NEXTOR National Airspace System Performance Workshop

# NextGen Integrated Financial Model for the Joint Planning and Development Office

## Overview of Initial Model Design

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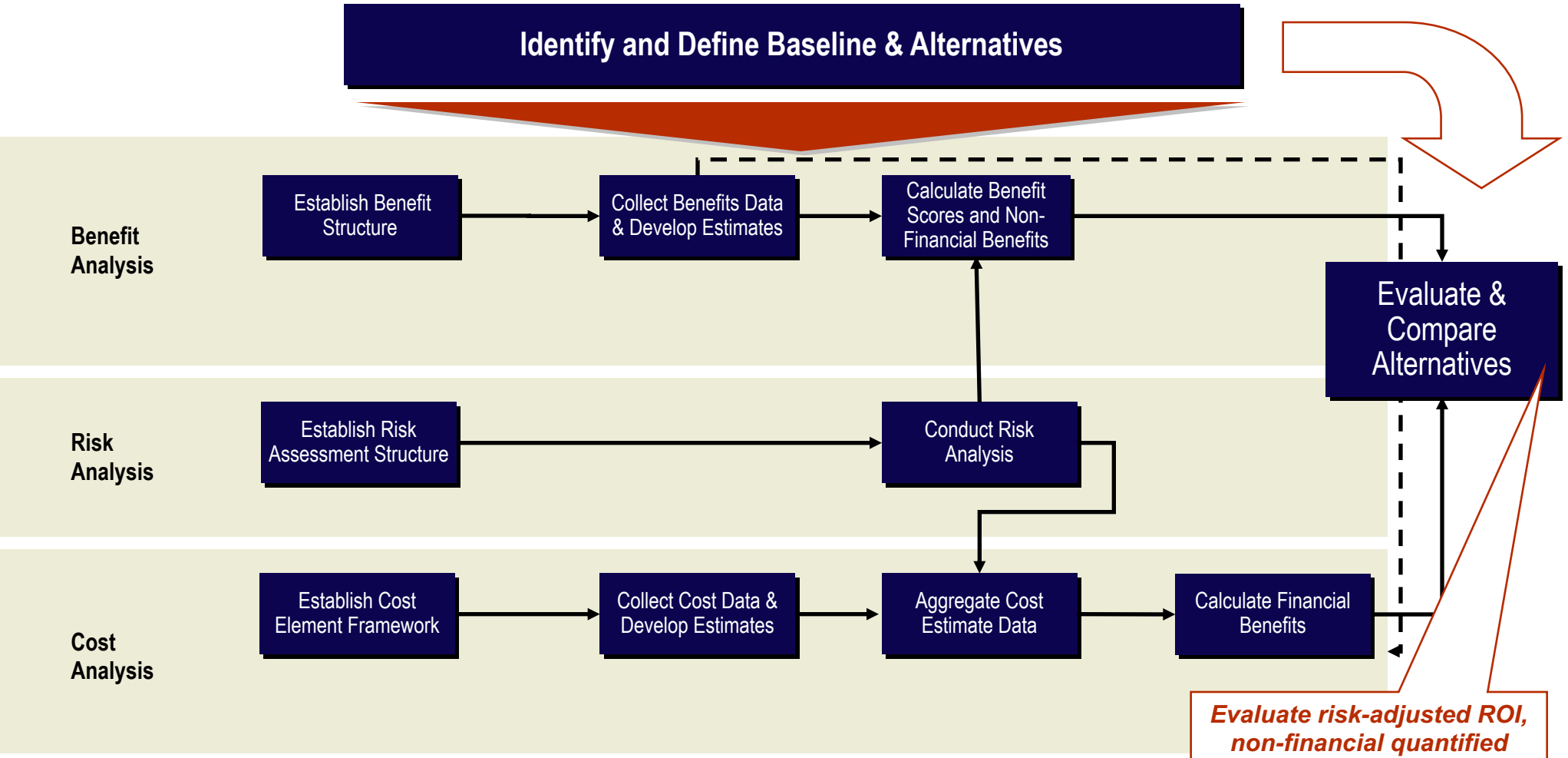
- Purpose
- Process Overview
- Model Logic
- Sample Inputs
- Sample Output Reports

# In order to effectively integrate costs, benefits and risks to generate return-on-investment metrics, a structured analytical process is needed to feed an integrated financial model



# An integrated financial model that aggregates and reports costs, benefits, and risks is the foundation of developing a sound business case

## Key Characteristics and Contents of NextGen Integrated Financial Model

***Contents***

- Full capital and operating (lifecycle) cost estimate for NextGen
- Lifecycle benefit estimate (financial and non-financial) of NextGen
- Base Case (baseline) capital and operating (lifecycle) costs
- Base Case (baseline) lifecycle benefits estimate (financial and non-financial)
- Risk-adjusted cost and benefit estimates

***Characteristics***

- Segmentation of costs by major stakeholder [federal government // industry – major commercial carriers, general aviation // airports – state and/or local airports authorities]
- Segmentation of select categories of financial benefit impacts by stakeholder (ROI metrics) [Some benefits captured and reported system-wide only; and some segmented by major stakeholder]
- Flexibility to change select input units for sensitivity analysis
- Flexibility to accommodate and aggregate input cost data from different sources with different levels of detail
- Flexibility to change select model baseline cost and benefit assumptions
- Configurability of Monte Carlo simulations (Crystal Ball) to model uncertainty and generate ranges
- Capability to incorporate risk data to enable reporting of risk-adjusted costs, benefits and ROI

# The process for developing the NextGen Integrated Financial Model includes the assessment of total lifecycle costs, benefits, and risks using a holistic framework

## 1 Identify Scope

- Define alternatives for the business case: the baseline and NextGen Alternatives
- Determine the scope of the NextGen Alternatives based on the Integrated Work Plan v1.0 and other key planning and architecture artifacts


**"Sample Target Portfolio" or NextGen Alternative**

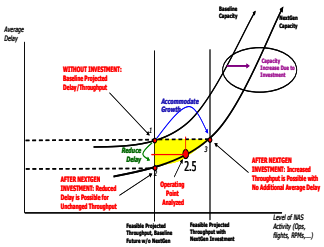
**Subset of Operational Improvements (OIs) –** modeled in the benefits analysis

**Enablers** – grouped into Cost Proxy Programs (CPPs) for costing purposes

## 2 Assess Benefits, Costs, & Risks

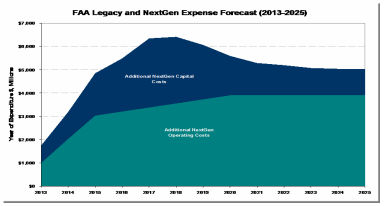
### A Benefits

- Consolidating metrics forecasts for monetized and non-monetized benefits of NextGen



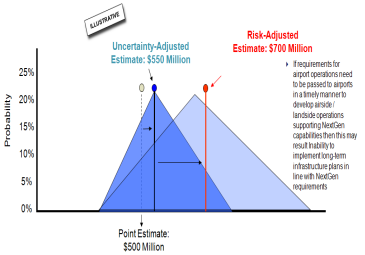

### B Costs

- Coordinate with partner agencies and select stakeholders to aggregate all lifecycle costs (capital and operating costs) for NextGen related programs & activities
- Apply uncertainty analysis to develop cost ranges



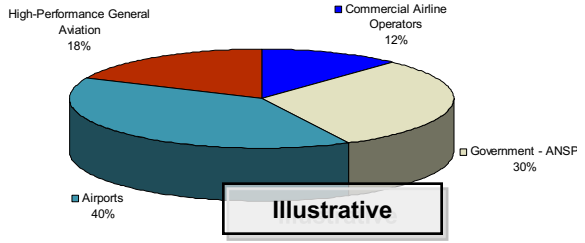

### C Risks

- Identify, quantify and aggregate risks
- Risk-adjust cost and benefit estimates




## Generate Cost and Benefit Results by Stakeholder

- Government / ANSP
- Commercial Airline Operators
- General Aviation
- Airports
- Society / Passengers




## 3 Document and Compare Results

- Place side-by-side the uncertainty and risk-adjusted discounted costs, monetized benefits, and non-monetized benefits of the Baseline and NextGen alternatives

## Analysis Documentation

***JPDO***

***NextGen Business Case Analysis Report***

***NEXTOR NAS Performance Workshop***

Booz | Allen | Hamilton

# Unit costs, drivers, assumptions, data and sources used for this analysis are captured in a MS Excel Integrated Financial Model

## 1 Global Structure

***Definition: Central Location for all Parameters that remains the same***

- Assumptions
  - Economic Rates
  - Airports Profile
  - Fleet Forecast (Equipage Profile)
  - IWP Elements & Dated
- Cost Element Structure (CES)
- Financial – Benefit Element Structure
- Non-Financial – Benefit Element Structure
- Risk Element Structure

## 2 Inputs

***Definition: Data Tables, Parameters, and Sub-calculations needed to generate financial estimates***

- Costs Inputs within Modules
  - Air Traffic Management Solutions
  - Aircraft
  - Airports
- Financial Benefits
  - Aircraft Operating Costs
  - Fuel Savings
  - Government Infrastructure Savings
  - Passenger Value of Time
  - Environmental Performance
- Risks
  - Inventory of Risks
  - Probability & Impact

## 3 Processes

***Definition: Calculation and formulas using inputs and global assumptions***

- Application of Phasing Profiles
- Risk Application to Costs & Benefits – Financial & Non-Financial Benefits

## 4 Outputs

***Definition: Showcases the results of the analysis***

- Lifecycle Costs by Stakeholder
- Lifecycle Financial Benefits by Stakeholder
- Comparison of Risk-Adjusted and Unadjusted ROI
- System Wide Performance Benefits (Non-Financial Benefits)

# Reports provide a ROM annualized lifecycle cost estimate that separates capital costs from operating costs by major stakeholder

| Cost Elements ($ Millions,Discount Year ) | FY 2010 | FY 2011 | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2016 - FY 2050 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| **1.0 Commercial Airline Operators** | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 1.1 Planning, Research & Development Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 1.2 Acquisition & Implementation Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 1.3 Operations & Maintenance Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **2.0 Government - ANSP** | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 2.1 Planning, Research & Development Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 2.2 Acquisition & Implementation Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 2.3 Operations & Maintenance Costs | | | | | | | | | |
| **3.0 Airport** | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 3.1 Planning, Research & Development Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 3.2 Acquisition & Implementation Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 3.3 Operations & Maintenance Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **4.0 High-Performance General Aviation** | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 4.1 Planning, Research & Development Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 4.2 Acquisition & Implementation Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 4.3 Operations & Maintenance Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **5.0 Total Direct System Costs** | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 5.1 Planning, Research & Development Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 5.2 Acquisition & Implementation Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 5.3 Operations & Maintenance Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **6.0 Total External Costs** | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **7.0 Total NextGen Costs** | | | | | | | | | |

ILLUSTRATIVE

# Reports provide ROM annualized lifecycle financial benefits system-wide and, in some instances, by select stakeholders

| Financial Impact Elements ($ Millions,Discoun | FY 2010 | FY 2011 | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 - FY 2050 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **1.0 Commercial Airline Operators** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| 1.1 Operating Cost Impact Delta from Delays | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 1.2 Fuel Impact | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **2.0 Government - ANSP** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| 2.1 Infrastructure Cost Impact | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 2.2 Productivity | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **3.0 Airports** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| 3.1 Revenue Impact | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **4.0 High-Performance General Aviation** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| 4.1 Operating Cost Impact from Delays | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 4.2 Fuel Impact | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **5.0 Society/Passengers** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| 5.1 Environment | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 5.2 Value of Additional Flights & Saved Time | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |

# The integrated financial model can generate expected, low, and high ROI range estimates by stakeholder, along with other comparative measures (NPV, Payback Period, Risk Adjustment)

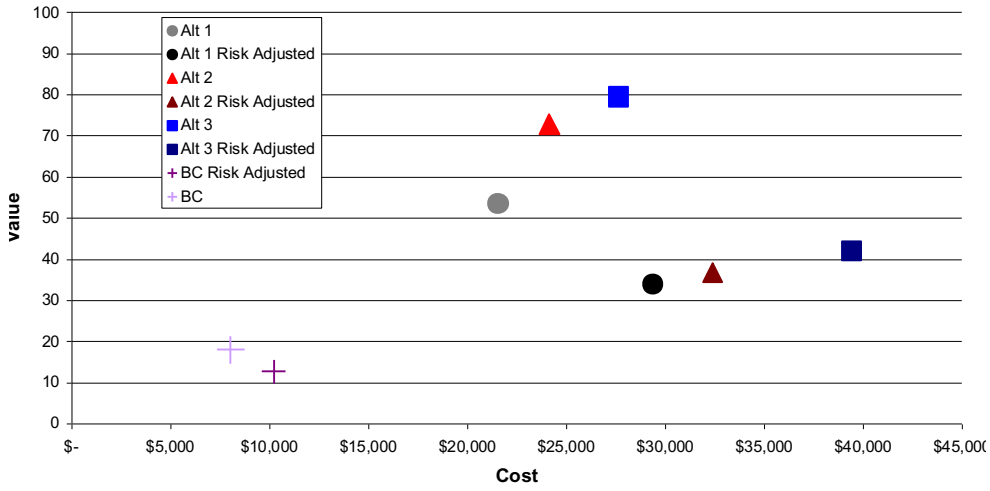
ILLUSTRATIVE

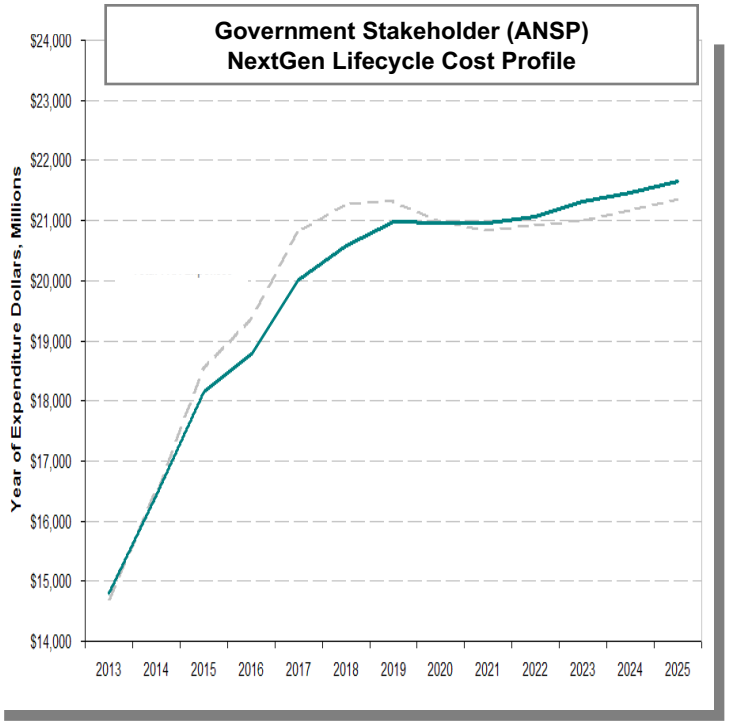
BaseCase | Alternatives

| Return on Investment<br>Discount Year (FY 2010 - FY 2040) | Expected | Low | High |
|---|---|---|---|
| 1.0 Commercial Airline Operators | | | |
| 2.0 Government - ANSP | | | |
| 3.0 Airports | | | |
| 4.0 Society/Passengers | | | |
| 5.0 General Aviation | | | |

## Summary Comparison of Risk Adjusted and Unadjusted Alternatives Profiles

*Profiles Integrating Financial and Non-Financial Benefits (Normalized Value Score – Y Axis)*



# The integrated financial model generates the results documented in the business case analysis

## Integrated Financial Model

NextGen Concept of Operations
NextGen Enterprise Architecture
NextGen Integrated Work Plan

| 1 Global Structure | 2 Inputs | 3 Processes | 4 Outputs |
|---|---|---|---|
| ➢ *Global Assumptions*<br>➢ *Cost Element Structure (CES)*<br>➢ *Financial – Benefit Element Structure*<br>➢ *Non-Financial – Benefit Element Structure*<br>➢ *Risk Element Structure* | ➢ *Costs Inputs within Modules*<br>– *Air Traffic Management Solutions*<br>– *Aircraft*<br>– *Airports*<br>➢ *Financial Benefits*<br>➢ *Risks Inventory ( Probability & Impact)* | ➢ *Phasing Profile for Costs*<br>➢ *Phasing Profile for Financial Benefits*<br>➢ *Risk Application to Costs & Financial – Benefits & Non-Financial Benefits* | ➢ *Lifecycle Costs by Stakeholder*<br>➢ *Lifecycle Financial benefits by Stakeholder*<br>➢ *Comparison of Risk-Adjusted & unadjusted ROI metrics*<br>➢ *System Wide Performance Benefits (Non-Financial Benefits)* |
| Definition: Central Location for all Parameters that remains the same | Definition: Data Tables, Parameters, and Sub-calculations needed to generate financial estimates | Definition: Calculation and formulas using inputs and global assumptions | Definition: Showcases the results of the analysis |

**Business Case Analysis**

# Challenges and Next Steps

- Incorporate monetized environment impacts, risk and uncertainty adjustments results into integrated financial model
- Finalize Total Benefits and Total Costs – Continue coordination with ATO-F and ATO-P to refine and clarify estimates, ensuring alignment
- Complete documentation of Business Case (End of May/Early June)
- Vet Business case with JPDO Partner Agencies (June - July)
- Deliver business case report to OMB (Early September)