

U.S. Department of Housing and Urban Development



Information Technology (IT) Investment Management Process

September 2001

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PREFACE

This guide is intended to provide an overview of the Department of Housing and Urban Development's (HUD) Information Technology Investment Management (ITIM) Process. It provides managers and staff with practical information designed to help them better understand IT planning at HUD and meet the requirements set forth by Congress, the Office of Management and Budget (OMB), and the Department. It also provides the framework within which HUD can formulate, justify, manage, and maintain a portfolio of IT investments. Separate documents detail HUD IT

project management requirements and the Department's System Development Methodology (SDM), so only the interfaces between the ITIM Process, and project management and SDM processes are discussed here.

This guide will be updated on a periodic basis to reflect "lessons learned," as the Department's ITIM Process matures and the capabilities of its Project Sponsors and Project Managers are strengthened through training and experience.

1 INTRODUCTION

Like most Federal Agencies, HUD has limited resources to allocate to information technology. Consequently, the Department has implemented a comprehensive IT Investment Management (ITIM) Process to ensure that its portfolio of IT projects adequately address HUD's business strategies, and are managed to achieve the expected benefits in accordance with accurate and complete cost, schedule, technical, and performance baselines. Monitoring and controlling investments is as important to ensure success as selecting the right portfolio of projects or investments. Control mechanisms have been established to minimize the likelihood of project failure or excessive cost and schedule overruns.

- The Government Performance and Results Act
- The Government Paperwork Elimination Act
- The Computer Security Act
- OMB Circular Nos. A-11 and A-130
- HUD's IT Investment Management Policy

The ITIM Process also incorporates guidance on ITIM process maturity, recently issued by the General Accounting Office (GAO) and described in Figure 1¹. At this time, HUD's ITIM Process is at Stage 1, and is expected to achieve Stage 2 by December 2001, and Stage 3 by December 2002. The ITIM Process will be continuously modified to reflect the issuance of new or revised mandates and guidance. The CIO organization is currently exploring opportunities to strengthen the provisions of the ITIM process for cyber security, privacy, work force planning and management, e-Government, and accessibility.

1.1 ITIM Governance: Federal and Departmental Mandates and Guidance

The Department's ITIM Process fully addresses a wide range of Federal and Departmental mandates, including but not limited to:

- The Clinger-Cohen Act
- The Paperwork Reduction Act

¹ HUD used GAO's exposure draft of *Information Technology Investment Management (ITIM): A Framework for Assessing and Improving Process Maturity to assess the ITIM process maturity*

FIGURE 1 – ITIM STAGES OF MATURITY WITH CRITICAL PROCESSES

MATURITY STAGE	DESCRIPTION	CRITICAL PROCESSES
Stage 1 – Creating Investment Awareness	There is little awareness of investment management techniques. IT management processes are ad hoc, project-centric, and have widely variable outcomes.	<ul style="list-style-type: none"> No Defined Critical Processes
Stage 2 – Building the Investment Foundation	Repeatable investment control processes are in place and key foundation capabilities have been implemented.	<ul style="list-style-type: none"> IT Investment Board Operation IT Project Oversight IT Asset Tracking Business Needs Identification for IT Projects Proposal Selection
Stage 3 – Developing a Complete Investment Portfolio	Comprehensive IT portfolio selection and control processes are in place that incorporate benefit and risk criteria linked to mission goals and strategies.	<ul style="list-style-type: none"> Authority Alignment of IT 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 IT investment portfolio.	<ul style="list-style-type: none"> Post-Implementation Reviews Portfolio Performance Evaluation and Improvement Systems and Technology Succession Management
Stage 5 – Investing for Strategic Outcomes	Investment benchmarking and IT-enabled change management techniques are deployed to strategically shape business outcomes.	<ul style="list-style-type: none"> Investment Process Benchmarking IT-Enabled Business Process Change Management

1.2 ITIM Process: General Status and Outlook

Status. During FY 1999, HUD initiated implementation of its ITIM Process. Since that time, the Department has accomplished the following:

- Established policy and charters to formalize the roles and activities of the IT executive level decision making boards that govern ITIM.
- Formulated policy and direction to delegate authority and accountability and define roles and responsibilities for ITIM.
- Established and maintain interfaces to external oversight and review organizations, such as OMB and GAO.
- Implemented a Department wide ITIM Process to select, control, and evaluate a comprehensive portfolio of IT projects.

- Initiated the alignment the ITIM Process with other internal processes such as budget formulation, procurement and acquisition, the System Development Methodology (SDM), and program management and technical reviews.
- Initiated efforts to strengthen the competencies and capabilities of HUD's IT investment and Project Managers through practical "hands-on" training.

Outlook. For FY 2001, HUD will continue to strengthen its ITIM process. Specific activities to be undertaken will include the following²:

- Review and annually update HUD's ITIM Process to take advantage of lessons learned, address changes to Federal mandates and

² See Appendix G for further discussion.

guidance, and incorporate government and industry best practices.

- Integrate the ITIM Process with HUD's enterprise architecture management and maintenance activities.
- Establish uniform and consistent project management methodologies and procedures, and annually update IT investment and project management training to leverage advances in associated methodologies and tools.
- Continue to integrate, streamline, and consolidate, as appropriate, the Department's performance, budget, acquisition, and ITIM planning and processes.
- Conduct formal post-implementation reviews of IT projects; implement project performance measurement practices; and benchmark portfolio performance.
- Continue to update HUD's training program for IT investment and Project Managers and leverage advances in associated methodologies and tools.
- Increase focus on total life cycle of IT investments.
- Continue to periodically assess ITIM Process maturity.

1.3 ITIM Process: Select – Control – Evaluate at HUD

The Department will apply the Select, Control, and Evaluate processes of the ITIM model as described below, and illustrated in Figure 2, to formulate, manage, and maintain its portfolio of IT investments. More detailed discussions of the Select, Control, and Evaluate processes are presented in chapters 2, 3, and 4, respectively.

Select. The Select process ensures the careful consideration of return, cost, and risk during the formulation of HUD's IT investment portfolio. It involves the activities by which initiatives are proposed by HUD organizations, evaluated against selection criteria defined by the

HUD IT executive-level decision making bodies, and included in the HUD IT investment portfolio. The Select criteria include measures such as mission support, agency priorities, material deficiencies (or weaknesses), project risk, project return on investment, project management controls, and conformance with the Department's current and target Enterprise Architectures (EA).

Key items to be addressed during the Select process are provided below:³

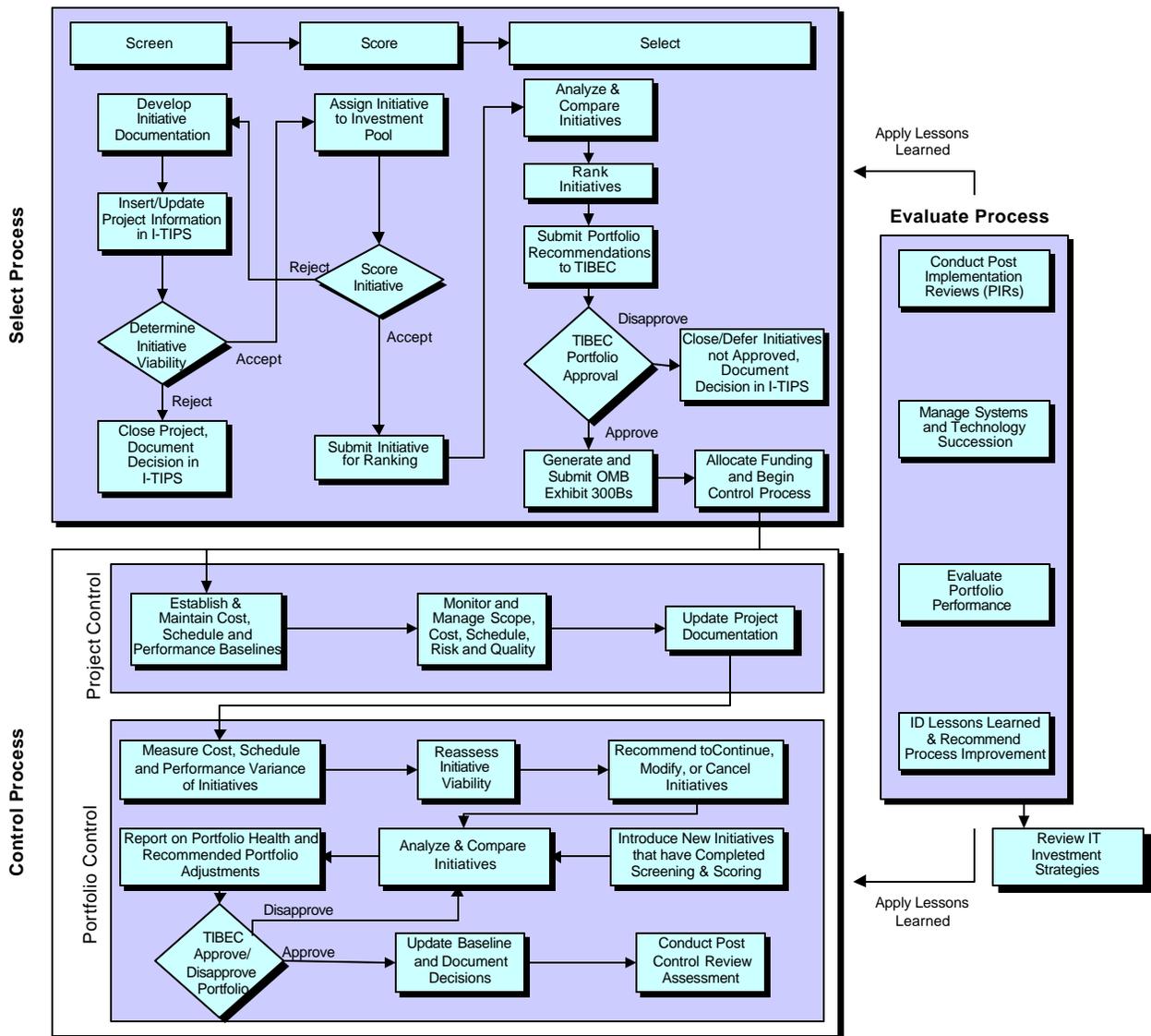
- Needs assessment
- Feasibility study
- Cost-benefit analysis
- Risk analysis
- Project plan

Control. The Control process ensures that HUD's IT portfolio remains healthy and is performing as expected to meet the Department's business objectives and goals. It involves on going efforts to monitor, review, and correct, as necessary, the performance of the IT portfolio. This is accomplished, primarily, by conducting Quarterly Control Reviews.⁴ The objectives of the review are to measure project health in terms of actual performance against baseline expectations for cost, schedule, risk, and return; identify projects that are performing below expectations; define and enforce corrective actions; and identify opportunities to reprogram HUD IT funding, as warranted.

³ The items to be addressed vary in accordance with the type of project being proposed (Development/Modernization/Enhancement, Non-Systems Development, Steady State/Maintenance).

⁴ In addition to the Quarterly Control Reviews, project managers monitor their projects on a more periodic (daily, weekly, monthly) basis. The frequency of the review depends upon the size, scope, complexity of the project as well as associated risks and potential impacts.

FIGURE 2 – HUD ITIM PROCESS

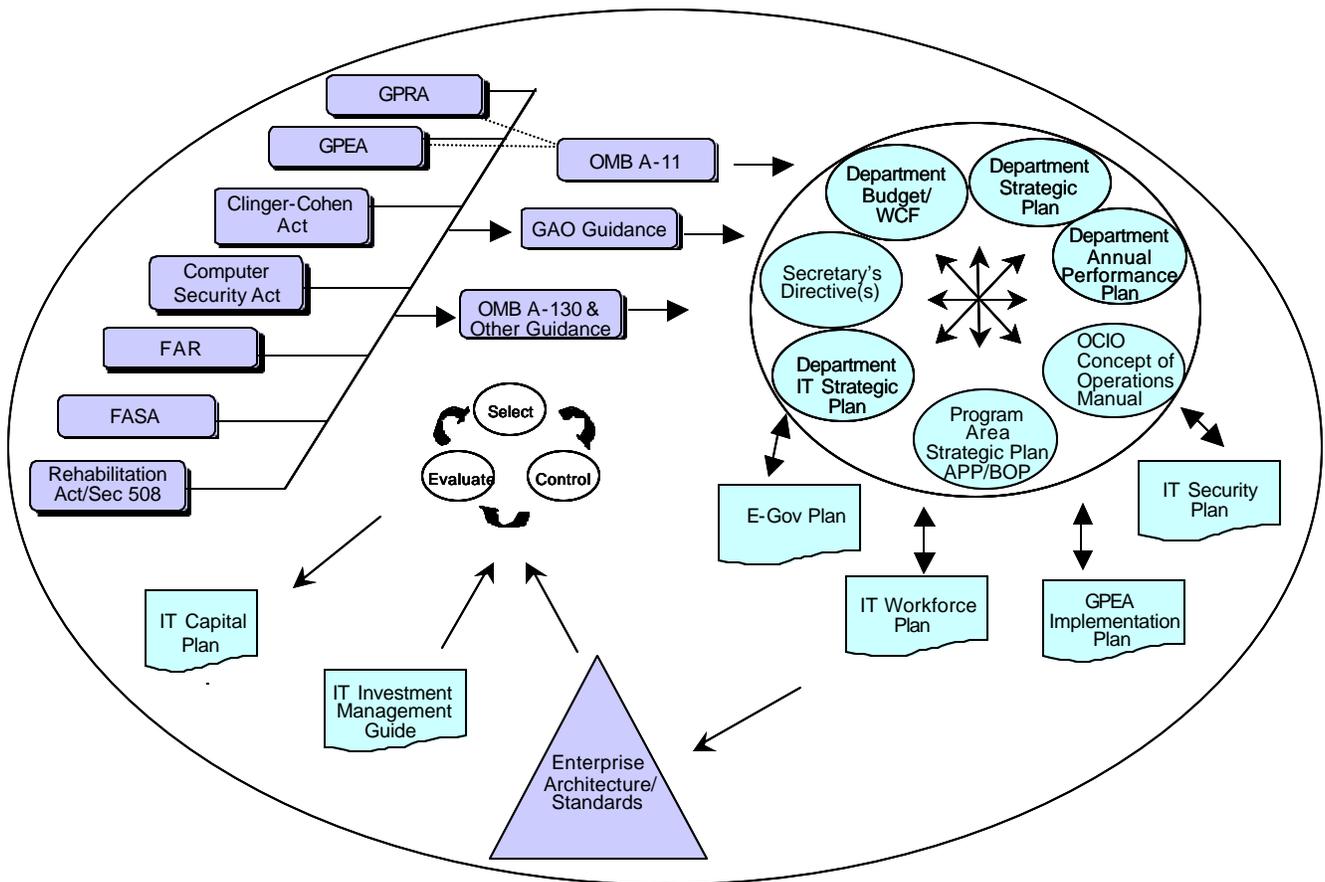


The overriding intent of the Control Review is to identify problems early and to quickly take corrective action to avoid or remedy them. The Control Review helps to ensure that project plans and activities adequately reflect changes in strategic goals, legislation, project scope, and business requirements. The results of the Control Review capture the Department's decision on whether and how to continue their projects.

Key questions to be addressed during the Control process are provided below:

- Does the project still address a current business need?
- Are project requirements still valid?
- What are the status and outlook for project cost, schedule, and technical performance?
- Have project risks, contingencies and corrective actions been addressed?
- Are IT development activities being conducted in accordance with approved methodologies?

FIGURE 3 – HUD IT INVESTMENT MANAGEMENT PROCESS



Evaluate. The Evaluate sub-process involves efforts to assess and improve the performance of HUD's IT portfolio, specific projects, and the ITIM process itself. IT investments in operation are evaluated to determine whether they should be retained, modified, replaced or otherwise disposed. Key questions to be addressed during the Evaluate process are provided below:

- Did an IT investment meet performance, cost, and schedule objectives?
- Did the Select and Control process optimize the outcome of the IT investment?
- Is the IT portfolio "technically" sufficient to deliver the most cost-effective IT solution to meeting HUD business goals?

- What lessons have been learned to apply to the ITIM process to increase the sufficiency of the Department's IT portfolio?

The Federal and Departmental direction documents governing the Select-Control-Evaluate model, as implemented at HUD, is portrayed in Figure 3.

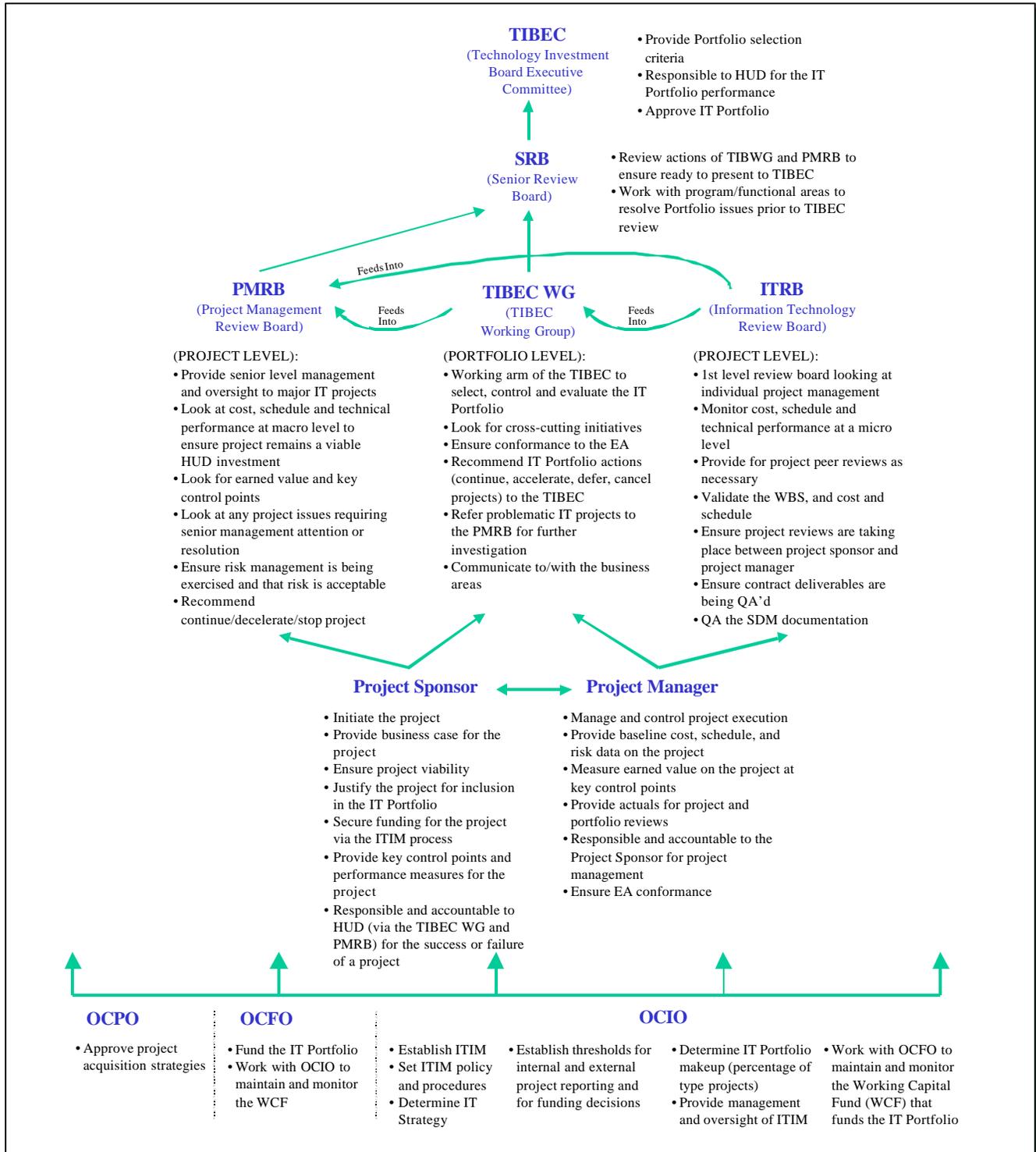
1.4 Overview of ITIM Roles and Responsibilities

The Clinger-Cohen Act recognizes the Chief Information Officer (CIO) to be responsible to the Agency Head for establishment of ITIM policy and processes. At HUD, the CIO is fulfilling this responsibility. However, the implementation of HUD's ITM process requires the participation of the entire Department. Executive-level boards

have been established to oversee and approve ITIM activities. Figure 4 Displays the HUD roles and responsibilities for ITIM across all select, control and evaluate processes, as established in

HUD's ITIM policy. Chapters 2, 3 and 4 will detail the roles and responsibilities for each process.

FIGURE 4 – ITIM PARTICIPATION AND ROLES



1.5 HUD Capital Planning and Budget Cycle Activities and Milestones

The HUD ITIM process supports the major budget milestones and procurement activities as outlined in Figure 5.

Figure 5 – MAJOR ACTIVITIES IN THE HUD FISCAL YEAR BUDGET CYCLE

TIME PERIOD (CURRENT FY)	PROCESS/EVENT	PRODUCTS/DELIVERABLES
OCTOBER – DECEMBER	<ul style="list-style-type: none"> • OMB recommends funding levels for upcoming fiscal year (FY +1 year) during the pass-back phase of the budget process • IT Portfolio is updated to reflect current year budget and procurement plans • TIBEC formulates the following year (FY+2) IT priorities • (Oct) IT portfolio and project quarterly control review is conducted for previous quarter's performance • (Oct) Emergent projects are considered for inclusion in the IT portfolio 	<ul style="list-style-type: none"> • OCFO issues current funding allocation for funds appropriated by Congress • IT portfolio is updated
JANUARY – FEBRUARY	<ul style="list-style-type: none"> • OMB reviews Congressional budget justification • (Jan) IT portfolio and project quarterly control review is conducted for previous quarter's performance • (Jan) Emergent projects are considered for inclusion in the IT portfolio 	<ul style="list-style-type: none"> • TIBEC issues FY+2 budget year requirements • IT portfolio is updated
MARCH – MAY	<ul style="list-style-type: none"> • (Apr) IT portfolio and project quarterly control review is conducted for previous quarter's performance • (Apr) IT portfolio is selected (solidified) for FY+1 • (Apr) IT portfolio is projected for FY+2 • OCFO conducts salaries and expense (S&E) mid-year review • OCFO distributes call for FY+1 budget and legislative estimates • OCFO prepares FY+2 IT budget formulation 	<ul style="list-style-type: none"> • IT portfolio is updated • TIBEC approves FY+1 and FY+2 IT portfolio
JUNE – SEPTEMBER	<ul style="list-style-type: none"> • All FY+2 budget requirements are submitted to OCFO and approved • (Jul) IT portfolio and project quarterly control review is conducted for previous quarter's performance • (Jul) Emergent projects are considered for inclusion in the IT portfolio • FY+1 procurement plans are finalized • OMB Exhibit 300's and Exhibit 53's are generated 	<ul style="list-style-type: none"> • IT portfolio is updated • OCPO approves FY+1 procurement plans • OCFO submits FY+2 budget to OMB • OCFO submits OMB Exhibit 300's and Exhibit 53's to OMB

2 SELECT PROCESS

• Screen • Score • Select

2.1 Select Process Overview

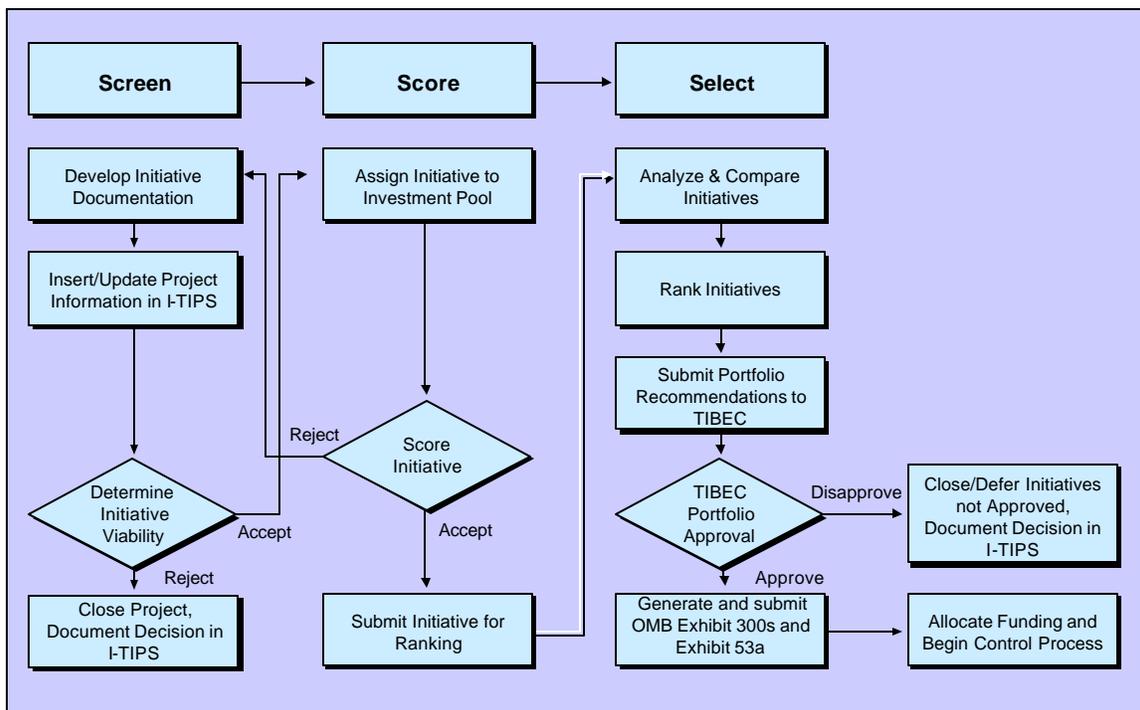
Within the IT Portfolio Selection process, HUD chooses the most appropriate mix (in terms of type, scope, schedule, cost, and risk) of IT projects to support Departmental missions and strategic goals. Through the Select process (see Figure 6), proposed IT initiatives are screened, scored, ranked, and selected based on benefit, cost, risk and a set of predetermined "project viability" criteria. The goal of the Select process is to ensure that only sound and viable initiatives are included in HUD's IT portfolio.

2.2 Select Process Prerequisites

The following preconditions and activities are critical to the successful execution of the Select process:

- Establish and charter HUD's executive management-decision making boards (such as the TIBEC, SRB, and TIBEC Working Group (WG) to drive all decision making associated with the selection of HUD's IT portfolio.
- Familiarize HUD IT managers and sponsors, principal staff, TIBEC WG members, and other key stakeholders with the SDM initiation documents and sound project management practices.

FIGURE 6 – HUD SELECT PROCESS



- Develop project documentation requirements and standards to provide Project Managers and sponsors with specific guidance on the documentation needed to screen projects and analyze project performance.
- Define and disseminate uniform sets of project screening and scoring criteria. These criteria should be approved by the TIBEC and help drive the selection of IT investments in accordance with HUD's mission goals and business objectives and operating requirements.
- Submit project proposals to the TIBEC WG for review during portfolio selection that have undergone judicious screening by Project Sponsors, and are accompanied by the requisite initiation documents.
- Clearly articulate and gain acceptance of the roles and responsibilities for stakeholders participating in the Select process.

2.3 Select Process Roles and Responsibilities

The active participation and collaboration of all IT Project Managers, Project Sponsors, HUD principal staff, and executive-level decision making bodies will ensure the successful execution of portfolio selection. The following is a list of the key stakeholders and participants in HUD's IT Portfolio Selection Subprocess, along with their associated roles and responsibilities.

➤ **Project Sponsor**

- Sponsors the project during business need identification and initial concept.
- Assigns and works with the Project Manager to develop, assemble, and evaluate potential project documentation to determine viability. Ensures that the documentation is current, accurate, and thorough.
- Responsible for accuracy of all materials submitted on behalf of the project.
- Reviews and approves project initiation documents, including, the project needs

statement, feasibility study, cost-benefit analysis, risk analysis and project plan.

- Manages the timeliness of data entry into I-TIPS, and adherence to documentation submission requirements and deadlines.
- Assigns the project to an investment pool, and prioritizes projects being sponsored.
- Prepares the OMB Exhibit 300 for a major project.
- Serves as primary point of contact to the TIBEC WG and the OCIO during selection.

➤ **Project Manager**

- Communicates regularly with Project Sponsor on project status, confers on unresolved issues, and discusses project progress.
- Conducts the project initiation procedures according to the SDM and generates the initiation documents.
- Develops project performance measures and outcomes.
- Enters all project information, in conjunction with the Project Sponsor, into I-TIPS, or updates existing data.
- Assists the Project Sponsor in preparing the OMB Exhibit 300 for a major project.
- Supports the Project Sponsor throughout the Select process.

➤ **Office of the Chief Information Officer (OCIO)**

- Initiates and facilitates the implementation of IT portfolio selection.
- Establishes procedures and guidelines to screen, score, rank order, and select IT projects.
- Administers project certification and scoring activities.
- Conducts analyses and creates reports on IT portfolio data for the TIBEC WG, SRB, and TIBEC. Provides the information

and insights needed to support project selection and executive decision making.

- Convenes and chairs the HUD IT Portfolio Select sessions of the TIBEC WG and SRB.
- Articulates the IT strategic vision.
- Coordinates the preparation and submission of Exhibit 300's and Exhibit 53's to OMB.
- Ensures that Departmental, program area, and CIO priorities are considered and incorporated into the decision making process.

➤ **Technology Investment Board Executive Committee Working Group (TIBEC WG)**

- Conducts the IT Portfolio Select sessions.
- Reviews OCIO recommendations pertaining to IT portfolio selection requirements and activities.
- Verifies the viability of projects assigned to portfolio investment pools.
- Identifies crosscutting and enterprise wide initiatives, as well as opportunities for project or system integration.
- Determines funding priorities and works to optimize the allocation of the HUD WCF.
- Solidifies projects for inclusion in the FY+1 year IT portfolio and begins to formulate the FY+2 year portfolio.
- Builds contingency plans and adjusts the composition of the IT portfolio in the event HUD does not receive the appropriations requested.
- Proposes the IT portfolio and associated actions to the SRB and the TIBEC.

➤ **Senior Review Board (SRB)**

- Evaluates the TIBEC WG's recommendations on the portfolio selection criteria.
- Reviews the recommended IT portfolio provided by the TIBEC WG from a Department wide perspective, taking into account the portfolio's organizational impact and other institutional considerations (such as the likely reactions to the portfolio by the Department's external oversight and review bodies).
- Submits the approved TIBEC WG recommendations to the TIBEC.

➤ **Technology Investment Board Executive Committee (TIBEC)**

- Reviews the soundness and oversees the execution of HUD's IT portfolio selection strategies.
- Approves the criteria to rank and score projects.
- Provides final concurrence on recommendations concerning the composition of the HUD FY+1 year and FY +2 year IT investment portfolios.
- Provides final approval of funding allocations and adjustments for the IT portfolio.

2.4 Select Process Support

HUD uses the following guidance and automated tools to support the Select process:

- The HUD SDM provides templates and guidance for the five investment initiation documents: Needs Statement, Feasibility Study, Cost-Benefit Analysis, Risk Analysis and Project Plan.
- I-TIPS⁵ is an information repository that facilitates the collection, review, and analysis of project documentation. It also supports the generation of OMB Exhibit 300s.
- Expert Choice⁶ is a multi-criteria decision support tool used to establish the relative importance of portfolio selection criteria, and to rank order IT projects against those criteria in accordance with HUD's funding constraints. The tool also is used to dynamically support project ranking, funding reallocations across projects, and re-optimization of the project portfolio during TIBEC WG decision making sessions.

⁵ See Appendix B for further description.

⁶ *Ibid.*

2.5 Pre-Select Activities

Pre-Select activities are those conducted prior to the submittal of an IT initiative to the Select process. To help ensure that only viable and well thought out initiatives are presented for IT portfolio inclusion, work on these activities should commence as soon as the need for an IT project is determined.

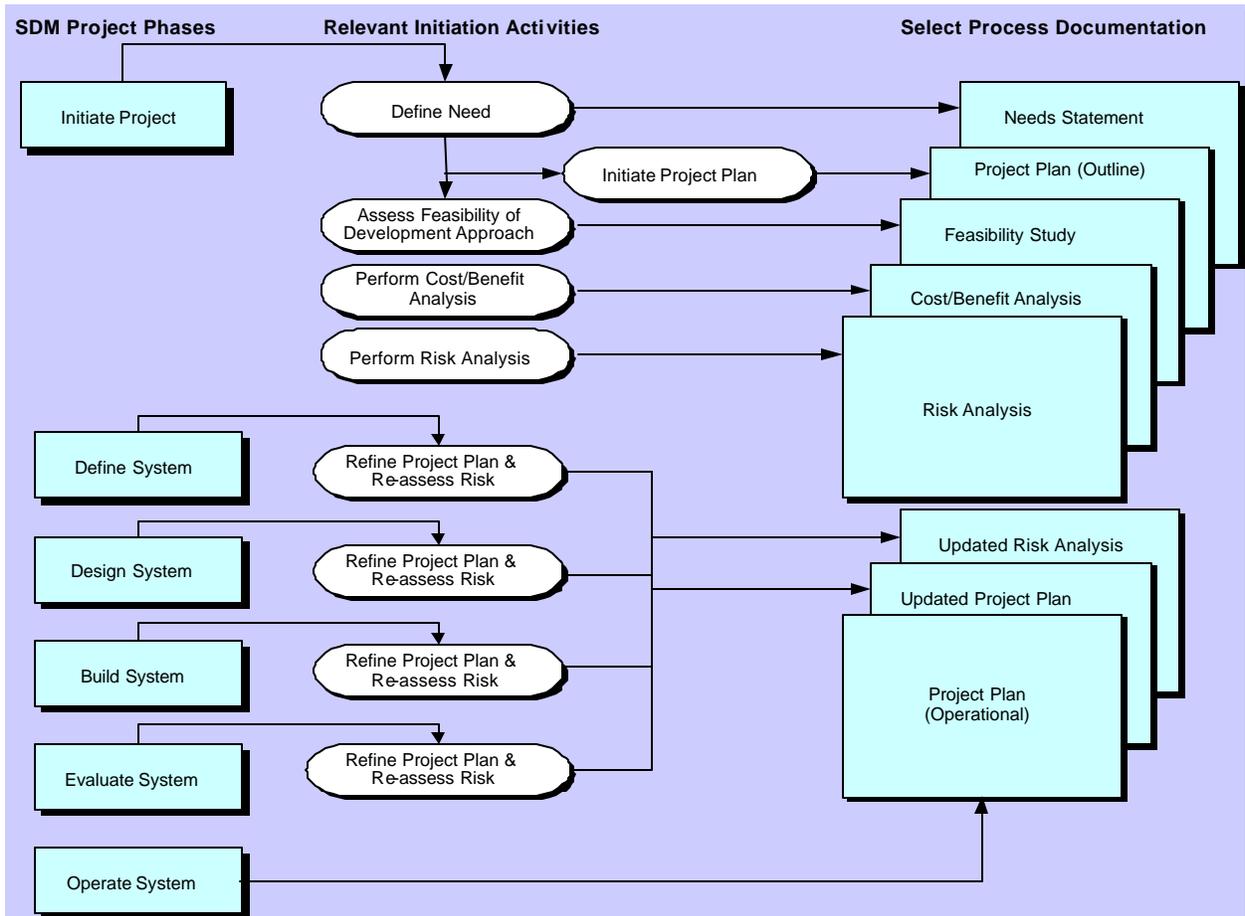
2.5.1 Business Need Identification and Concept Development

All IT projects at HUD support a documented business need. HUD strives to ensure that poor business processes are not automated. To this end, the business process must first be assessed for currency, accuracy and efficiency, and possibly re-engineered prior to

developing and proposing a concept for an IT project. In addition, initiatives must be in compliance with HUD's Enterprise Architecture. Compliance is demonstrated through documentation that describes the consistency and compatibility of the proposed project with HUD's baseline, transitional, and target architectures at the business, application, data and technology layers.

HUD will assess the health and well being of its IT portfolio, including projects that are in the operational or maintenance phase of their life cycles. The assessments will be used to adjust the portfolio, as necessary, to reflect changing business and organizational conditions. The documentation must be updated, as appropriate, and submitted for the Select process.

FIGURE 7 – HUD SDM ACTIVITIES AND ITIM SELECT PROCESS DOCUMENTATION REQUIREMENTS



2.5.2 Project Initiation

Following the determination that there is a need for an IT project, specific activities are undertaken to support its selection to the IT portfolio. The SDM details the project initiation activities. Figure 7 links the SDM project phases with the relevant initiation activities and required Select process documentation.

2.5.2.1 Project Categorization

The HUD IT investment process treats IT projects differently depending on the type of project and its phase in the project life cycle. Projects that consist of maintaining an existing operating system are, and should be, identified separately from initiatives that involve the development of a new information system. This differentiation is important when HUD allocates funding for an initiative, as well as when it determines the type of initiation documents that must be prepared. In accordance with the guidance in OMB Circular A-11⁷, HUD's IT initiatives are assigned the following categories.

Development, Modernization, Enhancement (DME)

This project category describes new systems or major modifications to existing systems that improve/enhance organizational capability or performance, and systems changes or changes mandated by legislation or agency leadership. DME projects can include both systems and infrastructure initiatives.

Steady State/Maintenance

This category describes the activities performed after systems or infrastructure initiatives are accepted and are in production. These activities are designed to sustain the operations and the responsiveness of these IT initiatives. Steady state/maintenance projects do not include enhancements or new development.

Non-Systems Development

This category refers to IT related activities conducted in support of HUD's mission or business areas that do not result in a system, such as IT consulting. These activities do not include the development, enhancement, operation, maintenance, or retirement of a system.

Each IT project falls within one of the categories identified above. However, in accordance with OMB circular A-11, HUD further distinguishes types of IT initiatives. Within both the DME and Steady State/Maintenance categories, projects are additionally categorized as either Infrastructure or Systems. As a result, HUD categorizes each of its projects in one of five ways:

- DME (Infrastructure)
- DME (Systems)
- Steady State/Maintenance (Infrastructure)
- Steady State/Maintenance (Systems)
- Non-Systems.

This further distinction allows HUD to refine its investment priorities and resource allocations. Each IT project also is identified as either a major or non-major project. Major projects receive special management attention, require generation and submission of an OMB Exhibit 300 annually, and have one or more of the following characteristics:

- Important to HUD's mission
- High development, operating, or maintenance costs (such as, life-cycle costs equal to or greater than \$5 million)
- High Risk
- High Return
- Critical to the administration of HUD's programs, finances, property, or other resources

⁷ OMB Circular A-11(2000) revised, Office of Management and Budget.

2.5.2.2 Initiation Documents

As was illustrated in Figure 7, the initiation activities culminate in a required documentation set to be evaluated during the Select process. The required documentation set is based on the project category of an initiative and the project's status as a major or non-major project. Prior to screening and scoring, Project Managers, in conjunction with the Project Sponsors, must generate and submit the appropriate documentation set for all IT investment projects. Figure 8 is a guide to the initiation documents that are required for the Select process.

2.5.2.3 I-TIPS Project Data

Once the appropriate documentation has been assembled, Project Managers, in conjunction with the Project Sponsor, must upload the files in the appropriate initiative documentation set folder (found in the Resource Library of I-TIPS). In addition, they must populate various fields in the I-TIPS database. The entry and updates to project data in I-TIPS facilitates the development of a project proposal and the analysis of an initiative against the screening and scoring criteria. The specific fields that Project Managers must populate are outlined in the HUD Select Users' Guide published prior to each Select activity. Additionally, the I-TIPS user manual provides guidance on using I-TIPS.

FIGURE 8 – SELECT PROCESS INITIATION DOCUMENTATION REQUIREMENTS

PROJECT CATEGORIES	SELECT PROCESS DOCUMENTATION REQUIREMENTS	
	Major Projects	Non-Major Projects
DME (including Systems and Infrastructure)	Submit <u>complete</u> SDM initiation documentation as follows: <ul style="list-style-type: none"> • Needs statement • Feasibility study • Cost-Benefit analysis • Risk analysis • Project plan, including a paragraph on technical performance Summarize the technical performance goals as described in the statement of work. Identify which elements or functionality of the technical performance of the system are achieved in each phase of the SDM.	Submit <u>partial</u> SDM initiation documentation as follows: <ul style="list-style-type: none"> • Needs statement • Feasibility study <ul style="list-style-type: none"> – General information – Proposed system • Cost-Benefit analysis <ul style="list-style-type: none"> – General information – Costs (high-level summary) – Benefits (high-level summary) • Risk analysis <ul style="list-style-type: none"> – System security – Risks and safeguards • Project plan, including technical performance
Non-Systems Development	Submit <u>Partial</u> SDM initiation documentation as follows: <ul style="list-style-type: none"> • Needs statement • Project plan • Cost-Benefit analysis 	Submit <u>Partial</u> SDM initiation documentation as follows: <ul style="list-style-type: none"> • Needs statement • Project plan • Cost-Benefit analysis, <ul style="list-style-type: none"> – General information – Costs (high-level summary) – Benefits (high-level summary)
Steady State/Maintenance (including Systems and Infrastructure)	<u>Partial</u> SDM initiation documentation <ul style="list-style-type: none"> • Needs statement (update, as necessary) • Risk analysis (update, as necessary) • Cost-Benefit analysis (if available) • Project plan, including technical performance 	<u>Partial</u> SDM initiation documentation <ul style="list-style-type: none"> • Needs statement (update, as necessary) • Risk analysis (update, as necessary) <ul style="list-style-type: none"> – System security – Risks and safeguards • Project plan, including technical performance

2.6 Select Activities

Project Sponsors and Managers must ensure that all pre-Select activities have been completed prior to the submittal of an initiative to the Select process.

The Select process is an iterative process. HUD has one IT portfolio whose composition changes as projects are modified, added to, or deleted from the portfolio. Within a given year, there are opportunities to make major changes and minor adjustments to the composition of the IT portfolio through the Control Process. The primary Select process occurs each April in conjunction with HUD’s budget request and submission process. This process results in the

formulation of the IT portfolio for the upcoming fiscal year (FY +1 year) and a projection for the following fiscal year (FY+2 year). The Select process, on a minor scale, also occurs quarterly, in conjunction with the IT portfolio Control Reviews. This is to accommodate emergent requirements that become known outside of the April Select timeframe, and to provide an opportunity to adjust the portfolio in response of changing business, program, and project conditions.

The OCIO establishes the sequence of events and timetables for the Select process on an annual basis. In terms of the April Select process, the OCIO schedules the TIBEC WG Select session towards the end of April. Consequently, the

loading of SDM documents within I-TIPS, and project screening and scoring must occur in March.

2.6.1 Screening

The primary goal of screening is to assess the viability of an initiative – that is, is the project worth undertaking? Project Sponsors must screen all proposed IT initiatives to ensure that sufficient analysis has been conducted to warrant HUD's investment in either a new or an on going initiative. They also screen initiatives to ensure that the appropriate level of documentation is provided and to flag poorly documented projects that contain gaps or substantial weakness in the level of information being provided. Figure 9 provides guidance on the criteria Project

Sponsors must apply when determining viability. This list is updated by the OCIO, as necessary, to reflect changes in the Department's business requirements or legislative mandates. Prior to submitting a project for scoring, Project Sponsors should direct corrective action to remedy any

deficiencies identified. Projects deemed "not viable" should not be included in the pool of candidate projects submitted for scoring. Ratings against the criteria and viability decisions are captured in I-TIPS in the "Project Screening Information" module.

If the Project Sponsor deems that an initiative is viable and worth consideration for funding, he/she assigns it to an investment pool established by the OCIO in I-TIPS. Only the Project Sponsor can assign an initiative to an investment pool. The OCIO extracts the assigned projects from the investment pool to score and consider them for inclusion in the IT portfolio. The Select User's Guide, which is updated and released in February, prior to the major Select process provides additional information and guidance to assign an investment to an investment pool.

FIGURE 9 – GUIDANCE FOR ASSESSING PROJECT VIABILITY

PROJECT SCREENING INFORMATION
<p>Viability Criteria:</p> <ul style="list-style-type: none"> ➤ Is the initiative clearly within the scope of HUD's mission or strategic goal(s)? ➤ Is HUD the best agency to efficiently carry out this initiative? ➤ Does this initiative support work processes that have been simplified or otherwise redesigned? <p>Viability Considerations:</p> <ul style="list-style-type: none"> ➤ Satisfies Raines' Rules or is otherwise justified ➤ Costs and benefits are clearly defined and expected benefits outweigh costs ➤ There are clear performance measures ➤ The project results in service/program delivery improvements ➤ All risks have been identified, assessed and addressed ➤ All required documentation is complete and present ➤ There are clear project milestones ➤ The project is in conformance with the enterprise architecture and advancing HUD towards the target architecture <p>Initiative Designation:</p> <ul style="list-style-type: none"> ➤ Is the initiative a Secretarial priority? ➤ Does the initiative represent or impact a mission-critical system? ➤ Does the initiative have a long development life cycle? ➤ Does the initiative have a high life cycle cost? ➤ Is the initiative required to satisfy the requirements of a law or regulation? ➤ Is the initiative required in response to an identified material weakness or deficiency?

2.6.2 Scoring and Ranking

Cross-functional and multi-organizational teams of HUD managers are established to score proposed IT initiatives. The OCIO has developed a methodology and scorecards to quantify the expected benefits and risks of IT projects. This methodology assigns numeric values to an initiative based on a set of criteria and associated weights that have been approved by the TIBEC. The criteria, or discriminators used to score initiatives include, but are not limited to, the following areas:

- Response to Material Weakness or Deficiency (Audit Findings)
- Support to HUD's Mission
- Evidence of Project Management Capability (and completeness of SDM documentation)
- Feasibility of Implementation
- Compliance with the Enterprise Architecture
- Support to Principals' Priorities

The scoring methodology relies on the objective application of explicitly defined and weighted project scoring criteria in accordance with well-defined scoring rules. Appendix C illustrates the project scoring rules and criteria that are utilized by the Department.

2.6.2.1 Initiative Scoring

The Department's scoring teams, composed of program area representatives, quantify the benefits and risks of candidate projects by assigning numeric values against the scoring criteria described above and in Appendix C. The numeric values assigned to a project are based on the scoring teams' evaluation of the information within the documentation set. Projects are assigned a weighted score for each of the criteria, and an overall total weighted score. These scores are used to rank the projects within the IT investment pool. The scoring teams document their rationale for assigned scores, relevant observations, and feedback for use by Project Managers and the TIBEC WG. In addition, the

scoring teams grade the quality of the initiation documentation according to a standard grading scheme:

- Red – The initiative documentation does not meet SDM requirements
- Yellow – The initiative documentation meets SDM requirements, however, the documentation can be strengthened.
- Green – The initiative documentation substantially meets SDM requirements

Figure 10 shows a partial score sheet for the SDM documentation. These grades are incorporated into the decision making process described in Section 2.6.3.

2.6.2.2 Initiative Ranking

The ranking of proposed IT projects is supported by Expert Choice, a commercially available automated decision support tool⁸ that uses the results of the scoring process to analyze and compare initiatives within the investment pool. Expert Choice allows HUD to develop a portfolio optimization algorithm to address project benefits, risks, and other key factors (such as mandatory funding requirements). The optimization produces a ranking factor, or benefit score, between 0 and 1 for each initiative, grouped by project type (DME, steady-state, etc.). These rankings are then used as a starting point for discussion and decision making within the TIBEC WG.

2.6.3 Portfolio Selection and Approval

2.6.3.1 Select Sessions

Ranked projects are presented by the OCIO to the TIBEC WG as candidates for selection into the HUD IT investment portfolio. Prior to the selection sessions, the OCIO develops and gains TIBEC approval of funding targets for each of HUD's five project types. These targets are based on the IT needs of the Department, the prior

⁸ Expert Choice is described further in Appendix B.

Figure 10 – PARTIAL SDM DOCUMENTATION SCORE SHEET

PCAS	INITIATIVE NAME	REQUESTED (\$000)	PROJECT PLAN				FEASIBILITY STUDY				COST BENEFIT ANAL				
			RED	YELLOW	GREEN	ABSENT	RED	YELLOW	GREEN	ABSENT	RED	YELLOW	GREEN		
NON-SYSTEMS															
00202940	ENFC03 EC Departmental Tracking System	\$1,014													
00251160	HSG-CO-004-A56-FHA Accounting System [PCAS# 00251160]	\$80													
00251370	HSG-SF-002-A80W-SF Neighborhood Watch [PCAS # 00251370]	\$889													
00251420	HSG-SF-007-F51A-Approval, Recertification, & Review Tracking (ARRTs) [PCAS # 00251420]	\$314													
00251430	HSG-SF-008-F51B-Mortgage Portfolio Analysis System (MPAS)	\$199													
00251480	HSG-OP-003-F60A-Work Request Tracking System [PCAS# 00251480]														
00251550	HSG-SF-010-SFDQ Data Quality Cleanup	\$383													
00251870	CPO-009 Electronic Commerce/Electronic Data Interchange (EC/EDI) in Contracting	\$79													
00252600	HSG-004-EDI-U26A Electronic Data Interchange	\$977													
00252950	CFO-Data Standardization/Clean-up	\$2,178													
00304260	Operate Hotline/Helpline, 00304260	\$4,606													
00306680	HSG-SF-013-F51Q-Quality Assurance Document Library System (QDLS) [PCAS# 00306680]	\$181													
00307160	PIH3020 GMC Support (00307160)	\$595													
00307680	REAC-01 Resident Assessment Subsystem (RASS) - (PCAS# - 00307680)	\$3,099													
00307810	REAC-06 Financial Assessment Subsystem - Federal Housing Administration (FASS-FHA) - (PCAS# - 00307810)	\$2,297													
00307820	REAC-07 Financial Assessment Subsystem - Public Housing (FASS-PH) - (PCAS# - 00307820)	\$3,685													
00307830	REAC-08 Management Assessment Subsystem (MASS) - (PCAS# - 00307830)	\$2,052													
00307880	REAC-11 Quality Assessment Subsystem (QASS) - (PCAS# - 00307880)	\$1,484													
00307890	REAC-12 Lender Assessment Subsystem (LASS) - (PCAS# - 00307890)	\$1,204													
00307920	REAC-14 inVentry Assessment Subsystem (VASS) - (PCAS# - 00307920)														
00308280	FHEO -3 F42F/MLIS-Mortgage Lending Information System	\$707													
00308430	ODEEO-03(SHOT)Sexual Harassment Training On-Line	\$30													
Total	22	\$26,052													
		Totals	0	0	0	0	0	0	0	0	0	0	0	0	0

year's rationale and funding distribution, as well as Government and industry best practices. To help prepare the TIBEC WG for the Select Sessions, the OCIO develops information packages that include:

- HUD's IT investment selection strategy
- Summary report for each initiative under consideration
- Scoring criteria and results
- Project documentation quality grades
- Initial optimization results by project type

During the Select Sessions, the TIBEC WG analyzes and compares competing initiatives within the investment pool to determine whether they will be recommended to the TIBEC for inclusion in the HUD IT investment portfolio. As part of its evaluation, the TIBEC WG reviews the project rankings to identify exceptions that may warrant special consideration or reprioritization (such as instances where mission critical initiatives receive low benefit scores). When projects are required due to their criticality to HUD's mission and business objectives, the working group directs the Project Sponsor and Project Manager for these projects to identify and

implement corrective actions to ensure the project's health. The members of the TIBEC WG votes on the selection of each IT project to be included in the portfolio.

The results of the TIBEC WG decisions and recommendations are captured in I-TIPS. Highlights of the proceedings and the outcome of the TIBEC WG Select sessions are documented and distributed to all stakeholders, including all HUD Principals. The proposed IT portfolio is forwarded to the SRB for executive review prior to the TIBEC for final approval.

2.6.3.2 Recommendations to the SRB and TIBEC

The TIBEC WG provides its recommendations on the composition of the HUD IT investment portfolio to the SRB and TIBEC. The SRB uses the following questions to determine whether it will support the TIBEC WG's recommendations and pass the portfolio to the TIBEC for approval.

- Does the portfolio reflect HUD's strategic priorities?

- Does the resultant mix of initiatives advance HUD towards the transitional or target enterprise architectures?
- Have potential funding constraints been considered and contingencies developed to address them?
- Does the IT portfolio adequately balance Departmental priorities with those of the program areas?
- Is the portfolio positioned to help the Department accrue the greatest return for its investment?
- Have the ramifications of deciding not to invest in certain initiatives been given careful consideration?
- Have IT initiatives that support the consolidation, integration, or streamlining of projects been explored?
- Have all opportunities to invest in crosscutting initiatives been appropriately evaluated?
- Is HUD capable of successfully executing the chosen IT portfolio (i.e., are the appropriate resources available to execute the included projects)?

There are frequent interactions between the TIBEC WG and the SRB until both parties are confident that all questions are adequately addressed. At that point, the recommended portfolio is forwarded to the TIBEC for approval.

2.6.3.3 OMB Exhibit 300

At the conclusion of the Select Process, Project Sponsors, with the assistance of Project Managers, must generate the OMB Exhibit 300 (Capital Asset Plan) for each of their major projects, as defined in section 2.5.2.1 above. The Exhibit 300 is a useful mechanism for OMB to identify the results of HUD's Select process. The Exhibit 300 provides program justification, acquisition strategy, costs analysis, risk management and performance goals and measures to OMB. Throughout the life cycle of the project, the Exhibit 300 will be revised and adjusted by the Project Manager to ensure that

the document reflects the adjustments within the evolving stages of the ITIM process. Information to be inserted in the Exhibit 300 is supplied by the Project Manager. The OCIO is responsible for directing the preparation of HUD's Exhibit 300 reports, ensuring their standardization and completeness, and submitting them through the OCFO to OMB each year.

2.7 Management Reserve

HUD uses various techniques to ensure the strategic management and efficient utilization of the HUD Working Capital Fund (WCF), which finances the IT portfolio. Mechanisms are in place to accommodate adjustments to the IT portfolio that may result from changing business, program, and project conditions.

A Management Reserve (MR) fund is allocated as a WCF cost element during the major Select process in April. The MR fund is used to accommodate unanticipated funding requirements or contingencies. The MR is separate from the baseline investment pool and is centrally managed by the OCIO and OCFO. The OCIO determines and recommends to the TIBEC the appropriate amount of funding reserve to be maintained (the allocation for FY 2001 was 2% of the WCF). Release of funds from the reserve must be endorsed by the TIBEC WG and approved by the SRB. Opportunities to present new initiatives that may require use of reserved funds are presented quarterly in conjunction with the IT portfolio Control Reviews.

3 CONTROL PROCESS

- Take corrective actions when necessary • Monitor progress continuously

3.1 Control Overview

The IT portfolio and project control process, as displayed in Figure 11, ensures that the Department's IT projects continue to support HUD's mission and business objectives.

IT investment control involves project and portfolio related activities. At the project level, control includes continually monitoring and managing project scope, cost, schedule, and performance; identifying, assessing and responding to project risk; and ensuring timely delivery and quality of IT products and supported services.

Portfolio control focuses on the overall health of the Department's IT portfolio by monitoring and managing project variance and validating the portfolio's overall return on

investment. It also seeks to ensure that the mix of IT projects within the portfolio continues to meet the needs of the Department and is enabling its Program areas to meet their strategic goals and performance objectives.

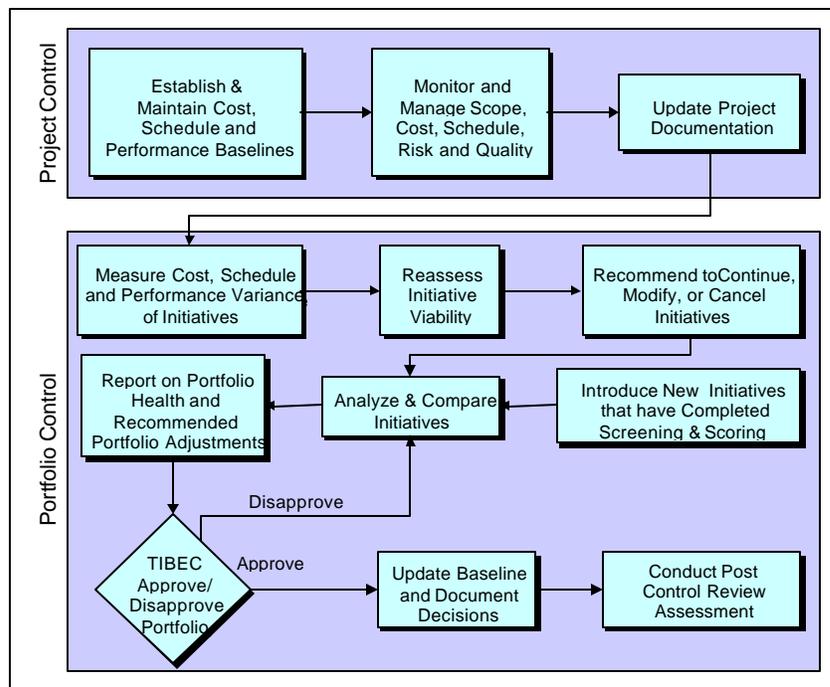
3.2 Control process prerequisites

HUD employs the following preconditions and activities to ensure the successful execution of IT portfolio and project control:

- Portfolio and project control standards are established and approved by the TIBEC. They provide Project Sponsors and Project Managers with specific guidance on the tolerable variances for cost, schedule, and technical performance.

HUD IT Project Managers are familiar with sound project management techniques and practices.

FIGURE 11 – HUD IT PORTFOLIO CONTROL PROCESS



- Project baselines are documented and reflect data provided during the Select process.
 - Cost, schedule, and performance information are accurate, complete, and are maintained by the Project Manager and periodically reviewed by the Project Sponsor.
 - Roles and responsibilities for stakeholders participating in the Control process are defined and institutionalized.
 - A mechanism to direct and monitor corrective actions is established and is fully operational.
- Make adjustments to the project plan, schedule, and contingency plans, as necessary.
 - Adjust OMB Exhibit 300 to reflect updated information and data.
 - Provide regular status reports and alert the Project Sponsor to significant deviations in cost, schedule, and performance baselines.
 - Define and implement corrective actions or risk mitigation strategies to avoid, alleviate, or minimize the impact of problems identified.
 - Prepare and maintain accurate and complete project documentation, including the actions and results associated with project level reviews.
 - Monitor performance outputs and outcomes. Analyze whether the project is meeting established performance measures.

3.3 Control Process Roles and Responsibilities

The roles and responsibilities of the individuals and organizations involved in the portfolio and project control processes are provided below.

➤ **Project Sponsor**

- Hold ultimate responsibility and accountability for the health and well being of the project(s) they sponsor
- Ensure that their projects are properly managed. Communicate regularly with Project Manager.
- Monitor project performance, and initiate and conduct regular project reviews.
- Work with the Project Manager to ensure that I-TIPS is updated with current and accurate information on project cost, schedule, and technical performance.
- **Work closely with OCIO to provide feedback on project performance in preparation for quarterly portfolio control reviews.**

➤ **Project Manager**

- Monitor and manage on going project control activities and risks. Evaluate project status and performance.
- Regularly update project performance documentation in I-TIPS (such as actual costs, milestones achieved, schedule and performance variances, resource and scope changes, etc.).

➤ **Information Technology Review Board (ITRB)**

- Conduct frequent detailed project-level reviews to assess the technical and programmatic health of all IT projects.
- Provide feedback to Project Sponsors and Project Managers on technical problems, and recommend actions to avoid or address them.
- Escalate high risk projects to the Program Management Review Board for further review.

➤ **Program Management Review Board (PMRB)**

- Evaluate and provide resolution to issues and concerns for high priority/high risk projects escalated by the ITRB or the TIBEC WG.

➤ **Office of the Chief Information Officer (OCIO)**

- Establish and manage the IT portfolio and project control process, and schedule and facilitate quarterly IT portfolio and project control meetings.
- Develop methodologies and procedures to collect and analyze information on project cost, schedule, and technical performance.
- Provide analyses and recommendations to the TIBEC WG, SRB, TIBEC, et al, as requested.
- Establish guidelines to conduct the TIBEC WG IT portfolio and project control meetings.
- Present the TIBEC WG's recommended portfolio adjustments to the SRB and the TIBEC.

- **Technology Investment Board Executive Committee Working Group (TIBEC WG)**
 - Conduct the quarterly portfolio and project control sessions.
 - Assess the health of the IT portfolio by reviewing the information provided by the OCIO.
 - Recommend actions to the SRB and TIBEC to maintain or adjust the IT portfolio through the continuation, acceleration, deferral, cancellation, or addition of IT projects.
 - Refer high risk projects to the PMRB for further investigation.
 - Maintain communications with HUD Program Areas.
- **Senior Review Board (SRB)**
 - Review the TIBEC WG's recommendations on the composition, adjustments, and maintenance of HUD's IT portfolio.
 - Consider the institutional and organizational dimensions, risks, and impacts of portfolio and project actions.
 - Submit TIBEC WG recommendations to the TIBEC.
- **Technology Investment Board Executive Committee (TIBEC)**
 - Oversee the control of HUD's IT portfolio.
 - Review the TIBEC WG's and SRB's recommendations on the composition, adjustments, and maintenance of HUD's IT portfolio.
 - Provide final approval on the IT portfolio and submit revised funding requirements to the CFO.

3.4 Control Process Support Systems

Project Sponsors and Project Managers establish and maintain project controls to help avoid or minimize the impacts associated with project and portfolio risk and maximize the return on HUD's IT portfolio.

Project management practices and methodologies can vary across HUD. To achieve Department wide consistency in the has established standard operating procedures to

guide project monitoring and reporting. These guidelines include standards for conducting technical assessments, cost and risk analyses, and definitions of the categories of project data and methodologies used to analyze project information.

In addition, the following automated tools are used to support the collection, analysis, and maintenance of information that supports project management and analysis, documentation, and IT portfolio and project reviews:

- Information Technology Investment Portfolio System (I-TIPS)
- MicroSoft Project Office
- Integrated Capital Investment Support System (ICISS)
- HUDCAPS

A more detailed description of the functions supported by these tools is provided in Appendix B.

3.5 Project Level Control

Project control at HUD involves the following activities:

- Project Monitoring
- Performance Measurement
- Earned Value Management
- Project Documentation and Updates

Figure 12 provides a summary of the key project-level control roles and functions, and the activities that support them.

FIGURE 12 – PROJECT CONTROL ROLES AND ACTIVITIES

PHASE	ROLE/FUNCTION	ACTIVITIES PERFORMED
Monitor and Review Project	Project Manager	<ul style="list-style-type: none"> • Project Plan Updates • Risk Assessment • Risk Mitigation Planning and Execution • Performance Trend Analysis
	Project Sponsor	<ul style="list-style-type: none"> • Re-evaluation of Business Requirements and Acquisition Strategy • Project Status Reviews • Performance Trend Analysis
	ITRB	<ul style="list-style-type: none"> • Detailed Technical Performance Reviews • Detailed Project Management Reviews
	PMRB	<ul style="list-style-type: none"> • Technical Performance Reviews • Performance Trend Analysis
Measure Project Performance	Project Manager	<ul style="list-style-type: none"> • Earned Value Measurements • Variance Analysis (Cost, Schedule) • Performance Measurement Baseline (PMB) • Corrective Action Identification • Corrective Action and Follow-Up
	Project Sponsor	<ul style="list-style-type: none"> • Performance Measurement Baseline (PMB) • Corrective Action Identification
Update Project Documentation	Project Manager	<ul style="list-style-type: none"> • Progress/Status Reports • Project Documentation Updates • PMB Changes and Variances • I-TIPS Updates
	Project Sponsor	<ul style="list-style-type: none"> • PMB Changes and Variances

3.5.1 Project Monitoring

The Project Manager is responsible to the Project Sponsor for day-to-day project execution and control, resource management, and project documentation. The required documentation for project control includes project status reports, requirements documents, baseline and actual cost, including the OMB Exhibit 300, schedule, and performance data, and risk management documentation. The Project Sponsor is ultimately responsible for the success or failure of a project, and in accordance with such responsibility conducts periodic project reviews.

The Department's Systems Engineering Oversight and Performance Monitoring Division (SEOPMD) conducts approximately project level technical reviews per quarter. For each project, the SEOPMD assesses technical performance, progress, and architectural compliance. The SEOPMD's technical reviews also serve to verify that corrective actions identified during previous technical reviews are being addressed.

Projects that have been designated as "high risk" may be referred to the Program Management Review Board (PMRB) for further assessment. Appendix D provides examples of the templates and forms that are used within the SEOPMD's technical review process. The results of technical reviews are included in the project's control records, which are maintained by the Project Manager.

3.5.2 Performance Measurement

The Project Sponsor is responsible for establishing baseline performance measures for cost, schedule, technical requirements and program area mission related outcomes. These baselines supply the framework and foundation necessary to assess the health of a project. The on going analysis of project performance provides the Project Sponsor and the Project Manager with performance trends that are used to help define corrective actions. For example, projects that demonstrate a sustained performance variance of

7% or more can be flagged for more in-depth review. Project Sponsors also are responsible for determining the impact of potentially cascading or long-term problems associated with project performance. Earned value management techniques are used to measure project performance. Project risk management is described further in Appendix G. Current and potential performance problems also are addressed at portfolio control review sessions.

3.5.2.1 Earned Value

OMB requires that all major projects utilize an earned value (or similar) approach to evaluate interim project outcomes. The determination of earned value involves an assessment of the estimated dollar value and scheduled dates associated with completing project milestones compared to actual costs and milestone completion dates. All IT projects are planned, budgeted, and scheduled in measurable and phased "value-added" increments. The two major objectives of the earned value approach are:

- To encourage the use of an effective internal cost and schedule management process.
- To provide Project Sponsors with timely data for use in evaluating project status.

An overview of the process employed by HUD to assess earned value, performance baseline, and variance analysis is provided in Appendix E.

3.5.3 Project Documentation and Updates

The Project Manager and Project Sponsor are responsible for maintaining the currency of project documentation. This includes the careful screening of project data to ensure that it is accurate, complete, and is entered into the relevant HUD project control systems (such as I-TIPS, HUDCAPS, and Project Office).

If a project is operating on schedule and within cost estimates, and other conditions surrounding the project remain unchanged, the

Project Sponsor must verify that the information provided to date is valid. However, if conditions change, the Sponsor must ensure that project documentation is updated in a timely manner. This includes data entered in the OMB Exhibit 300, which is used by OMB to ensure program viability and by HUD to measure performance. Provided below are examples of changes that would lead to more in-depth project review and likely updates to project documentation:

- The project shows a sustained variance of 7% in either cost or schedule.
- There are actual or potential changes to project scope or technology.
- The initiative is no longer aligned with HUD strategic goals or performance objectives, or the alignment has changed significantly.
- New risks have been identified or the likelihood and impacts of current risks are considerably different than initially expected.

3.6 Portfolio Control

Portfolio control focuses on the assessment of the overall health and performance of the IT portfolio. Quarterly portfolio and project control reviews are conducted to provide for the assessment and to make necessary adjustments to the IT portfolio. Figure 13 summarizes the key roles and functions of portfolio-level control and the associated activities that support them.

3.6.1 Controlling Portfolio Performance

The performance of HUD's entire IT portfolio is reviewed on a quarterly basis. The OCIO schedules and manages portfolio control reviews, including the preparation of supporting analyses. In practice, the HUD portfolio control process provides the basis to re-affirm or "re-select" funded projects on the basis of continuing to meet a business need, and meeting project performance objectives (such as cost, schedule

FIGURE 13 – PORTFOLIO CONTROL ROLES AND ACTIVITIES

PHASE	ROLE/FUNCTION	ACTIVITIES PERFORMED
Evaluate Portfolio Performance and Determine Corrective Actions	Project Sponsor	<ul style="list-style-type: none"> • Re-Affirmation of the Business Need and the IT Project Requirement
	Project Manager	<ul style="list-style-type: none"> • Provision of Project Actuals
	OCIO	<ul style="list-style-type: none"> • Portfolio Screening and Analysis • Portfolio Performance Benchmarking • Earned Value Assessment
	TIBEC WG	<ul style="list-style-type: none"> • Mission/Business Priorities Re-Assessment • Portfolio Risk Assessment and Mitigation • Portfolio Adjustment Recommendations
Review and Approve Recommended Adjustments and Corrective Actions	SRB	<ul style="list-style-type: none"> • Budget Variance Analysis • Portfolio Adjustment Assessment
	TIBEC	<ul style="list-style-type: none"> • IT Portfolio Approval
Conduct Post Control Review	OCIO	<ul style="list-style-type: none"> • Performance Trend Analysis • Best Practices Identification • Process Improvement Analysis

and technical performance). The quarterly portfolio control reviews also facilitate the realignment of the IT portfolio based on changes in mission, legislative, or business requirements.

3.6.1.1 Pre-Control Review Activities

As displayed in Figure 14, the portfolio Control Review serves to answer some basic questions that help to determine the health of each project, and thereby, the overall IT portfolio. Pre-control review activities consist of the collection and analysis of this data for presentation at the control review. At a point prior to the quarterly control review, Project Managers and Project Sponsors are provided guidance by the OCIO to enter actual cost- and schedule- to-date information into I-TIPS and supply other project information as indicated below. The OCIO will then “freeze” all project data in I-TIPS to begin the analysis.

The OCIO will access project information stored in I-TIPS to help calculate the earned value to measure cost and schedule variances. The aggregation and analysis of project information provides a picture of the health of the entire portfolio, by project category (such as infrastructure D/M/E, Systems D/M/E, etc.),

and by special interest (such as e-Government, infrastructure, maintenance, or cross-cutting projects). In this manner, HUD gains insight into whether or not the portfolio is adequately meeting Departmental needs, and whether adjustments are necessary.

3.6.1.2 Control Reviews

Executive decision making during the Control Review by the OCIO ensures that IT funds are spent efficiently and are providing maximum benefit to HUD. Once project screening and assessment are complete, the information is passed on to the TIBEC WG, who meets to assess portfolio performance. Their analysis is based on the cost, schedule, and performance variance, as well as the working group's level of confidence that projects with difficulties can recover. The TIBEC WG's decision making activities focus on the assessments of high risk and high priority projects; making revisions to portfolio priorities; and the approval of requests for modifications to the portfolio. The TIBEC WG submits status recommendations for changes to funding for projects to the SRB. Based on their analysis, the TIBEC WG will offer one of the following recommendations for each project they review:

FIGURE 14 – CONTROL SCREENING CRITERIA

ELEMENT	DESIRED INFORMATION	BASELINE DATA SOURCE	'ACTUAL' DATA SOURCE	ANALYSIS
Business Need	<ul style="list-style-type: none"> Does the project still address a current business need? 	<ul style="list-style-type: none"> Needs Statement 	<ul style="list-style-type: none"> Project Sponsor 	<ul style="list-style-type: none"> If the business need is not valid or has changed, what is the impact?
Project Requirement	<ul style="list-style-type: none"> Are project requirements still valid? 	<ul style="list-style-type: none"> Business Case (Needs Statement + C/BA) 	<ul style="list-style-type: none"> Project Sponsor 	<ul style="list-style-type: none"> If the current IT project does not adequately address the business need, what is the impact? Is an additional alternatives analysis required?
Project Life Cycle	<ul style="list-style-type: none"> Status and outlook of project cost, schedule, and technical performance 	<ul style="list-style-type: none"> I-TIPS Project Office Procurement Plan OMB Exhibit 300 	<ul style="list-style-type: none"> I-TIPS Project Office HUDCAPS Project Manager 	<ul style="list-style-type: none"> Is the project within acceptance variances? If not, what is the perceived likelihood that it can recover?
Risk Assessment and Mitigation	<ul style="list-style-type: none"> Have risks, contingencies and corrective actions been addressed? 	<ul style="list-style-type: none"> Risk Assessment Plan 	<ul style="list-style-type: none"> Project Manager ITRB Results 	<ul style="list-style-type: none"> Are there new risks that have not yet been addressed? Have risks hindered the success of the project?
SDM Documentation	<ul style="list-style-type: none"> Are development activities being conducted according to the approved methodology? 	<ul style="list-style-type: none"> SDM Documentation 	<ul style="list-style-type: none"> ITRB Results 	<ul style="list-style-type: none"> Is the SDM documentation sufficient and accurate?

- **Continue As-Is:** The project is proceeding within acceptable cost and schedule variances; performance targets and milestones are being met; all identified risks are mitigated; the technology solution and project scope remain viable. Any deviation from these conditions can be corrected within the scope and budget of the existing project.
- **Modify:** A change to the project scope, budget or timetable is needed to enable the project to meet its objectives; or objectives have changed that require modifications to the scope, budget or timetable.
- **Accelerate:** External factors require the project to be completed sooner than expected or project

resources are available that can enable an acceleration of project schedule.

- **Decelerate:** The project timetable or funding needs to be reduced in order to allow the project an opportunity to regain acceptable cost, schedule, and/or performance levels. Or, external factors, such as dependence on another project, require expanding the project life cycle.
- **Suspend:** It is not cost-effective to proceed with further development or on going activity until problems stemming from resource shortfalls, project performance, system dependencies, or other external issues are resolved. Typically, a suspension due to these factors will result in a project review by the PMRB. In addition, a realignment of Departmental priorities among

existing IT initiatives may result in the suspension of a project.

- **Cancel:** The project is no longer required or there is a low probability that it will ever meet acceptable cost, schedule or performance levels. The TIBEC WG deems that it is more economical and in HUD's best interest to end the project (and potentially replace it) than to fund a recovery effort.

3.6.1.3 Recovery Plans

Project Sponsors and Project Managers are given 15 days to complete a recovery plan for projects that are deemed unhealthy.⁹ Following the review of the recovery plan, the TIBEC WG makes the recommendation to the SRB to decelerate, suspend, or cancel the project.

The 15-day recovery planning period provides Project Sponsors and managers with the opportunity to demonstrate that they can get their project(s) under control. They do so by documenting and presenting a causal analysis of the problem, a new project plan indicating recovery techniques, and a new risk management

plan. The table presented in Figure 15 provides an overview of the corrective actions and/or remedial measures required for unhealthy projects that are placed on a 15-day recovery plan cycle during the quarterly portfolio and project control review.

The TIBEC WG reviews all project recovery plans and makes their final project recommendations. Adjustments to the portfolio recommended by the TIBEC WG are then forwarded to the SRB for executive review and then to the TIBEC for final approval.

3.6.2 Post-Control Assessment

At the completion of the IT portfolio and project Control Review, the OCIO provides a summary of outstanding issues and opportunities to the TIBEC WG. The TIBEC WG utilizes the Post-Control Assessment to resolve issues and identify "lessons learned." The OCIO collects the lessons learned and applies them to subsequent control activities, as appropriate.

⁹ Outside acceptable cost, schedule, or performance variance.

FIGURE 15 – RECOVERY PLAN CORRECTIVE ACTION CRITERIA

RECOVERY PLAN REQUIREMENTS FOR UNHEALTHY PROJECTS**For projects with greater than 7% negative variance:**

- Provide justification for project continuation:
 - Explain why this project is required at HUD and should not be canceled.
 - Discuss the impact to HUD if the project is not continued.
 - Provide a business case analysis for establishing a new baseline.

FOR ALL:**Perform and report on causal analysis for any cost, schedule, or technical performance variances:**

- Identify and analyze the factors that drove the project off plan.
- Identify and explain any causes of variance that were missed by the project risk management plan or how the risk management plans failed to handle those risks that were identified.
- Give new estimates to and at completion for cost, schedule, and technical performance. For cost and schedule estimates, include the impact of the Control Review's 15-day recovery requirement.

Describe any changes in scope and their impact on project variances**Provide new planning documentation**

- Provide a new WBS that incorporates new cost and schedule estimates from the analysis above.
- Provide key control points and milestones for at least six months into the project's future. Identify and justify a confidence level (low, medium, high) for meeting each key control point and milestone.
- Indicate any phased, successive segments of the project as narrow in scope and brief in duration as practicable that can move the project forward or solve a specific part of the business problem and that can be developed and funded independently (e.g., specific phase of system development such as design; pilots, simulations, or prototypes; different levels of service). Incorporate these discrete modules into the WBS.
- Provide a new risk management plan that clearly identifies how causes of risks will be identified and avoided or mitigated. If there are risks now identified that were not identified in the original plan, explain what steps will be or are being taken to insure such "blind spots" will be avoided.
- Provide an updated Cost Benefit Analysis (CBA) for the project, to include costs and benefits for the successive independent modules.

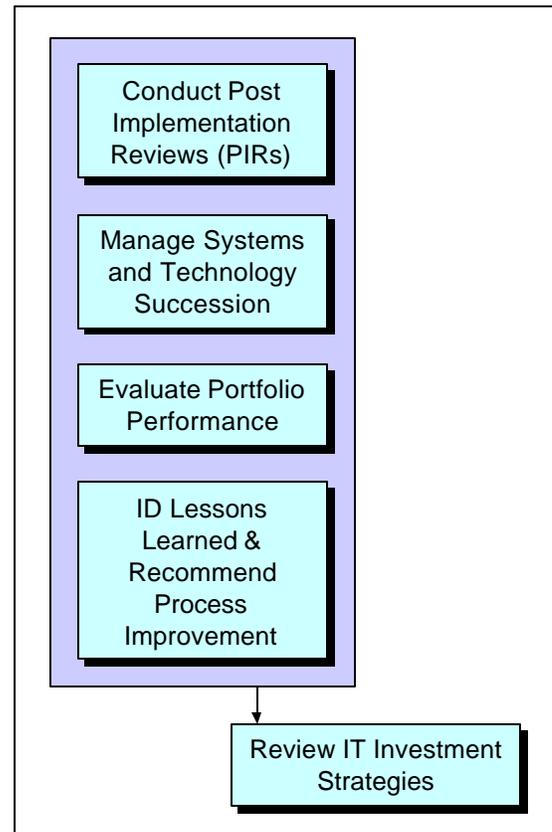
4 EVALUATE PROCESS

- Conduct post implementation reviews - Make adjustments - Apply lessons learned

4.1 Evaluate Process Overview

The Evaluate process, which HUD has recently initiated, is displayed in Figure 16. A primary objective of this process is to periodically conduct Post Implementation Review (PIR) for all completed projects (or discrete operational increments of larger projects). Each PIR will assess project performance by comparing actual results to original estimates, and sharing the lessons learned to improve decision making about future projects. IT projects in operation are evaluated to determine whether they should be continued, modified, replaced, or retired. The Evaluate process also includes an analysis of the performance of the entire HUD IT portfolio via an assessment of how well the portfolio is meeting HUD's strategic and programmatic needs, and the delivery of IT products and services. Finally, the Evaluate process is the mechanism by which users and management routinely improve HUD's ITIM process. The results and lessons learned from the analyses conducted within the Evaluate process are reflected within HUD's IT

FIGURE 16 – EVALUATE PROCESS



4.2 Evaluate Process Prerequisites

The following preconditions and activities enable HUD to successfully evaluate its portfolio and ITIM process.

- The policies and procedures necessary to support the Evaluate process are established and communicated to users and key stakeholders.
- Performance measurement metrics are defined and institutionalized.
- An IT Strategic Plan is maintained.
- The Enterprise Architecture is current, accurate, and routinely updated

4.3 Roles and Responsibilities

Roles and responsibilities for the Evaluate process will be developed in FY01 and FY02, as the process is more fully defined.

4.4 Evaluate process Support Requirements

The following tools provide for the collection and analysis of information that supports the Evaluate process. The tools are described in Appendix B:

- I-TIPS
- Microsoft Project Office

- HUDCAPS
- Enterprise Architecture Management System (EAMS)
- OMB Exhibit 300

4.5 Evaluate process Aspects

The Evaluate process is comprised of the following activities: Post Implementation Reviews; Systems and Technology Succession Management; Portfolio Performance Evaluations; and ITIM Process Improvement.

4.5.1 Post Implementation Reviews

Post Implementation Reviews (PIRs) are conducted within 6 to 12 months following project completion (such as during the Operate System phase of the SDM), or immediately upon its cancellation (to capture lessons learned). The TIBEC WG, in collaboration with the OCIO and the Office of Information Technology Reform (OITR), identify the projects that are due to complete a PIR. In some cases, an independent or cross-functional team will be assigned to perform the PIR. The OCIO is responsible for the management of PIR records and the maintenance of a "clearinghouse" for the collection and dissemination of lessons learned.

During the project PIR, a range of qualitative and quantitative factors are considered, including:

- Impact on customers/customer satisfaction
- Support to HUD's mission and program objectives
- Financial performance
- Technical capability
- Return On Investment (ROI)
- Project-level decisions throughout its life-cycle
- Effectiveness of the HUD's Select and Control activities to ensure the success of the project
- Gaps or deficiencies in the process used to develop and implement the projects

- Best practices that can be applied to sustain or improve the success of other IT projects

A sample PIR evaluation form is provided in Figure 17. The PIR process will be further defined in FY01 and FY02.

4.5.2 System and Technology Succession Management

To minimize inadequate returns on low value or high cost IT investments, HUD conducts periodic reviews of operational systems to determine whether they should be retained, modified, replaced or retired. With the emergence of new business and process requirements, and new and updated technology, systems should be assessed to determine the extent to which they continue to support the Department's mission and business objectives. This component of the Evaluate process also will be further defined in FY01 and FY02.

4.5.3 Portfolio Performance Evaluation

The evaluation of portfolio performance is a results-driven activity that tracks and measures performance outcomes, based on the quantitative and qualitative data accumulated during the ITIM process. The objective of these evaluations is to utilize aggregated project data to assess the overall effectiveness of HUD's IT investments to:

- Meet the Department's overall strategic objectives and business needs
- Deliver useful IT products that support program and end-user requirements
- Provide quality services to HUD's business partners

The evaluation of portfolio performance is conducted annually by the TIBEC WG with the support of the OCIO. Prior to each evaluation, the OCIO defines and issues guidance on portfolio performance evaluation measures, methodologies, techniques for comparative analysis, and reporting requirements. This process will be further defined in FY01 and FY02.

FIGURE 17 – IT INITIATIVE EVALUATION DATA FROM

IT INITIATIVE EVALUATION DATA SHEET				
GENERAL INFORMATION				
Project Title:				
Project Description:				
Project Sponsor/Manager:				
PCAS No:				
PIR Conducted By:				
Date of PIR:				
PERFORMANCE MEASURES				
	Baseline	Actual	Variance	Comments
Quantitative				
Financial				
Non-Financial				
Qualitative				
BASELINE STATUS				
	Baseline	Actual	Variance	Comments
Life Cycle Cost				
Life Cycle Return				
Schedule				
ARCHITECTURAL ANALYSIS				
Architectural Analysis:				
RISK ANALYSIS				
Risk Assessment:				
STAKEHOLDER ASSESSMENT				
General Comments:				
LESSONS LEARNED				
Project Management Assessment:				
Technical Assessment:				
IT CAPITAL PLANNING PROCESS ASSESSMENT				
Selection Assessment:				
Control Assessment:				
Evaluation Assessment:				

4.5.4 ITIM Process Improvements

The activities conducted during the Evaluate process are essential to the on going improvement of the HUD ITIM process and to the contributions that IT projects make toward the accomplishment of the Department's goals and objectives. Careful attention by Project Sponsors and Managers to the factors that contribute to project difficulties and failures will help to ensure that they do not repeat mistakes. In addition, the lessons learned from project performance can be used by individuals and organizations involved in the formulation of HUD's IT portfolio (such as the TIBEC WG, SRB, and TIBEC) to refine portfolio selection criteria, improve risk management, and determine appropriate work increments and associated levels of funding.

The OCIO solicits input from key process users and stakeholders to improve the HUD ITIM process. The key questions and considerations of this activity include:

- Is HUD's IT spending and project performance consistent with expectations? If not, what adjustments are needed?
- Do HUD's ITIM procedures help or hinder the management of individual IT projects?
- Is the Department effectively identifying business needs and subsequently developing IT solutions?

The steps that HUD will take to promote the continuous improvement of its ITIM process also will be further developed in FY01 and FY02.

APPENDIX A. GLOSSARY

Acquisition	The acquiring by contract with appropriated funds 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/NDI, and major milestones (e.g., software releases, hardware delivery and installation, and testing).
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.
Alignment	The degree of agreement, conformance, and consistency among organizational purpose, vision, and values; structures, systems, and processes; and individual skills and behaviors.
Alternatives Analysis	Assessment of all technological options to determine the optimal solution for meeting functional requirements based on cost, scope and schedule, and considers in-house or outsourcing options.
Architectural Alignment	Degree to which the IT initiative is compliant with HUD's Enterprise Architecture
Asset	Property, funding, technical knowledge, or other valuable items owned by the HUD. Assets are typically created by investments.
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.

Business Case	Justification that the initiative supports the HUD's core business or strategic goals and meets legislative requirements. Includes documentation of performance measures, analysis of business process performance and associated needs or problems, proposed alternative solutions, assumptions, constraints and a risk-adjusted cost/benefits analysis.
Capability Maturity Model SM	A descriptive model of the stages through which organizations progress as they define, implement, evolve, and improve their organizational processes. This model serves as a guide for selecting process improvement strategies by facilitating the determination of the current process capabilities and the identification of issues most critical to quality and process improvement
Control	Ongoing monitoring process that manages IT projects against predetermined schedules, budgets, and performance measures.
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-Benefit Analysis	Technique used to compare the various costs associated with an investment with benefits that it proposes to return. Both tangible and intangible factors should be addressed and accounted for in the analysis.
Development/ Modernization/ Enhancement (D/M/E)	Acronym used to define new systems development or modernization to existing or legacy systems that improve organizational capability or performance; changes mandated by legislation or agency leadership; personnel costs for project management and direct support. D/M/E initiatives can include both systems and infrastructure projects.
Enterprise Architecture	A strategic model of information asset represented by integrated components comprising business, data, application and technology architecture layers that are aligned with HUD'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.

SM *Capability Maturity Model (CMM) is a service mark of Carnegie Mellon University*

Expected Outcome	Projected end result of an initiative (e.g. system(s) or improvements in customer service) that is directly linked with pre-determined performance measures.
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.
Information Technology	Includes any equipment used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, 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.
IT Investment	The decision by a HUD organization to expend resources or the actual expenditure of resources on selected information technology or IT-related initiatives with the expectation that the benefits from the expenditure meets or exceeds the value of the resources expended.
IT Investment Control	The ongoing monitoring and management of the performance of IT projects that comprise HUD's IT investment portfolio against cost, schedule, risk, and technical baselines, and the identification of corrective actions to manage and mitigate project risk.
IT Investment Evaluation	The formal assessment of an operational IT project (also known as a Post-Implementation Review) 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 Evaluation process are used to modify future Select and Control decisions.
IT Investment Portfolio	The collection of IT projects approved by the TIBEC to address HUD's strategic and programmatic objectives, and to support managerial, business operations and administrative functions.
IT Project Management	The activities necessary to ensure that an IT 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 IT Project Managers to direct, control, administer, and regulate a project team creating an IT asset such that the resultant product meets its requirements upon delivery.

IT Project	An organizational initiative employing or producing IT or IT-related 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.
IT Project Value	The measurable contribution that an IT project makes towards the achievement of HUD goals and objectives.
IT Investment Selection	The decision making process within which all new, ongoing, and operational IT projects are considered for inclusion in the HUD IT Investment Portfolio. The Selection process combines rigorous technical reviews of project proposals and performance together with the application of uniform portfolio selection criteria.
Life Cycle Costs	The total cost of an IT initiative over its expected life. This cost should be broken down in accordance with the phases defined in HUD System Development Methodology (SDM) and the I-TIPS "A - J" cost categories. The lifecycle cost categories are: Project Initiation/Planning; Requirements Definitions; Systems Design; Software Acquisition; Hardware/Infrastructure Acquisition; New Development/Perfective Maintenance; Systems Integration and Testing; Installation and Deployment; Systems Operations; Corrective and Adaptive Maintenance.
Milestone	The completion of a scheduled, discrete project phase or task. A milestone is typically used to measure progress.
Non-Systems Development	Information technology related activities conducted in support of HUD's mission or business objectives that do not involve D/M/E, operation, maintenance, or retirement of a system or infrastructure.
Outcome	The actual results, effects or impacts of a business initiative, program, or support function. Actual outcomes are typically compared to expected outcomes.
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.
Payback Period	The forecasted timeframe in which a given investment is anticipated to achieve the projected ROI Ratio (ROI Ratio = Return/Investment Cost) equal to 1.0.

Passback/OMB	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.
Performance Measurement	The process of systematically tracking metrics or indicators to evaluate progress made in achieving predetermined goals and using such metrics and indicators to assess progress in achieving these goals.
Performance Measure	Metrics or indicators used to evaluate the success of an investment in contribution to predetermined strategic goals. Measures can be quantitative (i.e., staff hours saved, productivity improvement, dollars saved, reduction in errors) or qualitative (improvements in quality of life, customer satisfaction, etc.)
Project Manager	Provides oversight for project performance and maintains information project status, control, performance, risk, corrective action and outlook. This person has the lead responsibility for project execution and is accountable to the Project Sponsor on issues related to the project. Regardless of organizational affiliation, the Project Manager is 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 Sponsors	Individual who has authority and ownership for a project, and ultimate responsibility and accountability for a project's success or failure. Project Sponsors initiate projects, and help to ensure effective planning, management, and commitment. The Project Sponsor serves as a leader, providing guidance to the project team, and secures from senior management the required reviews and approvals.
Post-Implementation Review (PIR)	Evaluation of the IT project after it has been fully implemented to determine whether the targeted outcome (e.g., performance measures) of the project has been achieved. The PIR should also include an evaluation of the effectiveness of the Select—Control—Evaluate process as it relates to an IT initiative.
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 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.
Selection Criteria	Factors that are identified by HUD to prioritize and discriminate IT investments selected for subsequent funding.
Senior Review Board	Reviews and ranks initiatives to determine relative positioning within the HUD IT Portfolio. Serves as an advisory board to the Technology Investment Board Executive Committee (TIBEC).
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.
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 systems operational and responsive to users' needs as originally intended. Steady state/maintenance projects do not include enhancements or new development.
Systems Development Life Cycle (SDLC)	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.
Systems Development Methodology	The set of methods, techniques, and procedures of an SDLC process. The methodology provides a general framework for systems design, development and deployment and outlines roles and responsibilities, development activities and subordinate tasks that produce formal end products, conducting quality reviews, and gathering milestone concurrence.
Technology Investment Board Executive Committee (TIBEC)	Chaired by the Secretary, Co-Chaired by the Deputy Secretary and comprised of HUD Assistant Secretaries and Principals. The Technology Investment Board Executive Committee makes final management decisions regarding the effective use of HUD information technology investments and resources, including systems development, infrastructure, maintenance and IT consulting.

APPENDIX B. PROCESS SUPPORT TOOLS AND METHODOLOGIES

EAMS – ENTERPRISE ARCHITECTURE MANAGEMENT SYSTEM

The Enterprise Architecture Management System (EAMS) is a repository for collecting information on HUD's business processes and activities, the data created and used within the processes, the applications that manipulate the data, and the technology used to support the applications and data. Graphical links exist to display the interfaces and associations among these four layers of the architecture. Users can access the EAMS to determine existing processes, data and systems that complement their envisioned technical solution to a business need prior to expending resources. The EAMS is also a tool to assist in Business Process Re-engineering (BPR) or Improvement (BPI) prior to automating business processes.

HUD's current architecture and standards are maintained within the baseline architecture view. Target architecture and transitional architecture (interim architectures to be achieved while in pursuit of the target architecture) views will also be derived and maintained starting in FY01. Compliance with the technology standards employed at HUD, and support to achieving the target architecture are requirements for project inclusion in the IT portfolio.

EXPERT CHOICE

Expert Choice is a multi-criteria decision support software product that was developed on the principles of a popular decision making methodology—the Analytic Hierarchy Process (AHP). Expert Choice provides the capability to define goals, identify decision criteria and alternatives, and evaluate key trade-offs. In addition, Expert Choice enables the creation of decision based-models and drives the use of pair-wise comparisons to conduct assessments of the relative importance of variables. Expert Choice synthesizes such assessments to facilitate the drawing of conclusions and also allows for sensitive analysis of various criteria.

HUDCAPS

HUDCAPS is a system that provides a central and standardized accounting environment and captures, reports, controls, and summarizes financial results of accounting processes. The system standardizes the primary accounting functions (i.e., budget execution and funds control, accounts receivable and collections, accounts payable, and general ledger) and provide for a user-driven system that supports the financial aspects of the users' programs. In addition HUDCAPS will conform to the following core accounting standards as mandated by Federal Government:

- OMB Circulars A-34, A-123, A-127, and A-130.
- GAO Title 2/FMFIA (Federal Managers Financial Information Act).
- FHA Program Managers Reporting Requirements.
- Joint Financial Management Improvement Program (JFMIP) Core Financial systems Requirements.

HUDCAPS is sponsored by the Chief Financial Officer and the Council of Comptrollers. The primary users of HUDCAPS is the Office of Finance and Accounting (OFA), the Comptroller for Federal Housing Administration (FHA), the Comptroller for Government National Mortgage Association (GNMA), the Comptroller for Community Planning and Development (CPD), the Comptroller for Public and Indian Housing (PIH), the Office of Budget, and the Regional and Field Offices.

HUDCAPS serves as the focal point for integrating all HUD financial systems and will provide the framework for systems to communicate with each other. HUDCAPS provides HUD managers easy ad hoc access to financial information that will allow them to evaluate the true cost of delivering HUD's programs.

HUDCAPS provides benefits to the Department by:

- Providing timely, complete, and comparable financial management information.
- Improving accounting processing control to detect, prevent and mitigate mistakes, fraud, waste, and mismanagement of funds
- Centralizing and providing uniformity in financial information and reporting
- Reducing data redundancy
- Improving data integrity
- Automating many existing manual accounting systems
- Complying with Standard General Ledger (SGL) requirements and Generally Accepted Accounting Principals (GAAP)

ICISS – INTEGRATED CAPITAL INVESTMENT SUPPORT SYSTEM

The Integrated Capital Investment Support System, ICISS, is an innovative Intranet application developed to integrate and interpret contract, financial, and project information for better monitoring and reporting to Managers, GTRs, GTMs, Project Leaders and Contractors.

The overall mission of ICISS is to minimize the manual labor requirements by centralizing access to critical statistics and automating reports. ICISS also aims to reduce data anomalies by highlighting discrepancies between the various systems. Ultimately, ICISS will empower stakeholders in managing the WCF and eventually Salary & Expenses (S&E) funds.

ICISS is a front end system to HUDCAPS, HPS, Project Office and I-TIPS. Users can build queries to access consolidated project information from these systems.

I-TIPS – INFORMATION TECHNOLOGY INVESTMENT PORTFOLIO SYSTEM

The Information Technology Investment Portfolio System (I-TIPS) is a Web-based information system developed to automate and assist in the management of the IT Capital Planning and Investment Control Process. I-TIPS was originally developed for the Department of Energy and is currently in use at a number of other Federal agencies, including the U.S. Department of Agriculture, the U.S. Department of Labor, the Small Business Administration, the General Services Administration, and the U.S. Department of the Treasury, as well as HUD. I-TIPS is a web-based decision-support tool that supports HUD's IT investment management process. It collects, stores, and organizes IT project and portfolio data that supports decision making by HUD. Specifically, I-TIPS:

- Assists managers in implementing the Select-Control-Evaluate process;
- Allows users to share information across the Department;
- Assists managers in assessing IT initiatives in terms of their costs, risks, and expected returns;
- Helps IT investment managers assess the impacts of alternative investment scenarios toward the development of a "balanced" IT investment portfolio;
- Assists in monitoring initiative progress, and supports and documents decisions regarding the continuation of ongoing IT initiatives; and,
- Provides a forum to analyze, disseminate and store information about initiative progress against planned functional, technical, cost, and schedule goals.

OMB EXHIBIT 300

The Exhibit 300 is a tool utilized by OMB to identify Federal agencies capital asset plans and justification. The Exhibit 300 is used by OMB to determine funding recommendations and identify agencies IT priorities. This document also meets Congressional reporting requirements in compliance with the Federal Acquisition Streamlining Act of 1994 (FASA) and the Government and Performance and Results Act of 1993 (GPRA). Not only is the Exhibit 300 utilized by OMB, it is also a useful tool for enabling HUD to effectively measure whether costs are on schedule and whether performance measures are adequately being met in accordance with original stated goals. The Exhibit 300 also provides a historical baseline data source for HUD when commencing new projects.

PROJECT OFFICE

For several years, the Office of Information Technology (OIT) has been using the PARMS system for project and resource management. This system was identified as not fully Year 2000 compliant, and scheduled for termination at the end of FY99. In December of 1998, Project Office was identified as the replacement for the IT standard tool for project management.

Project Office is COTS software developed by Pacific Edge as an enterprise project management tool that is fully integrated with Microsoft Project 98, another Departmental standard. In FY98, HUD procured a site license for Project Office, and accomplished more than half of the deployment across IT. Project Office is being upgraded in FY01.

Project Office will permit all HUD decision makers display status of every project, person, and budget, under their responsibility. It is a system that simplifies and eases the process of tracking and monitoring HUD projects. Through Project Office, HUD managers can create and modify projects, tasks, and budgets. They can also assign resources, both personnel and financial, to projects and tasks. This system allows managers and oversight organizations to maintain a global perspective on the projects within the organization because all relevant information is centrally compiled and readily accessible.

SDM – SYSTEMS DEVELOPMENT METHODOLOGY

HUD's System Development Methodology (SDM) provides a structured approach for the solution of information management problems that require consideration of automated systems. The SDM has two objectives:

- To explain the importance, objectives, and benefits of system life cycle management to all potential participants in the system life cycle; and
- To describe the progression of the life cycle through individual activities and processes, in terms of their respective objectives and products, and to describe the relationships among the activities.

The SDM has been developed to address a wide range of information systems, including Computer-Aided System Engineering (CASE) method, techniques, and tools. Systems that support HUD programs vary greatly in size, scope of application, complexity of processing, technologies used, and the methodologies and tools used to support the evolution of the system from initial problem statement through the operation and ultimate termination of the system. Such variation reflects the diversity of HUD programs. Thus, this methodology does not prescribe a single method, or present a "cookbook" approach applicable without change, to every system. Rather, it presents a structured, disciplined approach for solving problems, and for selecting and using the methods, tools, and techniques appropriate to each problem.

APPENDIX C. SELECT SCORING CRITERIA

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS/ INFRA	NON- SYSTEMS
<p>1. Is the initiative responding to a material weakness identified in an IG audit?</p> <p>0 = The initiative is not responding to a material weaknesses.</p> <p>1 = The initiative is responding to one material weaknesses.</p> <p>2 = The initiative is responding to two or more material weaknesses.</p>	<p>§ Material weaknesses are deficiencies or findings identified by the Office of Inspector General or the General Accounting Office.</p> <p>§ How well does this project address material weakness or avoid weakness or condition.</p>	<p>§ Business Case</p> <p>§ Needs Statement</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	0	0
<p>2. Have performance measures been developed to assess and identify how well the initiative achieves its' goals?</p> <p>0 = Performance measures do not exist</p> <p>1 = Performance measures lack appropriate metrics</p> <p>2 = Performance measures are clearly identified and are closely linked to the project goals and objectives</p>	<p>§ Performance measures provide a means to measure the extent to which the project achieves its stated goals. In other words, is there a way to identify if the project was a success or failure in achieving the original objective.</p> <p>§ Well-defined performance measures should be measurable, quantifiable, and obtainable.</p> <p>§ Performance measures can be financial or non-financial that provide an ability to measure project objectives.</p>	<p>§ Performance Measures</p> <p>§ Expected Outcome</p> <p>§ Project Description</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	0	0
<p>3. Are the performance measures accurate, reliable, valid, verifiable, cost effective and linked to expected outcomes?</p> <p>0 = The metrics are hard to verify and are difficult to obtain supporting data</p> <p>1 = Some measures are accurate, reliable, valid and verifiable</p> <p>2 = All metrics are accurate, reliable, valid, verifiable and are closely linked with the achievement of the expected outcomes.</p>	<p>§ Performance measures (metrics) must produce an accurate, reliable, valid and verifiable indication of mission accomplishment.</p> <p>§ The set of measures should be built on data that are available at reasonable cost, appropriate, and timely for the purpose.</p>	<p>§ Performance Measures</p> <p>§ Expected Outcome</p> <p>§ Project Description</p>	<p>SCORE:</p> <p>WEIGHT: 3</p> <p>WEIGHTED SCORE:</p>	0	0

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS/ INFRA	NON- SYSTEMS
<p>4. Is a performance-based management system being used to monitor achievement of or deviation from baseline goals?</p> <p>0 = A performance-based management system is not being used.</p> <p>1 = A performance-based management system is being used to identify cost, schedule, and technical performance variances.</p>	<p>§ Identifies the amount of planned work actually accomplished.</p> <p>§ Compares actual work accomplished against planned work and actual costs incurred against planned cost.</p> <p>§ Establishes the deviation percentage from the goals.</p>	<p>§ Performance Measures</p> <p>§ Expected Outcome</p> <p>§ Project Description</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	0	0
<p>5. Is project data of high quality?</p> <p>0= Project data is not consistently accurate, timely, complete, and/or credible.</p> <p>1= Project data is consistently accurate, timely, complete, and credible.</p>	<p>§ Identifies if project management documentation is complete and meets all SDM requirements.</p> <p>§ Identifies if cost, schedule, and performance data is up to date.</p> <p>§ Verify if the initiative contains a reasonable data quality control plan.</p>	<p>§ Project Plan</p> <p>§ Cost Benefit Analysis</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	0	0
<p>6. Is the contract performance-based?</p> <p>0 = The project will involve a new acquisition during FY2001 but it is not performance-based</p> <p>1 = The project is under an existing contract and no new acquisitions will occur in FY 2001, or the project will involve a new acquisition during FY 2001 that is performance-based.</p>	<p>§ Performance-based contracts generally contain one or more of the following elements:</p> <p>§ Fixed price contract type.</p> <p>§ Quality assurance provisions, including formal, measurable performance standards.</p> <p>§ Performance-based statement of work that defines “what” the required output is rather than “how” the work is to be accomplished.</p> <p>§ Performance incentives and deduction schedules.</p>	<p>§ Acquisition Strategy</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	0	0

Support of HUD's Mission

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS/ INFRA	NON-SYSTEMS
<p>1. How well does the project link to HUD's mission?</p> <p>0 = The project does not support nor is there a linkage with the mission.</p> <p>1 = The project supports a few of HUD's missions or linkages are weak or indirect.</p> <p>2 = The project strongly supports several of HUD's mission.</p>	<p>§ Cross references the Strategic Goals and links the project with the Business Operating Plan.</p>	<p>§ Needs Statement</p> <p>§ HUD Budget Operating Plan</p> <p>§ HUD 2020 Plan</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>
<p>2. Is this initiative cross-cutting (i.e., does it support more than one HUD mission or organization)?</p> <p>0 = This initiative is not cross-cutting.</p> <p>1 = This initiative supports two missions or organizations.</p> <p>2 = This initiative supports more than two missions or organizations.</p>	<p>§ The more cross-cutting the project, the greater the cost savings or the greater the benefit to HUD.</p>	<p>§ Project Plan</p> <p>§ Business Case</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>
<p>3. What are the consequences of not going forward with the project at this time?</p> <p>0 = There are no adverse impacts if the project is not funded.</p> <p>1 = The project is necessary to maintain current business functions OR delays will have adverse impacts.</p> <p>2 = The project is necessary to maintain current business functions AND delays will have significant adverse impacts that may compromise core business functions.</p>	<p>§ The decision not to fund a project can have significant impacts on HUD if the project is critical to the operations of the organization.</p> <p>§ If a one-year or more delay in deploying the project has little or no impact on HUD's mission, than there are no significant consequences for delaying or not funding the project.</p>	<p>§ Needs Statement</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS/ INFRA	NON- SYSTEMS
<p>4. Is this initiative required by law or mandated by Congress?</p> <p>0 = no 1 = yes</p>	<p>Many initiatives are being implemented as a result of legislation/directives such as:</p> <p>§ OMB CIRCULAR A-127, "Financial Management Systems," mandates that each Federal Department and agency "establish and maintain a single, integrated financial management system."</p> <p>§ OMB CIRCULAR A-130., "Management of Federal, Information Resources" describes systems security requirements.</p> <p>§ OMB CIRCULAR A-123, "Internal Control Systems," provides policies and procedures pertaining to establishing, maintaining, evaluating, improving, and reporting on internal controls by federal agencies.</p>	<p>§ Needs Statement</p> <p>§ Project Description</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>
<p>5. Does the initiative support the Government Paperwork Elimination Act (GPEA)?</p> <p>0 = The initiative does not support the GPEA. 1 = The initiative supports the GPEA.</p>	<p>§ Paper avoidance is one factor that can greatly impact the Agency's productivity.</p> <p>§ GPEA was signed into law in 1998 making it possible for Agency's to fully create electronic work environments and eliminate paper. Agencies are mandated to support the "electronic maintenance, submission, or disclosure of information..."</p>	<p>§ Project Plan</p> <p>§ Business Case</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>

Project Management

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS/INFRA	NON-SYSTEMS
<p>1. How soon does the payback period occur?</p> <p>0 = Payback occurs after 5 years (or does not have a payback period)</p> <p>1 = Payback occurs between 2 to 5 years</p> <p>2 = Payback occurs within 2 years</p>	<p>§ Payback period is the period of time (in years) required for the investment to recover the cost of the investment. These benefits are intended to be equal to or greater than the cost of the project.</p>	<p>§ Project Plan</p> <p>§ Cost-Benefit Analysis</p> <p>§ Needs Statement</p>	<p>SCORE:</p> <p>WEIGHT: 1</p> <p>WEIGHTED SCORE:</p>	0	0
<p>2. The cost estimate is highly dependent upon uncontrolled variables (e.g., availability of external funding sources, changes in component pricing or maintenance contracts and is therefore subject to significant change (i.e., 10% or greater)?</p> <p>0 = Cost variance may exceed 10%</p> <p>1 = Minimal cost variance (no more than 10%) is expected</p> <p>2 = There is high confidence that there will be no variance from the planned costs.</p>	<p>§ Situations may arise which may cause this year's costs to vary by no more than 10% of the estimate</p>	<p>§ Cost-Benefit Analysis</p>	<p>SCORE:</p> <p>WEIGHT: 2</p> <p>WEIGHTED SCORE:</p>	0	0
<p>3. Does the project contain major phases, tasks and milestones that follow a logical sequence and that are comprehensive enough to ensure project completion?</p> <p>0 = There are significant gaps or holes in the phasing of the project and/or not all aspects of the project are accounted for.</p> <p>1 = Project phasing and major tasks are reasonable but leave some minor gaps that could lead to problems with project execution.</p> <p>2 = The project is phased in a logical manner and every major aspect of the project is taken into consideration.</p>	<p>§ Proper and thorough project planning dictates the identification of the major tasks and milestones at the outset of the project.</p> <p>§ A project has a much higher likelihood for success if the project plan is logically phased and does not contain any major gaps.</p>	<p>§ Project Plan</p>	<p>SCORE:</p> <p>WEIGHT: 1</p> <p>WEIGHTED SCORE:</p>	0	0

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS/ INFRA	NON- SYSTEMS
<p>4. Is there a specific plan for monitoring, managing and mitigating project risks?</p> <p>0 = No Risk Management plan.</p> <p>1 = Risk management plan lacks mitigation measures for each identified risk.</p> <p>2 = Risk management plan clearly identifies categories and factors with associated probability of occurrences, severity of impacts, priorities and mitigation strategies.</p>	<p>§ A Risk Mitigation Plan identifies, analyzes, plans for, and reports risks that could affect the successful delivery of the project. The plan includes descriptions of the project's risks and the corresponding mitigating action.</p>	<p>§ Risk Plan</p>	<p>SCORE:</p> <p>WEIGHT: 2</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>
<p>5. How much does the initiative depend on another project or initiative?</p> <p>0 = The initiative's impact depends upon another project still requiring completion.</p> <p>1 = The initiative's impact does not significantly depend on another project.</p> <p>2 = There are no foreseen or predicted impacts on the initiative's schedule.</p>	<p>§ Dependence on other projects increases the overall project risk.</p>	<p>§ Project Plan</p> <p>§ Feasibility Study</p>	<p>SCORE:</p> <p>WEIGHT: 2</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>

Feasibility of Implementation

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS /INFRA	NON-SYSTEMS
<p>1. Are Total Life Cycle Costs – including training costs - distributed in a logical manner over the life of the project and is the distribution consistent with best practices?</p> <p>0 = Life Cycle Costs are not consistent with the proposed development and maintenance timeframes and/or there is no apparent logic to the cost distribution.</p> <p>1 = The Life Cycle Costs are generally consistent with the proposed development and maintenance timeframes but there are some inconsistencies.</p> <p>2 = Life Cycle Costs are logically sequenced and there are no inconsistencies with the proposed development and maintenance timeframes.</p>	<p>§ The seven non-recurring costs (A – G) should typically occur before installation/deployment and the two recurring costs (I-J) should occur for the rest of the project life.</p> <p>§ Typical System Operations and Maintenance costs are fairly consistent throughout the life cycle.</p> <p>§ Project Initiation/Planning costs typically end before Software and Hardware Acquisition is initiated.</p> <p>§ The project costs is typically high in the first two years and then drop significantly thereafter.</p>	<p>§ Life Cycle Costs</p> <p>§ Project Plan</p> <p>§ Cost-Benefit Analysis</p>	<p>SCORE:</p> <p>WEIGHT: 1</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>
<p>2. How large is the proposed initiative in comparison to the overall proposed IT budget?</p> <p>0 = Greater than 5% of the total IT budget</p> <p>1 = Less than 5% but greater than 1% of the total IT budget</p> <p>2 = Less than 1% of the total IT budget</p>	<p>§ Divide the cost of the initiative by the proposed IT budget. Generally, the higher the cost, the riskier the project.</p>	<p>§ Needs Statement</p> <p>§ Estimated or proposed IT budget</p>	<p>SCORE:</p> <p>WEIGHT: 1</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>
<p>3. How well does the cost benefit analysis support the initiative?</p> <p>0 = Value of the benefits is less than 110% of the total cost of the initiative.</p> <p>1 = Value of the benefits is greater than 110% but less than 140% of the total cost of the initiative.</p> <p>2 = Value of the benefits is greater than 140% of the total cost of the initiative.</p>	<p>§ The value of the benefit can include qualitative estimates for cost savings, cost avoidance, and productivity increases. The value of benefits can also include estimates for the value of intangible benefits.</p>	<p>§ Cost-Benefit Analysis</p>	<p>SCORE:</p> <p>WEIGHT: 2</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS /INFRA	NON-SYSTEMS
<p>4. Was a business process improvement analysis conducted prior to considering this initiative?</p> <p>0 = No business process improvement analysis was conducted</p> <p>1 = A business process improvement analysis was conducted</p>	<p>§ Processes have been simplified, improved or otherwise redesigned to reduce costs, improve effectiveness, etc.</p>	<p>§ Performance Measures</p> <p>§ Expected Outcome</p> <p>§ Project Description</p> <p>§ Feasibility Study</p>	<p>SCORE:</p> <p>WEIGHT: 1</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>

Compliance with Enterprise Architecture

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS/ INFRA	NON-SYSTEMS
<p>1. Is the proposed technology consistent with the organization's technical standards (including computer security compliance)?</p> <p>0 = The project is not in compliance with the organization's technical standards and/or the standards are not defined or addressed and requires all or nearly all custom designed components.</p> <p>1 = <i>The project is partially in compliance with the organization's technical standards.</i></p> <p>2 = The project is fully in compliance with the organization's technical standards.</p>	<p>§ HUD's Standard Information Technology will serve as the benchmark for compliance. The Office of Information Technology developed a standard environment that integrates desktop computers (multi-function workstations), Local Area-Networks (LANs), mainframe computers, and a Wide Area Network (WAN), which facilitates shared access to the mainframe computers and LAN-to-LAN connectivity. These standards are described in "HUD's Standard Information Technology Environment" and "Network Standards Guide." Both of these guides can be found in HUDWEB.</p>	<p>§ Architectural Data</p> <p>§ Feasibility Study</p>	<p>SCORE:</p> <p>WEIGHT: 2</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>N/A</p>
<p>2. Does the initiative use commercial-off-the-shelf technology (COTS) or Government off-the-shelf technology (GOTS)?</p> <p>0 = The project does not use COTS or GOTS or will change or make modifications to the COTS/GOTS it plans to use.</p> <p>1 = The project partially uses COTS or GOTS without change or modifications.</p> <p>2 = The project fully uses COTS or GOTS without change or modification.</p>	<p>§ COTS or GOTS reduces the overall project risk.</p>	<p>§ Project Plan</p> <p>§ Business Case</p> <p>§ Feasibility Study</p>	<p>SCORE:</p> <p>WEIGHT: 2</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>N/A</p>

Principal's Priorities

QUESTION	GUIDANCE	SOURCE DATA	SCORE	SYSTEMS/INFRA	NON-SYSTEMS
<p>1. How significant are the benefits that will be realized by carrying out this project?</p> <p>0 = The project does not result in significant benefits for internal (within HUD) and external customers</p> <p>1 = The project provides some benefit to internal and/or external customers but the benefit is not well defined.</p> <p>2 = The project provides a significant benefit to internal and/or external customers and the benefits can be measured accurately.</p>	<p>§ Benefits to internal and/or external customers can be measured in many ways, including increased efficiencies, improved customer satisfaction, reduction in costs, increase in revenues, improved public access to HUD information, etc.</p>	<p>§ Direct Beneficiaries</p> <p>§ Project Description</p> <p>§ Needs Statement</p>	<p>SCORE:</p> <p>WEIGHT: 2</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>
<p>2. How well does the initiative address the Program Area priorities?</p> <p>0 = The initiative does not support or identifies any Program Area priorities.</p> <p>1 = The initiative supports or identifies some Program Area priorities.</p>	<p>§ Check the planned project outcomes to identify which Program Areas are addressed.</p>	<p>§ Project Plan</p> <p>§ Business Case</p>	<p>SCORE:</p> <p>WEIGHT: 4</p> <p>WEIGHTED SCORE:</p>	<p>0</p>	<p>0</p>

Scoring Summary

	FY2000 SELECT		FY2001 SELECT	
Number of questions	10		24	
Discriminators	Response Range	Weights	Response Range	Weights
Material Weakness	Addresses or avoids	.325	0 – 34	.318
Supports HUD's Mission	0 – 14	.302	0 – 32	.299
Project Management	0 – 18	.130	0 – 16	.150
Feasibility of Implementation	0 – 7	.089	0 – 9	.084
Compliance with Architecture	Fully or partially	.079	0 – 8	.075
Principal's Priorities	High, Med, Low	.075	0 – 8	.075

APPENDIX D. SEOPMD TECHNICAL ASSESSMENT TEMPLATES



Invitation

Chairperson: SEOPMD

Sent by:

Start:

End:

Description: Workshop for (System Name, Contact Name, Phone Number and Location of Meeting)

This meeting repeats starting on (if the date occurs on a weekend the meeting).

Meeting Dates:

Detailed description:

You are cordially invited to attend the (System Name) Workshop on (Date) **at (Time), in (Meeting Location)**. The purpose of this Workshop is to assist you in preparing for the upcoming Tech Review. Please complete the attached documents (Tech Review Template, TR Report Card, and Tech Review Invitee List) and bring them to the Workshop. **You are welcome to invite others to the Workshop (additional staff, contractors, etc.).** In addition please ensure the following items are updated:

A. SDM Documentation (provide the date when last updated)

- 1) Needs Statement
- 2) Feasibility Study
- 3) Cost Benefit Analysis
- 4) Risk Assessment
- 5) Project Plan

B. Project Office

C. Inventory of Automated Systems (IAS)

D. Tech Review Invitee List. Please indicate on the Invitee List additional people you wish to be invited to the Tech Review.

BACKGROUND / MISSION	INTEGRATED PROJECT TEAM	FY 2000 ACCOMPLISHMENTS										
<p>(Provide a short project description. Include information deemed relevant; suggestions include project history, benefits, expected outcomes, systems being replaced, etc.)</p> <p>Type of System (Developmental or Operational):</p> <p>Interfaces with:</p> <p>Platform:</p>	<p>Project Number: _____ PCAS #: _____ Sponsor: _____ Project Manager: _____ IT Project Leader: _____ GTR: _____ GTM: _____ Customer: _____ Contractor Support: _____</p> <table border="1" data-bbox="656 590 924 762"> <thead> <tr> <th>FIRM</th> <th># FTE's</th> </tr> </thead> <tbody> <tr> <td>HUD</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Total:</td> <td></td> </tr> </tbody> </table> <hr/> <p style="text-align: center;">Preliminary Briefing Questions</p> <hr/> <p>1. Please list contract(s) and expiration date(s): _____ _____ _____</p> <p>2. Is the project currently on schedule? Circle one: Y N</p> <p>3. When is the next major deliverable date (signoff required)? _____</p> <p>4. Is the project fully staffed? Circle one: Y N</p> <p>Has all required funding for this project been identified and acquired? Circle one: Y N</p>	FIRM	# FTE's	HUD						Total:		<p>Recent (Provide description of recent significant project events. Examples include: plans completed, approved or executed, releases, rollouts, certifications, implementations, sign-off, acceptance tests, etc.)</p> <p>.</p> <p>.</p> <p>.</p> <p>Planned</p> <p>.</p> <p>.</p>
FIRM	# FTE's											
HUD												
Total:												

SCHEDULE/MILESTONES																											
	1999												2000														
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D			
xxxxxxxXX	[Yellow bar from Feb 1999 to Dec 1999]																										
X xxxxxxxx	[Yellow bar from Feb 1999 to Oct 1999]																										
X X X													[Yellow bar from Nov 2000 to Dec 2000]														
Xxxxx													[Yellow bar from Feb 2000 to Oct 2000]														
Xxxxxxxx XX													[Yellow bar from Feb 2000 to Oct 2000]														
XXxx													[Yellow bar from Nov 2000 to Dec 2000]														
XXXX													[Yellow bar from Feb 2000 to Oct 2000]														
Xxxxx xxxxxx													[Yellow bar from Feb 2000 to Oct 2000]														
Xxxxxxxxxxxx													[Yellow bar from Feb 2000 to Oct 2000]														
ISSUES	RECOMMENDATIONS																								FY 2001		
(Indicate principal issues and/or challenges facing project)	(For each Issue identified, method of addressing, proposed solution, or assistance required)																								(Outline major goals or intended efforts for the next fiscal year)		
•	•																								•		
•	•																								•		
•	•																								•		

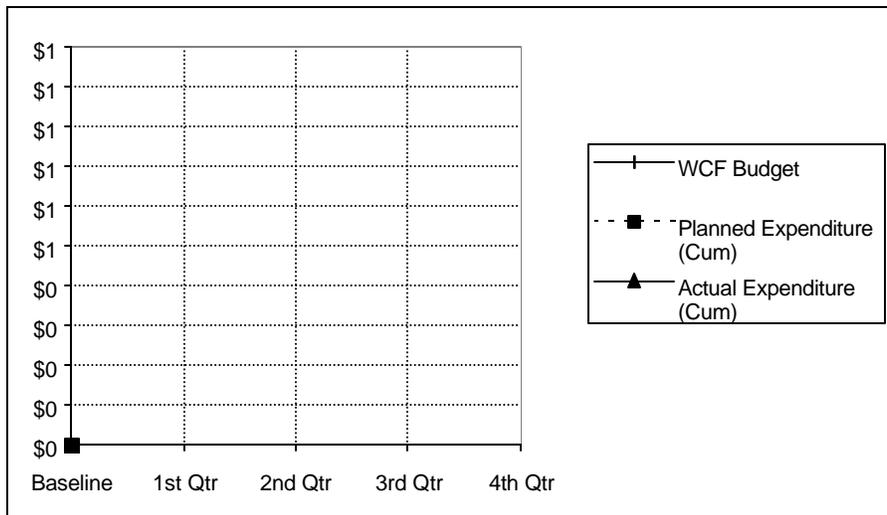
FY 2000 FUNDING IMPACT				
Budget / WBS Categories	FY00 Budget	Expended as of	Balance	Projected for FY01
DEVELOPMENT				
A. Project Initiation/Planning				
B. Requirements Definition				
C. System Design				
D. Software Acquisition				
E. Hardware/Infrastructure Acquisition				
F. New Development / Perfective Maintenance				
G. System Integration and Testing				
H. Installation and Deployment				
MAINTENANCE				
I. System Operations				
J. Corrective and Adaptive Maintenance				
TOTAL	\$0	\$0	\$0	\$0

FUNDING HISTORY			
	FY 94-97 Budget Expended	FY98 Budget Expended	FY99 Budget Expended

BUDGET GRAPH

Actual Expenditure (Cum)

\$0





IT SELF ASSESSMENT SCORECARD

PROJECT	Resident Assessment Subsystem (RASS)	DATE	02/09/2000
DESIG.	PCAS #	OPS DIVISION	
	307680		

MANAGEMENT

		<u>Performance Measurement</u>	
YES		1. Has an IT project leader been assigned in writing to manage this project? Name: Yangja Lee	
YES		2. Has a Work Breakdown Structure (WBS) been developed for the project? Number of elements: 94	
YES		3. Are program reviews included in the schedule?	
YES		4. Is the project/system referenced in an employee performance plan?	
		<u>Deliverables</u>	
YES		1. Are contractor deliverables completed in timely fashion?	
YES		2. Is the quality of the deliverable satisfactory?	
YES		3. Will the next deliverable be met on schedule?	
	No	4. Will the next deliverable be within budget?	
YES		5. Is the contractor's performance satisfactory?	
		<u>Reviews</u>	
Not Applicable		1. Has an internal A-123 review of the project been conducted and are findings documented?	
YES		2. Are there any active GAO/OIG reviews ongoing for of this project/system?	
Yes		3. Is this a TIBEC Priority Project?	
Not Applicable		4. Does the current project plan include all actions documented from OIG and/or GAO audits?	
		<u>SDM Initiating Documents</u>	
		Have the SDM Initiating Documents for the current PCAS# been completed:	
YES		1. Needs Statement	
YES		2. Feasibility Study	
YES		3. Cost / Benefit Analysis	
YES		4. Risk Assessment	
YES		5. Project Plan	
Score			

APPENDIX E. EARNED VALUE ANALYSIS AND METHODOLOGY

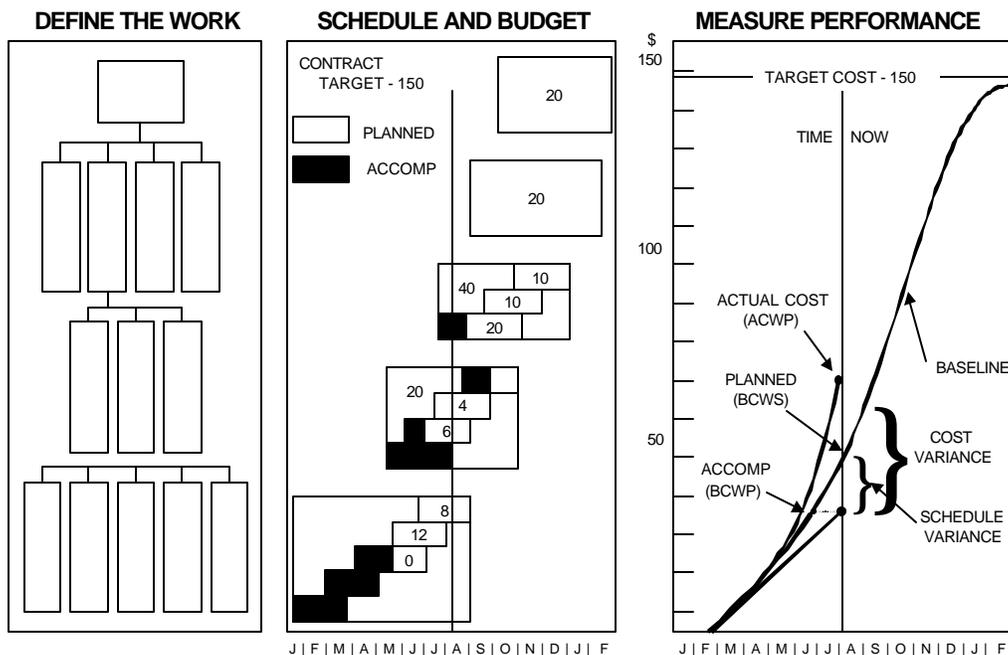
OVERVIEW OF METHODOLOGY FOR CONDUCTING EARNED VALUE ANALYSIS

As illustrated in Figure 18, the following approach outlines the key steps necessary for establishing a process for assessing a project's earned value:

- Develop a Work Breakdown Structure (WBS)
- Define project scope of work or project activities
- Allocate costs to each WBS element
- Schedule each activity
- Chart and evaluate the project's status

FIGURE 18 - PRINCIPLES OF EARNED VALUE ANALYSIS

Earned Value Management = Basic Management Principles



Completion of the above steps will provide the basis for evaluating project performance. This includes updating and reporting on the project's schedule of activities (i.e., started or completed with a remaining duration). The percent complete of unfinished activities should also be reported. Once the project's schedule is updated, actual costs should be recorded. After recording actual project costs for the reporting period, Earned Value measures are calculated and reports generated (as illustrated in Figure 18 under "Measure Performance").

Definition of Key Earned Value Measures as Illustrated in Figure 18:

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

Budgeted Cost for Work Performed (BCWP) –The sum of 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 sum of all WBS element budgets that are planned or scheduled for completion.

Cost Variance – Earned Value minus the actual cost (BCWP - ACWP)

Performance Measurement Baseline (PMB) or Baseline – The time-phased budget plan against that project performance is measured

Schedule Variance (SV) – Earned Value minus the planned budget for the completed work (BCWP-BCWS)

PERFORMANCE MEASUREMENT BASELINE (PMB) OR BASELINE PROCEDURES

Maintaining a Performance Measurement Baseline is a controlled process by that a project team establishes a budget, incorporates formal changes, conducts internal re-planning and adjusts past, present and future information to accommodate budgetary changes. The following baseline maintenance procedures are based on the *Industry Standard Guidelines for Earned Value Management System*¹⁰ as outlined in the March 15, 2000 publication of the *United States Customs Service Investment Management Process System Description*¹¹.

1. Develop a Performance Measurement Baseline

The Performance Measurement Baseline (PMB) is formed by developing a budget for each Work Breakout Structure (WBS) element. The PMB should be developed shortly after project authorization is granted. When practical, all WBS elements should be planned, at least at a summary level, throughout the project's life cycle. Any WBS that cannot be established initially should identify the critical event(s) necessary to develop the PMB.

2. Summary Level Planning Packages

In instances where it is impractical to plan authorized cost at a detailed WBS element level, budgeted work should be aggregated to a higher WBS level for later subdivision into detailed WBS elements. This budget must map to specific elements, be time-phased, periodically assessed, assigned organizational and individual responsibility, and limited to activities within the project's scope. Summary level planning is not a substitute for early and definitive detail planning.

¹⁰ *Industry Standard Guidelines for Earned Value Management Systems: Management Systems Subcommittee of the National Security Industrial Association*, January 15, 1997.

¹¹ United States Custom Service. *Service Investment Management Process System Description*, Version 2.1, p. c-29, March 15, 2000.

3. Authorized, Unbudgeted Projects

For projects that have been authorized but unbudgeted, the Project Manager should plan and budget the near-term effort in detailed WBS elements, with the remaining effort and budget assigned to a summary level WBS.

4. Incorporate and Document Project Changes

Changes in major projects are inevitable. The PMB should reflect any authorized budget and schedule changes. Changes that have been incorporated into the PMB must be documented and traceable to the original baseline.

5. Trace and Benchmark Project Against Initial Budgets

The PMB process should constitute a traceable basis against which project growth can be measured. The starting point or base on which the original budget is built is the initial project budget. This value increases or decreases only as a result of authorized changes. Adequate records should be maintained for reconciling all changes back to the baseline budget.

6. Establish Measures to Control Internal PMB Changes

Future plans may vary significantly from the original baseline and as such the Project Manager may choose to re-align the project's scope, schedule or budget. Examples of instances when it may be appropriate to conduct internal re-planning (i.e., within the project's target cost or approved total allocated budget) include:

- Changes resulting from design reviews that modify requirements
- A major shift in the resources needed to complete the project
- Funding restrictions or modifications that effect future resource availability
- Rate (labor, overhead, direct costs, etc.) changes that are significant enough to warrant re-planning

VARIANCE ANALYSIS ¹²

Variance analysis is the systematic comparison of planned versus actual project performance measures in order to explain deviations from the project plan. Variance analysis therefore 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. In addition, variance analysis provides Project Managers with the capability to do the following:

- Determine the immediate and underlying cause(s) of variances
- Understand both the short term and total project impact
- Identify when work is being performed out-of-scope
- Identify and select the appropriate corrective action alternatives
- Verify whether corrective action taken is resulting in the planned recovery

¹² *United States Customs Service. Service Investment Management Process System Description, Version 2.1, p.C-23, March 15, 2000.*

Significant Variances

Analyzing every cost and schedule variance (for large projects) can be time consuming. By estimating cost and schedule variance thresholds, variances can be identified effectively by assessing only events that exceed a predetermined threshold. Variance thresholds typically established prior to project development are Cost Variance (CV), Schedule Variance (SV), and Estimate at Completion (EAC).

Cost Variance (CV): Compares the cost of completed work with the value of planned work. Analysis of this difference reveals the factors contributing to the variance. Examples include poor initial task estimate, technical difficulties that required additional resources, differences in planned versus actual cost of labor or materials, rates or personnel productivity.

Schedule Variance (SV): Is earned value minus the planned budget for completed work (BCWP-BCWS). Comparing the value of work completed to the value of work scheduled during a specific period provides a valuable measure of progress achieved to date. This variance, when evaluated in hours, quantifies the amount of time the project is behind or ahead of schedule. However, this variance may not indicate clearly whether or not scheduled milestones are being accomplished since some tasks may have been performed out of sequence or ahead of schedule. Schedule variance also does not indicate whether a completed activity is a critical event or if delays in completing an activity will impact the completion date of the contract. Therefore, it is important that the schedule variance analysis process provides a means of determining, not only the status of specific activities, but the impact on achieving milestones and on critical events.

Variance at Completion (VAC): Is the difference between the total budget assigned to a contract, WBS element, organizational entity or cost account and the Estimate at Completion (EAC). It represents the amount of expected overrun or underrun. When the EAC exceeds the total budget, an unfavorable variance overrun exists. Project Managers should be alert to circumstances that affect the EAC and, therefore, the VAC.

APPENDIX F. RISK MANAGEMENT

A risk is any event, about which there is uncertainty, which may interfere with achieving the project objectives of remaining within cost, schedule, scope or quality. It is important to identify risks in every project, and just as important to proactively respond to the risk.

Risk management consists of the following 6 phases:

- Risk management planning
- Risk identification
- Risk assessment
- Risk quantification
- Risk response planning
- Risk monitoring and control

Risk Management Planning: The activity of deciding how to approach and plan for risk management, and practicing that management in a consistent, coordinated and controlled manner throughout the project life cycle. Factors to take into consideration when planning risk management include:

- HUD's risk management policies, experience and practices
- Assigning roles and responsibilities in measuring, monitoring and controlling risk
- Project decision making authority
- Stakeholder risk tolerances and thresholds of acceptable risk
- Timing of risk management processes
- Risk reporting formats and timing
- Methodologies to be used

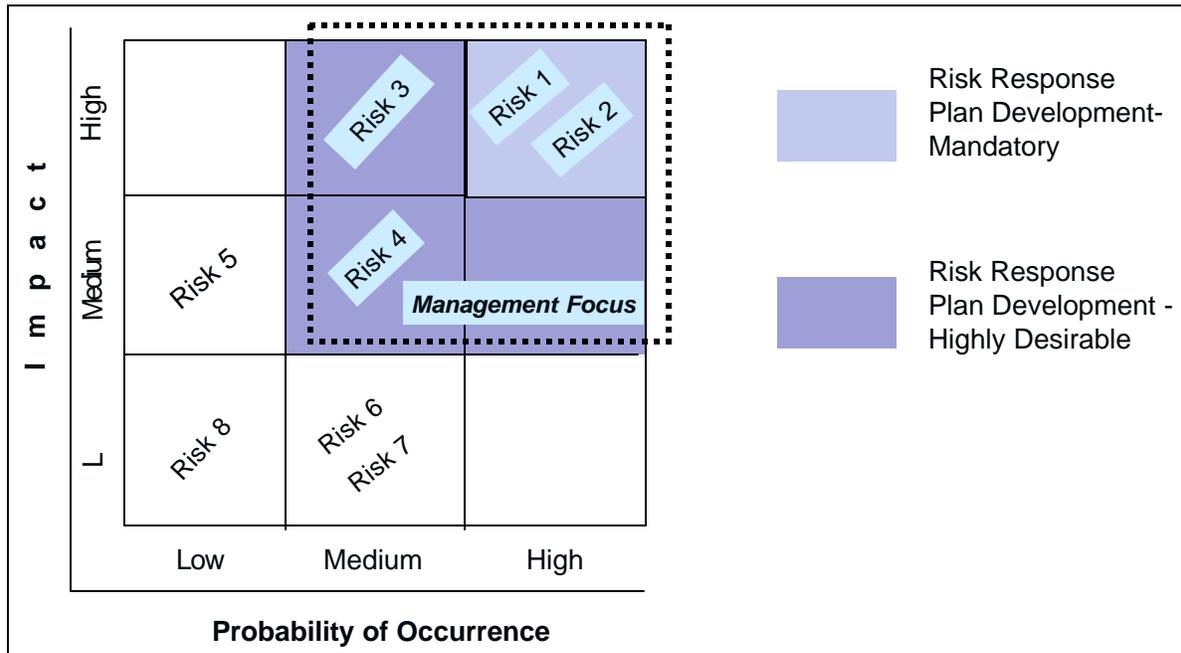
Risk Identification: The activity of identifying all potential risks that could impact the project, and documenting the characteristics of the risk. Types of risk associated with IT projects include schedule risk, cost risk, risk of impact to other projects, risk of dependence on other projects, project size and scope, technical feasibility, resource availability and skills, and business requirements. Risks can be internal (i.e., those that the project team controls or influences) and external (i.e., those beyond the control or influence of the project team).

Risk Assessment: The activity of performing a qualitative analysis of project risks and conditions to prioritize their effects on project objectives. Risk assessment is a measurement of the inability to achieve an objective of a project within known technical, cost and schedule constraints. It is characterized by 3 factors:

- Risk Event: The precise description of what might happen to the detriment of the project.
- Risk Probability: The degree to which the risk event is likely to occur.
- Impact: The extent of adverse consequences which could occur to the project if the risk event occurs.

Figure 19 displays a risk assessment matrix, indicating risks that portray a high probability of occurrence and a high level of impact are risks that require proactive responses. It is also desirable that responses be planned for those risks that are considered moderate. Low level risks are typically documented in the "Assumptions" list of a project.

FIGURE 19 – RISK ASSESSMENT MATRIX



Risk Quantification: Compared to the *qualitative* analysis of risk assessment, this activity is a *quantitative* analysis of risk that uses simulation and decision analysis. Risk quantification measures the severity of the impact of the risk against the probability to derive specific schedule and cost threat. Additionally, all risk to individual project objectives (e.g., cost or schedule), can be calculated. COTS software packages are available to compute these risk values, as it would be an arduous task to do so manually.

Risk Response Planning: The activity of determining, in advance, appropriate action to Avoid, Mitigate, Transfer or Accept the risk.

- Avoid: Change the project plan to *eliminate* the risk or condition (e.g., adopt a familiar rather than an innovative technical approach).

- Mitigate: Reduce the probability and/or impact of a risk, usually by taking preventive action (e.g., building in redundancy).
- Transfer: Transfer the *impact* of a risk to a third party, together with ownership of the response (e.g., using a fixed price contract to transfer cost and schedule risk to the contractor).
- Accept: There exists no cost-effective way to avoid, mitigate or transfer a risk. Contingency planning is usually done to identify action that will be taken in the event the risk does occur.

Risk Monitoring and Control: The activity of putting the risk response plan into action, and following the risk management plan. Risk *triggers* should be identified and tracked to know when a risk event is imminent. Risks may get larger or smaller as the project proceeds necessitating trend analysis be performed. The change in risk will indicate a greater or lesser urgency for risk management actions.

APPENDIX G. HUD'S ITIM PROCESS – STATUS AND OUTLOOK

Process Aspect	Status	Comments	Planned Activities FY 01		Planned Activities FY 02	
			Q3	Q4	Q1	Q2
ITIM roles and responsibilities	3	Formulated policy and direction to formalize the roles, responsibilities, authority, and accountability of ITIM participants.	Develop and document procedures for training and orienting new ITIM board members.	Define the roles and responsibilities of integrated project teams.	Verify the effectiveness of the authority alignment of the ITIM boards.	Increase the utility of the project management review boards in the ITIM process.
			Determine and implement methods to increase the maturity of Project Manager – Project Sponsor relationships.			
Interfaces with oversight and review organizations	4	Established and maintained relationships with external oversight (OMB and GAO). Conducted an independent audit of ITIM processes and procedures.	Increase level of partnership with and participation on the Capital Planning and Investment Management Committee of the Federal CIO Council. Update HUD's ITIM process audit and action plan as required.			
Select procedures	3	Implemented a Department wide process to Select a comprehensive portfolio of IT projects.	Refine select procedures, including improving the efficiency of working group meetings.	Determine a method to annually update portfolio characteristics and performance expectations.	Update scoring criteria with more complete risk, security, and Section 508 factors.	Increase focus on total life cycle of IT investments.
Control procedures	2	Initiated efforts to develop and implement an effective process for monitoring the performance of the IT portfolio.	Determine and incorporate a mechanism to capture and effectively utilize real-time project financial data.		Implement project performance measurement practices.	Benchmark portfolio performance.
Evaluate procedures	1	Initiated development of HUD's Evaluate process and procedures.	Develop roles and responsibilities.	Define the IT project and portfolio Evaluation process.	Initiate a lessons learned feedback mechanism.	Make formal improvements to the ITIM process.
Alignment with budget formulation	3	Initiated the alignment of the ITIM process with budget formulation.	Use Expert Choice software to weight the Department's goals and objectives and revalidate IT project priorities.		Develop a procedure for assisting the CFO to successfully analyze IT vs. non-IT considerations.	
Alignment with procurement and acquisition	2	Initiated the alignment of the ITIM process with procurement and acquisition.	Refine the data sharing between the ITIM (OCIO) and acquisition processes (OCPO).		Work with OCP to develop clear guidance for performance-based contracting.	
Alignment with the System Development Methodology (SDM)	2	Initiated the alignment of the SDM and ITIM process.	Revise the Risk initiation document to more thoroughly capture risks and mitigation plans.	Tailor the SDM initiation documents to account for differing project types, classifications, size, criticalities, and life-cycle phases.		Determine a schedule of reviews for major projects based on life-cycle milestones.
Integration of HUD's Enterprise Architecture (EA)	1	Developed HUD's baseline EA and captured it in the EA Management System (EAMS).	Determine how the EA data will be used to identify IT needs and opportunities for savings, consolidation, e-Gov, etc.		Begin to define the target and intermediate EAs. Decide how they will be used for the FY '03/'04 Select.	

Integration of other IT areas (maintenance, security, GPEA, e-Gov, Section 508)	1	Incorporated numerous key IT management aspects into the ITIM process, including security plans and evaluations, and e-Gov selection criteria.	Develop formal policies and procedures for IT asset tracking.	Tailor I-TIPS to capture GPEA transaction information.	Develop a methodology to gauge the validity and effectiveness of business processes supported by systems in maintenance.
			Collect Section 508 data during FY '02/'03 Select.	Begin system and technology succession management practices.	Improve IT security-scoring criteria.
ITIM and IT Project Manager training	2	Began efforts to strengthen the competencies and capabilities of HUD's IT investment and Project Managers through practical hands-on training.	Project Management Professional (PMP) certification course.	Conduct PMP testing and obtain certifications.	Conduct assessment of training program and review needs for follow on training.
			Phase II of the ITIM and PM training program.		

Key

- 4 Aspect is fully developed and implemented
- 3 Aspect is mostly developed and implemented
- 2 Aspect is partially developed and implemented
- 1 Aspect is under development
- Aspect has not been addressed