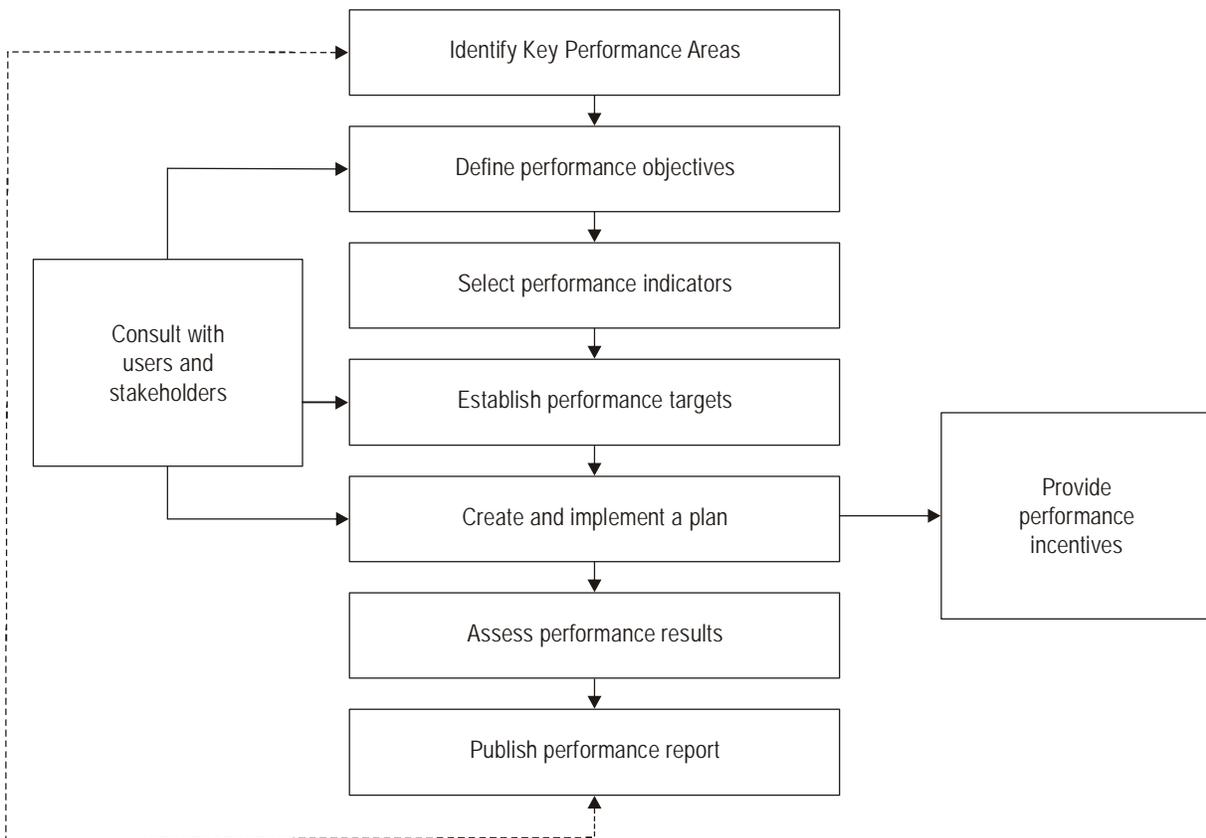


## Appendix 1

### MEASURING AIRPORT ECONOMIC PERFORMANCE

1. The key elements of a performance management process that could be applied to the economic and managerial aspects of an airport business are illustrated in Figure App 1-1. Detailed considerations are presented in the following pages.



**Figure App 1-1. Performance management process flow diagram for economic and managerial aspects of airports**

## Key performance areas and performance objectives

### *Identification of key performance areas (KPAs)*

2. The starting point for developing a successful performance management process is the identification of Key Performance Areas (KPAs). For economic and managerial performance of airports, as recommended in ICAO's policies on charges in Doc 9082, Section I, paragraph 16 i), four KPAs should be emphasized, i.e. safety, quality of service, productivity and cost-effectiveness, it being understood that States may choose additional KPAs according to their objectives and particular circumstances.

3. For each KPA, a variety of indicators may be appropriate to consider, depending on the circumstances at each airport (see paragraphs 6-12 below). For example, it may be appropriate to focus on an area where a present or anticipated need for action and improvement has been identified.

### **Definition of performance objectives**

4. A performance objective expresses a goal that improves on today's performance in a qualitative and focused way (for example, reduce the total number of delays). At least one objective for each of the selected KPAs should be defined. Selecting a few key, high-level, achievable objectives is a good rule to follow. Especially when the airport has little prior experience, it would be wise to start from a limited set of low-risk objectives.

5. Performance objectives are often inter-related and therefore there might be some trade-offs among them. When inter-relationships are identified, priorities should be established to resolve any conflicts between the objectives. In this regard, objectives related to safety should always be given the highest priority. Prioritization is supported by risk management, which helps to identify the risks that are most urgent or must be avoided, those that should be transferred or reduced, and those that are reasonable to retain. Also, the objectives at the different levels of the organization need to be linked to ensure overall coherence and to focus on priorities throughout the airport. This will foster teamwork and facilitate effective communication.

### **Performance indicators**

#### *Selection of performance indicators*

6. Performance indicators are a tool for quantitatively measuring current, past and expected future performance, as well as the degree to which performance objectives are being met and should be met. The performance indicators, which represent the high-level knowledge about the performance of the airport, are often called Key Performance Indicators (KPIs). To be relevant, the indicators need to correctly reflect the intention of the associated performance objectives and thus should not be developed without having specific performance objectives in mind.

7. The number of performance indicators within each performance objective should be limited so as to ease the burden on monitoring (collecting and processing statistical data), but should be relevant and sufficient to allow for an ongoing review of performance. ICAO's policies on charges in Doc 9082, Section I, paragraph 16 ii), recommend that at least one relevant performance indicator is selected and reported for each of the KPAs selected.

#### *Examples of indicators*

8. A range of possible performance indicators for the four KPAs that are in use in various jurisdictions, which may be of use in developing a performance management system, are listed here below. When performance indicators

are not directly measured, they should be calculated from supporting metrics according to clearly defined formulas. Supporting metrics determine which data need to be collected to calculate values for the performance indicators.

### *Safety*

9. Runway accidents and incursions are primary safety concerns for airports. A runway incursion is often defined as any occurrence at an airport involving an aircraft, vehicle, person or object on the ground that creates a collision hazard or results in a loss of separation with an aircraft taking off, intending to take off, landing, or intending to land. Potential indicators include:

- a) runway accidents per thousand operations;
- b) fatal runway accidents per thousand operations;
- c) accidents per thousand hours worked;
- d) runway incursions per thousand operations; and
- e) bird strikes per thousand operations.

### *Quality of service*

10. Quality of service can be measured from aircraft operators' and from end-users' perspectives. Potential indicators include:

- a) airport average daily capacity (aircraft movements per day);
- b) number of delays by cause; and
- c) average delay per flight.

Passenger surveys on quality of airport services:

- d) time at security queues;
- e) percentage of time out-bound and in-bound baggage system available during hours of operation;
- f) ease of finding one's way;
- g) accuracy of screen information;
- h) cleanliness of washrooms; and
- i) overall passenger satisfaction.

### *Productivity*

11. Productivity performance indicators look at the relationship of airport output (for example, number of aircraft movements, number of passengers and tonnage of cargo handled) to inputs (for example, employees, gates and airport facilities). Potential indicators include:

- a) aircraft movements per employee;
- b) aircraft movements per gate;
- c) passengers per employee; and
- d) tonnage of cargo per employee.

#### *Cost-effectiveness*

12. Cost-effectiveness performance indicators measure the financial cost (for example, total airport costs, facility costs and operating costs) of input required to produce an output (for example, aircraft movements, passengers and cargo handled). Potential indicators include:

- a) total costs per aircraft movement;
- b) total costs per passenger;
- c) total costs per 1 000 air traffic units; and
- d) staff costs as a percentage of turnover.

#### *Data collection and processing*

13. Good quality information is essential to the whole performance management process and hence design of performance management systems must take into account the quality of data collection systems in place or that can be developed. It is critical that robust information systems provide all the relevant data. However, data collection and processing (as well as storage and analysis) are not cost free and may require investment, which may at times be substantial. Airports should always take care that the benefits of data collecting and processing justify the cost incurred and that the effort and money spent on the collection and processing of data are actually used to improve the effectiveness of decision making. It should be noted that airports do not require sophisticated information systems in order to start performance measurement, but there are dangers in relying on simplistic partial productivity metrics. Management can subsequently add refinements as required.

14. For performance management to be effective and credible, it is important to adhere to certain guidelines on data collection and processing. First, the data used should be obtained from accurate sources. Second, the compilation of data should be thorough with clear definitions of services and units of measurements, and if estimation procedures such as sampling are used, they should be free from bias as much as possible. Third, consistent, transparent methodologies should be used to compile or estimate results. Without consistency, changes of performance cannot be meaningfully interpreted. (For example: is the observed change caused by a difference in measurement method or by a real difference in performance?)

### **Performance targets**

#### *Establishment of performance targets*

15. Each performance indicator should, where practical, have a unique target value that needs to be reached or exceeded over a predetermined period in order to determine whether or not a performance objective has been fully achieved. Performance targets can be set as a function of time (i.e. the required speed to achieve the targets) and at

different aggregation levels (i.e. on an individual airport basis, on an airport system basis, or on an airport network basis). They can also vary by geographic area.

16. The airport should develop realistic and achievable performance targets. The determination of a baseline performance (i.e. an initial performance level) is a prerequisite to setting performance targets. The baseline performance should be established taking into account the past year's performance, peer group best performance (benchmarks), the State's (or economic oversight entity) expectations for performance, and specification of potential performance improvements and trade-offs. Knowledge gained through the baseline performance and modelling of future scenarios can provide guidance as to achievable target values for performance indicators.

17. Airports are complex environments where different components of the services to aircraft operators, passengers or forwarders are provided, in some cases through a variety of parties.<sup>1</sup> Service quality as a whole thus comprises a range of components. Where there is such a range of service providers, the relevant economic oversight authorities should consider whether targets should also be set for service providers other than the airport authority, and there should be an obligation on the service providers to comply with the targets thus set. Where it considers such targets suitable, the relevant economic oversight authorities should consider appropriate ways to ensure that such targets are met, which may include supporting the airport, as the entity with overall management control, to put in place measures to ensure that service providers comply. Economic oversight or regulatory structures should be supportive of such management activities to ensure that the interests of users, including end-users, are safeguarded.

18. Target setting depends on the nature of the objectives and other circumstances. In some cases, the performance targets may be dictated by external circumstances such as a cost reduction of a specified amount or percent in response to an industry downturn, or a budget cut imposed on a government-owned airport, or competitive pressures from rival airports. Overall, the targets should relate to the airport's ongoing efforts to improve over time. In this case, they may be more nuanced (for example, established as "meeting", "exceeding" or "far exceeding").

#### *Planning how to achieve the targets*

19. Achievement of performance targets may require new initiatives, while airports typically have limited resources. Prioritizing use of staff, financial and infrastructure resources is important to ensure achievement of the targets. In this respect, decision makers need to gain a good understanding of the strategic fit, the benefits, cost and feasibility of each initiative for performance improvement. To plan how to achieve the targets, it is suggested that an airport:

- a) determine what initiatives need to be taken to close current performance gaps, i.e. the shortfall between the baseline performance and its performance target;
- b) estimate the budget, staff and management time required for each initiative;
- c) prioritize each initiative to most efficiently close performance gaps;
- d) if there are a significant number of new initiatives, decide what non-critical work can be stopped or deferred to free the resources required to achieve the targets; and
- e) establish internal commitment to each initiative and collaboration with aircraft operators, end-users and other interested parties through consultation.

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1. As many services critical to the airport's performance are outsourced to suppliers or undertaken by other providers, they are also often included in the performance measurement system.

*Performance incentives*

20. Incentives may be incorporated in the performance management process to help the achievement of the performance targets. It should be noted that incentives may apply to both airports and users, in particular in situations where the airport is not directly involved in a specific operation (for example, the handling of a flight by a third-party ground handler contracted by the airline, or by the airline itself). The following paragraphs focus on financial incentives for airports, whereas incentives for users are described in Chapter 4 of this manual in the context of differential charges.

21. There are a variety of potential incentives that airports can initiate on their own. Such incentives include, but are not limited to, the following:

- a) compensation of airport employees tied to meeting performance targets;
- b) share in cost saving/profit among airport staff for meeting performance targets; and
- c) service level agreements with users.

22. There are also potential incentives that States can establish for airports through some forms of economic oversight. The archetypal example is price cap regulation (see Chapter 1, Part C), under which performance targets for productivity and cost-effectiveness can be set through the introduction of an incentive “x” factor. Under a direct cap on charges, all traffic and cost risks are for the airport. Some other forms of regulation exist, which introduce a risk sharing mechanism between airports and users, where some risks are borne by the airport but some risks are borne by the users.

23. When introducing incentives for cost-reduction, States should ensure that safety will not be affected and that quality of service will be maintained at a satisfactory level in the interests of current and future users, including end-users.

24. It should be noted that financial incentives are not necessarily compatible with the full cost recovery principle, which means by definition that the airport should recover all its costs. Within the full cost recovery principle, any penalty applied to the airport would have to be considered as an extra cost, which would then have to be charged back to the users. As a consequence, any incentive effect would be lost. Conversely, any reward granted to the airport would have to be considered as surplus income, which would then have to be passed back on to the users through a decrease in charges if an adjustment mechanism is in place. Strict application of the full cost recovery principle in these circumstances would negate the purpose of such incentives for cost reduction.

**Performance assessment and report***Assessment and applying results*

25. Performance assessment or measurement can start once the required data on performance indicators and targets, as well as actual performance results, are available and made at regular time intervals, at least annually. Performance assessment is to continuously keep track of performance and monitor whether progress is made in achieving performance objectives and targets.

26. The critical step of performance assessment is to develop a factual understanding of the reasons for (good or bad) performance, and explain these to high-level decision makers. To that effect, managers in charge should compare actual performance results against performance targets and analyse historical trends of performance results. They should look at the big picture (e.g. annual totals and averages, performance results) and, to the extent practicable, also examine details. If an airport is getting better-than-expected results, airport managers should determine what factors are causing improved performance and analyse whether those factors could be applied in other areas. If there

are deficiencies, cases where performance is not as expected despite the implementation of initiatives designed to achieve performance targets, managers should determine what the root cause of the problem is and how it can be improved. It is important to note that the purpose of assessment is not punitive, but is to assist in the achievement of planned performance improvements.

27. An integral part of the performance assessment is the formulation of recommendations, where this is possible and meaningful from the level of analysis undertaken. Recommendations will fall typically into the following categories (not exhaustive):

- a) related to the need to improve performance data collection;
- b) suggested initiatives aimed at closing identified performance gaps;
- c) suggestions to accelerate or delay performance improvements, based on anticipated evolution of traffic demand and predicted performance indicator trends; and
- d) recommendations of an organizational nature (set up a task force, define an action plan, etc.) with a view to actually starting the implementation of the above recommendations.

28. When inconsistencies between expectations and performance objectives and targets are found, recommendations may include the need to (re)define performance objectives and/or the need to set or change performance indicators and targets.

#### *Performance comparisons and benchmarking*

29. Airport performance is frequently discussed in relative terms, which can be internal or external.

30. Internal benchmarking (or self-benchmarking) means considering an airport's performance against itself over time. Within an individual airport, this might involve reviewing the average performance of facilities of a given type, or the performance of a specific facility, at a point in time. In the former case, individual facilities are compared to the average level of performance, while in the latter case changes in performance of a single facility over time are compared to its review period.

31. External benchmarking involves comparing airports with one another. The term "airport benchmarking" is generally taken to mean a process whereby it is intended to compare an airport with the "benchmark" — an estimate of what a best performer could reasonably be expected to achieve in a given set of circumstances, based on the achieved performance in a relevant and comparable group of airports. It is very important to note that great care must be taken when going through this exercise as comparisons of performance between airports are difficult and can often be misleading, particularly true if partial productivity indicators are being used. Measures used by one airport may not be comparable to measures in another airport, due to, inter alia, differences in the nature of the operating model, the operating environment and the stage in the airport investment cycle. Definitions, content, data collection, and accounting practices may also differ. The size and operational complexity of an airport is another factor to consider. To the extent that such comparisons are made, great caution should be exercised in interpreting the results, especially when the goals are to understand performance drivers and shortfalls, and thus establishing best practices.

32. If airport managers attempt to make performance comparisons with other airports, differences in operational, structural, commercial and organizational situations must be adequately reflected in the analysis. It is therefore of major importance to first create a level field for comparison by means of KPIs. For this reason, in order to gain a deeper understanding of the drivers of efficiency, airports often apply process level benchmarking of particular activities as this is a more useful approach to dealing with the data and business diversity issues than using partial productivity analysis. As mentioned in Chapter 4, Part A, paragraph 4.52 of this manual, comparisons between cost centres at different airports may be more feasible than comparing entire airports with each other.

33. Performance comparisons and benchmarks must be readily understandable at a decision-maker level and provide a basis for discussion and awareness across all the stakeholders. Such activities can:

- a) improve transparency of a performance management process;
- b) provide insight into the opportunities for the improvement of individual airports' performance (learning opportunities, setting performance targets);
- c) highlight best practices for delivering improvements in performance through the identification of highly efficient or high-quality service facilities and/or processes;
- d) support more effective regional coordination and planning, thereby rationalizing and avoiding duplication of efforts;
- e) support constructive dialogue with users and other interested parties; and
- f) provide global reach to expand the knowledge base.

#### *Investment analysis*

34. Performance assessment can help to support and justify investment decisions. As the investment decisions regarding changes to the airport become more complex, the need for thorough assessment of performance increases. The identification of best practices and associated levels of output and quality can help estimate the potential benefit or return that could be produced by investment in facilities and equipment, as well as the optimum size of investment.

#### *Forecasting*

35. Performance assessment results can be used to forecast needed capital and staff investments required for airport development. Forecasts are an important input to cost-benefit analyses associated with infrastructure development.

#### *Information disclosure and performance report*

36. Information disclosure is an important component of a performance management process for airports. While information disclosure is often an obligation imposed on a statutory monopoly as the counterpart of its monopoly rights and on a public company whose registered securities are traded in the market, it is also an essential component of a performance management process for all airports. Appropriate dissemination of performance information on a periodic basis can build public confidence in the airport and enables an effective dialogue between all interested parties (see Doc 9082, Section I, paragraph 16 iv)). It can also support the setting of objectives/targets and encourage ongoing thinking about what works to improve performance and what improvement opportunities can be pursued by offering a measurable means by which to ascertain how an airport is performing against its stated objectives and targets.

37. Performance reports normally describe the performance indicators established, the targets selected and the actual results achieved. ICAO's policies on charges in Doc 9082, Section I, paragraph 16 ii), recommend that, for each of the KPAs selected, at least one relevant performance indicator and its target should be reported. To assist readers with interpreting the report's findings, the derivation of the performance assessments used along with a discussion of how these assessments were applied is also incorporated either directly within the report or by reference to a public document. The level of detail of information to be provided depends on the circumstances. For example, if it has to be used for the purpose of a price cap regulation, then the information disclosure can be quite comprehensive.

38. The contents of performance reports need not be limited to just a review of the airport's past performance. They can, to the extent practicable, look forward, anticipating future capacity needs.

39. For transparency purposes, performance reports should be readily obtainable and be made available to all interested parties on a timely basis (for example, placing performance information in the public domain wherever it is possible or practicable to do so). Whether performance reports are subject to an independent audit is left to the discretion of the State.

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