

3.2. Comments on IMG's Methodology

There are four key issues regarding the approach adopted by IMG:

- they did not properly adjust for the differences in the degree of outsourcing at airports;
- they examined an insufficient number of airports for their results to be robust;
- they made a number of other errors; and
- their overall approach, based on simple partial productivity indicators, is inappropriate.

Each of these problems is discussed in turn.

3.2.1. IMG did not properly "normalise" the data

Benchmarking the performance of airports can only be valid if like is compared with like. An important issue with benchmarking airport costs is that there are significant differences in activities between the airports and in the degree of outsourcing of activities between airports. In particular, Aer Rianta operates a number of activities (notably car parking and retailing) itself, whereas these are outsourced at many of the comparator airports. If Aer Rianta operates a non-aeronautical activity (e.g. retailing), then both the associated costs and revenues will appear in its accounts. If a comparator airport outsources the non-core activity, then the associated costs and revenues will appear in the accounts of the subcontractor. The comparator airport accounts will only show the concession fee under revenues and nothing under operating costs (except possibly depreciation, if the airport retains ownership of the facility). Unless these differences are adjusted for, any comparison of the costs per unit of output incurred by the two airports will be meaningless.

IMG suggest that they have carried out normalisation of the data on the comparator airports. However, we were actually able to reproduce many of IMG's results on the comparator airports without adjusting (or "normalising") the data to take account of the different activities carried out by individual airports. This suggests that IMG's claimed normalisation was very inadequate, if indeed it was carried out at all. IMG certainly did not adjust the Aer Rianta data to take account of the different activities that Aer Rianta undertakes (with the exception of netting fuel cost of sales against revenue for Shannon).

We note that we have raised this point in our response to the Draft Determination, CP6/2001, and that the Commission claims in the Report, which accompanied its Determination (CP9/2001) to have subjected the IMG benchmarking analysis to "intensive review". In view of the problems with IMG's analysis, we would question the nature of this "intensive review".

3.2.2. IMG used an insufficient sample size

The IMG analysis has been carried out on the basis of an insufficient sample size, notably in the case of Shannon and Cork. When basing comparisons on averages across just six airports, it is clear that the addition of a seventh airport or a replacement of one airport by another could substantially alter the results. The same problem applies, to a slightly lesser extent, to the Dublin comparator group.

3.2.3. IMG made a number of other errors

The IMG analysis also contains a number of other errors.

As stated earlier, the sample size used by IMG was insufficient. This deficiency was compounded by the fact that IMG did not calculate all of the performance measures for all of the “Peers”. The result is that the “average” numbers are based on even more limited data than would otherwise be the case and makes them very unsuitable bases for projecting efficiencies. It is unclear why the full range of indicators were not prepared for all comparators as with the exception of the *Maintenance cost per Work Load Unit* and the *Concession Revenue per Enplaned Passenger* measures, Aer Rianta was able to calculate the remaining performance measures for almost all airports using annual reports, Airport Council International (ACI) and website data, the sources used by IMG.

It appears that IMG have included all Group Head Office costs for Aer Rianta in their analysis for Dublin Airport, but excluded the related employee numbers. The effect of this is that all measures based on employee numbers report a less favourable result for Dublin than is actually the case (with the exception of *Work Load Unit per Employee*).

IMG has omitted the cargo throughput figures when calculating the number of Work Load Units for Dublin. This has an adverse effect on the results of all measures based on work load units for that airport, including the operating expense per work load unit indicator that was the basis for the challenging efficiency factor set by the Commission for Dublin Airport as part of its Determination.

3.2.4. IMG’s approach based on simple partial productivity indicators is flawed

IMG’s overall approach is also seriously flawed and entirely different from the approach in regard to benchmarking commonly adopted by regulators. IMG has based its entire analysis on simple partial productivity comparisons, usually dividing a type of cost or input (e.g. operating expenditure) by a type of output (e.g. work load units) or vice versa. Due to the problems associated with partial productivity measures, they cannot be relied on as a valid measure of airport efficiency. In particular:

- they use a single measure of inputs, and therefore fail to take account of differences in the quantity and quality of other inputs;

When two airports that may be equally efficient and with the same level of total costs are compared, simple partial productivity analysis results may indicate that one airport is significantly less efficient than the other. This is due to the fact that such a comparison would fail to take account of the different mixture of resources used by the different airports in their production process. Airport A may be using a higher level of capital and a lower level of labour compared to Airport B which if comparing the airports on a labour cost basis alone would show Airport A to be more efficient, the opposite would be true if the measure was based on capital expenditure indicators – Airport B would then appear to be more efficient.

- they use a single measure of outputs, and therefore fail to take account differences in the range (and quality) of outputs provided by different airports; and

Airports often provide different standards of products and services. For example Airports A and B could have the same level of passenger numbers but Airport A provides a higher level of service quality. In this scenario Airport A would appear to be less efficient due to the higher cost associated with providing the higher level of service quality.

- they fail to take account of external factors that may lead to unavoidable cost differences between equally efficient airports.

Variations in the quality of service delivered, the peakiness of traffic, lumpiness of investment or different input prices for labour etc. are widely acknowledged to impact on airport costs. However these factors will not be identified in the type of simple partial productivity comparisons carried out by IMG.

Benchmarking work in other regulated sectors has generally also employed much more sophisticated statistical approaches than the simple comparisons used by IMG. Even in these cases, regulators have used benchmarking results in conjunction with a range of other potential indicators on the scope for efficiency improvements, instead of just relying on the benchmarking results.

3.3. Summary

In this section, we have reviewed the main problems with IMG's analysis. IMG's analysis is flawed, both in terms of its overall approach and in terms of the detailed application of its methodology.

In the remainder of this paper, we show what IMG's results would have been if they had appropriately adjusted for the differences in the activities that Aer Rianta and the comparator airports undertake.

4. ADJUSTMENTS TO IMG'S ANALYSIS

4.1. Introduction

The review of IMG's benchmarking study has used the same overall approach as IMG, i.e. is based on the same simple partial performance indicators as IMG has used. It has also used the same sources as IMG. However, adjustments have been made for the differences in activities that airports undertake by removing the costs and revenues associated with activities that Aer Rianta airports undertake directly, but their comparator airports do not.

4.2. Comparator Airports

In the case of Dublin, the analysis focuses on the airports that IMG identified as "Best of Peers": Brussels, Copenhagen, Glasgow, Oslo and Stansted. The reason why the other airports have not been included is that many of these were engaged in activities not undertaken directly by Aer Rianta (e.g. as of 1999, the year for which the analysis was undertaken, Manchester and Vienna were directly engaged in groundhandling). The associated costs appear in the accounts of these airports. It is not possible to adjust for these differences since data at activity level for the comparator airports was not available.

In the case of Shannon and Cork, the same comparator airports as in the IMG analysis have been used.

4.3. Adjustments

4.3.1. Dublin

In order to "normalise" data for Dublin airport, the revenues, costs and employees relating to the direct retailing and car parking activities at Dublin have been excluded from the underlying data and replaced with net contribution estimates on the basis of Aer Rianta's accounts. This has the effect of reporting these activities as if concession arrangements were in place, similar to comparator airports, with a concession fee equal to the contribution.

As already indicated, IMG also appear to have omitted the cargo throughput figures when calculating the number of Work Load Units for Dublin. In the revised analysis, this has been corrected.

In addition, IMG appear to have excluded Aer Rianta Group Head Office employees from their analysis, even though the related costs have been included. Aer Rianta's analysis adjusts for this by including Head Office employees.

4.3.2. Shannon and Cork

Shannon's "peer" airports do not operate fuel sales or catering activities directly. In order to make Shannon and Cork airports comparable to the majority of the "peers" the revenues, costs and employees relating to the fuel sales and direct catering (both ground and inflight) at Shannon, and direct retailing at Shannon and Cork have been removed from the data, and then the contributions from these activities have been included as concession revenue. This has the effect of reporting these activities as if concession arrangements were in place, with a concession fee equal to the contribution. None of the "peers" carry out retailing directly. With the exception of Cardiff and Southampton, Shannon and Cork's peer airports did carry out car parking directly in 1999, therefore Aer Rianta has not removed the car parking costs and revenues from the Shannon and Cork accounts since the majority of Shannon and Cork's peer airports did carry out car parking directly as of 1999.

5. A COMPARISON BETWEEN THE ADJUSTED RESULTS AND IMG'S RESULTS

5.1. Introduction

In this Section, we report the adjusted results and compare them with IMG's figures. We also provide some detailed comments on the problems associated with the individual performance indicators.

We note that the *Operating Expense per Work Load Unit* indicator can be regarded as the most important one, since the selection of "best of peers" (in the case of Dublin) and the Commission's assessment of the scope for efficiency improvement were based on this indicator. We therefore analyse this measure separately in Section 5.2. Section 5.3 deals with the other indicators, under a number of broad headings.

5.2. Operating Expense per Work Load Unit

Operating Expense per Work Load Unit was the most important indicator in IMG's analysis. It was on the basis of this indicator that IMG selected the "best of peers" group for Dublin, without taking other indicators into account. It was also on the basis of this indicator that the Commission based its assessment on the scope for efficiency improvement at the Aer Rianta airports.

IMG's results were flawed, as they failed to adjust for the fact that the Aer Rianta airports undertake more activities directly than their comparator airports do. After properly adjusting for this, the Irish airports in fact perform significantly better than the average of the comparator airports.

However, it is important to note that the use of this single indicator for the purpose of assessing the scope for efficiency improvement is problematic in general. As already pointed out, the indicator measures Aer Rianta's productivity only in a partial way. It ignores the fact that airports produce many different products and services, and that they can produce these in different ways (e.g. by providing different levels of quality). It also does not take into account the fact that airports produce these outputs not just using operating expenditure but also using capital expenditure.

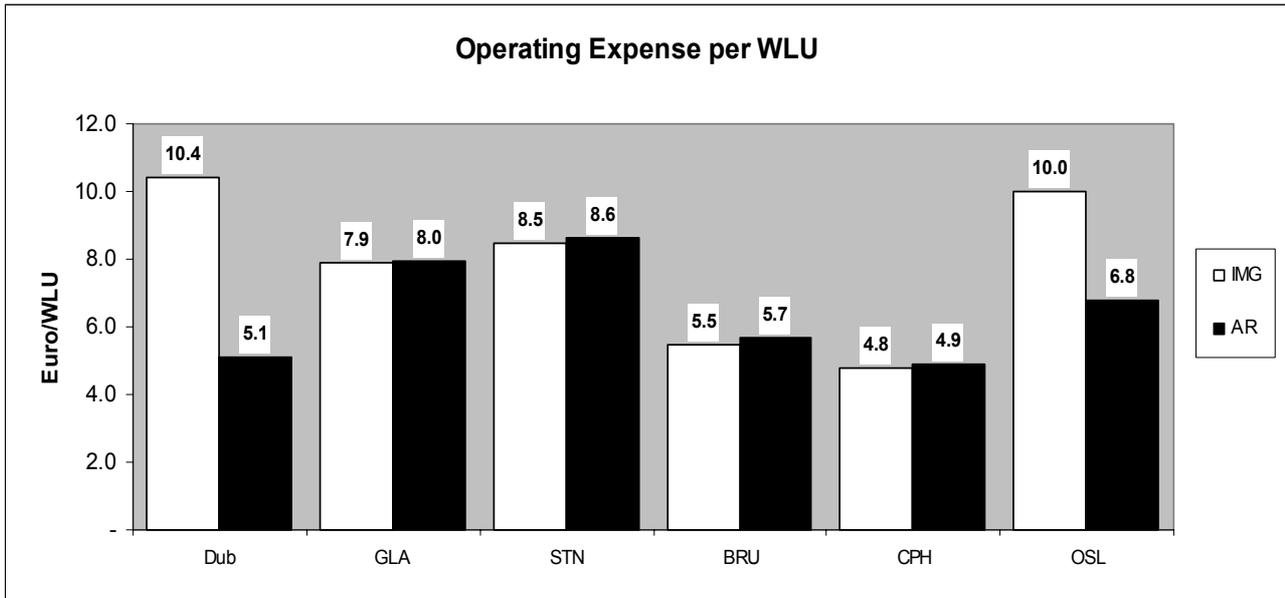
The *Operating Expense per Work Load Unit* measure ignores differences that may exist in the operating environment, including the impact of economies of scale, the degree of peakiness in demand, the airport's position in the investment cycle, local labour market costs, etc.

Another shortcoming is that in IMG's analysis, Aer Rianta performed well in measures relating to generation of non-aeronautical revenues. However, IMG do not appear to have taken into account the fact that there are costs associated with the generation of high non-

aeronautical revenues. Compared to airports that have lower non-aeronautical revenues, this will lead to a higher measured operating expense per Work Load Unit.

Dublin

Figure 5.1
Operating Expenses per Work Load Unit: Dublin



Note: A glossary of airport codes is provided at the end of the document

The Aer Rianta results reflect replacing the costs and revenues associated with car parking and retailing at Dublin (including the costs of sales) by the net contribution of these activities, similar to concession income in the accounts of the comparator airports. The Aer Rianta analysis also includes the correct Work Load Units by including cargo throughput as for other airports.

The adjustments made for Dublin airport are set out in [Table 5.1](#) below.

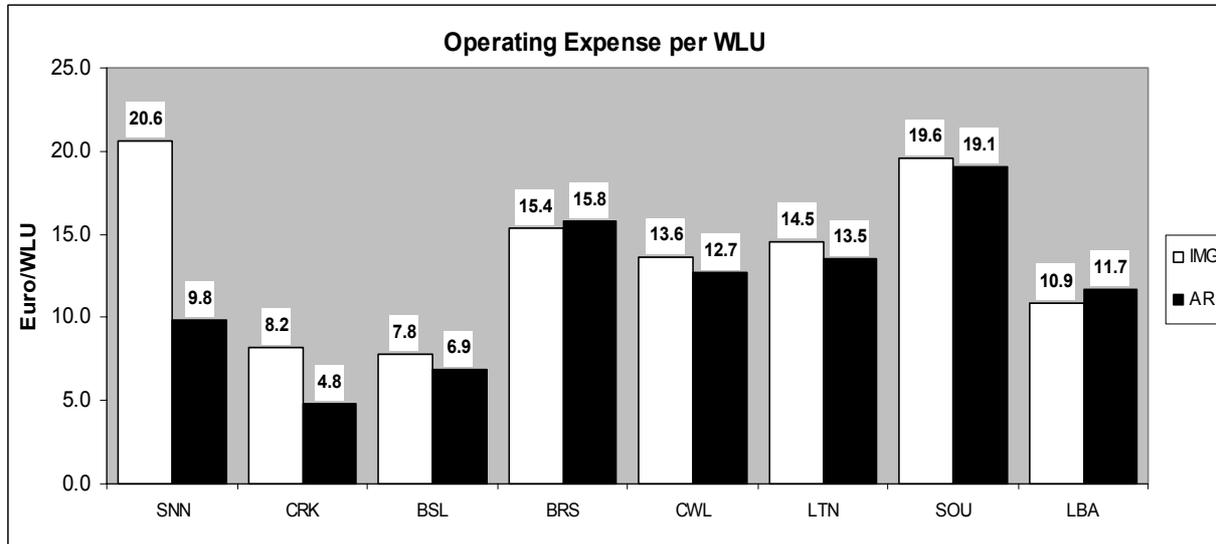
Table 5.1
Reconciliation of IMG's Underlying Data to Aer Rianta's: Dublin Airport

	Per IMG €'000	Adjustments €'000	Per AR €'000
Aeronautical	(49,036)		(49,036)
Non Aeronautical revenue	(134,104)	65,526	(68,578)
Cost of sales	46,370	(46,370)	0
Staff costs	55,008	(10,809)	44,199
Operating costs	33,227	(4,613)	28,614
Operating Income	(48,534)	3,734	(44,800)
Depreciation	16,610	(3,734)	12,876
Operating Profit	(31,924)	-	(31,924)
WLU	12,802,031	1,453,910	14,255,941
Operating Expenses per WLU	10.5		5.1

On the comparator airports, Aer Rianta was able to approximately reproduce IMG's results for each of the comparator airports, with the exception of Oslo. It is not clear how IMG derived their results for Oslo.

After applying the adjustments, the *Operating Expense per Work Load Unit* is €5.10 for Dublin airport not €10.50 as stated by IMG. When compared to the average of €6.8 per Work Load Unit for IMG's defined "Best of Peers" (as calculated by Aer Rianta), Dublin's operating expenditure per Work Load Unit is almost 20% lower. This contrasts sharply with IMG's assertion that Dublin's operating expenditure per Work Load Unit is 29% higher than the average of its "best of peers", or 35% if Oslo were excluded from this group.

Figure 5.2
Operating Expenses per Work Load Unit: Shannon/Cork



The Aer Rianta adjustments to the data for Cork and Shannon involved removing the costs for some specific activities carried out at Shannon from the Shannon cost data as at the comparator airports, these activities are outsourced and only the net contribution appears in their accounts. Similarly, the costs and revenues associated with retailing were removed from the cost data for both Cork and Shannon airports and the net contribution included as concession income reflecting the manner in which this activity would be reported in the accounts of the comparator airports.

The full adjustments for Shannon and Cork can be found in Table 5.2.

Table 5.2
Reconciliation of IMG's Underlying Data to Aer Rianta's: Shannon and Cork Airports

	Shannon			Cork		
	Per IMG €'000	Adjustments €'000	Per AR €'000	Per IMG €'000	Adjustments €'000	Per AR €'000
Aeronautical	(10,589)		(10,589)	(5,923)		(5,923)
Non Aeronautical revenue	(49,357)	27,516	(21,841)	(12,415)	5,299	(7,116)
Cost of sales	10,379	(10,379)	(0)	4,358	(4,358)	(0)
Staff costs	25,881	(11,371)	14,510	6,452	(754)	5,698
Operating costs	15,590	(5,354)	10,236	2,268	(159)	2,109
Operating Income	(8,096)	412	(7,684)	(5,260)	28	(5,232)
Depreciation	2,294	(412)	1,882	1,676	(28)	1,648
Operating Profit	(5,802)	-	(5,802)	(3,584)	-	(3,584)
WLU	2,533,972		2,533,972	1,612,416		1,612,416
Operating Expenses per WLU	20.5		9.8	8.1		4.8

It should be noted that IMG appear to have netted the cost of sales of fuel (at Shannon) against revenues in the Shannon accounts. This can be regarded as a first step towards normalisation and shows that IMG did have some basic understanding of the need for this. However, they failed to adjust for differences in the non-aeronautical activities carried out at comparator airports.

On the basis of the adjusted data, the *Operating Expense per Work Load Unit* for Shannon and Cork is €9.8 and €4.8 respectively, compared with IMG's stated numbers of €20.6 and €8.2. Shannon and Cork compare very favourably to the average of the "peer" airports, which is €13.3 per Work Load Unit. In fact, Shannon's operating expense per Work Load Unit is 25% below the average of the "peers"; Cork's operating expense per work load unit is no less than 60% below the peer group average. This shows that IMG's conclusions in regard to Shannon and Cork's operating costs were based on a completely inaccurate analysis.

5.3. Other Indicators

5.3.1. Introduction

After the discussion of the most important indicator *Operating Expense per Work Load Unit* in Section 5.2, we report the results on the other indicators in this section. The indicators are grouped under the following main headings:

- Employee-related measures;
- Revenue and income related measures; and
- Work Load Units per Movement.

5.3.2. Employee-related measures

In this section, we report the following three measures:

- *Work Load Units per Employee;*
- *Operating Expense per Employee; and*
- *Labour Expense per Employee.*

These measures are all heavily affected by the degree of contracting out (as opposed to the use of own labour) for certain activities. In addition, they may be influenced by other specific factors affecting the size of the workforce for example local legislative requirements in relation to staffing ratios etc.

The *Work Load Units per Employee* measure is a very partial measure of productivity that does not take account of the fact that airports produce more outputs than just Work Load Units. For example, if an efficient airport employs a relatively large number of employees and uses them to provide a high level of service quality, the airport will appear to perform poorly on this indicator without this being a result of cost inefficiency. The indicator also fails to take account of the trade-offs between employee numbers and capital expenditure.

The *Labour Expense per Employee* measure largely reflects relative labour costs in the various countries in which the airports are located and can only to a limited extent be influenced by airports. These differences will also impact on the *Operating Expense per Employee* measure.

Dublin Airport

In our analysis, we have adjusted for the employees associated with retailing and car parking in Dublin, as these are also not included in the employee numbers for the comparator airports. We have added the Group Head Office employees to the total, as IMG has included the related Head Office costs. The net effect of this is that the *Work Load Units*

per Employee measure is higher than in IMG's analysis, though still lower than at the comparator airports.

There are a number of factors which impact upon the results related to this measure including:

- Economies of scale – some airports have significantly higher passenger throughputs than Dublin. There is not necessarily a direct correlation between an increase in passenger numbers and the number of employees required
- Level of outsourcing of operational functions – For example, all of the “best of peer” airports outsource either cleaning or security, which improves their performance in the employee based measures whereas Dublin Airport performs both of these activities directly. In this context it should be noted that Dublin’s cleaning and security employees make up approximately 40% of the adjusted employee figure.

We have also adjusted for the costs associated with retailing and car parking in Dublin, including the cost of sales. Both the *Operating Expense per Employee* and the *Labour Cost per Employee* measures are thus lower than in IMG's analysis, this is in spite of the lower number of employees in Aer Rianta's analysis. As a result, Dublin now performs better than its “best of peers” on both measures.

Table 5.3
Results for Employee related measures: Dublin Airport

	DUB	GLA	STN	BRU	CPH	OSL
Aer Rianta's results						
WLU's per Employee	11,571	14,612	17,367	37,461	14,698	25,552
Operating Expense per employee	59,102	116,322	149,605	212,219	71,684	173,075
Labour Cost per employee	35,876	47,442	52,553	64,284	43,627	61,039
IMG's results						
WLU's per Employee	10,248	14,349	17,367	37,158	14,697	n/a
Operating Expense per employee	106,086	113,449	148,175	205,440	71,145	n/a
Labour Cost per employee	41,869	46,212	52,162	48,683	43,299	n/a

Shannon and Cork Airports

After adjusting for retailing, catering and fuel activities at Shannon, a number of other activities are carried out in-house (unlike at the comparator airports), the number of employees used in Aer Rianta's analysis was considerably lower than in IMG's analysis. As a result, the Aer Rianta result for *Work Load Units per Employee* is substantially higher than in IMG's analysis.

The difference on the other two indicators is lower as the removal of non-core activities causes both the costs and the employee numbers to fall. The net impact is that both the *Operating Expense per Employee* and the *Labour Cost per Employee* are higher in Aer Rianta's analysis than in IMG's analysis.

On the basis of the adjusted data, Cork now performs better on the *Work Load Units per Employee* measure than the average of the comparator airports, whereas Shannon is only slightly below the average. It should be noted that the average itself has fallen by around 10 per cent following the inclusion of Southampton. IMG did not appear to have employee data for Southampton and therefore did not report any Southampton values for these three indicators. The fact that the inclusion of a single airport causes the average result for the comparator airports to fall by around 10 per cent is another example of the non-robustness of IMG's approach.

Even after the adjustments, the Aer Rianta airports still perform significantly better than the average of the comparator airports on the *Operating Expense per Employee* measure (although, as we pointed out, it is unclear what the significance of this indicator is). On the *Labour Cost per Employee* measure, Cork and Shannon now perform broadly in line with the average across the comparator airports.

Table 5.4
Results for Employee Related Measures: Shannon/Cork

	SNN	ORK	BSL	BRS	CWL	LTN	SOU	LBA
Per Aer Rianta								
WLU's per Employee	8,308	12,797	16,800	11,203	13,598	7,730	3,805	5,983
Operating Expense per employee (Incl COS)	81,134	61,963	116,625	176,718	173,222	104,665	72,700	70,228
Labour Cost per employee	47,575	45,223	48,151	53,155	38,699	44,851	42,748	41,909
Per IMG								
WLU's per Employee	3,591	10,452	16,800	11,220	13,658	7,472	n/a	6,324
Operating Expense per employee (Incl COS)	74,026	86,196	131,451	173,286	185,350	108,050	n/a	68,864
Labour Cost per employee	37,237	42,348	45,956	52,123	37,947	43,980	n/a	41,095

5.3.3. Revenue and income related measures

In this Section, we report the following four measures:

- *Operating Revenue per Work Load Unit;*
- *Aeronautical Revenue per Work Load Unit;*
- *Non-Aeronautical Revenue as a Percentage of Operating Revenue; and*
- *Operating Income per Work Load Unit.*

Dublin Airport

Table 5.5
Results for Revenue Related Measures: Dublin

	Dub	GLA	STN	BRU	CPH	OSL
Aer Rianta's results						
Operating revenue ⁵ per WLU	8.3	15.9	13.9	9.5	11.1	15.1
Aeronautical revenue per WLU	3.4	10.1	5.7	5.4	5.9	8.5
Non-aeronautical revenue as % of revenue	58.3%	36.7%	58.8%	43.6%	46.9%	44.1%
Operating Income Per WLU	3.1	8.0	5.3	3.8	6.3	8.4
IMG's results						
Operating revenue per WLU	13.4	15.8	13.8	9.3	11.1	14.0
Aeronautical revenue per WLU	4.3	10.0	5.7	n/a	5.9	n/a
Non-aeronautical revenue as % of revenue	68.1%	63.3%	41.2%	n/a	46.9%	n/a
Operating Income Per WLU	3.1	7.9	5.3	3.8	6.2	4.0

Note: IMG made an error in the calculation of Non-Aeronautical Revenue as % of Revenue for Glasgow and Stansted airports; the ratios IMG state are in fact Aeronautical (rather than non-Aeronautical) Revenue as % of Revenue. The ratios are corrected under the Aer Rianta results.

The total revenue from car parking and retailing at Dublin Airport has been replaced with net contribution estimates i.e. concession income as at the comparator airports. As a result of this, both the *Operating Revenue per Work Load Unit* and the *Non-Aeronautical Revenue as % of Revenue* are lower in Aer Rianta's analysis than in IMG's. The *Aeronautical Revenue per Work Load Unit* is also lower in Aer Rianta's results since the correct Work Load Unit figure including cargo throughput at Dublin has been used. The *Operating Income per Work Load Unit* measure is the same in IMG's and in Aer Rianta's analysis, however, since Aer Rianta

⁵ Operating Revenue = Total revenue

used a higher Work Load Unit figure (including cargo), it is unclear how IMG obtained its figure for Dublin Airport.

On the basis of the adjusted data, Dublin’s result for *Operating revenue per Work Load Unit* is €8.3 per Work Load Unit, which is lower than any of the “peers”. This is as a direct consequence of Dublin’s *Aeronautical revenue per Work Load Unit* being less than half the “Best of Peers” average.

Aer Rianta’s *Non-Aeronautical Revenue as a % of the normalised Operating Revenue* is 58.3%, which is higher than all but Stansted. It should be noted that Dublin and Stansted are the only airports whose *Aeronautical Revenue per Work Load Unit* is lower than their *Operating Cost per Work Load Unit*. Dublin’s *Aeronautical Revenue per Work Load Unit* barely covers the labour cost per Work Load Unit. Again this is a reflection of the low level of *airport charges* at Dublin airport.

Shannon and Cork Airports

Table 5.6
Results for Revenue Related Measures: Shannon/Cork

	SNN	ORK	BSL	BRS	CWL	LTN	SOU	LBA
Per Aer Rianta								
Operating revenue per WLU	12.8	8.1	13.8	24.9	23.0	15.3	27.3	18.8
Aeronautical revenue per WLU	4.2	3.7	6.6	11.6	17.3	6.9	15.7	13.5
Non-aeronautical revenue as % of revenue	67.3%	54.6%	52.2%	53.5%	25.1%	54.7%	42.4%	27.8%
Operating Income Per WLU (before Deprec)	3.0	3.2	6.8	9.1	10.3	1.7	8.2	7.0
Per IMG								
Operating revenue per WLU	23.7	11.3	12.6	24.3	22.5	15.5	24.0	17.4
Aeronautical revenue per WLU	N/a							
Non-aeronautical revenue as % of revenue	81.4%	69.1%	56.0%	53.5%	25.1%	54.7%	36.4%	27.8%
Operating Income Per WLU (before Deprec)	3.1	3.0	4.7	8.9	8.9	1.0	4.4	6.5

In the case of Cork and Shannon, non-aeronautical revenue was adjusted downwards in Aer Rianta’s analysis by replacing the total retail revenue at the two airports (including the cost of sales) by net contribution estimates. The same was done for some specific activities carried out at Shannon only.

As a result, *Operating Revenue per Work Load Unit* and *Non-Aeronautical Revenue as % of Revenue* are substantially lower in IMG’s analysis. Aer Rianta has also calculated the *Aeronautical Revenue per Work Load Unit* for the two airports, something that was not

included in the IMG report. The Aer Rianta adjustments did not impact on the *Operating Income per Work Load Unit* measure, which is broadly similar to IMG’s result.

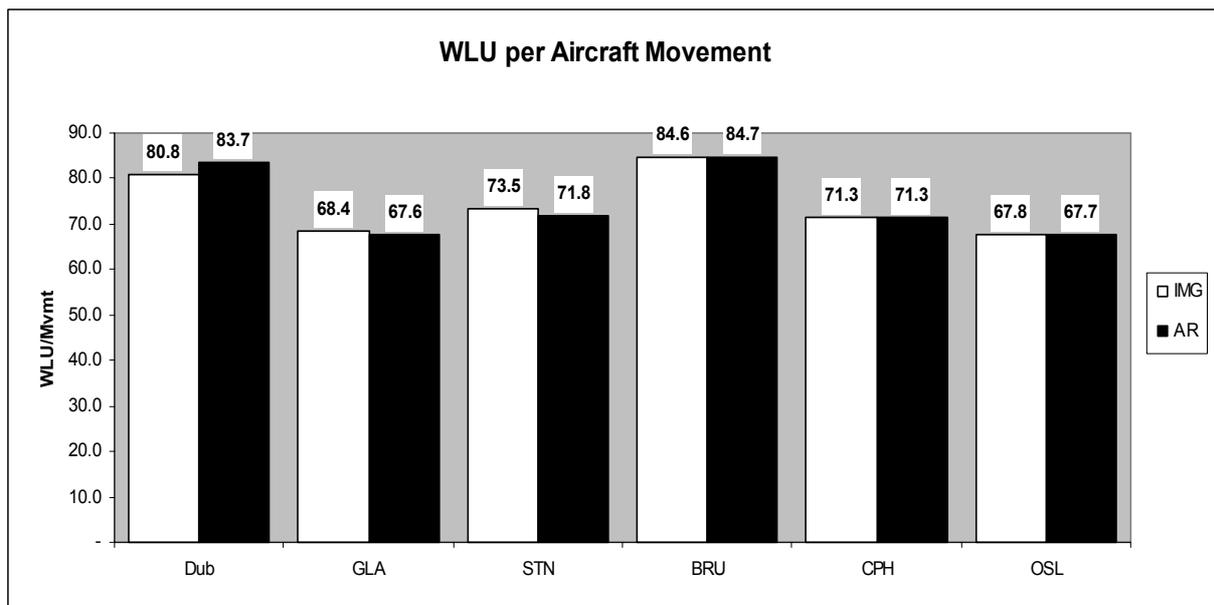
Based on Shannon and Corks *Aeronautical Revenue per Work Load Unit* results, it is reasonable to conclude that Shannon and Cork’s higher *Non-Aeronautical Revenue as a % of Operating Revenue* is significantly influenced by the aeronautical revenues being only one third that of their “peers”.

5.3.4. Work Load Units per Movement

This section presents the final indicator, *Work Load Units per Movement*. Although we include the indicator for completeness, we note that airlines’ profiles in terms of fleet, sectors flown (i.e. short, long haul, domestic, international etc.) and performance, rather than that of airports heavily influences this measure. This includes the long-haul/short-haul split at an airport, the wide-body/narrow-body split and the average aircraft load factors at the airports in question. Average load factors are a function of airline performance and, in addition, of the scheduled/charter mix at an airport and the presence of low-cost airlines. Another factor that impacts on this measure is the level of non-passenger and non-cargo movements at the various airports.

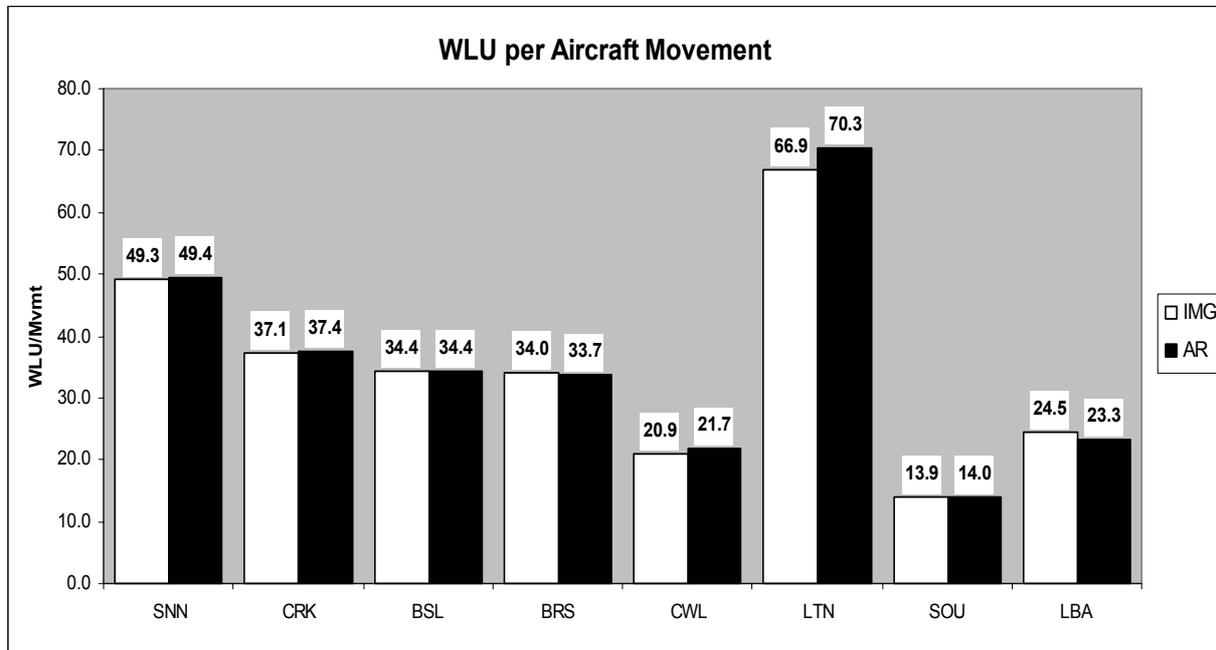
The results for Dublin are shown in the figure below. As can be seen, there is little difference on this indicator between the IMG and Aer Rianta analyses; Dublin remains in the top tier.

Figure 5.3
Work Load Units per Aircraft Movement: Dublin



Finally, the results for Shannon and Cork are shown in the figure below. Again, the IMG and Aer Rianta analyses are broadly similar.

Figure 5.4
Work Load Units per Aircraft Movement: Shannon/Cork



Due to data availability problems, we do not report the following two indicators that IMG have used:

- *Maintenance Expense per Work Load Unit; and*
- *Concession Revenue per Enplaned Passenger.*

GLOSSARY OF AIRPORT CODES

DUB	=	Dublin
SNN	=	Shannon
ORK	=	Cork
GLA	=	Glasgow
STN	=	London Stansted
BRU	=	Brussels
CPH	=	Copenhagen
OSL	=	Oslo
BSL	=	Basel
BRS	=	Bristol
CWL	=	Cardiff
LTN	=	London Luton
SOU	=	Southampton
LBA	=	Leeds Bradford