

Enterprise Risk and Opportunity Management for Nonprofit Organizations and Research Institutions

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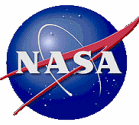
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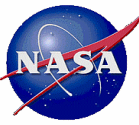
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The Underpinnings of EROM at Nonprofit Government Agencies & Research Institutions

- **Enterprise Risk and Opportunity Management (EROM) concerns the means by which organizations develop their strategic goals through consideration of risks and opportunities, and implement them through a portfolio of programs, projects, institutional assets, research and development activities, etc.**
 - **The primary emphasis in nonprofit Government agencies such as NASA, DoD, FAA, and nonprofit research institutions is on performing services in the national interest and achieving technical gains to maintain national leadership**
 - **This differs from commercial enterprises, where the primary emphasis is on achieving financial gains and minimizing the risk of financial losses**
 - **In addition, the objectives at nonprofit Government agencies extend to institutional development and maintenance, financial health, legal and reputational protection, education and partnerships, and mandated milestone achievements**
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- **This presentation provides a current snapshot of an evolving EROM process that is being funded by NASA**

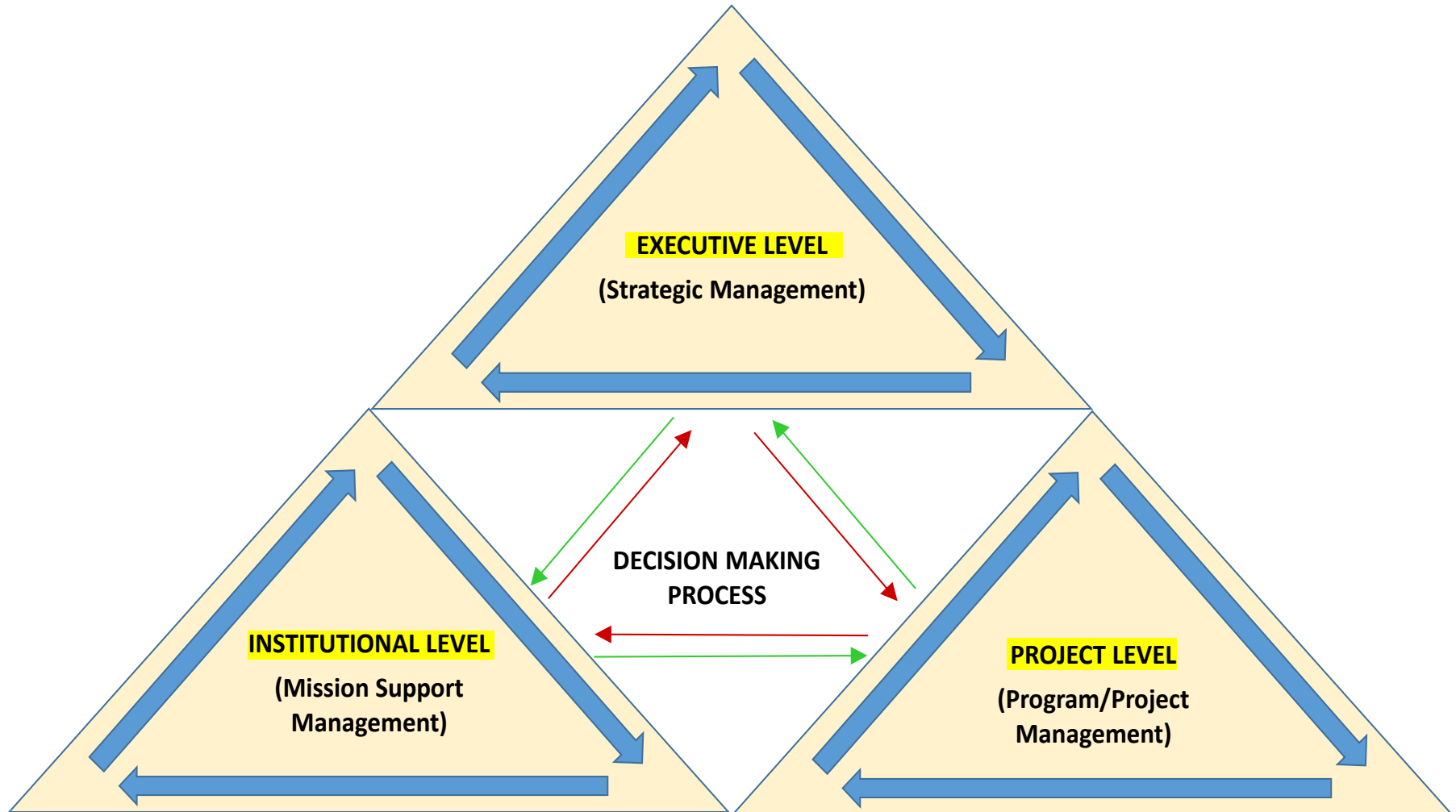


Controlling Risk while Seeking Opportunity

- The overall objective of EROM is to reach an optimal balance between minimizing the potential for loss (risk) while maximizing the potential for gain (opportunity).
- Nonprofit technical agencies are concerned with two types of opportunity:
 - Events that have a potential to reduce the risk of not meeting one or more desired outcomes
 - E.g., an emerging opportunity for an originating organization to share risks with a partner organization might result in a reduction of risks for the originating organization.
 - Events that provide an opening to change strategic goals or desired outcomes to align them better with stakeholder expectations
 - E.g., the emergence of a new technology might open up possibilities for the originating organization to achieve strategic benefits that were not previously considered possible.
- Significant gains in advancement or progress may involve proactively searching for opportunities (e.g., by putting resources into basic or applied research)

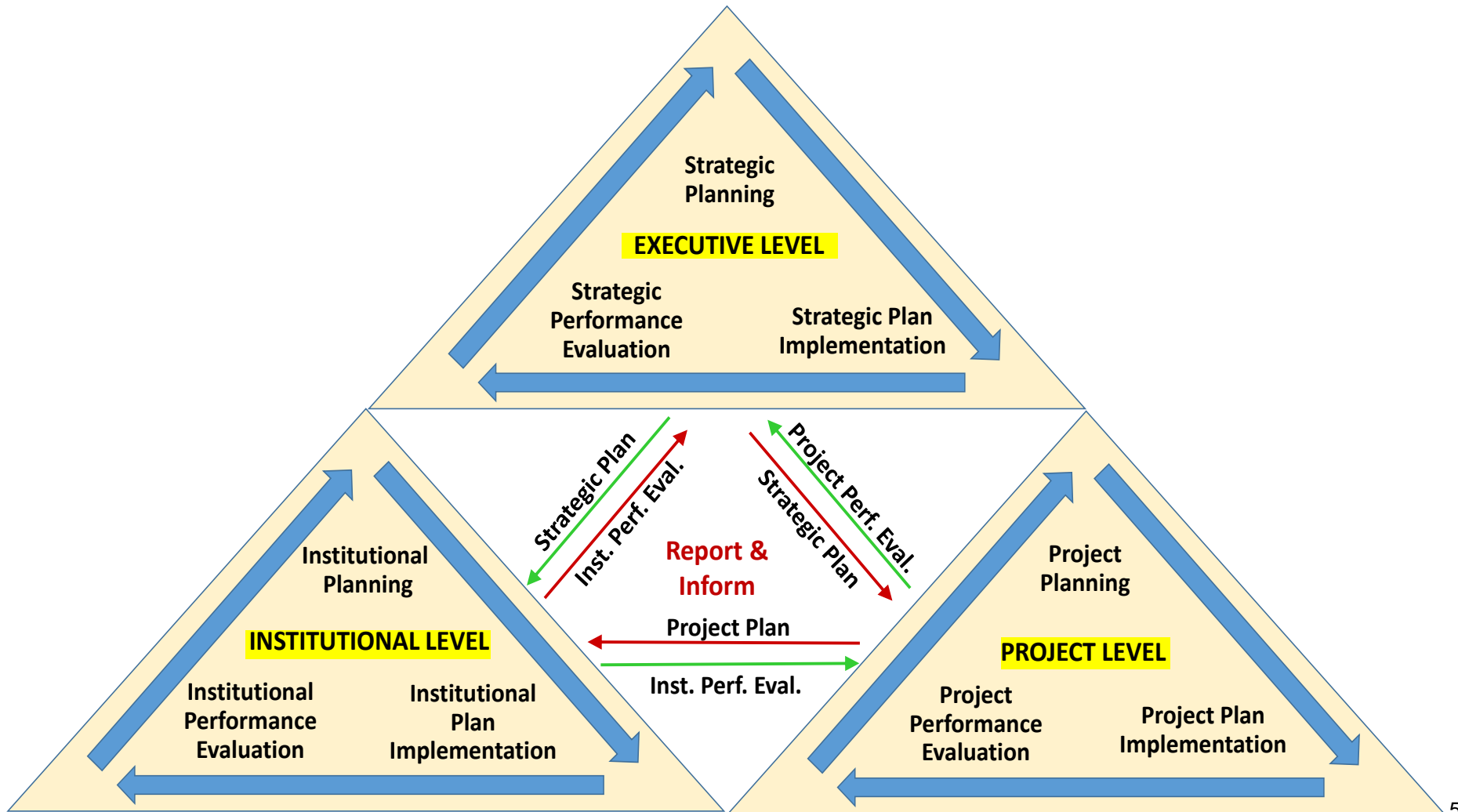
EROM in Relation to the Organization

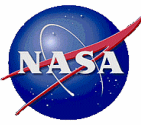
- The EROM framework at nonprofit agencies supports decisions made within the strategic management, program/project management, and mission support management functions of the agency



EROM in Relation to the Organization (Cont.)

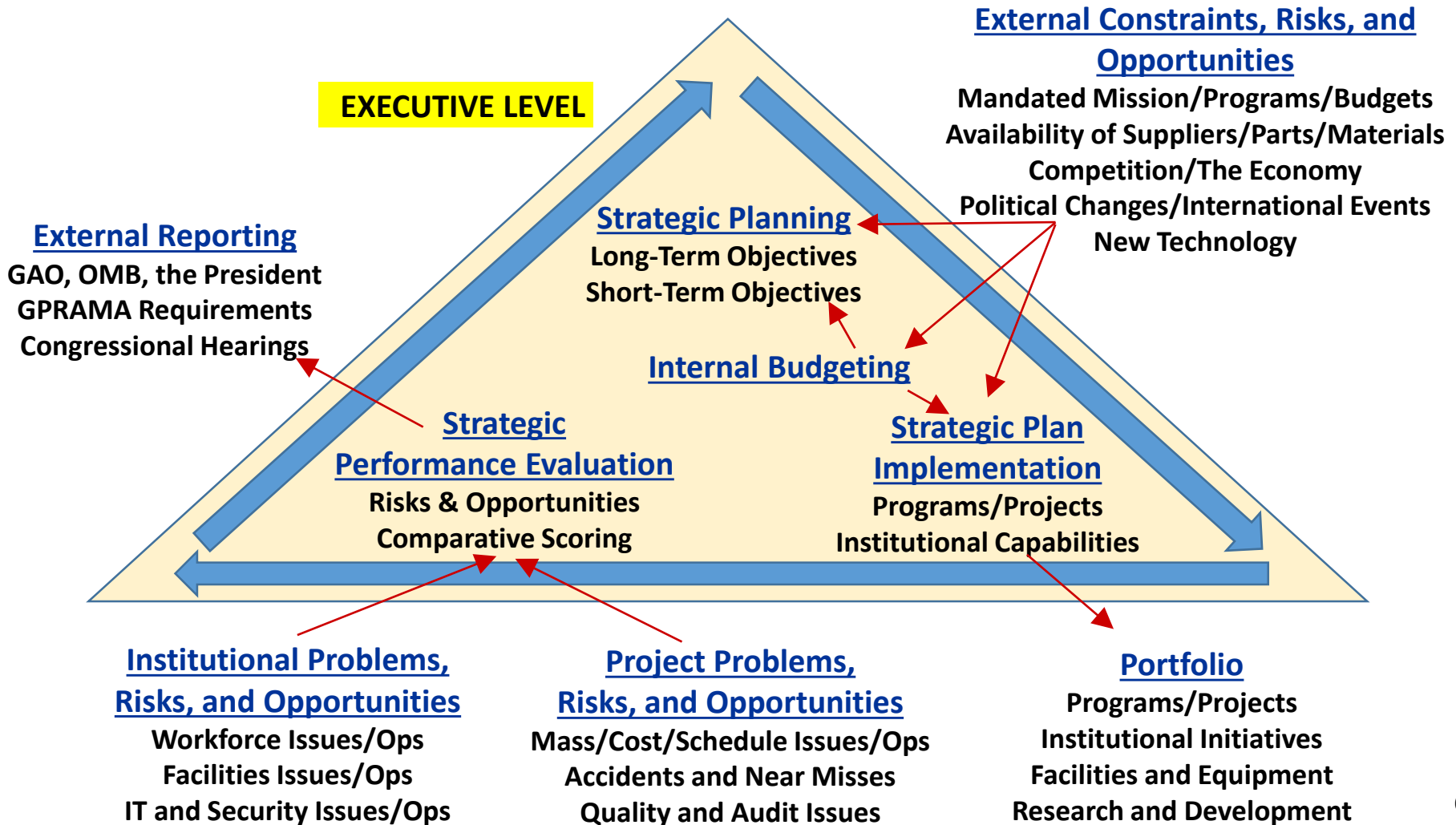
- Each level has responsibilities for planning, plan implementation, and performance evaluation and for communicating the results of these activities with the other levels





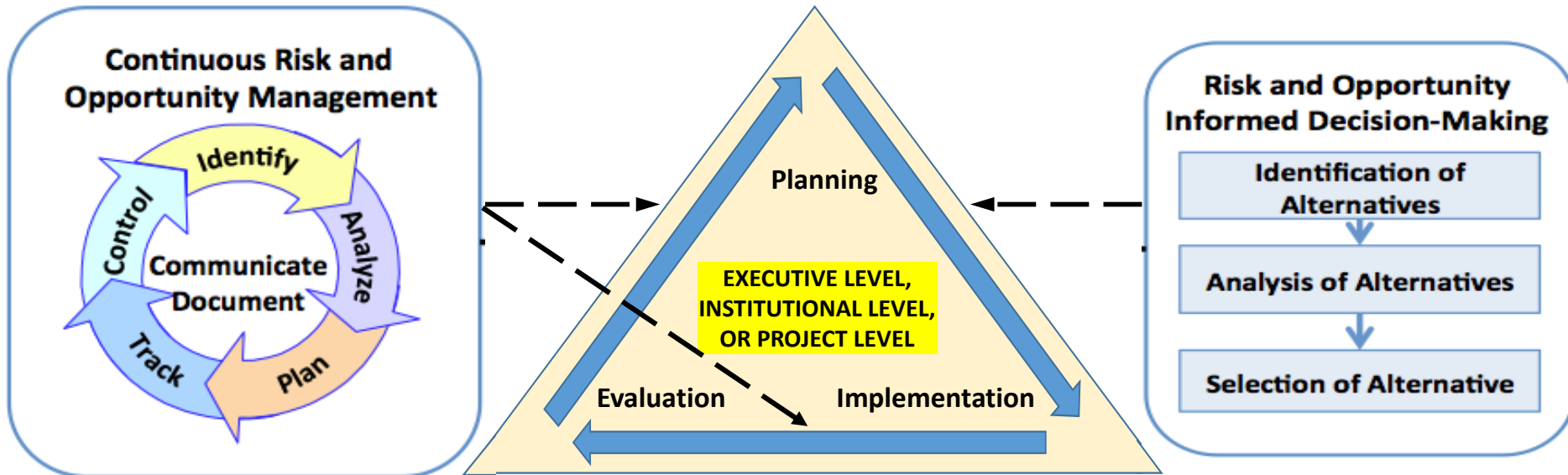
EROM at the Executive Level

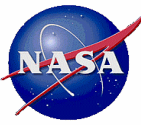
- Information flows into and out of the executive level from/to several entities
 - Internal: Mission support (institutional) and program/project entities
 - External: Governance and marketplace entities



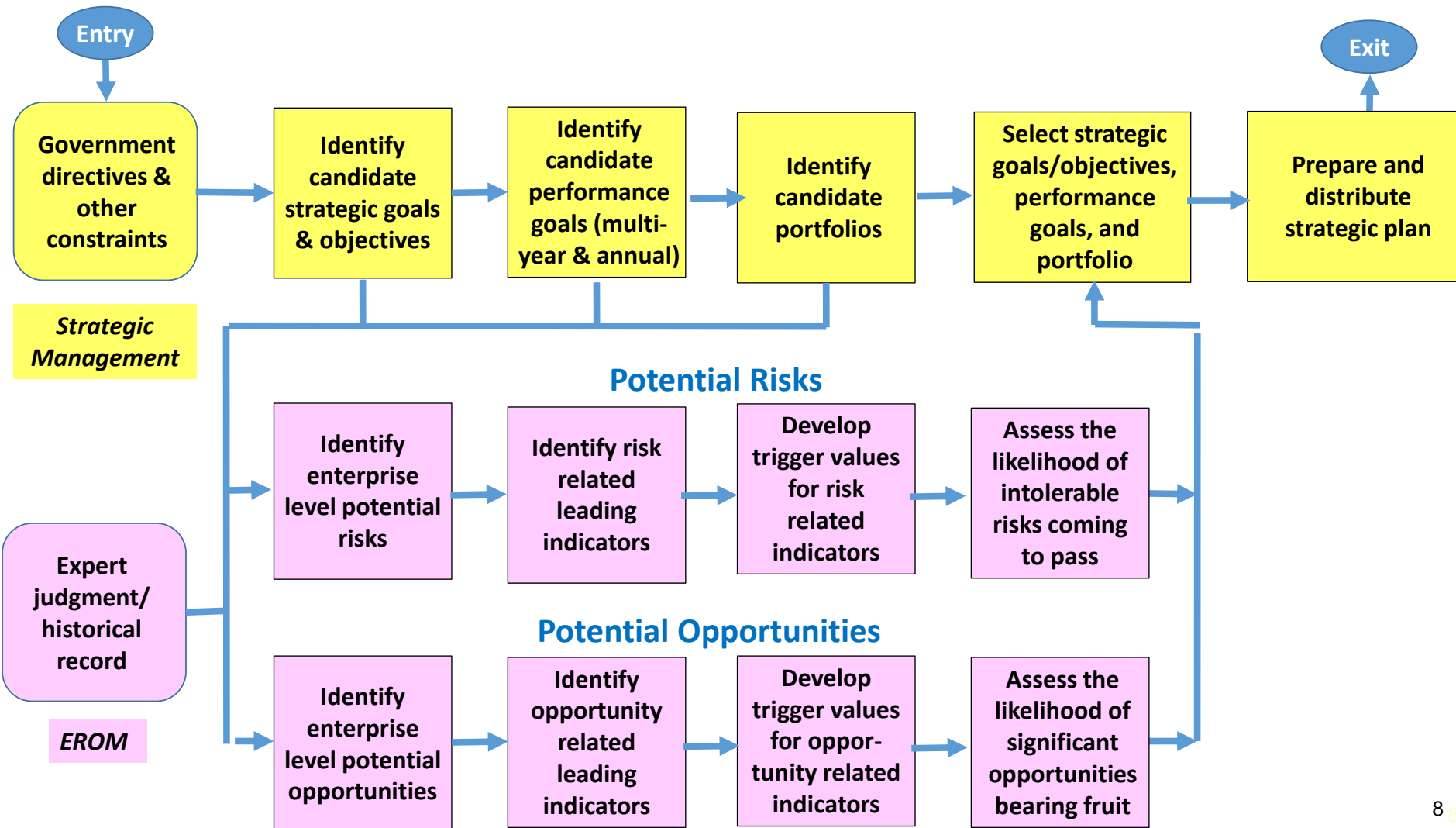
Operationalization of EROM

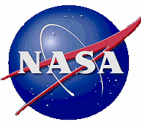
- EROM is operationalized within an organization through the introduction of risk and opportunity informed decision-making and continuous risk and opportunity management
- Risk-and-opportunity-informed decision-making enters into the planning stage for each management function (including strategy and implementation planning)
- Continuous risk and opportunity management enters into the evaluation stage for each management function (including implementation corrections and re-planning when necessary)



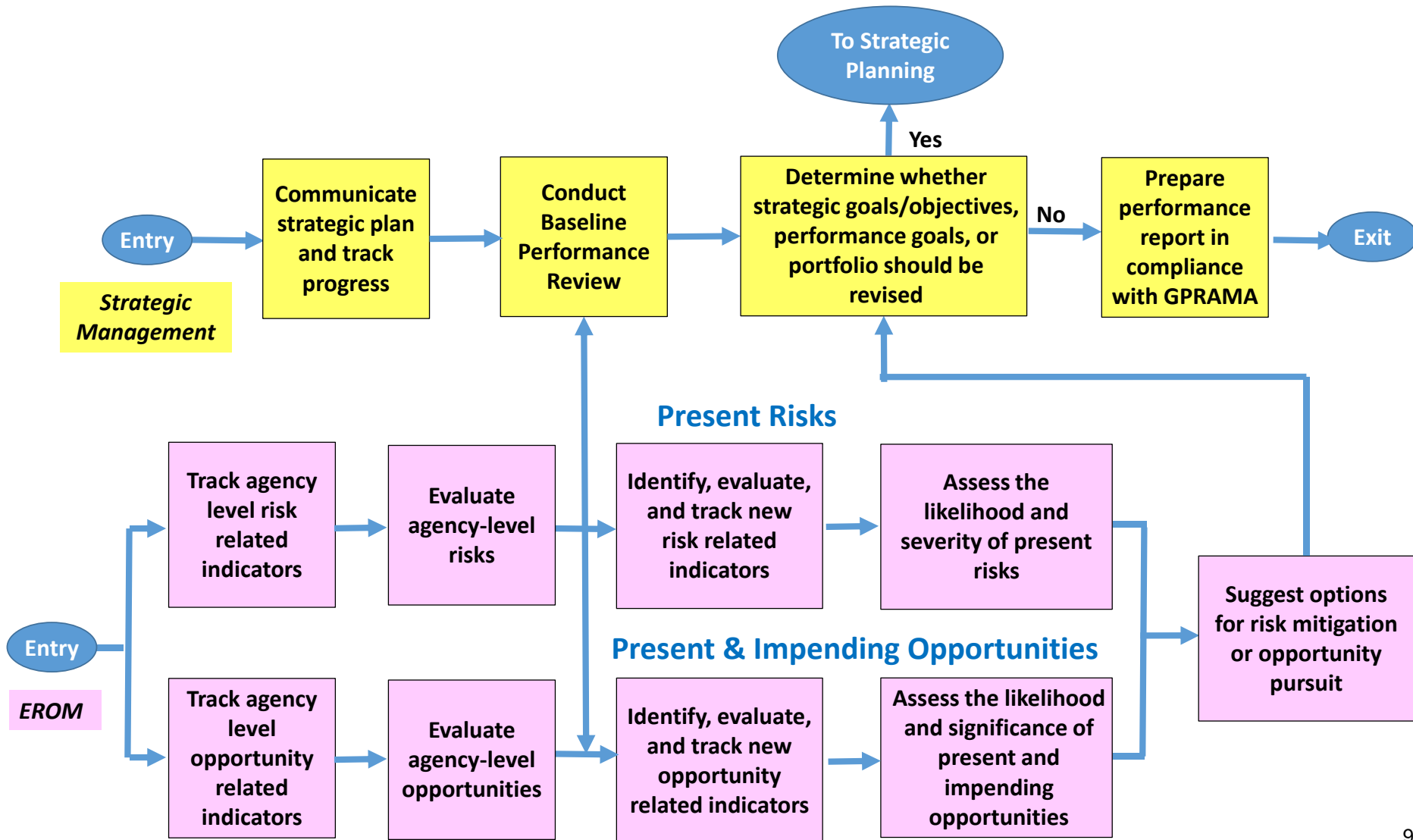


Interfaces between EROM Activities and Strategic Management Activities: Strategic Planning





Interfaces between EROM Activities and Strategic Management Activities: Strategic Performance Evaluation



Example Individual Risk and Opportunity Statements



- Risk and opportunity statements consist of a Condition, Departure, Entity, and Consequence

Example Category	Example Risk Statement
Workforce	Given that [CONDITION] the workforce is aging, there is a possibility that [DEPARTURE] there will be a larger number of retirements next year than anticipated resulting in [ENTITY] the hiring and technical organizations [CONSEQUENCE] having to accelerate their efforts to attract qualified new personnel.
Legal Liability	Given that [CONDITION] an audit of ethics training has indicated shortcomings in the contents and attendance of the training, there is a possibility that [DEPARTURE] there will be a serious ethical infraction resulting in [ENTITY] the ethics and public relations organizations [CONSEQUENCE] having to revamp their priorities and programs
Externally Mandated Schedules	Given that [CONDITION] the schedule for Future Project A is much more stringent than was the schedule for Past Project B, there is a possibility that [DEPARTURE] the operational date will be delayed by as much as 6 months resulting in [ENTITY] the project [CONSEQUENCE] being unable to begin operation within the mandate.
Example Category	Example Opportunity Statement
New Technology	Given that [CONDITION] new technology in the area of XX shows promise, there is a possibility that [DEPARTURE] the technology will become available for use within 5 years resulting in [ENTITY] the XX organization [CONSEQUENCE] being able to achieve its performance requirements with a significant weight savings

Example Leading Indicators



- Two reasons for developing goal taxonomies and identifying/tracking leading indicators
 - Estimate the likelihood of success relative to achieving the goals and objectives
 - Improve the likelihood of success by developing responses to risks and opportunities

Example Category	Example Leading Indicators
New technology pursuits: mission performance and support technology	<i>Internal:</i> Initiation of and results from internal state-of-the-art assessments; number and types of patents obtained; rate of progress in technology readiness level (TRL). <i>External:</i> Technology trends in areas pertinent to the organization’s missions and support capabilities.
Utilization of facilities	<i>Internal:</i> Scheduling backlog. <i>External:</i> Market demand for facility capabilities; capabilities of competitive facilities.
Workforce technical capabilities	<i>Internal:</i> Educational and experience backgrounds; technical training courses taken and passed; number and type of technical papers published.
Cyber security	<i>Internal:</i> Number of unaddressed vulnerabilities. <i>External:</i> Hacking trends; new viruses.
Government requirements	<i>Internal:</i> Quality of ethics program; quality of record keeping (e.g., for OSHA requirements). <i>External:</i> New regulations.
Legal liability	<i>Internal:</i> Increased use of hazardous or toxic materials; accident precursors. <i>External:</i> Trends in Court decisions regarding liability.
Management issues	<i>Internal:</i> Findings of independent reviews; resolution of internal dissenting opinions.
Scientific or technical reputation	<i>Internal:</i> Number of technical papers published; number of patents granted. <i>External:</i> Number of citations in technical papers; number of nominations or awards received.

Rating Effects of Risks on Strategic Goal Likelihoods of Success



- Decision maker specifies a maximum tolerable likelihood of failure for each strategic goal
- EROM analysis specifies optimistic and pessimistic triggers between negative leading indicators and likelihood of failure
- The status of each leading indicator (or combination thereof) is determined by the current value of the leading indicator relative to the optimistic and pessimistic triggers

Strategic Goal or Desired Outcome	Maximum Tolerable Likelihood of Failure due to Risks	Leading Indicator Triggers	Values for Leading Indicator 1 (Technology Readiness)	Values for Leading Indicator 1 (Public Support)	Values for Leading Indicator 2 (Material Cost)	Etc.	Overall Rating of Risk of Failure
A	20% (Notional)	Optimistic	7	N/A	\$20M		Marginal (Compensating Factors)
		Pessimistic	8	N/A	\$25M		
		Present	8.5	N/A	\$30M		
B	25% (Notional)	Optimistic	N/A	High	N/A		Tolerable
		Pessimistic	N/A	Moderate	N/A		
		Present	N/A	Very High	N/A		
C	10% (Notional)	Optimistic	8	N/A	N/A		Marginal
		Pessimistic	9	N/A	N/A		
		Present	8.5	N/A	N/A		
Etc.							

Risk Rankings:



TBD



Tolerable



Marginal



Intolerable

Rating Effects of Opportunities on Strategic Goal Likelihoods of Success



- Decision maker specifies a minimum significant likelihood of success for each strategic goal
- EROM analysis specifies optimistic and pessimistic triggers between positive leading indicators and likelihood of success
- The status of each leading indicator (or combination thereof) is determined by the current value of the leading indicator relative to the optimistic and pessimistic triggers

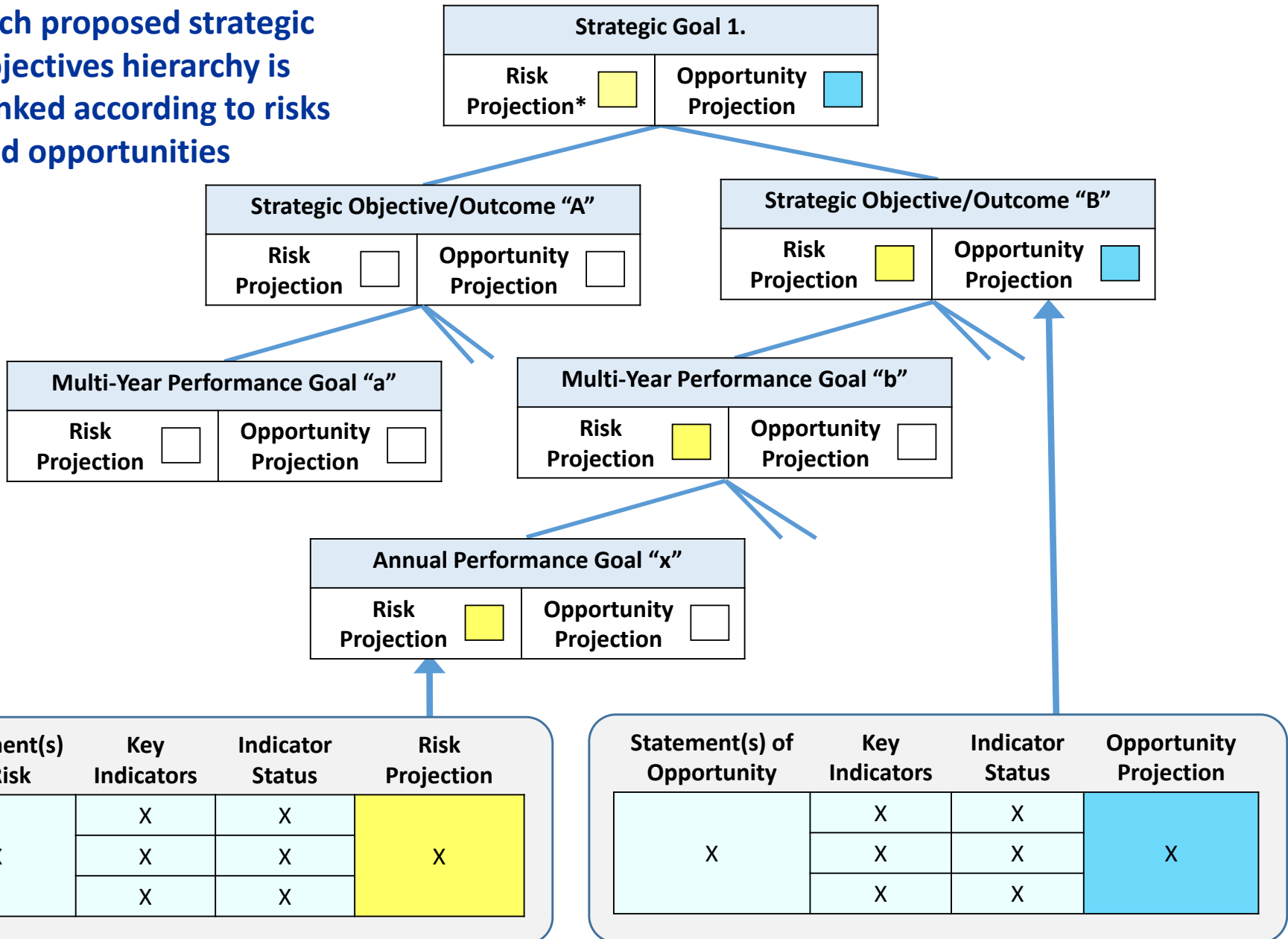
Strategic Goal or Desired Outcome	Minimum Significant Likelihood of Success due to Opportunities	Leading Indicator Triggers	Values for Leading Indicator 4 (New Technology Test Result)	Values for Leading Indicator 5 (Public Favorability Polling)	Etc.	Overall Rating of Risk of Failure
A	80% (Notional)	Optimistic	120,000	N/A		Significant
		Pessimistic	150,000	N/A		
		Present	165,000	N/A		
B	75% (Notional)	Optimistic	N/A	Moderate		Significant
		Pessimistic	N/A	High		
		Present	N/A	Very High		
C	90% (Notional)	Optimistic	200,000	N/A		Marginal
		Pessimistic	150,000	N/A		
		Present	165,000	N/A		
Etc.						

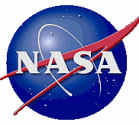
Opportunity Status: TBD Insignificant Marginal Significant



Rating Effects of Risks and Opportunities on Strategic Goal Likelihoods of Success

- Each proposed strategic objectives hierarchy is ranked according to risks and opportunities





Summary

- **The overall objective of EROM is to reach an optimal balance between minimizing the potential for loss (risk) while maximizing the potential for gain (opportunity)**
- **Nonprofit agencies like NASA, DoD, FAA and various research institutions are concerned with two types of opportunity:**
 - **Events that have a potential to reduce the risk of not meeting one or more strategic objectives or desired outcomes**
 - **Events that provide an opening to change strategic objectives or desired outcomes to align them better with stakeholder expectations**
- **EROM supports strategic planning, strategic plan implementation, and strategic performance evaluation**
- **The key processes in EROM for nonprofits are identifying and tracking leading indicators, relating them to strategic goals and desired outcomes, correlating them with likelihoods of success, and evaluating changes to the strategic plan and its implementation that could increase the likelihood of success**
- **Significant gains in advancement or progress may involve proactively searching for opportunities (e.g., by putting resources into basic or applied research)**
 - **“A wise man will make more opportunities than he finds” [Francis Bacon, “The Essays,” 1612]**