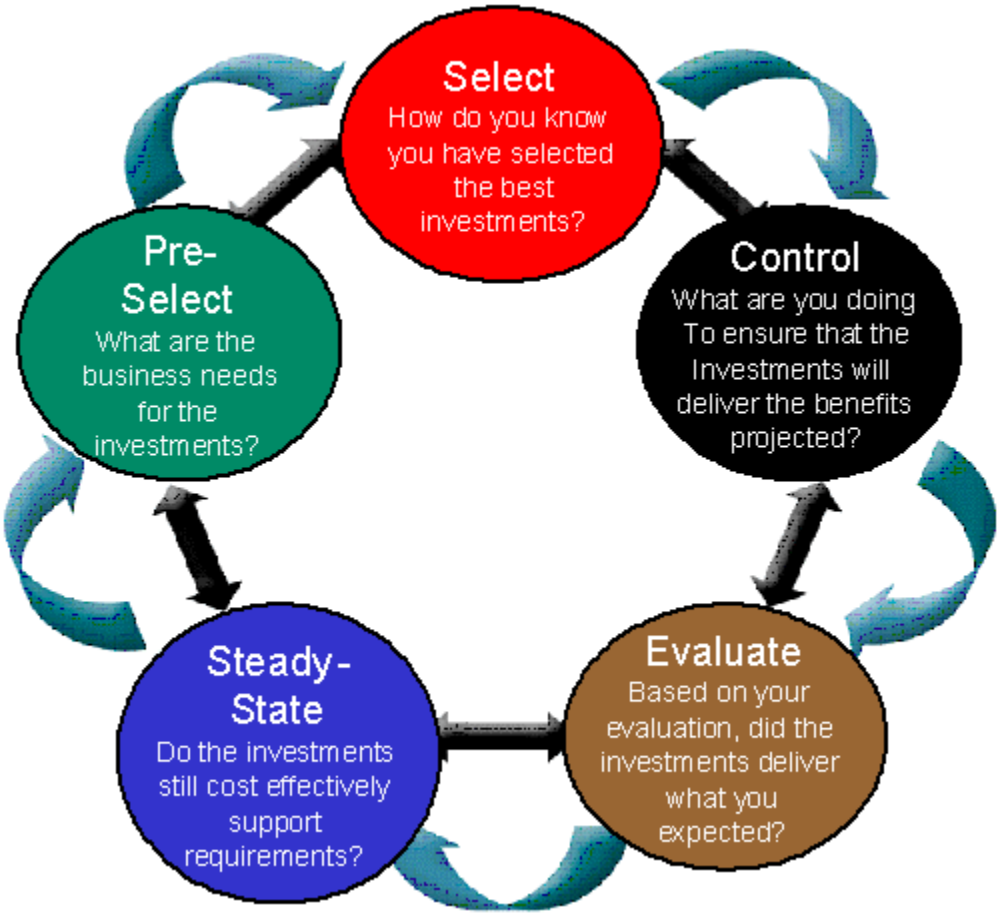
UNITED STATES DEPARTMENT OF THE

INTERIOR

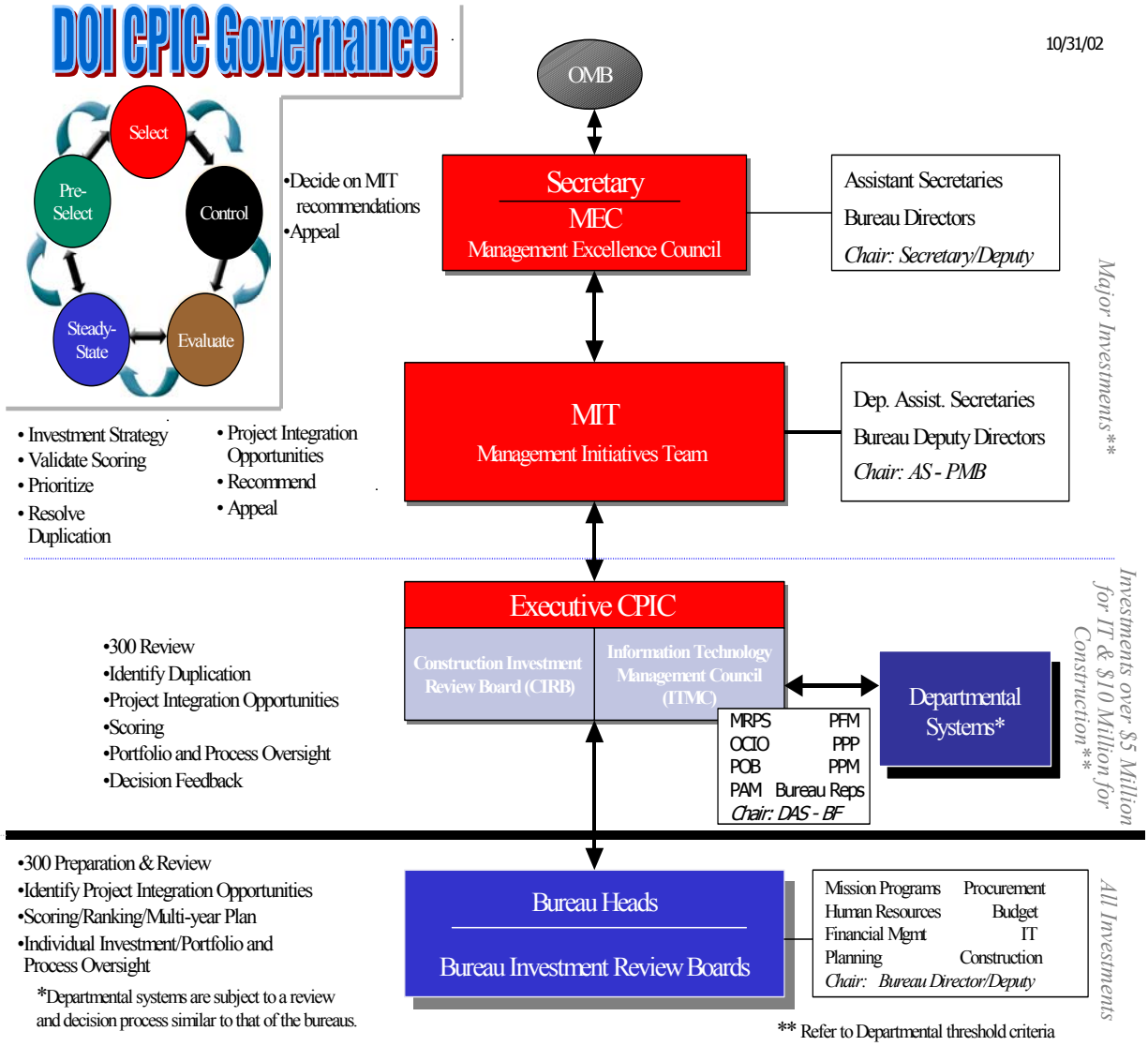
Appendices



APPENDIX A — BOARD PROCEDURES

The Department's CPIC executive review structure is multi-tiered, comprised of bureau and Departmental investment review boards. The reviews by senior-level investment boards operated by the bureaus and the Department are integral to the success of DOI's CPIC process. The boards ensure compliance with guidance from Congress, OMB, and GAO, as well as apply sound business practices to the planning, acquisition, and operation of capital investments.

The following sections describe the investment review boards, Management Excellence Council, Management Initiatives Team, the Executive CPIC' s Information Technology Management Council (ITMC) for information technology and the Construction Investment Review Board (CIRB) for construction, and the Bureau Investment Review Boards noted in the following diagram.



Management Excellence Council (MEC)
I. Authority

The Secretary of the Interior established the MEC, chaired by the Secretary, which consists of the senior leadership from the Department and the bureaus. The MEC provides leadership, direction and accountability to implement the Administration's goals, including the President's Management Agenda, the Department's strategic plans and the Department's management reform activities. The MEC's leadership role for DOI's CPIC process is to select and prioritize the Department's capital investments, and to provide a critical link between the capital investment portfolio, the Department's budget, and the Department's many missions.

The MEC, made up of DOI's most senior leadership, will ensure that DOI's information technology and construction investments are managed as strategic business resources supporting efficient and effective program delivery. Additionally, the MEC will assure that the Department's information technology and facility/building construction programs remain in compliance with the requirements of the President's Management Agenda, Clinger-Cohen Act, GPRA, and other legislation and regulations that address capital investment issues.

II. Membership

The MEC is comprised of:

Secretary—Chair
Solicitor
Assistant Secretary for Policy, Management and Budget
Assistant Secretary for Fish and Wildlife and Parks
Assistant Secretary for Indian Affairs
Assistant Secretary for Land and Minerals Management
Assistant Secretary for Water and Science
Director, National Park Service
Director, Fish and Wildlife Service
Deputy Assistant Secretary, Indian Affairs
Director, Bureau of Land Management
Director, Minerals Management Service
Director, Office of Surface Mining
Director, Geological Survey
Commissioner, Bureau of Reclamation

At the MEC's discretion, ex-officio members may be named to provide specialized expertise and advice.

III. CPIC Roles and Responsibilities

The MEC will recommend to the Secretary of the Interior new capital investments, and evaluate MIT recommendations and make decisions on existing information technology (IT) and construction projects to create a DOI capital investment portfolio which best supports the Department's missions and program delivery processes. For all five CPIC phases of DOI's process (pre-select, select, control, evaluate, and steady-state), the MEC evaluates

recommendations from the MIT and conducts the final investment review. With the exception of the select phase, when the Secretary of the Interior makes the final investment decisions, the MEC makes final investment decisions. The MEC also serves as an appeal board for decisions made by the MIT.

The MEC will use a standard set of criteria modeled after those used by OMB, to assemble DOI's capital investment portfolio and evaluate bureau and Department-wide IT and construction initiatives. The criteria will be developed by the OCIO for IT and the Office of Managing Risk and Public Safety (MRPS) for construction, and reviewed and recommended by the Executive CPIC's ITMC and CIRB, and the MIT and approved by the MEC, The Criteria will include a consideration of Departmental or Government-wide impact, visibility, cost, risk, architecture, and standards.

In the scope of MEC activities, information technology investment encompasses all investments involving information technology and information resources as defined in the Clinger-Cohen Act, including equipment, IT services, information or application system design, development, and maintenance, regardless of whether such work is performed by government employees or contractors. Construction investments include new facilities, renovations and retrofits, etc.

IV. Meetings and Voting

MEC meetings are held quarterly or more frequently, as circumstances warrant. The OCIO and MRPS working with the MEC's Executive Secretary will prepare the CPIC portion of the agenda for all MEC meetings, prepare and distribute briefing and decision documents. CPIC related materials will be provided MEC members through the Executive Secretary prior to meetings. Attendance at meetings may be in person or any other two-way, interactive communications means, such as conference call or video teleconference. Members may also be represented by a designated alternate at the Deputy level and may have a proxy cast their votes.

MANAGEMENT INITIATIVES TEAM (MIT)

I. MIT Authority

The Secretary of the Interior established the MIT. The MIT is chaired by the Assistant Secretary for Policy, Management and Budget and includes senior leaders in the Department and the bureaus. The MIT, like the MEC, provides leadership, direction, accountability and makes recommendations to the MEC and the Secretary to implement the Administration's goals, including the President's Management Agenda, the Department's strategic plans and the Department's management reform activities. The MIT's leadership role for DOI's CPIC process is to assist the MEC coordinate and prioritize the Department's capital investments, and to provide to the MEC an additional critical business perspective link between the capital investment portfolio and bureau and the Department's many inter-related missions.

The MIT works through seven teams responsible for direction and oversight of the implementation of the Department's strategic plans. Two of the teams, the IT Management Council/E-Gov Team for IT and the Facilities and Asset Management Team, are dedicated to ensuring that DOI's information technology and construction investments respectively are managed as strategic business resources that support efficient and effective program delivery. Additionally, the MIT helps the MEC ensure that the Department's information technology and facility/building construction programs remains in compliance with the requirements of the President's Management Agenda, Clinger-Cohen Act, GPRA and other legislation and regulations that address capital investment issues.

II. MIT Membership

The MIT is comprised of:

Assistant Secretary for Policy, Management and Budget —Chair
Deputy Assistant Secretary for Policy, Management and Budget
Deputy Assistant Secretary for Fish and Wildlife and Parks
Deputy Assistant Secretary for Indian Affairs
Deputy Assistant Secretary for Land and Minerals Management
Deputy Assistant Secretary for Water and Science
Deputy Director, National Park Service
Deputy Director, Fish and Wildlife Service
Deputy Director, Bureau of Land Management
Deputy Director, Minerals Management Service
Deputy Director, Office of Surface Mining
Deputy Director, Geological Survey
Deputy Commissioner, Bureau of Reclamation

At the MIT's discretion, ex-officio members may be named to provide specialized expertise and advice.

III. MIT CPIC Roles and Responsibilities

The MIT, with support from the MIT's IT Management Council/E-Gov Team for IT and its Facilities and Asset Management Team, will recommend to the MEC new capital investments, and

evaluate and make recommendations to the MEC on existing information technology and construction projects to create a DOI capital investment portfolio which best supports the Department's missions and program delivery processes. For the phases of DOI's CPIC process (pre-select, select, control, evaluate, and steady-state), the MIT will conduct investment reviews and will make recommendations to the MEC. The MIT also serves as an appeal board for decisions made by the Executive CPIC's ITMC for IT investments and CIRB for construction investments. Specifically the MIT will:

- Establish an investment strategy for the investment portfolio;
- Validate the ITMC and CIRB scoring of business plans (OMB Exhibit 300s);
- Prioritize investments;
- Resolve duplication of activities;
- Seek project integration opportunities; and
- Make recommendations to the MEC

The MIT will use a standard set of criteria modeled after those used by OMB, to assemble DOI's capital investment portfolio and evaluate bureau and Department-wide IT and construction initiatives, The criteria will be developed by the OCIO for IT and the Office of Managing Risk and Public Safety (MRPS) for construction, and reviewed and recommended by the Executive CPIC's ITMC and CIRB, and the MIT. The criteria will include a consideration of Departmental or Government-wide impact, visibility, cost, risk, architecture, and standards.

In the scope of MIT activities, information technology investment encompasses all investments involving information technology and information resources as defined in the Clinger-Cohen Act, including equipment, IT services, information or application system design, development, and maintenance, regardless of whether such work is performed by government employees or contractors. Construction investments include new facilities, renovations and retrofits, etc.

IV. MIT Meetings and Voting

Meetings of the MIT and its IT Management Council/E-Gov Team for IT and its Facilities and Asset Management Team are held bi-monthly or more frequently subject to the call of the Chair, as circumstances warrant. The OCIO and MRPS working with the MIT's Executive Secretary will prepare the CPIC portion of the agenda for all MIT meetings, prepare and distribute briefing and decision documents. CPIC related materials will be provided MIT members through the Executive Secretary prior to meetings. Attendance at meetings may be in person or any other two-way, interactive communications means, such as conference call or video teleconference. Members may also be represented by a designated alternate at the Deputy level and may have a proxy cast their votes.

The minutes of each meeting are recorded and distributed by the MIT's Executive Secretary.

The MIT makes decisions on CPIC investments and related issues by voting. In order for a vote to occur, a quorum must be present. A quorum consists of two-thirds of the voting members in person or by proxy. Each member shall have one vote.

EXECUTIVE CPIC (INFORMATION TECHNOLOGY MANAGEMENT COUNCIL AND CONSTRUCTION INVESTMENT REVIEW BOARD)

I. Authority

The Assistant Secretary for Policy, Management and Budget established the Executive CPIC tier of the Departmental CPIC process. The Executive CPIC consists of two boards, the Information Technology Management Council (ITMC) chaired by the Chief Information Officer, and the Construction Investment Review Board (CIRB) chaired by the Director of Managing Risk and Public Safety.

The ITMC was established under the authority of the Clinger-Cohen Act and functions under the provisions of OMB Circular A-130. The Secretary of the Interior through the MEC provides functional oversight of the Council. The ITMC is comprised of leaders from the bureau CIO community. The CIRB is comprised of leaders from the bureau construction and facility management community.

The Deputy Assistant Secretary for Budget and Finance, with assistance from PMB staff offices, provides guidance and oversight to these two boards on matters related to CPIC governance. The Executive CPIC boards support the MEC and MIT leadership, provide direction, and accountability and make recommendations to the MIT to implement the Administration's goals, including the President's Management Agenda, the Department's strategic plan and the Department's management reform activities. The ITMC and the CIRB provide leadership for DOI's CPIC process to assist the MIT and MEC to coordinate and prioritize the Department's capital investments. They link the capital investment portfolio with the Department's many missions.

The ITMC and the CIRB are dedicated to ensuring that DOI's information technology and construction investments, respectively, are managed as strategic business resources that support efficient and effective program delivery. These boards help the MIT assure that the Department's information technology and facility/building construction programs remain in compliance with the requirements of the President's Management Agenda, Clinger-Cohen Act, GPRA, and other legislation and regulations that address capital investment issues.

Attached to this Appendix is the "ITMC Charter/Documentation, August 2002" that details the ITMC's scope, objectives, authority, definitions, membership responsibilities, procedures, membership, and protocol.

II. Executive CPIC Membership

The ITMC is Co-Chaired by the Departmental Chief Information Officer and a rotating Co-Chair elected by the Council annually. Representatives from the following Interior bureaus and offices participate on the Council:

Bureau of Land Management
Office of Surface Mining
Minerals Management Service
Bureau of Reclamation
US Geological Survey
National Park Service

US Fish and Wildlife Service
Bureau of Indian Affairs
National Business Center
Department's Senior Procurement Executive

The CIRB is Chaired by the Director of Managing Risk and Public Safety. Representatives from the following Interior bureaus and offices participate on the Council:

Bureau of Land Management
Bureau of Reclamation
US Geological Survey
National Park Service
US Fish and Wildlife Service
Bureau of Indian Affairs
Department's Senior Procurement Executive

At the discretion of both boards, ex-officio members may be named to provide specialized expertise and advice.

III. Executive CPIC Roles and Responsibilities

The ITMC and the CIRB will recommend to the MIT new capital investments, and evaluate and make recommendations to the MIT on existing information technology and construction projects to create a DOI capital investment portfolio which best supports the Department's missions and program delivery processes. For all five CPIC phases of DOI's process (pre-select, select, control, evaluate, and steady-state), the two boards will conduct investment reviews and will make recommendations to the MEC. Primarily the Executive CPIC will:

- Provide guidance for business cases (Exhibit 300s)
- Identify duplication activities
- Identify project integration opportunities
- Defining the decision criteria that will be employed to select among projects for the DOI capital investment portfolio
- Review and provide scoring of business cases
- Provide portfolio and Departmental and bureau CPIC process oversight
- Maintain the Department's Governance Guide
- Provide decision feedback to the bureaus on MIT, MEC, Secretary and OMB decisions

The ITMC and the CIRB will use a standard set of criteria modeled after those used by OMB, to assemble DOI's capital investment portfolio and evaluate bureau and Department-wide IT and construction initiatives, The criteria will be developed by the OCIO for information and the Office of Managing Risk and Public Safety (MRPS) for construction, and reviewed and recommended to the MIT and approved by the MEC, The Criteria will include a consideration of Departmental or Government-wide impact, visibility, cost, risk, architecture, and standards.

In the scope of ITMC activities, information technology investment encompasses all investments involving information technology and information resources as defined in the Clinger-Cohen Act,

including equipment, IRM services, information or application system design, development, and maintenance, regardless of whether such work is performed by government employees or contractor. Construction investments include new facilities, renovations and retrofits, etc.

IV. Executive CPIC Meetings and Voting

Meetings of the ITMC and CIRB meet routinely. Attendance at meetings may be in person or any other two-way, interactive communications means, such as conference call or video teleconference. Members may also be represented by a designated alternate at the Deputy level and may have a proxy cast their votes. The minutes of each meeting are recorded and distributed. The two boards make decisions on CPIC investments and related issues by voting. In order for a vote to occur, a quorum must be present.

BUREAU INVESTMENT REVIEW BOARD

I. Authority

In order to operate a CPIC process that meets Department certification standards and to make progress in Stage 2 of ITIM, each bureau is to establish and maintain an active Investment Review Board (IRB), chaired by the Bureau Head or Deputy Bureau Head which includes senior bureau leaders. The IRBs are to be modeled after the ITMC, CIRB, MIT and MEC. These boards are required as part of the Fiscal Year 2005 President's Budget Pre-Select and Select Phases. They will also be structured to conduct the Control, Evaluate, and Steady State monitoring activities.

The IRBs consist of the basic elements of management described in this section. Like the Departmental boards discussed above, the IRBs provide bureau-level leadership, direction, accountability and make recommendations to their respective Bureau Heads to implement the Administration's goals, including the President's Management Agenda, the Department's and bureau's strategic plans and the Department's management reform activities. The IRB leadership role for the bureau CPIC process is to assist the Bureau Heads to coordinate and prioritize bureau capital investments, and to provide to the Departmental CPIC boards a critical link between the bureaus' capital investment portfolios and the bureaus' and the Department's many missions.

The IRB will ensure that bureau and multi-bureau information technology and construction investments are managed as strategic business resources supporting efficient and effective program delivery. Additionally, the IRB assists the Bureau Head to assure that the bureaus' information technology and facility/building construction programs remain in compliance with the requirements of the President's Management Agenda, Clinger-Cohen Act, GPRA, and other legislation and regulations that address capital investment issues.

II. IRB Membership

The IRBs may be comprised of bureaus' senior managers from the following areas:

Bureau Director/Deputy – Chair (required)
Mission Programs (at least one required)
Procurement (required)
Human Resources
Budget (required)
Financial Mgmt
IT (required)
Planning
Construction (required)

At the IRBs' discretion, ex-officio members may be named to provide specialized expertise and advice.

III. IRB CPIC Roles and Responsibilities

The IRBs recommend to their respective bureau head new capital investments, and evaluate and make recommendations to the bureau head on existing information technology and construction projects to create a DOI capital investment portfolio which best supports the Department's missions and program delivery processes. The bureau head will submit approved investments into the Department's CPIC process. For the CPIC phases of DOI's process, the IRB will conduct investment reviews and will make recommendations to the bureau heads. At a minimum each IRB will:

- Develop and maintain multi-year capital investment plans for IT and construction investments using the pre-select process;
- Guide business case (Exhibit 300) preparation and review;
- Identify project integration opportunities;
- Score and rank investments;
- Review ongoing projects to ensure that their status, progress, and outlook are satisfactory and consistent with project plans;
- Provide individual investment and portfolio management;
- Identify deficiencies in project management and monitor corrective actions.
- Oversee the bureaus' CPIC process;
- Submit completed business and multi-year plans to PMB and OCIO staff for analysis in support of the Executive CPIC;
- Provide recommendations to the ITMC or CIRB to support their decision to continue, reduce, terminate, or defer IT or construction projects, respectively;
- Conduct periodic reviews of project status, control, performance, risk and outlook for approved and funded projects; and
- Establish and execute the necessary project controls to manage requirements; risk; cost, schedule and technical baselines; and performance outcomes.

At a minimum, the IRB will have a documented description or charter outlining their bureau's CPIC process and the roles and responsibilities of the IRB. The IRB will use a standard set of criteria modeled after those developed by the OCIO for IT and the Office of Managing Risk and Public Safety (MRPS) based on OMB criteria to assemble a bureau capital investment portfolio which feeds into the Department's capital investment portfolio. The criteria will be used to evaluate bureau and Department-wide IT and construction initiatives. The criteria will include consideration of Departmental or Government-wide impact, visibility, cost, risk, architecture, and standards.

In the scope of IRB activities, information technology investment encompasses all investments involving information technology and information resources as defined in the Clinger-Cohen Act, including equipment, IT services, information or application system design, development, and maintenance, regardless of whether such work is performed by government employees or contractors. Construction investments include new facilities, renovations and retrofits, etc.

IV. IRB Meetings and Voting

Meetings of the IRB are held at least quarterly in line with Department's Quarterly Milestone Control Review (See Appendix Q) or more frequently subject to the call of the Chair, as circumstances warrant. Attendance at meetings may be in person or any other two-way, interactive communications means, such as conference call or video teleconference. Members may also be represented by a designated alternate and may have a proxy cast their votes. The minutes of each meeting are recorded and distributed. The IRB makes decisions on CPIC investments and related issues by voting. In order for a vote to occur, a quorum must be present.

APPENDIX B — CPIC PROCESS CHECKLIST

The Department's CPIC process is a disciplined approach to better enable managers Departmentwide to: (1) make sound decisions about which initiatives and systems DOI should invest in; (2) create and analyze the rationale for these investments over their life cycle; and (3) effectively manage their investment portfolio. Each capital investment, whether new or on-going, will undergo the same rigorous capital planning, selection, control and evaluation process. The Checklist contained in this Appendix provides a roadmap of CPIC process-related actions to assist managers that plan, manage and oversee capital IT and construction investments and portfolios. It is presented in a matrix on the following five pages.

The Checklist provides a sequence of actions to be undertaken, documents to be prepared and reviewed, and decisions to be made in support of bureau and Departmental CPIC processes along with the key staff and officials with primary CPIC responsibilities. It illustrates the CPIC process for both IT and construction investments.

As the project moves through each of the CPIC phases, the Checklist will be a useful tool to determine the levels of support and approval that will be needed to track and monitor how well a project is complying with the CPIC guidelines and provide visibility of the project to each approval level. It is provided to aid project managers, project and system owners, project proponents, and review boards to track progress of projects through the CPIC phases and plan future steps to ensure the project is successfully designed, implemented, operated and maintained.

Decisions on individual projects made by the Bureau and Departmental investment review boards, Bureau heads and the Secretary may result in repeating steps or tailoring the process as circumstances warrant. The Checklist is designed to remain constant along with the scoring and ranking methodology used by the Bureau and Departmental review boards as well as OMB. The Checklist does not presume a project-scoring outcome on individual projects. Using this Checklist as a guide will foster familiarity and consistency by managers at every level as they transition through an investment's life cycle from project conceptualization, through selection, development, operations and maintenance and termination.

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CPIC PROCESS CHECKLIST													
Project Name:													
ACTIONS FOR INFORMATION TECHNOLOGY OR CONSTRUCTION	**BUREAU CPIC**								**DEPARTMENT CPIC**				
	Project Manager	Integrated Project Team	Program Manager	System Owner	Project Sponsor	Bureau Sponsor	Bureau Investment Review Board	Bureau Head	Executive CPIC ITMC	Executive CPIC CIRB	MIT	MEC	Secretary
PLACE "**IT**" for Information Technology Investment or "**C**" for CONSTRUCTION INVESTMENT or "**B**" for BOTH IT and CONSTRUCTION													
Pre Select Phase – Business need statement (Part of the Select Phase for IT)													
Identify a Project Sponsor								B					
Conduct a mission need analysis			C	IT	B								
Develop the investment concept			C	IT	B								
Prepare the preliminary business case			C	IT	B								
Prepare the annual investment review submission package			C	IT	B								
Review all proposed investment packages and make recommendation							B						
Review and approves/disapproves investment submissions								B					
Review the initiative and recommend appropriate actions									B	B	B		
Makes final investment decisions												B	

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CPIC PROCESS CHECKLIST													
Project Name:													
ACTIONS FOR INFORMATION TECHNOLOGY OR CONSTRUCTION	**BUREAU CPIC**								**DEPARTMENT CPIC**				
	Project Manager	Integrated Project Team	Program Manager	System Owner	Project Sponsor	Bureau Sponsor	Bureau Investment Review Board	Bureau Head	Executive CPIC ITMC	Executive CPIC CIRB	MIT	MEC	Secretary
PLACE "**IT**" for Information Technology Investment or "**C**" for CONSTRUCTION INVESTMENT or "**B**" for BOTH IT and CONSTRUCTION													
Select Phase — How do you know you have selected the best investments?													
Review and update mission needs statement			C	IT	B								
Approves integrated project team (IPT) membership								B					
Identifies the funding source(s) and obtains agency approvals			C	IT	B								
Develops supporting materials for major investments			C	IT	B								
Prepares the investment review submission			C	IT	B								
Review investment submission and make recommendation							B						
Review and approves/disapproves investment submissions								B					
Reviews the initiative and recommends an appropriate action[1]									B	B	B		

[1] See Section 1.5 of the Introduction Chapter of this Guidance for a for a description of the Department's threshold requirements for major investments requiring Departmental CPIC review.

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CPIC Process Checklist													
Project Name:													
ACTIONS FOR INFORMATION TECHNOLOGY OR CONSTRUCTION	**BUREAU CPIC**								**DEPARTMENT CPIC**				
	Project Manager	Integrated Project Team	Program Manager	System Owner	Project Sponsor	Bureau Sponsor	Bureau Investment Review Board	Bureau Head	Executive CPIC ITMC	Executive CPIC CIRB	MIT	MEC	Secretary
PLACE "**IT**" for Information Technology Investment or "**C**" for CONSTRUCTION INVESTMENT or "**B**" for BOTH IT and CONSTRUCTION													
Conducts final investment review and makes recommendation												B	
Makes the final investment decisions													B
Control Phase — What are you doing to ensure that the investments will deliver the benefits projected?													
Establishes and maintains initiative and security costs, schedule, and technical baselines			C	IT	B								
Maintains current initiative and security costs, schedule, technical, and general status information			C	IT	B								
Assess the initiative's progress against performance measures (Does it have time, cost, and performance variance exceeding 5 per cent).			C	IT	B								
Prepares the annual investment review submission package			C	IT	B								
Reviews the investment submission and makes recommendation							B						

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CPIC Process Checklist													
Project Name:													
	BUREAU CPIC								**DEPARTMENT CPIC**				
ACTIONS FOR INFORMATION TECHNOLOGY OR CONSTRUCTION	Project Manager	Integrated Project Team	Program Manager	System Owner	Project Sponsor	Bureau Sponsor	Bureau Investment Review Board	Bureau Head	Executive CPIC ITMC	Executive CPIC CIRB	MIT	MEC	Secretary
PLACE "**IT**" for Information Technology Investment or "**C**" for CONSTRUCTION INVESTMENT or "**B**" for BOTH IT and CONSTRUCTION													
Review and approves/disapproves investment submission								B					
Review the initiative and recommend an appropriate action									B	B	B		
Makes the final investment decisions. (For variances of 10 per cent or more, the Secretary submits corrective actions to OMB for approval)												B	
Evaluate Phase — Based on your evaluation, did the investments deliver what you expected?													
Conducts a Post Implementation Review				IT	IT								
Conducts a Post Occupancy Evaluation (POE)	C												
Prepares the annual investment review submission package					IT								
Reviews and recommends investment submission.							IT						
Reviews and approves/disapproves the investment submission.								IT					

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CPIC Process Checklist													
Project Name:													
	BUREAU CPIC								**DEPARTMENT CPIC**				
ACTIONS FOR INFORMATION TECHNOLOGY OR CONSTRUCTION	Project Manager	Integrated Project Team	Program Manager	System Owner	Project Sponsor	Bureau Sponsor	Bureau Investment Review Board	Bureau Head	Executive CPIC ITMC	Executive CPIC CIRB	MIT	MEC	Secretary
PLACE "**IT**" for Information Technology Investment or "**C**" for CONSTRUCTION INVESTMENT or "**B**" for BOTH IT and CONSTRUCTION													
Review and assess the PIR results and recommend an appropriate action									IT		IT		
Review and assess the POE results and recommend an appropriate action										C	C		
Makes final investment decisions												IT	
Evaluate the IT and construction capital investment management process.									B	B	B	B	
Steady State Phase — Do the investments still cost-effectively support requirements? (Part of the Evaluate Phase for IT)													
Analyze the mission				IT	IT	IT							
Assesses user/customer satisfaction				IT	IT								
Conducts a technology assessment				IT	IT								
Review operation and maintenance costs					IT	IT							
Prepares the investment review submission package					IT								
Reviews and recommends investment submission.							IT						

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CPIC Process Checklist													
Project Name:													
	BUREAU CPIC								**DEPARTMENT CPIC**				
ACTIONS FOR INFORMATION TECHNOLOGY OR CONSTRUCTION	Project Manager	Integrated Project Team	Program Manager	System Owner	Project Sponsor	Bureau Sponsor	Bureau Investment Review Board	Bureau Head	Executive CPIC ITMC	Executive CPIC CIRB	MIT	MEC	Secretary
PLACE "**IT**" for Information Technology Investment or "**C**" for CONSTRUCTION INVESTMENT or "**B**" for BOTH IT and CONSTRUCTION													
Reviews and approves/disapproves the investment submission								IT					
Review the initiative and recommend an appropriate action									IT	IT	IT		
Make final investment decision												IT	
Prepares Facility Management Plan	C												
Quantifies needs and prepares initial project description and justification					C								

APPENDIX C — MISSION NEEDS STATEMENT

Purpose

The Mission Needs Statement (MNS) for IT investments and the Project Data Sheet (PDS) for construction, which has a purpose similar to the MNS, are completed during the Pre-Select Phase of DOI's construction CPIC process. These summary documents describe the operational problem and present the major decision factors that the bureau investment review boards, the Executive CPIC (the Information Technology Management Committee for IT investments and the Construction Investment Review Board for construction), the Management Initiatives Team and the Management Excellence Committee should evaluate in considering the need and proposed investment.

They must analytically justify: (1) the need for action to resolve a shortfall in the bureau's ability to provide the services needed by its users or customers, or (2) the need to explore an opportunity for performing bureau missions more effectively. The MNS and PDS must be derived from rigorous mission analysis (i.e., continuous analysis of current and forecasted mission capabilities in relationship to projected demand for services) and must contain sufficient quantitative information to establish and justify the need. Extensive performance analysis should be completed and capability shortfalls should be identified before preparing the MNS for IT or the PDS for construction. Detailed quantitative and analytical information should be included as attachments to the PDS and the MNS.

The following sections provide templates for preparing the MNS for IT investments and the PDS for construction investments. The templates for IT and construction investments differ reflecting unique characteristics of these two categories of investments. The MNS template for IT investments is followed by the template for the PDS (provided in Attachment G of the annual budget guidance to the bureaus) that serves as the equivalent MNS for Construction.

Mission Need Statement Template for IT

1. Administrative Information

A. MNS Title:			
B. MNS Number:			
C. Originator:			
D. Originator's Organization:			
E. Originator's Phone Number:			
F. Sponsoring Line of Business:			
G. Sponsor's Focal Point:			
H. Sponsor's Focal Point Phone Number:			
I. Submission Date:			
J Revision Number:			
K. Revision Date:			
Signature:			
	Bureau Head		Date

2. Impact on The DOI Mission Areas

The MNS must provide a brief description of the impact of the capability shortfall or technological opportunity with respect to performance metrics, goals, or standards in the DOI and bureau mission

areas. Performance goals are delineated in the DOI and bureau strategic plan, business plans, and annual performance plan prepared in compliance with GPRA (Public Law 103-62). This should be linked directly to the DOI strategic plan and the bureau strategic plan.

3. Needed Capability

Describes the functional and technological capabilities needed. Functions to be performed or services to be provided are needed capability that must be described in terms of the MNS. Cite any Congressional, Secretarial, or other high-level direction, such as international agreements, to support the needed capability. Cite any statutory or regulatory authority for the need. Provide validated growth projections based on operational analysis.

This is not a description of an acquisition program (i.e., this is not the details of a particular hardware or software solution). Do not describe needed capability in terms of a system or solution but rather focus on the business/mission aspects.

4. Current and Planned Capability

Quantify the capability of systems, facilities, equipment, or other assets currently deployed or presently planned and funded in a description that meet the mission need. Use tables when applicable to present and illustrate the information. If this MNS proposes to replace an existing investment, provide the existing system name and OMB number. References should be made to the existing architecture and asset inventory. Back up data as attachments.

5. Capability Shortfall

A description of the capability shortfall and explanation of the performance analysis used to identify and quantify the shortfall (or does not meet) must be provided. The capability of the current technology and how it meets the business requirements in support of the mission must be defined. Technological changes between current state and future state must also be identified and recommendations for closing gaps between the two provided. Define, in detail, the specific limitations of current facilities, equipment, or service to meet projected demand and the needed capability. Explain the criteria used to measure performance. Include appropriate graphs, tables, and formulas to define the extent of the shortfall. Identify databases and other data sources upon which the analysis is based. Identify models and methodologies used to quantify the shortfall.

Alternately, describe the technological opportunity in terms of improved productivity, facility availability, operational effectiveness, or improved efficiency to the DOI. In attachments, explain the analysis used to quantify the magnitude of the opportunity, and identify and describe databases, models, and methodologies used to support the analysis.

Provide specific operational and performance analyses, quantitative projections, maintenance indicators, reports, recommendations, or other supporting data, as attachments.

6. Impact of Not Approving the Mission Need

The MNS must provide a description of the impact if this capability shortfall is not resolved relative to the DOI's ability to effectively perform the responsibilities of the stated mission. If the capability shortfall is not resolved, an expected change in mission performance indicator should be defined.

To quantify and illustrate the impact on performance, appropriate graphs, tables, and formulas used should be included as attachments. Databases, and other sources of data, models, and methodologies used to support the impact analysis are also identified. Include an explanation of the performance analyses used to quantify the impact of not implementing the opportunity, and the external factors (such as validated growth projections) used to support the analysis.

6. Benefits

Summarize the mission analysis determination of benefits. Describe the benefits accrued by the needed capability or technological opportunity. Benefits may accrue from more efficient operations, improved responsiveness to customers, lower operational costs, or other savings.

The summary of accrued benefits should describe ground rules and assumptions, benefits, estimating methods, sources, and models. Include as attachments appropriate graphs, tables, and formulas used to quantify the benefits.

8. Timeframe

Identify when the capability shortfall will seriously affect the DOI's ability to perform its mission if no action is taken. Establish a timeframe depicting when action must be taken to avoid the adverse impact on services as a result of inaction. Explain the performance analysis used to quantify the extent of the impact over time.

9. Criticality

Criticality must be prioritized relative to other DOI needs. The priority for the specified need relative to other needs and across all mission areas are defined in that order. A characterization whether the mission need is an internal DOI capability shortfall or mainly a shortfall in servicing the customer is established.

10. Long Range Resource Planning Estimate

Provide a rough estimate of the resources that will likely be committed to this mission need in competition with all others, within the constraint of realistic projections of future budget authority.

To capture a mission need for a project during the Pre-Select phase, a mini-Exhibit 300 focusing on Part 1 of the Exhibit 300 (**see Appendix M at the end of the IT Guide in Chapter 2**) is prepared. The mini Exhibit 300 summarizes the investment and provides the bureau investment review board and, as applicable, the Information Technology Management Council a consistent basis to review and approve/disapprove proposals. Project approval is a green light for the project sponsor to develop a comprehensive business case to be used for the project selection phase.

Project Data Sheet (Mission Need Statement Template) for Construction (a detailed description of a PDS is issued annually in Attachment G of the Annual DOI Budget Guidance Document to the bureaus)

The Department of the Interior is committed to reducing its accumulated deferred maintenance on existing facilities before constructing most new facilities. When developing the FY 2005 Budget and the Five-Year Deferred Maintenance and Capital Improvement Plan, bureaus are to rank and prioritize projects with highest emphasis on critical deferred maintenance needs in health and safety, resource protection, and bureau mission.

For each project in the Five-Year Plan that is greater than $2 million, bureaus must submit project description and justification information... These projects are typically described as a "Line-Item Construction" project in the budget justification or it is of a size, duration (multi-year), or complexity that it is to go through a formal planning and design process, the information on the Project Data Sheet (contained in the following page) must be completed and submitted.

Construction projects for which a Capital Asset Plan Exhibit 300 is required to be submitted to the Department, must have a completed Project Data Sheet, including Five-Year Plan ranking score, reviewed and approved by the Bureau investment review board (IRB) and Bureau director. A bureau approved Project Data Sheet is submitted to the Executive CPIC's Construction Investment Review Board during the Pre-select Phase of the formal CPIC process for construction projects. The submittal date of the Project Data Sheets for the CPIC Pre-Select Phase review corresponds with the final Five-Year Plan submittal date in January each year.

The Project Data Sheet is contained on the next page followed by a summarized description of the data elements.

UNITED STATES DEPARTMENT OF THE

INTERIOR

[*Bureau Name*]

Project Data Sheet

Project Score/Ranking	
Planned Funding FY	
Funding Source	

Project Identification

Project Title:		
Project No.:	Unit/Facility Name:	
Region/Area/District:	Congressional District:	State:

Project Identification

Project Description:

Project Need/Benefit:

Ranking Categories: Identify the percent of the project that is in the following categories of need.

_____% Critical Health or Safety Deferred Maintenance _____% Critical Mission Deferred Maintenance

_____% Critical Health or Safety Capital Improvement _____% Compliance & Other Deferred Maintenance

_____% Critical Resource Protection Deferred Maintenance _____% Other Capital Improvement

_____% Critical Resource Protection Capital Improvement

Capital Asset Planning 300 Analysis Required: Yes: No:	Total Project Score:

Project Identification

Project Cost Estimate (this ~~request):~~	Project Funding History:
Deferred Maintenance Work: $ Capital Improvement Work: $ Total: $	Appropriate to Date: $ Requested in FY _____ Budget: $ Planned Funding FY _____: $ Future Funding to Complete the Project: $ Total: $
Class of Estimate (circle one): **A B C D DM** Estimate Good Until (mm/yy): __/__	

Dates: Sch'd (qtr/yy) Construction Start/Award __/__ Project Complete __/__	Project Data Sheet Prepared/Last Updated __/__/__	Unchanged Since Department approval: Yes: No: Yes: No:

PDS DATA ELEMENTS

Project Identification

Project Score/Ranking
This is to be the same number as shown in the Total Project Score block in the Project Justification section of the Project Data Sheet.

Planned Funding FY
The fiscal year in which a project is projected to be funded, as of the current submittal of the Five-Year Plan.

Project Title
A brief (100 characters or less) title of the project. The location and facility name of the property may be included, as well as descriptive words to indicate the action(s) being taken.

Examples:

Upper Snake River Drinking Water Upgrade
Minute Man NHP, Rehabilitate Unsafe Historic Residence
Tensas River NWR, Retrofit existing Oil & Paint Storage Building

Project No.
The identification code used to distinguish this project from all others within a Bureau. The code can be any combination of characters and numbers. The current form will accommodate approximately 16 characters.

Unit/Facility Name
The name of the unit, facility or location at which the project is to be accomplished.

Region/Area/District, Congressional District, State
Geographic information where the facility is located.

Project Justification

Project Description
The project description must include a statement of the identified problem(s), its impact, and the prescribed solution. It must be written in a way to support the percentage in each ranking category included in the project. This section may be used to provide additional details of the property to be improved, the specific tasks to be accomplished, and the deficiencies to be corrected. For deferred maintenance projects, reasons for the project should be provided, with a brief explanation of safety, resource, or mission risks and benefits. Project duration and timing or project phases may also be discussed here.

Project Need/Benefit
Justify here the primary safety, resource, or mission needs to be satisfied and benefits to be gained with project accomplishment. These should relate directly to the problem or risk expressed in the project description. Also, state the quantifiable GPRA outputs (measures) and ultimate outcomes that this project will help achieve. For those projects that are $2 million or greater, briefly state how the project will meet DOI and Bureau Strategic Plan goals and objectives. Three example statements are provided:

Olympic National Park (NP), WA; Elwha River Restoration Project – This project will allow for ecosystem restoration to occur, including areas within Olympic National Park and supports DOI Strategic Resource Protection Goal, 1.1 Improve Health of Watersheds and Landscapes.

Pine Ridge Community School, ND, Construct Therapeutic Dormitory - This school facility project supports Interior's core mission to fulfill its trust responsibilities and promote self-determination on behalf of Tribal Governments, American Indians and Alaskan Natives. This project supports DOI Strategic Serving Communities Goal, 4.4 Advance Quality Communities for Tribes and Islands.

Bear River Migratory Bird Refuge, UT, Construct Headquarters and Education Center Complex - This project will enable the Refuge to provide interpretation and education to the public about critical habitat and wildlife management. Project supports DOI Strategic Recreation Goal, 3.2 Ensure Quality of Recreation.

Ranking Categories
Identify the percentage of the projects work that is in each of the 7 categories listed below. These categories are described early in this guideline. The percentages must add to 100%.

Critical Health and Safety Deferred Maintenance Needs
Critical Health and Safety Capital Improvement Needs
Critical Resource Protection Deferred Maintenance Needs
Critical Resource Protection Capital Improvement Needs
Critical Mission Deferred Maintenance Needs
Compliance and Other Deferred Maintenance Needs
Other Capital Improvements

Capital Asset Planning
OMB requires preparation of a Capital Asset Plan and Justification (Exhibit 300 in OMB Circular A-11) for major capital acquisitions. The Department has determined that exhibit 300s should be prepared for any construction project whose total project cost is $10 million or greater. For more details, see the Capital Planning and IT Investment in the general management guidance section of the FY 2004 Budget Guidance.

Total Project Score
The result of the calculation after applying the weight factors for the Ranking Categories. The weighting factors to be applied are:

Critical Health and Safety Deferred Maintenance (CHSdm)	10
Critical Health and Safety Capital Improvement (CHSci)	9
Critical Resource Protection Deferred Maintenance (CRPdm)	7
Critical Resource Protection Capital Improvement (CRPci)	6
Critical Mission Deferred Maintenance (CMDM)	4
Compliance and Other Deferred Maintenance (C&ODM)	3
Other Capital Improvements (OCI)	1

Based on these weight factors, projects are to be ranked using the following calculation:

(%CHSdm x 10) + (%CHSci x 9) +(%CRPdm x 7) + (%CRPci x 6) + (%CMDM x 4) + (%C&ODM x 3) + (%OCI x 1) = TOTAL PROJECT SCORE

Project Costs and Status

Project Cost Estimate (this request)

This applies only to the project or portion of a project being requested in this Project Data Sheet.

Deferred Maintenance Work
This is the estimated cost of the proposed project that addresses deferred maintenance needs. For those projects addressing both deferred maintenance as well as capital improvement needs, it includes only those costs addressing deferred maintenance. The estimate should include the cost of project planning, design, other direct and indirect cost if the bureau typically funds these activities in the project cost. Labor costs should only be included when a contractor accomplishes the project.

Capital Improvement Work
This is the estimated cost of a proposed project that addresses capital improvement needs. For those projects addressing both capital improvements as well as deferred maintenance needs, it includes only those costs addressing capital improvements. It should include all planning, design, value engineering, construction management, and construction costs for which the bureau typically funds in the project cost.

Total
Cost of deferred maintenance portion plus cost of capital improvement portion of a project.

Class of Estimate
Use the following to categorize the status of current cost estimates of projects:

A - Working Drawings and Specifications Complete - This estimate is based on complete quantity take-off from completed construction drawings and on specifications ready for a competitive bid. It reflects the best available estimate of construction costs based on a competitive bid situation.

B - 40% Design Complete - This estimate is based on the development of the selected alternative and tentative bid schedule items, either lump sum or unit price. It uses quantities based on design drawings. At the end of project planning, the project should be developed in sufficient detail to demonstrate that the design will fulfill the functional and technical requirements of the project. This is the first time in the planning and design process where a project construction cost estimate is accurate enough to support a budget request.

C - Planning Complete - This estimate is a conceptual cost estimate based on square footage or other unit cost of similar construction. The project identification/feasibility process should result in a description of facility goals, objectives, and needs and the information needed to evaluate the feasibility of the project and provide a preliminary project cost range and initial project schedule. This description is used to request future planning and engineering design funds only. The engineering design process is considered approximately 15 percent complete at end of this phase.

D - Pre-Planning - This estimate is based on a tentative project design, with project size and complexity that is still experiencing significant development.

DM - Deferred Maintenance Project - If the Project Data Sheet is being used for a project that would be typically described as smaller, shorter duration, and less complex deferred maintenance ("Repair and Rehabilitation"), and not normally requiring extensive planning and design as opposed to a “Line-Item Construction” type projects, this item should be circled. This is the estimated cost of the proposed project. The estimate should include the cost of project planning, design, other direct and indirect cost if the bureau typically funds these activities in the project cost. Labor costs should only be included when the project is accomplished by a contractor.

Estimate Good Until (mm/yyyy)
This is the date (by month and year) on which the current cost estimate will expire.
Project Funding History

Appropriated to Date
This is the total funds that have been appropriated to this project from all funding sources through and including the current fiscal year. This applies primarily to capital improvement (construction) projects; for deferred maintenance projects only funds actually obligated up through the date of data entry should be used.

Requested in FY___ Budget
This is the President's Budget request.

Planned Funding FY___
This is the budget year and amount being requested for the project or portion of the described on this Project Data Sheet. This should be the same cost that is entered in Total space in the Project Cost Estimate (this request) block of the data sheet.

Future Funding to Complete Project
This is outyear funding. Show all costs necessary to complete the total project.

Total
The sum of all anticipated funding needs for the proposed project - the sum of the above four lines.

Dates:

These are spaces to put the scheduled dates in this block.

Construction Start/Award
This is the projected date (by quarter and fiscal year) that the project bid will be awarded (for those projects requiring bids) or the date construction is planned to begin.

Project Complete

This is the date that the work in the project is scheduled to be complete. For contracted projects, it is not the contract close-out date or end of warranty.

Project Data Sheet Prepared/Last Updated
This is the date (by month, day, year) that the last significant alteration of data was made on this particular record. For most projects whose data are entered at the field level with only insignificant changes at the Regional and National levels, this would be the latest date the responsible facility personnel enter new data or verify data from previous years. For projects which are corrected or updated at Regional or National levels, this would be the latest date that a record had been (significantly) changed.

Unchanged Since Department Approval
This indicates whether the project that has received prior Departmental review and approval. Check YES if the project has been reviewed and approved by the Department and has no subsequent changes in scope, score/ranking or cost since that approval. Check NO if the project is new or there have been subsequent changes in scope, score/ranking or cost since last reviewed and approved by the Department.

APPENDIX D—STEADY-STATE INVESTMENT REVIEW TEMPLATE

Purpose

Investments are reviewed during the Steady-State Phase to ascertain their continued effectiveness in supporting mission requirements, evaluate the cost of continued maintenance support, assess technology opportunities, and consider potential retirement or replacement of the investment. The following section provides a template for the package of materials required for a Steady-State Investment Review. Detailed quantitative and analytical information should be included as attachments.

Steady-State Investment Review Template

Investment Title—Name/title of investment

Bureau—Name of sponsoring bureau or activity

1. Administrative Information

A. Date of PIR	Date of the most recent PIR or the date of system deployment/implementation
B. Originator	Name, phone number, and e-mail address of document originator
C. Project Sponsor	Name, phone number, and e-mail address of the Project Sponsor
D. Submission Date	Date of initial document origination
E. Revision Number	Document revision number
F. Revision Date	Date of latest revision
Signature	Bureau Head Date

2. Introduction/Overview of Existing System

Provide a brief summary of the investment to include mission areas supported, key capabilities, customer/user base, key system or infrastructure interfaces, and dependencies.

3. Mission Analysis

Provide a summary of the mission analysis to determine if the system is continuing to meet mission requirements and needs, and to supports the DOI's evolving strategic direction. This should include a discussion of the mission needs being supported. The mission analysis process identified in the Pre-Select Phase and the Mission Needs Statement (see **Appendix C—Mission Needs Statement**) provides a framework to assist in the mission analysis for the Steady-State Phase.

Include the investment's performance measurement projected baseline and actual performance measurement information to determine if the investment is continuing to provide realizable benefits.

4. User/Customer Assessment

Assess user and customer satisfaction. Include a discussion of results of user/customer surveys, user/customer community inputs, or analysis of usage trends. Supporting documentation, reports, or graphs should be provided as an attachment. Some or all of these activities may be beneficial to assist in determining continued support for the system, additional user/customer needs, or improvement opportunities.

5. Performance Measures Assessment

Assess investment performance against approved performance measures. Performance data is collected, evaluated, and compared to performance projections made during the Select Phase. The evaluation should indicate needed adjustments to the IT investment or performance measures. Supporting documentation should be provided as an attachment.

6. Technology Assessment

Assess the technology to determine potential opportunities to improve performance, reduce costs, support the DOI enterprise architecture, and ensure alignment with DOI's strategic direction. Describe quantitatively the capability of systems, facilities, equipment, or other assets currently deployed or presently planned and funded to meet the mission need. Where applicable, use tables to present the information and provide any back-up data in attachments. References should be made to the existing architecture and asset inventory.

7. Operations & Maintenance (O&M) Cost Analysis

Conduct an O&M review to assess the cost and extent of continued maintenance and upgrades. The O&M review should include a trend analysis of O&M costs and a quantification of maintenance releases. Include any supporting graphs and spreadsheets. Costs for government FTEs should be included in all cost estimates and analysis.

8. Recommendations

Describe bureau recommended actions—continue in the Steady-State Phase, terminate or dispose of the existing system, or consider new investment alternatives.

APPENDIX E — BENEFIT-COST ANALYSIS

Introduction/Purpose

Current laws, regulations, and DOI guidance require bureaus and agencies to conduct a benefit-cost Analysis (BCA) prior to deciding whether to initiate, continue, or implement capital investment projects (including IT and construction investments). (*May also be referred to as a Cost-Benefit Analysis (CBA) as noted in Chapter 2 of this guide -- IT CPIC Governance Guide*.) CPIC benefit-cost analyses are intended to inform decision-makers about the potential consequences of proposed actions. Such analyses should provide sufficient information to reasonably determine: 1) whether CPIC action is needed; 2) whether the benefits of CPIC action justify its costs; and 3) whether a particular CPIC action will maximize net-benefits within statutory and judicial constraints. This information can help define CPIC objectives and identify the most efficient way to achieve them.

The goal of benefit-cost analysis is to estimate the net benefits of a proposed action in order to evaluate its desirability with respect to other alternatives. In general, net benefits are determined by identifying and characterizing individual impacts as costs or benefits, assigning a relative weight or value to each, and then calculating the balance of the benefits in excess of costs. This type of analysis is not a substitute for common sense, but rather a systematic framework for organizing thoughts, estimating impacts, and evaluating alternative actions.

The BCA exams the business processes that the investment will change and presents a quantifiable picture of those changed business processes. Simply put, if the changes in business operational costs and any new benefits are greater than the project costs, the investment provides a positive return on investment (ROI). The benefit to cost ratio is expressed as:

- **A = Current Costs of Business**
- **B = Future Costs of Business**
- **C = New Benefits**
- **D = Project Costs**

$$\frac{A-B+C}{D}$$

CPIC benefit-cost analyses should not be complicated or costly in most situations. Order-of-magnitude estimates will often suffice to indicate whether the benefits of CPIC action will justify its costs and whether net benefits are maximized within statutory and judicial constraints. Such estimates can often rely on existing studies in the economics literature. In some situations, detailed economic studies may need to be conducted to evaluate complicated CPIC actions with large economic impacts. In any case, the level of analytic effort should be scaled to the task at hand.

The BCA informs decision-making and helps ensure resources are effectively allocated to support mission requirements. The BCA should include at least three alternatives, one of which should be the status quo. Possible alternatives include:

- In-house development versus contractor development;
- In-house operation versus contractor operation;
- Current operational procedures versus new operational procedures; or
- One technical approach versus another technical approach.

The BCA should include estimates of the projected benefits and costs for each alternative. Costs and benefits should be quantified and monetized where possible. Where benefits and costs cannot be monetized, they should at least be discussed qualitatively. Sunk costs (costs incurred in the past) and

realized benefits (savings or efficiencies already achieved) should not be considered since past experience is relevant only in helping estimate future benefits and costs.
A BCA performed for each investment alternative should be initiated during the Pre-Select phase, more comprehensively conducted during the Selection phase and regularly updated in the subsequent phases. Care must be taken to ensure that alternatives are evaluated in a consistent manner. For example, the period of analysis needs to be the same for each alternative. Some mandatory systems may not provide net benefits to the government. In such cases, the lowest cost alternative should be selected. If functions are to be added to a mandatory system, though, the additional functions should provide benefits to the government.

Process

A BCA should be completed in the selection phase. The Project Sponsor ensures the BCA is done. The Project Sponsor should obtain expertise from the Department's OCIO or bureau OCIOs in IT systems development and operation and from the Office of Managing Risk and Public Safety or bureau construction management programs for construction management. Expertise can be sought from budget, finance, economic analysis, procurement, construction/architecture, and planning offices as needed. For any but the most straightforward analysis, project sponsors are urged to obtain economic expertise from either their bureau or the Department.

The BCA process can be broken down into the following steps:

1. Determine/define objectives
2. Document current process (the status quo against which alternatives are evaluated)
3. Estimate future requirements
4. Describe at least three alternatives
5. Document the assumptions to be used
6. Collect cost and benefit data for alternatives
7. Estimate the costs and benefits[2] over the planning cycle
8. Identify relevant risk factors and adjust cost or benefit estimates if necessary.
9. Discount costs and benefits, using OMB approved discount rates, over the period of analysis.
10. Calculate the net benefits for each alternative.
11. Perform sensitivity analysis (including testing the sensitivity of the results to different discount rates).
12. Compare the net present value of the alternative investments.

Each of these steps is detailed in the following sections. The numerical examples provided are from a variety of sources and do not relate to one specific investment.

1. Determine/Define Objectives

The BCA should include a statement identifying the problem being addressed and the objectives to be achieved. This section should include pertinent background information such as staffing, funding, system history for IT investments, and customer satisfaction data, a list of investment objectives that identify how the investment will improve the work process and support the mission.

2 The analysis should be performed without adjusting the costs and benefits for inflation.

2. Document the Current Process

The existing/current process should be thoroughly documented and address these areas:

- Customer Service—Each customer's role and services required should be clearly documented and quantified, if possible (e.g., in an average month, a customer inputs two megabytes (MB) of data and spends 10 hours on database maintenance).
- System Capabilities—Resources required for peak demand should be listed. For example, 100 MBs of disk storage space and Help Desk personnel to support 50 users.
- System Architecture—The hardware, software, and physical facilities required should be documented, including information necessary for determining system costs, expected future utility of items, and the item owner/lessor (i.e., government or contractor). Table E-1—displays the information desired.
- System Costs—Current costs provide the baseline against which to evaluate alternative investments. Current costs include planned or expected future investments as well as operations and maintenance costs.

3. Estimate Future Requirements

Future customer demands or requirements determine needs. Two items to consider are:

- Period of analysis and/or life cycle time—The period over which the analysis is conducted needs to be explicitly defined. In some cases the period of analysis may be determined by estimates of the useful lifetime of the capital investment under consideration. Capital investments have varying useful lives. For example, large, complex IT systems should have a life cycle of at least five years, and no more than ten to 12 years. Physical infrastructure investments might be expected to last for longer periods.
- Analysis of demand over the period of analysis—Identify the most appropriate demand measures and use the measures to determine previous year demands, calculate the change in demand from year to year, average the demand change, and use the average to make predictions. In a complex situation, more sophisticated tools, such as time-series and regression analysis, may be needed to forecast the future.

4. Identify at Least Three Alternatives

A BCA should present at least three alternatives, with one alternative being to continue with no change. For IT investments, each viable technical approach should be included as an alternative. However, the number of technical approaches may be limited if only one or two are compatible with the architecture or if some approaches are not feasible for reasons other than costs and benefits.

- Performance-oriented standards (as opposed to design-oriented standards)
- Customized requirements for different resource user groups, economic sectors, income groups, etc.
- Alternative compliance standards (more or less stringent)
- Alternative compliance dates
- Alternative monitoring and enforcement procedures
- Measures that improve the availability of information
- Market-oriented approaches

5. Document BCA Assumptions

It is important to document all assumptions and, if possible, justify them on the basis of prior experiences or actual data. This can be an opportunity to explain why some alternatives are not included. If an alternative is eliminated because it is not feasible, the assumption should be clearly explained and justified.

It is important to include only "real" costs and benefits in the overall calculation of net-benefits. Real costs and benefits accrue to society in the aggregate, regardless of their incidence on particular groups or sectors. Distributional impacts should nevertheless be described and quantified as additional information. Some CPIC impacts on state, local, and tribal governments, and small entities may not constitute real costs or benefits. If not, such costs and benefits should be described and quantified as distributional impacts. Use of “real” quantities also implies not making any adjustments in estimated benefits or costs for inflation.

6. Collect Cost Data and Estimate the Costs of the Alternatives

Data should be collected to estimate the cost of each investment alternative. This data should focus on obtaining information on annual capital costs as well as any ongoing operations and maintenance costs. Examples of sources of data for IT investments include the following:

- Historical Organization Data—If contracts were used to provide system support in the past, they can provide the estimated future cost of leasing and purchasing hardware and hourly rates for contractor personnel. Contracts for other system support services can provide comparable cost data for the development and operation of a new system.
- Current System Costs—Current system costs can be used to price similar alternatives.
- Market Research—Quotes from multiple sources, such as vendors, Gartner Group, IDC Government, and government-wide agency contracts (GWACS), can provide an average, realistic price.
- Publications—Trade journals usually conduct annual surveys that provide general cost data for IT personnel. Government cost sources include the General Services Administration (GSA) pricing schedule and the OMB Circular A-76, “Performance of Commercial Activities” supplemental listing of inflation and tax rates.
- Analyst Judgment—If data is not available to provide an adequate cost estimate, the BCA team members can use judgment and experience to estimate costs. To provide a check against the estimates, discuss estimated costs with other IT or construction professionals.
- Special Studies—Special studies can be conducted to collect cost data for large IT investments. For example, the Federal Aviation Administration (FAA) used three different in-house studies to provide costs for software conversion, internal operations, and potential benefits. These data sources became the foundation for a BCA.

Many factors should be considered during the process of estimating costs for alternatives. Full life cycle costs for each competing alternative should be included (including expected annual O&M and replacement costs), and the following factors should be addressed:

- Activities and Resources—Identify and estimate the costs associated with the initiation, design, development, operation, and maintenance of the capital investment under consideration. In general, the following categories should be considered.
- Cost Categories—Identify costs in a way that relates to the budget and accounting processes.

- Personnel Costs—Personnel costs are based on the guidance in OMB Circular A-76, "Supplemental Handbook, PART II—Preparing the Cost Comparison Estimates." Government personnel costs include current salary by location and grade, fringe benefit factors, indirect or overhead costs, and General and Administrative costs.
- Cost Distribution - The analysis should explicitly recognize that many costs and benefits are uncertain. Uncertainty should be considered either by specifying a probability distribution over a set of outcomes or, absent such detailed information, by specifying a likely range of key parameter values in a sensitivity analysis. Costs and benefits should be expressed in terms of their certainty equivalents when the necessary information is available (outcome probabilities and risk premiums). Absent such information, the influence of risk and risk attitudes on individuals' valuations should be qualitatively discussed.
- Annual Costs—All cost elements should be identified and estimated for each year of the system lifecycle. This is necessary for planning and budget considerations.

For IT investments, the tables E-1 and E-2 provide examples.

Physical Facilities	Hardware and Software	
Location Size Capacity Structure type Availability Annual cost	Manufacturer Make/Model/Year Cost Power requirements Expected life Maintenance requirements Operating characteristics (e.g., size, speed, capacity, etc.) Operating systems supported	Manufacturer Name Version number Year acquired License term Hardware requirements Cost (annual or purchase)

Table E-1. Investment Asset Requirements

Cost Category	Cost Elements
Equipment, Leased or Purchased	Supercomputers, mainframes, minicomputers, microcomputers, disk drives, tape drives, printers, telecommunications, voice and data networks, terminals, modems, data encryption devices, and facsimile equipment.
Software, Leased or Purchased	Operating systems, utility programs, diagnostic programs, application programs, and commercial-off-the-shelf (COTS) software.
Commercial Services	Commercially provided services, such as teleprocessing, local batch processing, on-line processing, Internet access, electronic mail, voice mail, centrex, cellular telephone, facsimile, and packet switching.
Support services (Contractor Personnel)	Commercially-provided services to support equipment, software, or services, such as maintenance, source data entry, training, planning, studies, facilities management, software development, system analysis and design, computer performance evaluation, and capacity management.
Supplies	Any consumable item designed specifically for use with equipment, software, services, or support services identified above.

Personnel (compensation and benefits)	Includes the salary (compensation) and benefits for government personnel who perform IT functions 51percent or more of their time. Functions include but are not limited to program management, policy, IT management, systems development, operations, telecommunications, computer security, contracting, and secretarial support. Personnel who simply use IT assets incidental to the performance of their primary functions are not included.
Intra-governmental services	All IT services within agencies, and between executive branch agencies, judicial and legislative branches, and State and local governments.

Table E-2. Example of Cost Elements for an IT System

The costs for each year should be summed to provide the estimated annual costs over the investment's life. For example, Table E-3 presents an example for a 10-year investment

Year	Startup	Acquisition	Development	Operation	Maintenance	Total
1	100,000	100,000				200,000
2			800,000			800,000
3				200,000	80,000	280,000
4				200,000	60,000	260,000
5		50,000		200,000	50,000	300,000
6		50,000		200,000	50,000	300,000
7				200,000	40,000	240,000
8				200,000	30,000	230,000
9				200,000	30,000	230,000
10				200,000	30,000	230,000
Total	100,000	200,000	800,000	1,600,000	370,000	3,070,000

Table E-3. Sample Life Cycle Cost Estimates

7. Identify the Benefits and Estimate Their Magnitude

The following four activities are completed to identify and estimate the value of benefits:

Identify the Relevant Types of Benefits—Benefits are the services, capabilities, and qualities associated with each alternative investment, and can be viewed as the return from an investment. Every proposed capital investment should have identifiable benefits for both the organization and its customers. Organizational benefits could include flexibility, organizational strategy, risk management and control, organizational changes, and staffing impacts. Customer benefits could include improvements to the current services and the addition of new services. Customers should help identify and determine how to measure and evaluate the benefits.

For IT investments, the following questions will help define benefits for IT systems and enable alternative comparisons. Different sets of questions will be relevant to other types of capital investments.

- Accuracy—Will the system improve accuracy by reducing data entry errors?
- Availability—How long will it take to develop and implement the system?
- Compatibility—How compatible is the proposed alternative with existing procedures?
- Efficiency—Will one alternative provide faster or more accurate processing?
- Maintainability—Will one alternative have lower maintenance costs?
- Modularity—Will one alternative have more modular software components?
- Reliability—Does one alternative provide greater hardware or software reliability?
- Security—Does one alternative provide better security to prevent fraud, waste, or abuse?

Establish Measurement Criteria—Establishing measurement criteria for benefits is crucial because the Government Performance and Results Act (GPRA) and the Clinger-Cohen Act (CCA) emphasize tangible measures of success (benefits) related to the organization's overall mission and goals. See **Appendix G — Performance Measurement** for guidance on how to develop performance measures.

Identify and Monetize the Benefits—Quantifiable benefits are "capable of being appraised at an actual or approximate value," and can thus be monetized. An important economic principle used in estimating public benefits is the market value concept. Market value is the price that a private sector organization would pay to purchase a product or service. In many instances, the dollar value of benefits can be estimated by determining the fair market value of the benefits. Benefits that cannot be assigned a dollar value are called non-quantifiable benefits. In some situations it may be possible to identify the benefits and evaluate their magnitude relative to the status quo, but not be able to quantify the benefits in dollar terms. As a result, evaluating alternatives may necessitate using a combination of dollar values and qualitative discussions of unquantifiable benefits.

8. Discount Costs and Benefits

After annual costs and benefits over the period of analysis have been identified, convert them to a common measurement unit by discounting future dollar values and transforming future benefits and costs to their "present value." Present values are calculated by multiplying the future value times the discount factors published in the OMB Circular A-94. All tables presenting discounted costs and benefits should clearly identify the discount rate used.

Table D-4 presents an example of the annual costs and benefits for a system lifecycle, along with the discount factor, the discounted costs and benefits, and the discounted net present value [NPV]. The discounted costs and benefits are computed by multiplying costs and benefits by the discount factor. The net benefit without discounting is $380,000 ($3,200,000 minus $2,820,000) while the discounted NPV is less than $60,000 because the biggest costs are incurred in the first two years, while the benefits are not accrued until the third year.

Year	Annual Cost (AC)	Annual Benefit (AB)	Discount Factor (DF)	Discounted Cost (DC) AC x DF	Discounted Benefit (DB) AB x DF	Net Benefit DB - DC
1	150,000		0.9667	145,005		(145,005)
2	600,000		0.9035	542,100		(542,100)
3	280,000	400,000	0.8444	236,432	337,760	101,328
4	260,000	400,000	0.7891	205,166	315,640	110,474
5	300,000	400,000	0.7375	221,250	295,000	73,750
6	300,000	400,000	0.6893	206,790	275,720	68,930
7	240,000	400,000	0.6442	154,608	257,680	103,072
8	230,000	400,000	0.6020	138,460	240,800	102,340
9	230,000	400,000	0.5626	129,398	225,040	95,642
10	230,000	400,000	0.5258	120,934	210,320	89,386
Total	2,820,000	3,200,000		2,100,143	2,157,960	57,817

Table E-4. Sample Discounted Life Cycle Costs and Benefits

9. Decision Criteria

The alternative with the highest net present value should be selected unless other factors indicate that other alternatives may be preferred. Table E-5 provides an example.

Alternative	Discounted Cost (DC)	Discounted Benefit (DB)	Net Present Value
1	1,800,000	2,200,000	400,000
2	1,850,000	1,750,000	(-100,000)
3	2,000,000	2,000,000	0
4	2,200,000	2,100,000	(-100,000)

Table E-5. Sample Investment Comparison (Lowest Cost Investments Provides Highest Benefit)

10. Risk

Capital investments are subject to risks. Risks need to be explicitly identified and addressed in the analysis. There could be risks associated with project completion and performance, customer demands, and/or unexpected costs. The analysis needs to identify the specific areas of risk and attempt to quantify the risks. Costs associated with mitigating risks should be included in the overall costs of the capital investment.

11. Perform Sensitivity Analysis

Sensitivity analysis tests the sensitivity of the result to changes in the input parameters or assumptions. The sensitivity analysis process requires the following:

Identify Input Parameters—The assumptions documented earlier are used to identify the model inputs to test for sensitivity. Good inputs to test are those that have significant (large) cost factors and a wide range of maximum and minimum estimated values. Some common parameters include:

- System requirement definition costs.
- Development costs.
- Operation and maintenance costs.
- Transition costs, especially software conversion.
- System lifecycle.
- Demand variables (e.g., peak demand, average demand, etc.).
- Discount rate.

Repeat the Cost Analysis—For each parameter identified, determine the minimum and maximum values. Then, choose either the minimum or maximum value as the new parameter value (the number selected should be the one that most differs from the value used in the original analysis). Repeat the BCA with the new parameter value and document the results. Prepare a table like

Table E-6—to summarize the different outcomes and enable the results to be quickly evaluated.

Parameter	Parameter Value	Alternative and NPV for each
Development Cost ($)	1,500,000 2,000,000 2,500,000	A - $NPV A - $NPV B - $NPV
Transition Costs ($)	100,000 200,000	A A
System Life Cycle (Years)	5 10 15	A B C
Benefits ($)	1,500,000 2,250,000 3,000,000	A A B

Table E-6. Sample Sensitivity Analysis

Evaluate Results—Compare the original set of inputs and the resulting outcomes to the outcomes obtained by varying the input parameters. In the previous table, the original values are the first value listed for each parameter. Sensitivity is measured by how much change in a parameter is required to change the alternative selected in the original analysis.

12. Compare Investments

Alternative investments should be compared based on their net present values. Payback Period and ROI analysis also may be useful to decision-makers.

Table E-7—illustrates that the money invested in the system's development, installation, and operation is not offset by the benefits until the 10th year. In other words, the payback period for the system is 10 years.

Year	Annual Cost (AC)	Annual Benefit (AB)	Discount Factor (DF)	Discounted Cost (DC) AC x DF	Discounted Benefit (DB) AB x DF	Net Benefits DB - DC	Cumulative Net Benefits
1	150,000		0.9667	145,010	0	(145,010)	(145,010)
2	600,000		0.9035	542,095	0	(542,095)	(687,106)
3	280,000	400,000	0.8444	236,428	337,754	101,326	(585,779)
4	260,000	400,000	0.7891	205,178	315,658	110,480	(475,299)
5	300,000	400,000	0.7375	221,256	295,007	73,751	(401,547)
6	300,000	400,000	0.6893	206,781	275,708	68,927	(332,620)
7	240,000	400,000	0.6442	154,603	257,671	103,068	(229,552)
8	230,000	400,000	0.6020	138,468	240,814	102,346	(127,206)
9	230,000	400,000	0.5626	129,409	225,060	95,651	(31,556)
10	230,000	400,000	0.5258	120,943	210,336	89,393	57,837
Total	2,820,000	3,200,000		2,100,171	2,158,008	57,837	

Table E-7. Sample Payback Period

Return on Investment—ROI is often used when comparing proposed investments. Total discounted net benefits (total discounted benefits minus the total discounted costs) is often referred to as the return or profit from an investment. ROI is calculated by dividing the Total discounted net by the total discounted cost. In the figure above, ROI is the total net benefits ($57,837) divided by total discounted costs ($2,100,171) and equals 0.0275. Since ROI is often cited as a percentage, multiplying by 100 converts the decimal rate to 2.75.

The ROI is really just another way to express the benefit-cost ratio. In the example above, the ratio of benefits to costs is 1.0275. The 1.0275 can also be expressed as 102.75 percent. This means that the benefits are 2.75 percent greater than the costs. Compute the ROI by subtracting 1 from the benefit-cost ratio. In general, however, avoid using the benefit-cost ratio as a decision making tool.

Because the magnitude of the benefit-cost ratio is affected by whether items or activities are classified as either benefits or costs (and in some cases benefits are simply negative costs and visa versa), the ratio does not always provide consistent results.

13. Checklist for Analysis

Statement Of Need For The Proposed Action

Does the analysis contain a discussion of the particular market failure, or other public need, that the proposed action is intended to address?

Are alternatives to Federal regulation considered (e.g., judicial action or legislative proposal)?

Examination Of Alternative Approaches

Are alternative approaches to achieving CPIC objectives examined in a screening analysis (e.g., performance-oriented standards and alternative compliance standards)?

Analysis Of Costs And Benefits

Are all methodologies, data, and assumptions clearly identified?

Has an analytic baseline been established?

Are all costs and benefits incremental with respect to the baseline?

Would the analysis be substantially improved if additional information could be collected at a reasonable cost?

Are future costs and benefits discounted at an appropriate rate of discount?

Does the analysis explicitly address uncertainty (e.g., sensitivity analysis)?

Are objective physical measures used to quantify impacts that cannot be monetized?

Does the analysis provide qualitative descriptions of impacts that cannot be quantified?

Does the analysis account for the costs of CPIC enforcement using a reasonable assessment of compliance?

Are distributional impacts identified and quantitatively described, including impacts on state and local governments, and small entities?

Does the analysis include only real costs in the overall calculation of net-benefits?

Has the appropriate economic efficiency criterion been used (maximum net present value or maximum cost-effectiveness)?

Has the analysis been externally reviewed?

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Steady-State Benefit-Cost Analysis Checklist

Need/Idea

Is this investment subject to DOI/OMB review (i.e. Exhibit 300)?

Is this investment Steady State? (Define Steady State characteristics)

Yes……..

1. Review previous year's BCA and estimate future changes to future environment.
2. Document assumptions affecting CBA.
3. Describe alternatives. At a minimum consider the alternatives of continuing as is, terminating, and modifying. (Raines Rules evaluation?)
   cycle costs from present time forward to end of asset life for all three alternatives.
4. Update estimated benefits for alternatives for the remaining life of the investment.
5. Discount costs and benefits for each alternative.
6. Select lowest cost price benefit alternative.
7. Resulting alternative undergoes risk analysis. (Link to RA appendix)

No……..

Is this a significant modification of an existing investment?

Yes.....…

Review previous year's CBA and identify impacts of major modification to current investment.
Document assumptions affecting CBA.
Describe alternatives for major modification. At a minimum consider three alternatives of continuing such as, outsourcing, collaboration, building in-house, etc. (Raines Rules evaluation?)

4. Develop/revise estimated asset life and investment life cycle cost impacts from present time forward to end of system life for all three alternatives.
5. Develop/revise estimated benefits for major investment alternatives for the remaining life of the investment.
6. Discount costs and benefits for each alternative.
7. Choose lowest cost alternative for major modification.
8. Update estimated asset life and investment life cycle costs from present time forward to end of investment life for the new baseline investment, which includes previous steady state investment, plus the major modification selected alternative.
9. Resulting alternative undergoes risk analysis. (Link to RA appendix)

Is this a significant modification of an existing investment?

No…. It's a completely new initiative.

1. Document assumptions affecting CBA.
2. Describe alternatives for new initiative. Consider at lease three alternatives such as, outsourcing, collaboration, building in-house, using COTS or GOTS, etc. (Raines Rules evaluation?)
3. Develop estimated asset life and investment life cycle cost for each alternative.
4. Develop estimated benefits for the investment alternatives for the life of the investment .
5. Discount costs and benefits for each alternative.
6. Choose lowest cost alternative for initiative.
7. Resulting alternative undergoes risk analysis. (Link to RA appendix).

APPENDIX F — RISK MANAGEMENT

Purpose

Risk is an integral part of any capital investment. Identifying and controlling risks throughout the life of a project, from inception to completion can have a significant impact on the investment's overall success. However, risk is not the only consideration for investment evaluations. Investments with high probable risk and great complexity may be selected if the investment is deemed a strategic or operational necessity. Other investments may be selected simply because they have low risk and require few resources. Conducting a risk assessment and controlling risk is a continuous process throughout the investment lifecycle.

Process

The risk evaluation process is composed of up to three steps:

1. Risk identification;
2. Risk analysis/assessment; and
3. Risk controls/response.

Each of these steps is detailed in the following sections.

1. Risk Identification

Risk identification consists of determining and documenting risks that will likely have an impact on the investment. The identification and associated analysis is a continuing process that should be done periodically throughout the investment lifecycle. Both internal and external risks should be identified. Internal risks are those that can be directly controlled within the project. There are several mechanisms available to assist in identifying risk areas that include historical information, work breakdown structure (WBS), project plans, risk checklist, and interviews. The following categories of risk are provided to assist in the risk identification. The Project Manager analyzes the following areas to identify investment risks.

Financial Risk—Risks that could result in needing unexpected funding, such as scope creep, sponsorship changes, cost overruns, legal dispute outlays, costs of lost information/data, hardware/software failure and replacement, costs to correct design errors or omissions, and potential cost of relying on a single contracting solution.

Technical Risk—Risks caused by an inability to accurately predict the investment's lifecycle. This can result from a failure to attain expected benefits from the investment, inaccurate investment cost or duration estimates, failure to achieve adequate performance levels, failure to adequately integrate a new system with existing hardware and software, or failure to integrate organizational procedures or processes. Technical risk can be determined by the following factors:

- Investment Size:
  - Number of project team members
  - Project duration
  - Number of organizational departments involved in the investment
  - Size of programming effort (e.g., hours)
- Investment Structure:
  - Complexity of effort (e.g., number of interfaces with other systems, materials required, inter-relationships of multiple contractors, etc.)

- Security vulnerabilities
- Number and variety of contractors involved
- New system or renovation of existing system(s)
- Organizational, procedural, or personnel changes resulting from the investment
- User perceptions and willingness to participate
- Management commitment
- Level of customer involvement

❖ Project team's familiarity with:
- Proposed business or application area
- Target development environment, tools, and operating system
- Development of similar systems or projects
- Unique code or specification requirements
- Special or sensitive environmental requirements

❖ User group's familiarity with:
- System development process
- Proposed application or business area
- Similar investments or projects
- New technology

Operational Risk—The degree to which a proposed investment solves business problems or takes advantage of business opportunities. The business case may be enhanced if the investment can be linked to the overall strategic plan. Information should be included on how the investment will affect organizational structures and procedures. (Investments with broader impacts on existing organizational structures or procedures are more risky than investments with lesser or more narrow impacts.)

Schedule Risk—The degree to which the expected completion dates for all major investment activities meet organizational deadlines and constraints for effecting change. Concerns may include governmental regulation deadlines, project management experience, schedule timeframe, resource availability and competency, and contractor capabilities.

Legal and Contractual Risks—The investment ramifications that could result from developing an information system or building a structure. Risks increase when outside organizations are involved. Risks may include, but are not limited to:

❖ Contract protests/disputes

❖ Labor laws

❖ Foreign trade regulations (limiting encryption techniques)

❖ Financial reporting standards

Organizational Risk—Risks associated with key stakeholders and their view of the investment. Redistribution of power is the single greatest element that will increase organizational risk. Increasing stakeholder buy-in lowers organizational resistance to change.

2. Risk Analysis/Assessment

Each risk is analyzed based on an assessment of likelihood and impact. There are numerous activities used to analyze risks in order to obtain a complete assessment of risks to aid in developing risk management and control strategies. The following provides a summary of activities to assist in risk analysis/assessment:

- Group similar and related risks into categories. This will aid in identifying related risks as well as identifying potential dependencies between risks.
- Determine risk drivers or variables that affect the probability and impact of identified risks.
- Determine the root cause or source of risk.
- Use risk analysis techniques and tools such as simulation or decision trees to assess trade-offs, interdependencies, and timing of identified risks.
- Determine risk severity. Risk severity level rating should be determined by high, medium, or low. This provides a means to assist in prioritizing risks to better focus control strategies.
- Rank and prioritize risks.

After all risks have been identified and rated, each risk is then prioritized. Not all risks identified will be carried into the risk plan for mitigation and management. Project managers should establish a pragmatic cut-off that is consistent with the scope of the project. Each significant risk must then include a description of the risk response strategy and activities. The risks must then be categorized by strategy – eliminate, mitigate, or manage.

The risk management plan provides a means by which risks can be easily tracked and managed. It identifies the priority, area of risk, description, overall rating, risk response strategy category, and status (new, increasing, static, decreasing, eliminated). The risk management plan will be used to track and communicate risk response activities, their status and their potential impact on the schedule/budget.

The Risk Assessment Plan, submitted as part of the Select and Control Phases should, at a minimum, have the columns shown in **Figure F-1**.

Risk Priority	Risk Description	Overall Risk Level Rating (High, Medium, Low)	Estimated Cost if Risk Occurred	Risk Response Strategy	Status

Figure F-1. Example of Risk Management Table

3. Risk Controls/Response

The Project Manager establishes and executes a risk management plan to mitigate risks. The development of a risk management plan provides an organized approach for addressing each risk and documents and tracks all actions and decisions regarding each risk. For each risk a determination should be made whether to accept, avoid, transfer, or reduce the impact of the risk. This includes determining risk controls based upon available resources and identifying responsible parties. Plans should include the identification of the appropriate risk control strategy, objectives, alternatives, mitigation approach, responsible parties, resources required, activities, actions taken to date, and results achieved. The risk management plan is an evolving strategy to assist the Project Manager and ensure a higher probability of success for the investment. The plan should be updated continually as risks change throughout the lifecycle. Risks, actions taken, and results should be tracked and included as part of periodic reviews.

Risks can rarely be completely eliminated, however they can be controlled. If the following controls or risk mitigation strategies are in place, the likelihood of risk decreases and the investment is more attractive:

- Financial Controls:
  - Perform Cost-Benefit and economic analyses
  - Implement a rigorous investment management program
  - Utilize earned value, share in savings, use contracting approaches, etc. to help control costs
  - Establish clear benefits to be realized
  - Use competitive bidding for each investment design increment
  - Require contractors to purchase liability insurance
  - Require contractors to have payment and performance bonds
- Technical Controls:
  - Reengineer the process first
  - Use development lifecycle methodology/ structure
  - Use project planning/management software
  - Use appropriately trained personnel
  - Divide the investment into increments
  - Isolate custom design portions of the investment
  - Assign a Project Manager (preferably with Project Management Institute or similar organization certification) to be accountable for the investment
  - Use past performance in evaluating contractors during the source selection process
  - Conduct regular project meetings and inspections
- Operational Controls:
  - Establish clear requirements and objectives
  - Use a change management program to minimize organizational disruption
  - Establish performance metrics and monitor metrics using a reporting system
  - Establish a communications plan
- Schedule Controls:
  - Use contractual incentives for quality or timeliness
  - Use contractual penalties for missed deadlines
  - Establish liquidated damages provisions in contracts
  - Use contractual incentives for meeting or beating deadlines
  - Use project management software
  - Use an experienced/certified Project Manager and/or provide the necessary training to the Project Manager
  - Set realistic expectations and manage those expectations
  - Use contract support to augment scarce internal resources.
- Legal and Contractual Controls:

- Review all applicable laws
- Apprise contracting personnel of potential legal concerns and contract disputes
- Maintain communication with contractors to minimize contract disputes
- Provide multiple termination opportunities within a contract

❖ Organizational Controls:

- Obtain “buy-in” from top management early in planning stages
- Work closely with end-users to establish system requirements
- Maintain good communication with all stakeholders

APPENDIX G — PERFORMANCE MEASUREMENT

Purpose

Performance measurement is the process an organization uses to determine which programs, investments, and acquisitions are reaching desired results in support of mission goals. Performance measures should be set during the Select Phase and assessed during subsequent phases. The focus of performance measurement is on outcomes, or how well an investment enables the program or agency to accomplish its mission. Consequently, performance measurement should look beyond measures of input (resource consumption), activities (milestones), and output (production numbers), which are more directly related to operational performance. This focus, however, does not imply that input, activity, and output measures are not useful. Internal measures are often used to track resources and activities and make necessary adjustments since investments are only successful if hardware, software, and capabilities are delivered on time and meet specifications.

Performance should be evaluated using two criteria—effectiveness and efficiency. Effectiveness demonstrates that an organization is doing the correct things, while efficiency demonstrates that an organization is doing things optimally. New acquisitions and upgrades should include a business case indicating the investment will result in effectiveness or efficiency improvements. Some questions that facilitate the development of performance measures include:

- What product will be produced, shared, or exchanged?
- Who will use the results?
- What decisions or actions will result from delivery of products from this investment?

Answers to these questions will help Project Managers develop effective performance measures with the following characteristics:

- Strategically relevant
  - Directed to factors that matter and make a difference
  - Promote continuous and perpetual improvement
  - Focus on the customer
  - Agreed to by stakeholders.
- Short, clear, and understandable
  - Measurable/quantifiable
  - Meaningful.
- Valid
  - Realistic, appropriate to the organizational level, and capable of being measured
  - Link to activity and provide a clear relationship between cause and effect
  - Focus on managing resources and inputs, not simply costs

Process

Outcome-based performance measures should be developed through a series of steps. It is important to understand that developing measures is only one part of the more comprehensive process. After measures are developed, baseline information is gathered if it does not already exist, and performance information is collected, analyzed, interpreted, and used throughout the life of an investment. These steps require an appropriate commitment of management attention and resources.

The following steps can be used to develop performance measures:

1. Analyze how the investment supports the mission goals and objectives
2. Develop IT performance objectives and measures that characterize success
3. Develop collection plan and collect data
4. Evaluate, interpret, and report results
5. Review process to ensure it is relevant and useful.

Steps one to three should be completed during the Pre-Select and Select Phases. Steps four and five should be completed during the Control Phase, with follow-up during the Evaluate and Steady-State Phases. Each of these process steps are defined in the following sections.

1. Analyze How the Investment Supports the Mission

Effective outcome-based performance measures should be driven by the relationship between the new investment and how users will apply investment outputs. Specifically, the users' mission and critical success factors (those activities and outputs that must be accomplished if users are to achieve their mission) must be clearly understood. The critical element of this step is linking proposed and in-process investments and activities to the user mission and critical success factors.

This process should identify the relationship between the investment and the agency's mission and strategic priorities. The first step in effectively developing outcome-based performance measures is to identify the organization's mission, the critical tasks necessary to achieve the mission, and the linkage to the investment.

Answers to the following questions will assist in developing performance measures:

- What are major functions or features that the investment will provide? What is the purpose of the investment? How will it be used?
- Identify who will use or benefit from the investment. What is the principal business task they perform? How will the investment help them with that task?
- How does completion of program goals contribute to organizational goals and Departmental goals?
- Determine whether there are related investments that affect the mission area and goal(s) selected. Understand the relationships between various investments that address the same or similar needs. This will help identify potential areas for consolidation.

2. Develop Performance Measures that Characterize Success

Well-designed performance measures define success parameters for the initiative. The following questions should be addressed for each performance measure:

- Is it useful for monitoring progress and evaluating the degree of success?
- Is it focused on outcomes that stakeholders will clearly understand and appreciate?
- Is it practical? Does it help build a reliable baseline and cost-effectively collect performance data at periodic intervals?
- Can the performance measure be used to determine the level of investment risk and whether the investment will meet performance targets?

Answering these questions affirmatively will help ensure that the investment, by supporting improvements identified earlier, will support organizational goals and objectives. Additionally, it will help limit the number of performance measures and focus management attention on the requirements that have the greatest priority or effect. After major requirements have been identified, the following questions should be addressed:

- What are the performance indicators?
- What additional steps must be taken to ensure outputs produce intended outcomes?
- How does this investment improve capabilities over the current method?

Once performance measures are identified, determine when each requirement is met. Some requirements may need to be changed if they are too difficult to measure. Or, if the requirement has indirect rather than direct outcomes, it may be necessary to use “surrogate” performance measures that mirror actual outcomes.

Of the possible performance indicators, select one or more to report performance against each requirement. One performance indicator may provide information about more than one requirement. The objective is to select the fewest number of performance indicators that will provide adequate and complete information about progress.

Selecting the fewest performance indicators necessary is important because data collection and analysis can be costly. The cost is acceptable if the benefit of the information received is greater than the cost of performance measurement, and if the data collection does not hinder accomplishment of primary missions. Answers to the following questions will help to determine the cost of tracking a specific performance indicator:

- What data are required to calculate the performance measure?
- Who collects the data and when?
- What is the verification and validation strategy for the data collection?
- What is the method to ensure the quality of the information reported?

In addition to determining costs, it is also necessary to determine the baseline performance, target performance, and expected time to reach the target. The baseline value is the start point for future change. If performance measures are currently in use, the data collected can provide the baseline. Otherwise the manager must determine the baseline by reasonable analysis methods. For example:

- Benchmarks from other agencies and private organizations
- Initial requirements
- Internal historical data from existing systems
- Imposed standards and requirements.

To determine the target value, obtain stakeholder agreement regarding the quantifiable benefits of the investment. The targeted improvement from the baseline must be achieved within the designated timeframe to be counted as a success.

3. Develop Collection Plan and Collect Data

To ensure performance data is collected in a consistent, efficient, and effective manner, it is useful to develop a collection strategy so all participants know their responsibilities and can see their contributions. The collection strategy may address the following items:

- Activities to be performed
- Resources to be consumed
- Target completion and report presentation dates
- Decision authorities
- Individuals responsible for data collection.

In addition, the collection strategy addresses the following questions:

- How is the measurement taken?
- What constraints apply?
- Who will measure the performance?
- When and how often are the measurements taken?
- Where are the results sent and stored, and who maintains results?
- What is the cost of data collection?

To ensure data is being collected in a cost-effective and efficient manner, it is important to ensure the data collectors are involved in developing performance measures. The collectors will do a much better job if they believe the performance measures are valid and useful, and they will have insight regarding the best way to collect the data.

4. Evaluate, Interpret, and Report Results

Performance measures are useful in monitoring the investment against expected benefits and costs. To evaluate performance, data is compiled and reported according to the collection strategy. The data is then evaluated and the following questions are answered regarding the collected data and the investment's performance:

- Did the investment exceed or fall short of expectations? By how much and why?
- What were the unexpected benefits or negative impacts to the mission?
- What adjustments can and should be made to the measures, data, or baseline?
- What actions or changes would improve performance?

This evaluation reveals any needed adjustments to the investment or performance measures. It also helps surface any lessons learned that could be fed back to the investment management process.

5. Review Process to Ensure It Is Relevant and Useful

Performance measures provide feedback to managers and help them make informed decisions on future actions. To ensure that performance measures are still relevant and useful, answer the following questions:

- Are the measures still valid?
  - Have higher-level mission or investment goals, objectives, and critical success factors changed?
  - Are threshold and target levels appropriate in light of recent performance or changes in requirements?
  - Can success be defined by these performance measures?
  - Have more relevant measures been discovered?

- Are the measures addressing the right things?
  - Are improvements in performance of mission, goals, and objectives addressed?
  - Are all objectives covered by at least one measure?
  - Are costs, benefits, savings, risks, or ROI addressed?
  - Do the measures emphasize the critical aspects of the business?

- Are the measures the right ones to use?
  - Are measures targeted to a clear outcome (results rather than inputs or outputs)?
  - Are measures linked to a specific and critical organizational process?
  - Are measures understood at all levels that must evaluate and use them?
  - Do the measures support effective management decisions and communicate achievements to internal and external stakeholders?
  - Are measures accurate, reliable, valid, and verifiable?
  - Are measures built on available data at reasonable costs and in an appropriate and timely manner for the purpose?
  - Are measures able to show interim progress?

- Are measures used in the right way?
  - Are measures used in strategic planning (e.g., to identify baselines, gaps, goals, and strategic priorities) or to guide prioritization of program initiatives?
  - Are measures used in resource allocation decisions and task, cost, and personnel management?
  - Do the measures drive improvement in performance?
  - Are measures used to communicate results to stakeholders?

APPENDIX H—PROJECT MANAGEMENT

Purpose

Project Management is a crucial element for capital investment success. It involves executing the necessary skills and management practices to ensure successful investment development and implementation. This integrated skill set addresses such areas as project planning, scope management, cost, schedule, performance, risk, and organizational management. The Project Manager is ultimately responsible for the investment's success and ensuring the investment delivers the functionality and capabilities expected by stakeholders (i.e., users, customers, and senior leaders). Perhaps the greatest project management challenge is identifying risks and then executing management techniques that mitigate the risks to ensure timely and successful completion.

Components

Project Managers should complete the following project management components to help ensure the investment's successful completion:

Project Planning—Project planning is a critical element of every successful investment. It provides a foundation on which to base anticipated efforts. Additionally, it helps identify investment components and illustrates these components in a project plan. Project planning includes:

- Charter development
- Scope definition
- Activity identification
- Activity duration estimation
- Activity sequencing
- Cost estimation
- Schedule development
- Project staffing/resourcing
- Project plan development.

Investments typically involve multiple components that may be complex (i.e., requiring interface with several contractors or with other proposed/existing systems or data). Integrating these components is very challenging. To support improved integration and management, it is useful to develop a Work Breakdown Structure (WBS). A WBS provides a management framework by separating the investment lifecycle into distinct, manageable components related to various phases/stage activities and interfaces. Each component is defined with appropriate sub-components and activities, such that one individual or team can implement each component. This enables the Project Manager to more effectively estimate the cost and schedule for completing individual components, supports sequencing activities and identification of interdependencies, and provides a basis to identify milestones and develop resource and schedule estimates. **Table H-1—**provides an example of a WBS.

Scope Management—The scope frames what is expected of the investment's ultimate capability and functionality. As such, it directly impacts functional and system requirements development. The Project Manager should obtain the Project Sponsor's concurrence on the investment's scope, and then effectively manage that scope and mitigate "scope creep" by maintaining requirements traceability throughout the project lifecycle and implementing configuration management procedures. It is important for the Project Sponsor to determine whether existing requirements have been redefined, new requirements have been identified, or existing requirements eliminated based upon events. The project scope should be based on the business requirements identified during the Pre-Select Phase and traced throughout the project lifecycle. All project features, functions, and capabilities should be linked to original customer. requirements throughout the entire planning, acquisition, design and implementation phases to ensure accurate system or network design or a facility built to specifications.

Risk—Risk is inherent in every investment. To aid in effectively identifying, analyzing, developing responses, and managing risk, Project Managers should develop a risk management plan early in the planning stages, ideally during the Select Phase. Project Managers should employ subject matter experts (SMEs) among the various functional areas of the investment to identify risk and provide mitigation strategy. Key risk areas may include technology, cost, schedule, and performance/quality. The risk management plan is continually updated throughout the investment's lifecycle and is part of periodic reviews. **Appendix F—Risk Management** provides additional guidance on risk assessment and management.)

Cost and Schedule Management—Effective investment management entails establishing cost and schedule baselines. Actual information is continuously collected, analyzed, and compared to original projections and the current baseline. Variances are identified, and appropriate actions are taken to inform senior management and mitigate the impacts of increased costs and schedule slippages. The WBS, milestones, activities, and project plan assist the development and tracking of cost and schedule. Earned value techniques provide a means to more completely evaluate costs and schedule, and assist in early risk identification (**see Appendix I—Earned Value Analysis**).

Plan Project	
100	Define Project
10	Determine Project Objectives
20	Define Project Scope
30	List Project Products
40	Determine Project Constraints
50	Select Project Approach
60	Determine Project Standards
70	Assess Project Risks
200	Make Project Plan
10	Define Work Breakdown Structure
20	Determine Activity Dependencies
30	Define Project Milestones
40	Determine Project Organization
50	Estimate Effort
60	Allocate Resources
70	Schedule Activities
80	Develop Budget
90	Assess Project Risks
300	Obtain Project Approval
10	Assemble Project Plan

20	Present Project Plan
30	Agree to Project Plan
MPMP1	Milestone PMP1

Table H-1. Example of a Project Planning WBS Activities during the Select Phase

Performance—An investment's ultimate objective is to meet or exceed stakeholder performance expectations by ensuring the investment satisfies the mission need and business requirements. In the Pre-Select and Select Phases, performance planning includes defining performance measures and identifying activities required to ensure performance objectives will be met (**see Appendix G—Performance Measurement**). This may include benchmarking to establish a baseline and to further refine the investment's performance objectives. The Control Phase includes a continual monitoring of the performance baseline to potentially include quality reviews, tests, or pilot tests. In the Evaluate Phase, a PIR helps compare actual investment performance with expectations (**see Appendix J—Post Implementation Assessments**). During the Steady-State Phase, performance measures are analyzed to determine whether investments are continuing to meet mission needs and performance expectations.

Organizational Management—Organizational management skills needed to manage an investment include project staffing, communications, and organizational understanding. Project Managers should be able to identify the needed skill sets and assign appropriate personnel to accomplish a given set of activities. Project Managers should also have the requisite interpersonal and leadership skills to communicate with the project team, Project Sponsor, and stakeholders. This includes possessing a vision for the investment and how to best meet stakeholder expectations, as well as ensuring the project team is able to focus on assigned tasks/activities. Additionally, Project Managers should be able to communicate and build consensus with key stakeholders, since this ultimately impacts the investment's success or failure.

APPENDIX I — EARNED VALUE ANALYSIS

Purpose

Earned value analysis is a program management technique that uses an investment's past performance and work as indicators of the investment's future. This enables the Project Manager to evaluate and gain insight into an investment's actual schedule and financial progress relative to the project plan. Earned value analysis identifies expenditure and scheduling projections for established critical path milestones, or significant points in the investment's development. The Project Manager tracks actual progress and expenditures against planned figures to obtain variances. These variances can then be used to identify schedule and cost overruns so they can be resolved as quickly as possible.

Earned value indicates how much of the budget should have been spent, in view of the amount of work that should have been done so far, and the baseline cost for the task, assignment, or milestone. The earned value methodology requires an investment to be fully defined at the outset. The information that is required to complete an earned value analysis includes:

- List of all critical path milestones/activities
- Budgeted dollars for work scheduled for each critical path milestone/activity
- Planned critical path milestone start and completion dates
- Budgeted dollars for work performed
- Actual cost of work performed
- Total investment budget
- Actual start and completion dates for each critical path milestone/activity
- Planned investment start and end dates

The approach can provide accurate and reliable assessments of cost and schedule performance from as early as 15 percent into the investment's lifecycle. It provides early indications of cost and schedule variances in order to take appropriate risk mitigation steps. Early investment assessment and identification of cost and schedule variances is critical for the overall success of the investment, and supports improved cost and schedule control. The time phased project plan is the incremental "planned value" which can be used as a performance measurement baseline. Earned value compared with planned value provides work accomplished "earned" against planned. Earned value is the basis upon which bureau and Departmental executives will monitor project performance.

Comparison of planned value, earned value, and actual cost data provides an objective measurement of performance, enabling trend analysis and evaluation of cost estimate at completion with multiple views of the project. The qualities and operating characteristics of earned value management systems are described in American National Standards Institute (ANSI/Electronic Industries Alliance (EIA) Standard 748-1998, *Earned Value Management Systems*.) OMB advocates the use of ANSI/EIA Standard 748 for integrating cost, schedule, and performance goals.

Process

Earned value enhances the cost performance analysis of a project. Traditional cost analysis centers around the actual cost of the work that was completed. What earned value brings to the process is a measure of the amount of work that has been done in a unit of measure that is consistent and comparable with costs.

Before completing earned value analysis, the Project Manager needs to complete the following project management tasks:

- Develop a Work Breakdown Structure (WBS) to divide the project into manageable activities
- Define investment activities to be scheduled that represent the entire project
- Estimate costs for each WBS activity
- Schedule each activity
- Chart and evaluate the investment's status.

The Project Manager will then have the basis for periodically assessing the investment's performance and completing the following four steps in the earned value analysis process:

1. Update the Schedule

The scheduled activities are reported as started, completed, or with a remaining duration as appropriate. For unfinished activities, the percent complete is reported. For example, if the activity is the completion of a project design, progress might be reported as follows: 20% when the conceptual drawing draft is completed, 40% when the first draft is printed, 50% when the first draft is reviewed, 60% when the second draft is completed, 75% when the client review is completed, 90% when the final draft is completed and 100% when the design drawing is issued for construction. An example construction project cost and schedule baseline is provided below.

Critical Milestone/Activity	Budgeted Percentage of $'s for Work Performed	Planned Start Date	Planned Completion Date	Budgeted Dollars for Work Performed
Project Design	5%	05/15/2000	06/06/2000	$600,000.00
Legal and Environmental Compliance/Review	5%	06/07/2000	07/01/2000	$600,000.00
Award Construction Contract	1%	07/02/2000	07/06/2000	$10,000.00
Mid-Point Review of Construction	40%	07/07/2000	12/20/2000	$4,800,000.00
Completion Review of Construction	40%	12/21/2000	5/30/2001	$4,800,000.00
Space Deliver/Occupancy	9%	06/01/2001	07/10/2001	$1,100,000.00

Figure I-1: Example Construction Project Baseline

2. Record Actual Costs

After updating the schedule, actual costs from the investment's accounting system are recorded. In situations where the accounting system does not provide the level of detail required to obtain actual accounting costs, the Project Manager may need to estimate what percentage of actual costs should be assigned to the investment. As the work is accomplished, there is an actual cost that is being incurred by the contractor. The actual work completed is expressed in a dollar value to represent the contractor's expenditure rate. By having this information, it can be determined whether the contractor is performing within cost or is in a cost overrun situation. The actual work accomplishment over time in dollar terms is the true value of the work that is accomplished or earned. Figure I-2: Actual Performance and Variance Table tracks planned and actual schedule and cost progress.

Comparison of OMB-Approved Baseline and Actual Outcome for Phase/Segment/Module of a Project								
	DOI / OMB-Approved Baseline				Actual Outcome			
Description	Schedule			Planned Cost	Actual Schedule		Percent Complete	Actual Cost
	Start Date	End Date	DURATION (IN DAYS)		Start Date	End Date		
1. Planning								
2. Design								
3. Construction								
Completion Date:					Total Cost Estimate at Completion:			
Total Cost: OMB-Approved Baseline:					Estimated at Completion:			

Figure I-2: Actual Performance and Variance Table

3. Calculate Earned Value Measures

After recording actual costs for the reporting period, earned value measures are calculated and reports generated. The earned value is the percent complete of an activity times its planned costs. This can be done, in part, by creating an earned value chart as shown in **Figure I-3: Sample Earned Value Analysis Chart** (This can be accomplished using a standard project management or spreadsheet software's charting functionality.)

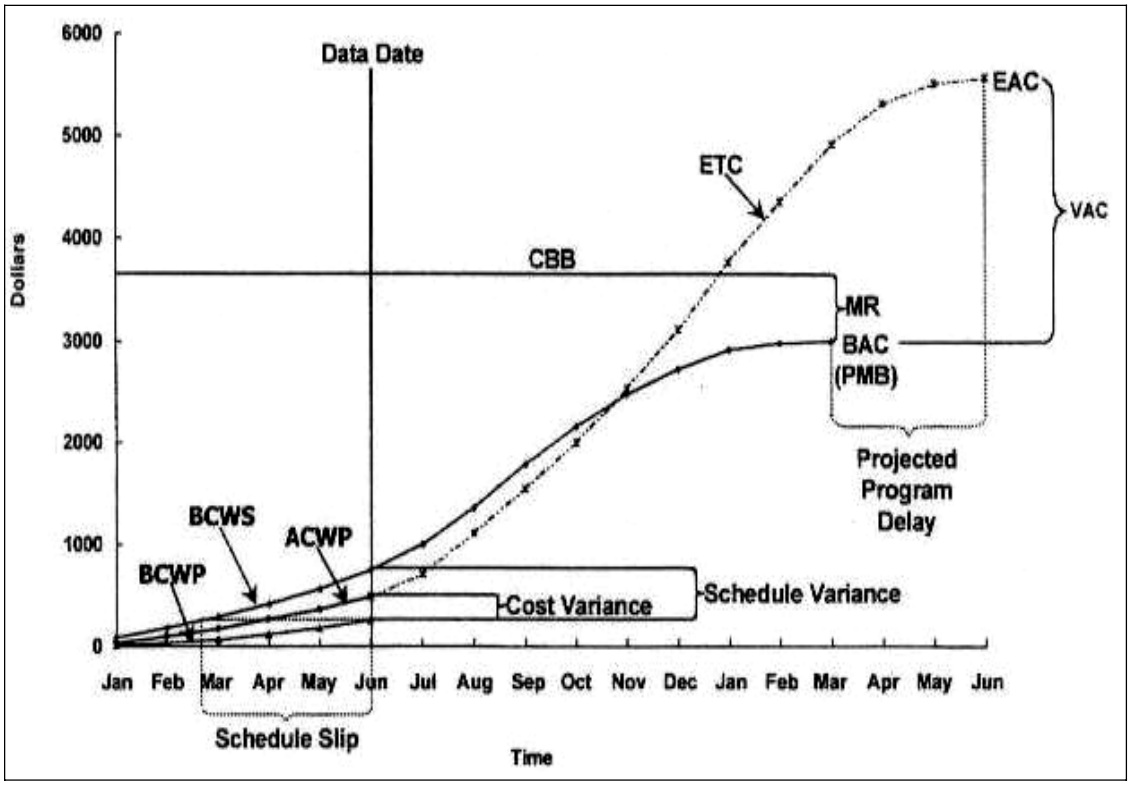

Figure I-3. Sample Earned Value Analysis Chart

The sample chart includes the following earned value measures:

Actual Cost of Work Performed (ACWP)—The costs actually incurred and recorded in accomplishing the work performed within a given time period.

Budget at Completion (BAC)—The sum of all budgets established for the project.

Budgeted Cost for Work Performed (BCWP)—The budgets for completed work packages and completed portions of open work packages, plus the applicable portion of the budgets for level of effort and apportioned effort.

Budgeted Cost of Work Scheduled (BCWS)—The budgeted cost of WBS elements that are planned or scheduled for completion.

Contract Budget Base (CBB)—The total cost of all budgeted activities necessary to complete a task.

Cost Performance Index (CPI)—Earned value divided by the actual cost (BCWP divided by ACWP). i.e. cost efficiency (Favorable if >1.0 and Unfavorable if <1.0)

Cost Variance (CV)—Earned value minus the actual cost (BCWP minus ACWP).

Earned Value (EV) –This is calculated by multiplying percent of actual work performed to date by the budgeted cost for work performed (BCWP). It is the dollar value of work already performed based upon the original budget for the individual milestone/activity.

Estimate at Completion (EAC)—The actual costs incurred, plus the estimated costs for completing the remaining work.

Estimate to Complete (ETC)—The cost necessary to complete all tasks from the ACWP end date through the investment's conclusion.

Management Reserve (MR)—The amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks; not part of the performance measurement.

Performance Measurement Baseline (PMB)—The time-phased budget plan against which investment performance is measured.

Schedule Variance (SV)—Earned value minus the planned budget for the completed work (BCWP minus BCWS).

Variance at Completion (VAC)—The difference between the total budget assigned to a contract, WBS element, organizational entity, or cost account and the estimate at completion; represents the amount of expected overrun or under run.

4. Analyze the Data and Report Results

The critical path milestones/activities used to complete the earned value analysis are directly derived from the project plan. These are the milestones that require completion before a successive milestone can begin. The data is collected and monitored for each milestone throughout the project to achieve maximum effectiveness.

PROJECT SUMMARY (CUMULATIVE)	Cost Variance (to date)	
	Cost Variance % (to date)	
	Cost Performance Index (CPI)	
	Planned Cost Incurred (to date)	
	Schedule Variance (to date)	
	Schedule Variance % (to date)	
	Schedule Performance Index (SPI)	
	Expected at Completion (EAC)	
	Expected to Completion (ETC)	
	Expected Completion Date	

When earned value analysis is applied to a project, performance effectiveness in both cost and schedule can be determined. The project manager must make sure that the contractor accomplishes the project by finishing all the tasks that were planned, on time and within budget. This requires the evaluation of three key elements that are normally associated with any project: performance, cost, and schedule. Based on variance indicators, the contractor's performance and the project status can be determined.

Earned value calculations provide early visibility to the critical areas that may need further attention. Additionally, the use of Earned Value provides a clear picture of the viability of a project, rather than looking only at the budget or actual values alone. A worst-case, best-case, and most-likely case for "Estimate at Completion" can be forecasted as performance trends are determined based upon the cost efficiencies. The accuracy of data and early recognition of problems assist in validating corrective options, and if used correctly, can validate good management practices as well as problem areas.

Cost and schedule variance for a project may or may not reflect the actual cost and schedule position of the project. Some element may be completed ahead of schedule or out of sequence, giving a false indicator of project well-being, particularly if the element represents a significant portion of the project. However, when tracking an individual milestone CV and SV can provide an indicator on how that milestone is performing relative to its plan. It is this indicator that serves as the basis for the use of Earned Value Management.

The Estimate At Completion (EAC) is a number of great interest at each quarterly update cycle. It indicates where the project cost is heading. Calculating a new EAC is one of the greatest benefits of Earned Value as a forecasting tool. The formula for arriving at the EAC at the time of the data date is:

$$EAC = \frac{(BAC - BCWP)}{CPI} + ACWP$$

This formula determines the unfinished or unearned work (BAC – BCWP) and divides it by the CPI. To that is added the sunk cost, or the cost of the completed work (ACWP).

Variance analysis is the systematic comparison of planned versus actual project performance measures in order to identify, analyze, and mitigate deviations from the project plan. Variance analysis provides the basis for identifying the root cause of deviations in project performance and implementing appropriate corrective action. As such, variance analysis provides early warning of variances that can become significant if ignored. The calculation of variances for cost and schedule can be facilitated by using the following tables:

Earned Value - Schedule Variance Work Units as of *(Date)*_____ : EXAMPLE

Milestone/Activity (as defined in the baseline)							
	A	**B**	**C**	**D**	**E**	**F**	**Total (to date)**
Planned Value ($ millions)	**1.800**						**1.800**
Earned Value ($ millions)	**1.567**						**1.567**
Schedule Variance ($ M)	**0.233**						**0.233**

Schedule variance is 13 %

Note: As work is performed, it is "earned" on the same basis as it was planned, in dollars or other quantifiable units such as labor hours. Planned value compared with earned value measures the dollar volume of work planned vs. the equivalent dollar value of work accomplished. Any difference is called a schedule variance (i.e., Planned Value - Earned Value = Schedule Variance).

Earned value - Cost Variance as of – (Date)_____: EXAMPLE

Milestone/Activity (as defined in the baseline)							
	A	**B**	**C**	**D**	**E**	**F**	**Total**
Earned Value ($ millions)	**1.567**						**1.567**
Actual Cost ($ millions)	**1.567**						**1.567**
Cost Variance ($ M)	**0**						**0**

Cost variance is 0 %
(Cost variance units the same units as shown in the cost and scheduling base line.)

Note: Earned value compared with the actual cost incurred (from contractor accounting systems) for the work performed provides an objective measure of planned and actual costs. Any difference is called a cost variance (i.e., Earned Value - Actual Cost = Cost Variance). A negative variance means more money was spent for the work accomplished than was planned.

APPENDIX J— POST IMPLEMENTATION ASSESSMENTS

Purpose

The Post Implementation Review (PIR) for IT projects and a similar Post Occupancy Evaluation (POE) for construction support and is conducted in the Evaluate Phase of DOI's CPIC process. The PIR and the POE fully assess how well a capital investment project meets the objectives, expected benefits and the strategic goals and mission of the Department and/or Bureau. Both assessment tools evaluate an investment's efficiency and effectiveness to determine how well the investment achieved the planned functionality and anticipated benefits. The PIR and the POE also determine if the investment supports the mission efforts and strategic plan as originally identified. They are an essential and valuable component in soliciting customer feedback and incorporating that feedback into improvements to the performance and delivery of the capital asset and the CPIC process.

The PIR and POE have a dual focus:

- They provide assessments of implemented investments, including an evaluation of the development process; and
- They indicate the extent to which the DOI's decision-making processes are sustaining or improving the success rate of capital investments.

For IT investments, the PIR is key in determining if the investment supports the re-engineering efforts as originally identified. It is part of the overall project costs and is included in the Business Case Development Stage initial project cost estimate.

The following sections provide guidance for preparing the PIR for IT investments and the POE for construction investments. The guidance for IT and construction investments differs in this Appendix, reflecting unique characteristics of these two categories of investments.

Post Implementation Review (PIR) for IT

The PIR usually occurs either after a system has been in operation for about six months or immediately following investment termination.

A team of bureau program and/or staff office personnel should conduct the PIR. However, in order to ensure the review is conducted independently and objectively, the PIR team should not include members from the investment under review. The PIR team should review the following investment elements:

- Mission alignment
- IT architecture including security and internal controls
- Performance measures
- Project management
- Customer acceptance
- Business process support
- Cost versus anticipated savings.

As a minimum, the PIR team will evaluate stakeholder and customer/user satisfaction with the end product, mission/program impact, and technical capability, as well as provide decision-makers with lessons learned so they can improve investment decision-making processes.

The review will provide a baseline to decide whether to continue the system without adjustment, to modify the system to improve performance or, if necessary, to consider alternatives to the implemented system. Even with the best system development process, it is quite possible that a new system will have problems or even major flaws that must be rectified to obtain full investment benefits. The PIR should provide decision-makers with useful information on how best to modify a system, or to work around the flaws in a system, to improve performance and bring the system further in alignment with the identified business needs.

Process

There are seven major steps to conducting a PIR:

Initiate PIR

The review team initiates a PIR by preparing and sending a memorandum to the Project Sponsor stating the review has begun. The memorandum should include a schedule for the planned review and indicate any areas that may receive special review emphasis.

Analyze Documentation

The review team reviews all existing investment documentation and analyzes the information to understand the investment scope, generate interview and survey questions, prepare for system overview briefings, and plan the PIR. The review team also reviews any existing reports and memoranda from the Pre-Select, Select, and Control Phases to uncover any findings or outstanding issues.

Interview Key Players

The review team interviews all key IT and business process players. The interviews should help the team develop an understanding of the system's goals, objectives, benefits, and costs as described in the Exhibit 300 submitted during the Select Phase. Additionally, the interviews will help the team determine how efficiently and effectively the system's objectives, goals, performance measures, and benefits are being achieved, as well as identify system deficiencies and enhancement needs.

Measure Performance

The review team assesses the investment performance measures established during the Select Phase. These performance measures are compared to actual data generated during the operations/production stage. In the absence of certain statistics, the review team may perform onsite observations to measure specific criteria.

Perform User Surveys

The review team conducts qualitative surveys with users to determine user satisfaction with the system. Executing the survey includes designing questionnaires, distributing survey questionnaires to remote users' locations, receiving responses, analyzing results, and generating a survey results memorandum. The survey measures the system's efficiency and effectiveness in achieving its stated goals and benefits and in satisfying user needs.

Perform Analysis

The review team analyzes all documentation, survey results, and performance measurements to determine if the system efficiently and effectively achieved its objectives.

Issue Report

After comments are received from the Project Sponsor, the review team prepares the Final Report and submits it for the OCIO, EWG, and IRB review. Report findings and recommendations must be clear and concise to avoid any misunderstandings.

Findings and Recommendation Report

The OCIO, project manager and agency sponsor determine the appropriate course of action to resolve any outstanding issues. Decisions will also be made whether to continue the system without adjustment, modify, or terminate, based on the PIR recommendations.

Post Occupancy Evaluation for Construction

A Post Occupancy Evaluation (POE) should be conducted twelve months after the construction project has been beneficially occupied. This period of time allows a sufficient amount of time for the customer to evaluate systems performance and aspects of project delivery.

Process

The POE is initiated with the Post Occupancy Questionnaire provided to the Project Sponsor by the Project Manager one year after delivery of the construction investment. The Project Sponsor completes the questionnaire, adds any relevant comments, and returns the completed questionnaire to the Project Manager within a two-week period of time. The Project Manager and the Program Manager review the provided information and assess process successes, as well as failures. Areas for improvement are analyzed and improvements to the process are evaluated.

The process stage includes the following five activities:

- Complete the POE Questionnaire
- Analysis of the Completed Questionnaire
- Interview Key Stakeholders
- Measure Performance
- Recommendations for Process Improvements

Complete the POE Questionnaire

The POE is initiated with the Post Occupancy Questionnaire provided to the Project Sponsor by the Project Manager one year after delivery of the construction investment. The Questionnaire is a two to three page document that is used consistently throughout a Bureau for evaluation of construction investments. This document will rate the quality of the construction investment provided to the Project Sponsor, in addition to the timeliness, responsiveness and customer service provided by the Project Manager during all phases of project delivery.

The Project Sponsor, in conjunction with all customer team members involved in the planning, design and construction of the construction investment, completes the POE Questionnaire.

Analysis of the Completed Questionnaire

The Project Manager and Program Manager review the completed Questionnaire jointly. Areas for improvement are focused upon for follow up discussion with the Project Sponsor. Corrective actions for areas of unsatisfactory performance will be decided upon and incorporated into future project plans. Subsequent corrective action plan implementation is to be monitored closely by the business process owners.

Interview Key Stakeholders

The Project Manager and Program Manager are responsible for interviewing all key stakeholders. The interview objective is to develop an understanding of the project goals, objectives, benefits, and costs as described in business case and project plan developed in the Select Phase. Areas for improvement indicated in the POE Questionnaire are to be discussed in depth. These interviews determine how efficiently and effectively the construction investment was delivered and whether the objectives, goals, performance measures, and benefits have been achieved. It is critical that the interview serves not specifically as a tool to identify project deficiencies, but also as a vehicle to identify successes that can be repeated in future project development and deployment.

Measure Performance

Reviewing all performance measurement documentation, specifically the baseline measures for the project aligned with Bureau and DOI strategic goals, is the responsibility of the Program Manager. Project performance measures are typically established in the Select Phase and are compared to data generated during the Evaluate Phase.

Recommendations for Process Improvements

The business process owners review the POE Questionnaire, information provided by key stakeholders and performance measure analysis. Best practices and lessons learned are to be shared with all Program Managers, Project Sponsors, Project Managers, bureau investment review boards and the Executive CPIC's Construction Investment Review Board. Corrective actions are proposed for deficiencies and successes are identified for incorporation into future construction project delivery processes.

APPENDIX K — STRATEGIC INVESTMENT CRITERIA

Proposed Department of the Interior (DOI) information technology (IT) and construction projects are evaluated, prioritized, and measured against DOI and bureau strategic plans, and OMB requirements and criteria to determine the best combination of assets to meet DOI's and each Bureau's mission, obligations, goals, and objectives. Bureaus must prepare and submit an investment proposal and a preliminary business case that will utilize the guidelines outlined in an OMB Exhibit 300 document.[3]

Process Coordination

Investment review boards within each bureau, under the leadership of bureau directors, analyze projects for quality and conformance to policies and guidelines, as well as to the strategic goals and missions of the bureau. Each investment is reviewed and scored against the applicable strategic investment criteria. For investments above the threshold (described in Section 1.5, Thresholds for Major IT and Construction Investments, of Chapter 1, Introduction of this Guide), the Executive CPIC, through the Information Technology Management Council (ITMC) for IT and the Construction Investment Review Board (CIRB) for construction, analyzes projects for quality and conformance to policies and guidelines, and reviews and scores them against the applicable strategic investment criteria. The Management Initiatives Team (MIT) reviews the ITMC and CIRB analysis and scoring of the major investment initiatives and defines a Departmental investment strategy. A recommendation is then prepared and forwarded to the Management Excellence Council (MEC) for validation and recommendation and on to the Secretary for approval/disapproval.

Approval, if granted, is an approval of concept, indicating that the bureau has done the preparatory work necessary to fully justify the investment, and has the mechanisms in place to manage the investment through acquisition, development, implementation, and operation. The investment must still compete for funding as it goes through the budget process. The CPIC is a fluid, dynamic process in which proposed and ongoing projects are continually monitored throughout their lifecycle. Successful investments, as well as those that are terminated or delayed are evaluated both to assess the impact on future proposals and to benefit from any lessons learned.

Projects not approved must be re-evaluated using the CPIC guidelines and ensure that the areas identified as deficient during the original evaluation are satisfactorily addressed when they are resubmitted for consideration.

All investments must appear on a current multi-year investment plan prepared by the bureau and reviewed and approved by the bureau investment review boards and bureau directors. Bureaus are responsible for carrying out the training and establishing the necessary internal controls to ensure that managers do not authorize capital expenditures from any funds for construction or IT that do not appear on a plan. Each bureau within DOI will evaluate their projects using a template that identifies the value, risk, and compliance with federal regulations and how well they meet the DOI's and the Bureau's strategic goals and mission.

OMB Criteria

To determine how well the investments comply with the various statutes and regulations hierarchically from a bureau mission to the President's Management Agenda, the bureaus, the Department and the Office of Management and Budget (OMB) have identified 10 criteria for evaluating and ranking IT and construction investments. The ten criteria serve as the minimum criteria that need to be addressed. Additional criteria such as scoring a project's description and justification or compliance with Government Paperwork Elimination Act (GPEA) can be factored in bureau and Departmental scoring and ranking.

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[3] The proposal's length and level of detail should be commensurate with the proposed investment's size or impact.

Below is a list of the ten criteria used for IT investments. Construction investments apply eight of the ten criteria and are noted:

- Supports the President's Management Agenda Items
- Acquisition Strategy
- Program Management
- Enterprise Architecture – IT only
- Alternatives Analysis
- Risk Management
- Performance Goals
- Security and Privacy– IT only
- Performance Based Management System
- Life Cycle Costs Formulation

Under the OMB scoring methodology used by the Department for both IT and construction investments, the potential for funding of proposed and continued funding of on-going projects is determined. The overall score for an investment is determined through the accumulation of points, ranging from one to five, scored within each of the ten criteria. For example, If a project scores fives for half of the ten criteria and fours for the other half, its total would have a cumulative score of 45 and equates to a 5 for the overall project score, See Table K-1 for the overall project score methodology.

Overall Score	Cumulative Score	Definition
5	**41-50**	Strong documented business case (including all appropriate sections of the OMB Exhibit 300)
4	**31-40**	Very few weak points within the business case but still needs strengthening.
3	**21-30**	Much work remains to solidify and quantify business case. The business case has the opportunity to either improve or degrade very quickly.
2	**11-20**	Significant gaps in the required categories of the business case.
1	**1-10**	Inadequate in every category of the required business case.

Table K-1 -- Overall Project Score Methodology

Under the above methodology, projects with an overall 5 and meeting program requirements are automatically recommended for funding. Projects scoring a 4 and meeting program requirements, and meeting most of the business case requirements are recommended for funding and the agency is instructed to continue improvements in the areas identified as needing work. Projects scoring 3 or below have the opportunity to improve to a 4 or degrade to a 2 rather easily. Projects scoring a 2 or below are not recommended for funding.

The overall project score is based on meeting requirements defined with each of the 10 criteria. Scores within each criterion range from 1 to 5. The criteria scores and where in the Exhibit 300 the criterion is addressed is as follows:

Supports the President's Management Agenda Items (Multiple Sections of the Exhibit 300)

5 This is a collaborative project that includes multiple agencies, state, local, or tribal governments, uses e-business technologies and the project is governed by citizen needs. Project also supports

the Federal Business Architecture published by OMB. If project is a steady state project, then an E-Gov strategy review is underway and includes all of the necessary elements. If appropriate, this project is fully aligned with one or more of the President's E-Gov initiatives.

4 This is a collaborative project that includes multiple agencies, state, local, or tribal governments, uses e-business technologies though work remains to solidify these relationships. Project also supports the Federal Business Architecture published by OMB though work remains to solidify the linkage. If project is a steady state project, then an E-Gov strategy review is underway but needs work in order to strengthen the analysis. If appropriate, project supports one or more of the President's E-Gov initiatives but is not yet fully aligned.

3 This is not a collaborative project though it could be and much work remains to strengthen the ties to the President's Management Agenda (PMA). If a steady state project and no E-Gov strategy is evident, this project will have a difficult time securing continued or new funding from OMB. If appropriate, this project supports one or more of the President's E- Gov initiatives but alignment is not demonstrated.

2 This is not a collaborative project and it is difficult to ascertain support for the PMA. Steady-State project, no E-Gov strategy was performed or is planned.

1 There does not seem to be any link to the PMA and no e-Gov strategy.

Acquisition Strategy (part I, Section I.G of the Exhibit 300)

5 Strong Acquisition Strategy (AS) that mitigates risk to the federal government, accommodates Section 508 as needed, and contracts and statements of work (SOWs) are performance based. Implementation of the Acquisition Strategy is clearly defined.

4 Contracts and SOWs are performance based with very few weak points that agency is strengthening and implementation of the AS is clearly defined.

3 Much work remains to solidify and quantify the AS.

2 Some parts of the AS are present but not clear implementation strategy. 1 There is no evidence of an AS.

1 There is no evidence of an AS.

Program Management (part I, Sections I.D and I.B of the Exhibit 300)

5 Program is very strong and has resources in place to manage it.

4 Program has some weak points in the area of Program Management (PM) and the agency is working to strengthen PM

3 Much work remains in order for PM to manage the risks for this project.

2 There is some understanding of PM for this project but it is very rudimentary.

1 There is no evidence of PM.

Enterprise Architecture (part II, Section II.A of the Exhibit 300) <u>for IT Only</u>.

5 This project is included in the Agency enterprise architecture (EA) and CPIC process. The business case (BC) demonstrates business, data, application, and technology layers of the EA in relationship to this project.

4 This project is included in the Agency EA and CPIC process. BC demonstrates weaknesses in the business, data, and application, and technology layers of the EA in relationship to this project.

3 This project is not included in the Agency EA and CPIC process. BC demonstrates a lack of understanding on the layers of the EA (business, data, application, and technology).

2 While the agency has an EA Framework, it is not implemented in the agency and does not include this project.

1 There is no evidence of a comprehensive EA in the agency.

Alternatives Analysis (part I, Section I.E of the Exhibit 300)

5 Alternatives Analysis includes three viable alternatives, alternatives were compared consistently, and alternative chosen provides benefits and reasons.

4 AA includes three viable alternatives; however work needs to continue in terms of the alternative chosen and the accompanying analysis.

3 AA includes fewer than three alternatives and overall analysis needs strengthening.

2 AA includes weak AA information overall, significant weaknesses exist.

1 There is no evidence that an AA was performed.

Risk Management (part I, Section I.F of the Exhibit 300)

5 Risk Assessment was performed for all mandatory elements and risk is managed throughout the project.

4 Risk assessment addresses some of the Risk, but not all that should be addressed for this project.

3 Risk Management is very weak and does not seem to address or manage most of the risk associated with the project.

2 Risk Assessment was performed at the outset of the project but does not seem to be part of the program management.

1 There is no evidence of a Risk Assessment Plan or Strategy.

Performance Goals (part I, Section I.C of the Exhibit 300)

5 Performance Goals are provided for the agency, are linked to the annual performance plan, the project discusses the agency mission and strategic goals, and performance measures are provided.

4 Performance Goals are provided for the agency, are linked to the annual performance plan, the project discusses the agency mission and strategic goals, and performance measures are provided yet work remains to strengthen the Performance Goals.

3 Performance Goals exist but linkage to the agency mission and strategic goals is weak.

2 Performance Goals are in their initial stages and are not appropriate for the type of project. Much work remains to strengthen the Performance Goals.

1 There is no evidence of Performance Goals for this project.

Security and Privacy (part II, Section II.B of the Exhibit 300) for IT Only.

5 Security and privacy issues for the project and all questions are answered, detail is provided about the individual project throughout the life-cycle to include budgeting for Security and Privacy.

4 Security and privacy information for the project is provided but there are weaknesses in the information that need to be corrected.

3 Security and privacy information for the project is provided but fails to answer the minimum requirements.

2 Security and privacy information points to an overall Agency Security Process with little to no detail at this project level.

1 There is no security or privacy information provided for the project.

Performance Based Management System (part I, Section I.B of the Exhibit 300)

5 Bureau will use, or uses an Earned Value Management System (EVMS) that meets ANSI/EIA Standard 748 and project is earning the value as planned for costs, schedule, and performance goals.

4 Bureau uses the required EVMS is within the variance levels for two of the three criteria and needs work on the third issue.

3 Bureau uses required EVMS but the process within their agency is very new and not fully implemented or there are weaknesses for this individual project's EVMS information.

2 Bureau seems to re-baseline rather than report variances

1 There is no evidence of a Performance Based Management System

Life Cycle Costs Formulation (LC) (Multiple Sections of the Exhibit 300)

5 Life cycle costs seem to reflect formulation that includes all of the required resources and is risk-adjusted to accommodate items addressed in the Risk Management. It appears that the project is planned well enough to come in on budget.

4 Life cycle costs seem to reflect formulation of some of the resources and some of the issues as included in the risk adjustment strategy but work remains in order to ensure that lifecycle costs are accurately portrayed.

3 Life cycle costs seem to reflect formulation of the resources but are not risk adjusted based upon the risk management plan.

2 Life cycle costs seem to include some of the resource criteria and are not risk adjusted.

1. Life cycle costs do not seem to reflect a planned formulation process.

The following investment assessment worksheet (see Table K-2) is used to ensure that the proposals are ranked and weighted and that each investment is thoroughly evaluated against the same set of criteria and that they consists of relevant, complete, and accurate information with supporting documentation using like factors. Proposals will also undergo quality control reviews prior to the final submission to the bureau investment review boards and DOI.

INVESTMENT ASSESSMENT WORKSHEET			
Scoring Element	Score	Scoring Element	Score
Supports the President's Management Agenda Items		Risk Management	
Acquisition Strategy		Performance Goals	
Program Management		Security and Privacy – IT only	
Enterprise Architecture – IT only		Performance Based Management System	
Alternatives Analysis		Life Cycle Costs Formulation	
BUSINESS CASE TOTAL			

Table K-2 -- Sample of an Investment Assessment Worksheet

OMB Recommendations For Improving Business Case Scores

OMB provided clarification and recommendations for improving business case scores in the areas identified in the OMB Exhibit 300 resulting from their review of DOI's business cases of proposed and on-going investments submitted with the Department's FY 2004 Budget. The following is a summary of those suggestions provided by OMB pertaining to the FY 2004 submission (and to be factored into the preparation of FY 2005 submissions) for the scored areas of the Exhibit 300 (ten criteria):

President's Management Agenda

E-Government reviews are to be conducted on all steady-state systems. For systems in development they want to see evidence that attempts were made to get other agencies involved.

The key to the issue of addressing the Presidents Management Agenda is in identifying how or if the initiative ties into the existing 24 e-Government initiatives. OMB expected collaborative business cases for each of the 24 e-Government initiatives. This score for this category is determined by information in a number of areas of the business case to include identification of the participating agencies, which integrated project teams (IPTs) they participate in, how the program is managed across the agency sets, and how the initiatives tie, complement, or leverage the technology, processes and people in the organizations. Focus of the PMA is on collaboration and whether or not projects have undergone an e-Government initiative review.

If the project is not collaborative across agencies (i.e., not just within a Department), the highest possible score in this category is a 3, but that is fine according to OMB. A key point out of the discussion was that it is okay to submit an initiative if you have no direct relationship to the 24 e-Government initiatives.

Acquisition Strategy

The acquisition strategy needs to show performance based contracting or fixed priced contracting. Contracts based on time and material, cost plus fixed fee, or labor hours are the last solutions and will result in a low score. If the project is using these types of contracts, then OMB's view is that we have no

idea what or where we are going. Movement towards the use of fixed price vehicles is the preferred alternative. In particular, OMB felt that use of time and materials or cost plus contracts is admitting that we do not know what we need (performance), what it will cost, or how long it will take (schedule). OMB wants everything, including interagency agreements, to be performance-based and measurable.

The problem with the use of cost plus contracts is that it shifts the burden of risk to the Government, which is not good. What they identified as being needed are definable outputs and the referencing of inter-agency agreements to deliver products/resources on time and at cost.

The business case is supposed to show what is actually happening on the project. The Acquisition Strategy should be specific and up-to-date. It was also pointed out that if a project has an Acquisition Plan that is more than 3 years old, it should identify when the plan will be updated and refreshed. They requested that we target specific dates.

Program Management

Program Management needs to show that the schedule is complete, resources are in place and the skill sets are identified. It will be helpful to show what each skill set will be doing on the project. OMB is looking for indication that the project is well managed. The Program Management score is based on answers in the Risk Management area, Acquisition Strategy area, Life Cycle Cost area, Cost and Schedule area, and PM areas.

The focus of Program Management appears to be on Governance issues. Does the project use a Capital Planning and Investment Control process? What are the various layers of that Governance structure, how are IPTs used, review processes, and finally, how is the program manager involved in the preparation and review of the submitted business cases.

Be honest about who is actually on the IPTs as regular contributing members. For the vague or unusual areas, provide elaborating text, but not page after page.

"Strong" project management means the program manager has a good handle on and control over performance, cost, and schedule.

Security

All of the security questions can be showstoppers. They must be answered, and dates must be provided.

Certification and Accreditation (C&A) has to be completed for systems that are implemented. New projects have to indicate when C&A will occur (i.e., provide a target date). If a project is new and does not have C&A and Security Plan in place, make it very clear up front ("on the cover page") that the project is new. COTS products must be certified.

Security costs must be included. The methodology for determining security costs is to identify what wouldn't be spent if security weren't an issue. Failure to provide this will lead OMB to drop the funding request from the President's budget. Specifically what they are looking for includes the costs associated with certification and accreditation to include FTE, hardware and software application estimates along with the identification of specific milestone dates to tests and upgrades. It will be easy to provide costs of security products (like CA/Top Secret) and contracts (like one with SAIC to develop the C&A documents), but it will be much more difficult to determine the security portion of programming, design, infrastructure, etc. costs. Exhibit 53 guidance can help identify security cost categories. OMB realizes the security

costs provided are estimates. The dollars identified for security and the percent of security identified for the project should coincide.

Security costs are asked for because OMB expects everyone to show that security has been incorporated into the project costs and to establish a 'base' to compare to if additional money is needed for security in the future. OMB is not using the security cost as a metric to measure anything against.

Government Information Security Reform Act (GISRA) is an internal review (i.e., internal to bureaus and the Department). The GISRA review is essential for each program/project. Security answers should be program specific, not general. Low scores in Security resulted from lack of specificity. Mixed life cycle projects (development and steady state) should address both the dates for the security plan for the steady state portion and target dates for the new development portion.

Under the security section (risk management as well) projects must identify weaknesses and state their current mitigation strategy. Then, provide program/project-specific mitigation strategies. Simply referencing generic policy documents and processes is insufficient.

Provide specific dates, even if only estimates. For example, it's much better to say that the C&A will be complete by December 3, 2003, than to say it will be completed "prior to deployment."

Security oversight is provided by the program manager - it is a distinction made in law.

C&A actions need to be program/project-specific. It is generally wrong to do a C&A on a LAN from an infrastructure perspective and say that it includes the applications running on that LAN. Similarly, you cannot claim that a generic mainframe C&A is sufficient to cover all the applications running on that mainframe. Each infrastructure and application component has its own risks and vulnerabilities that must be covered in some C&A. It's fine to do logical groupings of IT components for C&A and funding/budget purposes, but the set of risks and vulnerabilities must be complete for each grouping.

OMB says they are not looking for subtle differences or key words in the security sections. Projects that identify security costs, provide C&A details, and provide details of security plans and other documents should "pass." Low scores may have been caused by what appeared to be inconsistencies between the security material and the other parts of the budget submission, our lack of specificity/details, and/or text that appeared inappropriate for the applicable life cycle stage the project/system was in.

Alternative Analysis

Alternative Analysis needs to include risk adjusted full life cycle costs for all alternatives. The alternative with the best Net Present Value (NPV) should be chosen unless a very strong argument is made otherwise. OMB wants to see that at least three viable/realistic alternatives for each project were considered before proceeding with development. They expect a complete and comprehensive analysis of each alternative to include NPV and Return on Investment (ROI). Status quo is an acceptable alternative as long as it is feasible, costed out and fully analyzed like the other alternatives.

Include assumptions (years in life cycle, discount rate, OMB inflation rate, growth rate, etc.) in the Assumptions area in Project Description.

Cost elements should address the entire life cycle to include government and contractor costs for each stage (i.e., planning, acquisition, and maintenance). All costs should be those you reasonably expect to incur, which means including inflation adjustments. OMB understands the Cost Benefit Analysis (CBA) does not include inflation, but life cycle cost estimates should include inflation.

Further, they want specific transformational paths to confirm that the program/project planners sufficiently considered ways to do the job better, including Business Process Re-engineering (BPR).

Risk Management

Another name for Risk costs is Management Reserve. The "management reserve" is just another term for the money one needs to add to the budget to make it risk-adjusted. Use own expertise for determining the percent of risk associated with the project. OMB expects the project cost to have been risk adjusted.

All 20 risks included in the OMB Exhibit 300 needs to be addressed. List all risks in the Risk Management table. If any of them are not applicable (which is unlikely), still include them and state why they are not applicable.

Put risk costs in I.H. Add line item for management reserve.

Performance Goals

You must have performance goals for every year of the project including EVERY year of maintenance. Performance measure in maintenance years may be the same goal repeated each year.

OMB stated that quantifiable performance goals for the life cycle of the project should be provided. The project specific goals should tie to the strategic plan and goals and the President's Management Agenda.

Enterprise Architecture

Enterprise Architecture (EA) discussions should always point back to the Department's enterprise architecture and not just to the bureau architecture. If your bureau has an EA, make sure you include how it points to the Department's EA. OMB is looking to see that stovepipe systems are not created.

Project and Funding Plan

OMB is looking for evidence that an ANSI compliant Earned Value Measurement System (EVMS) is being used on the project. I-TIPS is ANSI Compliant. Microsoft Project is not ANSI Compliant. Contractor system, not the software, is what must be ANSI compliant. The system in use/to be used must be able to demonstrate the project's BCWS, BCWP, and ACWP.

The Cost and Schedule Plan should only address the phase of the project that you are in. For example, if your project is in the planning stage, only address planning in the C/S Plan. When you move to acquisition, OMB do not care about planning anymore and only development/acquisition needs to be included in the Cost and Schedule Plan. Earned value is computed on the stage of the project that you are in.

Projects that are in steady state don't require an EVMS. Steady state projects must address their "baseline" (i.e., the annual out year maintenance costs) in I.H.1. Steady state projects have to address the ability to assess performance between planned performance and actuals to date, demonstrate customer satisfaction and a level of service (i.e., is the project/system still doing what it is supposed to be doing). This is referred to as an operational analysis.

Summary of Project Spending

This topic was discussed within the context of Alternative Analysis. The point made regarding Life Cycle was to report risk-adjusted costs for the full life cycle of the project.

Other Key Points

OMB was especially concerned about what appeared to be life cycle stage inconsistencies in agency submissions. For example, if a project includes money to enhance and operate an existing system, then the text in each section (including security) needs to address both the current system and development of the enhancements. Further, if part of the package says a project is in one stage, then the text in other sections should be consistent with that fact.

On the part I questions OMB pointed out that their assessments are based upon the choice identified for stage that the project is in. This has a ripple effect on other sections of the business cases.

Do not assume all projects will be 10 years long. Document your supporting logic for the selected program/project's life cycle in the assumptions.

OMB does not have access to the Resource Library in I-TIPS, and the Department does not provide the information, meaning that we need to fold information into the initiatives. None of the attachments get transmitted to OMB. They only get the HTML material that fits nicely into their databases.

APPENDIX L — E-GOVERNMENT

Purpose

"Expanding Electronic Government" (E-Government) is one of the five key elements of the President's Management Agenda. The goals of the Administration's E-Government Strategy are to:

- Create single points of access for government services
- Reduce reporting requirements
- Share information more effectively with State, local, and Tribal governments
- Automate internal processes to reduce costs

E-Government is enabled by a wide range of electronic, multimedia and digital solutions, such as the Internet, personal digital assistants, call centers, handheld wireless devices, machine-to-machine devices (i.e., Smart Tags) and kiosks.

E-Government at Interior

In support of the President's Management Agenda and Interior's desire to transform and enhance the delivery of the Department's programs, services, and information, Interior is developing a strategic framework for meeting the challenges and opportunities of service delivery in an E-Government environment.

Interior is developing an E-Government vision of making information, services, and programs available any place, at any time. To meet this vision, the Department is using an enterprise approach to delivering information, services, and programs. It also addresses the Office of Management and Budget's (OMB) requirements to fully integrate the business, information management and IT planning processes. At the highest level, Interior IT investments should demonstrate the following:

Collaborative and Blended Ventures vs. Single Agency Approaches

- Requiring new problem-solving perspectives
- Leveraging existing agency expertise for interdepartmental and cross-mission area benefit
- Foregoing single agency initiatives that are not integrated with Government-wide or Departmental E-Government strategies
- Expands the number of agencies involved
- Expands the functionality provided
- Pools funds to support enterprise approaches and acquisitions beginning in fiscal year 2002.

Customer-Centered Government

- Improves customer service;
- Connects the Federal Government with its citizens
- Assesses customer demand and readiness and projects expected growth for E-Government service delivery channel
- Provides for multiple delivery channels.

Internal Pressures and Demands

- Enables employees and the enterprise to do more with less
- Focuses on results-oriented solutions.

1. Looking Forward Interior's existing and proposed information technology (IT) investments will be evaluated to ensure that the Internet-based and other electronic information, services, and program delivery channels have been sufficiently considered. Investments must align with Interior's mission, vision, business goals and objectives. The following types of investments should be identified.

President's Management Agenda

Expanding Electronic Government is one of the five key elements in the President's Management Agenda. The key goals of this element are to improve IT planning through the budget process and champion citizen-centered electronic government that will result in a major improvement in the Federal Government's value to the citizen. A government-wide E-Government task force (Quicksilver) was convened by the OMB and the President's Management Council in July 2001. The task force selected 24 high priority initiatives as a part of the Administration's E-Government portfolio. Interior is participating in several of the 24 initiatives, and is serving as managing partner for two; the Geospatial One-Stop initiative and the Recreation One-Stop initiative. Interior is also the lead agency in the multi-agency Volunteer.Gov/Gov initiative, which is part of the President's USA Freedom Corps network.

Interior's E-Government Strategy

Interior is developing a Departmental E-Government strategy, which will provide a framework for implementing electronic government within the Department. The strategy will be completed in 2003. Upon completion of the strategy, proposed investments should be consistent with the plan.

2. Major, Significant, and Other IT Investments

Through the Capital Planning and Investment Control Process (CPIC) investments are designated as major, significant, or other IT investments.

Major IT investments meet at least one of the following criteria:

- Total lifecycle costs greater than $35 million[4]
- Financial systems with a lifecycle cost greater than $500,000[5]
- Multiple-bureau and/or agency projects
- Mandated by legislation or executive order, or identified by the Secretary as critical

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[4] IT investments with lifecycle costs greater than $5 million require review by the Executive CPIC (see Section 1.6 of this chapter for details of roles and responsibilities of bureau and Departmental decision-making bodies) and approval if the bureau has a certified CPIC process. For those bureaus that do not have a certified CPIC process the threshold is greater than $500,000. Generally, only those deemed as "major" are fully reviewed, approved, and monitored within the Department's CPIC process and are approved and monitored by OMB. For other investments that are not deemed "major", generally the bureaus follow their CPIC process to review, approve and monitor these investments. However, OMB has the discretion to review, approve, and monitor "non-major" projects that it determines merit attention.

[5] OMB has defined a financial system as an information system, comprised of one or more applications, that is used for any of the following: collecting, processing, maintaining, transmitting, and reporting data about financial events; supporting financial planning or budgeting activities; accumulating and reporting cost information; or supporting the preparation of financial statements.

- Requires a common infrastructure investment
- Department strategic or mandatory-use system
- Significantly differs from or affects the Department infrastructure, architecture, or standards guidelines
- High risk as determined by OMB, GAO, Congress and/or the CIO
- Directly supports the President's Management Agenda Items of "high executive visibility"
- E-Government in nature or use e-business technologies must be identified as major projects regardless of the costs.

These investments are considered to be strategic for the Department and, thus, have a greater documentation burden, including being individually reported to OMB on an Exhibit 300B.

- **Significant** IT investments are those investments deemed significant by the agency but do not rise to the definition of “major” (e.g., used by a single agency, agency-wide in scope, relative high lifecycle cost, etc.).
- **Other** IT investments are those investments that are not deemed major or significant. They are generally investments of lower dollar value that are aggregated with other small IT investments to complete the costs included in the agency IT portfolio.

3. New and Existing Investments

New and existing investments will be evaluated against the following set of criteria. Each investment must address the following questions:

CPIC/I-TIPS:

- In which investment phase does this investment fall: Pre-Select, Select, Control, Evaluate, or Steady-State?
- If this is an existing investment, indicate the category, based on the CPIC criteria: Major, Significant, or Other.

PMA/E-Government

- Does the investment support the President’s Management Agenda—Expanding Electronic Government?
- Does the investment support one or more Quicksilver initiatives? Identify the initiative name(s)?
- If the proposed investment is related to the Geospatial One-Stop initiative or the Recreation One-Stop initiative, has the proposal been coordinated with the Geospatial One-Stop and/or the Recreation One-Stop teams?

Collaboration

- Does this project support one agency, multiple agencies, or the entire DOI enterprise?
- Does the proposed investment leverage existing or proposed IT investments?
- Does the proposed investment unify and simplify program delivery and eliminate redundancy in system development and information and data collection efforts?
- Does the proposed investment enable sharing of information more quickly and conveniently between DOI employees and agencies and/or federal and state, local and tribal governments?

Planning & Assessment

- Does the proposed investment provide for increased customer-centered government? Identify customer group(s) impacted.
- Has business process reengineering/ improvement been conducted?
- Does the proposed investment address legislative priorities, GAO material weaknesses, OMB guidelines and/or IG findings?
- Does the proposed investment identify, examine and employ, where appropriate, industry best practices?
- Does the proposed investment reduce the reporting burden on citizens, public and private entities and/or employees? For information collection from the public, does the proposed investment identify the information collection package control number and associated forms numbers and title and the level of the service provided, (i.e., print, fill, save, submit, transmit)?
- Does the proposed investment describe the information and records to be created and the associated records management requirements from creation to disposition, such as records scheduling, migration, etc.?
- Does the proposed investment incorporate appropriate privacy safeguards, as needed?

Change Management Component:

- Does the proposal include a change management component?
- Does the proposed investment address the awareness and training requirements to effect change?
- Has the proposal considered governance, communications, training and other change management needs?

Citizen-Focus

- Has the project identified specific performance measures and indicators that are geared to citizens' needs?
- Will the proposed investment deploy existing or create easy-to-find point(s) of access to DOI services? Will the proposed investment use facilities such as FirstGov or USA Services?
- Will a marketing/communications plan promote the products/services to the public? Other government agencies? Business Partners? Internally?

Budget/Finance

- Does the investment reduce/eliminate redundant expenditures (intra and inter-Departmental)?
- Can multiple agencies collaborate or pool resources?

Architecture/Infrastructure/Security

- Does the proposed investment describe the technology components required to support this investment, (e.g., web farm, web server, e-signature, etc.)?
- Does the proposed investment advance IT priorities in the areas of enterprise architecture, telecommunication, and information management?
- Have security-related components been addressed and coordinated?

APPENDIX M — EXHIBIT 300 – CAPITAL ASSET PLAN AND BUSINESS CASE

Exhibit 300 – Capital Asset Plan and Business Case

The OMB Exhibit 300 consists of two parts, each of which is designed to collect information that assists OMB during budget review. Bureaus must review their portfolio of capital assets each year to determine whether it continues to meet bureau and Departmental mission needs reconciled with existing capabilities, priorities, and resources. Capital asset investments should be compared against one another (rated and ranked using decision criteria, such as investment size, complexity, technical risk, expected performance benefits or improvement) to create a prioritized portfolio.

Capital Asset Plans and Business Cases are products of a capital programming process and should be developed for all capital asset acquisitions. Major acquisitions are reported to OMB through an Exhibit 300 in the Select phase. (In the Pre-Select phase a mini-Exhibit 300, focusing on Part 1 of the Exhibit 300, is prepared -- see Appendix M at the end of the IT Guide in Chapter 2). A Capital Asset Plan and Business Case for each new and on-going major acquisition should be included in the bureau and Departmental capital asset portfolio. A major project requires special management attention because of its:

- Importance to a bureau or the Department's mission;
- High development, operating, or maintenance costs;
- High Risk
- High return; or
- Significant role in the administration of bureau or Departmental programs, finances, property, or other resources.

See Section 1.5 of the Introduction Chapter of this Guidance for a description of the Department's threshold requirements.

The Exhibit 300 requires information that demonstrates compliance with the capital programming and Capital Planning and Investment Control processes, and justifies new or continued funding for major acquisitions by demonstrating a:

- Direct connection to bureau and Departmental strategic plans;
- Positive return of investment for the selected alternative;
- Sound acquisition (program and procurement) plan;
- Comprehensive risk mitigation and management plan;
- Realistic cost and schedule goals;
- Measurable performance benefits; and
- Direct link to the President's Management Agenda focusing on e-government initiatives.

Detailed information to substantiate the portfolio of major projects is included in the justification, and will be documented in accordance with the bureau's capital programming process. Information within the Exhibit 300 should not be re-created, but is a byproduct or summary of all of the planning information necessary to approve the capital investment.

Capital Business Plan Submission

At the end of the selection process, a Capital Business Plan is developed and submitted with the bureau budget. The Business Plan includes all investments that have been approved through the select phase of the Capital Planning and Investment Control process, and is comprised of the Exhibit 300's for each investment. Recommendations for each of the bureau's portfolios are made through the Bureau Investment Review Board, the Executive CPIC (the Information Technology Management Council and the Construction Investment Review Board), Management Initiatives Team (MIT), the Management Excellence Council (MEC) and the Secretary, who has the ultimate responsibility of approving the IT investment portfolio.

Recognizing that business priorities may change and the rapid changes that occur in technology, updates to the Capital Business Plan may be necessary. If changes occur during the year, the bureaus or Departmental offices will submit investment selection documentation for any new investment, any enhancement, or modification to an existing operational system. The Office of the Chief Information Officer for IT and the Office of Managing Risk and Public Safety for construction will assist the bureau and Departmental office staffs in the development of the necessary documentation. The bureau and offices will ensure that the changes are made in the Information Technology Investment Portfolio System (I-TIPS).

Once an investment is approved, it moves to the control phase. As warranted, the Exhibit 300 is continually updated to reflect the current plans, status, conditions, progress, etc. throughout the life cycle for IT projects and during the design and construction for construction projects.

APPENDIX N — SECURITY INFRASTRUCTURE GUIDE

Overview

The Department of the Interior has a long-standing concern for the protection of its vital information and technology resources. The first Departmental computer security policy was issued in May 1980. Since that time, information technology has undergone significant changes. The Department's dependence on automation to accomplish its mission has led to extensive growth in the number and types of computer systems in operation or planned throughout the Department. As a result, automated information security concerns at the Department have increased.

The Department created its first full-time computer security position on August 15, 1988, because of increased Departmental awareness of potential security threats. The Department continues to modify and improve its information technology security program and policies in an effort to try to keep up with changing technology. The latest edition of the Departmental IT Security Plan was published in April 2002.

The Chief Information Officer (CIO) of the Department is responsible for providing policy, guidance, advice and oversight for IT security. The CIO is supported by the Departmental IT Security Manager (DITSM). (further information may be found at www.doi.gov/ocio/security) The senior official for IT systems (or Information Resources) management at each bureau is responsible for the security and protection of bureau IT systems. Each bureau shall appoint a Bureau IT Security Manager (BITSM) and an alternate to serve as the focal point for IT security matters and to coordinate IT security program requirements with the Department. In addition, each IT installation shall appoint an Installation IT Security Officer to ensure that users know and understand the security responsibilities for the IT resources they control.

Departmental policy requires managers and users, including contractors, at all levels to be responsible and accountable for protecting the information technology resources they utilize. Departmental policy also places emphasis on risk management, contingency planning, and awareness training.

Objectives

DOI will safeguard its IT systems through the implementation of the DOI IT Security Program, which will accomplish the following:

- Establish a level of IT security for all unclassified IT systems and information commensurate with the sensitivity of the information and with the risk and magnitude of loss or harm resulting from improper operation or losses resulting from fraud, waste, abuse, disasters, or mismanagement.
- Define, manage, and support the security planning process for all DOI systems.
- Establish a program to formally certify and authorize processing of SBU data on all systems within DOI.
- Define and manage the contingency planning process, including training and testing, to provide IT systems with adequate continuity of operations upon disruption of normal operations.
- Understanding, by all levels of DOI, the critical role of IT security to achieve DOI's missions and be appropriately and periodically trained through an IT security awareness and training program.
- Define and manage the computer security incident response capability program for all DOI employees.

- Use the procedures outlined in Federal Information Processing Standards (FIPS) and other Federal government guidance except where the costs of using such standards exceed the benefits or where use of the standards will impede DOI in accomplishing its mission.

Policies and Bulletins

Several documents establish and define the Department's policy for the security of its information technology resources. These include:

- Departmental Manual Chapter 375 DM 19, "Information Technology Security Program"
- Departmental Information Technology Security Plan (ITSP), April 2002
- Risk Assessment Guide
- Contingency Planning Guide
- System Security Plan for General Support Systems
- System Security Plan for Major Applications
- Asset Valuation Guideline

Interior IT Security Guidance

Information Technology Security Team

The Department established the IT Security Team (ITST) in January 2002. The Team's mission is to ensure the successful implementation of the Office of Management and Budget (OMB) Circular A-130, Appendix III. The ITST is chaired by the DITSM with membership comprised of BITSMs and representatives from the Inspector General's office. The team works on issues relating to IT security such as policy, procedures and reporting to oversight agencies.

Training and Awareness

Awareness training plays an important role in achieving the Department's goal for computer security. Periodic computer security awareness training is provided to employees who are involved with the management, use, or operation of computer systems under its control. The training objectives are to enhance employee awareness of the threats to and vulnerability of computer systems; and to encourage the use of improved computer security practices within the Department.

Personnel

IT related supervisors, in conjunction with their respective personnel and security officers, review positions within the Department and assigned a sensitivity level based on the program supported and duties assigned. Personnel Officers arrange for background investigations for personnel assigned to sensitive positions.

IT Security Program Manager: Roger Mahach 202-208-6194

APPENDIX O — CAPITAL PLANNING FOR TELECOMMUNICATIONS SYSTEMS

Introduction

Investments in telecommunications infrastructure are subject to the CPIC processes and procedures. The purpose of this appendix is to summarize the CPIC process and apply it to specifically to telecommunications infrastructure investments. Refer to the Guide for full details on CPIC process.

Telecommunication infrastructure includes the full range of voice, data, and video services and equipment, including Internet, intranet, extranet, LAN, WAN, and wireless, toll-free network services and calling card services. The telecommunications infrastructure has two components: (1) Telecommunications equipment and (2) telecommunications services. Telecommunications equipment includes routers, switches, private branch exchanges (PBX's), cell phones, video cameras, etc. used for various modes of transmission such as digital data, audio signals, image and video signals. Telecommunications carriers provide telecommunications services to move data, voice, or video signals from one location to another regardless of the type of media used.

CPIC processes apply to telecommunications infrastructure investments when those investments exceed one of the criteria that follow:

- Total lifecycle costs greater than $35M
- Financial systems with a lifecycle cost greater than $500K
- Significant multi-bureau and/or agency impact
- Mandated by legislation or executive order, or identified by the Secretary as critical
- Department strategic or mandatory-use system
- Significantly differs from or affects the Department Infrastructure, architecture or standards guidelines
- High risk as determined by OMB, GAO, Congress and/or the CIO

EVALUATION CRITERIA

Evaluation criteria serve as a basis for the evaluation of telecommunications planning, design, acquisition, installation/integration, operations, and maintenance.

Select Phase	• What is the scope of the anticipated requirements for the project? • What changes to current capability are anticipated? • What is the current and anticipated budget? • Has resource sharing been explored? • Based on a supportable cost estimate, is return on investment (ROI) positive?
Control Phase	• Has the system been acquired and deployed in a satisfactory manner? • Have goals and measures been established? • Have original cost estimates been compared to actual total costs of ownership?
Evaluate Phase	• Is the system functioning as anticipated? • What are the lessons learned for replacement or upgrade?

Select Phase Activities

What is the scope of the anticipated requirements for the project?

The first step of the select phase is to perform a preliminary investigation to determine whether the telecommunications infrastructure investment opportunity is related to existing performance, a need for different information or data, a need for improved cost control, security requirements, efficiency requirements, or customer service issues. Once the current environment and customer concerns are understood, it becomes possible to define the perceived business problems, as well as the causes and effects. Preliminary network improvement objectives are defined, and an analysis determines the size of the gap between the legacy network and requirements for change.

What changes to current capacity are anticipated?

Stakeholders can identify what technology exists in the legacy network that performs functions associated with improvement objectives, and assess the current state of network performance relative to those objectives. In the early stages, it should be possible to determine whether the problems are too minor or great to solve, or whether next steps should be taken to initiate a project. The gap analysis should have sufficient detail to determine the scope of a project.
Scope defines how big the project is and how long it may take to accomplish the improvement objectives. Telecommunications technology experts such as network design engineers, network operations technicians or network transmission engineers should be able to review the current state of the network and estimate in general terms how much development is required to achieve the desired state, and how long it might take.

Has resource sharing been explored?

Stakeholders and project proponents hold conversations with the bureau CIO, Departmental and other bureau telecommunications experts to determine opportunities for intra- and inter-bureau network planning.

Based on a supportable cost estimate, is return on investment (ROI) positive?

This includes development of a supportable cost estimate and cost benefit analysis to support selection of an investment alternative. A cost benefit analysis should present at least three alternatives, with one alternative being to continue with no change. Many factors should be considered during the process of estimating costs for the alternatives. For each alternative, consider what labor costs are likely to occur throughout the entire system development lifecycle and develop estimates based on the general scope of the anticipated tasks. The **Cost Checklist for Telecommunications Labor** (below) includes recommended tasks that have telecommunications labor costs to consider in the project cost estimate.

Cost Checklist for Telecommunications Labor

Components	Personnel
Planning	Agency head, agency sponsor, project sponsor or functional manager, IT manager, system analyst, capital planning analyst, budget analyst, quality assurance manager, configuration management specialist, administrative
Design	Project manager, IT manager, system analyst, network architecture engineer manager, traffic modeling engineer, systems integration engineer, test engineer, quality assurance manager, configuration management specialist

Acquisition	Contracting specialist, project manager, IT manager, capital planning analyst,
Installation	Project manager, on-site technicians, integration engineer, test engineer, administrative, logistics (inventory tracking, handling shipping), training, administrative
Operations and Maintenance	Functional manager, training manager, help desk logistics (maintenance, repairs), technical engineering, support, administrative, quality assurance manager, configuration management specialist
Gap Analysis	Project sponsor or functional manager, project manager, IT manager, system analyst, network architecture engineer
Rough order of magnitude lifecycle cost	Project sponsor or functional manager, project manager, IT manager, system analyst, network architecture engineer
Telecom-munications infrastructure analysis	Project manager, IT manager, system analyst, network architecture engineer, traffic modeling engineer, systems integration engineer, test engineer
Cost Estimate	Project manager, IT manager, system analyst, network architecture engineer, traffic modeling engineer, systems integration engineer, test engineer
Systems/service performance goals/measures	Project manager, IT manager, system analyst, network architecture engineer, traffic modeling engineer, systems integration engineer, test engineer, quality assurance manager, configuration management specialist
Cost Estimate	Agency head, agency sponsor, project sponsor or functional manager, project manager, IT manager, system analyst, capital planning analyst, budget analyst, administrative
Telecom-munications infrastructure post-implementation	Project sponsor or functional manager, project manager, IT manager, system analyst, network architecture engineer, quality assurance manager, configuration management specialist
Performance Goals/Measures	Project sponsor or functional manager, project manager, IT manager, system analyst, network architecture engineer, quality assurance manager, configuration management specialist
Project Status	Project sponsor or functional manager, project manager, IT manager, system analyst, network architecture engineer

Next, consider costs for the non-labor project costs for each alternative. The **Checklist for Telecommunications Non-labor Costs** (below) provides a checklist of additional telecommunications components that may be useful in developing a total cost of ownership lifecycle cost estimate.

Checklist for Telecommunications Non-labor Costs

Cost Type	Components
Facilities	• Office space for project management office telecommunications team members • Logistics including equipment staging, warehousing (spares), training, repairs • Cost of new construction for implementation • Cost of modifications for implementation • Land mobile radio shelters
Real Estate	• Property for telecommunications facilities or infrastructure.
Network Design, Development, and Management Software Tools	• Requirements management • Diagramming • Design • Traffic modeling • Simulation • Prototyping • Optimization • Network management • Configuration management • Quality assurance • Help desk • Inventory tracking.
Application Software	• Purchased COTS applications • Periodic COTS license fees.
End-User Hardware/Equipment (purchase and lease costs)	• Plain old telephone service (POTS) Handsets • Secure phones • Secure faxes • Secure cellular telephones • Fixed telephony • Pay telephones • Pagers • Cellular telephones • PCS telephones • Satellite telephones • Enhanced specialized mobile radios (Nextel) • Land mobile radios • Videoconferencing equipment • Satellite dishes.

Network Infrastructure Hardware/Equipment (purchase & lease costs)	• Web Servers • Communications Hardware (hubs, routers, bridges, switches, PBX's) • Power protection devices (UPS, line conditioning equipment • Backup generators • Network Cabling • Lab or test equipment • Operation support servers (e.g. billing, inventory, tracking, maintenance) • Microwave equipment • Radio Towers • Repeaters • Wiring
Services	• Local voice, video and data transmission services • Domestic long distance voice, video, and data transmission services • International voice, video, and data transmission services • Secure voice, video, and data transmission services • Toll free number services • Commercial wireless transmission services • Microwave frequency management • Land-mobile radio frequency management • Automated attendant • Voice mail • Teleconferencing • Videoconferencing • Internet access • Access for the disadvantaged • Call center support • Help desk support • Redundancy • Emergency response • Recovery • Repairs • Capacity planning • Cost estimating • Cost management • Records management (call detail records) • Design • Integration • Installation

	• Testing • Optimization • Training

Benefits are the services, capabilities, and qualities of each alternative, and can be viewed as the return from an investment. The following questions will help define benefits for telecommunications infrastructure:

Accuracy—Will the system improve accuracy by reducing transmission errors?

Availability—How long will it take to develop and implement the system?

Compatibility—How compatible is the proposed alternative with existing procedures?

Efficiency—Will one alternative provide faster or more accurate response?

Maintainability—Will one alternative have lower maintenance costs?

Modularity—Will one alternative have more modular components?

Reliability—Does one alternative provide greater hardware or software reliability?

Security—Does one alternative provide better security to prevent fraud, waste, or abuse?

Every proposed telecommunications infrastructure investment should have identifiable benefits. Organizational benefits could include flexibility, organizational strategy, risk management and control, organizational changes, and staffing impacts. Customer benefits could include improvements to the current telecommunications services and the addition of new services. Customers should help identify and determine how to measure and evaluate the benefits.

The dollar value of benefits can be estimated by determining the fair market value of the benefits. An important economic principle used in estimating public benefits is the market value concept. Market value is the price that a private sector organization would pay to purchase a product or service. Intangible benefits can be quantified using a subjective, qualitative rating system

After costs and benefits for each system lifecycle year have been identified, convert them to a common measurement unit by discounting future dollar values and transforming future benefits and costs to their "present value." Present values are calculated by multiplying the future value times the discount factors published in the OMB Circular A-94. Detailed procedures for calculating Return on Investment and evaluating results can be found in Part XX of the Guide.

CONTROL PHASE ACTIVITIES

Has the system been acquired and deployed in a satisfactory manner?

THE CONTROL PHASE MOVES AN INVESTMENT FROM REQUIREMENTS DEFINITION TO IMPLEMENTATION. THE MAJOR COMPONENT OF THE CONTROL PHASE IS GOOD PROJECT MANAGEMENT. PROJECT MANAGEMENT INVOLVES EXECUTING THE NECESSARY SKILLS AND MANAGEMENT PRACTICES TO ENSURE SUCCESSFUL INVESTMENT DEVELOPMENT AND IMPLEMENTATION. ELEMENTS OF PROJECT MANAGEMENT IN THE CONTROL PHASE INCLUDE:

- Project planning
- Scope management
- Risk management
- Cost and Schedule management (using Earned Value Analysis tools)
- Performance measurement
- Organizational management

Have goals and measures been established?

Goals and measures flow from the investment's Cost Benefit Analysis. Benefits become the project goals that are measured to determine project success. The performance measurement component of project management consists of five steps:

- Analyze how the telecommunications infrastructure investment supports the mission goals and objectives and reduces performance gaps
- Develop (or update) performance objectives and measures that characterize success
- Develop collection plan and collect data
- Evaluate, interpret and report results
- Review process to ensure it is relevant and useful

Evaluation Phase Activities

Is the system functioning as anticipated?
What are the lessons learned for replacement or upgrade?

Investments are reviewed in during the evaluation (steady-state) phase to ascertain their continued effectiveness in supporting mission requirements, evaluate the costs of continued maintenance support, assess technology opportunities, and consider potential retirement or replacement of the investment. The following steps provide a template for a Post Implementation Review (PIR) for telecommunications infrastructure investments.

1. Provide a brief summary of the investment to include mission areas supported, key capabilities, customer/user base, interfaces, and dependencies.
2. Provide a summary of the summary of the mission analysis to determine if the system is continuing to meet mission requirements and needs. Include the investment's performance measurement projected baseline and actual performance information to determine if the investment is continuing to provide realizable benefits.
3. Assess user and customer satisfaction via surveys, user input, or analysis of user trends.
4. Assess investment performance against approved performance measures.
5. Assess the technology to determine potential opportunities to improve performance, reduce costs, support the enterprise architecture, and ensure alignment with DOI strategic direction.
6. Conduct an O&M review to assess the cost and extent of continued maintenance and upgrades.
7. Describe the recommended actions; continue, terminate the existing system, or consider new investment alternatives.

APPENDIX P — I-TIPS REQUIREMENTS BY PHASE

The following is a checklist for I-TIPS Investment and Portfolio Managers to use when entering information in I-TIPS on their agencies' investments. This list is divided into the five phases of the Capital Planning and Investment Control (CPIC) process. For further instructions on using I-TIPS, please refer to the *I-TIPS Users' Guide, Version 3.02* by selecting the following URL:

Pre-Select Phase

- Create the new investment.
- Create a contacts list for this investment.
- Add the investment to your agency's Investment Pool and to the agency's Investment Portfolio.
- Designate the investment as Major, Significant, or Small/Other.
- Ensure that points of contact such as the Project Sponsor and/or Functional Manager are kept updated within the General Information folder.
- Complete the Select Screening Criteria checklist found in the Selection Screening information of the Selection Information section.
- As directed by your agency, use the established scoring weights and rules in I-TIPS to assist in ranking this investment with others in the portfolio.
- Complete Lifecycle Cost and Lifecycle Budget information located in the Financial Information folder.
- Add supporting information to the Resource Library for the investment, such as preliminary budget estimates and spreadsheets and the Investment Review submission package.
- Grant permissions to allow OCIO, OCFO, EWG, IRB, and others to view the investment.

Select Phase

- Update the Lifecycle Cost and Lifecycle Budget information located in the Financial Information folder as required.
- Add any new or revised documentation that supports the initiative to the Resource Library. This includes documentation such as the Investment Review submission package, the Performance Measures Plan, Project Plan with schedule and costs, and Security and Telecommunications information. It also includes the Business Case, Risk Profile, Technical Profile, and Management and Planning Profile information.
- Complete the Performance Measures information.
- Complete the Planned Cost and Schedule information.
- Review and complete the Select Screening Criteria checklist found in the Selection Screening information of the Selection Information section.
- Complete the Select Scoring Scorecard Information located in the Selection Scoring Information section of the Investment Manager.
- Grant permissions as needed to enable editing, viewing, and scoring.

Control Phase

- Update the Lifecycle Cost and Lifecycle Budget information located in the Financial Information folder as required.
- Add any new or revised documentation that supports the initiative to the Resource Library, such as the Investment Review submission package.
- Update the Performance Measures information.
- Update the Planned Cost and Schedule information.
- Complete the Control Screening Criteria checklist found in the Control Screening Information section.
- Complete the Control Scoring Scorecard information located in the Control Scoring Information section of the Investment Manager.
- Review initiative history and background information to support assignment of individual scores located in the General Information folder and in the initiative's Resource Library.
- Ensure all folders from the Select Phase are completed and the Selection Status folder indicates the investment is approved and finalized so it can advance to the Control Phase.
- Complete the Control Screening and Control Scoring data screens in the Control Information folder.
- Complete the Control Cost and Schedule Information folder, including milestones to the 2nd level, associated costs, and variances.
- Grant Permissions as needed to enable editing, viewing, and scoring.

Evaluate Phase

- Update the Performance Measures information.
- Update the Planned Cost and Schedule information.
- Add any new or revised documentation that supports the initiative to the Resource Library, such as the Investment Review submission package. Include copies of the Post-Implementation Review and Independent Verification and Validation.
- Grant permissions as needed to enable editing, viewing, and scoring.

Steady-State Phase

- Update the performance measures information.
- Update the planned cost and schedule information.
- Add any new or revised documentation that supports the initiative to the resource library, such as the investment review submission package.
- Add any new or revised documentation that supports the initiative to the resource library, such as the investment review submission package. include copies of the post-implementation review and independent verification and validation.
- Grant permissions as needed to enable editing, viewing, and scoring.

APPENDIX Q — QUARTERLY MILESTONE CONTROL REVIEW

Purpose

Once proposals have been approved and funded and the project is initiated, the Control phase begins. During this step of the CPIC process, proposal teams led by the project manager evaluate project performance and submit quarterly progress reports to determine if schedules and costs are on target. The Quarterly Milestone Control Reviews enable bureau and Departmental decision-makers to revalidate the planning assumptions made on capital projects that have already been selected for funding and to develop a well-informed picture of current and potential problems with these projects. They also enable the bureau and Departmental senior officials to ensure that project managers take action to correct identified deficiencies.

Reporting on the Portfolio

The IT and construction project managers within each bureau will be asked by their respective bureau's investment review board (IRB) on a quarterly basis to prepare a report on the project status noting any variance. The bureaus' IRBs will evaluate individual project status reports and assemble these reports into a portfolio status report of ongoing projects (see Attachment A as a suggested format for displaying the bureaus' portfolios). The portfolio status report is an important tool in the planning and management of the portfolio.

Reporting on Projects at Variance

If a project is behind schedule, over or under cost, or not being developed according to expectations, the bureau IRB must decide whether to continue the project as is, modify the project, cancel the project, or accelerate the project's development. Decisions of this sort require careful study and consideration.

The Information Technology Management Council (ITMC) and the Construction Investment Review Board (CIRB) receives quarterly reports for IT and construction projects respectively, that are at variance of greater than 5 percent for cost, schedule and performance. For these projects at variance, the project managers are required to prepare a *Quarterly Summary Project Control Report* (see report form in Attachment B of this Appendix). Included in the report is a corrective action plan for each project that outlines the steps the project manager will implement to bring the project back on track with the cost, schedule and/or performance. For those projects with a variance of greater than 10 percent, the corrective action plan will require MIT and MEC review and approval prior to seeking OMB approval. (Corrective Action may include a request for change in project baseline)

Conducting earned value analysis (see Appendix I—Earned Value Analysis), and the identification and the updating of performance measurements (see Appendix G — Performance Measurement) are major components to determine if projects are at variance during the Control phase. Timely, accurate and thorough earned value analysis and performance measurements are crucial to successful implementation of existing investments as well as decision-making on future investments

In some instances, the project manager will be requested to present a project status report to the bureau IRBs or to the Department's Executive CPIC's Information Technology Management Council (ITMC) for IT projects and the Construction Investment Review Board (CIRB) for construction projects. The ITMC or CIRB will review bureau IRB recommendations for projects at variance and determine whether to continue the project as is, modify the project, cancel the project, or request that an in-process review be conducted prior to making any decisions. The Office of Chief Information Officer (OCIO) and the Office of Managing Risk and Public Safety (MRPS) will work with their respective bureau counterpart organizations to ensure that projects that have deficiencies or problems identified (actuals exceed estimated levels, risks are increasing, requirements have changed, etc.) are brought to the attention of the ITMC or the CIRB.

Critical Issues to be Addressed Quarterly

During Executive CPIC Control Reviews, the following critical areas should be addressed.

1. Status of the critical path:
   a. Where is the investment on the critical path?
   b. If it is behind schedule, by how much?
   c. Is there a strong plan for recovery, and what steps are being taken to recover?
2. Milestone hit rate:
   a. What is the total number of milestones planned vs. the total number actually met?
   b. What is the milestone hit rate since the last control review or since the most recent Executive CPIC review?
3. Deliverables hit rate:
   a. What is the number of deliverables provided to date vs. the number planned?
4. Issues:
   a. Have there been issues that had a major effect on the investment?
   b. Are issues logged and evaluated, and resolutions documented?
5. Actual cost-to-date vs. estimated cost-to-date:
   a. What is the total cost-to-date vs. the estimated cost-to-date?
   b. Is Earned Value Management used to measure actual resources expended against planned resources expended and to estimate future performance of projects?
   c. Are causes of cost variances tracked and addressed?
6. Actual resources vs. planned resources:
   a. Are there more or fewer FTEs working vs. number of FTEs planned?
   b. Has there been significant, unplanned turnover among the core team, Project Manager or Sponsor?
7. Have high-probability and high-impact risks been tracked and adequately addressed?
8. Has contractor reporting been adequate?
   a. Does the contractor report by Work Breakdown Structure (WBS) and does the contractor utilize an Earned Value Management System of project management?
      i. Task progress (Actual cost and schedule reporting)
      ii. Deliverables
      iii. Planned activities
      iv. Expenditures
   b. Are the reports assessed and action taken?

Annual Review of Projects and the Portfolio

During the Quarterly Reviews meeting that coincides with the development of the capital investment portfolio for the next budget cycle, the bureau investment review boards receive a more detailed annual report that, in addition to the regular quarterly review questions, answers the following questions:

- Are the answers to the "Three Pesky Questions" still "yes"?[6]

- Does the project still adhere to the DOI IT architecture?
- Have new requirements "crept" into the project?
- Have goals, objectives, scope or mission changed since the original application was submitted?
- Have any other planning assumptions changed?
- Is there sufficient confidence that the acquisition plan and accountability to ensure the success of the project are still high?
- Has a viable operational analysis been developed?
- Has a maintenance plan been developed to maximize the life of the investment and minimize operating costs?
- Have outcome performance measures been determined to ensure the project is viable? Do those measure support DOI strategic goals?

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[6] Three Pesky Questions:

1. Is the function the asset will support tied directly to our agency mission?
2. Could another agency, government or private entity do the job better?
3. Have our processes been reengineered to give the best performance at the lowest cost?

UNITED STATES DEPARTMENT OF THE

INTERIOR

SAMPLE

Capital Planning and Investment Control

Capital Project Quarterly Status Report Summary

Bureau _____ Date _____

Number	Project Name	Estimated Total Cost ($M)	Project Status	Schedule Variance	Cost Variance	Performance Variance	Summary of Variance and Corrective Actions

UNITED STATES DEPARTMENT OF THE

INTERIOR

Quarterly Summary Project Control Report

Reporting Period:		**Executive CPIC:**
Project Number:	**Project Name:**	**Bureau:**

Assessment	**COSTS**
Assessment	**MAJOR MILESTONES AND SCHEDULE**
Assessment	**PERFORMANCE MEASURES**
Overall Assessment	

Include in each category the variance percentage, an explanation of the variance and any proposed corrective actions and attach revised Exhibit 300.

🔴	The category or overall assessment will be noted as red if the actual cost, milestones and schedule, and/or performance measures indicate significant variances from the planned for the reported period. (Variance greater than 10 %)
🟡	The category or overall assessment will be noted as yellow if the actual costs, milestones and schedule and/or performance measures indicate some minor variances or a trend of minor difficulties. (Variance between 5 % and 10 %)
🟢	The category or overall assessment will be noted as green if the actual costs, milestones and schedule and/or performance measures indicate that the project is within costs, on schedule and has no performance problems or issues. (Variance is less than 5 %)

APPENDIX R — CPIC PROCESS ASSESSMENT

Focused senior management attention is required to ensure that each bureau's capital planning and investment control process is adequate, well managed and effectively implemented. Improvements to the CPIC process should continuously occur within the context of the organization's evolving needs, objectives and operating plans. The responsibility of facilitating and managing the organization's process improvements are typically assigned to a process group comprised of staff responsible for managing the CPIC process with their organization. The bureaus need to establish and sustain a group to support and maintain a documented standard CPIC process. The bureaus must also provide the long-term commitment and resources required to ensure the overall success of the group's activities.

Although OMB sets the driving guidance and direction of the CPIC process, bureaus have substantial flexibility to fit this standard process within current management processes. Management's commitment and the resources necessary for sustaining and improving a standard process are critical to establishing the CPIC process at each bureau. Utilizing a set of process standards enables consistent performance within each bureau and provides a basis for cumulative, long-term benefits to the bureau that, in turn, provides increased benefits to the Department and the Federal government. Continued improvements to the bureau's process are obtained through various sources, including performance measurements, lessons learned during implementation, results assessment, establishment of baselines and benchmarking against the Department, other bureaus and other Federal agency processes and recommendations from other improvement initiatives.

The General Accounting Office's (GAO) Information Technology Investment Management (ITIM) Stages of Maturity, as described in GAO's May 2000 Version 1 of the ITIM: A Framework for Assessing and Improving Process Maturity, identifies key CPIC processes, creates a means of assessing an organization's capital investment management capability and maturity, and offers recommendations for improvement. ITIM was designed as an analytical tool to aid Federal agencies with establishing and assessing IT investment processes. However, ITIM can also apply to the capital planning and investment control of construction and other capital assets and will be used as a Departmental standard to regularly assess the capability of the Department and individual bureau CPIC processes. The complete GAO publication describing ITIM can be found at http://www.gao.gov/special.pubs/ai10123.pdf.

ITIM, as summarized below in Figure R-1, measures the presence or absence of processes supporting all phases of the CPIC process. ITIM is a valuable tool that (1) supports organizational self-assessment and improvement and (2) provides a standard against which an external evaluation of an organization can be conducted.

MATURITY STAGE	DESCRIPTION	CRITICAL PROCESSES
Stage 1 – Creating Investment Awareness	There is little awareness of investment management techniques. Capital investment management processes are ad hoc, project-centric, and have widely variable outcomes.	• No Defined Critical Processes

Stage 2 – Building the Investment Foundation	Repeatable investment control processes are in place and key foundation capabilities have been implemented.	• Capital Investment Board Operation • Capital Project Oversight • Capital Asset Tracking • Business Needs Identification for Capital Projects • Proposal Selection
Stage 3 – Developing a Complete Investment Portfolio	Comprehensive capital investment portfolio selection and control processes are in place that incorporate benefit and risk criteria linked to mission goals and strategies.	• Authority Alignment of Capital Investment Boards • Portfolio Selection Criteria Definition • Investment Analysis • Portfolio Development • Portfolio Performance Oversight
Stage 4 – Improving the Investment Process	Process evaluation techniques focus on improving the performance and management of the organization's capital investment portfolio.	• Post-Implementation Reviews • Portfolio Performance Evaluation and Improvement • Systems and Technology Succession Management
Stage 5 – Investing for Strategic Outcomes	Investment benchmarking and Technology-enabled change management techniques are deployed to strategically shape business outcomes.	• Investment Process Benchmarking • Technology-Enabled Business Process Change Management

FIGURE R-1 – ITIM STAGES OF MATURITY WITH CRITICAL PROCESSES[7]

ITIM as a Tool for Organizational Improvement

ITIM offers a roadmap for improving their capital investment management processes in a systematic and organized manner. These process improvements are intended to:

- Improve the likelihood that capital investments will be completed on time and on budget;
- Promote a better understanding and management of capital investment related risks;
- Ensure that capital investments are selected based on their merits by a well-informed decision-making body;
- Implement process management improvement ideas and innovations; and
- Increase the business value and mission performance improvements of capital investments.

The implementation of ITIM as a tool for organizational improvement can be achieved in a variety of ways. For example, an organization can create a separate improvement program, employ external assistance and support, or use it as a managerial support tool. Regardless of the implementation technique, the following important factors should be considered when using ITIM as an organizational improvement tool.

- Bureaus will have a variety of selection, control, and evaluation processes currently in place across the organization. ITIM can help these organizations understand the relationships among these processes and determine the key opportunities for immediate improvements.

[7] The ITIM Stages of Maturity was revised so it can be applied to the management of all capital investments

- ITIM is a structured approach that identifies the key practices for creating and maintaining successful capital investment management processes. However, ITIM describes *what* to do, not *how* to do it. Thus, specific implementation methods can and will vary by organization.
- The developmental nature of a maturity model means that process maturation is cumulative. Lower stage processes provide the foundation for upper stage processes. As additional critical processes are introduced into and implemented within the organization, the organization attains greater process capabilities and maturity. As additional processes are incorporated within the organization, the maturity progression requires that the organization maintain previously implemented lower stage critical processes at each successive stage of maturity.
- ITIM is not a substitute for good project management. While ITIM takes an enterprise-wide focus, good project-level management forms the foundation for successful capital investments.
- Critical processes may be initially implemented and practiced within individual bureaus or divisions before they are implemented and are mature across the organization.
- Within ITIM, business process improvement (BPI) initiatives are not considered to be IT investments but instead are considered to be parallel efforts that may or may not be linked to IT investments. Thus, ITIM assessments do not evaluate individual BPI initiatives. However, if such initiatives do have IT investments, then these IT investments should be subject to the organization's IT investment management process.

ITIM as A Tool for Assessing Maturity of an Organization

Just as ITIM can be used as a tool for organizational improvement, it can also be used as a standard against which the maturity of the capital investment management process of a given organization can be judged. For example, ITIM can be used to support external inspections to ensure compliance with industry standards or acceptable practices, independent reviews of organizational maturity by oversight bodies, or other external CPIC process reviews. Regardless of the specific use, however, the following important factors should be considered when using ITIM as an organizational assessment tool.

- An ITIM assessment can be conducted for an entire organization (e.g., an executive branch department) or for one of its lower level divisions (e.g.. a branch. bureau. or agency). However, the unit or scope of analysis (e.g., branch, bureau, agency. or department) must be defined before conducting an ITIM assessment. Additionally, the assessed maturity stage for a lower level division is not necessarily indicative of the maturity stage of a higher-level division or of the organization as a whole.
- ITIM is applicable to organizations of different sizes. Some of the processes described in ITIM may be implicitly conducted by smaller organizations. For example, although ITIM addresses the organizational need to align and coordinate multiple IT investment boards, clearly a smaller organization with only one investment board would implicitly perform this critical process.
- An organization may be concurrently implementing key practices associated with several maturity stages. In fact, key practices associated with upper stage critical processes are frequently initiated while the organization as a whole is at a lower stage of maturity.

- However, organizational maturity is determined by assessing at what maturity stage the organization implements all key practices for all of the critical processes associated with a given stage of maturity and any lower maturity stages. For example, performing key practices in just several Stage 3 critical processes does not mean the organization has attained Stage 3 maturity.
- The key practices describe *what* is to be done not *how* it is to be done. Alternative practices may accomplish the underlying purpose of a critical process. The key practices should be interpreted rationally to judge whether the purpose of the critical process is effectively achieved.

Establishing Investment Review Boards: A Critical Initial Step

In order to operate a CPIC process that meets Department certification standards and to make progress in Stage 2 of ITIM, each bureau is to establish and maintain an Investment Review Board (IRB), chaired by the Bureau Head or Deputy Bureau Head. The IRBs are to be comprised of senior bureau managers. These boards are required as part of the Fiscal Year 2005 President's Budget Pre-Select and Select Phases. They will also be structured to conduct the Control, Evaluate, and Steady State monitoring activities.

The IRB is to systematically review all pertinent investments and to recommend to its bureau head new capital investments. The IRB evaluates and makes recommendations to the bureau head on existing information technology and construction projects to manage a bureau capital investment portfolio which best supports the Department's missions and program delivery processes. The bureau head will approve and submit investments for major IT and construction projects into the Department's CPIC process. The decision to proceed includes identifying and approving the needed budget resources. For all phases of the CPIC process, the IRB conducts investment reviews and makes recommendations to the bureau Head. Each IRB will:

- Develop and maintain multi-year capital investment plans for IT and construction investments using the pre-select process;
- Guide business case (Exhibit 300) preparation and review;
- Identify project integration opportunities;
- Score and rank investments;
- Review ongoing projects to ensure that their status, progress, and outlook are satisfactory and consistent with project plans;
- Provide individual investment and portfolio management;
- Identify deficiencies in project management and monitor corrective actions.
- Oversee the bureaus' CPIC process;
- Submit completed business and multi-year plans to PMB and OCIO staff for analysis in support of the Executive CPIC;
- Provide recommendations to the ITMC or CIRB to support their decision to continue, reduce, terminate, or defer IT or construction projects, respectively;
- Conduct periodic reviews of project status, control, performance, risk and outlook for approved and funded projects; and
- Establish and execute the necessary project controls to manage requirements; risk; cost, schedule and technical baselines; and performance outcomes.

At a minimum, the IRB will maintain a documented description or charter outlining their bureau's CPIC process and the roles and responsibilities of the IRB and other entities and bureau offices involved in CPIC. The IRB will develop and use a standard set of criteria to assemble a bureau capital investment portfolio that feeds into the Department's capital investment portfolio. The criteria will be modeled after those developed by the OCIO for IT and the Office of Managing Risk and Public Safety (MRPS) for construction based on OMB criteria. The criteria will include a consideration of Departmental or Government-wide impact, visibility, cost, risk, architecture, and standards. For further information on the bureau IRBs see Appendix A — Board Procedures

The steps below need to be accomplished in the short-term along with establishing a bureau IRB. They also apply in strengthening the Department's CPIC processes.

- Establish policy and charters to formalize the roles and activities of the IRB that governs the bureau-level CPIC process;
- Formulate policy and direction to delegate authority and accountability and define roles and responsibilities for the CPIC process;
- Establish and maintain interfaces to the Department's oversight and review organizations, and for the Department with OMB, GAO and other Federal agencies;
- Implement a bureau-wide CPIC process to pre-select, select, control, and continuously evaluate a comprehensive portfolio of capital projects;
- Align the CPIC process with other internal processes such as budget formulation, strategic planning, procurement and acquisition, program management and technical reviews;
- Strengthen the competencies and capabilities of capital investment staff and Project Managers through practical "hands-on" training.

A CPIC Self-Assessment Guide

To help assess bureau progress in navigating the ITIM roadmap toward CPIC maturity, the following self-assessment criteria developed by the Department of Energy will serve as a tool for bureaus and the Department to use in improving and developing their CPIC processes. Below is a list of critical activities that need to occur at each CPIC phase and key questions to aid in assessing progress in achieving sound CPIC processes.

Overall Capital Planning and IT investment Process

- Has the agency developed and published guidelines, which document their process?
- Do the guidelines define where and/or how data on capital projects will be maintained?
- Does the agency maintain and track data on its current capital investment portfolio by category of investment in accordance with current OMB reporting guidelines?

Pre-Select and Selection

Activities

- Screening of proposed investments
- Analyzing and ranking all investments based on benefit, cost, and risk criteria
- Selecting a portfolio of projects
- Establishing project review schedules
- Evidence that each project has met project submission requirements
- Analyses of each project's cost, benefits, and risk

- Data on the existing portfolio
- Scoring and prioritization outcomes
- Project review schedules
- Determining whether projects met process-stipulated requirements
- Deciding upon the mixture of projects in the overall capital investment portfolio

Assessment Questions

- Is there a process in place for screening new capital investments?
- Does the process establish the time guidelines and assign responsibility for scoring and selecting investments?
- Is the data required for the initial project submission clearly defined?
- Have standard benefit, cost, and risk criteria been developed Are the new initiatives required to submit analyses based on these criteria?
- Has the methodology been established to score and develop priorities for IT investments?
- Are all the phases of the process properly documented?
- Have the selected initiatives been linked to the budget?
- Have the selected initiatives been linked to the mission?

Control

Activities

- Consistently monitoring projects
- Involving the right people
- Documenting all actions and decisions
- Feeding lessons learned back in to the selection phase
- Measures of interim results
- Updated analyses of each project's costs, benefits, schedule, and risks
- Deciding whether to cancel, modify, continue or accelerate a project
- Aggregating data and reviewing collective actions taken to date

Questions

- Can capital initiatives be consistently monitored with existing control processes?
- Are the right people assigned to specific roles and responsibilities? Do they have the authority and the expertise to make decisions regarding capital projects?
- Based on the data required to be submitted by each initiative can a decision be made to cancel continue or accelerate the investment process?

Evaluate and Steady-State

Activities

- Conducting post-implementation reviews (PIR) for IT and post-occupancy evaluation (POE) for construction using a standard methodology
- Feeding lessons learned back in to the Selection and Control phases
- Measurements of actual vs. projected performance
- Documented "track record" (project and process)
- Assessing the project's impact on mission performance and determining future prospects for the project
- Revising the selection and control phases based on lessons learned

Questions

- Is there a forum to evaluate capital projects?
- Are the standards used to compare the actual versus projected investment performance?
- Can a project's impact on mission performance be determined?
- Is the methodology in place for analyzing and documenting the lessons learned for the select, control, and evaluate phases? Can the phases be revised or improved based on lessons learned?

APPENDIX S — ACQUISITION STRATEGY

Development of the project's acquisition strategy should begin as soon as the need is identified and the budgetary process is begun. For projects subject to the A-11, Exhibit 300 capital asset investment process, this occurs well in advance of the fiscal year in which the contract award is necessary. Acquisition strategy development represents the initial segment of Acquisition Planning. Acquisition Planning encompasses:

- Development of the overall acquisition strategy;
- Stating the program's needs;
- Identifying all essential acquisition actions, including milestones; and
- Identifying potential sources.

Acquisition planning and market research should be conducted for all acquisitions as appropriate for the dollar value and the complexity. A written plan is required when it is expected that the acquisition will be over the $300,000 threshold (404 DM) or at a lower threshold if so adopted by the bureau/office. Acquisitions related to capital asset investments subject to the A-11, Exhibit 300 decision process, generate the most formal acquisition planning process and documentation. In these cases, the acquisition strategy segment of the plan is both more formal and required earlier in the process.

Program management, contracting, financial, technical and personnel from other appropriate disciplines are brought together as an integrated project team (IPT), from the outset, to create the acquisition strategy required to support the A-11, Exhibit 300 Investment Decision Document and, ultimately, to prepare and execute the acquisition plan.

In order to achieve the desired acquisition objectives, the required acquisition plan must identify those milestones at which decisions should be made. The plan shall address all technical, business, management, and other significant considerations that will control the acquisition. The specific content of the plans will vary, depending on the nature, circumstance, and state of the acquisition. In preparing the plan, the Contracting Officer or formal Source Selection Official, if so designated, should adhere to the outline contained in FAR 7.105, summarized below, together with the Agency's implementing procedures contained in DIAR 1407 and 404 DM, Acquisition Planning. In addition, supplemental requirements for the acquisition of major systems are covered under FAR Part 34 and contract bundling under FAR 7.107. 375 DM and 376 DM should be consulted for requirements unique to IT resource requirements.

Acquisition Plan Format and Contents for Projects Subject to the CPIC Process

Acquisition plans for projects subject to the CPIC process will be prepared in two segments, and include the contents as specified in FAR Subpart 7.105. Segment I – Program Acquisition Strategy - shall be prepared and submitted as part of the required documentation for the investment selection process phase. Segment II –Acquisition Phase plans- would only be prepared as part of the formal acquisition process after the project has been selected by the Department for inclusion in the FY budget request to OMB, included in the President's budget submitted to Congress and included in the Agency's Appropriation Act signed by the President.
If necessary and appropriate multiple contracts may need to be awarded to bring the capital asset to the fully operational stage and during the maintenance phase. These contracts will be supported by multiple Segment II Acquisition Phase plans. (Occasionally, a program will be initiated by Congress and included in the Agency's Appropriation Act. When that occurs, the Agency must prepare the necessary Exhibit 300 supporting documentation as soon as possible and obtain the CPIC process approval prior to executing the program contracts.)

Acquisition Strategy Documentation Supporting the CIPC Process

As part of the investment decision process, requesting offices will provide all the information listed below for Segment I of the acquisition plan. The information to be provided includes background, objectives, and the overall acquisition strategy. The IPT designated by the bureau/office initiating the capital asset acquisitions (including procurements from existing contracts) must complete the Acquisition Strategy information, and submit it for review and approval as part of the capital investment selection process.

Segment I -Acquisition Strategy at Program Initiation

The information in this section of the plan constitutes the acquisition strategy and initial plans and includes, from FAR Part 7:

- Statement of Need;
- Applicable conditions;
- Life Cycle Cost Estimates, including energy consumption and asset disposal, if applicable;
- Preliminary market research for prospective sources;
- Contract type;
- Source selection procedures;
- Capability or performance;
- Delivery requirements;
- Trade-offs; and
- Risks.

Acquisition Phase Documentation Supporting the Procurement Process

The Acquisition Phase begins after the Agency has determined, in the Investment Selection Phase, that a capital asset acquisition is necessary, and has received funding authorization from Congress. The Acquisition Phase includes those actions necessary to complete the procurement of the required resource including: the final determination/validation of requirements; market research; completion of Acquisition Plan - Segment II, and includes effective post-award contract administration, validation of the cost/benefit analysis in the operations period and, if applicable, disposal of the asset at the end of the systems life. The program office and the IPT will complete the following steps and develop the required supporting documentation.

Validate Requirements

The IPT should begin by validating that the Planning Phase decision is still current, and a need still exists for the asset.

Final Market Research

A more in-depth, formal market research effort is now required as the first step in the Acquisition Phase. It should build on the data collected in the initial market survey. This research is done for the purpose of collecting and analyzing information about market capabilities to satisfy Agency needs. Competition is important; each acquisition plan must describe how competition will be incorporated into the investment.

Segment II - Acquisition Phase Plan

Segment II of the acquisition plan is required to be developed before a procurement can be initiated. The information in Segment II shall serve as the "plan of action", and includes:

- Source selection procedures;
- Contracting considerations;
- Budgeting and funding;
- Product descriptions;
- Priorities;
- Contractor versus Government performance;
- Management information/Performance management system;
- Test and evaluation;
- Logistics consideration;
- Government-furnished property;
- Government-furnished information;
- Other considerations;
- Whether the Statement of Work (SOW) is performance based;
- Sources Solicited and Responding with Offers/Bids;
- Competition and Competitive Range Determinations, if applicable;
- A summary the performance goals in the contract as stated in the SOW; and
- Identification of participants in the acquisition planning process.

Major Systems Acquisition

In addition to the acquisition planning requirements that are imposed by FAR Part 7, supplemental policies and procedures must be followed for the acquisition of major systems, as defined in FAR Part 34 and OMB Circular A-109. Policies and procedures for use in acquiring IT are contained in FAR Part 39.

Final Acquisition Plan Approval (for Capital Investment Projects Subject to the A-11, Exhibit 300 Process

Upon completion of Acquisition Plan – Part II, the plan will be submitted for review and approval by Contracting Officer, the Head of Contracting Activity (HCA), Competition Advocate, as applicable, Senior Program official, and technical team leader. Detailed information on acquisition planning can be found in FAR Part 7.

The Acquisition Plan for major IT systems and construction projects must be reviewed by the Office of Acquisition and Property Management (PAM) and approved by the Senior Procurement Executive prior to submission of the business case to OMB. PAM will score each major system/construction project business case as part of the Executive CPIC review.

APPENDIX T — STRATEGIC PLANNING – PRESIDENT'S MANAGEMENT AGENDA

Overview

Proposed Departmental investments should be consistent with the policies and direction described in the President's Management Agenda and Secretary Norton's Plan for Citizen-Centered Governance. Proposed investments should also demonstrate linkages to the Department's strategic plan, relevant bureau/office strategic plans, and appropriate internal management plans. This section provides an overview of the management policies of the Department and the Administration, describes the Department's strategic planning structure, and provides guidance in linking proposed investments to strategic goals.

President's Management Agenda

The President's Management Agenda (PMA) was issued in August 2001. The PMA describes the Administration's management priorities and objectives. The PMA is organized around three guiding principles: citizen-centered government; results-oriented management; and market-based approaches, actively promoting innovation through competition.

The PMA includes five key elements:

1. Strategic Management of Human Capital
2. Competitive Sourcing
3. Improved Financial Performance
4. Budget and Performance Integration
5. Expanded Electronic Government

The following is a brief summary of the main objectives of the five PMA elements:

Strategic Management of Human Capital

- Human resources strategies should be linked to mission, vision, goals and objectives
- Strategic workforce planning and flexible tools should be used to develop a high-performing workforce and attract and retain quality workforce
- Agencies should determine core competencies, develop internal capacity, or contract for services

Competitive Sourcing

- Assess activities in accordance with the FAIR Act
- Develop processes to improve and expand competition
- Incorporate full costs into budget and acquisition processes

Improved Financial Performance

- Improve the timeliness of financial reporting
- Reengineer reporting processes
- Enhance the usefulness of financial information

Budget and Performance Integration

- Integrate performance reviews with budget decisions
- Develop quality performance measures and integrate associated costs
- Develop activity-based costing approaches

Expanded Electronic Government

- Create single points of access for government services
- Share information more effectively with State, local, and Tribal governments
- Automate internal processes to reduce costs

To assist in the implementation of the E-Government initiative, the Administration established the "Quicksilver" task force in 2001. The task force and the President's Management Council identified 24 high-impact E-Government projects organized under four business lines:

- Government to Government (G2G)
- Government to Citizen (G2C)
- Government to Business (G2B)
- Internal Efficiency & Effectiveness (IEE)

Interior is the managing agency for two of the 24 government-wide projects, **Geospatial One-Stop** and **Recreation One-Stop**. Proposed investments related to geospatial information and recreational programs should be consistent with these two projects. Interior is also participating in the following government-wide E-Government projects:

- Disaster Assistance
- Safecom (Wireless Networks)
- E-Travel
- Integrated Acquisition
- E-Grants
- Enterprise HR Integration
- E-Payroll Integration
- Recruitment One-Stop
- E-Training
- One-Stop Business Compliance

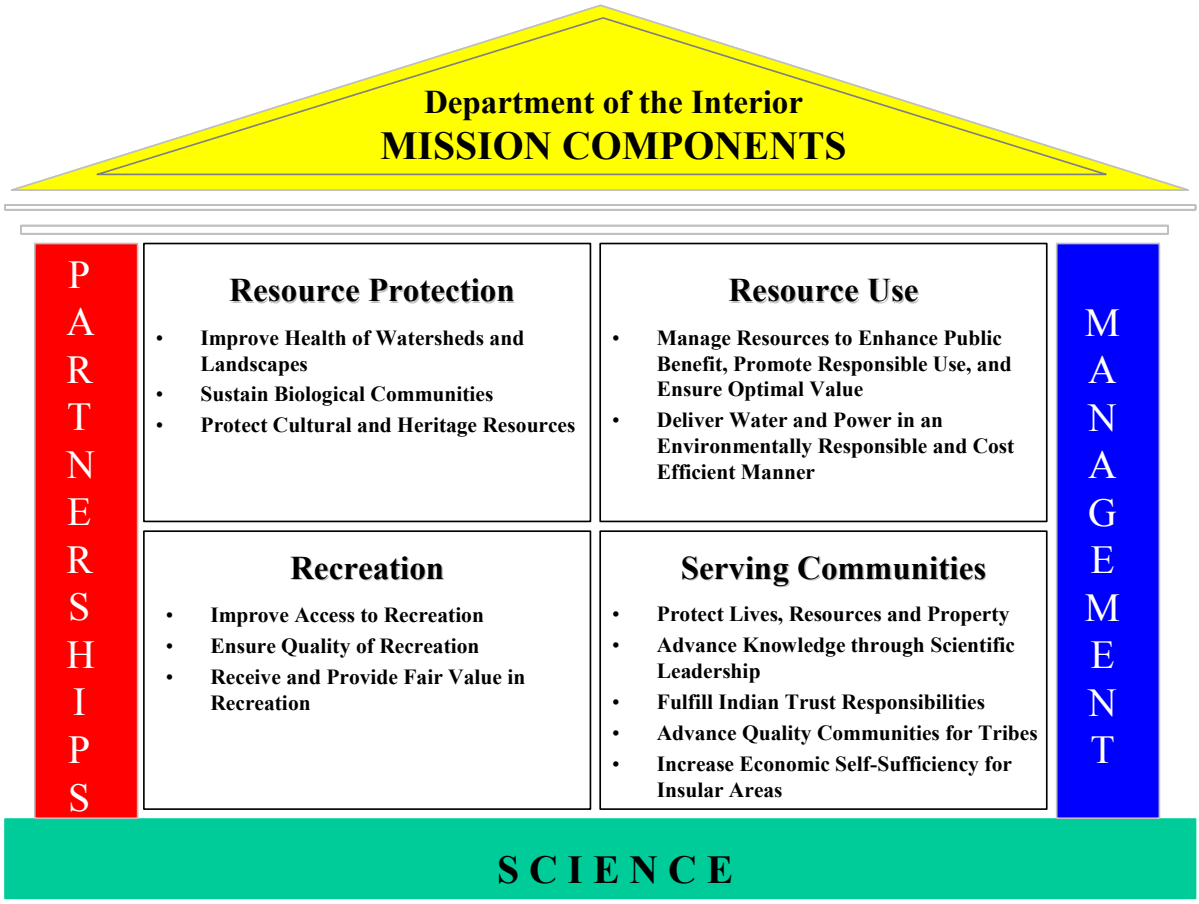
Proposed IT investments in these areas should be consistent with and supportive of these initiatives.

Interior's New Strategic Plan

The Government Performance and Results Act (GPRA) requires all Federal agencies to develop strategic plans, develop annual performance plans that are tied to the Agency goals and budget allocation, and report actual results against performance plans. Interior is developing a new Strategic Plan that revolves around the Department's four major mission components: Resource Protection, Resource Use, Recreation, and Serving Communities. The five elements of the President's Management Agenda are tools for helping us deliver results in these goal areas in a citizen-centered way. The Secretary's Four C's (Conservation through Cooperation,

Consultation, and Communication) set the tone for cooperating with many partners internally and externally to achieve our mission.

DOI Draft Strategic Plan Framework Overview



The Department began revising its five-year strategic plan in 2001, well ahead of the statutory date for plan revision, in order to align its planning process with the FY 2004 budget formulation process. The revised strategic plan will be an integrated document, reflecting the Department's evolution toward an enterprise approach to management. Previous strategic plans consisted of separate bureau documents and a Departmental overview. This decentralized approach is being replaced with a single, highly integrated, Department-wide strategic plan. The result will be an enterprise-based, outcome-oriented, and organizationally unified planning framework. The new strategic plan is consistent with Interior's vision of a unified Departmental management approach.

The revision of the strategic plan was initiated in 2001 with a review of the primary missions of the Department. Multi-bureau internal teams subsequently developed a set of outcomes, strategies, and performance measures for each mission area. In addition, the Department convened a series of stakeholder meetings to solicit external viewpoints and recommendations. Hundreds of organizations and individuals participated in the facilitated focus

group sessions, and several thousand comments were received. The conclusions and recommendations of the focus sessions and comments were incorporated into a strategic plan framework.

The strategic plan framework -- consisting of core missions, end outcome and intermediate outcome goals and companion performance measures—has undergone a series of intensive, multi-level internal reviews. The next critical steps include additional review by all senior officials in the Department, continuing consultation with the Office of Management and Budget, consultation with Congress, and publication of a full draft strategic plan for public review and comment.

The new strategic plan should be completed in early 2003, allowing bureaus and offices to tie proposed investments to the new set of Departmental strategic goals and objectives. Bureaus or offices with questions about the relationship of a proposed investment to the new plan should consult with their strategic planning office or the Department's Office of Planning and Performance Management at 202-208-1818.

Linking Proposed Investments to Strategic Goals and Objectives

Proposed Departmental investments should be consistent with the policies and direction described in the President's Management Agenda and the Secretary's Plan for Citizen-Centered Governance. Proposed investments should also demonstrate linkages to the Department's strategic plan, relevant bureau/office strategic plans, and appropriate internal management plans. The Exhibit 300 for a proposed investment should identify specific strategic goals and/or objectives that will be supported by the investment. The 300 should describe how a proposed investment would help the organization meet the relevant goals and objectives.

In addition to the Department's strategic plan, there are several additional policy and guidance documents that may have a relationship to proposed investments. Projects should be reviewed for consistency with the goals and performance measures expressed in these documents. The following documents may be consulted:

The Secretary's Plan for Citizen-Centered Governance. The Secretary's plan is based upon the President's Management Agenda, and includes a series of goals for the Department's management programs.
(http://www.doi.gov/ppp/ccgp2.html)

Interior's Strategic Human Capital Management Plan. This plan provides a roadmap for the Department to develop and use the skills and abilities of our employees in more effective and productive ways.
(http://www.doi.gov/pfm/human_cap_plan/)

Interior's Information Technology Strategic Plan. The IT Plan establishes a framework to also align information technology resources with the Department's critical missions and programs.
(www.doi.gov/ocio/strategic/retyped_final_whole.doc)

Internal bureau/office Strategic Plans and Annual Performance Plans. Bureaus will prepare internal strategic plans and annual operational plans to implement and supplement the high-level goals included in the Departmental strategic plan.

APPENDIX U — VALUE ENGINEERING

Purpose

Value Engineering, also termed Value Analysis, Value Management, and Value Methodology, is defined as an "organized effort directed at analyzing the function of systems, equipment, facilities, services and supplies for the purpose of achieving the essential functions at the lowest overall costs consistent with the required performance, reliability, quality and safety". The value engineering analysis process, or value methodology, reduces processes, equipment, facilities, services, supplies, or products to their most basic functional elements and then looks for cost effective alternatives. In the most basic terms, value engineering is a systematic approach to obtaining optimum value for every dollar spent. The study of functions helps achieve "best value" for resources involved by improving the relationship of worth or utility to monetary cost. Best Value is attained when an item performs its function at an optimum level of quality, reliability, maintainability, and life-cycle cost.

Value Engineering is a proven management tool that can be used by agencies to streamline operations, improve quality, and reduce contract costs. The value engineering methodology emphasizes the return on investment aspect of decision-making in terms of life cycle costs to maintain or improve on desired levels of capability and performance during planning, acquisition, execution and procurement activities. For example, a value engineering study could conclude that a different, initially more expensive heating system would be less costly over the life of the system because it was more energy efficient than a proposed system with a lower acquisition cost.

Value engineering is an effective tool to help analyze and manage risk, conduct alternative analysis, and support economic and business decisions in the design and development of IT and Construction projects.

Value Engineering Directives and Guidelines

The Federal Government and Congress have acknowledged the merits and importance of implementing the value engineering methodology as a management tool. The following summarizes Value Engineering specific requirements that are applicable to Federal agencies.

1. Public Law 104-106, enacted February 10, 1996, amended the Office of Procurement Policy Act (41 U.S.C. 401 et seq.) By adding the following:

"Sec.36 VALUE ENGINEERINGIN GENERAL.– Each executive agency shall establish and maintain cost-effective value engineering procedures and processes.

(a) DEFINITION. – As used in this section, the term 'value engineering' means an analysis of the functions of a program, project, system, product, item of equipment, building, facility, service, or supply of an executive agency, performed by qualified agency or contractor personnel, directed at improving performance, reliability, quality, safety and life cycle costs."

2. Office of Management and Budget (OMB) Circular A-131, "Value Engineering." May 21, 1993, requires Federal Departments and Agencies to use value engineering to identify and reduce nonessential procurement and program costs. Federal agencies are to establish and improve on their use of value engineering as a tool to ensure realistic budgets and reduce program and acquisition costs. The Circular stipulates that agencies' value engineering programs encompass certain aspects, including:

- A single entity to manage and monitor value engineering efforts

- A process that ensures that funds necessary for operating agency value engineering programs are included in annual budget requests

- An approach to facility acquisition and design to incorporate environmentally-sound and energy-efficient practices and materials

- A practice of actively eliciting value engineering change proposals from contractors

- The use of FAR (Federal Acquisition Regulations), Part 48 & 52, value engineering program requirement clauses in procurement and production contracts

Originally written and issued in 1988, OMB Circular A-131 has been the main directive that has guided Federal agencies to implement value engineering practices. OMB recognized that for agencies to be successful at implementing a value engineering program, they needed three main elements of an effective program: organization and staffing, policies and procedures, and continuity of support.

3. DOI Value Engineering Guidance Handbook is a complete reference document that explains the principles and methodology of value engineering. The essential elements of a value engineering program, duties, responsibilities and procedures are described. A detailed explanation of the Six-Step Job Plan for a comprehensive VE study is provided. Blank VE forms are provided to assist personnel and contractors in conducting VE studies. A complete reference section and training support are provided. Contact information: DOI Value Engineering Program Manager, Kurt A. Gernerd, Office of Managing Risk and Public Safety, Washington, DC, 202/208-5399, kgernerd@ios.doi.gov.

4. DEPARTMENTAL VALUE ENGINEERING MANUAL (369 DM 1)

Federal agencies have found that a successful value engineering program requires a clear statement of policies and well defined procedures. The Value Engineering program must be an integral part of the overall project delivery process and not a separate entity designed to cut costs or reduce quality for the sake of preventing project budget overruns.

369 DM 1 - Value Engineering, establishes Interior policy, assigns responsibilities, and defines objectives, goals and actions required to maintain an effective Value Program within all Interior Bureaus and Offices. It provides more specific procedures, actions and responsibilities for carrying out the DOI Value Engineering Program. The DM states that “All [Construction] projects over $1,000,000 shall be subjected to VE study”.

The Department of the Interior adheres to the basic value engineering philosophy that the methodology is applied to enhance the value received per dollar spent over the life-cycle of constructed assets. Interior’s policies and procedures include the following general overall objectives:

I. The VE program should be an integral part of the overall project delivery process. The application of VE should be planned and scheduled early and often to promote timely, effective and efficient input into the project.

II. For maximum effect without undue impact on project schedules, VE focus must begin early in the planning and design process, then continue through preliminary design and into construction documents if necessary.

III. Emphasis is placed on identifying maximum life-cycle value for first-cost dollars expended within project budgets. Improved value can be represented in a number of different ways depending

upon specific project needs. This would include improved function, flexibility, expandability, maintainability, sustainability, and reduced life-cycle costs.

IV. An effective VE program must be supported by top management and organizational authority, with stable and adequate funding.

Value Engineering Study Methodology

The VE study must follow VE methodology precisely, using a Six-Step Job Plan. The job plan is described in detail in the DOI VE Guidance Handbook. The Value Engineering/Analysis study plan consists of:

1. Information gathering
2. Speculation
3. Evaluation of alternatives
4. Develop top alternatives
5. Presentation of recommendations
6. Implementation

1. Information Gathering - The objective of this investigative phase is to acquire knowledge of the project to be studied and to assess major functions, cost, and relative worth. The critical requirements of the information phase are (a) determining the basic and secondary functions of the items in the design, and (b) relating these functions to cost / worth.

2. Speculation - The objective of this phase is to determine alternative ways that the necessary function can be performed. A number of alternatives for each basic function(s) of high cost design elements, with high cost-worth ratio, are generated through brainstorming.

3. Evaluation - Alternatives developed in the speculation phase are now subjected to an initial feasibility analysis. The study team refines the alternatives to ensure that they meet the necessary project criteria, environmental, and operating conditions of the particular situation. Ideas whose advantages outweigh the disadvantages and which indicate the greatest cost savings are selected for further evaluation.

4. Development - The development phase of the value engineering job plan is to thoroughly analyze the best alternatives selected during the evaluation phase. Additional data and information are collected, project and life-cycle cost estimates are prepared, and change proposals are developed, where applicable, in order to determine feasibility of implementation.

5. Presentation - The initial presentation of the value engineering recommendations must be concise, factual, accurate, and presented in such a manner as to create a desire on the part of those responsible to implement the change. The success of the value engineering study is measured by the savings achieved from implemented study recommendations.

6. Implementation - The implementation plan must describe what must be done by whom and by what time and for how much cost, to modify the existing design, concept, program, or process. Decision makers need to know the full impact of acceptance, including costs, risks and benefits.

UNITED STATES DEPARTMENT OF THE
INTERIOR

Department of the Interior

Departmental Manual

Effective Date: 10/6/98

Part 369: Value Engineering

Chapter 1: General Criteria and Policy

Originating Office: Office of Managing Risk and Public Safety

369 DM 1

1.1 Purpose. This part implements the Value Engineering (VE) provisions of Public Law 104-106 and Office of Management and Budget (OMB) Circular No. A-131, Value Engineering. It establishes policy, assigns responsibilities, and defines objectives, goals, and actions required to establish and maintain a productive VE program. For the purposes of this Departmental Manual value analysis, value planning, value management and value control all use the value process/methodology and are considered synonymous with VE.

1.2 Scope. The VE program is a mandatory program that applies to all Department of the Interior (DOI) bureaus and offices. All DOI bureaus/offices shall use VE methodology and analysis techniques as a management instrument in performing or contracting for the planning, design, construction, repair and rehabilitation/renovation of facilities, and in administrative and management programs to improve operations, identify and remove nonessential capital and operating costs, and improve and maintain optimum quality of program and acquisition functions. Bureaus/Offices which administer Federal grant programs involving construction, repair and rehabilitation of facilities shall encourage grantees to implement VE wherever possible.

All bureaus/offices having contractual authority for procurement and/or construction will implement contractor Value Engineering Change Proposal (VECP) programs in accordance with references 1.3C, 1.3D, 1.3E, and 1.3F.

1.3 References.

A. Public Law 104-106, Defense Authorization Act, Section 4306 - Value Engineering for Federal Agencies, February 10, 1996.

B. OMB Circular No. A-131, Value Engineering.

C. Federal Acquisition Regulation (FAR), Title 48, Part 48 (Value Engineering), and value engineering clauses in Part 52.

D. FAR, Title 48, Part 31, Contract Cost Principles and Procedures.

E. Title 43, (Public Lands: Interior), Part 12, Subpart C, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments.

F. Department of the Interior Acquisition Regulation (DIAR), Part 48, Value Engineering.

G. DOI Value Engineering Guidance Handbook (Copies may be obtained from the Office of Managing Risk and Public Safety).

1.4 Definitions.

A. Administration and Management Programs. Include all activities, organizations and personnel that manage and perform tasks to meet the missions of the various bureaus/offices within DOI. Program activities include administration, supervision, labor, procurement, operations and maintenance, and similar activities needed to produce the products and services required by customers.

B. Certified Value Specialist (CVS). A designation recognizing those practitioners who have fulfilled the certification requirements as established by the CVS Board of the Society of American Value Engineers, International (SAVE, International), reflecting world-wide expectations of a professional Value Engineer.

C. Construction Program. Comprises planning, design, construction, maintenance, building, alteration or repair of buildings, structures, or other real property, and includes all preparatory conceptual design activities. Structures include but are not limited to, buildings, pavement, bridges, dams, irrigation systems, water supply and sewer systems, power generation and transmission systems, hatcheries, recreation facilities, and installation of fixed equipment.

D. Cost Avoidance. An action taken in the immediate time frame that will decrease costs in the future. For example, an engineering improvement that increases the mean time between failures and thereby decreases operation and maintenance costs is a cost avoidance action. Another example would be performing value engineering during the planning stages of a construction project. If a VE study reveals a different alternative that is lower cost and is consistent with project required performance, reliability, quality, and safety, then the change in project estimated cost would constitute a cost avoidance. Cost avoidance is the cost differential between the proposed project configuration developed by the planning efforts and the actual project configuration that is sent forward for design.

E. Cost Savings. A reduction in actual expenditures below the projected level of costs to achieve a specific objective. Examples of cost savings are: revisions to the design of an authorized and funded project such that actual expenditure for the project is less than the amount which was funded and scheduled to be expended; or, a measurable reduction in personnel requirements needed to conduct a specific required activity or project function.

F. Life Cycle Cost (LCC). The total cost of a system, facility, or other product, computed over its useful life. It includes all relevant costs involved in acquiring, owning, operating, maintaining, and disposing of the system or product over its useful life or other specified period of time, including environmental and energy costs. Economic analysis is used in determining LCC.

G. Program/Project/Activity (PPA). Any item specifically identified in tables or written material set forth in the Interior and Related Agencies Appropriations Act or accompanying reports.

H. Return on Investment (ROI). The ratio of the dollars saved through implementation of VE proposals versus the cost of performing the VE study or program (normally expressed similar to the following: ROI= $10:1).

I. Value (V). The relationship of worth to cost as seen by the user in regard to his/her needs and resources in a given situation. Worth for this purpose is defined as the lowest LCC that satisfactorily performs the function. When cost exceeds worth, poor value occurs. When cost is less than worth, good value exists.

J. Value Analysis/Management (VA/VM). The application of analysis techniques, such as functional analysis, cost evaluation, life-cycle costing, and creative techniques of "brainstorming" in an organized effort focused on improving (adding value to) non-construction processes, procedures and systems at reduced cost and/or resources while maintaining equal or improved services or products. The term value analysis or value management is often used when conducting value engineering study of administrative procedures, organizational structures, or management systems.

K. Value Engineering (VE). An organized team effort directed at analyzing the functions of processes, systems, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life-cycle cost consistent with required performance, reliability, quality, and safety. These organized efforts can be performed by in-house agency personnel and/or by contractor personnel.

L. Value Engineering Change Proposal (VECP). A proposal submitted by a contractor under the VE provisions of the Federal Acquisition Regulations (FAR) Part 48 that, through a change in a project's plans, designs or specifications as defined in the contract, would lower the project's cost to the Government. VE contract clauses are listed in FAR 52.

M. Value Engineering Proposal (VEP). A recommendation resulting from using VE methodology to study an item. It is developed by Government in-house employees and/or Government and non-Government contract personnel in the performance of a VE study.

N. Value Engineering Program Coordinator (VEPC). Manages the VE program at the bureau/office level.

O. Value Engineering Program Manager (MRPS-VEPM). Manages and oversees the DOI VE program in the Office of the Secretary, Office of Managing Risk and Public Safety (MRPS).

P. Value Engineering Review Board (VERB). A board composed of those individuals who head organizations that are responsible for implementing VE recommendations. A VERB must consist of personnel having decision-making authority that allows immediate action to be taken on each VE proposal/recommendation presented before it.

1.5 Policy.

A. All DOI bureaus/offices, in accordance with P.L. 104-106, this Part and the DOI VE Guidance Handbook, shall:

(1) Establish VE programs to ensure realistic budgets, identify and remove nonessential capital and operating costs, and improve and maintain optimum quality of program and acquisition functions;

(2) Utilize VE as an analytical technique in pursuing PPA and system improvements;

(3) Ensure VE program continual support with necessary funding and trained staff; and

(4) Maintain constant management support.

B. VE is applicable to any or all phases of PPA's. Review of VE proposals and recommendations should be prompt and objective with the intent to implement them to the maximum extent possible. Results shall be documented by the bureau/office VEPC and reported annually to MRPS-VEPM through bureau/office heads.

C. Responsibility and authority for the VE program are assigned to each of the DOI Assistant Secretaries. Goals, responsibility and authority will be suballocated to bureau/office heads and the VE program

coordinators. Meeting VE goals shall be a performance measure of bureau/office heads and appropriate managers responsible for the mandatory VE program.

1.6 Objectives. VE program objectives are to:

A. Increase productivity, innovation, communication, personal growth, and teamwork within the total organization through the use of VE principles, methodology and management.

B. Reduce costs to bureaus/offices while maintaining quality in fulfilling their missions by performing VE studies, promoting contractor VECP's and implementing VEP's and VECP's.

C. Encourage the application of VE to Federal grants, loans and cooperative agreements as a way to provide additional program benefits for a given funding amount.

D. Establish and maintain VE procedures and processes to provide for the systematic development and maintenance of the most effective, efficient, and economical arrangements for conducting the work of bureaus and offices, and to provide for identifying and reporting VE program accomplishments.

1.7 Goals.

A. Construction Programs/Projects/Activities. All bureaus/offices with mandatory VE program responsibility, as set forth in 369 DM 1.2, shall set as an annual fiscal year (FY) cost savings goal, the amount equal to four (4) percent of the aggregate value of all construction, repair, rehabilitation, and renovation projects that are over $500,000 in estimated project costs. All projects over $1,000,000 shall be subjected to VE study.

Projects between $500,000 and $1,000,000 may be excluded from VE analysis if it is determined that estimated VE savings do not economically justify study and redesign costs. Justification for VE analysis exclusion shall be reviewed and approved by the bureau/office VERB and reported to the MRPS-VEPM. Regarding those projects requiring several years to construct, the savings may be uniformly prorated over the construction period. Bureaus/Offices will use value engineering studies and contractor generated VECP's to meet the goal. The 4-percent goal will be evaluated after three (3) years to determine if it should be adjusted. In addition, each bureau/office shall have a goal to encourage contractor participation in the VECP program sufficiently to produce one VECP for every active contract over one million dollars ($1,000,000) that they administer.

B. Non-construction Programs/Projects/Activities. The bureaus/offices shall utilize VE methodology and analysis techniques in conjunction with other management improvement techniques to improve operations and reduce cost. When effectively applied, VE techniques
streamline operations, increase productivity, and improve quality. These include organizational development, production, specifications, standards, contract requirements, and other acquisition program documentation. VE can be incorporated into the business practices improvement process by using it as an analytical technique in process/product improvement. There is no minimum dollar amount threshold for requiring application of VE to a non-construction PPA.

C. Disposition of VE Savings. Subject to the PPA's appropriation language, money saved from VE efforts may remain with the bureau/office to be used within discretionary authority as follows:

(1) Fund authorized but underfunded or unfunded elements of the PPA where the VE savings accrued;

(2) Fund other VE reviews within that PPA;

(3) Fund authorized but underfunded or unfunded elements of another PPA through a reprogramming action;

(4) Fund other VE program activities of another authorized PPA through a reprogramming action if necessary;or

(5) Return surplus savings to U.S. Treasury.

1.8 Procedures.

A. Bureau/Office heads shall prepare and implement an Annual VE Plan of Action. The VE Plan of Action should list and prioritize specific projects or programs for VE study. Bureau/Office heads who administer Federal grant programs exceeding one million dollars ($1,000,000) in Federal funds per grant should prepare and implement a VE Plan of Action for promoting and encouraging VE and identify specific grant projects which will employ VE techniques. The development of an annual VE Plan of Action is required to aid in VE program planning and implementation; and shall be submitted to the MRPS-VEPM.

B. VEPC's will ensure VE activities are pursued below the $500,000 threshold whenever poor value is identified by the use of cost/worth determinations. Projects should be examined for unnecessary costs by people trained in VE. Studies will be performed if the ROI promises savings of $5:1 over study and redesign costs; if the project is over budget; or if requested by management. Studies mandated by this Part will be performed at a development stage when concept and estimated costs are sufficiently detailed for comparison of alternatives. However, VE studies may be performed at any phase of a PPA cycle to correct poor value. Voluntary VE studies do not supplant the mandated requirement, but any savings generated may be counted in meeting bureau/office goals defined in 1.7 above.

C. Architect-Engineer (A-E) design contracts for construction projects one million dollars ($1,000,000) or more must stipulate an independent VE study be performed on the design, preferably at the 25-40 percent design completion stage. Sufficient time should be scheduled to appraise the VE study and redirect design efforts, if necessary, before final design begins. VE studies may be conducted by Government personnel and/or by A-E firms with fully qualified VE capabilities and total independence of the design firm. VE actions that change approved design and procedures must include review by the authorities who approved the original design or procedures. The ultimate approval authority resides with the appropriate VERB.

D. VE costs will be accounted for and will be deducted from gross VE cost savings to show net return. VE costs include those for implementing VE proposals such as redesign, additional field and laboratory investigations, additional reviews, and other implementation costs. All VE costs will be identified in a manner to monitor program effectiveness. Funds for VE programs shall be included in the annual budget requests.

E. VE cost savings, cost avoidance, and cost savings sharing with contractors shall be reportable in the summary report of VE activities immediately following completion of the PPA design, award, adoption, or implementation as applicable.

F. VEPC's will accumulate, consolidate and forward the original copy of the annual summary of VE activities to MRPS-VEPM, Washington, DC, in the content and general format shown in the DOI Value Engineering Guidance Handbook or as requested. Reports will be submitted to reach MRPS-VEPM within 90 days after the end of the Fiscal Year (FY). VEPC's will submit additional reports as requested by the MRPS-VEPM. Any corrections or revisions to past reports should be forwarded to the MRPS-VEPM at the time they are made.

1.9 Responsibilities.

A. The Office of Managing Risk and Public Safety (MRPS) will:

(1) Oversee the entire DOI VE program; formulate, establish and maintain DOI policy on VE; establish goals; measure progress against the goals; evaluate program effectiveness; and submit reports required by OMB, the Congress, and others.

(2) Review Plans of Action, staffing, and funding to assure VE programs are being fully supported and utilized throughout DOI. Advise Assistant Secretaries and bureau/office heads of deficiencies and recommend corrective actions.

(3) Designate a full-time VE Program Manager, the MRPS-VEPM, and support staff as required, to develop and manage the DOI VE Program. The MRPS-VEPM will serve as the point of contact on VE matters for all elements within DOI and other agencies or elements interfacing with DOI.

(4) Report to OMB on VE Program goals and accomplishments as required by OMB Circular No. A-131. Establish report formats and schedules to be prepared and submitted by DOI elements.

(5) Promote a high level of professional VE competence within DOI. Advise selection committees on qualifications needed for key VE personnel. Establish and chair meetings with bureau/office VE Program Coordinators, at least annually.

(6) Utilize a crossfeed system and ensure it provides ideas and VE program information to all VE Program Coordinators. Coordinate, consolidate and schedule VE training programs for all bureaus/offices.

B. Program Assistant Secretaries are responsible for VE program efficiency and productivity in all bureaus/offices within their jurisdiction. The Assistant Secretaries will:

(1) Demonstrate support for the VE program to ensure total top management commitment for the program.

(2) Direct bureau/office heads to designate a VE position to be filled by a VEPC.

C. Bureau/Office Heads will:

(1) Assign all necessary resources and staffing to establish and maintain a VE program that fully complies with the requirements of this Part. Designate a VEPC individual.

(2) Ensure a VE organizational and management structure that supports a long-term program.

(3) Budget sufficient funds to pay for all VE activities, including: VE staff; VE studies conducted by Government personnel and/or A-E firms under contract; VECP processing; VE related technical assistance; review of VE proposals; redesign to incorporate accepted recommendations; VE related training; and incidental costs such as testing, travel and professional activities related to VE.

(4) Direct that a VE Plan of Action is prepared each year which describes the bureau/office VE goals and objectives. The plan should be submitted and reviewed by MRPS-VEPM and the Assistant Secretary. Direct corrective actions in plan execution when advised of inadequacies by MRPS-VEPM or by VEPC.

(5) Establish a VERB(s), as appropriate, within bureaus/offices with mandatory VE program responsibility to advise the VEPC, make recommendations on VE study proposals and provide management assistance in implementing proposals and recommendations.

(6) Provide training in VE techniques to bureau/office staff responsible for coordinating and monitoring VE efforts and for staff responsible for conducting VE studies and developing, reviewing, analyzing, and carrying out VE proposals, change proposals, and evaluations.

(7) Develop internal criteria and guidelines necessary to ensure accomplishment of VE requirements contained in this Part.

(8) Assign responsibility to the senior management official designated pursuant to section 1.9C(1) above, to grant exclusions to the requirement to conduct VE studies on certain programs and projects.

D. Bureau/Office VEPC's will:

(1) Maintain and monitor an active and effective VE program conforming to the requirements of P.L. 104-106, this Part, the DOI VE Guidance Handbook, the FAR and DIAR;

(2) Develop and assemble Plans of Action and summary reports of VE activities and other reports as requested;

(3) Coordinate and maintain a VE training program;

(4) Evaluate VE program effectiveness and recommend remedial or improvement actions to the bureau/office head; and

(5) VEPC's should strive to attain CVS status (Certified Value Specialist, as recognized by the Society of American Value Engineers, SAVE, International).

APPENDIX V — BUDGET CONSIDERATIONS IN CAPITAL INVESTMENT PLANNING AND CONTROL

Purpose

This appendix sets out some general considerations to assist anyone estimating and entering capital asset investment budget data into Exhibits 300 and 53 for the Department as well as those responsible for preparing the budget request for these investment funds. The Appendix to OMB Circular A-11 entitled "Principles of Budgeting for Capital Asset Acquisition" should also be studied for additional information regarding budget considerations in investment planning and control.

Exhibits 300 and 53 and the Budget

Annually, the Department is required to submit, in accordance with the requirements of OMB Circular A-11, a business plan justifying major investments as part of the Interior budget request. Business plans are currently prepared for construction and major rehabilitation investments in facilities and for information technology. The business plan is presented in the format of the Exhibit 300. The business plans are needed for existing projects and systems and incremental increases for existing projects and systems as well as for new initiatives. In Exhibit 300 the budget amounts needed for the investment appear most prominently in the Summary of Spending table in Part I. Dollar amounts that should tie to budget figures appear again in some form in the benefit-cost alternatives analysis and on the schedule of performance, schedule, and cost goals used to measure project status in Part I in Exhibit 300.

In addition <u>all</u> Department IT expenditures, investments in major systems <u>and</u> IT operations and management costs, are expected to be included in the Exhibit 53 sent to OMB in early fall with the budget request. Exhibit 53 breaks out individual major investments and small & other expenditures by category (purpose) for three years. The bottomline totals on your Exhibit 53 should equal the total IT obligations by your bureau for the prior year and the estimated budget authority for IT expenditures in the current and budget year. Exhibit 300 and 53 budget numbers should equal one another. There is no conceptual basis for a difference in these numbers.

Both Exhibit 300 and Exhibit 53 should demonstrate a clear linkage to the bureau budget itself. Readers of the Exhibits should be able to learn from them where in the budget structure the funding for each project is located. Going the other direction, readers of the budget presentations (budget requests to the Department and OMB and Budget Justifications prepared for the Appropriations Committees of the Congress) should find language that points out specific major investments and linkages to the business case, including cross reference from specific funding requests to specific Exhibit 300 plans. For this reason, it is important that bureau budget staff be included on the multi-disciplinary project teams throughout the life cycle of the project.

Validating the Budget Data in the Exhibits

During the Department's and OMB's budget process, the reasonableness of the cost estimates in these two exhibits is examined. If a budget analyst finds that the cost information is not well thought out and carefully presented, the investment will lose credibility and the chance of its being fully funded greatly reduced. Reasonableness is determined by the budget analyst if he or she finds positive answers to the following basic questions:

1) Do the dollar amounts in your budget, Exhibit 53 and Exhibit 300 agree?

2) Can descriptions and cross references to the systems described in the 300s be found in the budget justifications?
3) Are the dollar amounts in the current version of these exhibits consistent with the amounts in prior editions? If not, is the change readily explained?
4) Do the amounts in the Exhibit 300 budget summary of spending table, alternatives analysis, and funding goals schedule tie together in an explicit logical manner?
5) Where total amounts are shown in a table, is the math correctly calculated?
6) Are the funding trends and major changes in the summary of spending table explained in an understandable fashion in the written justification and project plan descriptions?
7) Do the funds for planning, acquisition, and maintenance show in the table in the years that would be expected from reading the project plan?
8) When funding for new systems ramps up, does the funding for the systems they replace go down?
9) Are previous Department and OMB input and concerns responded to? For instance, OMB and the Department have a continuing concern that linkages to specific Department Strategic planning goals be clear as well as linkages to e-Gov current projects or potential future e-Gov initiatives.

Note that while risk-adjusted costs might be used in your alternatives analysis, risk adjustment has no place in your budget numbers. It is still necessary to present these two numbers in a fashion that makes the relationship between them clear, i.e., be explicit in showing the application of the risk adjustments to costs if you do make them.

Source of Funds

Both the Exhibit 53 and the Exhibit 300 should include the source of funds (account charged for the project) in the presentation. This information is already part of the standard Exhibit 53 spreadsheet the CIO's office has been using. Including the source of funds means specifying the appropriations account in which the funds are provided and the activity and program within that account. If the funds result from pooling several account sources, all the sources should be listed. The bureau budget office should be consulted regarding what source of funds should be shown. Funds of any type (discretionary, mandatory, federal and non-federal reimbursements, balances, and allocations) should be reported.

The Exhibit 300 budget summary table requires estimates of both budget authority (how much funding you need available to start the project) and outlays (how much has been spent from the Treasury for the project). Most budget authority for investments is provided by the Congress in the annual appropriations acts. Outlays are significant because they are what OMB and the Congress watch most closely when analyzing the budget deficits or surpluses. Outlay information is also very helpful to budget analysts in understanding the budgetary impact of the investment, so it is worth putting forth the effort to establish realistic outlay numbers. Budget authority in one year is rarely equal to outlays that year. Copying the BA amount down into the outlay line signals budget reviewers that the plan has perhaps been prepared too hastily. Even in the case of an activity that is mostly salaries, there will be some small spillover of outlays into the following year unless all activity ends before the fiscal year ends. Outlays for contracts usually follow a payment schedule set out in the contract.

Note that the Summary of Spending table in Exhibit 300 includes six columns, the second through seventh, each of which shows amounts for a single fiscal year (prior year (PY) through budget year plus three (BY+3)). On the other hand, the first column (PY-1 and Earlier) and eighth column (BY+4 & Beyond) should include amounts from multiple years covering the entire estimated life of the project. In this way, when the columns are summed across the entire row, they should equal the total budget

authority and outlays over the life cycle of the project. Total budget authority for all years should equal total outlays for all years.

Budget Phasing

The OMB investment guidance requires that the entire amount of budget authority needed to complete a viable component of the investment, a so-called "useful segment," be requested in a lump sum. A useful segment is one that is economically and programmatically justifiable even if the larger investment of which it is a part is not completed. It has value in and of itself. OMB guidance also states that it is generally preferable to include as many segments as possible in the project plan as a risk reduction strategy. Funding an entire "useful segment" up front can create year-to-year "spikiness" in the budget funding levels requested. This is a problem. Investments with large funding spikes in appropriations request are difficult to get through the budget process, and this difficulty should be kept in mind when designing the segments, phasing of a major investment, and mapping out what the source of funds will be. A corollary of the caution on funding spikes is that level funding from year to year is much easier to deal with in a budget than funding patterns that rise and fall significantly from year to year. Once a project has ramped up to its full acquisition level it is best to keep it there until the acquisition phase is complete and the project is ready to ramp down to its maintenance level.

Basis for Estimates

Whenever budget estimates are shown they should represent the complete gross amount of the costs. Specifically, all related overhead costs that will be loaded onto the project should be included in the budget number. At the Department of the Interior the practice is **not** to inflate budget numbers for general economic inflation. Budgeting for assumed federal salary and benefit cost increases over the years is the practice, however. Budget offices will be able to provide advice on what increase factors should be used.

Budget Process

Interior's IT Capital Planning and Investment Control process is closely aligned to the budget formulation cycle at Interior. All capital investment budget requests will be reviewed and prioritized against not only other investments, but also all other funding demands based on meeting budget targets. The fact that an investment has passed successfully through the CPIC process is a necessary but not sufficient condition to ensure it being funded. New projects are justified based on the need to fill a gap in the Department's ability to meet strategic goals and objectives with the least life cycle costs of all the various possible solutions, and of meeting cost and schedule goals and delivering measurable performance benefits.

The initial budget estimates for each investment will be input into the Departmental I-TIPS at the beginning of the budgeting cycle. In FY 2005 this may be as early as mid-April. These budget estimates must be updated when the final budget for submission to OMB is decided, normally in August, for submission to OMB in early September. Once the OMB passback has been received and adjustments made, the budget estimates for investments must be updated again to reflect the amounts included in the President's Budget. Note that current policy is that this material is to be treated as internal decisional working documents and should not be released outside the Executive Branch. The Department's current interpretation is that Exhibit 53s may be released after the budget is on the Hill, but that Exhibit 300s with their great procurement sensitivity should not be released. The final update of the calendar year may also reflect Congressional action on that fiscal year's appropriations.

Once agency budgets are approved through the Federal budget process and enacted, the funding for IT investments is finalized and provided to the program and project manager to execute. The budget for IT investments is executed throughout the life cycle of the project. Execution of the budget and the financial performance of the investment, as compared to the approved budget, is reviewed and evaluated throughout the control and evaluation phases of the IT Capital Planning and Investment Control process. It is the responsibility of finance and project staff to track investment-related expenditures to specific projects for project oversight and management reporting. Budget office staff should be consulted on tracking financial results.

APPENDIX W—PORTFOLIO MANAGEMENT

Purpose

The purpose of Portfolio Management is to ensure that an optimal capital investment portfolio with manageable risk and returns is selected and funded. The steps in Portfolio Management include:

- Defining portfolio goals and objectives
- Understanding, accepting and making tradeoffs
- Identifying, eliminating, and minimizing risks
- Monitoring portfolio performance
- Determining if desired goals and objectives have been obtained

The benefits of Portfolio Management are that it:

- Encompasses the entire investment management process (pre-select, select, control, evaluate and steady state)
- Aids investment management decision making by providing the necessary information
- Provides the information necessary for monitoring cost and performance
- Helps determine if an investment should be continued, modified, or terminated

Process

This Guide, Version 1.0 provides that both IT and construction projects go through similar management review processes but are not compared or ranked against each other. Through coordination and adoption of best practices, DOI will define a process that will allow for trade-offs between information technology (IT) and construction projects. DOI is working toward implementing this process for the FY 2005 budget.

In order to perform the activities associated with planning, selecting, funding and managing optimal IT and construction investment portfolios, adequate resources must be provided for executing the process. The Bureaus' investment review board members (IRB) must exhibit core competencies in portfolio management, all investments within a portfolio have been analyzed and prioritized based on each investments, cost, benefit, schedule and risks throughout their life-cycle and that the agency has defined its common portfolio categories.

The portfolio management process ensures that each investment review board collectively analyzes and compares all investments and proposals to select those that best fit with the strategic business direction, needs, and priorities of the agency. In addition, DOI will have practical limits on funding, the risks it is willing to take, and the length of time for which it will incur costs on a given investment before benefits are realized. To address these practical limits, portfolio management uses categories to aid in investment comparability, and cost, schedule, benefit and risk (CBSR) oversight. Once all investments within an IT or construction portfolio are categorized, investments and proposals can be compared to one another within and across portfolio categories, and the best overall portfolio can be selected and funded.

Portfolio Management is an integral component of the CPIC process; however, Portfolio Management cannot be accomplished without first establishing a capital investment foundation.

Building a capital investment foundation, using GAO's IT Investment Management maturity model, requires that DOI first establish capital investment management processes to ensure:

- Investments are pre-selected and selected based on established selection criteria.
- Investment proposals are business driven.
- The IRBs establish and maintain an asset inventory of current investments.
- The IRBs oversee these investments throughout their life cycle.

With maturity and experience in establishing a capital investment foundation, DOI can move forward with developing a complete investment portfolio. Based on the GAO model cited above, portfolio management maturity efforts to develop the DOI IT portfolio are based on:

- Ensuring the alignment of the IRBs
- Developing portfolio strategic plans, and selection rating and ranking criteria that support DOI mission and strategic goals
- Conducting continuous analysis of each investment at every phase of its life-cycle
- Developing IT portfolio performance measures

To demonstrate that portfolio management is occurring, there must be physical, documentary and testimonial evidence of portfolio management activities (see **Appendix A—Board Procedures**).

APPENDIX X — GLOSSARY OF KEY TERMS AND ACRONYMS

KEY TERMS

Acquisition—The acquiring by contract of supplies and services by and for the use of the Federal government through purchase or lease, whether the supplies or services are already in existence or must be created, developed, demonstrated, and evaluated. Acquisition begins at the point when agency needs are established and includes the description of requirements to satisfy agency needs, solicitation and selection of sources, award of contracts, contract financing, contract performance, contract administration, and those technical and management functions directly related to the process of fulfilling agency needs by contract.

Acquisition Plan—Description of the acquisition approach including the contract strategy (defined government and contractor roles and responsibilities), use of COTS, and major milestones (e.g., software releases, hardware delivery and installation, and testing).

Activity-Based Costing—A cost accounting method that measures the cost and performance of process-related activities and cost objects. It assigns direct and indirect costs to cost objects, such as products or customers, based on their use of activities. It recognizes the causal relationship of cost drivers.

Activities—An ITIM core element that describes the procedures necessary to implement a critical process. An activity occurs over time and has recognizable results. This core element typically involves establishing plans and procedures, performing the work, tracking it and taking corrective actions as necessary.

Alternatives—Viable options to achieve the same programmatic goals wherever practical and more cost beneficial, including new program design or operational improvements through cross-cutting initiatives or cross-servicing prior to selecting an alternative.

Alternatives Analysis—An analysis to compare and evaluate the costs and benefits of various alternatives for meeting a requirement for the purpose of selecting the alternative that is most advantageous to the enterprise.

Agency IT Capital Plan— A document that identifies existing and proposed IT capital assets and that provides justification for new capital funding. Included in the IT capital plan should be a statement of the agency's strategic plan, a description of assets already owned by the agency or in procurement, an analysis detailing the performance gap between existing capabilities and the goals and objectives highlighted in the strategic plan, justification for new capital acquisitions proposed for funding, and other related information.

Annual Performance Plan— A document, covering each program activity identified in an agency's budget, that describes the actions and goals that the organization will undertake during the year to work towards the long-term goals established in the organization's strategic plan. Specifically, the annual performance plan establishes the agency's performance goals for the year, describes strategies the agency will use to meet these goals, and identifies performance measures to measure or assess the relevant service levels, outcomes, or outputs that are to be achieved and to compare actual program results with the established performance goals.

Appropriation—An appropriation provides budget authority that permits Government officials to incur obligations that result in immediate or future outlays of Government funds.

Baseline Goals—Baseline cost, schedule, and performance goals will be the standard against which actual work is measured. They will be the basis for the annual report to the Congress required by FASA Title V on variances of 10 percent or more from cost and schedule goals and any deviation from performance goals. OMB must approve the goals, and any changes to the goals.

Benchmarking—A structured approach for identifying the best practices from industry and government, and comparing and adapting them to the organization's operations. Such an approach is aimed at identifying more efficient and effective processes for achieving intended results, and suggesting ambitious goals for program output, product/service quality, and process improvement.

Benefit—Term used to indicate an advantage, profit, or gain attained by an organization. Tangible benefits are those benefits that can be explicitly quantified. Such benefits may include reducing costs, increasing productivity, decreasing cycle time, or improving service quality. Intangible benefits are those benefits that may be easily identifiable but are difficult to quantify. These may include more efficient decision making, greater data accuracy, improved data security, reduced customer burden, or increased organizational knowledge

Benefit-Cost Analysis (BCA)—A technique used to compare the various costs associated with an investment or project with the benefits it proposes to return. It should address and account for both tangible and intangible factors. May also be referred as a Cost-Benefit Analysis.

Benefit-to-Cost Ratio (BCR)—Benefits divided by costs, where both are discounted to a present value or equivalent uniform annual value.

Best Practices—Processes, practices, or systems, used by public and private organizations that perform exceptionally well and are widely recognized as improving an organization's performance and efficiency in specific areas. Successfully identifying and applying best practices can reduce business expenses and improve an organization's efficiency.

Blanket Purchasing Agreement (BPA)—Simplified method of filling anticipated repetitive needs for supplies and services by establishing "charge accounts" with qualified sources of supply. Use of BPAs does not exempt an agency from the responsibility for keeping obligations and expenditures within available funds.

Breakeven Analysis—A technique for determining that value of a variable that results in benefits (savings) equaling costs.

Budget Authority—The authority provided by Federal law to incur financial obligations that will result in outlays. Most budget authority for acquisitions is in the form of appropriations; other types are contract authority, authority to borrow, and spending authority from offsetting collections.

Bureau Head—Senior Bureau executive responsible for approving the multi-year investment plan and Capital Asset Plan and Justification documents

Bureau Sponsor—Responsible for providing sponsorship of the investment at the senior executive level. Assures that the multi-year investment plan is consistent with bureau mission and long term goals. Generally the Deputy, Assistant or Associate Director senior bureau manager, who may serve as chairperson for the Bureau Investment Review Team.

Business Case (BC)—Structured proposal for business improvement that functions as a decision package for organizational decision-makers. The BC provides justification that the initiative supports DOI's core business or strategic goals and meets legislative requirements and Includes documentation of performance measures, analysis of business process performance and associated needs or problems, proposed alternative solutions, assumptions, constraints and a risk-adjusted benefits-cost analysis.

Business Process—A collection of related, structured activities—a chain of events—that produce a specific service or product for a particular customer or customers.

Business Processes Analysis—An evaluation of the business processes supported by, or associated with, an information system, cyber security project, or information technology initiative to determine which processes should be improved, which should be reengineered, and which should not be changed. Such an analysis may involve using performance measures to benchmark existing processes against similar processes in other organizations or against performance goals.

Capital Assets—Land, structures, equipment and intellectual property (e.g., software) that are used by the Federal government and have an estimated useful life of two years or more. Assets are typically created by investments.

Capital Planning and Investment Control—A decision-making process for ensuring that investments integrate strategic planning, budgeting, procurement, and management of the asset (IT, construction, etc.) in support of agency missions and business needs.

Capital Project—The total capital project, or acquisition of a capital asset which includes useful segments that are either planning segments or useful assets.

Commercially Off-The-Shelf (COTS)—Any item, other than real property, that is of a type customarily used by the general public for non-governmental purposes, and that has been sold, leased, or licensed to the general public; is sold, leased, or licensed in substantial quantities in the commercial marketplace; and is offered to the Government, without modification, in the same form in which it is sold, leased, or licensed in the commercial marketplace.

Concept of Operations—As it relates to cyber security services, a concept of operations document defines the roles, responsibilities, and procedures for day-to-day operation and maintenance of networks and other telecommunications services. A concept of operations can also describe the planned or expected method of performing a service or delivering a product in the future, e.g., when a new capital investment is operational.

Configuration Management— The management of security features and assurances through control of changes made to hardware, software, firmware, documentation, test, test fixtures and test documentation of an automated information system, throughout the development and operational life of a system. The control of changes--including the recording thereof--that are made to the hardware, software, firmware, and documentation throughout the system lifecycle. Ongoing monitoring process that manages IT projects against predetermined schedules, budgets, and performance measures.

Control—Ongoing monitoring process that manages IT projects against predetermined schedules, budgets, and performance measures.

Construction Program—Comprises planning, design, construction, maintenance, building, alteration or repair of buildings, structures, or other real property, and includes all preparatory conceptual design activities. Structures include but are not limited to, buildings, pavement, bridges, dams, irrigation systems, water supply and sewer systems, power generation and transmission systems, hatcheries, recreation facilities, and installation of fixed equipment.

Cost—Term used to indicate the expenditure of funds for a particular investment alternative over an expected time period. Cost may include direct and indirect initial costs plus any periodic or continuing costs for operation and maintenance.

Cost, Full—All direct and indirect costs to any part of the Federal Government of providing goods, resources, and services. The total amount of resources used to produce the output. More specifically, the full cost of an output produced by a responsibility segment is the sum of: 1) the costs of resources consumed by the responsibility segment that directly or indirectly contribute to the output; and 2) the costs of identifiable supporting services provided by other responsibility segments within the reporting entity and by other reporting entities.

Cost Accounting System or Process—A continuous and systematic accounting process, designed to accumulate and assign costs to a variety of objects routinely or as desired by the management. Costs may be accumulated either through the use of cost accounting systems or through the use of cost finding techniques.

Cost Avoidance—An action taken in the immediate time frame that will decrease costs in the future. For example, an engineering improvement that increases the mean time between failures and thereby decreases operation and maintenance costs is a cost avoidance action. Another example would be performing value engineering (VE) during the planning stages of a construction project. If a VE study reveals a different alternative that is lower cost and is consistent with project required performance,

reliability, quality, and safety, then the change in project estimated cost would constitute a cost avoidance.

Cost Savings— A reduction in actual expenditures below the projected level of costs to achieve a specific objective. Examples of cost savings are: revisions to the design of an authorized and funded project such that actual expenditure for the project is less than the amount which was funded and scheduled to be expended; or, a measurable reduction in personnel requirements needed to conduct a specific required activity or project function.

Data integrity—Assurance that data has not been altered or destroyed in an unauthorized manner.

Decision criteria—Documented set of factors that are used to examine and compare the costs, risks, and benefits of various IT projects and systems. These decision criteria consist of 1) screening criteria, which are used to identify whether new projects meet initial acceptance requirements and ensure that the project is reviewed at the most appropriate organizational level, and 2) criteria for assessing and ranking all projects. These ranking criteria weigh the relative costs, risks, and benefits of each project against all other projects.

Discount Factor—The factor that translates expected benefits or costs in any given future year into present value terms. The discount factor is equal to 1/(1 + i)t where i is the interest rate and t is the number of years from the date of initiation for the program or policy until the given future year.

Discount Rate—The interest rate used in calculating the present value of expected yearly benefits and costs.

Earned Value—A management technique that relates resource planning to schedules and to technical, cost, and schedules requirements. All work is planned, budgeted, and scheduled in time-phased "planned value" increments constituting a cost and schedule measurement baseline. The two major objectives of an earned value system are to encourage contractors to use effective internal cost and schedule management control systems and to permit the government to be able to rely on timely data produced by those systems for determining product-oriented contract status.

Effectiveness—An assessment of the qualitative level of achievement of program goals and the intended results, as defined in strategic or other plans or documentation or in legislation.

Efficiency—A measure of the relative amount of resources used in performing a given unit of work. Sometimes characterized as doing things right. Can involve unit costing, work measurement (standard time for a task), labor productivity (ratio of outputs to labor inputs), or cycle time.

Enterprise Architecture—A strategic model of information assets represented by integrated components comprising business, data, application and technology architecture layers that are aligned with DOI's mission, business goals and objectives. The architecture defines the business requirements, the information systems and technologies necessary to execute business activities and the transitional processes needed to implement new technologies in response to and in support of changing business needs.

Evaluate—Review process that takes place after an investment is operational to determine whether the investment meets expectations.

Exhibit 300—Designed to coordinate OMB's collection of agency information for its report to the Congress as required by the FASA and Clinger Cohen Act of 1996.

Fair Market Value—The estimated amount that can be realized, determined by the prices at which a bona fide sales have been consummated for project of like kind, quality, and quantity in a particular market at any moment in time.

Feasibility Study—Preliminary research performed to determine the viability of a proposed initiative by performing alternatives analysis including conducting market research and extensive interviews with subject matter experts. Also includes a proposed technical approach and preliminary cost, scope and schedule data.

Financial Management System—A system that consists of financial systems and the financial portions of mixed systems necessary to support financial management.

Financial System—An information system comprised of one of more applications, that is used for any of the following: Collecting, processing, maintaining, transmitting, and reporting data about financial events. Supporting financial planning or budgeting activities. Accumulating and reporting cost information. Supporting the preparation of financial statements. A financial system supports the financial functions required to track financial events and provides financial information significant to the financial management of the agency and/or required for the preparation of financial statements.

Five-Year Deferred Maintenance and Capital Improvement Plans— The plans prepared annually by each bureau are the prioritized lists of deferred maintenance and capital improvement projects, reviewed and approved by the bureau investment boards and bureau head, for maintenance and construction budget line items over a five year period. The annual update presents the opportunity for the bureaus to adjust their project priorities based on newly identified needs or previously identified needs that have become critical during the past year.

Full Funding—Full funding means that regular appropriations, advance appropriations, and other budgetary resources sufficient in total to complete a useful segment of a capital project are totally available before any obligations are incurred for that segment. Full funding for an entire capital project is required if the project cannot be divided into more than one useful segment. If the asset can be divided into more than one useful segment, full funding for a project may be desirable, but is not required to constitute full funding.

Funding Source—The direct appropriation or other specific budget authority an agency receives to pay for a particular project or service.

Gap Analysis—To identify the “as is” and “to be.” Then identifying the the steps to move from “as is” to “to be.”

Goals, Cost and Schedule—The baseline cost and schedule goals should be realistic projections of total cost, total time to complete the project, and interim cost and schedule goals. The interim cost and schedule goals should be based on the value of work performed or a comparable concept.

Implementation/Integration plan—(Also called a Systems Integration Plan) A document discussing the steps for progressively linking and testing of system or network components to merge their functional and technical characteristics into a comprehensive, interoperable system or network.

Incremental Funding— Incremental (partial) funding of a capital project means that regular or advance appropriations or other budgetary resources available in a fiscal year are sufficient to complete for just part of a useful segment of a capital project, if the project has useful segments, or for part of the capital project as a whole, if it is not divisible into useful segments. Under incremental funding for a capital asset, which is not permitted under OMB policy, the funds could be obligated to start the segment (or project) despite the fact that they are insufficient to complete a useful segment or project.

Independent Verification and Validation (IV&V)— IV&V is the process of verifying that the output of each software phase meets its requirements, and validating that the software, at the end of the development effort, meets the overall project objectives. It is conducted by an organization or agency that is technically, managerially and financially autonomous from the development organization.

Inflation—The proportionate rate of change in the general price level, as opposed to the proportionate increase in a specific price. Inflation is usually measured by a broad-based price index, such as the implicit deflator for Gross Domestic Product or the Consumer Price Index. (OMB Circular A-94)

Information System—A discrete set of information technology, data, and related resources, such as personnel, hardware, software, and associated information technology services organized for the collection, processing, maintenance, use, sharing, dissemination or disposition of information. Information systems include non-financial, financial, and mixed systems.

Information Technology—Includes any equipment used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, inter-change, transmission, or reception of data or information (e.g., computers, software, telecommunication equipment, and peripheral information management and processing devices), capital and non-capital purchases or leases.

Infrastructure Projects—Building systems, additions, new construction, renovation, acquisitions and disposal of properties.

Intangible Benefits—Benefits produced by an investment that are not immediately obvious and/or measurable.

Integrated Project Team (IPT)—Business lines should apply an integrated project and process development approach to manage capital assets, using the IPT for continuity and accountability. The team should be cross-functional to accomplish tasks and reflect the user community and the project stakeholders. The IPT should have a core of project management, technical proficiencies appropriate to the investment proposal, value management, budget, finance and procurement knowledge.

Investment—The decision by a DOI organization to expend resources or the actual expenditure of resources on selected information technology or construction initiatives with the expectation that the benefits from the expenditure meet or exceed the value of the resources expended.

Investment Control—The ongoing monitoring and management of the performance of IT and construction projects that comprise DOI's capital investment portfolio against cost, schedule, risk, and technical baselines, and the identification of corrective actions to manage and mitigate project risk.

Investment Evaluation—The formal assessment of an operational project (also known as a Post-Implementation Review for IT projects or Post Occupancy Evaluation for construction projects) to determine the degree to which it satisfies the performance outcomes and expectations established by the business case, project justification, and/or the current expectations of the project's stakeholders. Lessons learned during the Evaluate Phase are used to modify future Pre-Select, Select and Control decisions.

Investment Management Approach—An analytical framework for linking investment decisions to an organization's strategic objectives and business plans. The investment management approach consists of five phases—pre-select, select, control, evaluate and steady-state. Among other things, this management approach requires discipline, executive management involvement, accountability, and a focus on risks and returns using quantifiable measures.

Investment Portfolio—The combination of all assets, resources, and investments owned or planned by an organization in order to achieve strategic goals, objectives, and mission.

Investment Portfolio Monitoring—A tool for weighing the risk and return of potential project portfolios against one another.

Investment Selection—The decision making process within which all new, ongoing, and operational capital projects are considered for inclusion in the DOI capital investment portfolio. The Selection process combines rigorous technical reviews of project proposals and performance together with the application of uniform portfolio selection criteria.

I-TIPS—Information Technology Investment Portfolio System is an innovative web-based application developed to assist Federal agencies manage their investments in accordance with Clinger-Cohen Act and other applicable statutory directions and guidance, as well as, government and industry best practices. I-TIPS helps managers and staff involved in planning and investment decision-making to assess initiatives in terms of their costs, risks and expected returns, and to help them determine and maintain the appropriate mix of investments with regard to these and other organizational considerations.

Legacy Systems—Fully developed IT systems that must be continued for flexibility of integration with new systems to ensure business applications and infrastructure align with strategic goals.

Life Cycle Cost (LCC)—The total cost of a system, facility, or other product, computed over its useful life. It includes all relevant costs involved in acquiring, owning, operating, maintaining, and disposing of the system or product over its useful life or other specified period of time, including environmental and energy costs. Economic analysis is used in determining LCC.

Local Area Network—A short distance data communications network, typically within a building or campus, that links computers and peripheral devices such as printers, CD-ROMS, and modems using some form of standard control. A local area network (LAN) allows users to be given access to databases and programs running on client servers and allow users to work jointly and send messages.

Major Project—An investment that requires special management attention because of its importance to an agency mission; its high development, operating, or maintenance costs; or its significant role in the administration of agency programs, finances, property, or other resources.

Milestone—The completion of a scheduled, discrete project phase or task. A milestone is typically used to measure progress.

Mission—Clear and concise statement, summarizing what an organization does and presenting the main purpose for its major functions and operations.

Mixed System—An information system that supports both financial and non-financial functions of the Federal Government to components thereof.

Needs Assessment—A research and planning activity designed to determine the extent and needs of an organization, a population or a community, to evaluate existing (baseline) programs and the utilization patterns, and plan programs to meet those needs.

Net Benefits (Savings)—The difference between the benefits and the costs when both are discounted to present or annual value dollars.

Net Present Value (NPV)—The future stream of benefits and costs converted into equivalent values today. This is done by assigning monetary values to benefits and costs, discounting future benefits and costs using an appropriate discount rate, and subtracting the sum total of discounted costs from the sum total of discounted benefits.

Non-Financial System—An information system that supports non-financial functions of the Federal Government or components thereof and any financial data included in the system are insignificant to agency financial management and/or are not required for the preparation of financial statements.

Non-Quantifiable Benefits—Those benefits that are internal non-customer related. They are established benefits without substantial quantifiable support. Any use of this benefit must be coupled with the rationale for the lack of supporting data and calculations.

Objective—A specific statement presenting something that is to be accomplished. It is more specific than a strategic goal, but general enough to allow flexibility in how it will be accomplished. An objective must relate directly to and support accomplishment of the strategic goal.

OMB Passback—This period in the budget process is when OMB notifies the Department regarding the President's funding decisions for the upcoming fiscal year. This process occurs during the October through November time period prior to the budget submission to Congress.

Operating Cost—The expense incurred during the normal operation of a building or a building system, IT systems or component, including labor, materials, utilities, and other related costs.

Opportunity Costs—Cost of not investing in the initiative or cost of a forgone option (I-TIPS choices include low, moderate or high).

Organizational Commitment—An ITIM core element that describes the management actions that ensure that the critical ITIM support processes are established and will endure. This typically involves establishing organizational policies and senior management sponsorship.

Outcome—The actual results, effects or impacts of a business initiative, program, or support function. Actual outcomes are typically compared to expected outcomes.

Outlay—The issuance of checks, disbursement of cash, or electronic transfer of funds made to liquidate a federal obligation. Outlays also occur when interest on the Treasury debt held by the public accrues and when the Government issues bonds, notes, debentures, monetary credits, or other cash-equivalent instruments in order to liquidate obligations. Also, under credit reform, the credit subsidy cost is recorded as an outlay when a direct or guaranteed loan is disbursed.

Output—Information, product or procedure that is received, analyzed, and improved upon before submission and completion.

Output Measure—A tabulation, calculation, or recording of activity or effort that can be expressed in a quantitative or qualitative manner. They shall have two key characteristics: 1) they shall be periodically or systematically captured through an accounting or management information system; and 2) there shall be a logical connection between the reported measures and the program's mission, goals, and objectives.

Outsourcing—The process by which an organization arranges for a contractor or other external entity to manage a specific department or provide a specific function or service for the organization—an organization may contract one of its internal functions out to an outside company. Those functions might include managing the company's networks and or maintaining them. An enterprise might be motivated to do this because they lack the internal resources (typically people with needed knowledge, skills, and experience) or believe they can obtain more economical, effective, or efficient cyber security services by using a contractor or other external entity.

Payback Period—The forecasted timeframe in which a given investment is anticipated to achieve the projected ROI Ratio (ROI Ratio = Return/Investment Cost)

Performance Gap—The gap between what customers and stakeholders expect and what each process and related sub-processes produces in terms of quality, quantity, time, and cost of services and products. (See also Gap Analysis)

Performance Goals—A desired endpoint or purpose of an operation or activity. The performance goals should be realistic assessments of what the acquisition is intended to accomplish, expressed in quantitative terms if possible. Performance goals appear in the annual performance plan for the specific year covered in the performance plan as defined levels (targets) that a quantifiable and measureable.

Performance Management—One of the five categories of network management defined by the International Standards Organization. As it relates to cyber security services, a set of procedures and practices for measuring and recording resource utilization.

Performance Measures/Performance Measurement—The process of developing measurable indicators that can be systematically tracked to assess progress made in achieving predetermined performance goals and to benchmark an organization's performance against that of other organizations.

Physical Life—Anticipated number of productive years of an asset.

Planning Segments—A planning segment of a capital project provides information that allows the agency to develop the design; assess the benefits, costs, and risks; and establish realistic baseline cost, schedule, and performance goals before proceeding to full acquisition of the useful asset (or canceling the acquisition). This information comes from activities, or planning segments, that include but are not limited to market research of available solutions, architectural drawings, geological studies, engineering and design studies, and prototypes. The process of gathering information for a capital project may consist of one or more planning segments, depending on the nature of the asset. If the project includes a prototype that is a capital asset, the prototype may itself be one segment or may be divisible into more than one segment.

Post-implementation review—A review of an investment or project that compares the actual cost, schedule, performance, and other results achieved, after an investment or project has been completed and is fully operational, against the conditions that existed prior to the implementation of the investment or project, as indicated by baseline cost, schedule, and performance data, and against the planned cost, schedule, and performance goals established for the investment or project. A post-implementation review can provide valuable "lessons learned" to be applied to future investments or projects.

Post-Occupancy Evaluation—An evaluation process of a construction investment or project that addresses the operational and conditions against the actual cost, schedule, and other results achieved, after an investment or project has been completed.

Program/Project/Activity—Any item specifically identified in tables or written material set forth in the Interior and Related Agencies Appropriations Act or accompanying reports.

Program Evaluation—The evaluations of programs or services to determine their effectiveness and/or efficiency. Program evaluations are often the basis for which strategic goals are formed.

Program Manager—Responsible for managing all CPIC program activities that may include many individual projects. Responsible for development and updating of the multi-year investment plan that prioritizes projects to best meet bureau mission and strategic plan goals. Identifies funding levels needed and develops funding requests for the overall program. Reviews project Capital Asset Plan and Justification documents before review by the Bureau Investment Review Team.

Project—An organizational initiative employing or producing assets. Each project has or will incur costs for the initiative, has expected or realized benefits arising from the initiative, has a schedule of project activities and deadlines, and has or will incur risks associated with engaging in this initiative.

Project Management—The activities necessary to ensure that a project accomplishes its objectives in accordance with planned or revised cost, schedule, technical baselines as well as performance outcomes. It involves the application of knowledge, skills, tools and techniques by Project Managers to direct, control, administer, and regulate a project team creating an asset such that the resultant product meets its requirements upon delivery.

Project Manager—Provides oversight for project performance and maintains information project status, control, performance, risk, corrective action and outlook. Has lead responsibility for project execution and is accountable to the Project Sponsor on issues related to the project. Responsible for the development and implementation of the project scheduling and budget. Responsible for the day to day management of one or more individual projects. Communicates regularly with the project sponsor on project status, confers on the unresolved issues and project progress. Conducts the project procedures according to Bureau and Departmental policy. Develops project performance measures and outcomes. Assists the Project Sponsor in preparing the OMB Exhibit 300 form. Supports the Project Sponsor throughout the CPIC process. Responsible for ensuring that project activities and decisions consider the perspectives of all affected organizations.

Project Plan—Outlines the technical and management (performance-based) approach to be followed for a project. This includes project milestones and associated resources, tools and techniques and organizational roles and responsibilities.

Project Sponsor—Identifies the initial deficiency or need for an individual project and frames the project requirements necessary to resolve the need. Oversees preparation of documents necessary to describe the project need, and request funding. Accountable for the overall success of the project from concept to project completion. Responsible for preparation and submission of needs assessment and project data sheets. Collaborates with the Project Manager for the preparation and submission of Capital Asset Plan and Justification forms to the Program Manager.

Project Value—The measurable contribution that a project makes towards the achievement of DOI goals and objectives.

Recurring Costs—Those costs that are incurred in a regular pattern each year throughout the study period.

Renovation—The modification of an existing building or facility to include new functions and systems, or accommodate the growth of existing programs and component improving functional and technical requirements.

Replacement Cost—Building component replacement and related costs, included in the capital budget, that are expected to be incurred during the study period.

Residual Value—The salvage value of an item, after depreciation or at the end of its useful life.

Return on Investment (ROI)—The quantitative amount of benefit to be gained compared to the investment into the initiative.

Risk—An uncertain event that affects the performance objectives (cost, schedule, scope or quality) of a project, usually negatively.

Risk Criterion—Risk is an inherent part of any capital investment. However, project risk can be mitigated. Identifying and controlling project risk can significantly impact a project's success. In this case, risk can be analyzed in six components: Financial, Technical, Operational, Schedule, Legal and Contractual, and Organizational risks.

Risk Management—An approach for addressing the risks associated with investment. Risk management includes identification, analysis, prioritization, and control of risks. Especially critical are those techniques that help define preventative measures to reduce the probability of these factors from occurring and identify countermeasures to successfully deal with these constraints if they develop.

Risk/Return—The foundation by which portfolio monitoring is based. When the two variables are weighed against one another, they project the most efficient combination of projects among the array of proposals.

Security Analysis—A formal analysis conducted by the Departmental IT Security Manager (DITSM), Bureau IT Security Manager (BITSM), or designee for the purpose of determining the importance of the information, assessing risks, formulating mitigation strategies, and other measures needed to safeguard the system/application.

Selection Criteria—Factors that are identified to prioritize and discriminate investments selected for subsequent funding.

Sensitivity Analysis—Analysis of the degree of sensitivity of outcomes to changes in assumptions or risk regarding an initiative. Those that warrant the most attention depend largely on the dominant benefit and cost elements and the areas of greatest uncertainty of the program or process being analyzed.

Software—The detailed instructions to operate a computer or other type of equipment or hardware. The term was created to differentiate instructions (i.e., the program) from the hardware.

Stakeholder—An individual or group with an interest in the success of an organization in delivering intended results and maintaining the viability of the organization's products and services. Stakeholders influence programs, products, and services. Examples include congressional members and staff of relevant appropriations, authorizing, and oversight committees; representatives of central management and oversight entities such as OMB and GAO; and representatives of key interest groups, including those groups that represent the organization's customers and interested members of the public.

Strategic Plan—A document used by an organization to align its organization and budget structure with organizational priorities, missions, and objectives. According to requirements of GPRA, a strategic plan should include a mission statement, a description of the agency's long-term goals and objectives, and strategies or means the agency plans to use to achieve these general goals and objectives. The strategic plan may also identify external factors that could affect achievement of long-term goals.

Strategic Planning—A systematic method used by an organization to anticipate and adapt to expected changes. The IT portion of strategic planning sets broad direction and goals for managing information and supporting delivery of services to customers and the public and identifies the major IT activities to be undertaken to accomplish desired agency mission and goals.

Steady State/ Maintenance—Pertains to activities performed as part of systems or infrastructure deployment activities following the completion of development, implementation and acceptance. This includes post-production activities required to keep these assets operational and responsive to users' needs as originally intended. Steady state/maintenance projects do not include enhancements or new development.

Sunk Costs—A cost incurred in the past that will not be affected by any present or future decision. Sunk costs should be ignored in determining whether a new investment is worthwhile.

Supplies—Any consumable item designed specifically for use with equipment, software, services, or support services.

Support Services Cost—Cost includes both the contract services costs for developing software, IT maintenance, or contracting for studies concerning the acquisition of IT systems or the architectural/engineering services for the design of a construction project or the use of a private management construction firm used to provide project management inspections during construction, as well as value engineering.

Systems Development Life Cycle—A sequence of phases and/or stages that comprise the process for developing software applications and systems. The sequence spans from the identification of need through deployment, operation and retirement.

Tangible Benefit—A benefit produced by an investment that is immediately obvious and measurable.

Total Life Cycle Costs—All direct and indirect costs, including planning and other costs or procurement: all periodic or continuing cost of operation and maintenance and cost of decommissioning the disposal. It can be used to determine whether or not a given project, which is expected to reduce future costs, is economically justified or to determine the efficient scale of investment when several levels of investment are under consideration.

Useful Life—The period of time over which an investment is considered to meet its original objective and/or function.

Useful Segment—Useful segment means an economically and programatically separate component of a capital project, i.e., one that provides a measurable performance outcome for which the benefits exceed the costs even if no further funding is available to complete the project.

User requirements study—The technical requirements for hardware, software, facilities, personnel, procedures, technical data, personnel training, verification matrices, spares, repair parts, and consumables needed to test, deploy, operate, and maintain a system, network, investment, or project. Also called Requirements Analysis.

Value—The relationship of worth to cost as seen by the user in regard to needs and resources in a given situation. Worth for this purpose is defined as the lowest life cycle cost that satisfactorily performs the function. When cost exceeds worth, poor value occurs. When cost is less than worth, good value exists.

Value Engineering (VE)— Also termed Value Analysis, Value Management, and Value Methodology, VE is An organized team effort directed at analyzing the functions of processes, systems, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life-cycle cost consistent with required performance, reliability, quality, and safety. These organized efforts can be performed by in-house agency personnel and/or by contractor personnel. The value engineering analysis process, or value methodology, reduces processes, equipment, facilities, services, supplies, or products to their most basic functional elements and then looks for cost effective alternatives. In the most basic terms, VE is a systematic approach to obtaining optimum value for every dollar spent.

Wide area network (WAN)—A network typically extending a local area network (LAN) or metropolitan area network (MAN) over telephone common carrier lines to link to other LANs or MANS. A WAN typically uses common-carrier leased lines, for example, from an analog phone line to a T-1 line. The jump between a LAN or MAN and a WAN can be made through a device called a bridge or a router.

Wireless—Wireless communication is anything that supports communication between mobile, portable, or fixed facilities through use of the electromagnetic spectrum. Examples are: AM and FM broadcasting, UHF and VHF television, satellite, microwave, land-mobile radio (used for public safety, commercial and private use), citizen's band, trunked radio, paging, cellular telephone, wireless LANs, wireless telephone PBXs and Personal Communications Services (PCS).

ACRONYMS

AB	Annual Benefit
AC	Annual Cost
ACWP	Actual Cost of Work Performed
AS	Agency Sponsor
BAC	Budget at Completion
BCR	Benefit-Cost Ratio
BCWP	Budgeted Cost for Work Performed
BCWS	Budgeted Cost of Work Scheduled
BPR	Business Process Reengineering
CBA	Cost-Benefit Analysis
CCA	Clinger-Cohen Act
CFO	Chief Financial Officer
CIO	Chief Information Officer
COTS	Commercial-off-the-shelf
CPI	Cost Performance Index
CPIC	Capital Planning and Investment Control
CSBR	Cost, Schedule, Benefit, and Risk
CV	Cost Variance
DB	Discount Benefit
DC	Discount Cost
DF	Discount Factor
EAC	Estimate at Completion
EBT	Electronic Benefit Transfer
IRB	Investment Review Board
ETC	Estimate to Complete
EWG	Executive Working Group(s)
FASA	Federal Acquisition Streamlining Act
FM	Functional Manager

FTEs	Full-Time Equivalents
FY	Fiscal Year
GAO	General Accounting Office
GISRA	Government Information Security Act of 2000
GPEA	Government Paperwork Elimination Act of 1998
GPRA	Government Performance and Results Act
GSA	General Services Administration
IPT	Integrated Project Team
IRM	Information Resource Management
ISSPM	Information System Security Program Manager
ISTA	Information System Technology Architecture
IT	Information Technology
I-TIPS	Information Technology Investment Portfolio System
IV&V	Independent Verification and Validation
MNS	Mission Needs Statement
MR	Management Reserve
NIST	National Institute of Standards and Technology
NPV	Net Present Value
O&M	Operations and Maintenance
OCFO	Office of the Chief Financial Officer
OCIO	Office of the Chief Information Officer
OMB	Office of Management and Budget
PDS	Project Data Sheet
PIR	Post-Implementation Review
PMB	Performance Measurement Baseline
POE	Post Occupancy Evaluation
PRA	Paperwork Reduction Act
RFP	Request for Proposals
ROI	Return on Investment
SV	Schedule Variance

SME	Subject Matter Expert
DOI	United States Department of the Interior
VAC	Variance at Completion
VPN	Virtual Private Network
WBS	Work Breakdown Structure

APPENDIX Y—REFERENCES

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