Issues Paper

Maximum Levels of Aviation Terminal Services Charges of the Irish Aviation Authority

Commission Paper CP8/2006

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1 EXECUTIVE SUMMARY

1. On February 27, 2001, the Minister for Public Enterprise established the Commission for Aviation Regulation ("the Commission") under Section 5 of the Aviation Regulation Act, 2001 ("the 2001 Act"). Under the Act, one of the principal functions of the Commission is the regulation of aviation terminal services charges that may be imposed by the Irish Aviation Authority ("IAA").

2. The Commission made its first determination on 26 February 2002, which specified a price cap on aviation terminal charges to apply for the five years beginning 26 March 2002. This price cap is due to expire on 25 March 2007.

3. It is, therefore, incumbent on the Commission to make a new determination specifying maximum levels of aviation terminal services on or before the expiration of the current determination on 25 March 2007.

4. The purpose of this paper is to set out the issues that the Commission considers pertinent to the making of a second determination on maximum levels of aviation terminal services charges. Its purpose is also to elicit the views of interested parties on those issues and on any other issues that they consider relevant to the Commission's task.

5. Section 2 of the 2001 Act states that "terminal services" should have the meaning assigned to it by the Irish Aviation Authority Act, 1993 ("the 1993 Act"). The 1993 Act defines terminal services as "the air navigation services provided for aircraft landing at or taking off from an aerodrome or while in the vicinity of an aerodrome before landing at or taking off from that aerodrome." Air navigation services are defined by the 1993 Act as including "services providing, giving, or issuing information, directions or instructions, or other facilities, for the purposes of or in connection with the navigation or movement of aircraft." The Commission, for the purposes of its first determination, interpreted the reference to "aircraft landing at or taking off from an aerodrome" in the 1993 Act to correspond to aerodrome control in the ICAO[1] principles, and the reference to "while in

[1] International Civil Aviation Organisation

the vicinity of an aerodrome before landing at or after taking off from that aerodrome" in the 1993 Act to correspond to approach control in the ICAO principles.

6. For the purposes of its first determination, the Commission used the relevant proportions of costs to be allocated to terminal services, as determined by Eurocontrol. These were the only set of cost allocations available to the Commission at the time. Given the significant developments that are likely to have taken place since 1993, it could be necessary for the Commission to review these cost allocations for the purposes of its second determination.

7. It is recognised that the air traffic management system within the European Union is constrained by air route networks that are based upon national borders. The Single European Sky Initiative is predicated on the belief that borders in the sky should not exist, and that a unified air traffic management system should be introduced. The Commission envisages that the air navigation charging rules, when agreed, may go beyond the current en route charging system by introducing harmonization of terminal charges and defining a mechanism for financing projects of common interest.

8. In determining maximum levels of aviation terminal services charges, Section 36 of the 2001 Act obliges the Commission to "aim to facilitate the development and operation of safe, cost-effective terminal services which meet international standards." Section 36 of the 2001 Act also requires the Commission to have due regard to seven specified factors.

9. The current price control takes the form of a cap on the average revenue per metric tonne of departing aircraft weight. Given the superior incentive properties of the hybrid approach to price regulation (over the cost pass-through alternative), the Commission currently sees no reason to alter its approach in favour of a cost pass-through system.

10. For the purposes of the first Determination, a period of 5 years was prescribed by the legislation. The Commission has discretion in choosing the duration of the second Determination, provided it is equal to or longer than 4 years. The Commission sees merit in having the second

Determination come into effect on 26 March 2007 with a move to a calendar-year basis on 1 January 2008. This involves a Determination with an opening price cap to apply for a period of 9 months, followed by annual price caps thereafter.

11. It is open to the Commission to set the determinants of maximum allowed revenue in a way that better reflects the costs incurred so that movements in future revenues can be expected to track movements in future costs more closely.

12. The Commission anticipates continuing with a regulatory till that only includes revenue earned by the IAA from aviation terminal services.

13. The downturn in traffic that resulted from the 9/11 attacks has meant that air traffic has lagged behind the forecasts used by the Commission for the first determination. As it did for the purposes of its first determination, the Commission will be requesting the IAA's traffic forecasts for the period of the second determination. It will, at that stage, endeavour to examine the robustness of these forecasts, including checking them against Eurocontrol's traffic forecasts for the same period. The Commission notes that price cap regulation tends to shift traffic outturn (or "volume") risk more towards service providers, as occurred for the IAA over the period of the first determination. It is open to the Commission to contemplate a volume-related price cap adjustment mechanism in the regulatory formula. In doing so, the Commission will also need to be mindful of the requirement to minimise user charge volatility.

14. The Commission plans, as at the time of the first determination, to review the IAA's operating cost projections for the period of the second determination at a high level from an efficiency perspective and include in the price cap operating expenditure ("opex") allowances sufficient to cover those operating costs necessary for the maintenance of safety and for a given level and quality of service.

15. The Commission, in making its first determination, also determined that aviation terminal services were being provided by the IAA at a level below the fully allocated cost of providing the service. The determination set the maximum charge at a level to cover all such costs, including the relevant

portion of meteorological service ("MET") costs, with the necessary increases phased in over the duration of the determination. The IAA has informed the Commission that, by 2005, it had allocated 15 per cent of aeronautical MET costs to the terminal services cost base and that, by the end of the period of the current determination, it will have allocated the full 20 per cent.

16. At the time of the first determination, the Commission examined evidence of the Authority's international cost competitiveness and found that the Authority's (albeit en route) costs were significantly below those of the other service providers in the study. It appears to the Commission, having studied the Eurocontrol Performance Review Commission ACE 2004 Report[2], that this picture has little changed in the interim.

17. The IAA has informed the Commission of the development of a technology plan, setting out its investment needs to 2015. As it did for the purposes of its first determination, the Commission plans to review the IAA's planned capital expenditure ("capex") for the period of the second determination. In doing so, it is likely to take into account the future needs of the airline industry, the need to maintain and enhance the safety and quality of its services, the need to increase capacity and any international commitments under the Single European Sky or otherwise.

18. The outturn magnitude and timing of investment in respect of aviation terminal services was very different from the assumptions underlying the calculation of the price cap. Significantly higher capex was allocated to terminal services during 2002 and 2003. However, in 2004 expenditure was negative arising from a decision to transfer a portion of the costs incurred in 2002 and 2003 to the en route cost base. The net result over the three years was expenditure of €6.2 million less than the allowance in the price cap. The Commission will investigate this further in the course of making its second determination.

19. It would be the Commission's intention to have a new or updated assessment of the IAA's cost of capital for the purposes of its second determination.

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[2] Annual Air Traffic Management Cost Effectiveness Benchmarking Report 2004. www.eurocontrol.int

20. For the 2007 Determination, the Commission will engage with the IAA and with users in order to establish their assessment of current service quality levels in respect of aviation terminal services. In particular, the Commission will consider whether explicit incorporation of service quality within the price cap is necessary or feasible before 26 March 2007.

21. The Commission for Aviation Regulation requests interested parties to submit responses to the questions posed in this consultation paper by noon on 9 November 2006.

2 CONSULTATION QUESTIONS[3]

1. *Does the Commission's interpretation of the meaning of terminal services continue to reflect the IAA's operational reality?*

2. *Is it necessary and/or appropriate for the Commission to review the IAA's cost allocations and cost allocation methodologies?*

3. *Do respondents believe that the Commission should continue to regulate the IAA through a CPI-X price cap?*

4. *The Commission would welcome views on the duration of the second Determination and, in particular, whether it should continue with a 5-year price cap?*

5. *Do respondents agree that it is appropriate and desirable to align the regulatory year and the calendar financial year?*[4]

6. *Should the Commission approach the structure of the IAA's terminal services costs, such that allowed revenues (through an appropriately designed price control) can, in general terms, be aligned with the structure of costs?*

7. *Do respondents agree that it is appropriate for the Commission to continue with a regulatory till that includes only costs incurred and revenues earned in the provision of aviation terminal services?*

8. *What are the respondents' views on the appropriate allocation of the future financial risks associated with traffic volatility betweenair navigation service providers (ANSPs) and users as well as the appropriate mechanism to allocate those risks in practice?*

9. *Should the Commission continue with its existing approach to reviewing the IAA's operating cost projections from an efficiency perspective to*

[3] For ease of reference, the specific questions to which the Commission is inviting responses are collected together in this section of the paper, they also appear in the body, of the document following the discussion of the material to which they relate.

[4] This would give a price control of 4 years 9 months.

decide opex allowances for the purposes of determining maximum levels of aviation terminal services charges?

10. *The Commission would welcome views on whether the service area allocations of aeronautical MET costs (i.e., an 80/20 split between en route and terminal respectively) is appropriate, and consistent with the ICAO principle that "the allocation of aeronautical meteorological costs should be determined in such a way as to ensure that no users are burdened with costs not properly allocable to them?"*[5]

11. *The Commission would welcome views regarding to what extent it should rely on the productivity and cost-effectiveness rankings implied by the PRC ACE 2004 and the SDG/Solar Alliance Benchmarking Reports in making a new determination specifying maximum levels of aviation terminal services charges?*[6]

12. *Should the Commission continue with its existing approach to deciding capex allowances for the purposes of determining maximum levels of aviation terminal services charges?*

13. *Do you agree with the proposed approach to calculating the IAA's allowed rate of return for the purposes of the second determination specifying maximum levels of aviation terminal services charges?*

14. *Do you agree with the Commission's current approach to the IAA's service quality? Would you instead wish to see an explicit system of financial bonuses and penalties linked to service quality incorporated into the Commission's price cap on the IAA? Over what horizon do you consider that such a system might be developed?*

[5] See ICAO Manual on Air Navigation Services Economics – Appendix 6.

[6] For the SDG/Solar Alliance Report please see www.aviationreg.ie

3 INTRODUCTION

3.1 Background

On February 27, 2001, the Minister for Public Enterprise established the Commission for Aviation Regulation under Section 5 of the Aviation Regulation Act, 2001 Under the Act, one of the principal functions of the Commission is the regulation of aviation terminal services charges.

Under the 2001 Act, the Commission was required, within 12 months of its establishment and at the end of each succeeding period of 5 years, to make a determination specifying the maximum levels of aviation terminal services charges that may be levied by the IAA. The Commission made its first determination on 26 February 2002, which specified a price cap on aviation terminal charges to apply for the five years beginning 26 March 2002. This price cap is due to expire on 25 March 2007.

The State Airports Act, 2004 ("the 2004 Act") amended the 2001 Act. Section 23 of the 2004 Act (amending Section 35 of the 2001 Act) states that "on the expiration of a determination, the Commission shall make a determination specifying the maximum levels of aviation terminal services charges that may be imposed by the Authority" and that "a determination shall (a) be in force for such a period of not less than 4 years, and (b) come into operation on such day, as the Commission specifies."

It is, therefore, incumbent on the Commission to make a new determination specifying maximum levels of aviation terminal services on or before the expiration of the current determination on 25 March 2007.

3.2 Purpose of Consultation Paper

The purpose of this paper is to set out the issues that the Commission considers pertinent to the making of a second determination on maximum levels of aviation terminal services charges. Its purpose is also to elicit the views of interested parties on those issues and on any other issues that are considered relevant to the Commission's task. In doing so, the paper summarises the way in which the Commission interpreted and approached the statutory objective and the statutory factors when making the first determination in 2002.

3.3 Call for Submissions

The Commission for Aviation Regulation requests interested parties to submit responses to the questions posed in this consultation paper by **noon on 9 November 2006**. Submissions should be addressed to:

Bridín O'Leary
Economist
Commission for Aviation Regulation
3rd Floor, Alexandra House
Earlsfort Terrace
Dublin 2.

The Commission requests that all written submissions be typed. Submissions may also be sent in electronic form either on floppy disk or by e-mail to info@aviationreg.ie and should be in either Microsoft Word (.doc) or portable document format (.pdf).

4 SCOPE OF REGULATION

4.1 Meaning of "Terminal Services"

Section 2 of the 2001 Act states that "terminal services" should have the meaning assigned to it by the Irish Aviation Authority Act, 1993 ("the 1993 Act"). The 1993 Act defines terminal services as "the air navigation services provided for aircraft landing at or taking off from an aerodrome or while in the vicinity of an aerodrome before landing at or taking off from that aerodrome." Air navigation services are defined by the 1993 Act as including "services providing, giving, or issuing information, directions or instructions, or other facilities, for the purposes of or in connection with the navigation or movement of aircraft."

According to the recommendations and charging principles of the International Civil Aviation Organisation (ICAO)[7], the provision of air navigation services is divided between the three main phases of a flight:

1. Aerodrome (movement at and around an airport);
2. Approach (including initial climb on departure and final descent on arrival);
3. En route.

The ICAO principles also distinguish between "approach and aerodrome control charges" and "route air navigation services charges," which appears to imply that terminal services comprise air navigation services provided to aircraft in the aerodrome control and approach control phases of flights. This is how the Commission, for the purposes of its first determination, interpreted the meaning of terminal services in the 1993 Act, that is, that the reference to "aircraft landing at or taking off from an aerodrome" in the 1993 Act corresponds with aerodrome control in the ICAO principles and that the reference to "while in the vicinity of an aerodrome before landing at or after taking off from that aerodrome" in the 1993 Act corresponds with approach control in the ICAO principles.

Question:

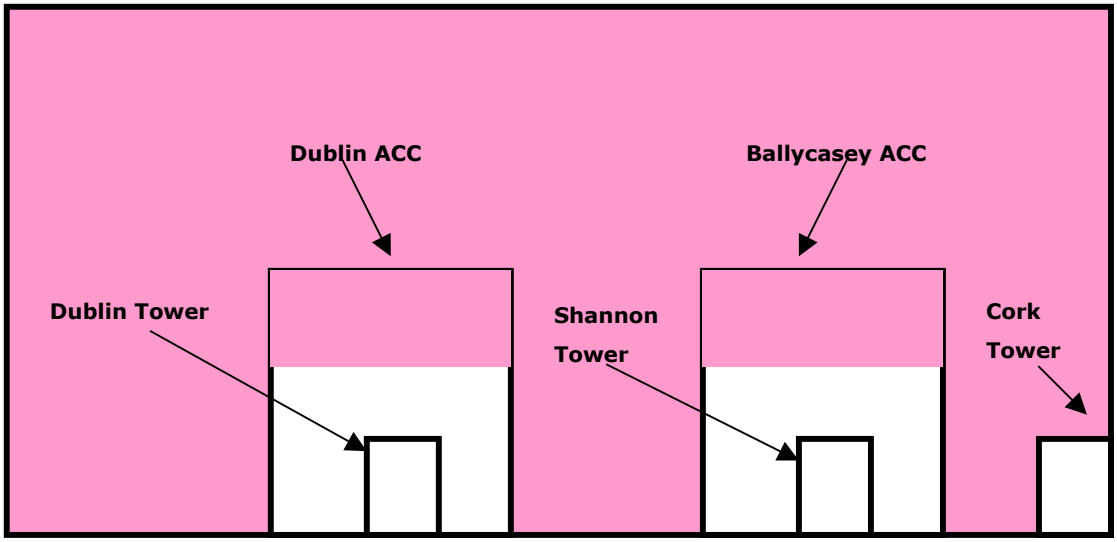
Does the Commission's interpretation of the meaning of terminal services continue to reflect the IAA's operational reality?

[7] See ICAO (2004), "Policies on Charges for Airports and Air Navigation Services," Seventh Edition, Doc 9082/7.

Figure 1 below is a figurative presentation of Irish airspace, as it relates to air navigation services and their inter relationships in Irish airspace. The vertical axis represents flight levels and the horizontal axis a northeast-southwest cross-section across Irish airspace. The black boundaries represent the IAA's operational units, while the coloured shading represents delineation between en route and terminal services and, therefore, between what is regulated and what is not.

The new Area Control Centre (ACC) at Ballycasey, (a greenfield development) controls all air traffic operating above 28,000 feet in Irish airspace, mainly aircraft travelling en route between Europe and North America. The Dublin ACC controls all flights in the Dublin area up to an altitude of 24,000 feet. This includes control of a certain proportion of low altitude en route traffic, but mainly controls for aircraft departing and arriving at Dublin Airport. It is the Commission's understanding that the Ballycasey ACC provides control for aircraft below 28,000 feet outside of the Dublin Area, (and that, this includes a certain proportion of low altitude en route traffic as well as approach control for aircraft departing and arriving Shannon and Cork Airports). The Cork tower provides a final approach and aerodrome control service to aircraft departing and arriving Cork Airport, within a zone that has a vertical limit of 5,000 feet and a radius around the airport of 15 nautical miles. The Dublin and Shannon towers provide a similar final approach and aerodrome control service to aircraft departing and arriving at those airports. It follows that the cost base for aviation terminal services is likely to include the costs of the Dublin, Shannon and Cork towers and certain proportions of the costs of the Dublin and Ballycasey ACCs.

Figure 1: Cross-Section of Irish Airspace



4.2 Other Services Provided by the IAA

As well as aviation terminal services at each of Dublin, Shannon and Cork airports, the IAA provides en route navigation for movements in Irish-controlled airspace,[8] Shanwick Communications,[9] safety regulation, air navigation for exempt air traffic[10] and commercial and training activities. Table 1 below shows both the absolute and proportional shares of turnover attributable to each of the IAA's services in 2005, along with a diagrammatic representation of these services in Figure 2.

[8] Aircraft that fly through Irish airspace en route between Europe and North America, generally above 28,000 feet and that do not touch down in Ireland.

[9] Shanwick Communications provides a long-range voice communications service for Oceanic air traffic control in the eastern half of the north Atlantic, the Volmet Broadcast Service and is the AFTN (Aeronautical Fixed Telecommunications Network) COM for Ireland.

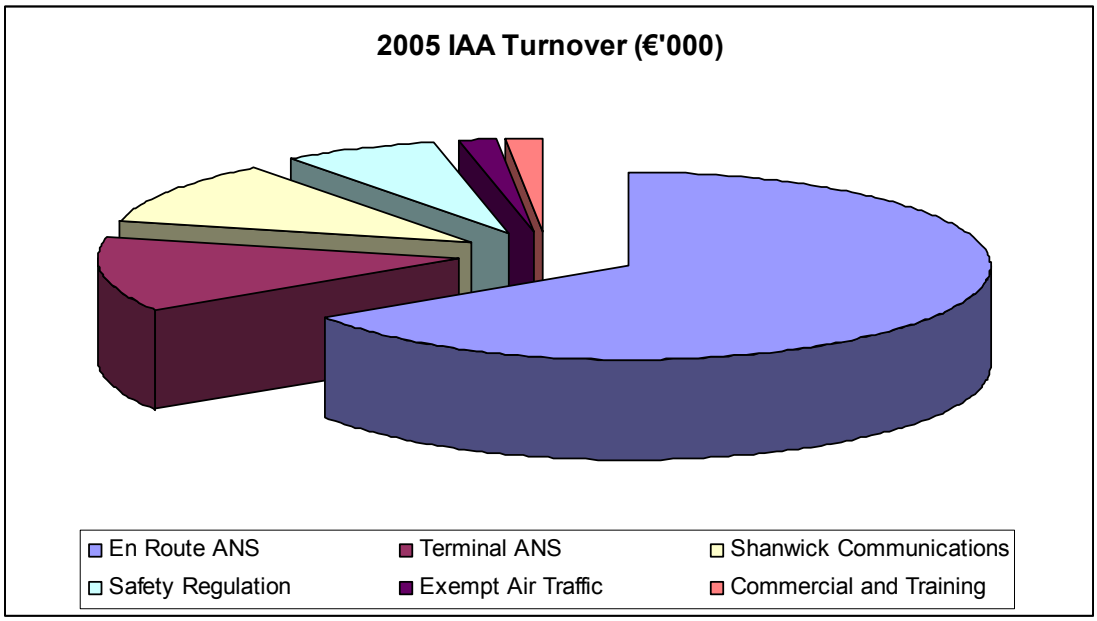
[10] Exempt air traffic includes military, search and rescue, flights with heads of State and any aircraft with a weight under two tonnes.

Table 1: The IAA's Services and 2005 Shares of Turnover

IAA Service	*Turnover (€'000)*	*Proportion*
En Route ANS	84,160	66%
Terminal ANS	16,140	13%
Shanwick Communications	14,192	11%
Safety Regulation	9,083	7%
Exempt Air Traffic	1,853	1%
Commercial and Training	2,253	2%
Total	127,681	100%

Source: IAA Annual Report and Accounts 2005

Figure 2: Diagrammatic representation of Table 1



Some resources that are used in the provision of aviation terminal services are simultaneously used in the provision of these other services, particularly en route air navigation services. Therefore, cost-reflective maximum aviation terminal services charges require the proportion of use of these common resources to be distinguished from the proportion used in the provision of the other services. Having examined the IAA's systems, Eurocontrol, in 1993, provided a set of allocations for costs that were common to the provision of terminal and en route services. This involved, approximately, a 25/75 split respectively. These

allocations were aimed at ensuring full cost recovery in accordance with ICAO principles.

For the purposes of its first determination, the Commission used the relevant proportions of costs to be allocated to terminal services, as determined by Eurocontrol. These were the only set of cost allocations available to the Commission at the time.

Given the passage of time and the likely significant developments since 1993, it may be necessary for the Commission to review these cost allocations for the purposes of its second determination.

Question:

Is it necessary and/or appropriate for the Commission to review the IAA's cost allocations and cost allocation methodologies?

4.3 Future Regulation of Charges

It is recognised that the air traffic management system within the European Union is constrained by air route networks that are based upon national borders. The Single European Sky Initiative is predicated on the belief that borders in the sky should not exist and that a unified air traffic management system should be introduced. In this context, the Single Sky Committee was set up, at EU level, to assist both Eurocontrol, (the European Organisation for the Safety of Air Navigation), and the European Union institutions to draft new rules to make this vision a reality.

Part of this process has been to draft implementing rules for a common charging scheme to be adopted by air navigation service providers throughout the EU. The drafting of this charging scheme, one of several in the overall single sky package, is taking place following the adoption in 2004 by the European Council of four regulations[11] that create the legal basis for a "Single European Sky".

[11] Regulation (EC) No 549/2004 of the European Parliament and of the Council of 10 March 2004 laying down the framework for the creation of the Single European Sky (the framework regulation); Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the Single European Sky;
Regulation (EC) No 551/2004 of the European Parliament and of the Council of 10 March 2004 on the organisation and use of airspace in the Single European Sky

The Commission envisages that the air navigation charging rules when agreed may go beyond the current en route charging system by introducing harmonization of terminal charges and defining a mechanism for financing projects of common interest.

It is for the European Commission to finalise the charging rules. A draft text[12] has been agreed between Eurocontrol and the Single Sky Committee to be considered by the Commission and the Council of Transport Ministers. This process should continue over the course of the remainder of 2006.

The objective of the proposed new charging rules is to develop a common charging scheme covering all phases of flight, to achieve greater transparency with respect to the determination, imposition and enforcement of charges to airspace users and to provide a framework for incentives and common projects which will encourage the safe, efficient and cost effective provision of air navigation services. Upon adoption, the new regulation would be applicable at aerodromes with more than 20,000 annual commercial air transport movements and at any identified group of aerodromes having this level of traffic. In Ireland, this means, Dublin, Cork and Shannon airports.

Article 3 of the draft regulation states that air navigation charges shall remunerate the costs of air navigation services; the costs of Eurocontrol and the costs incurred by the State in relation to air navigation services. Air navigation charges shall consist of (i) en route air navigation charges and (ii) air navigation services made available at aerodromes.

Air navigation services made available at aerodromes are defined as services exclusively needed for arriving and departing flights. They shall comprise:

(a) Aerodrome control services, flight information services including air traffic advisory services, and alerting services;

(b) Final approach services using dedicated resources at aerodrome level;

Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network

[12] The text of this draft scheme is available on the EUROCONTROL website - http://www.eurocontrol.int/ses/public/standard_page/sk_chargingschemes.html

(c) Communication, navigation, and surveillance services that are required for landing and take off;

(d) Local access to aeronautical information, pre-flight information service and, where applicable, the preparation of any aeronautical information relating to this aerodrome; and

(e) MET services exclusively needed to meet aeronautical requirements and comprising meteorological data, observations and reports for the aerodrome air traffic service units, aerodrome and low-level wind shear warnings, aerodrome climatological information, aerodrome forecasts, landing forecasts and forecasts for take-off, aerodrome weather watch, as well as briefing, consultation and access to meteorological information for the benefit of arriving and departing flights.

En route air navigation services shall consist of all air navigation services with the exclusion of those made available at aerodromes to arriving and departing flights, as set out above.

Pursuant to the draft regulation, air navigation service providers such as the IAA will have to identify the annual full costs for the provision of:

(a) Air navigation services made available to arriving and departing flights, at each aerodrome; and

(b) En route air navigation services made available within each charging volume of airspace.

In principle, and in general, charges will be based upon the costs of air navigation services made available to flights performed under Instrument Flight Rules. These shall be recovered from airspace users by means of:

(a) A single en route charge per flight, that is the sum of the en route charges accruing for that flight in the different charging volumes of airspace as defined by the Member States, and

(b) Charges for air navigation services made available to arriving and departing flights, at each aerodrome or group of aerodromes.

Charges for en route air navigation services shall be levied as a single charge on the basis of the distance flown within each charging volume of airspace and of the aircraft weight, in accordance with the Eurocontrol route charges system and the Conditions of Application of the route charges system and conditions of payment. The distance flown and the aircraft weight shall be taken into account by means of a distance factor and of a weight factor, respectively. The number of service units for the flight shall be equal to the product of the distance factor in the charging volume of airspace and of the weight factor. For each charging volume of airspace, the charge shall be equal to the product of the unit rate for the charging volume of airspace and of the number of service units for the flight. En route air navigation charges shall be collected in accordance with the Eurocontrol route charges system.

The draft scheme states that charges for air navigation services made available at each aerodrome or group of aerodromes shall be levied as a charge per departing flight, taking account of the aircraft weight by applying the same weight factor as for en route air navigation services. The resulting number of service units for the flight shall be equal to the weight factor. For each departure, the charge shall be equal to the product of the unit rate for the aerodrome in question and of the number of service units for the flight.

In addition, the appropriate authorities shall

(a) Calculate a yearly unit rate for en route air navigation services for each charging volume of airspace, in accordance with the Eurocontrol route charges system; and

(b) Ensure that a yearly unit rate is calculated, for each aerodrome or group of aerodromes.

Except for services subject to independent economic regulation as referred to in Article 10 of the draft regulation (such as air terminal navigation services), the unit rate shall be calculated for each charging volume of airspace and for each aerodrome or group of aerodromes, by dividing the corresponding forecast number of service units into the corresponding forecast full costs for the same year. For the calculation of unit rates, amounts carried over from the previous financial years as a result of differences between actual costs incurred and

revenues shall be added to the forecast full costs for the year, to ensure that only actual full costs are eventually recovered.

The draft regulations envisage that Member States, or regulators such as the Commission, shall conduct periodic reviews of air navigation charges and shall set in advance, for the chosen period which shall not exceed five years, conditions to determine the level of the unit rate in each year of the period. In the event of exceptional circumstances, an interim adjustment to these conditions may be introduced.

The Single Sky initiative, therefore, foresees a common charging scheme to be adopted by air navigation service providers throughout the EU. It envisages harmonization in the method of calculation of terminal charges. These are subject to independent regulation in Ireland at present and this approach remains consistent with the proposed rules. These envisage charges for air navigation services at aerodromes levied per departing flight, based on a unit rate to be calculated for each aerodrome or group of aerodromes. This unit rate may be subject to independent regulation.

5 APPROACH TO REGULATION

5.1 The Commission's Statutory Objective and due-regard factors

In determining maximum levels of aviation terminal services charges, Section 36 of the 2001 Act obliges the Commission to "aim to facilitate the development and operation of safe, cost-effective terminal services which meet international standards." Section 36 of the 2001 Act also requires the Commission to have due regard to seven specified factors, as follows:

(a). The relevant charging principles of ICAO and of Eurocontrol;

(b). The level of investment in aviation terminal services, in line with safety requirements and commercial operations, in order to meet the current and prospective needs of the airline industry;

(c). The efficient and effective use of all resources by the IAA;

(d). The level of the Authority's income from aviation terminal services and other revenue earned by the Authority generally;

(e). Operating and other costs incurred by the IAA in providing aviation terminal services;

(f). The level and quality of aviation terminal services, and the reasonable interests of users of these services; and

(g). The cost competitiveness of aviation terminal services with respect to international practice.

The Commission interpreted the development and operation of cost-effective terminal services as importing concerns with productive and dynamic efficiency.[13] However, terminal services must be safe and, so, measures designed to achieve cost-effectiveness must be fully compatible with the maintenance of safety standards. Likewise, the Commission interpreted the reference to international standards as referring to a number of or all aspects of aviation terminal services, including safety and efficient utilisation of airspace and Air Traffic Management ("ATM") systems. Moreover, such international standards are designed such that

[13] Productive efficiency refers to a situation where a firm produces a given level of service at minimum cost and that dynamic efficiency is concerned with investment and innovation and the pursuit of longer-term cost savings.

the requirements of users of the system (namely the airline industry and, ultimately, consumers of air transport) are met.

Once safety and international standards are met, economic welfare is maximised with productive and dynamic efficiency and with prices that are cost-reflective and that are efficiently structured. Economic welfare may be expressed as the excess of the total value of a service to society over its total costs. On this principle, regulatory choices would be made so as to maximise economic welfare from a given service, subject to any constraints (such as requirements to meet safety and international standards). Accordingly, in having due regard to each of the seven factors in Section 36 of the 2001 Act, the Commission will aim to determine the extent to which reliance on each of the factors maximises economic welfare. By using this test, the Commission will be in a position to determine with greater accuracy, the extent to which reliance on each of the statutory factors furthers the objective of the Commission to facilitate the development and operation of safe, cost-effective terminal services that meet international standards.

6 DESIGN & SCOPE OF THE PRICE CONTROL

6.1 Legal basis

Section 35(4)(a) of the 2001 Act states that a determination, specifying the maximum level of aviation terminal services charges, may "provide

(i) For an overall limit on the level of aviation terminal services charges;
(ii) For limits to apply to particular categories of such charges, or
(iii) A combination of any such limits."

Section 35(4)(b) specifies that a determination may "operate to restrict increases in any such charges, or to require reductions in them, whether by reference to any formula or otherwise" or [as stated in Section 35(4)(c)] "provide for different limits to apply in relation to different periods of time falling within the period to which the determination relates."

6.2 Current Control

The current price control takes the form of a cap on the average revenue per metric tonne of departing aircraft weight. The cap imposes annual limits, although any shortfall (or under-recovery) in outturn average revenue compared with the maximum may be added to the following year's allowed revenue and, likewise, any over-recovery is deducted from future revenue. The annual caps are adjusted according to a CPI+X formula, where X=7 is the permitted real percentage increase in maximum allowed average revenue. The equivalent nominal increase is, therefore, CPI+7, where CPI is the annual percentage change in the value of the Consumer Price Index.

The following table shows the unadjusted and adjusted (for under- or over-recoveries) nominal values of the price cap for each of the five regulatory years covered by the existing determination. (Note that the first regulatory year was the twelve-month period beginning 26 March 2002 and that the last regulatory year ends on 25 March 2007).

Table 2: Unadjusted and Adjusted nominal values of the price cap for each of the five regulatory years covered by the existing determination

Regulatory Year	Unadjusted Price Cap (€)	Adjusted Price Cap (€)
1	1.34	1.34
2	1.50	1.79
3	1.63	2.01
4	1.78	1.98
5	1.96	1.94

6.3 Form of the Control

There are two broad approaches to determining price controls:

1. A price cap, which, in its purest form, involves setting maximum charges for an extended period without reference to the firm's costs or volumes, but rather with reference to industry yardsticks; or

2. A cost pass-through, which sets charges based on the firm's actual costs and often with ex post revenue adjustments to exactly match costs.

According to the Commission's understanding, the latter approach is used by all states in Eurocontrol, other than the UK in respect of National Air Traffic Services ("NATS") provision of en route and Oceanic air traffic control, and Ireland in respect of the IAA's provision of terminal services, both of which are subject to price cap regulation. However, these and most other price caps are, in practice, a hybrid of the pure price cap and the cost pass through methodology.

The poor incentive properties of the cost pass-through methodology (akin to rate-of-return regulation) are well documented. There are no incentives to minimise operating costs and there is a risk of over-investment as the firm attempts to boost the asset base, which is used to calculate the allowed return. A price cap, on the other hand, is an application of incentive regulation, involving a price control that is allowed to increase by no more than CPI+/- X annually. The required real change in prices is equal to X, which is determined by the

regulator's view of, *inter alia*, the firm's rate of productivity improvement and cost reduction and its consequent ability to reduce prices without threatening its financial integrity. The incentive lies in the firm's ability to retain earnings resulting from productivity improvements and cost reductions in excess of those reflected in X. This encourages both productive and dynamic efficiency.

As outlined in Section 4.2 above, the prevailing price control on the IAA in respect of terminal services is a CPI+/- X price cap. However, the price control was determined (and is expected to be reset) with reference, *inter alia*, to the IAA's cost base. Therefore, in practice, the prevailing price control is a hybrid of the price cap and the cost pass-through methodologies. Given the superior incentive properties of this hybrid approach over the cost pass through alternative, the Commission currently sees no reason to alter its approach in favour of a cost pass-through system.

Question:

Do respondents believe that the Commission should continue to regulate the IAA through a CPI-X price cap?

6.4 Duration of the Control

Section 35(3) of the 2001 Act (as amended by the 2004 Act) states that "A Determination shall – (a) be in force for such period of not less than 4 years, and (b) come into operation on such day, as the Commission specifies."

For the purposes of the first Determination, a period of 5 years was prescribed by the legislation. The Commission has discretion in choosing the duration of the second Determination, provided it is equal to or longer than 4 years. The Commission sees merit in making a Determination with duration in excess of the statutory minimum. The longer the duration, the stronger the efficiency incentives implied by the price cap. It would also provide greater stability to facilitate long-term planning in relation to the operation and development of terminal services. Over-frequent reviews, as recently noted by the UK water regulator Ofwat, may: - disrupt planning; - divert management from the long-term pursuit of efficiency; - dilute incentives; - leave users with uncertainty about

the scale of their bills in future years; - be disruptive to the need to take a long-term view of capital needs.[14]

On the other hand, the quality of information and projections on which price controls are typically based tend to diminish the longer the period they cover. Price controls set for too long may also fail to anticipate changes in operational circumstances, investment requirements and financial needs. However, recourse, if necessary, to interim reviews with limited appropriate scope might address such matters while preserving the incentive of the price cap. Another disadvantage of longer durations is a greater lag before users benefit from the out-performance of the price cap by the regulated firm.

The ideal duration, therefore, depends on a trade-off between these various effects. One must also consider the need to avoid imposing administrative burdens on the regulated firm, its users as well as on the regulator itself.

Question:

The Commission would welcome views on the duration of the second Determination and, in particular, whether it should continue with a 5-year price cap?

If the option is available, it undoubtedly makes sense for regulatory years to be aligned with the financial year of the regulated firm. The IAA's financial year-end is 31 December, so the Commission sees merit in having the second Determination come into effect on 26 March 2007 with a move to a calendar-year basis on 1 January 2008. This involves a Determination with an opening price cap to apply for a period of 9 months, followed by annual price caps thereafter. [15]

Question:

Do respondents agree that it is appropriate and desirable to align the regulatory year and the calendar financial year in this manner?

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[14] Ofwat (2006), "Setting water and sewerage price limits: Is five years right?" Available from www.ofwat.gov.uk .

[15] This would give a price control of 4 years and five months from march 2007 to December 2011.

6.5 Structure of the Control

The Commission favours efficient charging structures, with individual users paying charges that reflect the costs they impose on the IAA. This is consistent with ICAO policies in respect of charges for airports and air navigation services[16], which, as a general principle, state that:

> *"…where air navigation services are provided for international use, the providers may require the users to pay their share of the related costs; at the same time international civil aviation should not be asked to meet costs which are not properly allocable to it."*

The ICAO policies also state that:

> *"…where charges for approach and aerodrome control are levied, whether as part of the landing charge or separately, the charge should, so far as possible, be a single element of the landing charge or a single charge per flight that could take aircraft weight into account but less than in direct proportion."*

At present, the manner in which these principles are applied is agreed with Eurocontrol's Central Route Charges Office (the CRCO).[17] Specifically, the IAA has entered into a bi-lateral agreement with Eurocontrol, entrusting the latter with the calculation, billing, accounting and collection on its behalf of charges for the use of terminal services in accordance with the laws and regulations in force in Ireland. Pursuant to this agreement and in accordance with the recommendations of ICAO, Eurocontrol has published *"Rules Governing Terminal Charges in Ireland"*.[18] Article 3 of these rules states that the terminal charge (**R**) shall be calculated in accordance with the following formula:

$$\mathbf{R = t \times N}$$

where **t** is the unit rate of charge and **N** is the number of service units. Article 4 of the rules states "that for a given departing flight, the number of service units in respect of terminal charges, designated (**N**), shall be equal to the maximum certified take-off weight (MTOW) for the aircraft concerned, expressed in metric tonnes…"

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[16] See ICAO (2004), "Policies on Charges for Airports and Air Navigation Services," Seventh Edition, Doc 9082/7, p. 15.

[17] Although the principal function of the CRCO is the operation of a common route charges system pursuant to a multi-lateral agreement relating to route charges, the CRCO also offers Member States a calculation, billing and collection service for terminal charges.

[18] These rules are incorporated in a document titled "Information Circular: Terminal Charges in Ireland", effective 1 January 2006 (Ref. EI 2006/01). www.eurcontrol.int/crco

The Commission is required, under Section 36 (a) of the 2001 Act, to have due regard to these principles, which it did for the purposes of its first determination. But these principles may not be binding on European terminal air navigation service providers[19] and, to the extent that they are not, there remains a question for the Commission over whether they can be improved upon. Note, however, that the Commission does not currently wish to require the IAA to adopt any specific charging structure. Likewise, the Commission does not expect the IAA to move away from the current arrangements with Eurocontrol. However, it is open to the Commission – as part of the process for making a second determination – to set the determinants of maximum allowed revenue in a way that better reflects the costs incurred so that movements in future revenues can be expected to track movements in future costs more closely.

In deciding how allowed revenues should be determined, the structure of allowed revenue should be aligned with the structure of costs. The structure of costs is likely to be complex and, in all probability, it would be impractical to seek to replicate all of the variations and nuances in determining allowed revenues.

However, it may be possible and desirable to seek to establish the main cost drivers that underlie the IAA's terminal business and to set a revenue constraint tied to those cost drivers. Against this background, the Commission could consider the extent to which the IAA's costs are: (i) fixed; (ii) driven by the number of service units supplied; (iii) driven by the distance travelled by aircraft and controlled by ATCOs; and (iv) driven by the complexity of airspace through which aircraft have travelled.

By way of illustration, note that NATS En Route Ltd.'s maximum allowed revenue in 2003 (as determined by the UK CAA[20]) in respect of its en route air traffic control business was Stg£417 million. This comprised a fixed revenue allowance of £217 million (52 per cent) plus a CSU[21]-related allowance of £199 million, i.e., £22.77 per CSU x 8.732 million CSUs (48 per cent of allowed revenues).

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[19] See PricewaterhouseCoopers (March, 2001), "Study of the Terminal Charges for Air Traffic Control Services", Final Report for the Commission of the European Communities.

[20] Civil Aviation Authority.

[21] CSU: Chargeable Service Units, which are based on a combination of aircraft weight and distance flown

Question:

Should the Commission approach the structure of the IAA's terminal services costs, such that allowed revenues (through an appropriately designed price control) can, in general terms, be aligned with the structure of costs?

6.6 Single Till vs. Cost-Based Approach

Section 36(d) of the 2001 Act requires the Commission to have due regard to "the level of the Authority's income from aviation terminal services and other revenue earned by the Authority generally." This factor requires the Commission to assess what are the appropriate revenues to be taken into account in determining maximum levels of aviation terminal services charges. As outlined in Section 2.2 above, the IAA's revenues consist of those for aviation terminal services, the control of en route movements in Irish controlled airspace, Shanwick communications, safety regulation, exempt air traffic and commercial and training activities.

When making its first determination, it was the Commission's view that there was no justification for taking into account revenues earned by the Authority for activities other than the provision of terminal services. In the case of en route control and Shanwick communications, charges are set according to ICAO cost recovery principles and are determined only after appropriate allocations from the total cost base. This rendered the application of a single till type principle redundant. Demand for the remainder of the IAA's services bears little or no relationship to the demand for aviation terminal services. Therefore, the Commission anticipates continuing with a regulatory till that only includes revenue earned by the IAA from aviation terminal services.

Question:

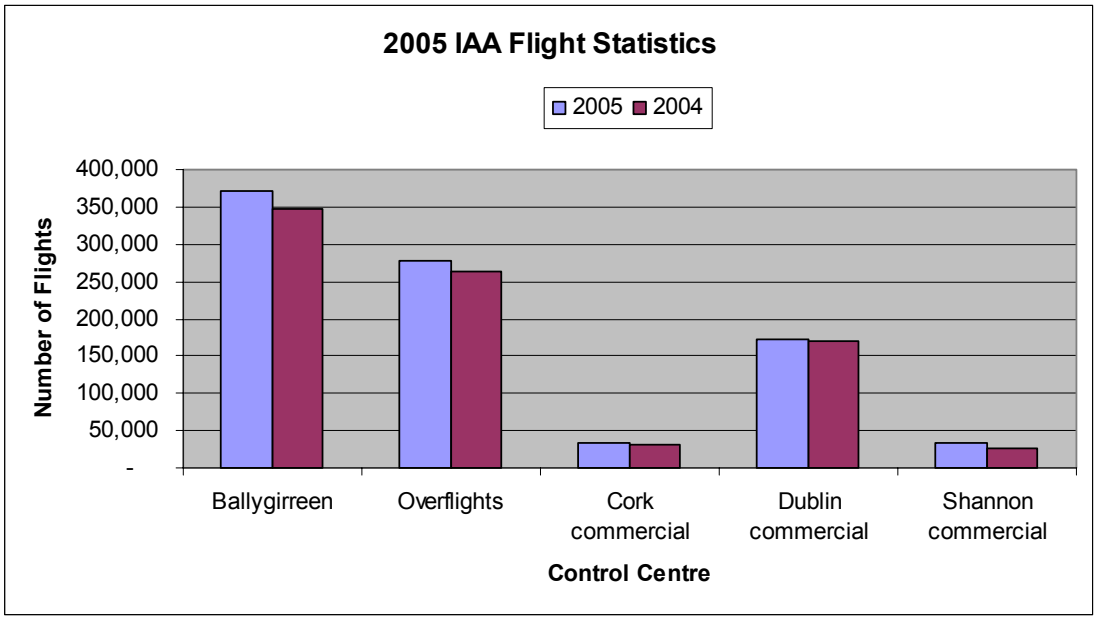
Do respondents agree that it is appropriate for the Commission to continue with a regulatory till that includes only costs incurred and revenues earned in the provision of aviation terminal services?

7 DEMAND FOR AVIATION TERMINAL SERVICES

7.1 Users and the Nature of Demand

Demand for aviation terminal services is derived from the market for air transport. Figure 3 illustrates the number of revenue-generating (commercial) air transport movements handled by the IAA from its various centres.

Figure 3: Revenue-generating (commercial) air transport movements handled by the IAA 2004-05



Source: IAA Annual Report and Accounts, 2005.

A high frequency communications service was provided from Ballygirreen to 371,345 flights in 2005, up 6.71 per cent on 2004. This includes all traffic en route between Europe and North America passing through Irish-controlled airspace and through the Shanwick Oceanic region.[22] En route air traffic control services were provided to 277,779 flights, up 5.36 per cent on 2004. There was a total of 186,831 aircraft movements at Dublin Airport in 2005, of which 173,108 were revenue-generating commercial movements. This was up 2.63 per cent on

[22] Irish-controlled airspace includes the Shannon Flight Information Region (FIR), the Shannon Oceanic Transition Area and, since 20 January 2005, the Northern Oceanic Transition Area (NOTA). UK National Air Traffic Services (NATS) provides air traffic control to flights in the Shanwick Oceanic region (from Prestwick), while the IAA provides the communications service.

2003. Commercial movements at Cork and Shannon airports were, respectively, 34,238 and 34,230, which were both up on 2004, substantially in the case of Shannon (31.94 per cent).

Therefore, in 2005, the total number of flights that were commercial revenue-generating operations for terminal services was 241,576.

7.2 Traffic Outturns vs. Projections

As outlined in Section 4.5, aviation terminal services charges are levied per unit of service where, per flight, the number of service units is equal to the maximum certified take-off weight (MTOW) of the aircraft concerned, expressed in metric tonnes. The following table shows the number of metric tonnes that correspond with the 241,576 commercial flights for which terminal services were provided in 2005, as well as the equivalent numbers for 2000-04. The table also compares these outturns to the forecasts used for the purposes of the Commission's first determination.

Table 3: Outturn and Forecast total metric tonnes of flights incurring aviation terminal services charges

	Total Metric Tonnes ('000)		
Year	**Outturn**	**Forecast**	**% short of forecast**
2000	7,190		
2001	7,552	8,712	13%
2002	7,196	8,277	13%
2003	7,593	8,674	12%
2004	7,729	9,073	15%
2005	8,648	9,472	9%
2006		9,857	

The downturn in traffic that resulted from the 9/11 attacks is evident from the deviation of the 2001 outturn from the forecast for that year as well as the drop in outturn between 2001 and 2002. Positive growth was re-established in 2003, with total metric tonnes just exceeding 2001 levels. However, outturns have consistently lagged behind the forecasts used by the Commission for the first determination.

7.3 Traffic Forecasts

As it did for the purposes of its first determination, the Commission will be requesting the IAA's traffic forecasts for the period of the second determination. It will, at that stage, endeavour to examine the robustness of these forecasts, including checking them against Eurocontrol's traffic forecasts for the same period.

7.4 Volume Risk

Unexpected exogenous shocks, such as the 9/11 attacks, can have a significant impact on traffic volumes and, therefore, on the IAA's ability to earn sufficient revenues to cover costs. This is because unit rates are calculated by dividing a total revenue allowance by a forecast of the total weight of commercial aircraft movements requiring aviation terminal services. If (weight of) traffic outturns[23] are less than forecast, then, to the extent that the IAA's costs are fixed, it faces the risk of recovering insufficient revenues to cover costs.[24]

In this context, an issue for the Commission to consider is the treatment of volume risk for the period of the second determination.

Note, however, that the total revenue allowance was based on projected costs. Outturn costs have varied from projected costs. Costs were lower than forecast in 2002, but exceeded forecasts in 2003-04. The IAA reported to the Commission between March 2002 and June 2006 that its costs have been approximately €3 million above the forecast supplied for the current price control period.

The sources of these unexpectedly higher costs are explained in the next two sections of the paper.

The Commission has the option of building into its second determination a mechanism to mitigate the impact of forecast traffic volumes being different to traffic forecasts. The Commission notes that, in the context of the charging system for en route air navigation services, the European Commission has been exploring the development of mechanisms that could be used to smooth the

[23] Which could be due to fewer movements, or lighter aircraft.

[24] If the entire cost base were variable with traffic, then the cost base would experience a corresponding fall and the under-recovery problem would not exist.

impact of deviations traffic forecasts on user charges and Air Navigation Service Provider (ANSP) revenues. The concerns that have led to calls for the development of such a smoothing mechanism are cited in a report by the Regulatory Policy Institute (RPI) [25], as follows:

1. Lagged charge increases (after two years under the current route charges system) on foot of under-recoveries resulting from traffic levels below forecast can serve to accentuate airline financial difficulties by not being sufficiently responsive to economic circumstances;

2. Lagged charge increases on foot of under-recoveries resulting from traffic levels below forecast can cause financial difficulties for ANSPs;

3. Significant lagged user charge increases could have a spiralling effect on charges by making it profitable for airlines to substitute away from using a particular ANSP's airspace, which causes a further fall in traffic, further increases in the unit rate and further avoidance activity and so on; and

4. There may be good efficiency reasons for smoothing user charges by, in particular, allowing for a higher proportion of fixed costs to be recovered in periods when demand is less price sensitive and vice versa.

The solution is one that allocates fairly the financial risks associated with traffic volatility between ANSPs and users. The Commission notes that price cap regulation tends to shift these risks more towards service providers, as occurred for the IAA over the period of the first determination. However, the risk allocation going forward must reflect a considered view of the balance between, on the one hand, an understanding that some part of the risk associated with traffic volatility is partly controllable by ANSPs and, on the other, the ability of ANSPs to respond flexibly to traffic volatility, particularly in the context of, at least in the short and medium term, a high proportion of ANSP costs being fixed.

Section 5.5 above outlined the fixed/variable split of NATS En Route Ltd's maximum allowed revenue (as determined by the CAA) in respect of its en route air traffic control business. This was (and still is) complemented by a supplementary "low volume" revenue allowance of Stg£13.66 for every

[25] Regulatory Policy Institute (October 2003), "Study on the Implementation Rules of Economic Regulation within the Framework of the Implementation of the Single European Sky," Final Report to the European Commission Directorate-General of Energy and Transport, Oxford.

Chargeable Service Unit (CSU) below a threshold of 80 per cent of forecast CSUs. It is open to the Commission to contemplate a mechanism of this nature or, perhaps, a form of volume-related price cap adjustment mechanism (in effect, a revenue cap) in the regulatory formula. In doing so, the Commission will need to be mindful of the requirement to minimise user charge volatility in light of the (relevant) reasons cited above for smoothing mechanisms to be introduced into the route charges system.

Question:

What are the respondents' views on the appropriate allocation of the future financial risks associated with traffic volatility between air navigation service providers (ANSPs) and users as well as the appropriate mechanism to allocate those risks in practice?

8 OPERATING EXPENDITURE

Section 36(e) of the 2001 Act requires the Commission to have due regard to the "operating and other costs incurred by the Authority in providing aviation terminal services." In making its first determination, the Commission sought to include in the price cap on aviation terminal services charges only those operating costs necessary for the maintenance of safety and for a given level and quality of service. The Commission is also required, under Section 36(c), to have due regard to the "efficient and effective use of all resources by the Authority". In that context, the Commission noted in its report on the first determination that the Authority had lowered its cost base (in response to the post-9/11 economic climate) by €7 million in 2002 on foot of staff reductions (including secondment of staff outside the Authority) as well as reducing discretionary spending. Those reductions partially funded the IAA's policy of maintaining terminal charges for most of 2002 at 2001 levels, which amounted to a real reduction in charges as the effects of inflation and reduced volumes would otherwise have put upward pressure on terminal charges. Accordingly, the Commission noted that the Authority was attempting to provide a cost-effective service to its customers in what was a difficult trading environment.

The Commission plans, as at the time of the first determination, to review the IAA's operating cost projections for the period of the second determination at a high level from an efficiency perspective and include in the price cap opex allowances sufficient to cover those operating costs necessary for the maintenance of safety and for a given level and quality of service.

Question:

Should the Commission continue with the approach to reviewing the IAA's operating cost projections from an efficiency perspective to decide opex allowances for the purposes of determining maximum levels of aviation terminal services charges?

8.1 Cost Developments 2002-04

Outturn costs have varied from projected costs. Costs were lower than forecast in 2002, but exceeded forecasts in 2003-2005.

Table 4: Excess of IAA opex over the Commission forecast by expense category, 2002-06

('000)						
Overruns (+)	**2002**	**2003**	**2004**	**2005●**	**2006●**	**Total**
Payroll	223	793	1,186	915	964	4,081
Training	-247	-85	-161	-391	88	-796
Rent, Rates & Administration	224	281	524	662	593	2,284
Other operating costs	79	23	62	164	509	837
Telecommunications & Utilities	35	17	212	77	96	437
Met	-69	-93	-188	-162	-81	-593
Finance	-207	-109	-123	1,379	1,724	2,664
Exceptional Items	0	973	0	0	0	973
Total	38	1,800	1,512	2,644	3,893	9,887

- The 2005 and 2006 figures are estimates given by the IAA to the Commission in September 2006. The figures are the differences between actual (or estimated outturns) and forecast annual figures.

The most significant cost overrun occurred in the area of payroll, with outturns exceeding allowances by €4 million over the five-year period 2002-06. Rent, rates and administration costs were also well above allowances by €2.2 million over the three-year period. Cost overruns in the areas of other operating costs and telecommunications and utilities are relatively modest in comparison. Meanwhile, the IAA appears to have made some savings in the areas of training (approximately €0.79 million. A significant contributor to the net total opex overrun of €9.8 million is the exceptional cost item incurred in 2003 of almost €1 million. The Commission has, as yet, to clarify the source of these exceptional costs with the IAA. Finally, Met costs appear as savings because the IAA has lagged slightly behind the recommendation in the first determination that it allocates 4 per cent per annum of its total met bill to the terminal services cost base (see subsection 7.2 below).

In respect of the cost overruns in payroll, table 5 shows the progression in the IAA's staffing levels during the same period. The IAA has been progressively reducing the number of staff employed in the areas of air navigation services provision.

Table 5: IAA Staff Numbers

IAA Category	*2004*	*2005*
Operations	452	438
Technology & Training	93	77
Commercial & Strategy	14	14
Safety Regulation	63	63
Finance, HR & Secretariat	51	48
Total Employees	673	640

Source: IAA Annual Report & Accounts 2005

It must therefore be the case that the cost overruns in payroll relate to changing pay levels and other provisions rather than additional staffing.

The Commission also notes from the company's 2004 Annual Report and Accounts that the IAA, in 2003, launched voluntary early retirement and voluntary severance schemes following an examination of operational staff numbers. Approval for the departure of fifty-five staff members was agreed and the majority of staff approved under the schemes had departed by the end of 2004. This may partly explain the payroll opex overruns or it may be reflected in the exceptional cost incurred in 2003.

8.2 Meteorological (MET) Costs

The Commission, in making its first determination, also determined that aviation terminal services were being provided by the IAA at a level below the fully allocated cost of providing the service. This was because the IAA did not allocate any portion of the cost of the provision of meteorological services to aviation terminal services charges. The determination set the maximum at a level to cover all such costs, including the relevant portion of MET service costs, with the necessary increases phased in over the duration of the determination. This involved allocating 4 per cent of the IAA's total MET service costs to terminal services for the first year and an additional 4 per cent per annum so that in the last year of the determination 20 per cent of the total MET service cost levied on the Authority is recovered through aviation terminal services charges.

The IAA has informed the Commission that, by 2005, it had allocated 15 per cent of aeronautical MET costs to the terminal services cost base and that, by the end of the period of the current determination, it will have allocated the full 20 per cent. Table 6 below shows the allocations for calendar years 2002 to 2005.

Table 6: Allocation of Aeronautical MET costs across the en route and terminal services cost bases 2002-05

	2002	**2003**	**2004**	**2005**
Total Aeronautical MET Costs (€'000)	8,204	6,185	6,683	7,247
% Allocation to Terminal	2.6%	7.7%	11.0%	15.0%
% Allocation to En Route	97.4%	92.3%	89.0%	85.0%

MET service costs levied on the IAA could be seen by the Commission as exogenous to the company or, alternatively, as something which is negotiated between the IAA and the Irish Government (the provider of MET services) and, therefore, could be exogenous from the Commission's perspective. However, there is discretion in the amount of these costs that are allocated to and recovered through en route relative to terminal services charges. Indeed, Eurocontrol's PRR 7[26] reports wide variations in these allocations across Eurocontrol member states in 2001, from a 100 per cent allocation to the en route cost base in Denmark, Germany, Italy and the Netherlands to a greater than 80 per cent allocation to the terminal cost base in Finland. In overall terms, the PRC's May 2004 report on aeronautical MET costs illustrates that only 11 per cent of total aeronautical MET costs across the 31 Eurocontrol member states were allocated to terminal services in 2002.[27]

There is little detailed guidance on the proper allocation of MET costs between service areas, i.e., between en route and terminal, or between aeronautical user groups. Inappropriate allocations would result in a cross-subsidy between aeronautical user groups and consequent discrimination in favour of the recipient of that cross-subsidy. For example, allocation of terminal MET costs to the en

[26] See PRC (2004), "Performance Review Report: An Assessment of Air Traffic Management in Europe during the Calendar Year 2003", April. Available at http://www.eurocontrol.int/prc

[27] See Eurocontrol (2004), "Report on Aeronautical MET Costs", commissioned by the Performance Review Commission, May. http://www.eurocontrol.int/prc/index.html

route cost base discriminates against users that fly over the country in favour of those terminating flights in the country.

Question:

The Commission would welcome views on whether the service area allocations of aeronautical MET costs (i.e., an 80/20 split between en route and terminal respectively) is appropriate, and consistent with the ICAO principle that "the allocation of aeronautical meteorological costs should be determined in such a way as to ensure that no users are burdened with costs not properly allocable to them?"[28]

8.3 Cost-Effectiveness & Benchmarking

Section 36(g) of the 2001 Act requires the Commission to have due regard to "the cost competitiveness of aviation terminal services with respect to international practice." At the time of the first determination, the Commission examined evidence of the Authority's international cost competitiveness and found that the Authority's (albeit en route) costs were below those of the other service providers in the study.

It appears to the Commission, having studied the ACE 2004 Benchmarking Report[29] that this picture has little changed in the interim. The 2004 report deals with two concepts of cost-effectiveness: economic and financial. The difference between them is that financial cost-effectiveness does not capture the additional costs borne by airspace users that are linked to ANSP service quality, which, for the time being at least, is assessed only in terms of ATFM (Air Traffic Flow Management) delays. For both indicators, output is measured in terms of composite flight-hours, a combination of en route flight hours controlled and (instrument flight rules) IFR airport movements controlled. On a gate-to-gate basis (that is, including all phases of flight), the average value in 2004 of the economic cost-effectiveness indicator for the 34 ANSPs included in the study was €444 per composite flight-hour. The corresponding amount was €387 for the IAA, some 13 per cent lower than the system average, and yielding a rank of 18.

[28] See ICAO Manual on Air Navigation Services Economics – Appendix 6.

[29] See "ATM Cost-Effectiveness (ACE) 2004 Benchmarking Report" prepared by Eurocontrol's Performance Review Unit (PRU) with the ACE Working Group and commissioned by Eurocontrol's Performance Review Commission (PRC), MM 2006.

Also on a gate-to-gate basis, the average value of the financial cost-effectiveness indicator for the 34 ANSPs was €392 per composite flight-hour. The corresponding amount was €327 for the IAA, some 16 per cent lower than the system average and yielding a rank of 17. The IAA appears to have performed well specifically on en route financial cost-effectiveness (€360 per flight-hour controlled compared to a system average of €396) and terminal financial cost-effectiveness (€61 per IFR airport movement relative to a system average of €108). This is all despite a 28 per cent increase in the IAA's real unit ATM/CNS[30] provision costs between 2001 and 2003, compared to a 3.1 per cent increase at the European system level.

The analytical framework in the ACE Benchmarking Reports provides a breakdown of the economic ratios that underlie the concept of financial cost-effectiveness, which can be used to understand differences between the various ANSPs. They are:

- ATCO[31]-hour productivity;
- Employment costs per ATCO-hour; and
- Support cost ratio.

At the European system level, ATCO-hour productivity (measured as the number of composite flight-hours controlled per ATCO-hour on duty) has seen a 6.7 per cent increase between 2002 and 2004. The European system average was 0.69 on a gate-to-gate basis in 2004, with the IAA coming in above average at 0.74 and a ranking of 14. The PRU notes that, while ATCO-hour productivity is commonly assumed to be driven by traffic complexity, with lower productivity expected in more complex airspace, its observations show that the ANSPs with the most complex traffic have the highest productivity indicators, while those with the lowest complexity have the lowest productivity indicators. It is also noted that optimising and rationalising the processes for ATM/CNS provision or introducing new concepts that make better use of existing resources could improve ATCO-hour productivity. With this component of ATM cost-effectiveness under direct ANSP managerial control, they provide (according to the PRU) an indication of the scale of improvements possible.

[30] Air Traffic Management / Communications Navigation Surveillance

[31] Air Traffic Controller

The Commission also notes (from the IAA's 2004 Annual Report and Accounts) that the availability of 3 nautical mile radar separation has been extended throughout the area controlled by the Dublin ACC and tower in order to enhance efficiency and increase capacity. While this is in keeping with international standards and is a common feature in many of Europe's busiest airports, this should have led to productivity and cost-effectiveness enhancements of the IAA's ATM operation.

Employment costs per ATCO-hour have a system average of €74 per ATCO-hour. IAA employment costs per ATCO-hour were 12 per cent lower at €65, a rank of 23rd amongst the 34 ANSPs. Wide variations at the European level can be explained by variations in the cost of living as well as by differences in the annual average number of hours on duty per ATCO, which ranges anywhere from 1,200 to 2,200. The IAA average annual hours per ATCO was approximately 1,600 in 2003.

The support cost ratio measures the amount spent on other costs relative to each Euro spent on ATCO employment costs.[32] The system average is 3.6, but this can be increased to 4.2 when Aena's atypically low ratio (due to particularly high employment costs per ATCO-hour of €154) is removed. The IAA's support cost ratio is 3.7 in 2004, which gives it a rank of joint 9th. High support cost ratios is the greatest weakness of the European ATM system due to duplicative investment.[33] One of the objectives of the Single European Sky is to reduce the current level of fragmentation throughout Europe, which should reduce support cost ratios and increase cost-effectiveness. It should also be noted that performance on cost-effectiveness has a high dependency on the level of support costs, representing, on average, 72 per cent of total ANSP costs, and that it is, therefore, necessary to better understand what drives them. This task and the task of identifying best practice will be a priority for the PRC in the future.

[32] Support costs include employment costs for staff other than ATCOs on operational duty, operating costs other than employment costs and capital related costs comprising depreciation and finance costs.

[33] See PRC (2003), "A comparison of performance in selected US and European en route centers", May. Available from http://www.eurocontrol.int/prc

Table 7 summarises the results set out above in section 7.3.

Table 7: IAA ATM/CNS Cost-Effectiveness Performance 2004

ACE Metric (gate-to-gate)	Unit	Max	Min	System Average	IAA	Rank (out of 34 ANSPs)
Economic cost-effectiveness	€/composite flight-hour controlled	€680	€159	€444	€387	18
Financial cost-effectiveness	€/composite flight-hour controlled	€637	€159	€392	€327	17
- en route	€/flight-hour controlled	€861	€107	€396	€360	n/a
- terminal	€/IFR airport movement	€193	€39	€108	€61	n/a
ATCO-hour productivity	Composite flight hours/ATCO-hour on duty	1.53	0.14	0.69	0.74	14
Employment cost	€/ATCO-hour	€154	€4	€74	€65	23
Support cost ratio		14.9	2	3.6	3.7	9

Eurocontrol's Performance Review Commission notes that the ACE 2004 Benchmarking Report is a purely factual analysis of the cost-effectiveness indicators and that a normative analysis would require a proper consideration of exogenous factors, especially input prices and traffic complexity. European ANSPs are characterised by significant heterogeneity and comparing their data is a complex task, with particular difficulties in the areas of the categorisation of non-ATCO staff, differences in ownership structure and hence costs, different methods used to finance assets, the treatment of regulatory costs and of costs that are recovered outside of ANS.

In May 2005, consultants Steer Davies Gleave (SDG) with the Solar Alliance produced a report for the UK CAA benchmarking NATS' costs relative to a select group of 13 European ANSPs. Comparators were chosen on the basis of similarities in unit labour costs and in airspace density and included the IAA. The principal added value of the report was a more comprehensive analysis and isolation of NATS costs of ANS/CNS provision. Table 8 shows the SDG/Solar rankings of the IAA under each of the cost-effectiveness metrics.

Table 8: SDG/Solar Cost-Effectiveness Ranking for the IAA, 2003

SDG/Solar Metric (gate-to-gate)	Rank (out of 13 ANSPs)
Economic cost-effectiveness	3
Financial cost-effectiveness	4
ATCO-hour productivity	10
Employment cost	1
Support cost ratio	10

The report shows the IAA's economic and financial cost-effectiveness metrics as well below the average for the thirteen ANSPs in the study, indicating strong cost-effectiveness. However, while unit employment costs are consistently (through 2001-03) and significantly below average (leading to the ranking of 1 shown in Table 8); ATCO productivity is also consistently below average. However, the ranking of 10 represents an improvement of one place since 2001. The IAA's support cost ratio was below average in 2001 and 2002, but above average in 2003. The ranking of 10 represents a fall of 2 places since 2002 and a fall of 5 places since 2001.

Question:

The Commission would welcome views as to what extent it should rely on the productivity and cost-effectiveness rankings implied by the PRC ACE 2004 and the SDG/Solar Alliance Benchmarking Reports in making a new determination specifying maximum levels of aviation terminal services charges?

9 CAPITAL EXPENDITURE & THE REGULATORY ASSET BASE

Section 36(b) of the 2001 Act requires the Commission to have due regard to "the level of investment in aviation terminal services by the Authority, in line with safety requirements and commercial operations, in order to meet current and prospective needs of the airline industry." In making its first determination, the Commission assessed the IAA's capex against the future needs of the airline industry and allocated the cost of a portion of that capex to users (through regulated charges) of aviation terminal services.[34]

The provision was made such as to allow the IAA to maintain and enhance the safety and quality of the ATM services it supplies, including resources to upgrade its ATM system to enable it to provide increases in capacity, to achieve increases in productivity and safety as well as to comply with its international commitments under the European Air Traffic Management Programme (managed by Eurocontrol).

The IAA has informed the Commission of the development of a technology plan, setting out its investment needs to 2015. As it did for the purposes of its first determination, the Commission plans to review the IAA's planned capex for the period of the second determination. In doing so, it is likely to take into account the future needs of the airline industry, the need to maintain and enhance the safety and quality of its services, the need to increase capacity and any international commitments under the Single European Sky or otherwise.

Question:

Should the Commission continue with this approach to deciding capex allowances for the purposes of determining maximum levels of aviation terminal services charges?

[34] The Commission was assisted by Infrastructure Management Group (IMG) whose report was published as Appendix II to CP3/2002.

9.1 Developments during First Five Years

During 2004, the IAA completed its largest capital expenditure programme to date with the new national air traffic management system becoming fully operational at the Shannon centre in early 2004 and at Dublin Airport in May 2004. This involved building a new air traffic control centre (ATCC) at Ballycasey, Co. Clare (replacing the ATC Centre at Shannon, which had been in operation since 1966), extending the Dublin air traffic control centre and equipping both with the most modern air traffic management systems, at a cost of €115 million. The company's 2004 Annual Report and Accounts report that the project was delivered on time, to specification, within budget and that it met all formal Eurocontrol Safety Regulatory Requirements.

However, the magnitude and timing of investment in respect of aviation terminal services was very different from the assumptions underlying the calculation of the price cap.

Significantly higher capex was allocated to terminal services during 2002 and 2003. However, in 2004 expenditure was negative arising from a decision to transfer a portion of the costs incurred in 2002 and 2003 to the en route cost base. The Commission, as yet, has no further information on the IAA's capital expenditure activities and, as such, cannot comment on the characteristics of this expenditure and the reasons for the terminal to en route transfer. However, it will investigate this further in the course of making its second determination.

As part of its work on airport capex, the Commission is seeking to develop principles or guidelines by which capex outturns would be evaluated vis-à-vis capex forecasts. This work in the future could also be applied to the evaluation of the deviations between the IAA's forecast and outturns capex.

10 COST OF CAPITAL

The Commission, as outlined in Section 4.5 of this paper, must have due regard to the relevant charging principles of ICAO, which state that "air navigation services may provide sufficient revenues to exceed all direct and indirect operating costs and so provide for a reasonable return on assets (before tax and cost of capital) to contribute towards necessary capital improvements." At the time of its first determination, the Commission deemed that the principles espoused in this extract recognise the link between the ability of the provider of air navigation services to undertake investment in improving its service and the rate of return that is earned by that firm. It also deemed that, in order for the Commission to have due regard to the level of investment by the Authority, there is an implicit requirement that the IAA be allowed a rate of return at least equal to its cost of capital, so that it may obtain funds for the purposes of investment.

Consequently, the Commission hired Dr. Colm Kearney, Professor of International Business, Trinity College Dublin and Elaine Hutson, Lecturer in Finance, University College Dublin to prepare an expert report, which concluded that the IAA's cost of capital (on a real, after-tax basis) was equal to 6.5 per cent. Therefore, in determining maximum levels of aviation terminal services charges, the Commission allowed the IAA a real, after-tax rate of return of 6.5 per cent.

It would be the Commission's intention to have a new or updated assessment of the IAA's cost of capital for the purposes of its second determination.

Question:

Do you agree with the proposed approach to calculating the IAA's allowed rate of return for the purposes of the second determination specifying maximum levels of aviation terminal services charges?

11 SERVICE QUALITY

Section 36(f) of the 2001 Act requires the Commission to have due regard to "the level and quality of aviation terminal services, and the reasonable interests of the users of these services." The reference to international standards in the Commission's statutory objective also warrants consideration in the service quality context.

11.1 Understanding Delay

In order to understand service quality in the ATM context, one must understand air transport delays and the importance of punctuality and predictability to airlines.

11.1.1 Air Transport Delays, Punctuality and Predictability

Air transport delays are measured with respect to scheduled departure and arrival times. Punctuality is measured as the proportion of flights delayed by more than 15 minutes.

Punctuality is important because late arrivals generate:

1. Inconvenience for passengers;

2. "Tactical costs" related to disruptions in airline and airport operations on the day[35]; and

3. "Strategic costs" where schedule buffers are introduced to compensate for delays.[36]

According to eCODA[37] data, 17.7 per cent of flights departing from and 18.5 per cent of flights arriving at European airports did so more than 15 minutes behind

[35] Note that early arrivals also put additional pressures on airport resources because gates are occupied longer than planned and additional resources are needed to cope with unforeseen workload.

[36] Buffers are included in flight schedules to cater for predictable delays. Although they improve punctuality and, hence, customer satisfaction, they entail high additional costs. The trade off is an airline business decision.

[37] Enhanced Central Office for Delay Analysis (of Eurocontrol).

schedule in 2004, with 6.7 per cent arriving more than 15 minutes ahead of schedule.

Flight delays have a number of sources. *Reactionary* delays, due to the late arrival of incoming aircraft or crew, comprise the largest share of air transport delay. *ATM-related* delays (mostly ATFM[38] delays) have been reducing steadily both in absolute and relative terms in recent years. ATM-related departure delays occur when traffic demand exceeds ATM capacity en route (en route ATFM delay) or at departure-arrival airports (airport ATFM delay). Aircraft are held at the departure airport through ATFM slots allocated by the Central Flow Management Unit (CFMU) of Eurocontrol. The ATFM delay of a given flight is allocated to the most constraining ATC unit. Aircraft are also subject to *taxi* delays, which are, in general, caused by waiting for a gate for inbound aircraft and by queuing at the holding point for outbound aircraft. En route flight path variations and airborne holding in terminal areas cause *airborne* delays.

A study commissioned by the Performance Review Commission of Eurocontrol and validated with airspace users[39] estimated the "tactical" cost of on-the-ground delay (engine off) as almost nil for delays shorter than 15 minutes and an average of €72 per minute for delays longer than 15 minutes. There was a total of 14.9 million minutes of delay in 2004, with 70 per cent from delays longer than 15 minutes. The corresponding tactical cost incurred by airspace users due to ATFM and associated reactionary delays was estimated to be some €800 million.

Greater predictability is important in airline and airport scheduling because it allows airlines to reduce buffers while maintaining punctuality. It is estimated that cutting five minutes on average off 50 per cent of schedules (due to higher predictability) would be worth €1 billion per annum, through savings or better use of airline and airport resources.[40]

[38] Air Traffic Flow Management delay.

[39] University of Westminster (2003), "Evaluating the true cost to airlines of one minute of airborne or ground delay." http://www.eurocontrol.int/prc/index.html .

[40] See PRR 8, Chapter 4, p. 22. What is PRR 8, where is it? www.caa.com

11.1.2 Eurocontrol Targets and Recommendations

According to PRR 8[41], "ATM would generate high added value to air transport if it could provide services (e.g., through Collaborative Decision Making, System Wide Information Management (SWIM), better management of bad weather situations, better control of take-off time) aimed at improving predictability."

The Provisional Council of Eurocontrol set the following target for en route ATFM delays in April 2001:

> *"to reduce progressively to a cost-optimum average ATFM delay of one minute per flight en route by the Summer 2006, as a basis for the cooperative planning and provision of capacity".*

Average en route ATFM delays per flight in summer 2004 were 1.2 min/flight, well below the agreed target of 1.7 min/flight, and almost at the medium-term optimum delay target of 1 min/flight. The PRC attributes this success to the co-operative efforts of ANSPs and Eurocontrol in capacity and flow management, resulting in an increase in the effective capacity of the system (5.5 per cent) that matched traffic growth (5.3 per cent).

Avoiding the recurrence of high delays by ensuring that effective capacity continues to match growing demand in a cost-effective way will be challenging in areas of high traffic growth like central and southeastern Europe. However, where possible, growth should (according to PRR 8) be absorbed through increased productivity. The PRC reports that traffic growth will be concentrated in areas where air traffic controller productivity is lowest, so there appears to be considerable scope for improvement. This better use of existing or latent capacity combined with the creation of new capacity where and when required through individual and Europe-wide co-operative capacity planning and management, as well as specific solutions to address so-called "hard bottlenecks" are required to ensure that effective capacity continues to meet demand and that en route delays reach the cost-optimum average delay target of one minute per flight during Summer 2006.

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[41] Eurocontrol Performance Review Commission, 8th Performance Review Report 2005 (PRR 8) see www.eurocontol,int

There is no target for airport ATFM delays and they increased in summer 2004 in both absolute (by 16 per cent) and relative value (38 per cent of summer ATFM delays). For the whole year, airport ATFM delays accounted for 49 per cent of total ATFM delays. 92 per cent of airport ATFM delays originate from the arrival airport. The average delay per flight is less than 1 minute.

Airport ATFM delays are influenced by a number of factors, some of which are not under the control of ANSPs. Bad weather[42] causes major disruptions, including long delays and flight cancellations. Moreover, weather-related delays propagate as reactionary delays throughout the network. According to PRR 8, ATM can work to minimise disruptions due to bad weather in the following ways: (i) minimising the capacity drop during bad weather; (ii) minimising the wastage of capacity before and after the bad weather period[43]; and (iii) helping airspace users mitigate weather-related disruptions. Better management of bad weather situations would also serve to limit reactionary delays, which (as noted earlier) comprise the largest share of air transport delays. Other measures to reduce the propagation of delays might include the exploration of the applicability of changing priority rules to ATFM, for example, giving flexibility to airlines in selecting their preferred order of arrivals from among the slots allocated to them (already offered in the US).

The PRC has also indicated concern over the inappropriate application of ATFM regulations, which are intended to provide protection against excess demand (so-called "over-deliveries"), whilst minimising penalties to users, i.e., ATFM delays. However, their use when demand does not significantly exceed capacity generates unnecessary delays. Alternative flow management methods should be used in these cases. In the case of airports subject to co-ordination, cases where demand significantly exceeds scheduled capacity for a prolonged period should occur rarely, so that ATFM regulations should not be used to manage flows into airports in normal circumstances.

PRR 8 states that ATFM slots need to be complemented by tactical measures to efficiently manage flows into airports, thus improving the airport capacity/delay trade-off, and by departure tools and processes to tighten "time to take-off"

[42] Bad weather is defined, for the purposes of PRR 8, as any weather condition (e.g., strong wind, low visibility, snow), which causes a significant drop in available airport capacity.

[43] This requires accurate MET information and it was noted that some airports (e.g., Amsterdam) use tailor-made MET products to improve their ability to manage bad weather situations.

distributions. More accurate flow management would, in the case of departures, lead to less queuing at holding points and, consequently, greater predictability in the network. In the case of arrivals, it would lead to improved flight efficiency and environmental friendliness in terminal areas (due to less holding and vectoring at low altitudes), while also offering the possibility of better use of airport capacity and of compressing airline schedules thanks to improved predictability.

11.2 IAA Performance

According to PRR 8, 2004 saw relatively high delays (1.5 minutes per flight) originating from the Dublin Area Control Centre (ACC) due to temporary issues, namely the ATM systems upgrade. Dublin Airport's share of total delay was 27 per cent.[44] However, even this spike is well below the target of 1.7 minutes per flight for 2004 and relatively close to the cost-optimum average target of 1 minute per flight for Summer 2006. With the new system now in operation, it would be expected that Dublin's ACC delays would revert to the 2003 levels of 0.3 minutes per flight.[45]

In 2003, the European system average of 0.8 flight-hours controlled per ATCO-hour on duty (the PRC measure of ATCO productivity) was exceeded by the Shannon ACC (almost 1 flight-hour per ATCO-hour on duty), while in the Dublin ACC, only 0.4 flight-hours per ATCO-hour on duty was recorded. This suggests the existence of some latent capacity at Dublin, which it should be possible to harness should delays become a significant issue.

There is a question over Dublin's application of ATFM regulations, whose inefficient use can be indicated by a high proportion of short ATFM delays (<0.5 minutes on average). Dublin's average en route delay for Summer 2004 exceeded 1 minute, while almost 200 of the total 365 days of the year experienced average delays of at least <0.5 minutes.

[44] See PRR 8, Annex II – ACC Traffic and Delay Data (2001-2004).

[45] Dublin Airport's share of total delay was 56 per cent in 2003.

11.3 Regulation

At the time of the 2002 review of maximum aviation terminal services charges, the Commission engaged with users of aviation terminal services charges – airlines – in order to assess their view of the quality of the IAA's terminal services at that time. Users expressed themselves generally satisfied with the service.

For a 2007 Determination, the Commission would also propose to engage with users on this question.

Currently, the Commission does not include in its price cap an explicit system of financial bonuses or penalties linked to service quality (e.g. average delays, or average delays vis-à-vis a reference value). The Commission would be open to considering the addition of such a service quality term to its price cap formula, on the following conditions. Such a modification would have to be widely and strongly advocated by service users, and to be capable of being designed on the basis of robust metrics.

Question

Do you agree with the Commission's current approach to the IAA's service quality? Would you instead wish to see an explicit system of financial bonuses and penalties linked to service quality incorporated into the Commission's price cap on the IAA? Over what horizon do you consider that such a system might be developed?

12 CONCLUSION

This consultation paper has aimed to discuss some of the pertinent issues that the Commission considers relevant in making the forthcoming determination.

The Commission has sought the views of interested parties and intends, once these responses have been received and considered, to produce a draft determination.

Interested parties will have the opportunity to make representations on the draft determination during the statutory consultation period. The Commission shall consider these prior to making its final determination.

Interested parties submitting information of any type or from any source in response to this document are reminded that the Commission intends to publish that information on the website of the Commission, in reports of the Commission and elsewhere as required or appropriate. In this regard parties are referred to the process paper, CP7/2006, accompanying this document setting out the context of such publication.