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|  |  | ***Acquisition Management System Guidance*** | |
| **Business Case Template for Software Enhancement** | | |  |

**October 2017**

Federal Aviation Administration

800 Independence Avenue SW

Washington, DC 20591

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| --- | --- | --- | --- |
|  |  | **Federal Aviation**  **Administration** | |
|  |  |  | |
|  |  | (Date) | |
| **Business Case for**  **(*Name of proposed software enhancement initiative*)** | | |  |

Enterprise Architecture Roadmap Statement #

Approved by: Date:

Vice President (ATO) or Director (Non-ATO) of

Sponsoring Service Organization

Contact Point

*Name*

*Organizational Code*

*Phone Number*

*FAX Number*

Federal Aviation Administration

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**TABLE OF CONTENTS**

EXECUTIVE SUMMARY

[1.0 InVESTMENT DESCRIPTION 1](#_Toc366739407)

[2.0 Problem Statement 1](#_Toc366739408)

[3.0 Assumptions 1](#_Toc366739409)

[4.0 Business Case Analysis 2](#_Toc366739410)

[**4.1 Cost Analysis 2**](#_Toc366739411)

[**4.2 Benefits Analysis 2**](#_Toc366739412)

[**4.3 Schedule Analysis** Error! Bookmark not defined.](#_Toc366739413)

[**4.4 Risk and Sensitivity Analysis 3**](#_Toc366739414)

[**4.4.1 Risk Analysis 3**](#_Toc366739415)

[**4.4.2 Issues and Opportunities 3**](#_Toc366739416)

[**4.4.3 Sensitivity Analysis 3**](#_Toc366739417)

[**4.5 Economic Analysis 4**](#_Toc366739418)

[**4.5.1 Cost-Benefit Analysis 4**](#_Toc366739419)

[**4.5.2 Net Present Value 4**](#_Toc366739420)

[**4.5.3 Payback Period 4**](#_Toc366739421)

[5.0 AFFORDABILITY ANALYSIS 5](#_Toc366739422)

[6.0 RELATED ASSESSMENTS 5](#_Toc366739423)

[7.0 Recommendation 5](#_Toc366739424)

[8.0 Impact if Not Funded OR DELAYED 5](#_Toc366739425)

[9.0 Procurement Strategy 6](#_Toc366739426)

**APPENDICES**

Appendix A: Business Case Analysis Team Members

Appendix B: References

**SUPPORTING DOCUMENTS**

Shortfall Analysis Report

Lifecycle Cost Estimate

Acquisition Program Baseline

Basis of Estimates

Benefits Analysis Report

PMO Risk, Issues, and Opportunities Management Plan (ATO investments only)

*The business case for a Software Enhance investment initiative is developed during final investment analysis using this template and instruction, which may be tailored by the IP&A Business Case Review Group. Requests for tailoring should be made very early in final investment analysis.*

*All guidance documents cited in this template can be found on the IP&A website at* [*http://www.ipa.faa.gov*](http://www.ipa.faa.gov) *or the FAA Acquisition Management System Toolset at* [*http://fast.faa.gov*](http://fast.faa.gov)*.*

**EXECUTIVE SUMMARY**

*Summarize the key information in this document, highlighting those elements that are most relevant to the Joint Resources Council when making the final investment decision. Include the following at a minimum: A brief summary of the operational shortfall or opportunity; a brief description of the proposed investment; a summary of the cost, benefit, schedule, risk, and economic business case analyses for the proposed investment; and the impact on FAA operational or business capability is the investment is delayed or not funded.*

# InVESTMENT dESCRIPTION

Briefly describe the proposed software enhancement initiative. Identify how it contributes to the Next Generation Air Traffic System (NextGen or NGATS) Program and FAA strategic goals. Briefly describe the key operational capabilities the software enhancement will provide. These capabilities should address the shortfalls or opportunities in Section 2.0: Problem Statement. Examples of new software enhancements include:

* Development, test, and deployment of new software to add functionality, improve performance, or achieve a priority agency operational or business capability
* Refreshment of COTS software to sustain maintainability or add functionality
* Upgrade test/diagnostic capability to improve maintainability or lower maintenance costs
* Other capability necessary to sustain the operational asset or improve performance or functionality

# ProblemStatement

Explain why software must be enhanced to support FAA operational or business needs. Identify operational shortfalls and key drivers for this investment initiative. Support each with the associated technical, operational, or legislative basis. Use and update the information in Section 1 of the Final Shortfall Analysis Report produced during concept and requirements definition. Express information succinctly so busy executives can quickly understand the need for the initiative.

This section is the basis for your analysis presented in Section 8: Impact if Not Funded or Delayed.

# ****Assumptions****

*List the key assumptions and conditions having major influence on the business case and its conclusions. The list should include as a minimum:*

* *The assumed remaining service life and disposition date of the existing capability*
* *The assumed required implementation date for the proposed investment*
* *The assumed service life of the proposed investment*
* *The future operational environment*

*See “Business Case Analysis Guidance, Appendix B” for definitions of assumptions, constraints, and conditions at* [*http://www.ipa.faa.gov*](http://www.ipa.faa.gov)*.*

# Business Case Analysis

*Summarize the evaluation criteria and their relative weighting used in the business case analysis.*

*See Business Case Analysis Guidance, Appendix A, Table A-1 for business case analysis requirements by ACAT at* [*http://www.ipa.faa.gov*](http://www.ipa.faa.gov)*.*

## **4.1** **Cost Analysis**

*Summarize the full risk-adjusted lifecycle cost estimate for the proposed investment as a basis for the final investment decision. Use actual cost data from vendors responding to the request for offer for the required capability as the basis for the estimate, as well as independent analysis by the business case team in the cost basis of estimate document.*

*Present results in the following table (or appropriate variation) as risk-adjusted then-year dollars.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Proposed Investment Description** | **Total F&E Cost**  **RATY $** | **Total OPS Cost**  **RATY $** | **Total Cost**  **RATY $** |
| *Descriptor* | *Dollar value* | *Dollar value* | *Dollar value* |

Total F&E cost includes all development, procurement, deployment, support, and infrastructure costs.

Total OPS cost includes all operational and support costs over the intended service life.

RATY = Risk-Adjusted Then Year

*Briefly describe the analysis conducted to generate the high-confidence lifecycle cost estimate. Summarize the sensitivity analysis performed on key cost drivers and the effect of technical, schedule, and risk on the cost estimate. Reference the Life Cycle Cost Estimate and Cost Basis of Estimate.*

*Include a summary budget chart by fiscal year for the recommended investment initiative containing both acquisition (F&E) and operational (OPS) costs in risk-adjusted then-year dollars.*

*Further information on the development of cost estimates, risk and uncertainty analysis, or budget summary can be found in the “Guide to Conducting Business Case Cost Evaluations” at http://www.ipa.faa.gov.*

## **Benefits Analysis (Quantitative/Qualitative)**

*Use the following table (or appropriate variation) to summarize the lifecycle benefit estimate for the proposed investment.*

|  |  |  |
| --- | --- | --- |
| **Proposed Investment Description** | **Quantitative Benefits** | **Qualitative Benefits** |
| *Descriptor* | *Values* | *Description* |

*Describe briefly the analytical activity undertaken to generate high-confidence lifecycle benefit estimates****.*** *Include the benefits analysis as an attachment.*

* 1. **Schedule Analysis**

*Provide a risk-adjusted implementation schedule and key milestones for the proposed investment initiative in graph, table, or network format. Briefly explain the assumptions and analysis on which the schedule is based.*

*See the “Guide to Conducting Business Case Schedule Evaluations” on the IP&A website at* <http://www.ipa.faa.gov>*.*

## **Risk and Sensitivity** **Analysis**

### Risk Analysis

*Risk analysis is an objective assessment to determine the probability of an undesirable event occurring during implementation and the significance of the consequence of the occurrence. It is a process in which a group of programmatic, technical, and analytical specialists review the cost and benefit estimates, as well as supporting ground rules, assumptions, and the basis of the estimates. If the analysis indicates an undesirable event may arise, the potential impact(s) resulting from such an occurrence are evaluated. At a minimum, the areas of risk to be analyzed are: costs, benefits, schedule, and technical.*

*Summarize results in a 5 X 5 risk matrix and specify the overall risk rating. Identify and evaluate major risk factors and summarize the mitigation strategy for each. Reference the risk mitigation plan for the proposed initiative and include mitigation costs in the lifecycle cost estimate.*

*For more information on risk analysis and a list of all risk areas, see the “Guide to Conducting Business Case Risk Assessments” on the IP&A website at* [*http://www.ipa.faa.gov*](http://www.ipa.faa.gov)*.*

### Issues and Opportunities

*Summarize major issues that have been identified, analyzed, and incorporated into the business case, as well as any opportunities that would have a positive impact on the initiative and FAA service delivery. For ATO initiatives, reference the PMO Risk, Issues, and Opportunities Management Plan.*

**4.4.3** **Sensitivity Analysis**

*Sensitivity analysis involves changing key parameters in the cost model to test their effect on cost variation. For sensitivity analysis to reveal how the cost estimate is affected by a change in a single assumption, the cost estimator must examine the effect of changing one assumption or cost driver at a time while holding all other variables constant. Perform the sensitivity analysis on key cost drivers to determine their impact on cost. Sensitivity analysis includes:*

* *Testing the sensitivity of cost elements to changes in input values and key assumptions*
* *Determining the effects of changing quantities and program schedule on the overall cost estimate*
* *Determining which assumptions are key cost drivers and which cost elements are affected most by changes*

*Use the following table to identify key cost drivers on which a sensitivity analysis was performed and to summarize their impact on cost. Briefly explain how key parameters were varied to determine these impacts.*

|  |  |
| --- | --- |
| **Key Cost Driver** | **Cost Impact** |
|  |  |
|  |  |

## **Economic Analysis**

*Economic analysis is the process of translating the cost/benefit analysis into net-present-value and other financial statements about FAA investments. Economic analysis provides a systematic approach by which the FAA determines what investments it should pursue. The FAA generally uses benefit-cost ratio, net present value, and payback period as the standard criteria for deciding whether an investment can be justified on economic principles.*

*Summarize in the sections below the analysis conducted for the proposed investment. Include benefit-cost ratio, net present value, and payback period.****Refer to the “Guide to Conducting Business Case Economic Evaluations” located at*** [*http://www.ipa.faa.gov*](http://www.ipa.faa.gov)***.***

### ****Cost-Benefit Analysis****

***Summarize in*** *the following table the total expected costs of this investment initiative against the total expected benefits. Use risk-adjusted then-year dollars.*

|  |  |  |
| --- | --- | --- |
| **Proposed Investment Description** | **Total Cost**  **RATY $** | **Total Benefit**  **RATY $** |
| *Descriptor* | *Dollar value* | *Dollar value* |

RATY = Risk-Adjusted Then Year

### ****Net Present Value****

*Net present value presents the net value of a proposed investment in today’s dollars. All costs and benefits are adjusted to "present value" by using discount factors to account for the time value of money. Net present value is a way of making commensurable the costs and benefits that occur in different years and presenting them in today’s dollars. OMB Circular A-94 establishes net present value as the standard criterion for deciding whether investment costs can be justified on economic principles.*

### ***Show in the table below the monetized value of the future stream of expected net benefits and costs discounted to the present for the proposed investment.***

|  |  |  |  |
| --- | --- | --- | --- |
| **Proposed Investment** | **Present Value of Benefits** | **Present Value of Costs** | **Net Present Value** |
| ***Short descriptor*** |  |  |  |

### ****Payback Period****

*The payback period specifies how long will it take to make back the money spent on an investment. It represents the time required for cumulative savings from the investment to equal the cumulative cost of the investment. In other words, the payback period measures the time (i.e., years, months) needed to recover the initial investment and break even.*

*Record the payback period for the proposed initiative in the table below.*

|  |  |
| --- | --- |
| **Proposed Investment Description** | **Payback Period** |
| ***Descriptor*** | ***Months or years*** |

*Briefly explain the assumptions and calculations used to determine the length of time required to recover the cost of the proposed investment.*

*For additional information on these analyses please see GAO Cost Estimating and Assessment Guide found at* [*http://www.ipa.faa.gov*](http://www.ipa.faa.gov)*.*

# ****AFFORDABILITY ANALYSIS****

*Send the lifecycle cost estimate for the proposed investment to FAA Finance. This office assesses the budget impact and relative contribution to agency goals of this initiative against other ongoing and proposed investment programs in the FAA financial baseline. When the initiative cannot be funded within the financial baseline, FAA Finance may propose offsets from lower priority programs. The budget impact assessment shapes subsequent deliberations of the business case analysis team.*

*Summarize findings and recommendations of the affordability analysis here.*

# ****RELATED ASSESSMENTS****

*Depending on the nature of the investment, some or all of the following assessments may be appropriate:*

* *Architecture Impact Assessment*
* *Human Engineering/Operability Assessment*
* *Information and System Security Assessment (see AMS Policy Section 4.11 on FAST)*
* *Environment and Occupational Safety and Health Assessment*
* *Other Specialty Engineering Assessments.*

*Summarize findings here.*

*See the IP&A website (*[*http://www.ipa.faa.gov*](http://www.ipa.faa.gov)*) for information on these assessments.*

# Recommendation

*State your recommendation and supporting rationale here (i.e., affordability, benefits, improvements in operational efficiency or effectiveness, cost savings, schedule, risk, etc.).*

# Impact if Not Funded OR DELAYED

*Explain why this investment must be approved now. Briefly state what will happen if it is delayed or not funded (Reference the Legacy Case Risk Assessment in the final Shortfall Analysis Report). Summarize the impact on other initiatives or operational assets dependent on this initiative.*

# Procurement Strategy

*Describe the recommended contracting approach, if any, and summarize the rationale for the recommendation*.

**APPENDICES**

**Appendix A: Business Case Analysis Team Members**

*Use the following table to identify the organization and briefly define the role of each business case analysis team member.*

|  |  |  |
| --- | --- | --- |
| **Name** | **Organization** | **Role** |
|  |  |  |
|  |  |  |

**Appendix B: References**

*Use the following table to list references and documents used in analyzing the business case. Examples include the basis of estimate for lifecycle costs and benefits, and documentation of related assessments. Each reference should include the document title, originating organization, and approval date.*

|  |  |  |
| --- | --- | --- |
| **Document Title** | **Originating Organization** | **Date** |
|  |  |  |
|  |  |  |

**SUPPORTING DOCUMENTS**

*Attach the following documents supporting this investment initiative, as appropriate.*

**Final Shortfall Analysis Report**

**Life Cycle Cost Estimate**

**Acquisition Program Baseline**

**Basis of Estimates**

**Benefits Analysis Report**

**PMO Risk, Issues, and Opportunities Management Plan** (ATO initiatives only)