

**CHECKLIST FOR COST-BENEFIT ANALYSIS
FOR INFRASTRUCTURE INVESTMENT PROJECTS**

COMPONENT	DESCRIPTION	NOTES
Objective	<p>This section should present the desired outputs of the project. For example, in the case of an investment in a new radar system, the objective of providing surveillance should be described in terms of expected improvements, for example:</p> <ul style="list-style-type: none"> • enhanced safety; • increased system capacity; • reduced costs; • better weather detection; and • increased traffic. 	<p>A common mistake when describing the objective is to focus on inputs required to accomplish the project rather than the desired outputs.</p>
Scope	<p>The scope needs to identify the following:</p> <ul style="list-style-type: none"> • timescale; • geographic area; • relationship to other projects; • development stage; and • cost estimates. 	<p>This section needs to identify affected airspace users. Identification will help to avoid double counting or omission of costs and benefits.</p> <p>Changes in the aviation sector impact many different stakeholders. It is therefore essential that the CBA, identify the impact for different stakeholders. This is particularly important as the non-quantifiable and non-financial factors may differ significantly between different stakeholders.</p>
Assumptions	<p>In aviation, assumptions usually cover:</p> <ul style="list-style-type: none"> • aircraft fleet characteristics; • levels of aircraft activity; • equipment life; • passengers/shipment revenues; • cost of fatalities/injuries; and/or • cost of passenger time. 	
Base case and alternatives	<p>The base case provides the benchmark against which the proposed project or investment can be measured. It is the “do-nothing” or “maintain status quo” option, describing what is likely to occur in the absence of the project being evaluated.</p>	<p>Any option viewed as providing an improvement to the status quo should be included as a project alternative.</p>
Time horizon	<p>The time horizon should cover the entire time period over which the project’s costs and benefits are expected to occur.</p>	<p>The determination of an appropriate time horizon will be specific to each option being evaluated and will be based on factors such as:</p> <ul style="list-style-type: none"> • lifespan of capital investments; • period over which relevant policy is likely to apply; and • other demographic, economic or social factors that may impact the project’s objectives.

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Benefits and costs (identification)	<p>All benefits and costs must be identified for the base case and for each of the alternatives under consideration in the CBA. Once identified, they should be quantified in monetary value where possible.</p>	<p>Typical cost categories include:</p> <ul style="list-style-type: none"> • capital infrastructure; • fleet; information technology (IT) equipment; • software; • staff costs; maintenance and repairs; and • relevant economic and societal costs (e.g. noise or emissions). <p>Typical benefits categories include:</p> <ul style="list-style-type: none"> • access and equity; • capacity; • cost-effectiveness; • efficiency; • environment; • flexibility; • global interoperability; • participation by the air traffic management (ATM) community; • predictability; • safety; • security¹; and • relevant economic and societal benefits.
Benefits and costs (comparison)	<p>Once all of the benefits and costs have been identified and forecast, they need to be converted into a comparable format in order to determine if the project is cost-beneficial, or to assess which options yield the greatest net benefits.</p> <p>For consistency, only incremental benefits and costs expected from the project should be compared.</p> <p>Future costs and benefits must be discounted to their value today or the value of the base year for the project.</p> <p>Once benefits and costs are in a comparable format and have been discounted, different criteria are available to establish whether or not the benefits exceed the costs. These include:</p> <ul style="list-style-type: none"> • net present value (NPV), i.e. sum of discounted project benefits less discounted costs; • benefit to cost ratio (BCR), i.e. ratio of present value of benefits to present value of costs. • internal rate of return (IRR), i.e. discount rate at which the NPV of a project is equal to zero. 	<p>The project's payback period is determined by counting the number of years it takes before cumulative forecast cash flows equal the initial investment.</p>

¹ See Key Performance Areas, *Manual on Air Navigation Services Economics* (Doc 9161)

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Sensitivity analysis	Sensitivity analysis examines how the NPV, total cost or other outcomes vary as individual assumptions or variables are changed.	In a CBA, the project outcome is typically influenced by one or more unknown factors. A complete picture is best presented if uncertainty is explicitly considered and decision-makers understand how “sensitive” the project outcome is to changes in these factors. Key assumptions can be updated, additional alternatives can be identified or the methodology can be revised, making the economic analysis process iterative and ultimately improving the quality of the analysis.
Distributional aspects of benefits and costs	For many governmental investments , the recipients of the benefits are not those who bear the costs. From an overall perspective, society’s welfare is improved as long as all accepted projects and regulations have benefits that exceed costs. While the potential for compensation exists between those who benefit and those who bear the costs, such compensation may require further initiatives to implement. If costs are imposed on parties who neither benefit nor are compensated, there is a potential for inequitable impact.	CBA should identify those who benefit from and those who bear the cost of governmental investments , and whether the former actually compensate the latter.
Conclusion and Recommendation	The final outcome is a recommendation concerning the proposed objective. The presentation of the conclusions and recommendations is as important as the underlying analysis.	The relevant points should be highlighted in a clear and concise manner that meets the needs of decision-makers and provides them with objective guidance.