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Full Impact Assessment

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Executive summary

Boosted by economic growth and market integration, air traffic is **expected to double** by 2025. While the single European Sky is providing structural answers to the issue of the "saturation of the skies", **airport capacity** appears a looming bottle neck in the air transport system.

Despite a 60% potential capacity increase of the airport network more than 60 airports will become **congested** in the coming 20 years, and the top-20 airports will be **saturated** at least 8-10 hours per day due to capacity imbalance, if no further action is undertaken. To accommodate this demand, distribution patterns could be adapted by using latent capacity at secondary airports or, alternatively, creating reliever airports (up to 10 new major airports and 15 medium sized airports) in the vicinity of their congested counterparts will be required.

The Commission undertook a **stakeholder consultation process** during the last quarter of 2005 to gather comments and suggestions from interested parties. The policy choices stemming from this consultation are evaluated in this impact analysis. Beyond the 'do not intervene' option, ten measures were analysed under three broad policy options.

The first policy option intends to promote **voluntary actions by industry** to facilitate the better use of existing infrastructures. **Air-rail ticketing** could have a positive impact on airport operations. The efficiency of air-rail ticketing could be increased by taking low cost accompanying measures such as obtaining IATA codes, which improve the level of services. Measures requiring high investment, although plausible, should be evaluated for implementation on a case-by-case basis. Efficiency of **local capacity implementation plans** (LCIP) to unlock latent capacity could be increased if all network relevant aerodrome operators participated on a voluntary basis to this medium term planning process. The content of the Status Reports of the Performance Review Commission could be enriched by more traffic and capacity planning related information.

The second option aims at **improving use of existing infrastructure** through a co-ordinating role at Community level. This option provides six measures. Firstly, airports should establish coherent **capacity assessment methodologies**. This would lead to the establishment of a Community wide capacity inventory and benchmarks for airport operators. Secondly, **early dissemination** of relevant research results on procedures and technical progress could speed up the pace of technological innovation. Thirdly, the necessity for **monitoring airport performance** should be examined, also by promoting implementation of best practices for airport capacity management. Fourthly, all stakeholders involved in the operational management of airports should formalise their links in a **collaborative decision-making** framework to improve punctuality of traffic flows. Punctuality leads to a more efficient use of the whole air transport system. Fifthly, **Advanced-Surface Movement Guidance and Control Systems** greatly contribute to situational awareness of pilots, especially during adverse weather conditions. Finally, sufficient priority of financing of inter-modal projects under **TEN-T funding** would improve efficient use of airport access infrastructure.

The third policy option promotes the provision of **new infrastructure** under which two measures were analysed. **Benchmarking and dissemination of information** (guidelines) on environmental protection policies could reduce environmental nuisance of air transport. The **European Investment Bank** could start playing a more active role in financing airport projects through the JASPERS initiative.

All measures, apart from the environmental guidelines, presented positive impacts in terms of **capacity** and reduction of delays. **Safety** is positively impacted by air-rail ticketing, rail access to airport, Local Convergence Implementation Plan (LCIP), implementation of validated research results, introduction of Collaborative Decision-Making (CDM) and Advanced-Surface Movement Guidance and Control Systems. Other measures were safety neutral. The impact of the measure varies most (from the positive to the negative) with regard to the **social and environmental** impact. On basis of limited quantitative data, it is reasonable to assume that there is a good balance between the expected **costs and benefits**. Most of the measures are expected to yield early impacts (especially their positive impacts) as from implementation.

In conclusion, the analysis confirmed the need to strike a right balance between the measures which all could become implemented in the short, medium and long term. Three of these measures could become **mandatory**: while common capacity assessment methodologies are proposed as binding measure to be adopted in the short term, Advanced-Surface Movement Guidance and Control Systems could become mandatory in the medium term and Collaborative Decision-Making in the long-term. Overall, all of the proposed measures provided positive impacts. These measures will be used to provide an action plan for tackling airport capacity within a given timeframe.

Section 1: Procedure followed and consultation of stakeholders

1. Background:

Boosted by economic growth and market integration, air traffic in Europe is increasing very dynamically: the number of passengers on internal Community flights grew at an average annual rate of 4.9% over the period 1995-2003, with passenger traffic growing by 5.8% in 2005. The enlargement of the Union, both in terms of new Member States as well as through the enhancement of trade and tourism in the Mediterranean region is expected to contribute positively to the further growth of the air transport sector. This will mainly be the case for its predominant natural market segments of passenger and light/high-value freight transport, over longer distances. Overall the number of Instrument Flight Rules (IFR) flights is **expected to double** by 2025.

Airport capacity (runway, airside and terminal capacity) is now widely recognised as being the future bottle neck of the air transport system. Take-off and landing capacity is at congested hub airports a pressing problem that has negative consequences for the global competitiveness of European airlines.

2. Methodology:

In order to tackle the looming problem, the Commission services' undertook a **public consultation process** during the last quarter of 2005 regarding issues arising from the recent growth in air traffic at European airports and the severe medium-term shortages forecast for runway and terminal capacity. The consultation paper asked a variety of questions in relation to the problems experienced by airports in their operational and regulatory environment and tested preliminary solutions. This was followed up in April 2006 with a stakeholder consultation hearing.

The Commission services' received some 60 responses to the consultation paper. The contributions came from government ministries, Civil Aviation Authorities, airports and airlines and their respective associations as well as air navigation service providers, environmental organisations, researchers and private citizens. In general, stakeholders **welcomed the idea of a proposed framework for action at EU level**.

In light of the outcome of the consultation, the Commission services' started **preparing a Communication** that would concentrate initially on the more efficient use of existing runway capacity, and secondly, in undertaking facilitating measures for the development of new airport infrastructure where it is needed. It would however, make reference to related initiatives such as (a) the work on the revision of Regulation 95/93 on slot-allocation and the ground handling Directive 96/67, (b) a proposal for a directive on airport charges, where the possibility of levying pre-funding charges for future airport projects is envisaged, and (c) the review of the so called "Noise Directive" which outlines the "balanced approach" (Directive 30/2002/EC) in 2007.

The Commission services' called upon the expertise of an external consultant (ECORYS) to undertake an economic, environmental and social impact assessment on the measures to be proposed in a Communication on airport capacity, efficiency and safety in Europe. ECORYS sub-contracted to the National Technical University of Athens (NTUA). In accordance with the revised guidelines on impact assessments, an inter-service steering group was established and met on three occasions from June – August 2006. The steering group comprised of DGs COMP, MARKT, ECFIN, ENV, ENTR, RTD, EMPL, the SG and Eurocontrol. The final study was sent to the steering group members in September 2006.

Section 2: Problem definition

Airspace constitutes a limited resource and its optimum and efficient use will only be possible if the requirements of all users are taken into account. European airspace is characterised by high fragmentation, rigid airspace divisions and route structures (which are often based on national needs, and do not utilise the totality of European air traffic management resources to the best effect), and lack of collaborative planning and real-time information exchange between air traffic management, airport operating authorities and airspace users, as well as between civil and military bodies. Airport delays and non-optimal use of airport capacities means that airports risk becoming the **next bottleneck** in the air transport chain.

The effects of a continuous increase in traffic demand on the airport system was investigated in the **Challenges to Growth 2004 study**¹, which estimated that the airport network has a long-term potential for 60% capacity growth. This potential is partly due to the fact that 25% of airports reported a possibility for building new runways in the next 20 years and the expectation that all airports will manage to apply best practices as soon as possible. Nevertheless, almost 80% of the airports indicate that without adding extra runways, they would not be able to achieve the same capacity as the best performing airport with comparable runway configuration (due to their physical site and infrastructure limits, environmental issues or physical constraints related to surrounding airspace and geography).

¹ Joint ECAC and Eurocontrol Study on Airport Capacity: Challenges to Growth, 14 December 2004, published on Eurocontrol's web-pages under:
http://www.eurocontrol.int/eatm/gallery/content/public/library/CTG04_report.pdf

Despite a 60% potential capacity increase of the airport network, more than 60 airports will become **congested** in the coming 20 years, and the top-20 airports will be **saturated** at least 8-10 hours per day due to capacity imbalance. To accommodate this demand, distribution patterns could be adapted by using latent capacity at secondary airports or, alternatively, creating reliever airports (up to 10 new major airports and 15 medium sized airports) in the vicinity of their congested counterparts will be required.

The non-optimal use of existing airport capacities has many causes starting from declared airport capacities. Since a total coherence in **declared airport capacity** figures does not exist and due to a lack of a commonly acceptable capacity assessment methodology an airport may underestimate or overestimate its capacity.

A main difficulty in effective **capacity identification** is the airport capacity shortfall during **adverse weather conditions** which typically exists due to the vulnerability of airport operations during reduced visibility that impose a lengthier separation between airplanes and reduce safety on the ground (e.g. runway incursion).

Furthermore, the high percentage of **non-punctual flight** departures has knock-on effects and puts pressure on the airport infrastructure i.e. inadequate passenger terminal operations and airline practices which generates instability in the whole system and causes reactionary delays for en-route and arrival flights.

In addition, **inconsistencies between airport slots and air traffic flow management slots**, arises due to communication gaps at strategic and operational level and further reduce the actual capacity.

Non-optimised runway capacity **operations** is an additional element that blocks the utilisation of latent airport capacity, since at present not all actors involved are sharing the same level of awareness and information on airport operation planning (both in the short and medium term).

Air/Rail ticketing systems and the possibility to reduce short-haul flights with alternative modes of transport may assist in reclaiming capacity for more effective long-haul routes. Airport access should also be improved: with the exception of a limited number of High Speed Train services, the existing rail links to airports do not seem able to provide the level and quality of service required.

Environmental issues are a primary reason for the reactions by local communities surrounding airports for new airport development and expansion. Environmental protection of the local communities needs to be respected without hampering the need for capacity expansion. Although, measures have been taken with the introduction of restrictions for the noisiest aircraft (so called 'Chapter 3 aircraft'), more still needs to be done. Improved land-use planning measures need to be put in place in order to avoid more residential areas being developed near airports.

Section 3: Objectives

The **general objectives** of the Commission Communication are supported by other initiatives such as the creation of the single European sky. The general objectives are:

- Develop capacity to cope with growing demand;

- Promote a more efficient use of the existing capacity of European airports;
- Increase the network capacity of European airports;
- Improve access to airports;
- Maintaining or increasing safety at airports;
- Promote environmental sustainability;
- Obtain a cost effective and efficient air transport system.

The **specific objectives** are those laid down in the Commission communication, which constitute the targets that should be reached through the action plan so that the general objectives can be achieved. These specific objectives can be summarized as:

- Encourage the better use of the airport network;
- Unlocking the latent capacity at individual airports;
- Increasing individual airport capacity (with existing runways) during normal and adverse operating conditions;
- Enhance aircraft departure punctuality;
- Promote railway connections to network relevant airports;
- Improve safety during normal and adverse operating conditions;
- Minimise impacts on the environment (noise and emissions).

The **operational objectives** are related to the measures to be assessed in the proposed action plan. These include:

- Improving measurement of airport capacity and information circulation;
- Improving co-ordination between airports so as to improve capacity planning (on a network basis);
- Encouraging better use of other transport modes i.e. facilitating substitution of air to rail where relevant;
- Facilitating decision-making and creating incentives for the better use of existing airport infrastructure by improving the regulatory framework;
- Promoting the use of state-of-the art surveillance and control systems;
- Encouraging the uptake of new procedures and technologies;
- Promoting new approaches on environmental protection around airports;
- Examining the criteria for possible financial support for airports (EU, EIB etc.).

Section 4: Policy options

A number of different measures under four policy options have been analysed in this impact assessment. Apart from option 1 (“Do nothing”), the options are denominators of sets of measures (e.g. voluntary action, facilitation). Therefore **each measure can be assessed on its own merits**:

- **Option 1**: “Do nothing”: continue with the present situation and do not take or facilitate any action. This option is considered the reference scenario;
- **Option 2**: “Encouraging voluntary actions by industry to facilitate the better use of existing infrastructures”. This policy option includes two measures :
 - **Measure 1**: Voluntary measures by industry in the area of air-rail ticketing to find operational and distributional solutions that make the issuance of integrated air-rail tickets a reality within Europe;
 - **Measure 2**: Formatted framework for voluntary collaboration by industry in the area of traffic and capacity planning as required for the Local Capacity Implementation Plan (LCIP) process of Eurocontrol;
- **Option 3**: “Facilitation of solutions to unlock latent capacity by improving use, efficiency and effectiveness of runway infrastructure exploitation through co-ordinated action at EU level”. This option includes six measures:
 - **Measure 3**: Introduction of Implementing Rules on capacity assessment methodologies that will constitute agreed analytical tools, mainly to standardise semantics and allow comparison of “what if” options.
 - **Measure 4**: Promoting the implementation of validated research results (concerning procedures and technology) at airports via a structured process before the SESAR implementation phase.
 - **Measure 5**: Promoting the implementation of best practices for capacity management at airports;
 - **Measure 6**: Introduction of Implementing Rules on Airport Collaborative Decision-Making (CDM);
 - **Measure 7**: Introduction of Implementing Rules on Advanced-Surface Movement Guidance and Control Systems (A-SMGCS);
 - **Measure 8**: Financial support for airport accessibility projects under the TEN-T programme;
- **Option 4**: “Promotion of the provision of new, needed airport infrastructure through co-ordinated action at EU level”. This option includes two measures:
 - **Measure 9**: Guidelines in the area of Environmental Impact Assessment of new projects and review the “balanced approach” legislation (Directive 30/2002/EC);

- **Measure 10:** Creation of a more proactive role of Community funding and the European Investment Bank in lending to airport development.

Section 5: Impact of the policy options

Option 1 – Do nothing

All measures appear to result in a more favourable situation than this option and therefore should not be pursued.

Option 2 – Voluntary measures by industry to facilitate the better use of existing infrastructure

Measure 1: Voluntary measures in the area of air-rail ticketing

The opening of high-speed lines has enabled rail transport to obtain significant market share on routes where time sensitive passengers would previously have travelled by air. Certain cases revealed the high-speed train potential to substitute flights and relieve airport slots. This potential is increased when the high-speed network serves many destinations.

Nevertheless, in many other cases air-rail services have been less successful in substituting air services (the passenger numbers using the services are significant but often transferring from other transport modes). One main reason is that, even when highly competitive high-speed train lines exist, airlines still perceive that short-haul flights are necessary **to feed passengers** to their long-haul flights. In such cases, slots are being used by smaller aircraft.

The high speed train network may contribute positively to the airport system by:

- (a) connecting airports with another fast transport mode, thus offering more travelling options for passengers; and
- (b) the integration of high speed trains at hub airports constitutes the best way to enhance the airport's catchment area.

To enhance the effectiveness of air-rail products several points should be improved:

- The obtaining of IATA codes for railway stations and railway companies (in order to be displayed in the computer reservation system) and the lowering of the computer reservation system distribution fees for the rail segment of the ticket;
- The introduction/enhancement of remote check-in at railway stations in the cities as well as onboard the trains, including the transfer of luggage;
- The zero VAT to rail transport, to be harmonised with the zero VAT of air transport;
- The harmonisation of the legal protection of passengers in case of disputes through applying air passenger rights also to rail passengers.

The conclusions of the current assessment, in relation to the above recommendations are:

- The obtaining of IATA codes is a positive, relatively low cost measure. The fact that some rail operators have already obtained their own code gives an indication as to

the usefulness of the measure. The cost of implementing this measure is insignificant in relation to the costs required for the establishment of an efficient rail link to the airport.

- The level of service offered and the issue of baggage transfer are important for the potential enhancement of the air-rail product. It is necessary for airports to find innovative means of handling baggage by capitalising on the experience of services currently in operation. In contrast, the assessment for checking-in passengers on-board a train is not positive (mainly due to high cost required for the WIFI installation on-board of trains).
- There is significant scepticism concerning the distribution fees and tax harmonisation due to the complex implications that such an initiative may have. The role of computer reservation systems may probably not be so important for the air-rail products since it could also be advertised through the websites of the railway companies. Exempting inter-modal transport across Europe from VAT is a proposal whose assessment seems to be beyond the scope of this project.
- Tackling the legal protection of passengers should favour air-rail products.

The introduction of air-rail ticketing could have quite positive effects. Efficiency could be increased through low cost measures such as obtaining IATA codes. Developing its potential depends on effectiveness of accompanying measures improving level of services. Measures requiring high investment, although plausible, should be evaluated for implementation on a case-by-case basis.

Measure 2: Voluntary collaboration of industry for traffic and capacity planning

The implementation of the single European sky requires a **systematic effort** for the planning and monitoring of progress, identification of weaknesses, setting net targets for the modification of tactics etc. Within this process, the role of local capacity implementation plans (LCIP) can be proven to be of major importance for the dissemination of information, as it is already a well organised process.

A weakness in the whole process is that the information included in LCIP has been characterised as confidential. Hence, a lot of the valuable information is processed in the form of a general analysis. The dissemination of the detailed information could bring benefits to other airports.

All network relevant aerodrome operators should participate to the medium term planning process. The content of the Status Reports of the Performance Review Commission should be enriched by including more traffic and capacity planning related information and must be extended in order to include best practices, environmental protection strategies, valid research results from single sky progress etc.

In order to identify the detailed information that should be provided on a compulsory basis, the Commission services' could initiate a dialogue and demonstrate to the airports the added-value of enhancing the reporting information of LCIP to include capacity assessment and best practices concerning airport operations and environment protection.

Therefore, although traffic and capacity planning is to be implemented on a voluntary basis, the confidential nature of the relevant information (through an enhanced LCIP dissemination channel) is proposed to become public.

Option 3 – Facilitation of solutions to unlock latent capacity by improving the use, efficiency and effectiveness of runway infrastructure exploitation

Measure 3: Airport capacity assessment methodologies

The identification of airport capacity improvement through an analysis that can indicate capacity underutilisation and investigate improvements (e.g. using "what if" scenarios) followed by an **annual capacity assessment** will indicate the existing capacity, together with the maximum theoretical capacity that could be achieved if the airport were to be fully developed for high intensity operations. Such a structured exercise would highlight the magnitude of the potential capacity that may be unlocked.

Nevertheless, **commonly agreed** assessment procedures (semantics and outputs) are required, to ensure the compatibility of the provided information and allow for the overall assessment of the network capacity.

It should be stressed that the issue of capacity declaration is not the actual assessment, but the **management of the whole process** which should include:

- Accurate airside capacity assessment;
- Assessment of other factors which act as a constraint on capacity;
- Checking the consistency between allocated slots with flight plans;
- Harmonisation of definition processes to ensure a common understanding;
- A rigorous post event slot monitoring system.

LCIP information can be disseminated and used for:

- (a) The establishment of a capacity inventory for European airports should include information for large airports (e.g. either more than 100,000 movements or more than 5 million passengers per year) as well as for the secondary and regional airports. These airports should produce a capacity plan for a rolling 5-year period that should include a statement of existing capacity, traffic forecasts and identify constraints. Such information is of critical importance for the anticipation of capacity inefficiencies in the European airport network.
- (b) The establishment of benchmarks: “Best in the class” performances and practices may assist airport operators to set reasonable targets.

Airports should establish a coherent capacity assessment methodology, starting from an accurate airside capacity assessment and ending to a rigorous post event slot monitoring system. The airport capacity assessment related information can be disseminated and used for (a) the establishment of a capacity inventory for European airports and (b) the establishment of benchmarks to set reasonable targets for airport operators.

Measure 4: Dissemination of validated research results (procedures & technology)

It is in the interest of all those involved in air traffic management to develop a **new partnership** approach allowing the balanced involvement of all parties and stimulating creativity and the sharing of knowledge, experience and risks. Such a partnership should aim at defining, in cooperation with industry, a coherent set of Community specifications that can fulfil the widest possible range of needs.

Relevant research results should be disseminated to system users (for early feedback) and industrial partners (with respect to patent related aspects) in order to give the required time for the adaptation of the existing system to the forthcoming advances.

The enhanced yearly Status Report LCIP could provide an appropriate dissemination “mode”. For the industrial partners, who may require a more detail technical analysis of the subjects as well as the opportunity to exchange views on possible modifications, the Commission should create a **Forum** with the support appointed experts or specialised consultants/universities as a platform for this cooperation.

Measure 5: Promoting best practices for capacity management at airports

Given the significant environmental barriers associated with new airport development, the implementation of best practices for the **optimal utilisation** of existing airport capacity seems of paramount importance. The recommendations may include:

- Monitoring the current airport and aircraft performance, based on a “no blame” principal and through a well structured methodology where aircraft and airports are clustering according to their technical/operational characteristics in order to identify “best-in-class” performances. It is recommended that such a measure should not be on a mandatory basis, but should be implemented only for the airports serving high traffic providing adequate time for proper preparation and training.
- Inform and provide “targets” to air traffic controllers and tower staff through technical visits to airports and area control centres that are considered as state-of-the-art in terms of efficiency and/or productivity. It is recommended that this measure be adopted on a voluntary base.

The necessity for monitoring the current airport and aircraft performance (best practice implementation) should be examined and its usefulness for compulsory implementation (in the medium term horizon) should be evaluated.

Inconsistencies between airport slots, filed flight plans (FPL) and air traffic flow management (ATFM) slots exist both at strategic and operational levels. Instead of establishing a dedicated committee for the investigation of these aspects, it seems better to refer these inconsistencies to the revision of the airport slot allocation scheme, the new framework for the air navigation service providers and the collaborative decision-making (CDM) framework.

Measure 6: Introduction of Implementing Rules on Airport Collaborative Decision-Making

Collaborative Decision-Making (CDM) at airports improves the way aircraft operators, ground handling agents, airport operators, air navigation service providers and the Central

Flow Management Unit (CFMU) work together **at an operational level**. CDM aims at improving punctuality in airports which leads to positive impacts to the whole network, as reactionary delays are also reduced.

Airport CDM is a culture that emphasises the importance of global collaboration in planning and managing air traffic. In practical terms this can be achieved by **systematising** the procedures (that currently are based on telephone communication and rely on the good will of airport actors) by using standard messages, presented in the information systems of the various airport actors, at agreed times before the actual problems would happen and by taking into account the preferences of the actors involved.

In relation to the current organisational schema, the CDM implementation provides certain clear advantages (messages on computer screen instead of voice communication, early warnings instead of problem announcements, formal co-operative decision-making instead of voluntary co-operation or lack of co-operation). Nevertheless, certain components of the system like the necessary software have not yet reached their mature and commonly accepted level.

Collaborative decision-making at airports brings benefits to all the parties involved. The CDM process is ongoing and given the progress achieved on a voluntary base, no mandatory measures are yet recommended. Nevertheless, the compulsory CDM implementation should be considered for the longer term or even for the medium term in case significant progress is achieved in the forthcoming years.

Measure 7: Implementing Rules on A- SMGCS

Advanced-Surface Movement Guidance and Control Systems (A-SMGCS) is an open architecture concept, using existing tools to support controllers, pilots and drivers of vehicles in order to **improve situational awareness** in all weather conditions. Different levels of implementation address the need to provide positive information concerning the surveillance, control, guidance and the planning of operations on the airport surface. The first two levels surveillance and control aim to ensure that the controller has total awareness of all surface movements in all weather conditions.

It allows for airport capacity enhancement, limited in normal, but substantial in adverse weather conditions reclaiming underutilized capacity that has a ripple effect on other airports. Pilot trials already provided positive results. The system has a positive impact on safety through reducing the risk of human errors and improving detection and recovery from possible errors. In addition, as a result of labelling the traffic, controllers are more able to identify and locate moving vehicles and therefore anticipate better traffic and possible conflicting situations. Less co-ordination activities and fewer communications are necessary producing in the end a better planning and use of existing infrastructure.

Eurocontrol is working with ICAO, the European Commission and stakeholders at several major airports to devise and validate A-SMGCS procedures and concepts of operations. The main constraints associated with the implementation of A-SMGCS are **cost related**. Nevertheless, a recent cost-benefit analysis performed for generic airport scenarios concluded in favour of the A-SMGCS implementation (benefits to cost ratios above 1 and up to 2.4).

Further cost reductions are expected in the near future following the **technical progress** of ADS/B (Automatic Dependent Surveillance Broadcast), that will make the system affordable

also for all vehicles circulating in the airport areas), and will allow (following the Airport Operations Strategy 2000+ recommendations) for the implementation of A-SMGCS on small and medium sized aerodromes.

Given the early stage of implementation of the A-SMGCS, the adoption of the systems should be on a voluntary basis.

Yet, when confidence on the functionality and usefulness of the system will be established in a medium term time horizon, the compulsory use of these technologies, at least for large and probably medium size airports, should be seriously considered for safety reasons.

Measure 8: Financial support for airport under the TEN-T budget

The benefits of the TEN-T programme as a whole have been demonstrated. The problem remains **financing**.

The 50% co-financing from TEN-T budget of **feasibility studies** is a significant aid for the initiation of the relevant investigation of airport access. Such studies can cover a variety of measures ranging from re-routing and timetable synchronisation and completion of missing links in the existing network up to new transport infrastructure plans. These studies may influence the local and regional transport network planning in favour of the airport access.

On the other hand, the 10% (in some cases for border regions 20%) limit of the EC contribution to the **total investment** cost of TEN-T projects does not seem critical enough to trigger the relevant infrastructure project implementation. There is a need to look for “external” funding. There is a concern that the competition between traditional airlines and low cost carriers, as a subsidy for a secondary/regional airport may be perceived as an indirect subsidy to the low-cost carriers. Any such funding should have due consideration to the Community rules on the financing of regional airports.

Appropriate priority in TEN-T funding should be given, if the project is a combination of rail access (and in some cases maritime access) and airport capacity expansion. In such cases, due regard needs to be given to the Community rules on the financing of regional airports.

Option 4 – Promotion of new airport infrastructure

Measure 9: Guidelines on Environmental Impact Assessment of new projects

In general, the environmental challenge (in medium term objective) for airports is to **reduce aircraft noise and emission levels**. The approach can be found in: (a) providing environmental training and improved impact assessment tools (b) implementing collaborative environmental management and (c) implementing impact reduction techniques.

It is true that very little can be done to change the land-use around large European airports where existing industrial and residential developments have already created a *status quo*. Even re-location of these airports would create major difficulties. Instead the Community should learn from these experiences and try to avoid similar problems at today’s medium and small sized airports. Consistent national policy and legislation need to be in place to safeguard both the existing national and regional economic interests of airports and their need for future expansion. National authorities must act to **balance** the economic as well as the environmental interests of society.

As each airport has its own peculiarities, the role of the EU should focus on developing an **appropriate framework** in order to allow consideration and identification of locally adopted solutions. In the field of noise, Directive 2002/30/EC can be considered as the first initiative in this direction: although it neither imposes noise measures nor indicates technical solutions other than phasing out noisy aircraft, it defines a common method for the description of the current situation and anticipates future problems.

It is recommended to establish benchmarks (using the "best in the class" approach) and disseminates information about effective environmental protection policies to other airports. Approaches that aim to limit the number of people affected by noise should be implemented.

Noise charges (or noise surcharge on landing fees) can be used for insulation schemes or even for the relevant expenses of relocating people away from high noise areas. A broadly similar approach could be considered where local emission impacts are a concern.

Measure 10: Community funding and EIB lending to airport development

The European Investment Bank (EIB) played a substantial role in the development of several European airports. Nevertheless, the EIB seeks funds from the international money fund under competitive market conditions with commercial banks. Evidently, the first class credit rating of EIB in combination with its non-profit-making basis allows for favourable rates when compared to commercial banks. These put a premium for the risk of the investment (depending on the country and type of infrastructure) that leads the interest in the order of magnitude of 5 to 10%. On the other hand the Governments secure the EIB loans.

Airports with a substantial traffic volume (or reliable and robust forecasts for their traffic increase) may take advantage from EIB loans, while small and regional airports would have to seek funding elsewhere (e.g. the Cohesion funds). As above, dedicated aspects related to the **distortion of competition** among airports and airlines may arise.

The EIB can have a more proactive role to airport development in new EU member states through **JASPERS** (Joint Assistance to Support Projects in European Regions) initiative. JASPERS aims to assist Member States (principally the new member states and acceding countries of the EU) in the complex task of preparing major infrastructure projects which can be assisted by the EU structural and cohesion funds over the 2007-2013 planning period.

The "observer" role of the EIB in the planning of TEN-T should be strengthened through the JASPERS initiative. The EIB, in parallel with the successful funding of large airports, should look into funding of smaller size regional airports that contribute to the efficiency of the European airport network. This is crucial if the airport is not eligible for TEN-T funding.

Section 6: Comparing the options

Since the different measures are rather complementary than exclusive, the impacts of measures are assessed against specific and operational objectives.

Measure		Voluntary measures by industry in the area of air-rail
Impacts		
Capacity		
Airports capacity	network	Slightly positive impacts in the short term, their magnitude depending from the number of the congested airports developing efficient rail services.
Individual capacity	airport	Slightly positive impacts in the short term but under certain circumstances, certain cases revealed the high-speed train potentiality to substitute flights and relieve airport slots. This potentiality is increased when (a) the airport is integrated in a wide high-speed network that contains many origins/destinations, (b) when high volumes of point-to-point traffic exist and (c) when the short-haul flights are serving destinations located at travel distances where high-speed trains are competitive.
Departure punctuality		Neutral impacts. The measure is not expected to affect departure punctuality in a direct or significant way.
Safety		
Transport Safety		Positive impacts from the short term for passenger safety: shifting passengers from airport to high speed trains, in terms of safety, means the altering of the accident probabilities that these two modes have. Air and rail within the EU have on average the same risk per distance. However, planes have much higher risks during the take-off, climb, descent, approach and landing manoeuvres than while cruising.
Safety improvements during airport operations	airport	Neutral impacts, since no improvement is expected concerning safety impacts during flight and during airport operations, as the free slots will be occupied by other flights.
Economic		
Implementation cost of measure		(a) Obtain IATA codes for stations and railway companies. For stations that does not already have on IATA city code: a fee of approximately 1600 euros and in case that rail companies enforce reservations on their trains another fee of approximately 4,000 euros/year, plus 20,000 euros for the development of the relevant software. Also costs for the rail operator distribution systems need to be added. (b) For remote check-in : Infrastructure capital costs in the railway stations, operating costs for the check-in staff in the railway stations and the staff that accepts the bags, baggage handling costs, cost for the security of the baggage transportation process. Additional costs are imposed for the check-in onboard option (WIFI network in train, space for computer etc.).
Administrative costs		Administration costs cannot be assessed today with the known level of detail.
Benefits for the airports		Concerning economic benefits for the airports, if any, it will be indirect and in the medium to long term in case where slots are released airport congestion in check-in facilities will be reduced and there will be a better image for the airport that in the long term might generate indirect economic benefits. However, in case that airlines will replace the shifted short-haul flights by long-haul flights the benefits are neutral.
Benefits for the airlines		Shifting of passengers from air to rail generate economic impacts and challenges for the relevant modes. Airlines fear losing market shares while on the other opportunities for replacing short-haul flights by more profitable long-haul flight arisen. To this end impacts will vary from neutral to slightly positive.
Benefits for travellers		<ul style="list-style-type: none"> Option for an additional, fast, reliable and safe travel alternative Potentially lower ticket cost More choice Passenger is relieved of the burden of the bags and is able to travel to the airport "hands free". <p>Overall, impacts on travellers will be very positive from the short term.</p>
Social		
Employment		Air-rail services favour very positively employment both temporarily and permanently (from short-to medium term).
Mobility		Slightly positive (indirect) impacts are expected in the medium term concerning citizens' mobility.
Environmental		
Noise		If freed slots are occupied by long-haul flights, the environmental impacts of air-rail alternative should be assessed as slightly negative in the medium term. In addition, the negative environmental impacts of high-speed trains should be taken into account. Certain benefits though might arise in the medium term when the high-speed trains replace transport to airport by car, but this should be considered in a case-by-case basis.
Air pollution		Idem as noise impacts.
Other		
Institutional impacts		Neutral impacts. The measure is not expected to affect the current institutional organisation and arrangements in a direct or significant way.

Impacts \ Measure		Formatted framework for voluntary collaboration of industry in the area of traffic and capacity planning
Capacity		
Airports capacity	network	Joint medium term planning involving all network relevant airports (and the local ATS), will have a very positive contribution to airports network capacity in the short term.
Individual capacity	airport	Publishing part of LCIP information concerning advantages from ECIP measure implementation, good practices etc could be fruitful for many airports. Such information can only have a very positive impact on airport performance already in the short term.
Departure punctuality		Neutral impacts. The measure is not expected to affect departure punctuality in a direct or significant way.
Safety		
Transport Safety		Neutral impacts. The measure is not expected to affect transport safety in a direct or significant way.
Safety improvements during airport operations		Slightly positive impacts, as information for safety-related practices and systems (e.g A-SMGCS) will most probably be included.
Economic		
Implementation cost of measure		The measure does not have implementation cost in the strict sense.
Administrative costs		Very limited costs.
Benefits for the airports		Slightly positive in the short term. Early identification of bottlenecks for the aerodrome capacity, not under the direct control of the aerodrome operator (e.g. due to airspace structures or management; air navigation infrastructures, etc.), could prevent wasting money and effort on the airport infrastructure, if not coordinated with synchronized actions by other actors.
Benefits for the airlines		Slightly positive impacts are expected indirectly in the short term, thanks to benefits for the airports.
Benefits for travellers		Slightly positive impacts are expected indirectly in the short term, thanks to benefits for the airports.
Social		
Employment		Positive impacts in the short term on employment, as one man month per airport is estimated for the preparation of the information plus 6 man months totally from Eurocontrol to assess, harmonise (if required) and prepare the information for dissemination.
Mobility		Neutral impacts. The measure is not expected to affect mobility in a direct or significant way.
Environmental		
Noise		Neutral. Due to the nature of the measure no direct or significant impacts are expected on the environment.
Air pollution		Idem as Noise.
Other		
Institutional impacts		Neutral impacts. The measure is not expected to affect the current institutional organisation and arrangements in a direct or significant way.

Measure		Introduction of Implementing Rules on capacity assessment methodologies
Impacts		
Capacity		
Airports capacity	network	The identification of airport capacity improvement, through analysis that can indicate capacity underutilisation and investigate improvements (e.g. using what-if scenarios) followed by an annual capacity assessment (using one of the tools available for this purpose) will indicate the existing capacity, together with the maximum theoretical capacity that could be achieved if the airport were to be fully developed for high intensity operations. Such a structured exercise would highlight the magnitude of the potential capacity that may be unlocked and in that case positive impacts can be expected in the medium term.
Individual capacity	airport	Idem as above.
Departure punctuality		Departure punctuality can be affected slightly negatively in the medium term as a higher declared capacity reduces the spare time that may be used to accommodate delays.
Safety		
Transport Safety		Neutral impacts. The measure is not expected to affect transport safety in a direct or significant way.
Safety improvements during airport operations		Neutral impacts. The measure is not expected to affect safety during airport operations in a direct or significant way.
Economic		
Implementation cost of measure		The measure does not have implementation costs in the strict sense.
Administrative costs		0,74 mil € per year
Benefits for the airports		Positive impacts from the short term. Additional flights at peak demand periods (revenues generation)
Benefits for the airlines		Positive impacts from the short term. Almost 500 euros per additional airplane movement.
Benefits for travellers		Positive impacts from the short term. Additional flights at peak demand periods
Social		
Employment		Positive impacts are expected in terms of employment, from the short term, as manpower effort is required on a yearly base for the implementation of the capacity enhancement method according to the proposed schema that include a post-event monitoring mechanism (at least for the airports that are not processed the capacity assessment in such a way). Effort is also required by Eurocontrol for the preparation of the airport capacity matrix. In average, one man month per airport is estimated for the collection and preparation of the information plus 6 man months totally for the additional effort posed to Eurocontrol.
Mobility		Idem as Benefits for Travellers. <i>See above.</i>
Environmental		
Noise		Slightly negative impacts are expected in the short term since an increase of declared capacity means more flights, therefore more noise. But on the long run slightly positive impacts can be expected, since a common capacity assessment methodology may be used to benchmark appropriate environment protection.
Air pollution		Idem as Noise impacts.
Other		
Institutional impacts		Neutral impacts. The measure is not expected to affect the current institutional organisation and arrangements in a direct or significant way.

Impacts \ Measure		Promoting the implementation of validated research results before the coming of the SESAR implementation phase
Capacity		
Airports capacity	network	Positive impacts in the long run, given that this dissemination of advanced Research and Technology will speed up SESAR implementation, that thanks to gate-to-gate operation will utilize better the time saving achievements at the airports.
Individual capacity	airport	Idem as Airports Network Capacity.
Departure punctuality		Idem as Airports Network Capacity.
Safety		
Transport Safety		The technological advances of the SESAR are contribute positively also to safety aspects of air traffic control. To this aim, dissemination of the relevant valid research results, before the SESAR phase is positively assessed in the long term.
Safety improvements during operations	airport	Idem as Transport Safety.
Economic		
Implementation cost of measure		The implementation cost of this measure cannot be assessed at this point. In any case it can be said that it will be equal to the cost of obtaining and implementing the technologies and the procedures resulting from validated research and as such he cost can vary greatly.
Administrative costs		Administration costs cannot be assessed today with the known level of detail. Nonetheless, the possible administrative actions will be in the form of dissemination of results and as such administrative costs might be included in the implementation costs (keep in mind that each research project includes dissemination plan).
Benefits for the airports		Positive impacts in the long run, given that this dissemination of advanced Research and Technology will speed up SESAR implementation
Benefits for the airlines		Idem as Benefits for the Airports.
Benefits for travellers		Idem as Benefits for the Airports.
Social		
Employment		Positive impacts are expected, since the promotion of Research and Technology can generate demand for labour from the short term.
Mobility		Slightly positive impacts are expected in the long run, since the promotion of Research and Technology can boost mobility.
Environmental		
Noise		Neutral impacts. The measure is not expected to affect noise in a significant way.
Air pollution		Positive impacts provided that this dissemination of advanced Research and Technology speeds up SESAR implementation,
Other		
Institutional impacts		Neutral impacts. The measure is not expected to affect the current institutional organisation and arrangements in a direct or significant way.

Impacts \ Measure		Promoting the implementation of best practices for capacity management at airports (Airport Capacity Enhancement program (ACE))
Capacity		
Airports capacity	network	As part of the LCIP it can affect positively (from the short term) many airports therefore provide a benefit for the airports network.
Individual capacity	airport	Depending on the traffic mix, runway capacity can be increased by between 5% (at single-runway airports) and 15% (multiple-runway airports). This can be interpreted to {1 to 2} and {4 to 5} movements per hour and per runway respectively.
Departure punctuality		Airplane departure punctuality will be slightly but positively affected (from the short term) from the more efficient use of runway and land-side facilities.
Safety		
Transport Safety		Neutral (meaning no direct or significant) impacts are expected. This study is refraining from defining an overall relation between flight number increase and accidents as various aspects are included (i.e. {more flights ⇒ more take offs and landings ⇒ more accidents}, {more flights⇒less high-speed train trips⇒relatively more accidents}, but also {more flights⇒less interurban/international road-trips⇒ less accidents}).
Safety improvements during airport operations		Idem as Transport Safety.
Economic		
Implementation cost of measure		The implementation of best practices for capacity management at airports is included in the LCIP. So no extra implementation cost is expected.
Administrative costs		Idem as Implementation Cost.
Benefits for the airports		The overall impacts from more enhanced use of airport capacity will be positive from the beginning for the airport (revenues from additional flights).
Benefits for the airlines		The overall impacts from more enhanced use of airport capacity will be positive from the beginning for the airlines (revenues from additional flights). A single slot is hugely beneficial for airlines, which is why they are sold for very high prices. Yet, specific practices have negative economic impacts for the airlines: increased deceleration and take off thrust impose higher than usual maintenance costs.
Benefits for travellers		The overall impacts from more enhanced use of airport capacity will be slightly positive from the beginning for the travellers (more flights at high demand periods).
Social		
Employment		Neutral impacts. The measure is not expected to affect employment in a direct or significant way.
Mobility		Neutral impacts. The measure is not expected to affect mobility in a direct or significant way.
Environmental		
Noise		Slightly negative impacts from the short term. Certain "best for capacity maximisation" practices generate more noise.
Air pollution		Slightly negative impacts from the short term for any nearby residential areas due to more intensive use of runway.
Other		
Institutional impacts		Slightly positive impacts from the short term. Voluntary sharing of common practices could provide both the EU and all stakeholders with more appropriate policy instruments

Measure		Introduction of Implementing Rules on Airport Collaborative Decision-Making (CDM)
Impacts		
Capacity		
Airports capacity	network	Neutral impacts are expected as CDM is not a capacity generator but contributes to the reduction of delays.
Individual capacity	airport	See above
Departure punctuality		Very positive impacts from the beginning. Departure punctuality is directly improved and departing airplane queue is reduced. Plus, since CDM provides benefits due to improved landing time estimates (such as reduction in delay due to late inbound etc.) it minimizes subsequent delays to connecting departing flights.
Safety		
Transport Safety		Impacts on transport safety in general are expected to be slightly positive from the short term, since safety improvements are expected in airport operations.
Safety improvements during airport operations		CDM have direct positive impacts for the safety of airport operations as it prevents/smoothes the rush operating conditions and in addition reduces the traffic in the aircraft taxi phase.
Economic		
Implementation cost of measure		The measure does not have implementation costs in the strict sense, since it is based more on procedures, training and system's integration.
Administrative costs		3, 526 mio € for the first year and 0,368 mio € for every year of the 14 th next.
Benefits for the airports		The economic benefits for airports are: <ul style="list-style-type: none"> Improved cost efficiency for ground handlers due to improved landing time estimates. (a direct and slightly positive impact) Increased asset utilization as fuelling services and de-icing services may be at the right place and time. (a direct and slightly positive impact) The increased predictability of departures might enable passengers to board later and spend more time in the airport; increasing airport retail revenues. (a direct and slightly positive impact).
Benefits for the airlines		The most economic benefits for airlines are related to the improved departure predictability, namely: <ul style="list-style-type: none"> Fewer lost slots and over-deliveries (a positive and direct impact/economic benefit to the ATC network that will be passed on to aircraft operators). Better fleet utilization (a positive and direct impact/an economic benefit). The possibility to reduce block times is a significant factor which can lead to greater utilisation of aircraft fleets. Lower accident repair costs as fewer aircraft will circulate on the apron and taxi-ways (a positive and direct impact).
Benefits for travellers		<ul style="list-style-type: none"> More on-schedule departures is a perceived benefit to passengers. (a direct and positive impact) Greater certainty in passenger gate allocation. (a direct and slightly positive impact) A more accurate estimate of arrival time should benefit passengers, where they are being met at the airport. (a direct and slightly positive impact) More advanced and accurate information for passengers, improving customer service. (a direct and slightly positive impact).
Social		
Employment		Neutral. No direct or significant impacts are expected since CDM make better use of available sources.
Mobility		Positive impacts are expected in the medium term on mobility as the delays (prior-to-CDM) present a discouraging factor for travelling.
Environmental		
Noise		<ul style="list-style-type: none"> Reduced ground noise due to improved departure predictability, as a consequence of shorter taxi-times Reduced ground noise due to reduced inbound taxi-time, as shorter inbound operating time leading to less noise from engines taxiing / waiting. Overall, the impacts on noise will be slightly positive on the short term.
Air pollution		<ul style="list-style-type: none"> Reduced ground emissions due to improved departure predictability and due to shorter taxi-times, with overall lower engine running times. Reduced ground emissions due to reduced inbound taxi-time. Shorter inbound operating time leading to fewer emissions from engines taxiing / waiting. Overall, the impacts on noise will be slightly positive on the short term.
Other		
Institutional impacts		Slightly negative since the "Airport operations strategy" identifies two major risks for the smooth CDM implementation, namely: <ul style="list-style-type: none"> There is a small risk that national airport co-ordinators, ATFM and airport/aircraft operators would not co-operate effectively. Commercial interests may pose a risk to information exchanges between ATC, ATFM, Airport Operations and Aircraft Operators, if data is seen as a proprietary item to be guarded or sold.

Measure		Introduction of Implementing Rules on Advanced Surface Movement Guidance Control Systems (A-SMGCS)
Impacts		
Capacity		
Airports capacity	network	Indirect and slightly positive benefits due to improved departure punctuality during adverse weather conditions.
Individual capacity	airport	Slight positive and direct impact under normal conditions. Positive (and direct) during adverse weather conditions. Simulations have shown a 5% average increase in capacity throughput in all visibility conditions using A-SMGCS
Departure punctuality		Slight positive and direct impact under normal conditions. Positive (and direct) during adverse weather conditions. A 5% increase in capacity throughput (as mentioned above), would lead to a 25% decrease in delays.
Safety		
Transport Safety		Positive and direct impacts in general for transport safety since it can improve safety during airport operations (and thus reduce the accident possibility)
Safety improvements during airport operations	airport	Pilot trials already provided a positive view for the potentialities of the system that has a very positive and direct impact on safety through a reduction of the risk of human errors and better detection and recovery from possible errors. <i>Safety benefits vary between medium and large size airports and in monetary terms are respectively 0,26 & 0,52 mio. €. It has to be mentioned though that these benefits were attributed to airlines (based on a CBA study for A-SMGCS).</i>
Economic		
Implementation cost of measure		The implementation cost of the measure (due to the cost of system's technology) is very high.
Administrative costs		Administrative cost of the measure is 0,053 mio. €, for every year (at least for the 10 first years).
Benefits for the airports		The system can have a positive and direct, from the short term, impact on airports. <ul style="list-style-type: none"> ▪ Airport Operators would benefit from increased revenue resulting from any identified reduction in diversions and cancellations as a result of low visibility. ▪ They would also benefit from any reduction in damage incurred to vehicles and/or airport infrastructure as a result of runway incursion through improved conditions of insurance and excesses and being able to purchase and maintain fewer mobiles. It can be estimated that the reduction in the accident rate at a generic large airport as a result of A-SMGCS Level II is 1 accident prevented in every 200 years. The accident at Linate resulted in damage to airport infrastructure. Estimating this cost at €10M, results in a (notional) average annual saving of €50k at a large airport where one accident in every 200 years is prevented by A-SMGCS Level II.
Benefits for the airlines		Impacts on the airlines are expected very positive from the beginning. Impacts include: <ul style="list-style-type: none"> ▪ Benefits from the reduction in delays: <i>that vary between medium and large size airports and in monetary terms are respectively 0,36 & 0,72 mio. €.</i> ▪ Benefits from the reduction in taxi duration (in all visibilities): <i>that vary between medium and large size airports and in monetary terms are respectively 0,28 & 0,57 mio. €.</i> ▪ Safety benefits: <i>that vary between medium and large size airports and in monetary terms are respectively 0,26 & 0,52 mio. €</i>
Benefits for travellers		Indirect and positive impacts are expected for the passengers from the short term, either from a reduction in delays or from a reduction in diversions and cancellations. Indirect but positive impacts are also expected (from the short term) due to reduction of accidents. Fewer accidents mean more safe transportation.
Social		
Employment		Neutral impacts are expected. Although a high degree of automation is included in the system, it is a tool that requires human interpretation of the output (e.g. false alarm situations). So if theoretically a work-place can be replaced from automation the same work-place can be filled from the person that should check the output.
Mobility		Neutral to slightly positive in the long term, since more safe transportation can indirectly increase mobility.
Environmental		
Noise		Neutral impacts. The measure is not expected to affect noise in a direct or significant way.
Air pollution		Positive impacts are expected since the beginning on air pollution thanks to the reduction of airplane taxi duration which in turn leads to savings in emissions. These savings are not large, but could be significant for those airports which are close to reaching environmental limits for emissions. In addition, positive impacts may be considered due to prevention of aircraft disasters.
Other		
Institutional impacts		Neutral impacts. The measure is not expected to affect the current institutional organisation and arrangements in a direct or significant way.

Measure		Financial support for airport accessibility projects under the TEN-T budget
Impacts		
Capacity		
Airports network capacity	network	Enhancement of airports' accessibility will have positive impacts but in the long run (when accessibility projects will be completed) on airports' network, since it will enhance the efficient use of the existing network capacity and especially the better utilization of secondary airports' capacity.
Individual airport capacity	airport	Neutral impacts. The measure is not expected to affect individual airports capacity in a direct or significant way.
Departure punctuality		Idem as Individual Airport Capacity.
Safety		
Transport Safety		Shifting part of the access traffic to airport, from road to rail (the latter being safer) will have a positive impact on the safety of citizens impacts but in the long run (when accessibility projects will be completed).
Improvements during airport operations		Neutral impacts are expected on air operations and air side safety. The measure is not expected to affect safety or air operations in a direct or significant way.
Economic		
Implementation cost of measure		The measure does not have implementation costs in the strict sense.
Administrative costs		Administrative costs cannot be assessed today with the known level of detail.
Benefits for the airports		Slightly positive in the long term. Improved access can contribute to enlarge the catchment's area and increase the number of passengers at airports today not used to their full potential.
Benefits for the airlines		The enlargement of the airport catchment's area (see above, Benefits for the Airports) will bring more passengers, thus more profits for the airlines. Nevertheless, in the case of secondary airports, a part of the passenger gains to low-cost airlines will probably be subtracted from the "traditional" airlines. So, overall, the impact on the airlines will vary from neutral to slightly positive in the long run.
Benefits for travellers		Slightly positive in the long run. More choice possibilities will be offered to air travellers (in choosing mode to access the airport or chose the airport to fly from).
Social		
Employment		Impacts on employment will be positive, since the beginning. <ul style="list-style-type: none"> ▪ Increase demand for labour during construction of the project. ▪ Better accessibility to airports that can improve the welfare of the population in the catchment area and thus create many jobs of all kinds from the lowest to the highest skills.
Mobility		Impacts on mobility will be positive in the long run. <ul style="list-style-type: none"> ▪ Idem as Benefits to Travellers. <i>See above.</i> ▪ In general, when transport infrastructure is offered, then mobility will be increased.
Environmental		
Noise		Slightly negative only in the short term during construction. Wherever/whenever construction of a transport project takes place, the areas around will suffer from the noise. Additionally, in the long term (when the project is finished) shifting part of the access traffic from road to rail, will have a positive impact on noise.
Air pollution		Idem as Noise.
Other		
Institutional impacts		Neutral impacts. The measure is not expected to affect the current institutional organisation and arrangements in a direct or significant way.

Impacts \ Measure		Guidelines in the area of Environmental Impact Assessment of new projects and review the "Noise Directive" laying down the "balanced approach" principle (Directive 30/2002/EC)
Capacity		
Airports capacity	network	Potential to restrict the capacity of individual airports.
Individual capacity	airport	Depending on the specific noise/emission reduction technique used.
Departure punctuality		Neutral impacts. The measure is not expected to affect departure punctuality in a direct or significant way.
Safety		
Transport Safety		Neutral impacts. The measure is not expected to affect transport safety in a direct or significant way.
Safety improvements during airport operations		Neutral impacts. The measure is not expected to affect safety during airport operations in a direct or significant way.
Economic		
Implementation cost of measure		Wide range of noise/emission reduction measures exists each one having a different implementation cost difficult to be assessed due to the complexity of most of the measures and limited data availability.
Administrative costs		Administrative cost cannot be assessed today with the known level of detail. Nonetheless it is almost certain that revision of a regulation will certainly impose high administrative costs.
Benefits for the airports		Neutral to negative impacts are expected in the short/medium term, depending on the environmental strategy implemented. An environmental protection strategy that results in appropriate land uses around airport can relief airport from its main development/extension restrictions. On the other hand, a strategy that is heavily based on operation restrictions and movement caps will result in airport capacity reduction and therefore will limit the associated benefits.
Benefits for the airlines		Idem as above.
Benefits for travellers		The effects to travellers from a reduced airport capacity may vary from slightly negative (in cases where this airport represent the only convenient way for travelling to the desired destination) to neutral (in case that other competitive transport modes or even other airports exist), in the long term.
Social		
Employment		Impacts on employment are ranked from slightly positive in the short term (in case where a number of jobs will be created for the monitoring of environmental impacts and in addition the airport capacity will not significantly affected), to negative (in case that a significant loss of new jobs due to severe airport capacity restrictions will offset the job created for the monitoring of the environment) in the medium term.
Mobility		The overall impacts in terms of mobility vary in the same way as <i>Benefits for travellers</i> (see above)
Environmental		
Noise		Due to the measure nature very positive impacts are expected from the beginning.
Air pollution		Due to the measure nature very positive impacts are expected from the beginning.
Other		
Institutional impacts		Difficult to estimate but most possibly slightly negative. For sure national authorities must act to safeguard both the environmental interests as well as the economic interests of society. A consistent national policy and legislation (which places environment at or close to the centre of the airport development strategy) need to be in place to safeguard the important national and regional economic interests of airports and their expansion potential.

Impacts \ Measure		Creation of a more proactive role of Community funding and EIB lending to airport development
Capacity		
Airports capacity	network	Positive impacts in the long term. More funding for airport development is by terms an enhancement of airports network capacity.
Individual capacity	airport	Idem as Airports Network Capacity.
Departure punctuality		Neutral impacts. The measure is not expected to affect departure punctuality in a direct or significant way.
Safety		
Transport Safety		Neutral impacts. The measure is not expected to affect transport safety in a direct or significant way.
Safety improvements during airport operations		Neutral impacts. The measure is not expected to affect safety during airport operations in a direct or significant way.
Economic		
Implementation cost of measure		The measure does not have implementation costs in the strict sense.
Administrative costs		Administrative cost cannot be assessed today with the known level of detail.
Benefits for the airports		Slightly positive in the long term since capacity increase may lead to more flight and therefore more revenues.
Benefits for the airlines		Slightly positive in the long term since more choice possibilities to serve destinations will be offered to the airlines. Additional flights might result to additional revenues.
Benefits for travellers		Slightly positive in the long term since more choice possibilities will be offered to air travellers. <i>See also mobility below.</i>
Social		
Employment		Very positive impacts in terms of employment from the short term. <ul style="list-style-type: none"> Increased demand for labour during the development/construction phase. New airports or enlargement of existing airports will improve the welfare of the population in the catchment area.
Mobility		Positive impacts in the long term, since if more airports are build, therefore more transport infrastructure is offered, mobility will be increased.
Environmental		
Noise		Negative in the long term. If more capacity is provided, by building new airports, the areas around will suffer from the noise.
Air pollution		Idem as Noise.
Other		
Institutional impacts		Neutral impacts. The measure is not expected to affect the current institutional organisation and arrangements in a direct or significant way.

General Conclusions

The following general conclusions can be drawn for each key category of impact:

- Most of the measures presented positive impacts in terms of capacity and reducing delays. Very few had no or neutral impacts, but only one presented negative impacts. Measures with the best performance in terms of capacity enhancement (if examined together and not individually) are the Local Convergence Implementation Plan (LCIP), promotion of best practices for capacity management, Collaborative Decision-Making (CDM) and Advanced-Surface Movement Guidance Control System (A-SMGCS).
- In terms of safety most of the measures presented neutral impacts with the exception of rail-air ticketing, rail access to airport, LCIP, implementation of validated research results, CDM and A-SMGCS.
- Concerning social and environmental impacts the performance of measures varied significantly (from negative to positive).
- For the assessment of economic impacts, little quantitative data existed and the measures were mostly assessed qualitatively. As such, the measures have not presented big differences in terms of costs and benefits. The main conclusion though, and this is valid for all measures, is that they present good balance between the expected costs and benefits and in some cases the expected benefits outweigh the expected costs.

Another interesting point is that most of the measures are expected to have **immediate impacts** (especially their positive impacts). The exceptions are by their very nature long-term measures: implementation of validated research results, financial support for airport accessibility projects under the TEN-T budget, and the creation of a more pro-active role for Community funding and EIB lending to airport development.

It is worth noting that **“do-nothing” is not a realistic option**: all measures (except the concerning the Environmental Impact Assessment (EIA) guidelines) are definitely better. The comparison among measures is of minor importance as all of them should be implemented in short, medium and long planning horizon in relation with the current and foreseen capacity status of each, network relevant European airport.

The critical point for the successful implementation of the measures/options is the framing of the **reasonable blend of measures**, adapted to the particular situation to make best use of their complementary character.

Section 7: The way forward

The analysis performed within the current assessment confirmed that one single solution could not solve the problem of airport capacity. The solution should be found in a **combination of measures** within an appropriate timeframe as synergies and inter-relationships exist among the measures.

All measures investigated are proposed to be implemented in the **short-term**. For three measures, **mandatory status** is proposed:

- (a) Common capacity assessment methodologies are proposed to be compulsory from the short term. In order to identify the subset of information that should be provide in a compulsory basis, the Commission services' would initiate a dialogue with the airports on the necessity and usefulness of enhancing the reporting information of LCIP to include capacity assessment and effective practices concerning airport operations and environment protection.
- (b) A-SMGCS is proposed to be mandatory from the medium term. Therefore, EC intervention will probably be required (in medium term) for the wide adoption of safety related technologies given that their use on a voluntary basis will provide enough evidence for their compulsory implementation.
- (c) Airport CDM is proposed to become mandatory in the long-term (although the compulsory implementation of CDM in medium term may be considered in case that significant progress will be achieved in the coming years). The EC intervention may be required for the acceleration of the organisational advancements given that their usefulness and cost-effectiveness will be proven by evidence stemming from the voluntary phase, if local barriers prohibit their implementation.