INTERNAL REVENUE SERVICE

REQUEST FOR PROPOSALS

FOR A

PRIME SYSTEMS INTEGRATION SERVICES CONTRACTOR

VOLUME II OF III

MODERNIZATION BLUEPRINT
PHASE I/RELEASE 1
BUSINESS CASE

March 26, 1998

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EXECUTIVE SUMMARY

Modernization Blueprint

Phase I/Release 1 Customer Service and Compliance

Executive Summary

I. Guiding Principles

- Opportunity to shorten time to market by focusing on only a single market segment (e.g., a segment of the individual income tax taxpayers);
- Minimal dependence on either interfacing with legacy or accessing legacy systems databases;
- Application of commercial off-the-shelf (COTS) software, middleware and hardware components wherever feasible; and
- Opportunity to undertake significant performance testing in a prototype and pilot environment to provide a "real world" assessment of the *Modernization Blueprint's* overall architecture (e.g., infrastructure, systems and data security and data management).

II. Scope

The Phase I/Release 1 Customer Service and Compliance is partitioned into five subreleases and summarized below. Please refer to the end of the Executive Summary section for a graphical representation of these subreleases.

- **Subrelease 1.1—Primary Telephone Call Routing and Management,** implements centralized primary screening Voice Response Units (VRUs) for all incoming calls and provides access to modernized non-account Automated Self Service Applications (ASSAs).
- **Subrelease 1.2—Enhanced Secondary Telephone Call Routing and Management,** provides secondary routing of telephone calls and taxpayer-provided data to CSRs and automated self-service applications for refund and fact of filing queries in a secure environment.
- **Subrelease 1.3—Infrastructure and Security,** provides infrastructure and security for employee access to modernized and legacy data through a single universal secure workstation and integrates the telephone infrastructure and capabilities implemented in the two previous subreleases.
- **Subrelease 1.4—Corporate Databases Read Only,** establishes the centralized databases that replace the stove-piped, stand alone distributed systems of the current environment.
- **Subrelease 1.5—On-Line Adjustments,** is the target for Phase I/Release 1 and fully implements call routing, telephone infrastructure, security infrastructure, legacy system access and the first three of five modernized corporate databases.

While Phase I/Release 1 represents only one of sixteen ***Modernization Blueprint*** Sequencing Plan Releases, Release 1 provides the following functionality for the form 1040 Individual Income Tax Taxpayer:

- **40 percent of the total *Modernization Blueprint* Business Requirements; and**
- **51 percent of the total *Modernization Blueprint* Customer Service and Compliance Business Requirements.**

III. Return on Investment Analysis

- **Return on Investment (ROI)** for the Phase I/Release 1 Customer Service and Compliance is as follows:
  - **Alternative I: No Reinvestment of Savings and Cost Avoidance.**

    ROI is 4.1

  - **Alternative II: Reinvestment in Customer Service and Compliance.**

    ROI is 53.1

    Reinvestment of savings and funds made available pursuant to the cost avoidance features of Phase I/Release 1 could be reinvested to increase taxpayer telephone Level of Access (LOA) from 62 percent to 85 percent and to reinstate Compliance programs to traditional levels; and

  - **Alternative III: Reinvestment in Compliance Only.**

    ROI is 64.5

    If alternative funds were to be made available to provide for an 85 percent LOA, all savings and cost avoidance stemming from Phase I/Release 1 could be reinvested in Compliance.

- **Risk Adjusted Return on Investment Analysis**

  Monte Carlo Risk Analysis was performed to assess the probability of meeting the Phase I/Release 1 schedule, cost and projected funding requirements:

  - Schedule risk was mitigated by assuming benefits would not accrue until new functionality was in production for twelve months; and
  - Cost risk was mitigated by increasing all costs by 4.79 percent to provide a 95 percent probability of Phase I/Release 1 being completed within cost projections.

- **Net Present Value Adjustment to Risk Adjusted Return on Investment** was performed to determine the discounted value of expected net benefits. A discount rate of 3.5 percent was applied.

- **Comparison of Alternatives**

Alternatives	Original ROI	Risk Adjusted ROI	Present Value
I. No Reinvestment of Savings and Cost Avoidance	4.1	3.7	3.1
II. Reinvestment in Customer Service and Compliance	53.1	47.3	39.2
III. Reinvestment in Compliance Only	64.5	60.0	51.3

IV. Sources of Savings and Cost Avoidance

- **Savings:** It is projected that the IRS could save a cumulative total 22,890 work years for the period 2001 through 2013 by:
  - Substituting technology for IRS employees currently performing manual transcription and input of tax return line item adjustments;
  - Applying technology to improve productivity in Compliance programs; and
  - Utilizing technology to answer more taxpayer inquiries.
- **Cost Avoidance:** It is projected that the IRS could avoid a cumulative total of $12.2 million for the period 2001 through 2013 by avoiding the need to hire additional staff to meet future projected non-discretionary workload increases.

V. Projected Funding Requirements

- It is anticipated that the cost to develop, integrate, test, prototype, pilot, deploy and maintain Phase I/Release 1 nationwide would be as follows:

Fiscal Year	Development Investments	Operations & Maintenance Investments	Total
1999	$69,219,015	$0	$69,219,015
2000	$153,857,086	$10,998,620	$164,855,706
2001	$53,346,103	$24,281,105	$77,627,207
2002	$55,189,064	$25,976,836	$81,165,900
2003	$54,732,719	$32,541,583	$87,274,303
2004	$15,082,350	$21,384,808	$36,467,158
2005 - 2013	$0	$192,463,273	$192,463,273
TOTAL	**$401,426,338**	**$307,646,225**	**$709,072,563**

Refer to the detailed Risk Adjusted Projected Funding Requirements that follow.

Phase I/Release 1, Subreleases 1.1 - 1.5 Risk Adjusted Projected Funding Requirements (PFR)*

	Total($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Phase I/Release 1 Risk Adjusted PFR	$709,073	$69,219	$164,856	$77,627	$81,166	$87,274	$36,467	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385
Development Investment	$401,426	$69,219	$153,857	$53,346	$55,189	$54,733	$15,082	$0	$0	$0	$0	$0	$0	$0	$0	$0
Prog Mgmt & Planning	$50,651	$16,955	$10,188	$8,513	$8,441	$6,273	$281	$0	$0	$0	$0	$0	$0	$0	$0	$0
Acquisition	$175,208	$40,643	$120,947	$13,151	$0	$467	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development	$65,943	$10,400	$20,933	$23,932	$10,678	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SAT & Pilot	$36,219	$857	$1,201	$7,191	$14,556	$12,415	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Rollout	$7,000	$0	$0	$0	$3,031	$3,190	$779	$0	$0	$0	$0	$0	$0	$0	$0	$0
Training & Procedures	$61,247	$109	$175	$166	$16,960	$30,561	$13,277	$0	$0	$0	$0	$0	$0	$0	$0	$0
M&A	$5,156	$256	$413	$392	$1,522	$1,827	$745	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$307,646	$0	$10,999	$24,281	$25,977	$32,542	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385	$21,385
Maintenance	$303,407	$0	$10,758	$24,040	$25,714	$32,228	$21,067	$21,067	$21,067	$21,067	$21,067	$21,067	$21,067	$21,067	$21,067	$21,067
Training & Procedures	$1,283	$0	$73	$73	$80	$95	$96	$96	$96	$96	$96	$96	$96	$96	$96	$96
M&A	$2,957	$0	$168	$168	$184	$219	$222	$222	$222	$222	$222	$222	$222	$222	$222	$222

	Total($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.1 Risk Adjusted PFR	$138,472	$46,659	$9,001	$8,562	$8,562	$10,093	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559
Development Investment	$48,629	$46,659	$439	$0	$0	$1,530	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$89,843	$0	$8,562	$8,562	$8,562	$8,562	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559

	Total($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.2 Risk Adjusted PFR	$23,604	$9,206	$3,976	$1,432	$1,081	$2,127	$578	$578	$578	$578	$578	$578	$578	$578	$578	$578
Development Investment	$13,498	$9,206	$2,896	$351	$0	$1,046	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$10,106	$0	$1,081	$1,081	$1,081	$1,081	$578	$578	$578	$578	$578	$578	$578	$578	$578	$578

	Total($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.3 Risk Adjusted PFR	$119,165	$9,730	$36,248	$20,405	$35,307	$6,918	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056
Development Investment	$103,986	$9,730	$35,940	$20,097	$33,304	$4,915	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$15,179	$0	$308	$308	$2,004	$2,004	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056

	Total($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.4 Risk Adjusted PFR	$337,236	$3,024	$108,295	$36,298	$26,928	$29,426	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327
Development Investment	$156,375	$3,024	$107,332	$22,131	$12,761	$11,126	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$180,861	$0	$963	$14,167	$14,167	$18,299	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327

	Total($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.5 Risk Adjusted PFR	$90,595	$600	$7,334	$10,930	$9,287	$38,711	$15,947	$865	$865	$865	$865	$865	$865	$865	$865	$865
Development Investment	$78,938	$600	$7,250	$10,766	$9,124	$36,116	$15,082	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$11,657	$0	$85	$163	$163	$2,596	$865	$865	$865	$865	$865	$865	$865	$865	$865	$865

*NOTE: Exclusive of ongoing business operating costs

Subreleases 1.1 - 1.5 Risk Adjusted Projected Funding Requirements (PFR)*

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.1 Risk Adjusted PFR	$138,472	$46,659	$9,001	$8,562	$8,562	$10,093	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559
Development Investment	$48,629	$46,659	$439	$0	$0	$1,530	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$89,843	$0	$8,562	$8,562	$8,562	$8,562	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559	$5,559
	• Acquisition of: – National Infrastructure – Web Servers • Design • Code & Unit Test • Integration • SAT	• Pilot • Rollout of: – 21 Non-account Auto Self-Service Applications – National Infrastructure – Web Servers	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.2 Risk Adjusted PFR	$23,604	$9,206	$3,976	$1,432	$1,081	$2,127	$578	$578	$578	$578	$578	$578	$578	$578	$578	$578
Development Investment	$13,498	$9,206	$2,896	$351	$0	$1,046	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$10,106	$0	$1,081	$1,081	$1,081	$1,081	$578	$578	$578	$578	$578	$578	$578	$578	$578	$578
	• Acquisition of: – RADB Servers – National Infrastructure Upgrade • Design • Code & Unit Test	• Code & Unit Test • Integration • SAT • Pilot	• Pilot • Rollout of: – National Infrastructure Services – TADB & Expanded ASSA	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.3 Risk Adjusted PFR	$119,165	$9,730	$36,248	$20,405	$35,307	$6,918	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056
Development Investment	$103,986	$9,730	$35,940	$20,097	$33,304	$4,915	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$15,179	$0	$308	$308	$2,004	$2,004	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056	$1,056
	• Acquisition of: – Secure Desktop COTS – IRIS • Design	• Acquisition of: – Secure Desktop COTS – IRIS • Design • Code & Unit Test	• Acquisition of: – Telecom Upgrade • Code & Unit Test • Integration • SAT	• SAT • Pilot • Nationwide Rollout of: – IRIS – Univ Secure WS with Legacy Access – Security Services – AUTHDB	• Complete Nationwide Rollout • Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.4 Risk Adjusted PFR	$337,236	$3,024	$108,295	$36,298	$26,928	$29,426	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327
Development Investment	$156,375	$3,024	$107,332	$22,131	$12,761	$11,126	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$180,861	$0	$963	$14,167	$14,167	$18,299	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327	$13,327
		• Acquisition of: – Corporate Computing Infrastructure – SADB/PAAS Platform • Design • Code & Unit Test	• Code & Unit Test • Integration	• Integration • SAT	• Pilot of: – CCDB, TRDB – TADB Enhancements – Daily IMF Updates – SADB/PAAS	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Subrelease 1.5 Risk Adjusted PFR	$90,595	$600	$7,334	$10,930	$9,287	$38,711	$15,947	$865	$865	$865	$865	$865	$865	$865	$865	$865
Development Investment	$78,938	$600	$7,250	$10,766	$9,124	$36,116	$15,082	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$11,657	$0	$85	$163	$163	$2,596	$865	$865	$865	$865	$865	$865	$865	$865	$865	$865
		• Design	• Design • Code & Unit Test	• Code & Unit Test • Integration • SAT	• SAT • Pilot • Nationwide Rollout of: – 1.4 (see above) – Data Directed Routing – On-line Adjustments – Legacy Sync – MIS	• Complete Nationwide Rollout • Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance	• Systems Maintenance

Legend

Acquisition | Design | Code & Unit Test | Integration | SAT | Pilot | Rollout | Maintenance

*NOTE: Exclusive of ongoing business operating costs

VI. Business Case Summary*

Summary	Total	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
FTE's Saved	22,890	658	786	787	881	2,121	2,207	2,207	2,207	2,207	2,207	2,207	2,207	2,207
							valued at:							
Labor $ (000) Saved	$864,322	$24,833	$29,687	$29,732	$33,269	$80,079	$83,340	$83,340	$83,340	$83,340	$83,340	$83,340	$83,340	$83,340
Non-Labor $ (000) Saved	$428,890	($7,380)	$28,400	$29,500	$31,760	$33,110	$34,460	$35,810	$37,160	$38,510	$39,880	$41,210	$42,560	$43,910

Alternative I: No Reinvestment of Savings and Cost Avoidance

Impacts	Total	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Labor And Non-Labor Savings (000)	$1,293,212	$17,453	$58,087	$59,232	$65,029	$113,189	$117,800	$119,150	$120,500	$121,850	$123,220	$124,550	$125,900	$127,250
Additional Phone Calls Answered	1,000													
Additional Revenue Generated	$0													

Alternative II: Reinvestment in Customer Service and Compliance

Impacts	Total	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Additional Phone Answered Calls	43,654,531	4,147,483	3,292,254	3,292,254	3,292,254	3,292,254	3,292,254	3,292,254	3,292,254	3,292,254	3,292,254	3,292,254	3,292,254	3,292,254
	(6,922 Work Years)						(522 FTE)							
Additional Revenue Generated	16.0 billion	-$0.009	$0.429	$0.432	$0.576	$1.626	$1.663	$1.665	$1.666	$1.667	$1.669	$1.670	$1.671	$1.673
	(15,968 Work Years)						(1,685 FTE)							
	(22,890 Work Years)						(2,207 FTE)							

Alternative III: Reinvestment in Compliance Only

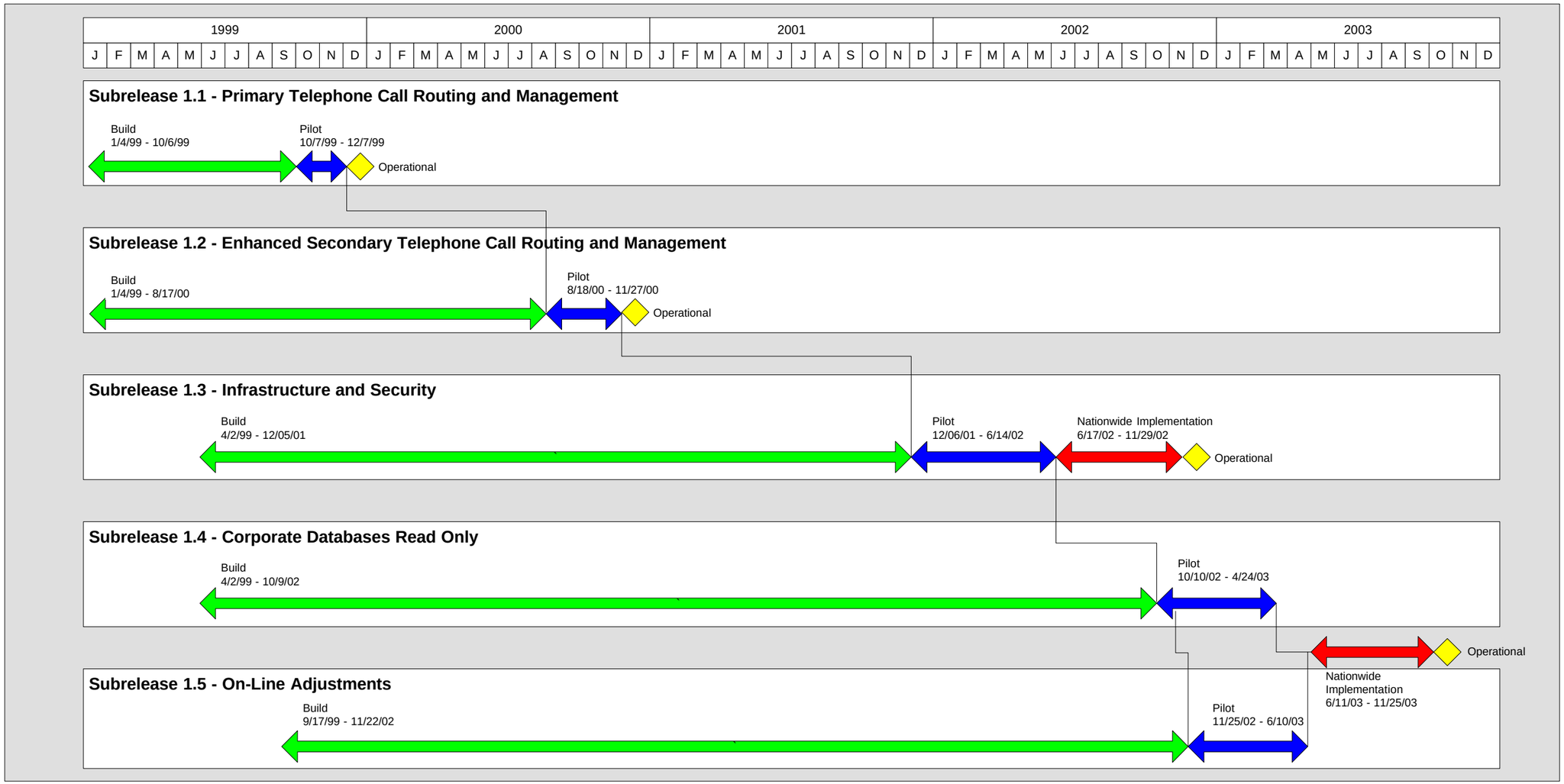
Impacts	Total	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Additional Revenue Generated	20.8 billion	$0.993	$1.079	$1.150	$1.220	$1.789	$1.814	$1.815	$1.816	$1.818	$1.819	$1.820	$1.822	$1.823
	(22,890 Work Years)						(2,207 FTE)							

* Note: Based on Risk management Adjusted Benefits

VII. Risk Adjusted Schedule

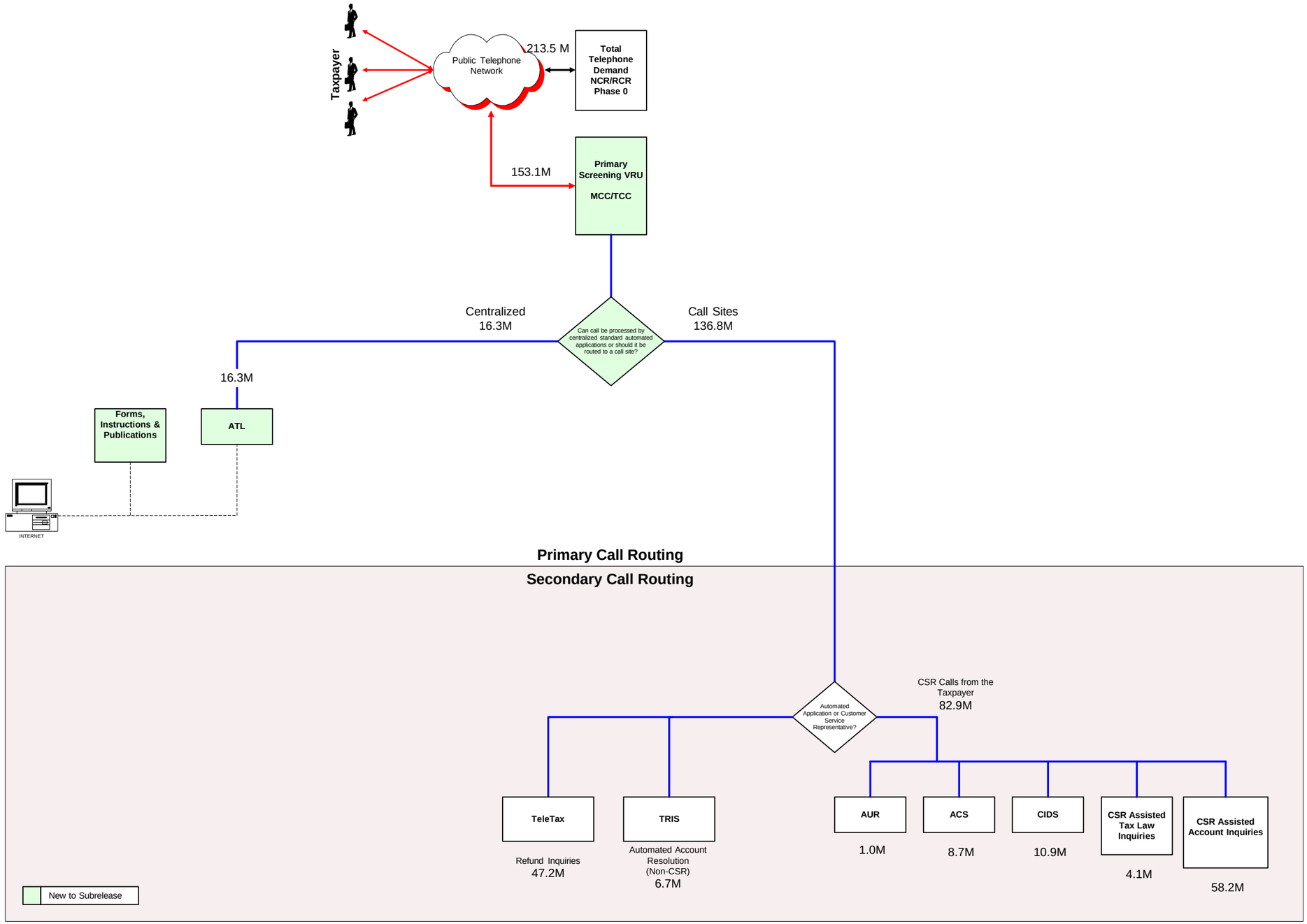
Based on risk adjusted government estimates, it is currently projected that Phase I/Release 1 be fully developed in accordance with the schedule below. The Modernization Phase I/Release 1 schedule was developed using the COCOMO (COnstructive COst MOdel) estimation tool for development and using IRS/ISC technical and programmatic expertise for non-development activities. The schedule below was **adjusted to account for schedule risk** pursuant to the application of the Monte Carlo risk simulation tool.

Modernization Phase I/Release 1 Schedule Overview



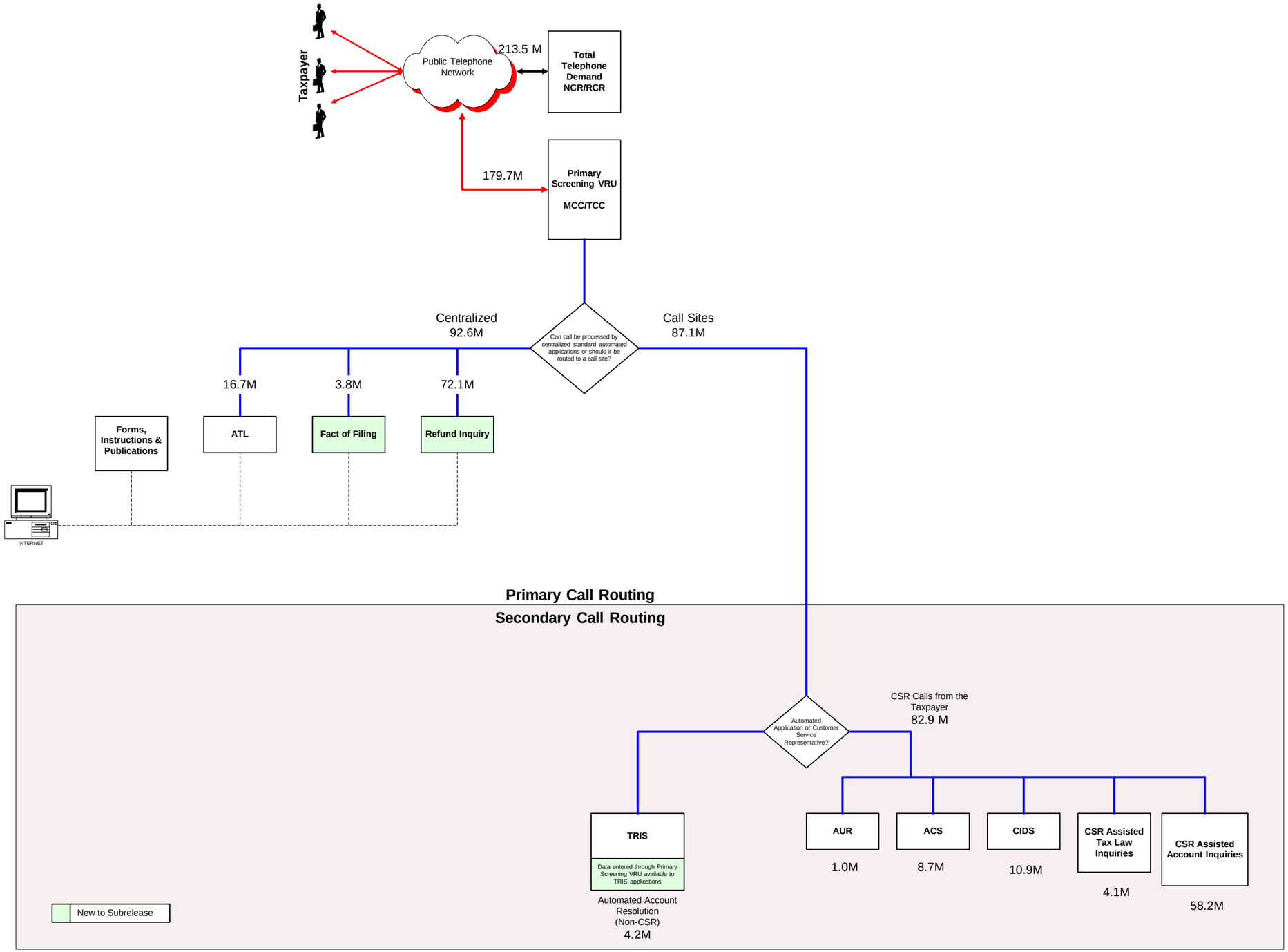
VIII. Validation

It is required that the offerors competing for the PRIME Systems Integration Services Contract will evaluate the Business Case and Engineering Specifications as part of the offeror's PRIME Technical and Business Proposals to develop and deploy Phase I/Release 1. The Proposal submission date is currently June 1, 1998.



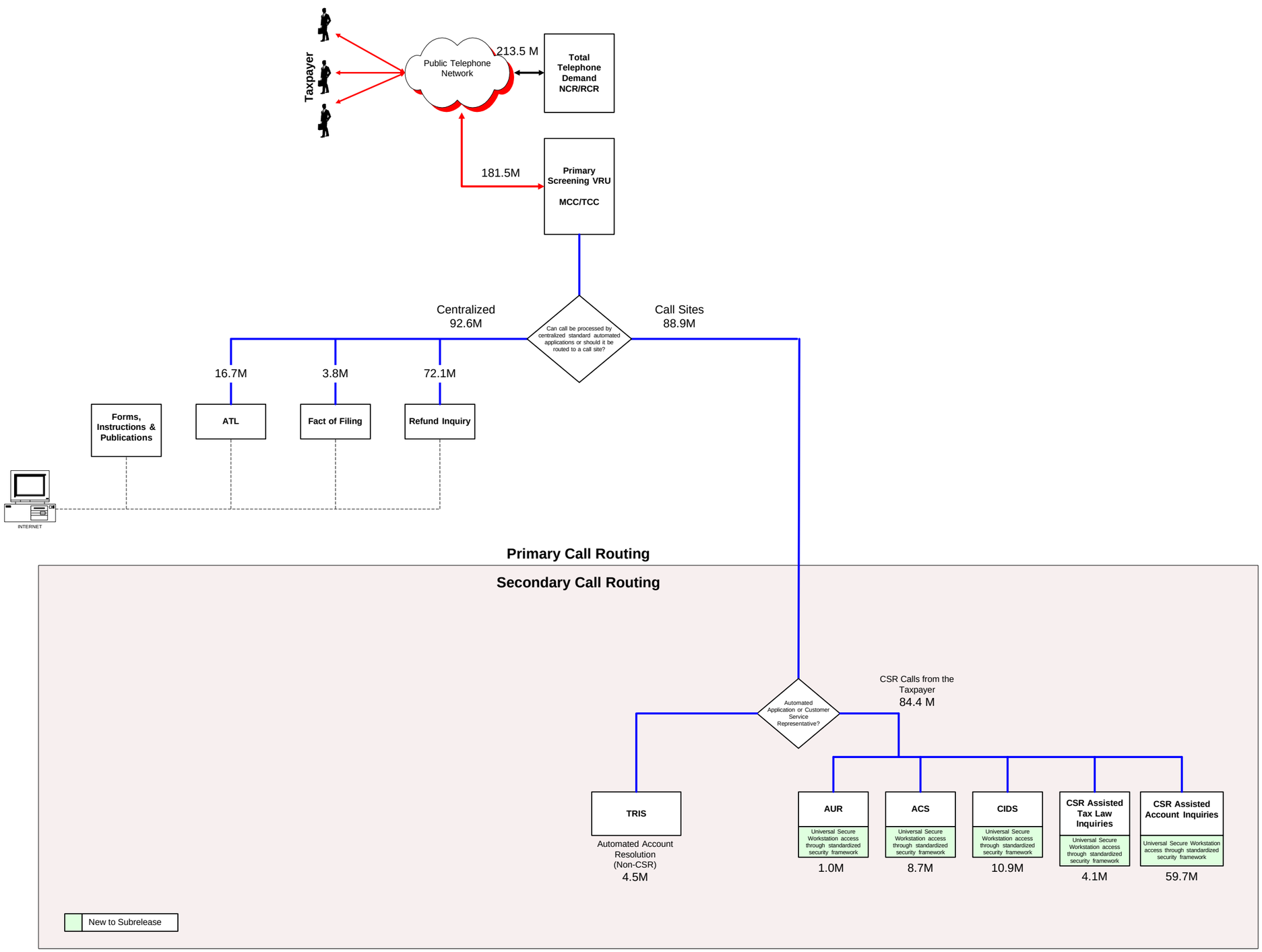
Note: Call volume based on FY97 actuals

Phase I/Release 1 Subrelease 1.1 Business View



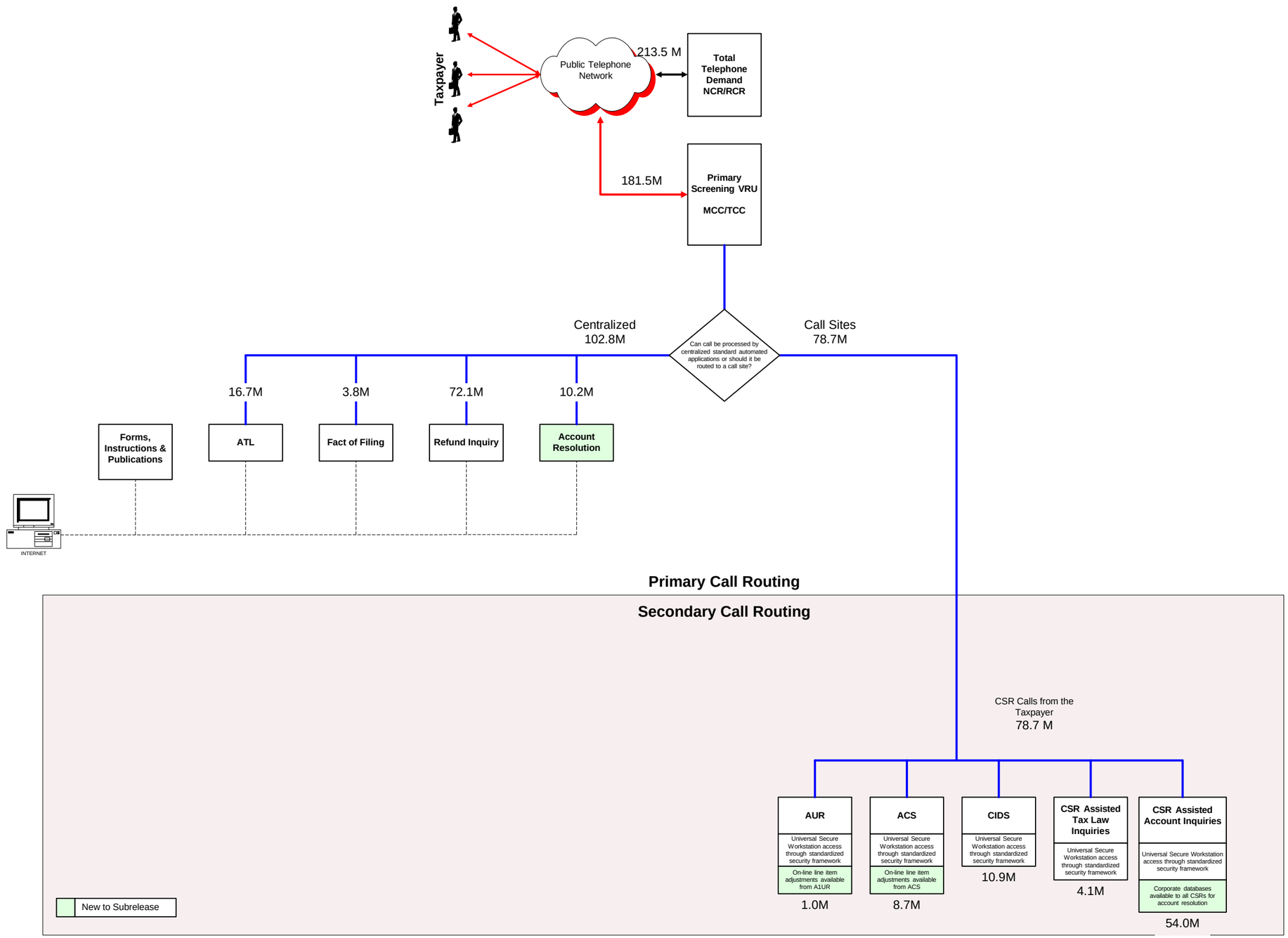
Note: Call volume based on FY97 actuals

Phase I/Release 1 Subrelease 1.2 Business View



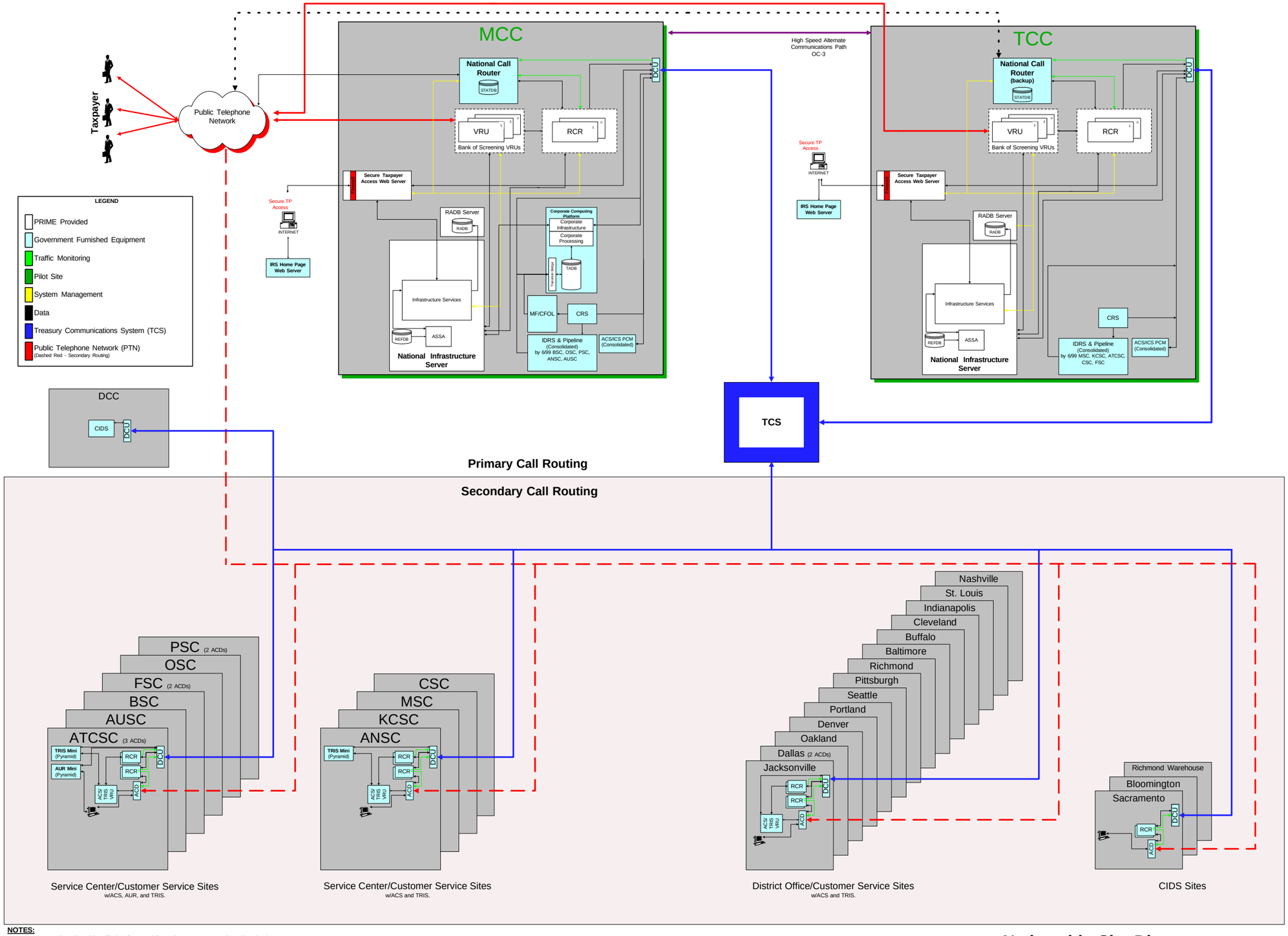
Note: Call volume based on FY97 actuals

Phase I/Release 1 Subrelease 1.3 Business View



Note: Call volume based on FY97 actuals

Phase I/Release 1 Subreleases 1.4 & 1.5 Business View



NOTES:

- Customer Service Sites identified reflect anticipated Customer Service Sites in the year 2002.
- The remote Customer Service Staff Centers functioning through the primary Customer Service Sites are not shown.
- Data Communication Utility (DCU) provides router based network connectivity and serves as the WAN gateway.

Nationwide Site Diagram
Technical View Subreleases 1.1 & 1.2

SECTION I:
TOWARD A MODERNIZED INTERNAL REVENUE SERVICE

I. TOWARD A MODERNIZED INTERNAL REVENUE SERVICE

The Modernization effort is one of the single, largest systems integration undertakings in the world—eclipsing in breadth and depth any previous efforts of either the private or public sector. Thus, it is essential for the Internal Revenue Service (IRS) and the private sector to form a strategic partnership in which the IRS contributes its knowledge of the tax administration and the operational systems and infrastructure, while the private sector provides project management, reengineering, systems engineering, design, development, and integration expertise.

✦ The Partnership Developed the Business Case

Although the IRS had previously employed contractors in its Modernization program, in a departure from normal custom, the Service established a collaborative relationship with its Integration Support Contractor to leverage the following:

- IRS' expertise in the design and operation of both the legacy and modernized applications and infrastructure;
- IRS' knowledge of day-to-day business operations; and
- Contractors' expertise with respect to reengineering, application development, database and infrastructure engineering, as well as systems integration.

The partnership developed the ***Modernization Blueprint*** and the IRS Systems Life Cycle (SLC) and continues with the preparation of:

- Volume I: Request for Proposals for a PRIME Systems Integration Services Contractor
- Volume II: Business Case
- Volume III: Engineering Specifications.

✦ Meeting the Expectations of Oversight

The Business Case complies with the following:

- **Government Performance Results Act (GPRA) Leads to Performance-Based Measures**

  The IRS is a pilot agency in developing strategic planning processes that incorporate the mandates contained in the GPRA. As required by the GPRA, the IRS has integrated the Strategic Plan & Budget with a strategic plan for program activities. The Government Cost Estimate provided by the IRS in the Business Case for Phase I/Release 1: Customer Service and Compliance (hereinafter known as the Business Case) is based upon a cost/benefit analysis where the benefits derive from the functionality provided in Phase I/Release 1. The functionality has been prioritized based upon the measures to be achieved as stated in the Strategic Plan. The success of the Phase I/Release 1 investment will be evaluated based upon these performance measures. Therefore, the Phase I/Release 1 investment aims to fulfill

the objectives of the Strategic Plan & Budget related to Customer Service and Compliance. See Appendix B for the Performance Measures applicable to this Business Case.

Another requirement of the GPRA is the establishment of a performance review process that informs the budget and planning process. This process has been defined as part of the IRS SLC and will provide feedback on performance, subsequently supporting the validation of the projected benefits outlined in the Business Case.

- **Clinger-Cohen Act (ITMRA) Links Investments to Budget Strategies**

  The Clinger-Cohen Act, formally known as the Information Technology Management Reform Act (ITMRA), sets forth requirements that Federal programs must link Information Technology (IT) investments to the budget strategies of the organization. The Act provides direction for establishing a process for selecting, managing, and evaluating the results of IT investments; and integrating this process with agency budget, financial and program management processes. Accordingly, the IRS has adopted investment review procedures as part of the recently promulgated Systems Life Cycle (SLC). The Business Case introduces the first incremental release of Modernization into the investment review process.

- **"Raines' Rules" Define Criteria for Evaluating Investments**

  ITMRA directed the Office of Management and Budget (OMB) to establish clear, concise direction regarding investments in major IT systems and to enforce the direction through the budget process. In response, Franklin D. Raines, Director of OMB, developed decision criteria that OMB uses to evaluate funding requests for major IT investments. These criteria, now known as *Raines' Rules*, are applied to evaluate agency IT proposals. As such, they also serve to guide agencies in proposing and justifying IT expenditures. Section IV summarizes the application of *Raines' Rules* to the Business Case.

- **OMB Circular A-130 Requires Review of Internal System**

  OMB Circular A-130 states that agencies must review internal systems on a regular basis for applicability to its business needs and must investigate existing intra-agency and inter-agency systems as well as commercial off-the-shelf (COTS) tools prior to investing and developing new systems. The IRS reviewed all of its existing systems throughout Customer Service, Compliance, Corporate Data Processing, Financial Reporting, Submission Processing, and Infrastructure as part of the development of the ***Modernization Blueprint***. The result of this review was incorporated into the Universal Architecture documented in the ***Modernization Blueprint***.

  The ***Modernization Blueprint*** is the architectural framework for the systems described in the Business Case. A COTS-based approach to Modernization is a central principle of the Architecture. The ***Modernization Blueprint***, Volume VI, Systems Standards Profile, documents standards for COTS product compliance and the importance of COTS products is referenced throughout the ***Modernization***

Blueprint. Where appropriate, COTS will be used in providing system components compliant with the ***Modernization Blueprint***.

- **Treasury/IRS Investment Review Process**

  The IRS Investment Review Board (IRB) prioritizes information technology investment recommendations for review and consideration by the Department of the Treasury IRS Management Board.

SECTION II:
CONTEXT FOR THE BUSINESS CASE: THE *MODERNIZATION BLUEPRINT*

II. CONTEXT FOR THE BUSINESS CASE: THE *MODERNIZATION BLUEPRINT*

A. THE CHALLENGE

The IRS originally developed its corporate database systems in the late 1950's and 1960's to capture, store and process tax return, information return and payment information. These systems were developed largely on mainframe platforms which provided for the requisite performance, capacity, and security. All of these aspects were critically needed by the IRS given the massive volume of data to be processed within narrow timeframes and the need to adhere to Federal statutes concerning the privacy and non-disclosure of confidential taxpayer information. These systems became known as the "Master Files."

As the volume of data mushroomed over the succeeding decades, however, the IRS experienced greater difficulty in managing the data, particularly given the increasing demand for data on-line to resolve taxpayer account issues, facilitate examination and collection, as well as provide for improved taxpayer service.

Through Tax Systems Modernization in the 1980's and early 1990's, effort focused on delivering taxpayer services and compliance functionality together with limited on-line access to taxpayer account information. These objectives were achieved through the development of stand alone "stovepiped" systems with stand alone databases utilizing the principles of distributed computer processing, an approach to computing en vogue during the late 1980's and 1990's.

While the modernized stovepiped systems provided on-line access to limited taxpayer account information, the IRS experienced increasing difficulties synchronizing disparate stand alone systems and databases and expended significant funds to develop and operate stand alone systems with duplicative functionality, infrastructures, and telecommunications. Minimal progress was made in replacing the legacy "Master File" systems. Overall, the IRS computing environment evolved into an extraordinarily complex array of legacy and stand alone modernized systems with respect to both connectivity and interoperability between the mainframe platforms and the plethora of distributed systems.

- **Timeliness of Taxpayer Account Information**

  The Corporate data, known as the Master Files, is comprised of taxpayer entity, tax return, tax payment, taxpayer account history, and third party information return data. Generally, payment and tax return information are received either electronically or via paper documents in the ten (10) Service Centers and following transcription and perfection, the data is transmitted daily to the Martinsburg Computing Center. Instead of updating the Master Files each day, however, the data is accumulated during the five business days of each week and posted to the Master File databases through a series of computer operations, commencing on Saturday of each week and extending over several days. Thus the data captured at the Service

Centers may not be available on the Master Files for as long as 10 days from the date the information is transmitted to Martinsburg.

Computer on-line access to this data and the ability to update the information are further delayed by the need to transmit the updated Master File data to each Service Center. In turn, the Service Center updates the on-line Integrated Data Retrieval System (IDRS), the primary system utilized by Customer Service Representatives (CSRs) to resolve taxpayer account issues.

The elapsed time for the entire process, therefore, from initial data capture at the Service Centers to posting of the data on IDRS may exceed two weeks.

- **Fragmentation and Inaccessibility of Taxpayer Account Information**

In addition to lacking currency, the information may not be either sufficient and/or readily accessible to facilitate the research and resolution of taxpayer account issues. For example, each Service Center IDRS database contains approximately one percent of the total number of taxpayer accounts on the Master File. The sum total of taxpayer accounts available on the ten (10) Service Center IDRS systems is approximately ten percent of the total number of taxpayer accounts on the Master Files. It should be noted, however, that while the accounts posted to IDRS are limited in number, they represent the accounts which are most likely to be active.

Further, the IRS neither maintains the source payment documents nor posts either detailed transaction specific payment or tax case information to the Master Files. Instead, the detailed tax and tax case information is stored on stovepiped systems with stand alone databases which, for the most part, are not integrated with either the Master Files or the corporate on-line system, IDRS.

For example, separate tax assessments for the same taxpayer could be found on the Automated Collection System (ACS), the Automated Underreporter System (AUR), the Automated Substitute for Return System (ASFR), the Audit Information Management System (AIMS), the Integrated Collection System (ICS) as well as the Totally Integrated Examination System (TIES). Thus, a CSR may need to research a variety of systems to obtain a comprehensive view of all data required to resolve a taxpayer's account issues.

Access to these systems is further complicated by the stand alone distributed systems infrastructure networks supporting these systems (e.g., IDRS, AUR, ACS, ICS, ICP), which require one or more CSRs to potentially access several computer terminal devices to comprehensively identify all potential taxpayer account issues. It should also be noted that these stovepiped distributed processing networks each require significant expenditures to develop, update, and maintain as well as drive the agency's telecommunications expenses.

- **Asynchronous Taxpayer Accounts Information**

Resolving taxpayer account issues often requires considerable research on multiple systems and a series of complex time consuming tasks to update the various databases. For example, a case resolution utilizing the Automated Collection

System (ACS) requires updating the ACS systems pursuant to interaction with the taxpayer, the generation of paper computer ACS outputs which are subsequently utilized to enter manually pending account resolution information into IDRS which, in turn, transmits data to Martinsburg to update the Corporate Master Files, which, in turn, posts final account data to IDRS.

Alternatively, a CSR could also initiate the account resolution sequence, described above, by entering information directly into IDRS. The IDRS command code structure which is used to initiate activity on the system, however, is extremely complex, which further complicates the work, adversely impacts productivity, and results in account resolution errors.

Additional delays occur if data fails to post to any one of the systems in the sequential posting processes, thereby further delaying the availability of current authoritative data. These corrections are subject to the same 7 to 10 day Master File update cycle previously described.

- **Managing Taxpayer Case Resolution Issues**

  Most of the stand alone systems provide for case management functionality which is duplicative (e.g., case creation, case assignment, case processing, and management reporting). Further, each system generates management reporting information which is not homogeneous, one with the other, therefore, depriving management of an integrated case management repository and, in turn, diminishing the agency's capability to effectively manage the customer service and compliance programs.

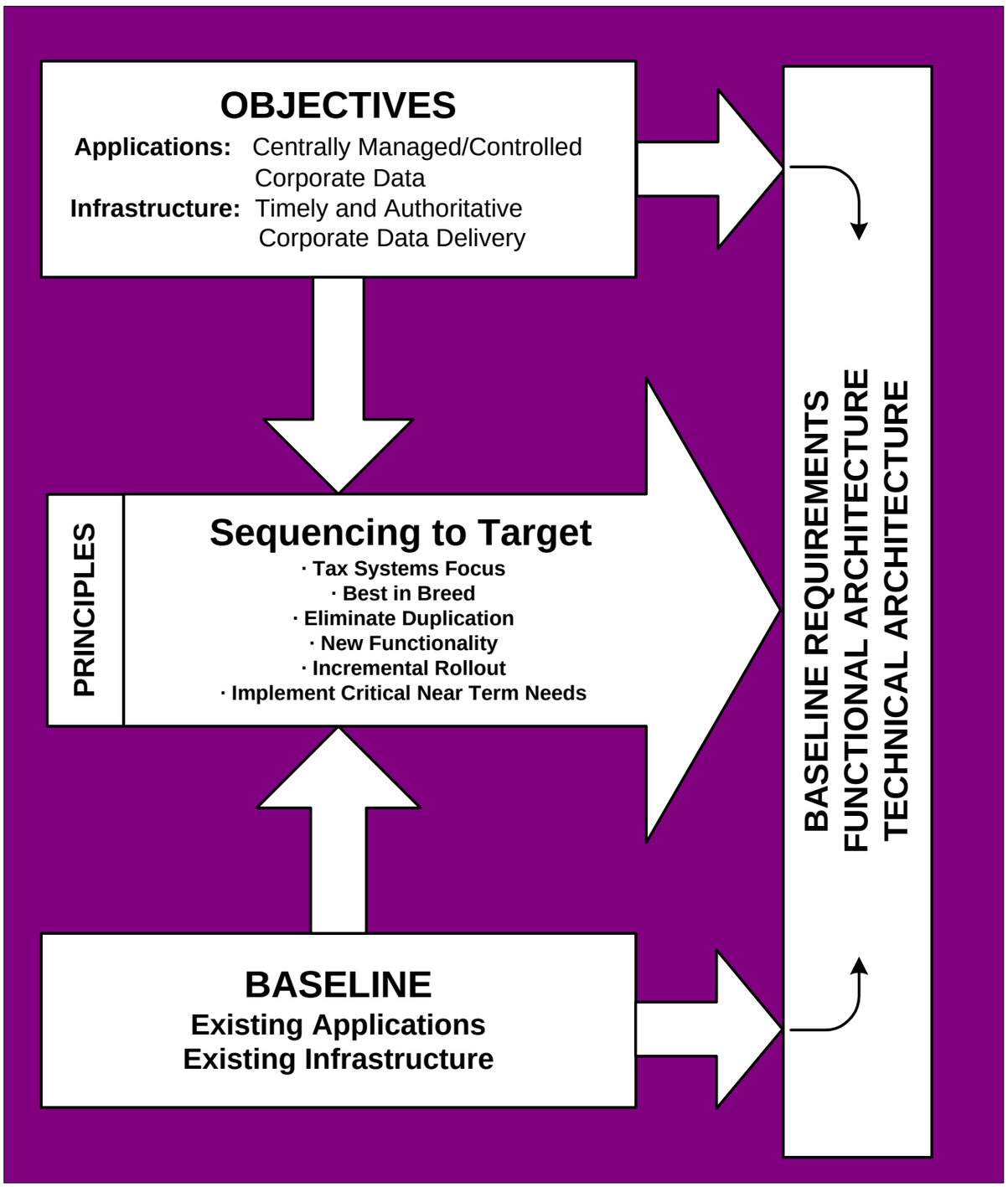
B. *MODERNIZATION BLUEPRINT* APPROACH

One of the more fundamental and wrong headed myths concerning Tax Systems Modernization is the nature of the technical problem: to modernize legacy systems.

Regrettably, the challenge is far more overarching: to modernize functioning but aged legacy systems which have been nearly irreparably overlaid by and interfaced with a tangle of stovepiped distributed applications systems and networked infrastructures.

- **"Top Down" Principle: Mainframe Centric and Centralized Data Warehouses. To move forward, the IRS must elect to either continue developing distributed processing systems or refocus the technical direction to invest in centralized databases supported by accessible mainframe centric solutions. Accordingly, the IRS evaluated alternatives by applying the following criteria:**
  - Cost to develop and maintain systems;
  - Performance including on-line transaction processing;
  - Complexity of applications, data structures, infrastructures;
  - Risk management including interoperability and connectivity;
  - Systems and data security;

Modernization Blueprint Approach



- Controls including recovery, capacity planning, security, and managed growth; and
- Time to market.

Without equivocation, the analysis reaffirmed that the **originally planned Modernization** technical direction to develop corporate databases including data warehouses on mainframe centric platforms would provide a feasible, cost effective, and secure computing environment.

Contrary to the original Modernization Plan, however, the **distributed stand alone applications systems, stovepiped databases, and overlapping computing networks should be largely centralized** thereby eliminating duplication (e.g., telecommunications networks), standardizing the application systems (e.g., consolidating disparate case management systems) and creating centralized authoritative databases (e.g., tax payment information database).

- **"Bottom Up" Baselining of Existing Investments. Untangling the myriad of existing technology is initially dependent on systematically baselining and rationalizing the stand alone systems, data flows, interfaces, and infrastructures.**
- **Defining the Target Environment: *Modernization Blueprint*. Still another Modernization myth is that the IRS has not undertaken significant reengineering efforts. Indeed, the Service Center Organization Study and the District Organization Study envision a far more efficient customer oriented IRS, the major principles of which have been incorporated in the Target environment.**
  - **Business Requirements**. While the primary systems reengineering proposals have not yet been implemented, the ***Modernization Blueprint*** has captured and documented the critical Business Requirements that would support the vision. Even if the Service were to reengineer its programs in the future, the ***Modernization Blueprint*** Business Requirements which focus on capturing, retaining, retrieving and processing, on-line, authoritative tax return, payment and information return data would remain largely unchanged. The ***Modernization Blueprint*** requirements, therefore, represent the current and future needs of the IRS.
  - **Functional and Technical Architectures**. Applying the "top down" principles of mainframe centric infrastructures to support centralized applications systems and databases, the Functional and Technical Architectures map the Business Requirements to target functional flows and technical elements including subsystems, databases, data flows, interfaces, and infrastructures which provide the requisite systems performance and security needs.
- **Sequencing Plan**
  - **Preserve Existing Investments.** To avoid "throwing the baby out with the bath water" the existing "bottom up" baseline of operational systems was analyzed to identify systems duplication, gaps, and "best of breed" functionality with the aim of preserving applicable existing investments by either "porting" or "morphing" elements of the "best in breed" systems to the target environment.

- **Unravel the Tangle.** A second focus of the sequencing effort was to unravel the tangle of existing application systems, databases, and infrastructures to create a rational strategy to migrate incrementally from today's myriad of technology to the target Modernized IRS. Again, the "bottom up" baselining of the operational systems and supporting infrastructure was utilized to facilitate the analysis.
- **Prioritize to Sequence.** Planning a path to the target modernized environment must reflect a mix of competing business and technical implementation considerations. Accordingly, the IRS developed and stringently applied prioritization criteria including, but not limited to:
  - Focusing on systems to support IRS business priorities;
  - Mitigating risk; and
  - Planning a cost-effective migration.

C. INCREMENTAL MODERNIZATION

Modernization is likely the single largest systems integration undertaking in the world eclipsing in breadth and depth any previous efforts of either the private or public sector.

Modernization, therefore, **must proceed incrementally**, focusing initially on creating centralized "data warehouses" that would be operational, accessible on-line relational databases to enable taxpayer account resolution.

Developing these capabilities in the initial phase of a planned five phase Modernization would stimulate significant improvements in customer service, compliance, and financial reporting -- the core businesses of the IRS.

Even if Modernization proceeded no further than the completion of the initial phase, the IRS would be positioned to effectively administer the Tax Laws insofar as **Phase I systems, together with the aged, but functioning, Master Files would provide a cohesive and integrated set of core business systems**.

Breakthroughs in electronic commerce programs that lead to significant increases in electronic filing and tax payments could be accommodated during any of the Modernization phases, with sufficient lead time to ensure installation of the additional data storage and retrieval capabilities.

Subsequent phases of the Modernization Sequencing Plan provide for further compliance and financial reporting enhancements as well as the eventual retirement of the Master Files through the development of the remaining newly planned centralized databases.

D. MODERNIZATION SEQUENCING PLAN

✦ Criteria for Sequencing Implementation

Planning a path to the target modernized environment must reflect a mix of competing business and technical implementation considerations. Accordingly, the IRS developed and stringently applied prioritization criteria including, but not limited to:

- **Focusing on systems to support IRS business priorities** with particular emphasis on modernizing that which is most needed: accessing centralized data to resolve taxpayer account issues on-line.
- **Mitigating risk** by planning the sequencing to limit the need for complex interfaces, large scale data conversions, and continuous disruption of business operations. Instead, planned increments of new systems would be gradually and rationally phased-in from a business user perspective and supported by new workflow procedures and associated retraining.
- **Planning a cost effective migration** by minimizing the need to develop interim "throwaway" systems and interfaces; prioritizing the centralization of duplicative stand alone applications systems, stovepiped databases and networked infrastructures while minimizing future systems development and maintenance expenses.

✦ Implementation Sequence

The Sequencing Plan proposes five phases, implemented through sixteen releases and incrementally rolled out at the subrelease level.

- Phase 0: Bridging Today's Technology To The Modernized IRS (focusing on upgrading Customer Service and non-face-to-face Compliance capabilities).
- Phase I: Customer Service Through Accessing Corporate Data (including Compliance non-face-to-face capabilities).
- Phase II: Field Compliance (local case management and laptop computer integration).
- Phase III: Complete Corporate Data (and retire the Master Files).
- Phase IV: Financial Reporting (and Compliance research through corporate data access).
- Phase V: Reengineered Submissions Processing (to accelerate processing timeframes, improve accuracy, and reduce costs).

✦ Durability of the Implementation Plan

The incremental build strategy provides for modernized systems that reflect reengineered business processes. For the first time, modernized systems would be implemented in a series of integrated modules pursuant to a Sequencing Plan that reflects both business priorities and systems engineering best practices. In addition to providing a map for the rollout of the modernized system modules, the plan

would identify required interim interfaces with legacy systems to ensure seamless integration as well as target retirement dates for legacy systems.

- **Phase 0: Bridging Today's Technology To The Modernized IRS**

  Major information technology investments have already yielded significant business improvements. While Modernization focuses on the future, it is essential to temporarily build a bridge to the modernized IRS via investments in today's technology including, but not limited to:

  - Implementing the **Customer Service Call Router Rollout** (**CSCRR**) (for primary routing) and the initial installment of **the Automated Tax Law System (ATL) (Internet only)**.
  - **Replacing** the aging tax return and payment **manual data capture systems.**
  - Rolling out the **Integrated Collection System (ICS)** and the interim Integrated **Case Processing System (ICP)** to facilitate tax collection.
  - **Replacing laptops** for the Totally Integrated Examination System (TIES) and **migrating TIES to the Report Generation System (RGS)**.
  - Rolling out the **Compliance Research Information System (CRIS)** to enhance the support structure for Compliance Research.
  - Enhancing the **Inventory Delivery System (IDS)** to facilitate the fit-for-use processing for cases being staged to Compliance.
  - Implementing the initial stage of the **Telephone Routing Interactive System (TRIS)** to support Customer Service and Compliance until the Enhanced Regional Infrastructure System (ERIS) is implemented in Phase I.
  - Rolling out the first phase of the **Financial Reporting Release (FRR)** system.

- **Completing America's Tax System**

  Phase I: Customer Service Through Accessing Corporate Data. Prioritization and sequencing of Modernization investments should be predicated largely on modernizing that which most adversely impacts America's Tax Administration System. Given the current inaccessibility of corporate data and its adverse impact on customer service and compliance programs, Modernization should focus on the development of **accessible, secure, and authoritative Corporate Data Systems**.

  - These databases, together with new applications systems capabilities would, **for the first time**, enable the IRS to detect, manage, and **resolve taxpayer accounts**.
  - Bringing together the taxpayer and the Customer Service Representative via a modern, integrated telephone system and, at the same time, accessing the corporate databases, on-line, would **enable the IRS to service taxpayers in a manner comparable with world class customer service organizations.**
  - The same systems capabilities would enable the IRS to significantly **improve the productivity** of its non-face-to-face compliance programs.

  Even if Modernization proceeded no further than the completion of Phase I, the IRS would be positioned to effectively administer the tax laws insofar as **Phase I**

systems, together with the aged, but functioning, Master Files, would provide a cohesive and integrated set of core business systems.

- **Replacing The Aging, But Serviceable Master File Systems**

Phase III: Complete Corporate Data. Master File replacement is potentially the **highest risk phase** of Modernization given the complexity and diversity of the application systems which create, read, update, and delete data related to the various Master File databases.

Nevertheless, while the IRS successfully processes more than 200 million tax returns and $1.4 trillion of tax revenues annually, utilizing these aged applications and databases, the **Master File systems must eventually be replaced**.

Given the scope and complexity of these systems, it would be essential to begin in the near term to document the application system functionality.

Beyond the magnitude of the application systems migration, the complexity and enormity of the data conversion that would be required necessitates careful planning and risk mitigation strategies (e.g., parallel processing). While the risks inherent in Phase III may be nearly incalculable given the aged systems, the absence of critical documentation, the dependency on Assembler Language Code (ALC) and the inevitable turnover of the IRS workforce supporting these systems, it is essential to plan and execute the conversion of the Master Files and its related suite of applications.

Phase I Deliverables and Benefits

Deliverables	Benefits
Submissions Processing	
• Common Secure workstation for ERS/GUF users	• Reduced Training and Maintenance Costs
• Electronic Tax Administration	• Increased Electronic Filing reducing paper processing costs and error rates
Corporate Processing	
• Authoritative, centralized Corporate Databases and Application Systems: — TADB, CCDB, PIDB — Centralized Notice Processing, — Analysis & Storage (MCDB) Corporate Case Creation and Management	• Provides the authoritative and single instance of mission critical data (tax accounts, payments, and cases): — Comprehensive view of a taxpayer's entire account — Single point of direct access to comprehensive taxpayer account/case data — Centralized generation, quality review, and issuance of notices and correspondence — Complete case history available to all users — Capability to effectively execute and manage the Compliance Plan — Corporate management of all balance due cases
• Daily Update of the Master Files	• Improves the currency of data by reducing the ten day update cycle to one day
• Simplified on-line transactions to support the access of up to 100 percent of the data captured	• Consolidation and standardization of corporate applications: — Simplified command codes — User friendly interfaces — Multiple inter-system data synchronization no longer necessary, reducing processing costs and errors
Customer Service and Compliance	
• Integrated Telephone and Call Distribution System: — Predictive Dialing — Nationwide Routing — Data Directed Routing	• Strategically located Standardized Telephone and Call Distribution Systems supporting nationwide work distribution: — Provides foundation to support additional telephone and on-line functionality — Provides foundation to deliver on-line access to corporate processing and data — Provides increased security capabilities through an integrated infrastructure
• Single Workstation for Account Resolution: — Common Secure Workstation/Data for CSRs/Agents — Local Case Management/Assignment — 1040 & BMF Line Item Adjustments	• Enhanced Customer Service capability is made available to all employees utilizing a universal workstation: — Provides standard presentation of corporate data — Access to standard applications — Increased productivity — Reduced training costs — Job/work mobility
• Expanded Self-Service and Customer Service Capabilities: — (ATL) Automated Tax Law System — Credit Card Payments	• Ability to service more taxpayer requests by increasing automated self-service capabilities and expanding payment options: — Fewer calls must go to assistors — More current and centrally available data — Credit card payments available for more timely account settlement
Financial Reporting Systems	
• Retention of source data for paper documents	• On-line payment tracer capabilities

Phase III Deliverables and Benefits

Deliverables	Benefits
Corporate Processing	
• Additional authoritative, centralized Corporate Databases and Application Systems (including TRDB and IRDB)	• Provides the authoritative and single instance of additional mission critical data (tax and information returns): — Comprehensive view of an entire account — Single point of direct access comprehensive taxpayer account/ data — Centralized generation, quality review issuance of notices, and correspondence — Complete case history available to all users — Capability to effectively execute and manage the Compliance Plan — Corporate management of all balance due cases
• Re-engineered Master File Processing (modern languages, on-line)	• Streamlined and more efficient Master File Processing: — Reduction or elimination of Master File — Accelerated Master File error and issue resolution capabilities
• Accelerated IRP Issue Detection	• Issuance of inappropriate refunds can be avoided and collection rates are improved due to earlier issue detection
• Establish secondary location(s) of all corporate databases to support extracts, Disaster Recovery, continuous availability, and IRMF extract processing	• Provides support for additional analysis and recurring parameter driven extracts of core tax processing data
Customer Service and Compliance	
• Decision Support System	• Reduces turnaround time for routine and ad hoc extracts and IRMF requests

✦ **Phase V: Reengineered Submissions Processing**

It is yet unclear to what extent the IRS will be capable of generating significant increases in either the electronic filing and/or payment of taxes. It is also **premature to predict the feasibility of outsourcing Submissions Processing**. Given these uncertainties and the potentially long lead times for these programs to reach fruition, implementation of these systems was **positioned for the latter stages of Modernization**.

Nevertheless, the ***Modernization Blueprint*** Technical Architecture anticipates either or both of these eventualities insofar as the new centralized corporate tax return and payment databases will be structured to accommodate up to 100 percent of the data.

To the extent that the **electronic filing and/or payment programs** evolve during the build cycles of earlier Modernization phases, the IRS would **accommodate that growth utilizing existing database capabilities** (e.g., Electronic Filing Tax Processing System (EFTPS) and Tax Return Database (TRDB).

Phase V Deliverables and Benefits

Deliverables	Benefits
Submissions Processing	
• Integrated tax/information return and remittance batch and data controls	• Greater control over the receipt and processing of paper and electronic returns and payments
• Capture additional data earlier in the processing cycle (intelligent data capture)	• Reduced manual labor costs by utilizing additional captured data to drive automated business rules
• Centralized Pipeline Transmission and Control	• Minimized system down time and erroneous transmissions with the flexibility to support future data sources
• Migrate data capture functions to an Image Enabled platform	• Reduces overall program costs: — Automated data capture (ICR/OCR) — Increased throughput and accuracy — Reduced processing backlogs bottlenecks

- **Completing Compliance And Financial Reporting**
  - **Phase II: Field Compliance**
  - **Phase IV: Financial Reporting**

While the sequencing strategy initially focuses on completing America's Tax System (Phase I), providing sufficient lead time to plan the conversion and retirement of the Master Files (Phase III), and reserving the least defined programs (e.g., Submissions Processing) for Phase V. Phases II and IV are positioned to be implemented on a flexible schedule. Specifically, these phases could either be accelerated or delayed without significantly impacting business operations.

It should be noted, however, that **complete Financial Reporting Systems functionality would be dependent on Phase III**, completing the development of the corporate databases and retirement of the Master Files.

Phases II and IV Deliverables and Benefits

Deliverables	Benefits
Corporate Processing	
• Enhanced Case Management and Assignment (e.g., ICS, RGS, ERCS, AIMS)	• Local and corporate workload management systems interact, providing improved field compliance and customer service case/workload management capabilities: — More effective execution/management of the Compliance Plan — Ability to quickly adapt to modified nationwide workloads and priorities
Customer Service and Compliance	
• Internet services provided to taxpayers for account resolution and Tax Law research	• Expanded services to taxpayers with secure access to the Internet
• Automated Quality Review	• Increased productivity, improved quality of service, and enhanced issue detection and strategic planning capabilities
• Completion of primary Compliance capabilities including full Corporate systems support for laptops in Examination and Collection	• Standard applications and databases provide enhanced capabilities to all compliance and customer service function
• Common Compliance laptop supporting examination and collection	• Provides access to the authoritative case and account data from the field, increasing agent effectiveness
Financial Reporting Systems	
• Complete the Financial Reporting Systems	• Provides integrated tracking of payment and liability data from point of receipt: — Track financial events to source documents — Accounting summary data by tax type/fee code and transaction type — Traceability between revenue accounting summary and journal entries — Enhanced reporting capabilities for internal and external oversight
• Comply with standards	• Establishes compliance with the Federal Accounting Standards Advisory Board (FASAB) and Treasury Financial Management System

Toward A Modernized IRS

BUSINESS ENTERPRISE	SUBMISSIONS PROCESSING	CORPORATE PROCESSING	CUSTOMER SERVICE	COMPLIANCE	FINANCIAL REPORTING SYSTEMS
BUSINESS FUNCTIONS	- DATA CAPTURED AND PERFECTED FROM 200 MILLION TAX RETURNS - $1.4 TRILLION TAX PAYMENTS PROCESSED - 1.1 BILLION INFORMATION RETURNS	- 200 MILLION TAX RETURNS PROCESSED - 80 MILLION REFUNDS PROCESSED; VALUED AT $130 BILLION - DOCUMENT MATCHING	- TAX ACCOUNT RESOLUTION - NON-FACE-TO-FACE COMPLIANCE - TAX LAW ASSISTANCE	- FACE-TO-FACE EXAMINATION - FACE-TO-FACE COLLECTION - CRIMINAL INVESTIGATION - RESEARCH - TAX LAW ASSISTANCE	- FINANCIAL REPORTING - TAX REVENUES - IRS OPERATIONS
NEW SYSTEMS AND FUNCTIONALITY	PHASE V - Accepts **storage of up to 100 percent** of the digitized and electronically filed data - Provides for the **capture of additional valuable data** while eliminating labor intensive and costly manual processes - **Automated performance management** systems to respond quickly and efficiently to variable filing and payment patterns - Accepts **100 percent of the data** from electronically filed tax returns and payments	PHASE I PIDB TADB CCDB - **Centrally managed, comprehensive and authoritative data** - Provides **nationwide access to all accounts** - Supports Customer Service, Compliance and Financial Reporting. 24 Hour Update Cycle - **Timely taxpayer account updates** ensure that the current status is available within 24hours compared with today's 2 - 3 weeks PHASE III TRDB IRDB - Centrally managed, **comprehensive and authoritative** tax and information return **data** - **Rebuilding** the aging **Master Files** - **Mitigates the risk** associated with the dependencies on outdated programming systems and languages - **Enhanced fraud detection** and increased compliance 1997 J F M A M J J A S O N D	- **World Class Customer Service** Voice Response - **Taxpayers Have Options** Internet - **Online** non-face-to-face **taxpayer account resolution** - **Comprehensive tax and information return data** available to Customer Service Reps and Compliance Agents - **Reduced** computer systems maintenance **costs** - **Enforces uniformity** in the application of the Tax Laws - **Shorter time frames** to implement business requirements	- **"One Stop Shopping"** to resolve all taxpayer questions with a single phone call - Comprehensive **Security Infrastructure** including the full audit trail for every business transaction - **Corporate Case Management** systems to maximize resource utilization PHASE II - **Full corporate systems support** for laptops in Examination and Collection - **Local Case Management** - **Common Compliance laptops** supporting Examination and Collection	- More **accurate financial reporting** - **Comprehensive payment data** is captured, tracked and maintained PHASE IV - **Federal Accounting Standards Advisory Board** (FASAB) - Provides **traceability** from point of receipt - **Treasury Financial Management System**
LEGACY SYSTEM RETIREMENTS (RIPS)	RIP BBTS, RIP EFTPS, RIP ELF, RIP EMS, RIP ERS, RIP FTD, RIP GMF, RIP GUF, RIP SCRIPS, RIP SCCF, RIP CTR, RIP DIS, RIP RPS	RIP ARF, RIP CTR, RIP BMF, RIP EFDS, RIP RTFOL, RIP IRMF, RIP EP, RIP EO, RIP IMF, RIP 701, RIP IRPOL, RIP PMF, RIP RTF, RIP FIRE WALL, RIP IRAF	RIP CRS, RIP IDRS, RIP TIES, RIP CAR, RIP TDI, RIP TRIS, RIP ACS, RIP AICS, RIP ARF, RIP ATL, RIP UMS, RIP AIMS, RIP BMF OL, RIP CAF, RIP DC, RIP EDS, RIP XSF, RIP EACS, RIP ERAS, RIP KIF, RIP PCS, RIP PINEX, RIP RAF, RIP RCA, RIP RFIF, RIP FOF, RIP TFR, RIP TIPS, RIP UR, RIP ACS, RIP ASFR, RIP AUR, RIP CAWR, RIP FUTA, RIP IDS, RIP 6020B, RIP TDA, RIP NAI, RIP NRPS, RIP ALS, RIP IMFOL	RIP AIS, RIP iip, RIP ACIL, RIP AWCS, RIP CAR, RIP CMIS, RIP ERCS, RIP Ex-TRAS, RIP Ex-Phone, RIP ICMS, RIP LM-QAS, RIP MAC, RIP RGS, RIP TRIS ACD, RIP TRIS VRU, RIP CMIS	RIP BID, RIP CEP, RIP ICS-2, RIP RICS, RIP IRAC
STAY IN BUSINESS JULY 1, 1997 THROUGH SEPTEMBER 30, 1998	- Year 2000 Conversion - Legislative Mandates - DIS/RPS Replacement Systems - Electronic Federal Tax Payment System Enhancements - Electronic Management System Enhancements - TeleFiling Enhancements - Electronic Fraud Detection System Enhancements	- Year 2000 Conversion - Legislative Mandates	- Year 2000 Conversion - Legislative Mandates - IDS Enhancements - TRIS (initial installment) - Interim ICP 1.5 Enhancements - Integrated National Call Routing System	- Year 2000 Conversion - Legislative Mandates - ICS Rollout - CRIS Planned Rollout - Interim ICP - RGS/Laptop Replacement, Windows NT(RGS replaces TIES) - Automated Tax Law System (initial installment)	- Year 2000 Conversion - Legislative Mandates - Interim RGLS

SECTION III:
PHASE I/RELEASE 1
CUSTOMER SERVICE AND COMPLIANCE

III. PHASE I/RELEASE 1—CUSTOMER SERVICE AND COMPLIANCE

A. BACKGROUND AND CONTEXT

A fundamental principle of the Modernization implementation strategy is to incrementally develop, integrate, test, prototype, pilot and deploy Modernization capabilities. To mitigate risk to cost and schedule, the incremental approach applies to all levels of decomposition of the ***Modernization Blueprint***, from the Phase level, which reflects the overall strategic plan for Modernization, to the build elements which represent specific, buildable technical products.

✦ **Conformity with Systems Life Cycle**

The ***Modernization Blueprint***, including the Business Requirements, Functional Architecture, Technical Architecture and Sequencing Plan defined at Level I and Level II was developed in conformance with system life cycle processes, and approved formally through a System Requirements Review (SRR) and a Systems Design Review (SDR). The approval process established a baseline under Configuration Management (CM) control.

✦ **Consistency with Sequencing Plan**

The Sequencing Plan to migrate to the target environment is defined in five phases consisting of sixteen releases. The Modernization Sequencing Plan was reviewed and approved by the business enterprises at a Sequencing Plan Review (SPR), in accordance with the system life cycle. Phase I/Release 1 is the first step in the migration to the modernized IRS target environment, and is defined as a series of five Subreleases to provide benefits independent of future releases and Phases. It also represents the first decomposition, completed within the framework of the Systems Life Cycle, to the next level of detail defined in the ***Modernization Blueprint****:* Level III, Subrelease Design.

✦ **Controlled Changes to Baseline**

Consistent with the Modernization Sequencing Plan, the IRS decomposed the baselined Level II Phase I/Release 1 architecture in accordance with SLC processes. The final Phase I/Release 1 requirements and specifications reflect the most current business goals, priorities, and technical considerations. The result, approved through a Change Control Configuration Management process, is an updated definition of Phase I/Release 1 designed to maximize business benefits provided in each of the five subreleases.

✦ **Accelerate Functionality and Mitigate Risk**

To mitigate risk and provide early business benefit, the Phase I/Release 1 Customer Service and Compliance is based on the following:

- Prioritization of critically needed functionality to provide the enhancements to telephonic and systems security infrastructure that would enable a market segment of individual income taxpayers to access the IRS more efficiently via the telephone and Internet and secure access, on-line, to taxpayer account information, thereby improving the productivity and responsiveness of IRS Customer Service and Compliance programs;
- Opportunity to shorten time to market by focusing on only a single market segment (e.g., a segment of the individual income tax taxpayers);
- Minimal dependence on interfacing with legacy or operational IRS systems;
- Application of commercial off-the-shelf (COTS) software, middleware, and hardware components wherever feasible; and
- Opportunity to undertake significant performance testing in a prototype and pilot environment to provide a "real world" assessment of the ***Modernization Blueprint***'s overall architecture (e.g., infrastructure, systems and data security, and data management).

Phase I/Release 1 - Subrelease Deliverables and Benefits

Toward A Modernized IRS

Relative Level of Effort

Subrelease 1.1 Primary Telephone Call Routing and Management

Deliverables

- Implements primary (centralized) and secondary (regional) call screening and routing
- Telephone and Internet **non-account based automated self-service applications**
- **National reference database**
- Implements National Infrastructure servers

Benefits

- **Taxpayers provided options** to obtain non-account based tax information
- Enables **seamless call routing to secondary call sites** reducing queues & increasing call capacity

Subrelease 1.2 Enhanced Secondary Telephone Call Routing and Management

Deliverables

- Telephone and Internet **account-based self-service applications** for refund, fact of filing and related security for taxpayers is centralized
- Infrastructure Services to support account-based self-service applications built and implemented at primary computing centers
- **Corporate Data Engine**
- Establish the initial **TADB**

Benefits

- **Taxpayers provided options** to complete **account-based** tax transactions (refund and fact of filing inquiries)
- **Timely access** to critical refund and fact of filing information
- **Reduces** CSR call volume
- **Centrally stored and managed** refund and fact of filing data
- Taxpayer **Identification and Authentication** and centrally managed audit controls

Subrelease 1.3 Infrastructure and Security

Deliverables

- **Implement IRIS**
- **Secure access to** IDRS, CFOL, ACS, AUR, CIDS, and SERP
- Universal Secure Workstations for **access to modernized and legacy systems**
- **Integrated** telephone & workstations

Benefits

- CSR **access to data from multiple legacy systems** and the new TADB through a single workstation with a **windowed desktop, improving Customer Service capabilities**
- **Improved call transfer** capabilities, integrated with data access
- Centrally managed privacy, security access, and audit controls

Subrelease 1.4 Corporate Databases Read Only

Deliverables

- Establish the **CCDB and TRDB**
- Enhance the **TADB**
- **Daily update** of the **Master Files**
- **Transition bridge** from the legacy environment to the modernized CCDB
- **Tax Account and Case Research** capabilities
- **Data conversion** to CCDB
- **Increased** Primary Computing Center **capacity**
- **Centrally managed and controlled Security** Audit Database
- **Post Audit Analysis System** (PAAS)

Benefits

- **Timely taxpayer account updates** ensure that the current status is available within 24 hours compared to today's 2 - 3 weeks
- **Consolidated view** of all of a taxpayer's **issues and cases**
- **Account and case research** capabilities
- **Every business transaction is recorded, tracked, and audited** for authorized IRS employees and taxpayers utilizing account-based automated self-service applications

Subrelease 1.5 On-Line Adjustments

Deliverables

- **Individual tax return adjustments** for the 1040 family of forms including penalty and interest computations and account settlement
- **Improved** Customer Service **Call Routing**
- **Corporate Case Processing** including case creation and the systematic capture of case history
- **On-line transition bridge** to dynamically draw data from the legacy RTF database
- **Transition bridge** to IDRS from the TADB
- **Additional account-based** automated **self-service** applications
- Management Information Systems **(MIS)**

Benefits

- **On-Line Account Resolution**
- **Comprehensive taxpayer account information** for "in the moment response" to taxpayer questions related to refunds, billings, etc.
- **Taxpayers have options to resolve account questions** through personal contact with an IRS Customer Service Representative, the Internet, or the Automated Voice Response services
- **Corporate case management database** and systems maximize resource utilization
- **Centrally managed MIS** data collection, storage, and reporting
- **Improved employee efficiency** through standardized information presentation on the Universal Secure Workstation

MAINFRAME CENTRIC

CENTRALIZED DATA

B. SCOPE OF PHASE I/RELEASE 1

The Phase I/Release 1 Customer Service and Compliance Pilot is partitioned into five Subreleases as follows:

- **Subrelease 1.1 - Primary Telephone Call Routing and Management;**
- **Subrelease 1.2 - Enhanced Secondary Telephone Call Routing and Management;**
- **Subrelease 1.3 - Infrastructure and Security;**
- **Subrelease 1.4 - Corporate Databases Read Only; and**
- **Subrelease 1.5 - On-Line Adjustments.**

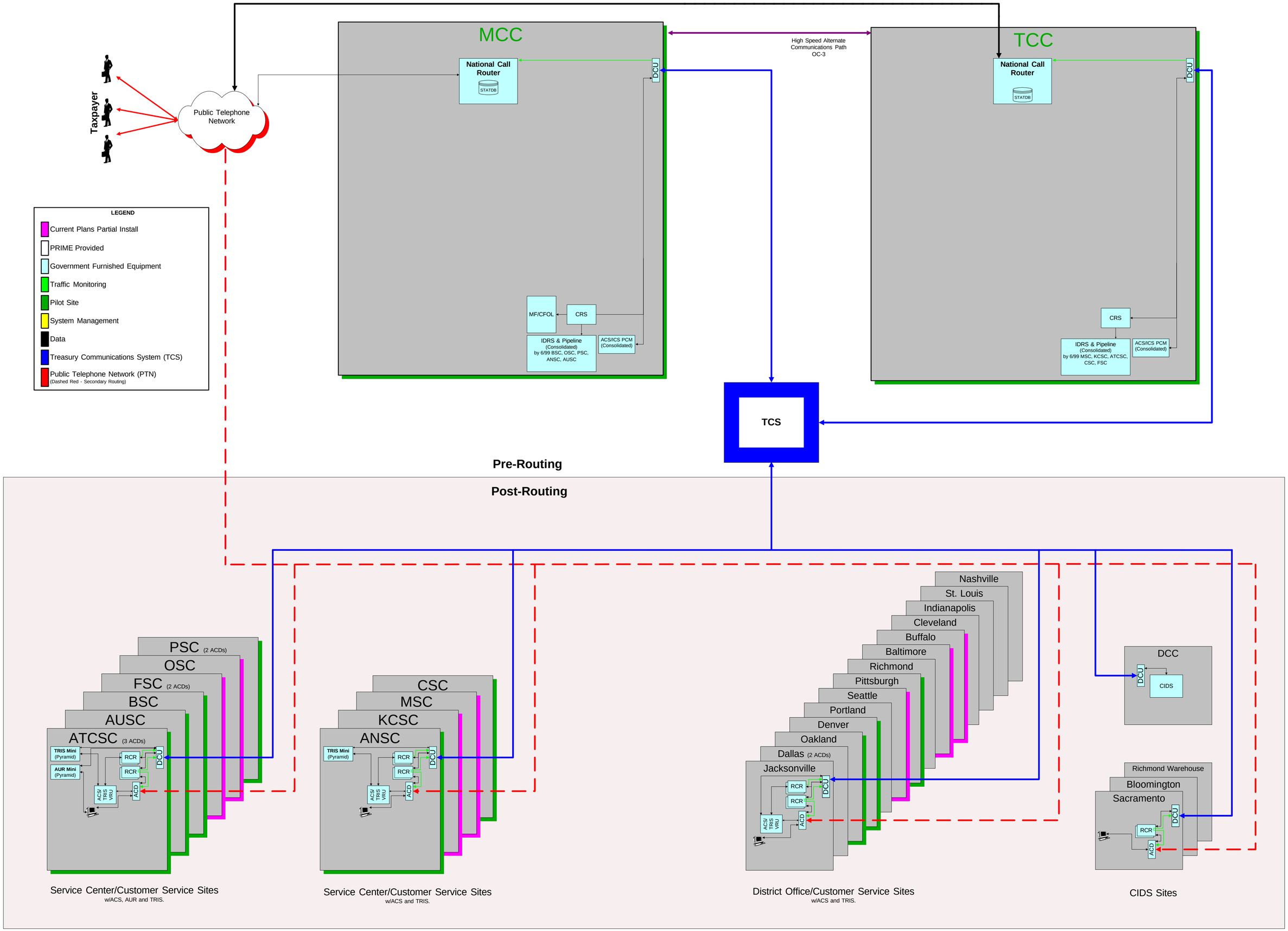
These subreleases are summarized in the following subsections. A more detailed description of the subreleases is set forth in Volume III (for Subrelease 1.1 and 1.2) which includes the Release Concept of Operations (CONOPS), Release System Requirements Specifications (Requirements) and Release Architecture Description (Engineering), Books 1-3, respectively.

In many cases, systems deployed in Phase I/Release 1 subreleases require interfaces to several Phase 0 systems. These systems are fully outlined in Volume I, Section III of the PRIME Request for Proposals (RFP). One Phase 0 system, the Customer Service Call Router Rollout delivers the telephone infrastructure that will interface with Phase I/Release 1, Subreleases 1.1 and 1.2.

Customer Service Call Router Rollout develops and deploys the National telephone infrastructure hardware components to interface dynamically with the public telephone network and legacy Automated Call Distributors (ACDs) to support:

- **Expanded capacity and improved telephone systems management;**
- **Initial call balancing and load management between existing CSR resources at regional sites managed by legacy ACDs; and**
- **Improved service level for calls to CSRs, TRIS, and other legacy applications.**

The supporting engineering specifications are provided in Volume III, Book 2, Release Systems Requirements Specification (Requirements), and Book 3, Release Architecture Description. These specifications are provided to assist in understanding these interfaces, not as the basis for design.



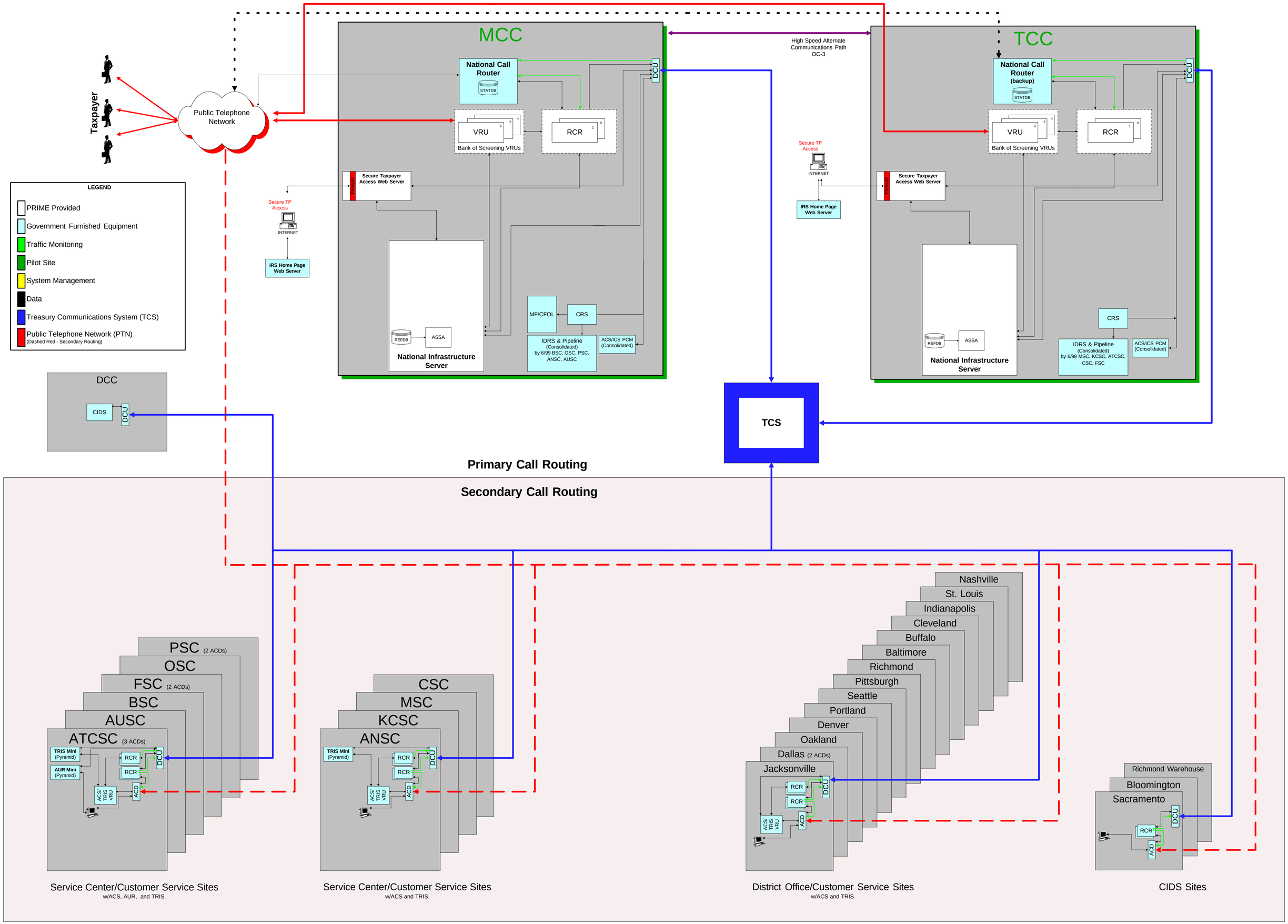
NOTES:
- Customer Service Sites identified reflect anticipated Customer Service Sites in the year 2002.
- The remote Customer Service Staff Centers functioning through the primary Customer Service Sites are not shown.
- Data Communication Utility (DCU) provides router based network connectivity and serves as the WAN gateway.
- Pre-Routing = CSCR term defining 1st step routing of call from the PTN to destination ACD using resource balancing information from the NCR.
- Post-Routing = CSCR term defining 2nd step routing of calls from automation application or CSR to new destination as requested by the Taxpayer.

Nationwide Site Diagram
Customer Service Call Routing

1. Subrelease 1.1—Primary Telephone Call Routing and Management

Subrelease 1.1 implements centralized primary screening Voice Response Units (VRUs) for all incoming calls and provides access to modernized non-account Automated Self Service Applications (ASSAs).

- **National Telephone Infrastructure enhanced with automated screening VRUs for all general incoming calls to provide:**
  - **Increased flexibility to manage existing call site resources** with improved intelligent national call routing to Customer Service Reprentatives (CSRs) and modernized and legacy resources through primary screening VRUs;
  - **National Call balancing** and load management capabilities;
  - **Improved operational data and load management data** collection and reporting; and
  - **Expanded capacity** and improved telephone system management.
- **Non-Account ASSA implementation introduces twenty-one Internet and telephone applications to provide:**
  - **An increase to the Internet** applications existing today;
  - **Additional flexibility to taxpayers** in resolving questions related to Tax Law and filing information; and
  - Customer Service **resource availability and flexibility** to focus on more complex inquiries and issues.
- **Standardized Infrastructure Components implement the National Infrastructure Server to host non-account self-service applications, and provide:**
  - **Standardized** infrastructure services;
  - **National servers** for non-account automated self-service applications;
  - **Reference Database (REFDB)** to serve as the repository for Tax Law and procedural information referenced by these applications; and
  - **Automated self-service applications** on national servers are available to **Internet and telephone customers**.



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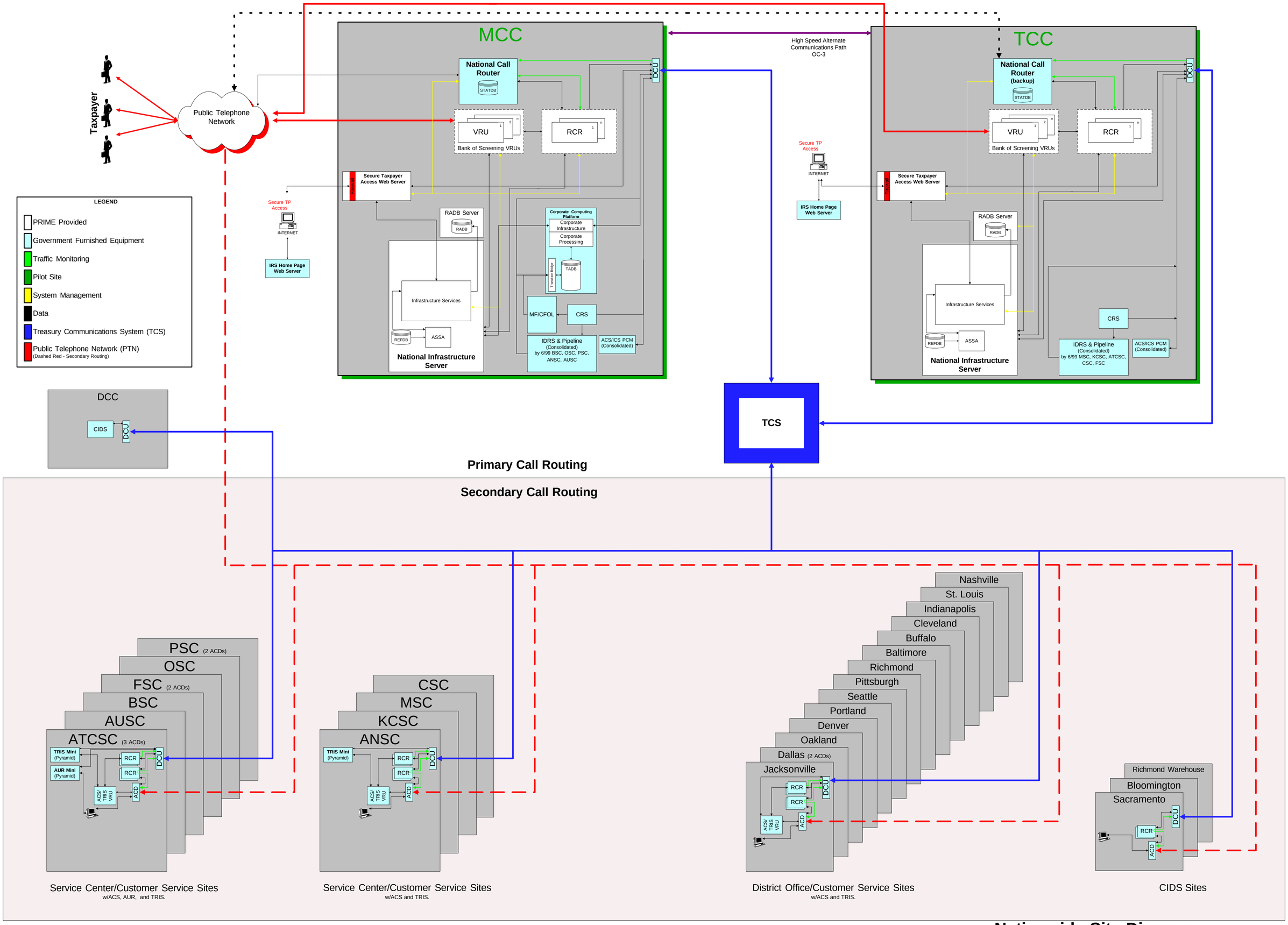
Nationwide Site Diagram
Subrelease 1.1 Primary Telephone Call Routing and Management

2. Subrelease 1.2—Enhanced Secondary Telephone Call Routing and Management

Subrelease 1.2 provides secondary routing of telephone calls and taxpayer-provided data to CSRs and automated self-service applications for refund and fact of filing queries in a secure environment.

- **Implement Integrated Call and Data Routing to provide:**
  - **Integration between modernized account-based ASSAs and legacy applications** to allow taxpayers to resolve refund queries without requiring additional taxpayer contact; and
  - **Expanded secondary routing of telephone calls and taxpayer-provided data** to use taxpayer entered menu choices to route telephone calls to CSRs with the correct skills; and to forward taxpayer entered data for use by CSRs or legacy Telephone Routing Interactive System (TRIS) applications.
- **Corporate Data and Expanded ASSA implements taxpayer Internet and telephone access to account related data and provides:**
  - **Expansion of telephone and Internet automated self-service applications** to include refund and fact of filing data access;
  - **Tax Account Database (TADB) hosted on a transitional legacy platform** compatible with the target architecture;
  - **Centralized Data Management** and access services to support TADB; and
  - **Secure access to taxpayer tax account data** in the TADB (populated with current year refund and fact-of-filing data) through taxpayer identification and authentication.
- **National Infrastructure Server expansion implements auditing and reporting capabilities to provide:**
  - **A repository of audit trail data** implemented for ASSA and systems administration; and
  - **Improved security management reporting**.



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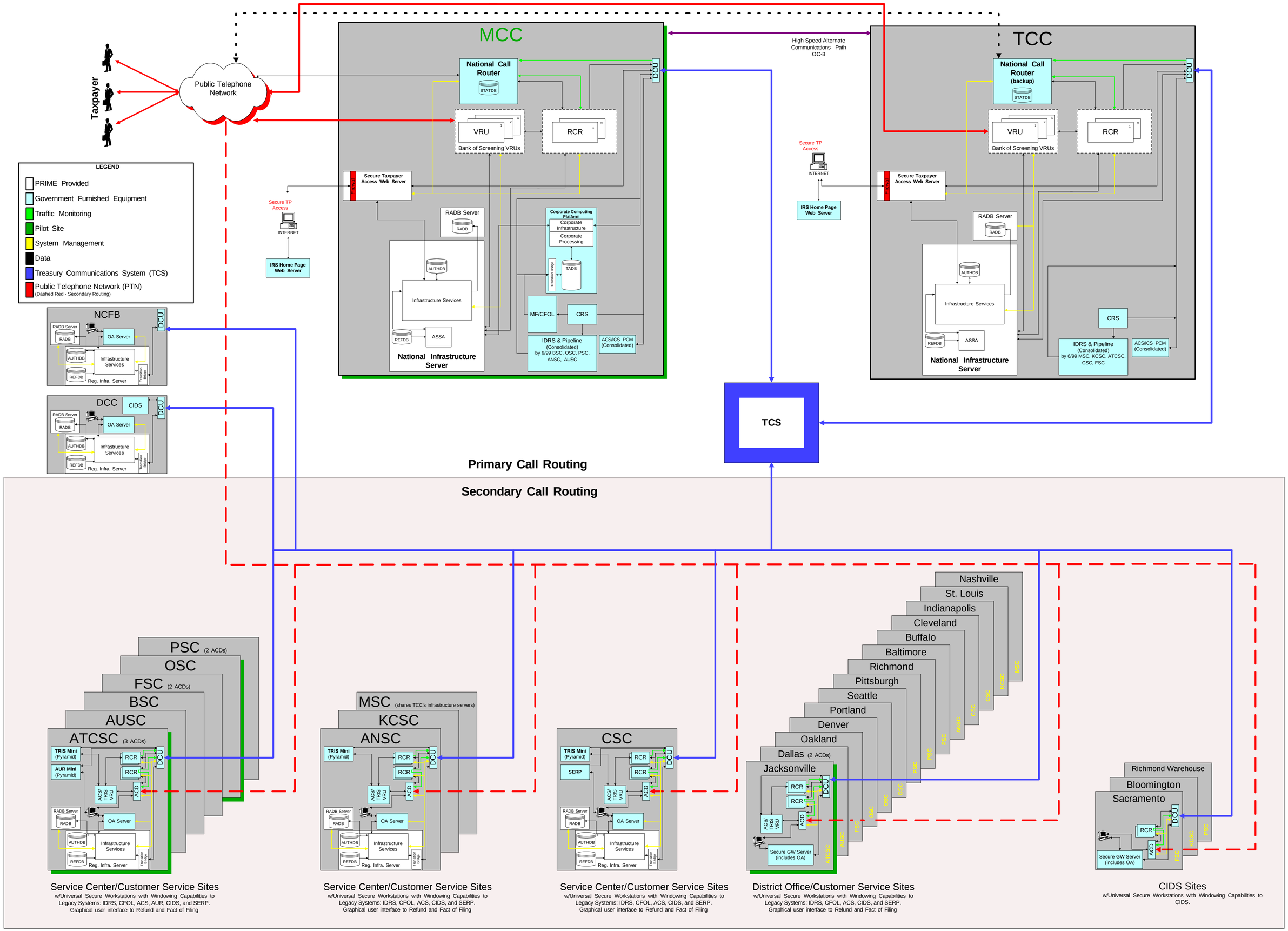
Nationwide Site Diagram
Subrelease 1.2 Enhanced Secondary Telephone Call Routing and Management

3. Subrelease 1.3—Infrastructure and Security

Subrelease 1.3 provides infrastructure and security for employee access to modernized and legacy data through a single universal secure workstation and integrates the telephone infrastructure and capabilities implemented in the two previous subreleases.

- **Implement Interim Regional Infrastructure Services (IRIS) at field locations and enhanced national infrastructure services to provide:**
  - **Standardized identification and authentication** security;
  - **Employee access controls** through the Authentication Database (AUTHDB); and
  - **Expanded audit trail data collection** to include legacy access audit information via secure workstations.
- **Universal Secure Workstations (USW), supported through the implementation of IRIS, enable access to modernized and legacy systems and provide:**
  - **Access to modernized and legacy systems** via a single universal secure workstation with a standardized graphical user interface (GUI); and
  - **Secure access** to applications and on-line data through IRIS.
- **Connectivity and Workstation Emulation is implemented to allow CSR access to modernized and legacy systems to provide:**
  - **An increase from the current IDRS/Corporate Files on Line (CFOL) access** to legacy systems (e.g., IDRS, CFOL, AUR, and ACS) required to resolve most account inquiries;
  - **REFDB access** for standard reference materials;
  - **Centralized Inventory Distribution System (CIDS) access** for ordering forms;
  - **Access to TADB** for refund and fact-of-filing inquiries; and
  - **Access to modernized automated self-service applications**.



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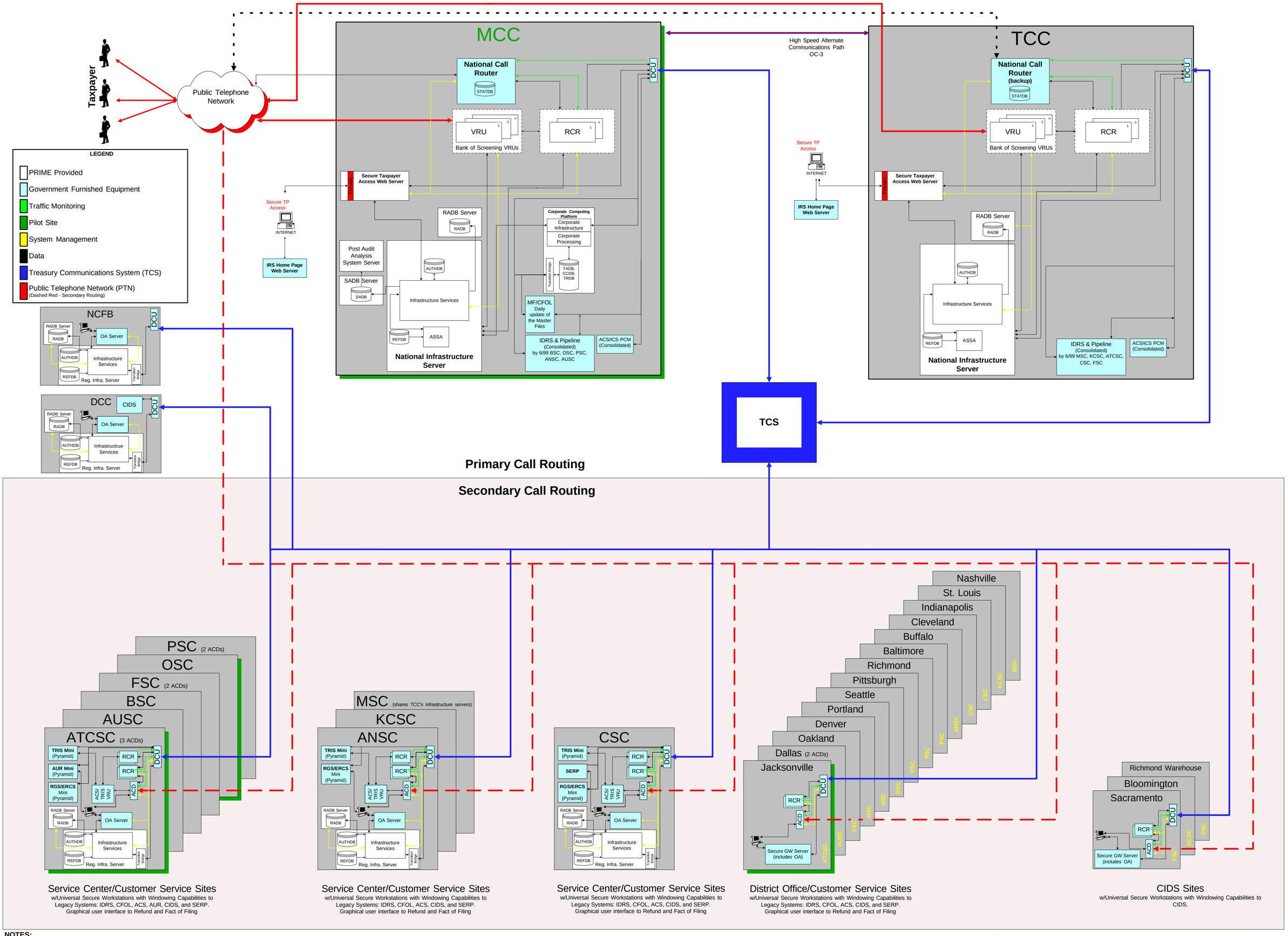
Nationwide Site Diagram
Subrelease 1.3 Infrastructure and Security

4. Subrelease 1.4—Corporate Databases Read Only

Subrelease 1.4 establishes the centralized databases that replace the stove-piped, stand alone distributed systems of the current environment.

- **Corporate Databases (CCDB, TRDB, TADB) implementation provides the foundation for the "data engine" that will enable access to timely and accurate data in a secure environment and provides the:**
  - **Corporate Case Database (CCDB)** populated with data from legacy systems (IDRS, AIMS, AUR, ACS, ICS, ASFR and RGS/ERIS) providing a consolidated view of all taxpayer issues;
  - **Tax Return Database (TRDB)** rehosted to modernized platform;
  - **Tax Account Database (TADB)** expanded to contain all information on active individual tax accounts on a read-only basis to support Customer Service and Compliance activities, populated from the Master File and IDRS Taxpayer Information File (TIF);
  - **Daily posting of Individual Master File (IMF)** data to populate the TADB with more timely account data; and
  - **Daily CCDB updates** from legacy systems.
- **Enhanced Corporate Environment establishes backup and recovery mechanisms and provides additional capacity to support Subrelease 1.5;**
- **Additional Security Capabilities are made available through the Security Audit Database (SADB), rolled up from the Regional Audit Database (RADB), and integrated analysis of audit data provided through the Post Audit Analysis System (PAAS);**
- **Transition software is implemented to maintain synchronization between authoritative legacy and modernized corporate databases; and**
- **CSRs are provided with the ability to supplement case information with case notes or case history updates.**



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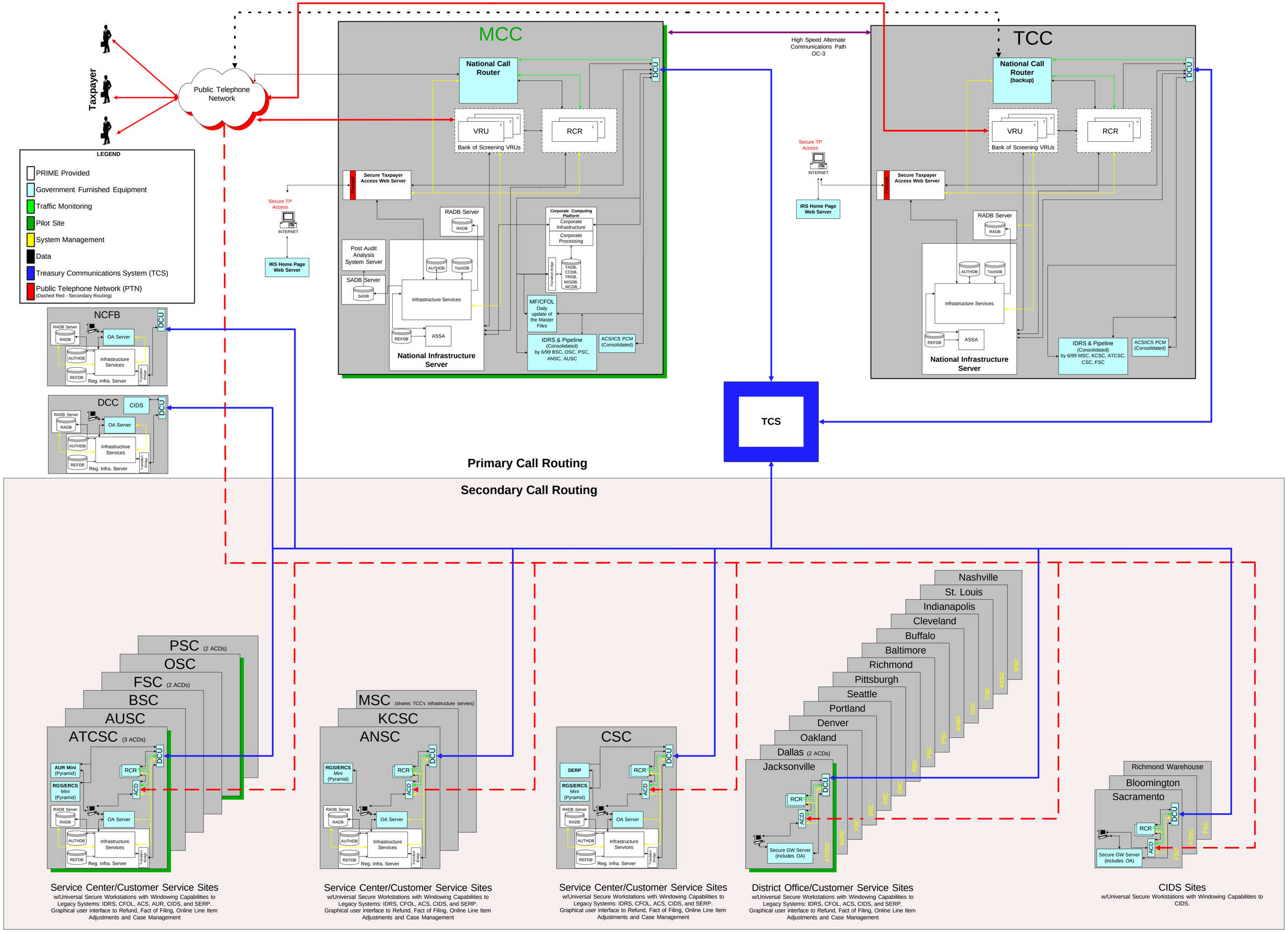
Nationwide Site Diagram
Subrelease 1.4 Corporate Databases Read Only

5. Subrelease 1.5—On-Line Adjustments

Subrelease 1.5 is the target for Phase I/Release 1 and fully implements call routing, telephone infrastructure, security infrastructure, legacy system access and the first three of five modernized corporate databases.

- **Data Directed Routing of telephone calls to groups of CSRs based on expertise provides:**
  - **Call routing to CSRs** through secure automated telephone applications for taxpayer account and case history;
  - Additional automated self-service applications to **update taxpayer or case files**; and
  - **Complete transition** of automated self-service applications from the legacy to the Modernized environment.
- **Access to complete individual taxpayer account data, with initial update capability, is implemented to resolve complex tax issues through TADB and CCDB and provides:**
  - **On-line case** creation;
  - **On-line modifications to TRDB** to reflect adjustments made to individual returns;
  - Individual **tax return line item adjustments** for the Form 1040 (Schedules A, B, C, D, E, and F), Form 2441, and Form 6251;
  - **Integrated application of penalty, interest and module balance** calculations;
  - **Systematic case history** updates and maintenance; and
  - **Generation of correspondence** associated with line item adjustments.
- **Synchronization of legacy systems implemented through the expansion of the Transition Bridge, providing near real time synchronization between:**
  - **TADB and IDRS**
  - **CCDB and the associated case management systems** (e.g., IDRS, ACS and AUR);
  - **TRDB and IDRS; and**
  - **TRDB and Returns Transaction File (RTF)** (when data from RTF is required to dynamically supplement TRDB data from on-line adjustments).
- **Centrally managed Management Information System (MIS) data collection, storage and reporting is implemented.**



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Nationwide Site Diagram
Subrelease 1.5 On-line Adjustments

SECTION IV:
DEFINING THE INVESTMENT—
RAINES' RULES

IV. DEFINING THE INVESTMENT—RAINES' RULES

A. INTRODUCTION

The fundamental change to investment methodology affecting the IRS, indeed the entire Federal sector, is clearly evident in the criteria used to evaluate major investments in information technology. These criteria, developed by the Office of Management and Budget (OMB) as directed by the Information Technology Management Reform Act (ITMRA) of 1995, represent the yardstick against which all IT funding requests are evaluated. Developed by Franklin D. Raines, Director of the OMB, these criteria embedded in the OMB **"Capital Programming Guide"** and known as **"Raines' Rules,"** have served as strict guidance to the IRS in proposing and justifying the investment for Phase I/Release 1 of Modernization, as documented by the Business Case.

In a memorandum dated October 25, 1996, OMB Director Raines states that; "The most effective long-term investment strategy is guided by a multiyear plan. The plan is a **roadmap for getting from 'where we are today', to 'where we want to be'--** achieving the strategic mission goals of the organization...." Inherent in this strategy is also the need to chart a course that both maximizes benefits while minimizing risk, within the framework of the Government Performance Results Act (GPRA). In planning the IT investments associated with Modernization, and justifying the Phase I/Release 1 investment, the IRS has addressed the following three principle areas (presented in Section B) reflected in the Raines' Rules.

B. PRINCIPLES OF THE INVESTMENT AND MODERNIZATION STRATEGIES

The roadmap provided by the **Raines' Rules** addresses three principle areas of focus to ensure both a sound investment and modernization strategy: **capital planning**, **information architecture, and risk management**.

Planning the capital investment must consider the degree to which the investment supports the mission of the IRS. Fundamental to achieving this objective is the need to provide critical functionality which will increase "customer" (end user and taxpayer) satisfaction. The cost incurred in achieving this objective is offset by the benefits realized through implementation of the objective.

Information Architecture must support both the functional and technical integration through the use of standards. Flexibility and expandability through open systems are principles that are key to mitigating technical and programmatic risk. Concurrently, the information architecture assures that the investment is responsive to the functional needs of the organization.

Managing risk is of paramount importance to assure the investment will deliver the expected benefits at the anticipated cost, while providing the degree of functional and technical integration required by the organization. In this regard, it is globally

agreed that successful risk management requires an incremental development/ deployment strategy which consistently employs rigorous design and development controls prescribed by a disciplined system life cycle. It also considers "best practices" leveraging the experience of industry through a stronger partnership between the public and private sectors.

C. RELEASE 1 SATISFIES RAINES' RULES

The Release 1 investment unequivocally reflects the guidance of the Raines' Rules. In fact, **the principles behind the Raines' Rules are the essence of the modernization strategy**. This is clearly evident when considering the strategic objectives of the Phase I/Release 1 investment. Phase I/Release 1 of Modernization focuses on delivery of Customer Service and Compliance functionality, as well as the foundation systems necessary for future expansion and modernization, by providing:

- **Critically needed functionality and the technical framework for both the telephonic and systems security infrastructure that would enable a market segment of the individual income taxpayers to access the IRS more efficiently via the telephone and Internet and providing secure on-line access to taxpayer account information to facilitate "one-stop shopping" for telephonic resolution of taxpayer account issues;**
- **Opportunity to accelerate time to market, manage risk, and maximize benefits by focusing on a single market segment (e.g., a segment of the individual income taxpayers);**
- **Application of commercial off-the-shelf (COTS) software, middleware, and hardware components where feasible; and**
- **Opportunity to undertake significant performance testing in a prototype and pilot environment to provide a "real world" assessment of the *Modernization Blueprint*'s system architecture and data security architecture to manage risks.**

Providing these technical and functional capabilities reflects the capital planning and information architecture principles, and contributes to the management of risk in the endeavor. However, fully effective risk management also involves providing the framework within which these capabilities can be delivered with minimal risk of failure or unanticipated costs.

Fundamental to the successful delivery of Phase I/Release 1 is a two-pronged strategy of incremental implementation following a highly-disciplined system life cycle, supported by a progressive acquisition strategy that forges a partnership with the private sector based on gainsharing and performance-based incentives that are directly tied to realized benefits and other measurable, performance-related results.

Evidence of the degree to which the modernization strategy, and the Phase I/Release 1 Business Case, reflect the guidance of the Raines' Rules can be

clearly demonstrated by a review of the Release 1 approach within the context of the Raines' Rules.

D. RAINES' RULES

1. Rule 1: Mission Support

Does the investment support core/priority mission functions that need to be performed by the Federal Government?

✦ **Conclusion**

The Release 1 investment implements information systems which are designed to deliver core, mission-critical functionality to the Customer Service and Compliance business functions, consistent with the strategic objectives of these business enterprises and in accordance with objectives defined in congressional mandates and necessary to support the IRS's mission.

✦ **Discussion**

- The mission of the IRS is to "Collect the proper amount of tax revenues, at the least cost to the public, in a manner that warrants the highest degree of public confidence in the integrity, efficiency and fairness of the IRS."
- The mission of the IRS is carried out by various Business Enterprises, each responsible for performing critical functions to meet the mission objectives of the IRS. The Business Enterprises representing the core business functions of the IRS involved in tax administration include Customer Service, Compliance, Submissions Processing, and Revenue Accounting and Control (Chief Financial Officer). These are supported by Information Systems and Corporate Processing. The Release 1 investment targets Customer Service and Compliance.
- The Strategic Plan and Budget includes the priority goals and objectives for each of the Business Enterprises, related to accomplishing the mission of the IRS.
  - Customer Service:

    Reduce Taxpayer Burden by minimizing the effort of the taxpaying public in complying with the tax code;

    Increase Level of Taxpayer Access to 85 percent;

    Communicate Accurate Data, reducing the number of attempts made by a taxpayer to resolve tax issues; and

    Provide a One-Stop Shopping Environment to ensure tax issues are resolved with a single phone call.

- Compliance:

  Increase Revenue Through Case Resolution by increasing the time spent on high yield tax settlement cases;

  Enhance collections by providing accurate and timely data to assist taxpayers in meeting their filing obligations.

  Enforce Compliance Equally for all Taxpayers by resolving more issues faster and optimizing opportunities to manage and resolve all tax settlement issues, as opposed to only those that are prioritized based on revenue yield.

  The investment in Release 1 targets these strategic goals and objectives, providing systems that enable the business functions to meet these goals. Specifically, Release 1, through a series of five subreleases which incrementally develop, pilot, test, and deploy these systems, provides functionality that clearly relate to the strategic goals and objectives of the IRS Business Enterprises as follows:

- Maximize Calls Answered by:

  Implementing screening Voice Response Unit capabilities, working in conjunction with the National Call Router, to load balance incoming calls and route calls based on area of expertise;

  Directing more routine calls to automated self-service applications, increasing the number of live assistor calls handled; and

  Providing access to centralized databases through a universal secure workstation for call resolution.

- Provide Accurate and Timely Data by:

  Posting data more timely, reducing the existing three week window to 24 hours;

  Implementing authoritative databases for single point access to data;

  Increasing Revenue Through Case Resolution;

  Providing common tools to support interactive sessions with taxpayers and IRS staff and Automated Self Service Applications (e.g., tax penalty and interest calculations);

  Providing flexibility to reassign resources to emerging Compliance trends through common applications;

  Implementing the security infrastructure to provide secure access to data and support prevention and detection requirements; and

  Providing universal secure workstations that support complete case resolution from a single device.

- Support the Ability to Comply with Mission Critical Directives by:

  Providing enhanced services to taxpayers to reduce taxpayer burden; and

  Supporting revenue generation through access to timely and accurate data.

2. Rule 2: Alternative Mission Delivery Sources

Should the investment be undertaken by the requesting agency because no alternative private *sector or governmental source can efficiently support the function?*

✦ **Conclusion 1**

While other private and public sector entities have expertise to perform some fraction of the Customer Service and Compliance functions, efficiency and effectiveness would be compromised by outsourcing these core functions.

✦ **Discussion**

There are three major factors related to the efficiency and effectiveness of the Customer Service and Compliance functions that have been considered: the functional integration between these core functions and other tax administration functions; the breadth of data required to support both functions; and the dependence of these functions on the interpretation of the tax code.

- The nature of the Customer Service and Compliance functions necessitates a great deal of functional integration with other business functions and systems involved in tax administration. To separate these functions would compromise efficiency and effectiveness by creating additional overhead, and increasing the risk of errors, inconsistencies and inaccuracies in addressing taxpayer issues.
- The Customer Service and Compliance functions are themselves most effective when they have access to the full breadth of data related to a taxpayer's account. This includes account and case history, financial data, and data received from external sources (e.g., offsets, levies, etc.). The ability to effectively resolve all issues with a single contact requires access to this data. However, providing access to this full range of data to an outsource organization presents significant privacy and security concerns among the taxpaying public. On the other hand, alternatives that would limit access to certain types of data would reduce the effectiveness of the function, by dividing it between the government and the outsource organization.
- As the nations' tax administrator, the IRS has a responsibility to interpret and implement the tax code. This interpretative role is critical to providing Customer Service and Compliance functions to taxpayers with tax settlement issues. This is not true of the more routine questions addressed by the IRS (e.g., Tax Law, forms inquiries, refund inquiries). However, the Release 1 investment already provides the most efficient manner in which to handle routine calls - direct more of these calls to automated self-service applications. Therefore, for the more complex tax settlement issues, tax

code knowledge and interpretation is critical. To separate the functions of responding to taxpayer inquiries and issues, and resolving cases, from the work of interpreting the tax code, will result in a loss of efficiency and effectiveness.

✦ **Conclusion 2**

While the business functions supported by the Release 1 investment are most efficiently performed by the IRS, the IRS has decided to proceed with Modernization through a PRIME Systems Integration Services Contractor.

✦ **Discussion**

By most accounts, the modernization effort is the largest systems integration effort in the world. An effort this vast requires the leveraging of significant resources with advanced expertise in information technology management. However, the IRS lacks the critical mass of information technology management and staff needed to modernize. Therefore, the IRS has begun a competitive acquisition process to expand the current partnership with the Integration Support Contractor (ISC) to include a PRIME Systems Integration Services Contractor. The expanded Partnership leverages:

- The IRS's expertise in tax administration and knowledge of the day-to-day business operations, and
- The ISC and PRIME expertise in reengineering, application development, database, and infrastructure engineering, as well as system integration and deployment. The PRIME will be responsible for development and delivery of the Modernized systems.

3. Rule 3: Simplified Processes and COTS Technology

Does the investment support work processes that have been simplified or otherwise redesigned to reduce costs, improve effectiveness, and make maximum use of commercial off-the-shelf technology?

✦ **Conclusion 1**

The Release 1 investment reflects the results of reengineering and work process redesign activities, which take advantage of the enhanced availability of additional data and improved access methods provided in Release 1.

✦ **Discussion**

- The Release 1 design represents a coming together of the reengineering of business processes undertaken by the Service Center Organization Study (SCOS), the District Organization Study (DOS), and the resultant Modernization Concept of Operations (CONOPS); and the reengineered processes and technical architecture that comprise the ***Modernization Blueprint.***
- The Release 1 investment is the first step in the migration from stove-piped, stand-alone, distributed applications, databases, and networks lacking sufficient security controls which support business functions short on automation; to centralized databases supported by accessible mainframe-centric solutions with centralized access controls and enterprise-wide network security.
- Notwithstanding the reengineering already included in the Release 1 plan, it is expected that the PRIME will also provide business process reengineering services to complement the development of modernized core business systems defined in the Release 1 architecture. This is expected to be accomplished through the PRIME's validation of the engineering material included for Subreleases 1.1 and 1.2 in Volume III of this Request for Proposals, and through ongoing involvement in the validation of requirements and architectures for the remaining three subreleases in Release 1.

✦ **Conclusion 2**

The investment in Release 1 enables the realization of cost reductions resulting from productivity gains and improvements in efficiency through complete automation of some functions, and elimination of duplication and redundancy in other processes and systems, with results measurable in accordance with GPRA and other performance factors defined in the business' Strategic Plan and Budget.

- **Discussion**
  - Release 1 provides benefits to the Customer Service and Compliance functions through consolidated and centralized databases accessible through mainframe-centric solutions supported by more effective, centralized security systems. Accomplishing this means migration away from the stovepiped, stand-alone, distributed applications and databases of today which at a minimum duplicate functionality, data, and interfaces. The ***Modernization Blueprint*** represents the IRS's effort to reengineer and eliminate duplication in core technical and business functionality.
    - Duplicate networks which today are required to support stand-alone, distributed systems, will be replaced by standardized regional infrastructure services, centrally managed privacy, role-based access, standardized identification and authentication and audit controls; standardized workstations and a windowed user interface to both new and legacy system applications.
    - Duplicate databases which today are deployed with stand-alone, stove-piped systems, will be replaced by the centralized databases in a mainframe-centric architecture allowing access through the standardized infrastructure services and centralized security system.
    - Duplicate applications which exist on many stand-alone platforms today will be replaced by mainframe-based applications which are supported by the standardized infrastructure and security systems, and access the data from the centralized, authoritative databases.
    - Duplicate taxpayer account and issue resolution functions will be consolidated and integrated to work with the new centralized databases. IRS professionals performing Customer Service or Compliance functions will no longer have to research multiple systems on different platforms using different workstations. Instead, a single access path to the centralized databases will result in retrieval of the data necessary to solve all taxpayer account issues.
    - Duplicate case management functions and systems are part of the many stove-piped, stand-alone systems that have been developed to address specific types of taxpayer account issues. These will be replaced with centralized applications accessing the full range of data needed to resolve any particular taxpayer account issue or multiple issues at the same time.
  - The Release 1 systems have been designed in accordance with business requirements, which reflect performance measures, and relate to the GPRA. These performance measures support the IRS Strategic Plan for Customer Service and Compliance, and the secondary measures provide the ability of the business to achieve its overall mission. The performance measures are presented in Appendix B.

- **Conclusion 3**

  The Release 1 architecture provides the flexibility to employ commercial technology, products and solutions, by specifying the functionality and standards without dictating the technical implementation.

- **Discussion**

  - Commercial Off-The-Shelf Technology

    The Release 1 requirements and architecture are developed to provide detail on "what" needs to be done functionally, without determining the specific technology product or implementation. Release 1, as an incremental subset of the ***Modernization Blueprint***, adheres to the same standards and guidelines as the ***Modernization Blueprint***. In fact, throughout the ***Modernization Blueprint***, repeated references to commercial off-the-shelf technology appear so as to encourage their use in the final implementation. Some examples are:

    - Volume II, Business Requirements – page CO-30, CO-37, IS-7, and IS-11
    - Volume III, Functional Architecture – page IS-1
    - Volume IV, Technical Architecture – page IS-4
    - Volume VI, Systems Standards Profile – pages B-5, C-3, and throughout.

  - Specialized Commercial Resources

    It is expected that the PRIME would propose extensive commercial sector consulting capabilities insofar as the IRS principal business enterprises are analogous to a variety of private sector business operations, but not limited to the:

    - Management of call sites;
    - Customer Service programs;
    - Large scale data capture operations;
    - Accounting;
    - Financial reporting;
    - Delinquent debt collections; and
    - Auditing.

4. Rule 4: Risk Adjusted Return on Investment

Does the investment demonstrate a projected return on the investment that is clearly equal to or better than alternative uses of available public resources? Return may include improved mission performance in accordance with GPRA measures; reduced cost; increased quality, speed, or flexibility; and increased customer and employee satisfaction. Return should be adjusted for such risk factors as the project's technical complexity, the agency's management capacity, the likelihood of cost overruns, and the consequences of under- or non-performance.

The risk adjusted return on investment is based on a systematic analysis of the expected benefits and costs, analysis and quantification of the risks associated with the anticipated benefits and estimated costs, and, finally, adjustment of the benefits and the costs to account for the risks.

The Phase I/Release 1 Business Case will be evaluated and validated by the PRIME offerors as part of the competitive PRIME acquisition. Suggested refinements will be evaluated and incorporated as appropriate.

- **Conclusion 1: Returns on Investment are Grounded in Assumptions**
- **Discussion**
  - **Cost assumptions**

    Modernization Blueprint costs for Phase I/Release 1 were derived by computing the sum of software development costs derived from the application of the Constructive Cost Model (COCOMO) model, COTS costs based on vendor pricing and projected quantities, and non-development costs derived from industry standard proportions for non-development activities (i.e., program management and control, quality assurance and testing, maintenance, etc.). A more extensive discussion of the costing methodology is included as Appendix D, "Cost and Benefit Analysis. "

    Refer to the "Cost Assumptions" table in this section for a listing of the assumptions relevant to the development of the estimated costs to build Phase I/Release 1.

  - **Benefit assumptions**

    Modernization Blueprint benefits for Phase I/Release 1 are derived from:

    - Staff year savings generated by telephone calls for Tax Law assistance being answered by automated systems instead of by Customer Service Representatives (CSRs);
    - Tax account calls being diverted from CSRs to automated applications; and

- Automating line item adjustment capability for the Form 1040 market segment.

Benefits are assumed to begin accruing twelve months after an element of functionality has been piloted or rolled out nationwide. A more detailed discussion of the methodology for deriving benefits is included as Appendix D, "Cost and Benefit Analysis."

Refer to the "Benefit Assumptions" table in this section for a listing of the assumptions relevant to the development of the staff year and monetary benefits to be derived from the functionality delivered in Phase I/Release 1.

✦ **Conclusion 2: Return on Investment**

✦ **Discussion**

Return on investment was calculated for three alternatives as follows:

▲ Alternative I: No Reinvestment of Savings and Cost Avoidance

Return on Investment = Benefit/Cost where there is no reinvestment of staff year savings and no reinvestment of cost avoidance savings. Refer to "Phase I/Release 1 Cost Benefit Summary" in this section for a more detailed presentation of the statistics relevant to this calculation.

$1,350,571/$333,105 = 4.1*

▲ Alternative II: Reinvestment in Customer Service and Compliance

Limited staff years would be reinvested to increase telephone "level-of-access" for taxpayers from 62 percent to 85 percent.

All remaining savings would be made available for reinstatement of Compliance programs to their traditional levels (i.e., prior to diversion of staff to raise level-of-access to 62 percent). Refer to the "Phase I/Release 1 Cost Benefit Summary" in this section for a more detailed presentation of the statistics relevant to this calculation. Refer to Appendix D, "Cost and Benefit Analysis" for a more detailed explanation of the reinvestment strategy.

$17,677,821/$333,105= 53.1*

▲ Alternative III: Reinvest in Compliance Only

If funds were to be made available to provide for an 85 percent level of telephone access, all staff year savings could be available for reinvestment in Compliance programs. Refer to the "Phase I/ Release 1 Cost Benefit

* NOTE: Benefit/cost reflected in ($k)

Summary" in this section for a more detailed presentation of the statistics relevant to this calculation.

$21,470,272/$333,105 = 64.5*

- **Conclusion 3: Risk Analysis Must be Performed on the Benefits and on the Costs**
- **Discussion**

A Monte Carlo risk analysis was performed to assess the probability of meeting the Modernization Phase I/Release 1 schedule and cost projections. Refer to Appendix G, "Monte Carlo Probability Analysis" for a complete discussion of the risk analysis.

The results of the schedule analysis are consistent with the Phase I/Release 1 schedule's anticipated completion date of November 25, 2003. The median date derived from the analysis is November 17, 2003. The latest date (95 percent probability) is projected to be March 19, 2004.

The total estimated Phase I/Release 1 cost is $333,105K. The Monte Carlo cost analysis generated a median estimate of $332,692K. The estimate at the 95th percentile of probability is $346,380K.

- Analysis of Schedule Risks

  Schedule risk impacts directly on the anticipated benefits stream to be derived from the Modernization program. In order to preserve a conservative position, the IRS opted to apply the maximum (95 percent probability) schedule to adjust downward the benefits stream. Since the ending date for that schedule fell directly in the middle of a filing season and it is unlikely the IRS would make organizational changes during a filing season, the IRS assumed new functionality would not be delivered until after the filing season was completed. Schedule risk was mitigated in calculating the risk adjusted benefits by assuming benefits would not begin to accrue until new functionality was in place for 12 months. The lag in the benefits stream is applied to all five subreleases.

- Analysis of Cost Risk

  In order to mitigate cost risk, the IRS elected to use the 95 percent probability result from the Monte Carlo analysis. All costs associated with Phase I/Release 1 were increased by the 3.98 percent difference between the estimated costs at the median and at the 95th percentile derived from the analysis to arrive at the risk adjusted costs.

* NOTE: Benefits/cost reflected in ($k)

- **Conclusion 4: Risk Adjusted Return on Investment**

  Risk adjusted benefits for these calculations reflect the delay in benefits accrual from a three-month lag to a twelve month lag after functionality **is** delivered. Risk adjusted costs for these calculations reflect the across the board 3.98 percent increase suggested by the probability analysis.

  - Alternative I: No Reinvestment of Savings and Cost Avoidance

    Risk Adjusted Return on Investment = Risk Adjusted Benefit/ Risk Adjusted Cost where there is no reinvestment of staff year savings or cost avoidance savings. Refer to the "Phase I/Release 1 Risk Adjusted Cost Benefit Summary" in this section for a more detailed presentation of the statistics relevant to this calculation.

    $1,293,212/$346,378 = 3.7*

  - Alternative II: Reinvestment in Customer Service and Compliance

    Limited staff years would be reinvested to increase telephone "level-of-access" for taxpayers from 62 percent to 85 percent. All other savings would be made available for reinstatement of Compliance programs to their traditional levels (i.e., prior to diversion of staff to raise level-of-access to 62 percent). Refer to the "Phase I/Release 1 Risk Adjusted Cost Benefit Summary" in this section for a more detailed presentation of the statistics relevant to this calculation.

    $16,396,009/$346,378 = 47.3*

  - Alternative III: Reinvestment in Compliance Only

    If funds were to be made available to provide for an 85 percent level of telephone access, all staff year savings would be available for reinvestment in Compliance programs. Refer to the "Phase I/Release 1 Risk Adjusted Cost Benefits Summary" in this section for a more detailed presentation of the statistics relevant to this calculation.

    $20,776,611/$346,378 = 60.0*

- **Conclusion 5: Risk Adjusted Net Present Value**

  The standard criterion for deciding whether a government program could be justified on economic principles is net present value – the discounted monetized value of expected net benefits. Risk adjusted future costs and risk adjusted future benefits were discounted by 3.5 percent (compounded). Refer to

* NOTE: Benefits/cost reflected in ($k)

Appendix D, "Cost, Benefit Analysis" for a more complete discussion of the net present value analysis.

Risk Adjusted, Net Present Value Return on Investment:

- Alternative I: No Reinvestment of Savings and Cost Avoidance

  $950,942/$303,074 = 3.1*

- Alternative II: Reinvestment in Customer Service and Compliance

  $11,887,044/$303,074 = 39.2*

- Alternative III: Reinvestment In Compliance Only

  $15,550,872/$303,074 = 51.3*

✦ **Relationship of Return on Investment (ROI) to the Modernization Projected Funding Requirements**

Phase I/Release 1 includes an investment in infrastructure which supports all future phases and releases of the ***Modernization Blueprint***, as well as the development of three of the five new primary corporate databases. Since infrastructure and other reusable components contribute to the delivery of functionality beyond Phase I/Release 1, the costs of reusable components are apportioned to their respective releases for the purpose of calculating ROI. The tables in Appendix D, "Cost and Benefit Analysis" present the apportioned costs by year used for determining the ROI, and they also present the ***Modernization Blueprint***'s projected funding requirements (PFR) by fiscal year.

* NOTE: Benefits/cost reflected in ($k)

Cost Assumptions

Cost Assumptions
General Assumptions • The Business Case spans 15 years. • Level III requirements will be developed prior to FY1999. • CFO FY1998 PFR labor rates were used. • FFRDC IRS Independent Cost Analysis (ICA) 9/95 Report was used to calculate non-development costs. • VRU usage reduces the utilization of Tele-Tax. • Schedule — Project start date is 10/1/98 (FY1999). — Deploying the Systems Life Cycle, Systems Requirements Review (SRR), and Systems Design Review will occur in two stages. Stage 1 for Subreleases 1.1 & 1.2 and Stage 2 for Subreleases 1.3, 1.4, and 1.5. — Subreleases 1.1 & 1.2 • PRIME is knowledgeable of requirements and design for Subreleases 1.1 & 1.2 as a result of preparing for the RFP bids, therefore an accelerated schedule for Subreleases 1.1 & 1.2 has been developed. • COCOMO settings for Subreleases 1.1 & 1.2 were adjusted to account for previous knowledge acquired. • The COCOMO level of effort and duration were used as the baseline. Schedule compression and resource leveling adjustments using COCOMO's level of effort and duration were made to produce the target schedule for Subreleases 1.1 & 1.2. — Stage 1 Systems Requirements Review (SRR) starts on 10/2/98. — Stage 1 Systems Design Review (SDR) depends on SRR. — Software Development Environment (SDE) for Subreleases 1.1 & 1.2 depends on SDR. — Planning and Software Specification Review (SSR) depends on SDR. — Subreleases 1.1 and 1.2 can be developed in parallel and immediately after SDR. — Acquisition depends on SSR. — Preliminary Design Review (PDR) depends on SSR. — Critical Design Review (CDR) depends on PDR. — Code and Unit Test depends on CDR. — Integration & Integration Testing (I&IT) depends on the acquisition of Integration Equipment and completion of the Code. — Systems Acceptance Testing (SAT) depends on I&IT. — Pilot depends on SAT and the acquisition of Production Equipment. — Pilot of Subreleases 1.1 & 1.2 occurs at MCC & TCC. — Pilot is operational in Subrelease 1.1 for 1 month, then is operational. — Pilot is operational in Subrelease 1.2 for 50 working days, then is operational. — All equipment is deployed during the pilot for Subreleases 1.1 & 1.2, therefore Nationwide rollout is not necessary. — Subreleases 1.3, 1.4 & 1.5 • PRIME is given 66 working days for Transition/Ramp Up for Subreleases 1.3, 1.4, & 1.5 after Contract Award (1/1/1999). • Subreleases 1.3, 1.4, & 1.5 schedule duration are extracted directly from COCOMO's duration baseline. — Stage 2 Systems Requirements Review (SRR) starts on 1/4/1999 after Transition/Ramp Up. — Stage 2 Systems Design Review (SDR) depends on SRR. — Software Development Environment (SDE) for Subreleases 1.3, 1.4, & 1.5 depends on SDR. — Planning and Software Specification Review (SSR) depends on SDR. — Subreleases 1.3 and 1.4 can be developed in parallel and immediately after SDR. — Subrelease 1.5 begins 120 days after SDR.

Cost Assumptions (Continued)

Cost Assumptions
— Acquisition depends on SSR. — Preliminary Design Review (PDR) depends on SSR. — Critical Design Review (CDR) depends on PDR. — Code and Unit Test depends on CDR. — Integration & Integration Testing (I&IT) depends on the acquisition of Integration Equipment and completion of the Code. — Systems Acceptance Testing (SAT) depends on I&IT. — Pilot depends on SAT and the acquisition of Production Equipment. — Pilot of Subrelease 1.3 occurs at MCC, ATCSC, OSC, and Jacksonville and is operational for 4.5 months. — Pilot of Subrelease 1.4 occurs at MCC, ATCSC, OSC and Jacksonville and is operational for 4.5 months. — Pilot of Subrelease 1.5 occurs at MCC, ATCSC, OSC, and Jacksonville and is operational for 5.5 months. — Nationwide rollout begins immediately after Post Pilot Review and Investment Evaluation. — Nationwide rollout is 5.5 months for Subrelease 1.3 and is across 21 Customer Service sites and 9 IRIS sites. — Subrelease 1.4 & 1.5 rollout together across 21 Customer Service Sites. • COCOMO Estimation — Software development will be completed by a SEI CMM Level 3 contractor. — The SEI CMM Level 3 contractor will provide staff that have experience with the technology and development process "75th percentile" (COCOMO setting). — There is good cooperation (COCOMO setting) amongst the stakeholders. **Development Investment Assumptions** • Program Management and Planning Assumptions — Labor Assumptions • IS — IS PM&C labor will be performed by GPMO PM&C staff years at a rate of $89.5K (GS14/7) per staff year. — IS PM&C labor was calculated by taking 20% of the total Contractor staff years (this calculation did not include the Contractor Acquisition staff years). — IS AE&I labor was calculated by taking 15% of the total Contractor staff years at a rate of $75.5K (GS13/6) per staff year (this calculation did not include the Contractor Acquisition staff years). — IS SS&E labor was calculated by taking 10% of the total Contractor staff years to ensure that IRS methodology and standards are enforced at a rate of $75.7K per staff year. • Non-IS — Non-IS planning labor for the Business user staff years is 5% of the Contractor staff years at a rate of $75.7K per staff year to support reviews of deliverables and to participate in walkthroughs. • Contractor — Contractor planning Labor was calculated by COCOMO II. — Contractor planning will commence at the beginning of each subrelease. — Contractor program management was calculated by taking 20% of the total Contractor staff years (this calculation did not include the Contractor Acquisition staff years). — Contractor labor to conduct the Subrelease 1.1 and 1.2 SRR and SDR was calculated as 25% of the labor for planning and product design and was applied to Subrelease 1.1 costs. — Contractor labor to conduct the Subrelease 1.3 – 1.5 SRR and SDR was calculated as 25% of the labor for planning and product design and was applied to Subrelease 1.3 costs. — Contractor Labor for planning and program management is $260K per year per staff year. — Non-Labor Assumptions • Planning Non-labor costs includes the cost for the planning tool needed by GPMO for managing Phase I/Release 1. • The planning tool will be acquired in FY1999. (There are no labor costs associated with acquiring the planning software for the GPMO.)

Cost Assumptions (Continued)

Cost Assumptions
Development Investment Assumptions • Acquisition Assumptions — Labor Assumptions • IS — IRS will be responsible to acquire the maintenance equipment to support the IRS maintenance programmers. • Non-IS — IRS labor to acquire the maintenance equipment is 6% of the maintenance equipment cost and is displayed under Labor Non-IS. • Contractor — The Contractor will be responsible to acquire the production hardware and COTS products. — The labor to acquire the hardware and COTS equipment is 6% of the total HW/COTS cost. — The Contractor will be responsible to acquire the Contractor development and integration environment. — The labor to acquire the development and integration testing equipment is 6% of the total development and integration testing equipment cost. — Non-Labor Assumptions • Business Environment — There is one Computing Center for Release 1 which houses the Corporate databases. — There are 11 IRIS sites. — There are 2 National Infrastructure sites co-located with Computing Centers — There are 24 Customer Service Centers: 10 Service Centers and 14 District Offices. — Acquisition Non-Labor costs include the costs of the HW and COTS for the IRIS sites, the national infrastructure sites, the Computing Center, and the Customer Service Sites, as well as all development, integration testing and maintenance equipment. — The corporate computing mainframe to house the databases will be purchased in Subrelease 1.4 at $60.5M. — Each Primary Screening VRU site is capable of handling 60% of the nationwide volume based on FY2004 estimates. — The cost of the primary screening VRU's in Subrelease 1.1 is $15.4M. — Subrelease 1.3 will require that approximately 60K IRS desktop computers be retrofitted with security software at a cost of $11.8M. — Customer Service workstations and LANS will be purchased through Phase 0; this Business Case contains no CS workstations or LAN equipment.
Development Investment Assumptions • Acquisition Assumptions — Non-Labor Assumptions • Development Environment — Software Development Environment (SDE) and Integration Environment — Development equipment includes the Software Development Environment (SDE) and Integration Environment, the maintenance equipment, as well as an additional cost for development and integration testing on the production mainframe. — Software Development and Integration Environment is $20K per Development contractor staff year. — The cost per staff year for the SDE is calculated by taking the number of person months divided by the number of months for development and integration test multiplied by $20K. — The Software Development and Integration Test Environment is for the Contractor only; there are sufficient development workstations for the IS:AD legacy modifications programmers. — The Development and Integration Test Environment will be procured by the Contractor in FY1999. — Production Mainframe — The Production Mainframe will require an additional cost of 20% of the total mainframe purchase price. — 10% to support the development of Phase I/Release 1

Cost Assumptions (Continued)

Cost Assumptions
— 10% to support the Integration Testing — Development of the mainframe applications and databases, as well as integration testing, will be performed on a physical partition of the Production Mainframe and will not require the purchase of an additional mainframe • Maintenance Environment — All equipment for maintenance will be purchased by the IRS the last year that Release 1 is fully implemented. — All SDE equipment for maintenance will be new; the Contractor will NOT be turning over SDE equipment to the IRS for maintenance. — Each IS:AD staff year will require a development workstation for maintenance at a rate of $20K per WS. — Subrelease 1.2 will require the purchase of $12.55M of telecommunications equipment to support the IRS telecommunications network. **Development Investment Assumptions** • Development Assumptions — Labor Assumptions • IS — IS:AD will be responsible for all legacy modifications at a rate of $75.7K per year per staff year. — IRS Product Assurance will test all SW before it is deployed. PA participation is 15% additional to the total developer staff years. Of the 15%, 25% of their resources are for the Development component and 75% are for SAT. — The cost for Subrelease 1.2 data conversion is 15 IRS staff years at a rate of $75.7K per staff year over 6 months. — The cost for Subrelease 1.3 data conversion is 1 IRS IS staff year per CS site at a rate of $75.7K per staff year over 6 months. — The cost for Subrelease 1.4 data conversion is 2 IRS IS staff years per CS site plus 5 IRS IS staff years at the computing center at a rate of $75.7K per staff year over 6 months. — The IRS labor to install the mainfame computer for Subrelease 1.4 is 5 IS staff years for 2 months. • Non-IS — Business costs applied to Planning, SAT, & Pilot. • Contractor — All Build and Integration Testing will be performed by the Contractor at a rate of $260K per year per staff year. — Contractor Labor for Build and Integration Test was calculated by COCOMO II. — The Contractor labor to support the SAT function is 1 IRS staff year per 1 Contractor staff year at a rate of $260K per Contractor staff year. 25% of their resources are for the Development component and 75% are for SAT. — The Contractor Development Labor depicts the cost for designing and building the software, as well as to provide support to deploy the Integration Test equipment. — Deploying the Integration Test environment will require a team of 5 persons over 1 month at a ratio of 4 Contractors to 1 IRS for Subreleases 1.1 and 1.2. — Subreleases 1.3 and 1.4 will require 4 months each for Integration Test Environment deployment. — Non-Labor Assumptions • There are no Development Non-Labor costs; all equipment costs to support development are listed under Acquisition Non-Labor. **Development Investment Assumptions** • SAT & Pilot Assumptions — Labor Assumptions • IS — IRS Product Assurance and the Contractor will perform all Systems Acceptance Testing.

Cost Assumptions (Continued)

Cost Assumptions
— IRS Product Assurance will test all SW before it is deployed. PA participation is 15% additional to the total developer staff years. Of the 15%, 25% of their resources are for the Development component, and 75% are for SAT. • Non-IS — National Office business user staff year participation for SAT is 5% of the IS:PA and Contractor staff years at a rate of $75.7K per year per staff year. — Each pilot site in Subrelease 1.3 & 1.5 will host 4 units of 15 CSRs each at 3 sites for a total of 180 CSRs per pilot. — The labor cost to conduct the pilot was calculated as 180 CSRs times 6 months times the CSR monthly rate of $3.1K. • Contractor — General Information — All subreleases will be piloted separately. — Pilot deployment will be performed by the Contractor and IRS IS. — Customer Service Site — There are 3 Pilot CS sites in Subrelease 1.3, 1.4, & 1.5: Atlanta SC, Ogden SC, and Jacksonville. — Pilot deployment for Subrelease 1.3 & 1.5 will require a team of 5 persons over 2 months at the ratio of 4 Contractor to 1 IRS for CS site pilot. — Infrastructure Sites — There are 2 Pilot National Infrastructure sites for Subreleases 1.1 and 1.2. — Each IRIS Pilot will require a team of 5 persons at a ratio of 3 Contractors to 2 IRS to conduct the pilot. — Subrelease 1.3 will require a double team for the IRIS pilot deployment. — Non-Labor Assumptions • The Production Mainframe will require an additional cost of 10% of the total mainframe purchase price to support Systems Acceptance Testing. • SAT of the Mainframe applications and databases will be performed on a physical partition of the Production Mainframe and will not require the purchase of an additional mainframe. • IRS PA for SAT will use the ITCC equipment. • All Pilot equipment is identified as part of Acquisitions. **Development Investment Assumptions** • Rollout Assumptions — Labor Assumptions • General — Four CS sites will be rolled out in Subrelease 1.3 & 1.5 at a time over a 1 month period for a total time period of 5 months. — Subrelease 1.4 will be rolled out with Subrelease 1.5, so there are no Subrelease 1.4. rollout costs. — Rollout deployment will be performed by the Contractor and IRS IS. — There are 9 IRIS rollout sites for Subrelease 1.3. — The other Subreleases will not require an IRIS rollout. • Non-IS — Subreleases 1.3 and 1.5 will require CSR training and/or procedural updates. • Contractor — Each CS site deployment will take 1 month with a team of 5 persons at the ratio of 4 Contractor to 1 IRS. — Subrelease 1.3 will require 2 teams of 14 persons at a ratio of 10 Contractor to 4 IRS to deploy the IRIS equipment. — Non-Labor Assumptions • There are no Non-Labor Rollout costs; all equipment costs are included under Acquisition Non-Labor.

Cost Assumptions (Continued)

Cost Assumptions
Development Investment Assumptions • Training & Procedures Assumptions — Labor Assumptions • IS — IS costs for knowledge transfer was calculated by the number of IS:AD staff years X $75.7K per staff year for 6 months. • Non-IS — Development of CSR training for the new system for Subrelease 1.3 will be performed by M&A @ a cost of 2 PMs X $75.7K per staff year. — Development of CSR training for the new system for Subrelease 1.5. will be performed by M&A @ a cost of 4 PMs X $75.7K per year per staff year. — Procedure and IRM updates for Subrelease 1.3 will require 2 Non-IS PMs at a rate of $75.7K per year per staff year. — Procedure and IRM updates for Subrelease 1.5 will require 4 Non-IS PMs at a rate of $75.7K per year per staff year. — Pilot Training is 2 weeks in length. — Pilot Training for Subrelease 1.3 is calculated as the hourly CSR wage rate ($18.15/hr) times 1 week times the number of Pilot CSRs (180) plus the cost of the instructors. — Pilot Training for Subrelease 1.5 is calculated as the hourly CSR wage rate ($18.15/hr) times 2 weeks times the number of Pilot CSRs (180) plus the cost of the instructors. — The cost of the instructors is calculated as the number of CSRs to be trained divided by the class size (30 CSRs per class) times 3 instructors per class times the CSR wage times the number of weeks of training. — Rollout Training costs are for Subreleases 1.3 and 1.5 only; there is no significant training for the other subreleases. — Rollout Training is 2 weeks in length. — Rollout Training for Subrelease 1.3 is calculated as the hourly CSR wage rate ($18.15/hr) times 1 week times the number of Rollout CSRs (19,820) plus the cost of the instructors. — Rollout Training for Subrelease 1.5 is calculated as the hourly CSR wage rate ($18.15/hr) times 2 weeks times the number of Rollout CSRs (19,820) plus the cost of the instructors. — The total number of CSRs needing training is assumed to be 20K. — Other IRS Training costs are 2.4% of the total labor costs of IS and Non-IS labor. • Contractor — Knowledge transfer by the Contractor to the IS maintenance programmers will occur the last year of Release 1, at an additional training rate of 2 Contractors per IS:AD staff year times the contractor rate of $260K per year for 6 months. This cost is listed as a Contractor Labor cost. — General training for the Contractor is assumed to be within the standard $260K per staff year rate and is not explicitly listed. • M&A Investment Assumptions — Travel for IRS is 5.4% of the total labor costs of IS and Non-IS labor. — Supplies for IRS is $100 per staff year per year of the total labor staff years of IS and Non-IS labor. — It is assumed that there are no significant facility modifications required by Phase I/Release 1. — Supplies, travel, space, and training costs for the contractor are assumed to be covered in the $260K Contractor rate and is not explicitly listed.

Cost Assumptions (Continued)

Cost Assumptions
O&M Investment Assumptions • Maintenance — Labor Assumptions • IS — IS:AD will be responsible for maintaining all Contractor developed software once Phase I/Release 1 is entirely deployed. — IS:AD staff years per year for maintenance are 15% of the Contractor & IS:AD Development staff years at a rate of $75.7K per year. — Maintenance costs of the SDE for IRS maintenance programmers are included here as Maintenance costs, not Release 1 Investment Costs. — All maintenance workstations will be procured by the IRS the last year that Release 1 is fully implemented. — The maintenance for the maintenance workstation and LAN equipment is 15% of the original purchase cost each year. — Maintenance for HW begins the year after purchase at a rate of 15% of the original purchase price per year. — Maintenance for COTS begins the year after purchase at a rate of 4% of the original purchase price per year. — Infrastructure maintenance support at each of the 11 regional sites begins after Subrelease 1.1 is deployed at a rate of 2 staff years per site at $75.7K per staff year until Phase I/Release 1 is deployed. — Maintenance for the 2 National Infrastructure sites begins after Subrelease 1.1 is deployed at a rate of 2 staff years per site at $75.7K per staff year until Phase I/Release 1 is deployed. — Maintenance for the corporate mainframe begins after it is installed in Subrelease 1.4 at a rate of 10 staff years at $75.7K per staff year until Phase I/Release 1 is deployed. — Software maintenance costs for annual tax law changes are not included. • Non-IS — There are no Business (Non-IS) costs for maintenance. • Contractor — The Contractor will maintain all subrelease software until the entire Phase I/Release 1 is deployed. — Contractor software maintenance begins the year the subrelease is piloted until all subreleases are deployed at an staff year rate of 15% of the Contractor Development labor staff years for each subrelease at a rate of $260K per staff year. — Maintenance costs for the Contractor SDE are included, at 15% per year following the year it was purchased, until all subreleases are deployed nationwide. — Non Labor Assumptions • Maintenance for all Software Development and Integration equipment is included as an O&M Investment. • Maintenance for recurring telecommunications is an ongoing operational cost and is not included in this Business Case. Expected decreases in this cost, however, are included in the benefits. • Telecom maintenance for the webserver begins the year Subrelease 1.1 is deployed and recurs yearly at a rate of $1M per year. • Training & Procedures — Other IRS Training costs are 2.4% of the total labor costs of IS and Non-IS labor yearly. • M&As — Travel for IRS is 5.4% of the total labor costs of IS and Non-IS labor. — Supplies for IRS is $100 per staff year per year of the total labor staff years of IS and Non-IS labor. — It is assumed that there are no significant facility modifications required by Phase I/Release 1.

Benefit Assumptions

Benefit Assumptions	Value
General Assumptions: • CFE is based on FY1996 actuals, except for telephone activities (FY1997). • FY1996 Cost structure is assumed to remain stable through out life of project • Growth rate is based on Compliance Research "Calendar Year Return Projections for Districts and Regions 1996-2003, Update 1996.". Growth rate is applied for all years through FY06 and then leveled off. This is used to determine Cost Avoidance calculations. • Salary cost of a CSR per CFO model is $37,760 per year • All CSR performing IMF adjustments and/or handling telephone calls will have a workstation with new applications. This can be achieved by either diverting all IMF work to specific population or every CSR having terminal. • Benefits begin to accrue one year after deployment to either pilot site or nationwide rollout.	

Benefit Assumptions (Continued)

Phase I/Release 1 Subrelease 1.1 Benefit Assumptions	Value
Subrelease 1.1	
• Functionality being delivered is Automated Tax Law for VRU which includes the following applications:	
Personal Exceptions	
— Interest Income	
— Dependents	
— Filing Status	
— Earned Income Credit	
— Filing Requirements	
— Standard Deductions	
— Other Income	
— Capital Gains	
— Who must file	
— Customer Survey	
— Estimated Tax	
— Extension to File	
— Basis of Real Estate Property	
— IRA Distributions	
— IRA Contributions and Deductions	
— Social Security and Railroad Retirements Benefits	
— Medical Expenses	
— Self Employment Tax	
— Credit for Elderly or Disabled	
— Adjustments to Income	
• FY1997 Total 1040 Assistor Calls.	23,536,236
• 33.6% of Assistor Calls which are Tax Law based on WITS Data.	7,908,175
• Tax Law volume reduced by 10% due to expected default at Master Menu.	7,117,358
• 20% default for taxpayers not making selection from 21 ATL application.	5,693,887
• 20% default to CSRs for taxpayers who fail to complete an application.	4,555,110
• FTE savings equate to balance of Tax Law calls divided by “fully loaded” Assistor calls/FTE (6,307).	722
• Functionality being delivered is Primary Screening VRUs integrated with Customer Service Call Router.	
• FY1997 Total Assistor Calls.	40,381,076
• Estimate 10% decrease in CSR screening due to voice recognition.	
• Total calls no longer requiring initial CSR screening.	4,038,000
• Projected staff year saving equals number of calls times length of call divided by 60 divided by 2088 plus 50% overhead (4,038,000x1 min.)/60 = 6,700 hours/2088 x 1.5 = FTE saved).	48.3

Benefit Assumptions (Continued)

Phase I/Release 1 Subrelease 1.2, 1.3, & 1.4 Benefit Assumptions	Value
Subrelease 1.2	
• Applications being delivered are as follows:	
— Refund Inquiry	
— Fact of Filing	
• Applications already available on legacy systems, therefore no new labor benefits will be accrued.	
• Non-labor savings accrued from maintenance of Teletax machines retired after 1.2.	$ 975K
Subrelease 1.3	
• There are minimal quantifiable benefits assumed for Workstation Emulation .	
• Tax Law functionality to CSR.	
— Number of tax law calls answered by CSRs in FY1997.	7,908,175
— Subtract estimated Tax Law calls answered by ATL applications equals number of calls answered by CSR. (7,908,175- 4,555,110).	3,353,065
— FTE required to answer calls at current productivity rate (3,353,065/ 6307).	532
— FTE required with 6% increase productivity rate (3,353,065/6,685).	501
— Projected staff year saving (532 -501).	31
Subrelease 1.4	
• Benefits included in Subrelease 1.5.	

Benefit Assumptions (Continued)

Phase I/Release 1 Subrelease 1.5 Benefit Assumptions	Value
Subrelease 1.5	
• Benefits for On-line Adjustments are as follows:	
— Workload volumes for impacted functions were obtained from FY1996 WP&C data, FY1997 Snapshot report, FY1997 WITS and PAS data.	
— Tax Account PAS data is used to determine ratio of volume dedicated to adjusting IMF accounts.	
— Estimated change in production rates due to new technology is based on focus group interviews of section and branch level personnel responsible for function.	
— AUR volumes are not included in calculations since AUR systems already have functionality.	
— Three Tax years, up front issue detection, and nationwide implementation are assumed.	
— Decrease in written referrals:	
• FY1996 CS Account call written referral volume @ 2.2 hr.	908,245
• Project 20% decrease in written referrals volume.	181,649
• Projected staff years savings (181,649 divided by 2.2hr. divided by 2088) x 1.5 overhead.	59.3
— Increase productivity in telephone account calls due to on-line adjustments, GUI & DDR:	
• Total Assistor IMF account call volume.	10,158,239
• Total 8815 Assistor IMF account call volume.	11,684,231
• Total 4262 Assistor IMF account call volume.	5,160,609
• FY1997 Total Assistor IMF calls.	27,003,079
• FTEs required to handle volume @ 6,090/calls per FTE.	4,434
• FTEs required to handle volume with 9% productivity increase (6,638 calls per FTE).	4,068
• Staff year savings (4434 FTEs - 4068 FTEs).	366
— Increase paper production rate due to on-line adjustments:	
• Adjustments:	
— Total FY1997 Nationwide TACS PAS sample.	32,114
— TACS PAS sample involving IMF tax/credit change.	8,181
— Percentage of Service Center paper with IMF tax/credit adjustment.	25.5%

Benefit Assumptions (Continued)

Phase I/Release 1 Subrelease 1.5 Benefit Assumptions	Value
— Total Service Center paper cases.	31,663,522
— Adjustments paper IMF tax/credit volumes (31,663,522x 25.5%).	8,074,198
— Service Center Collection Branch:	
• Total SCCB Workload.	3,784,453
• Ratio.	5.0%
• Total SCCB workload for IMF adjustments.	189,223
— Correspondence Exam:	
• Total Correspondence Exam.	938,049
• Ratio (From TACS PAS IMF adjustments).	58.5%
• Total Correspondence Exam workload for IMF adjustments.	549,051
— Total paper adjustment workload for IMF adjustments:	8,812,472
• Existing production rate.	3.2
• New production rate with tool.	5.5
• Direct staff hour savings.	1,151,630
• Direct staff year savings.	551
• Staff year savings with 50% overhead.	827
• ASSA –EIC	
— Assumes Automated on-line adjustments will be in place:	
• Total paper workload for IMF adjustments per calculation above.	8,812,472
• Estimated EIC portion of workload is 15%.	1,321,871
• Projected EIC volume diverted to ASSA.	462,655
• New production rate with IMF on-line adjustments (Note: if on-line adjustment is not available, rate is 3.2).	5.5
• Direct staff hour savings.	84,119
• Staff year savings with overhead (84,119 /2088x1.5).	61
• ASSA- Levy	
• Levy response volume (from OFP 64120).	2,016,022
• Levy response hours.	304,213
• Based on AUCC Non-Remit Levies is 60% of hours used.	182,528
• Project 50% of non-remit Levies diverted to ASSA.	91,264
• Direct staff year savings.	43.7
• Total staff year savings with overhead.	65.5
• Reinvestment with LOA assumptions	
— Projected increase in cost for additional calls answered is calculated based on 10 minute average call length multiplied by .06 cents.	

PHASE I/RELEASE 1 COST BENEFIT SUMMARY BY CATEGORY

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Investment Cost	$333,105	$35,770	$50,339	$37,540	$54,179	$60,805	$22,041	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008
New Investment	$210,255	$35,770	$42,944	$27,600	$43,340	$46,209	$14,393	$0	$0	$0	$0	$0	$0	$0	$0	$0
Prog Mgmt & Planning	$30,816	$10,432	$5,458	$4,458	$5,674	$4,525	$269	$0	$0	$0	$0	$0	$0	$0	$0	$0
Acquisition	$48,679	$16,535	$24,275	$7,530	$0	$339	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development	$39,056	$7,884	$11,792	$13,487	$5,894	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SAT & Pilot	$26,342	$658	$1,003	$1,747	$11,388	$11,545	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Rollout	$6,680	$0	$0	$0	$2,893	$3,044	$744	$0	$0	$0	$0	$0	$0	$0	$0	$0
Training & Procedures	$54,210	$78	$124	$112	$16,142	$25,086	$12,670	$0	$0	$0	$0	$0	$0	$0	$0	$0
M&A	$4,472	$183	$292	$265	$1,351	$1,671	$711	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$122,850	$0	$7,396	$9,940	$10,839	$14,595	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008
Maintenance	$119,623	$0	$7,166	$9,710	$10,588	$14,297	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786
Training & Procedures	$976	$0	$69	$69	$76	$90	$67	$67	$67	$67	$67	$67	$67	$67	$67	$67
M&A	$2,251	$0	$160	$160	$175	$209	$155	$155	$155	$155	$155	$155	$155	$155	$155	$155
Benefit prior to Savings Reinvestment	$1,350,571	$0	$17,494	$22,302	$58,128	$62,046	$93,936	$116,443	$117,800	$119,150	$120,500	$121,850	$123,220	$124,550	$125,900	$127,250
Labor FTE Saving	24,071.1	0.0	449.5	770.6	771.7	846.2	1,619.2	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3
Labor Cost Saving	$908,925	$0	$16,973	$29,097	$29,138	$31,952	$61,142	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291
Cost Avoidance FTE Savings	337.8	0	14	15	16	16	27	28	28	28	28	28	28	28	28	28
Cost Avoidance Saving	$12,757	$0	$521	$585	$590	$594	$1,033	$1,041	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049
Non-Labor Saving	$428,890	$0	$0	($7,380)	$28,400	$29,500	$31,760	$33,110	$34,460	$35,810	$37,160	$38,510	$39,880	$41,210	$42,560	$43,910
Revenue Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ROI prior to Savings Reinvestment	4.1	0.0	0.3	0.6	1.1	1.0	4.2	14.5	14.7	14.9	15.0	15.2	15.4	15.6	15.7	15.9
Benefit after Savings Reinvestment including LOA Goal	$17,677,821	$0	$0	$304,089	$430,185	$544,818	$1,393,546	$1,661,782	$1,663,198	$1,664,548	$1,665,898	$1,667,248	$1,668,618	$1,669,948	$1,671,298	$1,672,648
Labor FTE Saving	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Labor Cost Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cost Avoidance FTE Savings	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cost Avoidance Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-Labor Saving	$402,991	$0	$0	($9,575)	$26,425	$27,525	$29,785	$31,135	$32,485	$33,835	$35,185	$36,535	$37,905	$39,235	$40,585	$41,935
Revenue Saving	$17,274,830	$0	$0	$313,664	$403,760	$517,294	$1,363,762	$1,630,647	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713
ROI after Savings Reinvestment including LOA Goal	53.1	0.0	0.0	8.1	7.9	9.0	62.2	207.5	207.7	207.9	208.0	208.2	208.4	208.5	208.7	208.9
Benefit after Savings Reinvestment excluding LOA Goal	$21,470,272	$0	$0	$1,112,086	$1,148,732	$1,203,671	$1,648,216	$1,812,081	$1,813,461	$1,814,811	$1,816,161	$1,817,511	$1,818,861	$1,820,211	$1,821,561	$1,822,911
Labor FTE Saving	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Labor Cost Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cost Avoidance FTE Savings	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cost Avoidance Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-Labor Saving	$428,870	$0	$0	($7,380)	$28,400	$29,500	$31,760	$33,110	$34,460	$35,810	$37,160	$38,510	$39,860	$41,210	$42,560	$43,910
Revenue Saving	$21,041,402	$0	$0	$1,119,466	$1,120,332	$1,174,171	$1,616,456	$1,778,971	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001
ROI after Savings Reinvestment excluding LOA Goal	**64.5**	0.0	0.0	29.6	21.2	19.8	73.6	226.3	226.5	226.6	226.8	227.0	227.1	227.3	227.5	227.6

PHASE I/RELEASE 1 RISK ADJUSTED COST BENEFIT SUMMARY*

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
RISK ADJUSTED INVESTMENT COST	$346,378	$37,195	$52,345	$39,036	$56,337	$63,228	$23,293	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327
Risk Adjusted Benefit prior to Savings Reinvestment	$1,293,212	$0	$0	$17,453	$58,087	$59,232	$65,029	$113,189	$117,800	$119,150	$120,500	$121,850	$123,220	$124,550	$125,900	$127,250
Risk Adjusted ROI prior to Savings Reinvestment	3.7	0.0	0.0	0.4	1.0	0.9	2.8	13.6	14.1	14.3	14.5	14.6	14.8	15.0	15.1	15.3
Risk Adjusted Benefit after Savings Reinvestment including LOA Goal	$16,396,009	$0	$0	($9,868)	$428,511	$431,498	$576,299	$1,626,156	$1,663,211	$1,664,548	$1,665,898	$1,667,248	$1,668,618	$1,669,948	$1,671,298	$1,672,648
Risk Adjusted ROI after Savings Reinvestment including LOA Goal	47.3	0.0	0.0	-0.3	7.6	6.8	24.7	195.3	199.7	199.9	200.1	200.2	200.4	200.5	200.7	200.9
Risk Adjusted Benefit after Savings Reinvestment excluding LOA Goal	$20,776,611	$0	$0	$993,421	$1,078,607	$1,149,933	$1,219,788	$1,789,376	$1,813,461	$1,814,811	$1,816,161	$1,817,511	$1,818,861	$1,820,211	$1,821,561	$1,822,911
Risk Adjusted ROI after Savings Reinvestment excluding LOA Goal	**60.0**	0.0	0.0	25.4	19.1	18.2	52.4	214.9	217.8	217.9	218.1	218.3	218.4	218.6	218.8	218.9

PHASE I/RELEASE 1 RISK ADJUSTED NET PRESENT VALUE COST BENEFIT SUMMARY*

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
RISK ADJUSTED NPV INVESTMENT COST	$303,074	$37,195	$50,575	$36,440	$50,813	$55,099	$19,612	$6,774	$6,545	$6,324	$6,110	$5,903	$5,704	$5,511	$5,324	$5,144
Risk Adjusted NPV Benefit prior to Savings Reinvestment	$950,942	$0	$0	$16,292	$52,391	$51,618	$54,753	$92,079	$92,590	$90,484	$88,415	$86,382	$84,399	$82,425	$80,501	$78,613
Risk Adjusted NPV ROI prior to Savings Reinvestment	3.1	0.0	0.0	0.4	0.9	0.8	2.4	11.1	11.1	10.9	10.6	10.4	10.1	9.9	9.7	9.4
Risk Adjusted NPV Benefit after Savings Reinvestment including LOA Goal	$11,887,044	$0	$0	($9,212)	$386,492	$376,025	$485,228	$1,322,879	$1,307,269	$1,264,077	$1,222,321	$1,181,943	$1,142,913	$1,105,143	$1,068,635	$1,033,331
Risk Adjusted NPV ROI after Savings Reinvestment including LOA Goal	39.2	0.0	0.0	-0.2	6.9	5.9	20.8	158.9	157.0	151.8	146.8	141.9	137.3	132.7	128.3	124.1
Risk Adjusted NPV Benefit after Savings Reinvestment excluding LOA Goal	$15,550,872	$0	$0	$927,370	$972,842	$1,002,101	$1,027,029	$1,455,659	$1,425,364	$1,378,188	$1,332,573	$1,288,467	$1,245,821	$1,204,585	$1,164,713	$1,126,161
Risk Adjusted NPV ROI after Savings Reinvestment excluding LOA Goal	**51.3**	0.0	0.0	23.8	17.3	15.8	44.1	174.8	171.2	165.5	160.0	154.7	149.6	144.7	139.9	135.2

Net Present Value adjustment rate = 3.5%		1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394	0.6178

*NOTE: Sunk costs not included

5. Rule 5: Consistency with Information Architecture

Is the investment consistent with Federal, agency, and bureau information architectures which: integrate agency work processes and information flows with technology to achieve the agency's strategic goals; reflect the agency's technology vision and Year 2000 Compliance plan; and specify standards that enable information exchange and resource sharing, while retaining flexibility in the choice of suppliers and in the design of local work processes?

✦ **Conclusion 1**

Release 1 is the first incremental step in delivery of target systems and functionality defined in the *Modernization Blueprint*, which represents the IRS architecture defined in accordance with Standards established by the IRS CIO.

✦ **Discussion**

As the first step in migrating to the target IRS defined in the ***Modernization Blueprint***, Release 1 conforms to the same set of standards and principles which governed the definition of the ***Modernization Blueprint***. The validation and approval of the ***Modernization Blueprint*** reflects consistency with other Federal information architectures, as well as a validation that the information architecture and standards defined in the ***Modernization Blueprint*** are a sound, "real world" framework for modernizing the IRS. Release 1 is, therefore, also consistent with other information architectures as it represents a decomposition of the framework presented in the ***Modernization Blueprint*** and a validation by a broad-based team of public and private sector organizations, as follows:

- Release 1 architecture adheres to standards established by the Chief Information Officer (CIO), based on Treasury and industry-accepted standards, and presented in ***Modernization Blueprint***, Volume VI, Systems Standards Profile.
- The Release 1 architecture reflects the core technology and process standards embodied in the ***Modernization Blueprint***, and represents a decomposition from an approved baseline, incorporating modifications driven by business priorities and the results of engineering impact analyses, approved under a formal change control process. Specific standards and principles embodied and reflected in Release 1 include:
  - Mainframe-centric architecture, with centralized databases accessible from standard workstations over a secure network employing centralized security and access controls;
  - Consolidation and centralization to eliminate duplicate networks; databases; applications; taxpayer account and issue resolution functions; and case management functions.

- Open system standards and the use of non-proprietary, commercially available technology solutions.
- Disciplined system life cycle processes and documentation, placed under configuration management, and validated through formal processes and reviews.

▲ The ***Modernization Blueprint*** and standards have been reviewed and approved by Treasury's Deputy Assistant Secretary for Information Systems and Chief Information Officer, and validated as consistent with the Treasury Architecture and Standards.

▲ The Treasury Modernization Management Board (MMB) has approved the ***Modernization Blueprint*** and standards.

▲ The Modernization Architecture and standards have been reviewed and validated by the PRIME offerors. Both PRIME offerors have unequivocally stated their agreement in written comments in response to the Request for Comments issued on 15 May 1997:

- "We found the ***Modernization Blueprint*** to be a comprehensive and thorough document which defines a management framework and technical architecture well suited to the business and technical challenges of the IRS."
- "The mainframe-centric approach is the best, most cost-effective, most flexible, least risky and most secure solution to addressing IRS needs today and into the future."
- "The mainframe centric solution offers…a simplified, lower risk architecture."
- "The mainframe centric approach is also more economical than a distributed environment."
- "The IRS's mainframe centric approach is also proven and low risk."
- "…the IRS Blueprint is not just a theoretical abstraction of ideas, but a very practical one which defines and builds a large integrated tax administration system with products available in industry today."
- "A mainframe-centric architecture is the right approach for the technical infrastructure necessary to support Modernization."
- "The Technical Architecture volume of the ***Modernization Blueprint*** provides an excellent foundation for moving forward with the IRS Modernization Plan."
- "We concur with the centralized database approach and the use of standards."
- "In addition, the Blueprint provides a good foundation for a time-sequenced design."

- "This Blueprint brings security to a high level of awareness…the centralized approach is the preferred approach for security."

▲ The General Accounting Office (GAO) evaluated the ***Modernization Blueprint***. From their analysis of the architecture, the following conclusion was drawn:

- "IRS has made a good start in developing its modernization "blueprint," but must complete and implement it before building or acquiring new systems."

✦ **Conclusion 2**

The Release 1 investment is defined based upon the specification of the functionality to be provided, not the operational implementation, thus allowing for flexibility to customize standard applications to accommodate unique work process requirements influenced by geographic or demographic factors addressed in the field.

✦ **Discussion**

Flexibility has been maintained through the standards-based approach used to define both the ***Modernization Blueprint*** and Release 1, and the disciplined processes employed to develop and manage the baseline engineering specifications.

▲ Release 1 was developed in accordance with the standards from the ***Modernization Blueprint***, Volume VI, System Standards Profile.

▲ The IRS expects the PRIME to complete the validation of the work process and technical details associated with Release 1 through system life cycle reviews. The IRS partnership with the PRIME compels the PRIME to work with the IRS to identify and select the specific technology, process, and implementation solutions for Release 1 subreleases.

6. Rule 6: Risk Management

Does the investment reduce risk by: avoiding or isolating custom-designed components to minimize the potential adverse consequences on the overall project; using fully tested pilots, simulations, or prototype implementations before going to production; establishing clear measures of accountability for project progress; and securing substantial involvement and buy-in throughout the project from the program officials who will use the system?

✦ **Conclusion 1**

Release 1 employs alternatives to custom-designed components to a significant degree.

✦ **Discussion**

▲ Commercial Off-The-Shelf (COTS) Technology

Release 1, as the first incremental step in the migration to the target IRS environment defined in the ***Modernization Blueprint*** adheres to the same standards, guidelines and principles as the ***Modernization Blueprint***. Throughout the ***Modernization Blueprint***, specific references point to where COTS is encouraged (see Rule 3, Conclusion 3, first Discussion point for examples referenced from ***Modernization Blueprint***).

The PRIME offerors are expected to employ the use of commercially available technology and products in the implementation solutions where feasible, notwithstanding those potential applications of COTS identified by the IRS in the ***Modernization Blueprint*** (see Rule 3, Conclusion 3, first Discussion point for examples referenced from ***Modernization Blueprint***.)

▲ Specialized Commercial Resources

The PRIME must leverage Commercial Sector Consulting expertise to maximize opportunities to reengineer and thereby improve the efficiency and effectiveness of the IRS.

It is expected that the PRIME would propose extensive commercial sector consulting capabilities insofar as the IRS principal business enterprises are analogous to a variety of private sector business operations, including but not limited to the:

- Management of call sites;
- Customer Service programs;
- Large scale data capture operations;
- Accounting;
- Financial reporting;

- Delinquent debt collections; and
- Auditing.

✦ **Conclusion 2**

Release 1 employs a low risk, incremental approach that includes the development, testing and evaluation of pilots; and the subsequent full-production system development and implementation, in accordance with the industry-standard system life cycle adopted by the IRS.

✦ **Discussion**

▲ Modernization occurs overall in five Phases, each strategically defined to deliver functionality and benefits associated with mission objectives of the IRS.

- Phase I: Customer Service Through Accessing Corporate Data (including support for non-face-to-face Compliance functions).
- Phase II: Field Compliance (local case management and laptop computer integration).
- Phase III: Complete Corporate Data (and retire the Master Files).
- Phase IV: Financial Reporting (and Compliance Research through corporate data access).
- Phase V: Reengineered Submissions Processing (to accelerate processing timeframes, improve accuracy, and reduce costs).

▲ Release 1 is defined by five subreleases, each intended to provide benefits in mission-critical functions, independent of the other subreleases. The Release 1 plan includes the development of a pilot, following the system life cycle; the testing and evaluation of the pilot results prior to the implementation of the full-scale, production system deployable nationwide.

- Subrelease 1.1: Primary Telephone Call Routing and Management (including telephone and Internet access to non-account tax information by taxpayers).
- Subrelease 1.2: Enhanced Secondary Telephone Call Routing and Management (including expanding automated self-service applications to access centralized account-based data).
- Subrelease 1.3: Infrastructure and Security (including enhancements for Customer Service and Compliance access to modernized and legacy data through a single universal secure workstation).
- Subrelease 1.4: Corporate Databases Read Only (including implementation of three centralized corporate databases, and additional security and audit analysis capabilities.).

- Subrelease 1.5: On-line Adjustments (including applications to provide the capability to perform line item adjustments, on-line, with associated penalty and interest calculations; expansion of the centralized databases; additional applications to provide automated self-service for account-based inquiries; and new management information system data capture, tracking, and reporting).

▲ Each subrelease is independently defined, engineered, developed, piloted, tested, and deployed following the system life cycle.

✦ **Conclusion 3**

Release 1 is planned and managed in accordance with the IRS's Program Management Approach, with the Government Program Management Office (GPMO) responsible for planning and managing all modernization activities performed by IRS and private sector partners; establishing measures of accountability for cost, schedule, and deliverables developed by, or received from, those contractors; and for obtaining private sector expertise to deliver modernization objectives.

✦ **Discussion**

▲ The GPMO is responsible for Program Management and Control for all modernization activities, including:

- Contractor management for the ISC, the FFRDC, and the PRIME; and
- Adopting performance measures and evaluating the performance of contractors against those measures.

▲ The GPMO employs standard program management tools to plan each stage of the effort, assess progress and track, report and resolve issues to mitigate schedule, cost or performance risk.

▲ The GPMO manages expectations and evaluates progress against cost, and schedule, and evaluates the completeness, quality and life cycle compliance of all deliverables.

✦ **Conclusion 4**

The *Modernization Blueprint* and the Release 1 subset have been defined in accordance with the Systems Life Cycle, which requires significant involvement of the business throughout, and formalizes buy-in through review, approval and baselining.

✦ **Discussion**

▲ ***Modernization Blueprint*** requirements were developed with the Business Enterprises, and approved at a target System Requirements Review (SRR) to establish a controlled baseline.

- The ***Modernization Blueprint*** architecture was developed with the representation of, and periodic review by, the Business Enterprises, and formally approved at a target System Design Review (SDR) to establish a controlled baseline.
- The scope of Release 1 and the five subreleases was reviewed and approved by the Business Enterprises through development and validation of Business Needs Statements, in the Release Definition phase of the systems life cycle.
  - This process included consideration of business priorities, and an engineering analysis to determine the technical considerations, resulting in the approval of the Release 1 definition through a Change Control process and a Change Control Board (CCB) review.
  - Formal approval of the Sequencing Plan and the modified Release 1 plan was provided by Business through a Sequencing Plan Review (SPR).
- Business participation has continued in the definition of the requirements for Subrelease 1.1 and 1.2 systems. These will be reviewed and validated, as well, through an SRR for each subrelease.

7. Rule 7: Implementation

Can the investment be implemented in phased, successive chunks as narrow in scope and brief in duration as practicable, each of which solves a specific part of an overall mission problem and delivers a measurable net benefit independent of future chunks?

✦ **Conclusion 1**

The overarching strategy behind the *Modernization Blueprint* is an incremental build approach. Modernization is defined in five overall Phases, each of which decompose into several Releases, with a total of 16 across the five Phases. Release 1 is the first of these Releases, and is further segmented into five subreleases, each of which consists of Subsystems, which are an integrated set of Configuration Items (CIs), which are further described as a series of Build Elements which represent the specific technical activities required to develop the Subrelease systems in logical, manageable development and deployment efforts.

✦ **Discussion**

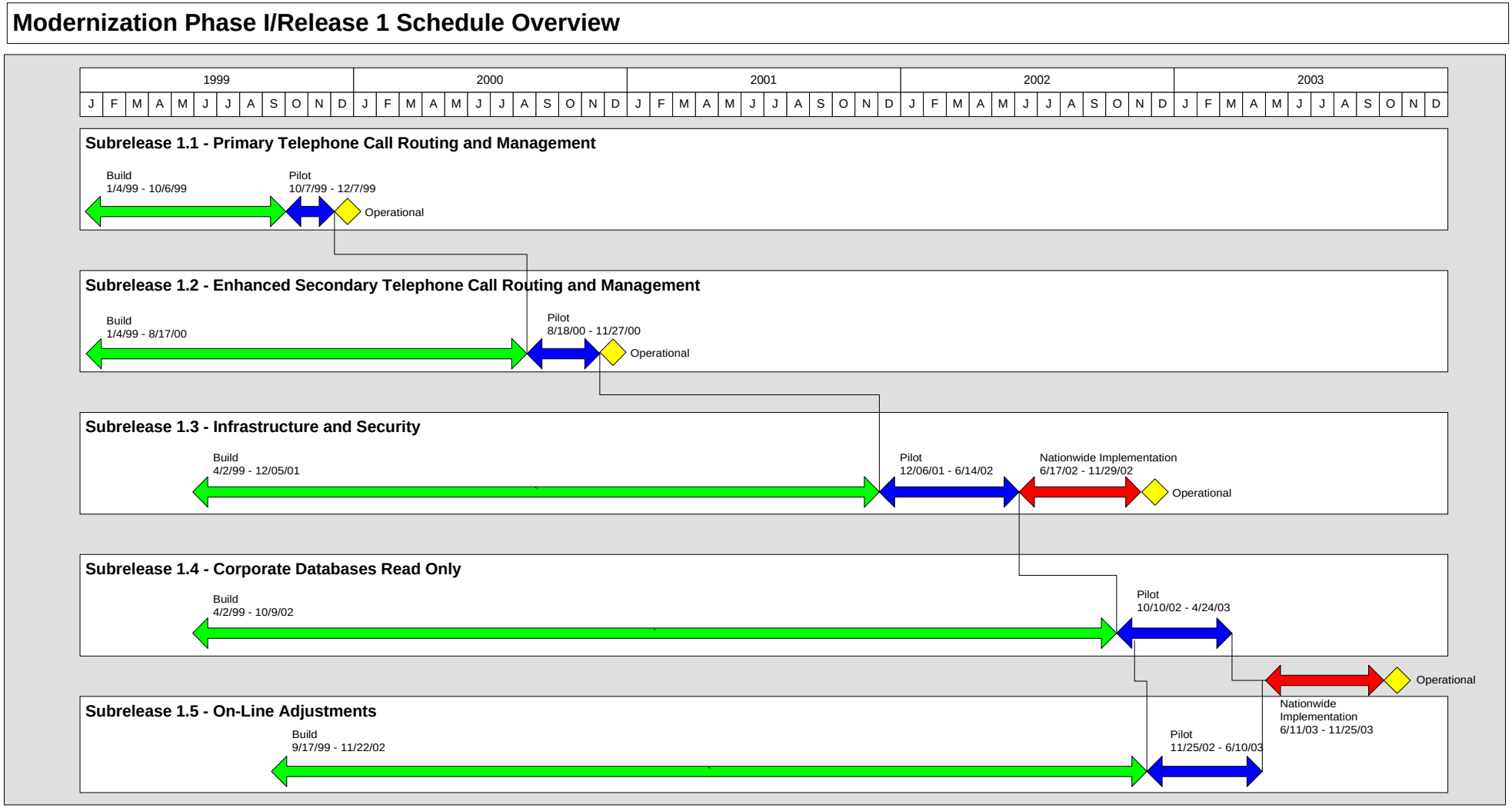
- Each Release 1 subrelease is narrow in scope and technical complexity and can be developed and piloted in a reasonable timeframe.
  - Subrelease 1.1, Primary Telephone Call Routing and Management, consists of 15 subsystems and 24 Configuration Items (CIs) and is estimated at 9 months to build and 2 months to pilot.
  - Subrelease 1.2, Enhanced Secondary Telephone Routing and Management, consists of 22 subsystems and 39 Configuration Items (CIs) and is estimated at 19 months to build and 3 1/2 months to pilot.
- All modernization activity, whether it be the definition of the releases and subreleases, or the design, development, pilot, testing, and implementation activities, are performed under the system life cycle, and the scope and definition of Release 1 subreleases is under Configuration Management control.

✦ **Conclusion 2**

Each Release 1 subrelease is defined to deliver measurable benefits in support of specific objectives defined in the Strategic Plan and PFR for the Customer Service and Compliance business enterprises.

Modernization Phase I/Release 1 Schedule Overview

Based on risk adjusted government estimates, it is currently projected that Phase I/Release 1 be fully developed in accordance with the schedule below. The Modernization Phase I/Release 1 schedule was developed using the COCOMO (COnstructive COst MOdel) estimation tool for development and using IRS/ISC technical and programmatic expertise for non-development activities. The schedule below was **adjusted to account for schedule risk** pursuant to the application of the Monte Carlo risk simulation tool.



✦ **Discussion**

▲ The capabilities provided in the Release 1 subreleases provide functionality that clearly relates to the strategic goals and objectives of the IRS Business Enterprises as follows:

- Maximize Calls Answered by:
  - — Implementing screening Voice Response Unit capabilities, working in conjunction with the National Call Router capabilities, to load balance incoming calls and route calls based on area of expertise;
  - — Directing more routine calls to automated self-service applications, increasing the number of live assistor calls handled; and
  - — Providing access to centralized databases through a universal secure workstation for call resolution.
- Provide Accurate and Timely Data by:
  - — Posting data more timely, reducing the two-week window to 24 hours;
  - — Implementing authoritative databases for single point access to data;
- Increase Revenue Through Case Resolution by:
  - — Providing common tools to support interactive sessions with taxpayers and IRS staff and ASSA (e.g., tax penalty and interest calculations);
  - — Providing flexibility to reassign resources to emerging compliance trends through common applications;
  - — Implementing the security infrastructure to provide secure access to data and support prevention and detection requirements; and
  - — Providing universal secure workstations that support complete case resolution from a single device.
- Support the Ability to Comply with Mission Critical Directives by:
  - — Providing enhanced services to taxpayers to reduce taxpayer burden; and
  - — Supporting revenue generation through access to timely and accurate data.

8. Rule 8: Acquisition Strategy

Does the investment employ an acquisition strategy that appropriately allocates risk between government and contractor, effectively uses competition, ties contract payments to accomplishments, and takes maximum advantage of commercial technology?

✦ **Conclusion 1**

Release 1, as a subset of a much larger implementation plan, is governed by the controlling acquisition strategy for all Modernization, which focuses on full and open competition at all levels of development, across all levels of the partnerships between the PRIME and subcontractors.

✦ **Discussion**

The guiding principles that govern the acquisition strategy, as set forth in the RFP, include but are not limited to:

▲ **The Competitive Acquisition of the PRIME Must be Based to Some Extent on Contractor "Solutions" but to a Greater Extent on Contractor "Capabilities."**

IRS is unable to prepare detailed systems specifications for a material component of the massive Modernization effort that would enable a traditional "solutions" based procurement (i.e., a competitive acquisition culminating in a fixed price proposal and based on the evaluation of Technical and Cost Proposals to develop and implement a system predicated on detailed government specifications). Thus, while the procurement strategy must be predicated to some extent, on a "solutions" based competition, to a far greater extent, the acquisition must be based on the "capabilities" of the private sector to successfully apply the necessary resources and processes to address the unique needs and limitations of the IRS;

▲ **The Government Must Be Assured of Post Award Cost Competition.**

While the IRS seeks to enter into a long-term contractual partnership with the private sector (e.g., fifteen years), through the competitive acquisition of a PRIME, the government must be assured that the contract would provide for effective cost competition for the duration of what is likely to be a multi-billion dollar contract extending into the next millennium;

- **Contracting Vehicles Must Provide for Public/Private Sector Shared Risks and Opportunities.**

  Given the breadth and depth of Modernization and the associated costs as well as the need to forge a public-private sector business partnership that provides for shared risk and rewards between the parties, the partnership must employ contracting strategies that reflect the tenets of the Information Technology Management Reform Act (e.g., measurable systems outcomes, consideration of alternative technical solutions, risk analysis, return on investment analysis) including, but not limited to, performance based contracting approaches;

- **The PRIME Must Leverage Commercial Sector Consulting Expertise to Maximize Opportunities to Reengineer and Thereby Improve the Efficiency and Effectiveness of the IRS.**

  While the IRS performs a variety of inherently governmental functions, it is evident that analogous private sector enterprises have benefited from reengineering efforts. Accordingly, the PRIME must apply commercial sector consulting and reengineering expertise to maximize improvements in the major IRS business enterprises (e.g., submissions processing, Customer Service, auditing, tax collection and financial reporting).

- **The PRIME and its Subcontractors Must Provide the Requisite Capabilities and Capacities.**

  The PRIME and its subcontractors must provide the capabilities and capacities to function utilizing defined processes and practices which meet or exceed the Software Engineering Institute (SEI) Capability Maturity Model (CMM) Level 3 for both Software Development (SW) and Software Acquisition (SA).

- **IRS and the PRIME Must Ensure the Continuity and Commitment of the Integration Support Contractor to Provide for the Near-Term Completion of Process Improvement Projects and Longer Term Engineering and Architecture Services.**

  To ensure continued momentum within the IRS with regard to Modernization, the IRS must continue process improvement projects during fiscal year 1998 in partnership with the Integration Support Contractor which has successfully implemented significant process improvements with the Service. To ensure continuity, effective knowledge transfer and the availability of systems engineering and technical assistance services, the IRS and its PRIME contractor must provide sufficient opportunity and incentives for the ISC to commit appropriate expertise to the long term Modernization.

- **IRS Must Complete the Acquisition of a Federally Funded Research and Development Center.**

  Notwithstanding the expertise and commitment of the ISC to Modernization, the IRS must complete the competitive acquisition of a Federally Funded Research and Development Center to provide strategic consulting and selected Independent Verification and Validation Services that would complement the roles of the IRS, the ISC and the PRIME.

- **Conclusion 2**

  The IRS and the PRIME will effectively use competition throughout the duration of the PRIME arrangement through competitively awarded subcontracts to complete work on components of each subrelease.

- **Discussion**

  - **Effective Use of Competition**

    Cost competition will be ensured by requiring that the PRIME, responsible for Level III specifications, would administer a competitive acquisition among its principle subcontractors and other subcontractors to undertake development of the detailed Level IV work packages and to complete systems development. Level IV subcontractors would enter into a performance based or fixed price or alternative contracting arrangement.

    All commodities would be acquired through a PRIME administered cost competition, but the government would reserve the right to substitute equivalent commodities acquired from existing government contracts. COTS hardware, middleware, and software solutions will be applied where feasible.

- **Conclusion 3**

  The acquisition strategy for the PRIME ties contract payments directly to accomplishments through a strategy of performance based contracts.

- **Discussion**

  The IRS intends to award performance based contracts to the PRIME based on the use of metrics to measure outcome, with compensation based on achieving the measurable outcome. For example, compensation for the development of the Subrelease 1.1 pilot would only occur after the system pilot successfully met pre-agreed upon measurable outcomes, negotiated between the IRS and the PRIME.

✦ **Conclusion 4**

The acquisition strategy for the PRIME is designed to encourage the acquisition of commercially available technology and services to implement Modernization.

✦ **Discussion**

The PRIME offerors are expected to employ the use of commercial off-the-shelf (COTS) software, middleware, and hardware components wherever feasible in the implementation solutions, notwithstanding those potential applications of COTS identified by the IRS in the ***Modernization Blueprint*** (see Rule 3, Conclusion 3, first discussion point for examples referenced from ***Modernization Blueprint***.)

▲ **Specialized Commercial Resources**

The PRIME must leverage Commercial Sector Consulting expertise to maximize opportunities to reengineer and thereby improve the efficiency and effectiveness of the IRS.

It is expected that the PRIME would propose extensive commercial sector consulting capabilities insofar as the IRS principal business enterprises are analogous to a variety of private sector business operations, including but not limited to the:

- Management of call sites;
- Customer Service programs;
- Large scale data capture operations;
- Accounting;
- Financial reporting;
- Delinquent debt collections; and
- Auditing.

APPENDIX A
BUSINESS NEEDS

APPENDIX A: BUSINESS NEEDS

As the first step in the decomposition of the ***Modernization Blueprint***, the functional scope of Phase I/Release 1 was defined in more detail and approved by the Business Enterprises and IRS Information Systems. This activity, performed in the Release Definition stage of the IRS's System Life Cycle, was an important prerequisite for both the development of this Business Case and beginning the development of engineering specifications for Phase I/Release 1 subreleases.

The methodology employed in Release Definition was to define the functionality required in the release in terms of Business Need Statements (BNSs). IRS Business and Information Systems representatives, along with the Integration Support Contractor (ISC) performed this effort. The Business Needs defining Phase I/Release 1 appear in the chart that follows. Each Business Need is assigned an identification number, the Business Need Identifier (BNID), which identifies the subrelease and the Business Need number (for example; 1.2.200 is Subrelease 1.2, BNS 200).

Phase I/Release 1 Business Needs

Subrelease 1.1		
BNID	**Title**	**Business Need**
1.1.100	• Establish non-account-based automated self-service applications (ASSA)	• Establish non-account based-automated self-service applications (ASSA) for the telephone and Internet to address taxpayer inquiries
1.1.101	• Enhance the telephone infrastructure	• Enhance the telephone infrastructure to handle more taxpayer calls: — New VRUs and increased server capacity — Nationwide call routing for Customer Service toll free telephone numbers including:1040 (Tax Return), 8815 (Response to a Notice), and 4262 (Refund) based on call volume — Augment telephone infrastructure capabilities
1.1.103	• Establish national infrastructure services	• Establish national infrastructure services to support access to non-account scripts and tax law including: — Storage — Software — Databases — Backup and recovery — Network management — Increased data and telecommunications capacity
1.1.104	• Enhance MIS data consolidation and reporting	• Enhance MIS data consolidation and reporting for the capabilities being implemented in this subrelease: — Nationwide telephone MIS data — Internet MIS data

Phase I/Release 1 Business Needs (Continued)

Subrelease 1.2		
BNID	**Title**	**Business Need**
1.2.200	• Establish a centralized repository to support account-based ASSAs	• Establish a centralized repository to provide a single source of access to taxpayer account data to support Refund and Fact of Filing inquiries
1.2.201	• Establish account-based ASSAs	• Establish account-based ASSAs to address taxpayer inquiries regarding Refund and Fact of Filing
1.2.205	• Expand national infrastructure services	• Expand national infrastructure services to expand and monitor on-line access to legacy and corporate processing and data including: — Expanded servers capacity — Expanded storage capacity — Software — Databases — Security services — Systems and performance management — Backup and recovery — Network management — Increased Data and telecommunications capacity
1.2.206	• Provide common integrated security management services	• Provide common integrated security management services for telephone and Internet users including: — Identification & Authentication of taxpayers for Refund and Fact of Filing inquiries — Audit trail of all tax related telephone and Internet accesses
1.2.207	• Establish the corporate mainframe computing infrastructure	• Establish a corporate mainframe computing infrastructure that provides a centralized and integrated processing environment including: — Storage — Software — Databases — Security devices — Systems and performance management — Operating systems management

Phase I/Release 1 Business Needs (Continued)

Subrelease 1.3		
BNID	**Title**	**Business Need**
1.3.202	• Establish initial inquiry processing	• Establish initial inquiry processing capabilities to support Refund and Fact of Filing inquiries for taxpayers requiring live assistance from a Customer Service Representative (CSR)
1.3.203	• Establish initial installation of a standard GUI	• Establish initial installation of a standard GUI to provide access to legacy and corporate processing and data: — Access to multiple systems from a single workstation — Provide standard presentation to corporate data — Increase workstation security — Continued legacy system access through the universal secure workstations — Provide screen presentation tailored to user community — Provide on-line support for each new application
1.3.205	• Establish regional infrastructure services	• Establish regional infrastructure services to expand and monitor on-line access to legacy and corporate processing and data including: — Servers — Storage — Terminal emulation — Software — Regional databases — Security services — Systems and performance management — Backup and recovery — Increased data and telecommunications capacity
1.3.206	• Expand common integrated security management services	• Expand the common integrated security management services for corporate workstation users including: — Identification & authentication of users — Audit trail of all workstation transactions

Phase I/Release 1 Business Needs (Continued)

Subrelease 1.4		
BNID	**Title**	**Business Need**
1.4.300	• Establish a centralized repository of taxpayer account, case, and tax return data	• Establish a centralized repository to provide a single source of research access to individual taxpayer account, case, and tax return data on the Corporate platform: — Populate the TADB with data from Master File and IDRS TIF (IMF only) — Populate the CCDB with data from AIMS, AUR, ACS, ICS, ASFR, and RGS/ERCS — Populate the TRDB with data from the legacy TRDB(ELF) — Provide the capability for research access to TADB, CCDB, and TRDB
1.4.301	• Establish daily update of Master File	• Establish daily update of Master File to improve currency of data to on-line users: — IMF daily posting
1.4.302	• Enhance standardized GUI for Subrelease 1.4	• Enhance standardized GUI to provide screen presentations for TADB, CCDB, and TRDB
1.4.303	• Expand the corporate mainframe computing infrastructure	• Expand the corporate mainframe computing infrastructure that provides increased capacity and performance including: — Processors — Storage — Software — Databases — Systems and performance management — Backup and recovery — Security services — Operations management
1.4.305	• Expand the common integrated security management services	• Upgrade the integrated security management services to include: — Security Audit database (SADB) at MCC — Audit trail activity for corporate systems — Post Audit Analysis System (PAAS) — Encryption — Additional security reports

Phase I/Release 1 Business Needs (Continued)

Subrelease 1.5		
BNID	**Title**	**Business Need**
1.5.400	• Enhance the centralized repository to support synchronization with legacy systems	• Enhance the centralized repository to provide: — Limited update access to TADB, CCDB, and TRDB to support line item adjustments and account-based ASSA — Daily update of TADB and CCDB with legacy data
1.5.401	• Enhance the ASSAs	• Enhance the ASSAs: — Provide additional account-based applications — Modify existing account-based applications to access the corporate databases established in Subrelease 1.4
1.5.402	• Establish initial case processing capabilities	• Establish initial case processing capabilities to include line item adjustment functionality for Customer Service and Compliance case work: — 1040 (Schedule A, B, C, D, E, and F) — Form 2441 (Child and Dependent Care Expenses) — Form 6251 (Alternative Minimum Tax - Individual) — Provide systemic capture of case history — Perform on-line calculation of penalty and interest, due dates, module and account balances — Provide training tools and on-line support for each new application — Provide operational reports
1.5.403	• Enhance standardized GUI for Subrelease 1.5	• Enhance standardized GUI to provide screen presentations for line item adjustments
1.5.404	• Enhance MIS data collection and reporting for Subrelease 1.5	• Enhance MIS data collection and reporting: — Includes establishing framework for a common integrated MIS data collection and reporting capability — Implements MIS data collection and reporting specific to Subrelease 1.5
1.5.405	• Expand regional and corporate infrastructure services by implementing the Technical database	• Implement the Technical database (TECHDB) to provide data for the regional and corporate infrastructure services: — TECHDB contains data used by the system software and support software to provide a technical infrastructure

APPENDIX B
PERFORMANCE MEASURES

APPENDIX B: Performance Measures

As required by the GPRA, the IRS has integrated the Fiscal Year Strategic Plan & Budget with a strategic plan for program activities. The Government Cost Estimate provided by the IRS in this Business Case is based upon a cost/benefit analysis where the benefits are tied to the functionality provided in Phase I/Release 1. The functionality has been prioritized based upon the measures to be achieved as stated in the Strategic Plan. The success or failure of the Phase I/Release 1 investment will be evaluated based upon these performance measures.

The performance measures for Phase I/Release 1 are defined in "IRS Mission Performance Measure Definitions," "Customer Service/CS Compliance Performance Measure Definitions," and "Customer Service/TPS Performance Measure Definitions." Rates for performance measures are applied to the business case benefit as specified in "Phase I/Release 1 Performance Measure Rates." The definition of many of the baseline performance measures for FY1998 are in the process of being redefined. These are presented as TBD (To Be Determined).

IRS Mission Performance Measure Definitions

Performance Measures	Definitions
Servicewide Measures:	
1. Mission Effectiveness Indicator (MEI).	Compares the revenue expected to be collected during a fiscal year, less the cost of collecting that revenue, with the amount of revenue that would be collected if all tax obligations were honored. The four components of the equation are: budget, total net revenue, burden, and total true tax liability.
2. Taxpayer Burden Cost (in dollars) for IRS To Collect $100.	Ratio that measures the costs imposed on the private sector for IRS to collect $100 in net tax revenue. Net tax revenue includes all revenue collected (income, employment, estate and gift, and excise taxes) by the IRS in a fiscal year, less refunds. Private sector costs cover both paperwork and contact burden imposed on the public as a result of the Federal tax reporting system administered by IRS. Paperwork burden generally covers taxpayer activities before and up to the time a tax return is filed while contact burden primarily covers activities that occur after a tax return has been filed by a taxpayer. Private sector costs of paperwork burden are based on the estimated time individual and business taxpayers spend keeping tax records, learning about tax laws, preparing tax forms, and sending tax forms to the IRS. Private sector costs of contact burden are based on the estimated time taxpayers spend in customer service, enforcement, and tax litigation activities as well as lost refund interest and out-of-pocket costs to obtain private letter rulings. Where necessary, taxpayer burden is converted from time into dollars for individuals and businesses using Bureau of Labor Statistics wage rate data. The IRS recognizes that the burden computation is not precise, and work is underway to improve it.
3. Budget Cost To Collect $100.	Ratio that measures the IRS' budget cost of collecting $100 in net tax revenue. Net tax revenue includes all revenue collected (income, employment, estate and gift, and excise taxes) by the IRS in a fiscal year, less refunds. Note: The target is highly dependent on the growth of the economy and IRS' budget.
4. Total Collection Percentage.	Ratio of total collections to estimated total true tax liability. (True tax liability equals the amount of tax which should have been paid, whether or not it is collectible.) The IRS recognizes that the total true tax liability computation is not precise and work is underway to improve it.
5. Total Net Revenue	All revenue collected by the IRS, including enforcement collections, but excluding refunds.

IRS Mission Performance Measure Definitions (Continued)

Performance Measures	Definitions
Customer Service Operations:	
1. ASSA Tax Law Calls Answered (w/o Teletax).	The count of all Tax Law calls answered at Customer Service sites (Toll-Free and ACS) by any automated system (TRIS/ATL excluding Teletax).
2. ASSA Account Calls Answered (w/o Teletax).	The count of all account calls answered at Customer Service sites (Toll-Free and ACS) by any automated system (TRIS/ATL excluding Teletax).
3. Number of Referrals.	Number of cases transferred from one CSR to another CSR either written or electronically.
4. CS Tax Law Telephone Production Rate.	Total of all assistor calls answered per hour on tax law issues. This excludes all automated call and messaging.
5. CS Account Telephone Production Rate.	Total of all assistor calls answered per hour on account issues. This excludes all automated call and messaging.
6. CS Paper Production Rate.	Number of Customer Service IMF Adjustment cases resolved per hour.
7. ASSA Tax Law Calls Completion Rate.	Number of taxpayers who successfully complete a Tax Law automated application using ASSA systems (ATL and TRIS).
8. ASSA Account Calls Completion Rate.	Number of taxpayers who successfully complete an account automated application using ASSA systems (TRIS).
Reinvestment Measures :	
1. Increase PYA CS Assistor Calls Answered.	The count of all calls answered at Customer Service Sites (Toll-Free and local lines), including 8815, 1040, 4262, ACS, Criminal Investigation, VITA/TCE line, non-toll-free Practitioner and Commissioner Hotlines, or administrative lines.
2. Increase PYA ACS Dollars Collected.	Increase in ACS dollars collected over prior year actuals.
3. Increase AUR Dollars Collected.	Increase in AUR dollars collected over prior year actuals.
4. Increase SC Examination Dollars Collected.	Increase in SC Examination dollars collected over prior year actuals.
5. Increase PYA SFR Dollars Collected.	Increase in SFR dollars collected over prior year actuals.
6. Increase EP/EO Dollars Collected.	Increase in EP/EO dollars collected over prior year actuals.

✦ **Servicewide Performance Measures:**

Following are the Servicewide Performance Measures expected to be directly impacted by the technology being implemented in Phase I/Release 1. The values reflected in this chart, except for the reinvestment measures, are consistent with the goals described in the IRS Strategic Plan Through 2002.

Performance Measures	Subrelease 1.1	Subrelease 1.2	Subrelease 1.3	Subrelease 1.4	Subrelease 1.5
Servicewide Measures					
– Mission Effectiveness Indicator	78%	78%	78%	78%	78%
– Taxpayer Burden Costs to Collect $100	$8.68	$8.68	$8.68	$8.68	$8.68
– Budget Costs to Collect $100	40 ¢	40 ¢	40 ¢	40 ¢	40 ¢
– Total Collection Percentage	87.4%	87.4%	87.4%	87.4%	87.4%
Servicewide Reinvestment Measures					
– Increase PYA Total Net Revenue Collected (w/loa)	**374.3M** ↑	**1.5M** ↑	**47.1M** ↑	N/A	**1.2B** ↑
– Increase PYA Total Net Revenue Collected (w/oloa)	**1.7B** ↑	**.7M** ↑	**22.4M** ↑	N/A	**646.6M** ↑

PYA = Prior Year Actual

✦ **Customer Service Operations Measures:**

Following are the Customer Service Operations performance measures that will be impacted by the technology being implemented in Phase I/Release 1. The values reflected in this chart are the increases expected in either calls answered or productivity improvements. The values in bold indicate the subrelease in which the increases over PYAs will occur. The same level of improvement is maintained through the balance of the subreleases.

Performance Measures	Subrelease 1.1	Subrelease 1.2	Subrelease 1.3	Subrelease 1.4	Subrelease 1.5
Customer Service Operations					
– ASSA Tax law Calls Answered (w/o Teletax)	**4.4M** ↑	4.4M	4.4M	4.4M	4.4M
– ASSA Account Calls Answered (w/o Teletax)	n/a	n/a	n/a	n/a	**1M** ↑
– Decrease PYA Number of Referrals	n/a	n/a	n/a	n/a	**20%** ↓
– CS Tax Law Telephone Production Rate	n/a	n/a	**6%**↑	6%	6%
– CS Account Telephone Production Rate	n/a	n/a	n/a	n/a	**9%** ↑
– Increase PYA CS Paper Production rate	n/a	n/a	n/a	n/a	**40%** ↑

Performance Measures	Subrelease 1.1	Subrelease 1.2	Subrelease 1.3	Subrelease 1.4	Subrelease 1.5
– ASSA Tax Law Calls Completion Rate	80%	80%	80%	80%	80%
– ASSA Account Calls Completion Rate	n/a	95%	95%	95%	95%

PYA = Prior Year Actual

✦ **Reinvestment Measures:**

Compliance Operations performance measures will not be impacted directly by the technology delivered in Phase I/Release1 except through the reinvestment of staff year savings derived from those areas that are impacted by this release. Following are the Compliance Operations performance measures that will be impacted by the reinvestment of the staff year savings achieved in each of the subreleases. The values reflected in this chart are the increases expected in calls answered and revenue collection. The values in bold indicate the subrelease in which expected increases over PYAs will occur. Improvements continue to increase until goals are achieved. Once a goal is achieved, the same level of improvement is maintained through the balance of the subreleases.

Performance Measures	Subrelease 1.1	Subrelease 1.2	Subrelease 1.3	Subrelease 1.4	Subrelease 1.5
Reinvestment Strategy (w/ Level of Access)					
– Increase PYA CS Assistor Calls Answered	**3.2M ↑**	3.2M	3.2M	3.2M	3.2M
– Increase PYA ACS Dollars Collected	**374.3M ↑**	**1.5M ↑**	**47.1M ↑**	-	**627M ↑**
– Increase PYA AUR Dollars Collected	n/a	n/a	n/a	n/a	**411M ↑**
– Increase PYA SC Examination Dollars Collected	n/a	n/a	n/a	n/a	**111M ↑**
– Increase PYA SFR Dollars Collected	n/a	n/a	n/a	n/a	**52.7M ↑**

PYA = Prior Year Actual

Performance Measures	Subrelease 1.1	Subrelease 1.2	Subrelease 1.3	Subrelease 1.4	Subrelease 1.5
Reinvestment Strategy (w/o Level of Access)					
– Increase PYA ACS Dollars Collected	**1.1B ↑**	1.1B	1.1B	1.1B	1.1B
– Increase PYA AUR Dollars Collected	**56.3M ↑**	**.7M ↑**	**22.4M ↑**	-	**332M ↑**
– Increase PYA SC Examination Dollars Collected	n/a	n/a	n/a	n/a	**169M ↑**
– Increase PYA SFR Dollars Collected	n/a	n/a	n/a	n/a	**117M ↑**
– Increase PYA EP/EO Dollars Collected	n/a	n/a	n/a	n/a	**28.6M ↑**

PYA = Prior Year Actual

APPENDIX C
COST AND BENEFIT ASSUMPTIONS

APPENDIX C: COST AND BENEFIT ASSUMPTIONS

✦ Risks Related to Stay in Business Projects

"Stay in Business" initiatives are those high priority business-line investments that have been determined to be so critical to the mission and effectiveness of the IRS that their development must be supported in advance of the establishment of a partnership with the PRIME contractor and subsequent development of the ***Modernization Blueprint***. Request for Proposals (RFP) Volume I, "***Modernization Blueprint***, Request for Proposals for a PRIME Systems Integration Services Contractor," Section X includes a chart (Identification of IRS Technology Initiatives In-Progress That Impact the Pilot) that lists all the stay in business initiatives.

Each stay in business initiative was evaluated to determine if its impact on Phase I/Release 1 represented simply an interface between the stay in business initiative and the modernized systems, or if the impact represented a dependency whose risk should be assessed. In general, Phase I/Release 1 is not closely dependent on the success of the stay in business initiatives. There are two exceptions: the Customer Service Call Router Rollout (CSCRR) and the Service Center Mainframe Consolidation project.

Subreleases 1.1 and 1.2 are dependent on the Customer Service Call Router Rollout. As currently planned, the CSCRR project is scheduled to evaluate a limited prototype and implement nationwide during 1998. From a benefits development perspective, we assume that secondary call routing to CSRs will be in place prior to Subrelease 1.1 for load balancing and that the PRIME contractor will be responsible for further development of the call routing system (primary routing and secondary routing to automated applications). From a cost development perspective, if secondary call routing to CSRs is not in place for the PRIME contractor to use as a foundation to build on, the PRIME contractor will have to implement that functionality. The RFP instructs the offerors to include the cost of primary call routing and secondary routing to automated applications in their proposals.

Subreleases 1.3 through 1.5 are dependent on the Service Center Mainframe Consolidation project primarily for the rollout of workstations (terminals). However, the 2-year Service Center Mainframe Consolidation implementation schedule would need to slip by 4 years before it would impact Subrelease 1.3, which is deployed in fiscal year 2002. The terminal replacement deployment portion of the consolidation schedule is likely to slip because of the scope and level of effort for terminal replacement such as number of sites, number of terminals and programmatic dependencies (including the General Services Administration and National Treasury Employees Union (NTEU)). However, it is highly unlikely that the schedule would slip enough to impact Subrelease 1.3 since a significant number of the existing workstations cannot be made century date change compliant and therefore must be replaced prior to January 2000.

- **Cost Assumptions**

  The Cost Assumptions used to determine the value of the derived cost are described in the following charts:

  - **General Cost Assumptions**
  - **Program Management and Planning Investment Cost Assumptions**
  - **Acquisition Investment Cost Assumptions**
  - **Development Investment Cost Assumptions**
  - **QA Test & Pilot Investment Cost Assumptions**
  - **Rollout Investment Cost Assumptions**
  - **Training & Procedures Investment Cost Assumptions**
  - **Management and Administration Investment Cost Assumptions**
  - **Operations and Maintenance Investment Cost Assumptions**
  - **Nationwide Hardware Software Costing**

- **Benefit Assumptions**

  The Benefit Assumptions used to determine the value of the derived benefits are described in the following charts:

  - **General Benefit Assumptions**
  - **Phase I/Release 1 Subrelease 1.1 Benefit Assumptions**
  - **Phase I/Release 1 Subrelease 1.2, 1.3, & 1.4 Benefit Assumptions**
  - **Phase I/Release 1 Subrelease 1.5 Benefit Assumptions**

- **Amortized Configuration Item Assumptions**

  The amortization of Configuration Items (CIs) across the five subreleases of Phase I/Release 1 are defined in the following charts. The '%' column indicates the percentage of the CI development cost that is allocated to Phase I/Release 1, given that the CI will be used in subsequent releases to support additional applications. The percentage rate multiplied by the full cost to develop and use the CI is used to calculate the cost of the CI for Phase I/Release 1. Likewise, the full cost to develop and use the CI is used to calculate the Projected Funding Requirements (PFR) required by fiscal year during Phase I/Release1.

  - **Phase I/Release 1 Subrelease 1.1 Amortized Software CI Rate**
  - **Phase I/Release 1 Subrelease 1.1 Amortized COTS CI Rate**
  - **Phase I/Release 1 Subrelease 1.2 Amortized Software CI Rate**
  - **Phase I/Release 1 Subrelease 1.2 Amortized COTS CI Rate**
  - **Phase I/Release 1 Subrelease 1.3 Amortized Software & COTS CI Rate**
  - **Phase I/Release 1 Subrelease 1.4 Amortized Software CI Rate**
  - **Phase I/Release 1 Subrelease 1.4 Amortized COTS CI Rate**
  - **Phase I/Release 1 Subrelease 1.5 Amortized Software & COTS CI Rate**

COST ASSUMPTIONS

General Cost Assumptions

General Cost Assumptions	ROI Risk Mitigation
General Assumptions	
• The Business Case spans 15 years.	0
• Level III requirements will be developed prior to FY1999.	+
• CFO FY1998 PFR labor rates were used.	+
• FFRDC IRS Independent Cost Analysis (ICA) 9/95 Report was used to calculate non-development costs.	+
• ASSA usage reduces the utilization of TeleTax.	0
• Costs are normalized, therefore no inflation is depicted.	-
• Sunken Costs are not included.	+
• Schedule	
— Project start date is 10/1/98 (FY1999).	0
— Deploying the Systems Life Cycle, Systems Requirements Review (SRR), and Systems Design Review (SDR) will occur in two stages. Stage 1 for Subreleases 1.1 & 1.2 and Stage 2 for Subreleases 1.3, 1.4, and 1.5.	+
— Subreleases 1.1 & 1.2	
• PRIME is knowledgeable of requirements and design for Subreleases 1.1 & 1.2 as a result of preparing for the RFP bids, therefore an accelerated schedule for Subreleases 1.1 & 1.2 has been developed.	0
• COCOMO settings for Subreleases 1.1 & 1.2 were adjusted to account for previous knowledge acquired.	+
• The COCOMO level of effort and duration were used as the baseline. Schedule compression and resource leveling adjustments using COCOMO's level of effort and duration were made to produce the target schedule for Subreleases 1.1 & 1.2.	-
— Stage 1 Systems Requirements Review (SRR) starts on 10/2/98.	+
— Stage 1 Systems Design Review (SDR) depends on SRR.	+
— Software Development Environment (SDE) for Subreleases 1.1 & 1.2 depends on SDR.	+
— Planning and Software Specification Review (SSR) depends on SDR.	-
– Subreleases 1.1 and 1.2 can be developed in parallel and immediately after SDR.	
— Acquisition depends on SSR.	+
— Preliminary Design Review (PDR) depends on SSR.	+
— Critical Design Review (CDR) depends on PDR.	+

General Cost Assumptions (Continued)

General Cost Assumptions	ROI Risk Mitigation
— Code and Unit Test depends on CDR.	+
— Integration & Integration Testing (I&IT) depends on the acquisition of Integration Equipment and completion of the Code.	+
— Systems Acceptance Testing (SAT) depends on I&IT.	+
— Pilot depends on SAT and the acquisition of Production Equipment.	
– Pilot of Subreleases 1.1 & 1.2 occurs at MCC & TCC.	+
– Pilot is operational in Subrelease 1.1 for 1 month, then is operational.	0
– Pilot is operational in Subrelease 1.2 for 50 working days, then is operational.	0
— All equipment is deployed during the pilot for Subreleases 1.1 & 1.2, therefore Nationwide rollout is not necessary.	0
— Subreleases 1.3, 1.4 & 1.5	
• PRIME is given 66 working days for Transition/Ramp Up for Subreleases 1.3, 1.4, & 1.5 after Contract Award (1/1/1999).	+
• Subreleases 1.3, 1.4 & 1.5 schedule duration are extracted directly from COCOMO's duration baseline.	
— Stage 2 Systems Requirements Review (SRR) starts on 1/4/1999 after Transition/Ramp Up.	+
— Stage 2 Systems Design Review (SDR) depends on SRR	+
— Software Development Environment (SDE) for Subreleases 1.3, 1.4 & 1.5 depends on SDR.	+
— Planning and Software Specification Review (SSR) depends on SDR.	
– Subreleases 1.3 and 1.4 can be developed in parallel and immediately after SDR.	-
– Subrelease 1.5 begins 120 days after SDR.	+
— Acquisition depends on SSR.	+
— Preliminary Design Review (PDR) depends on SSR.	+
— Critical Design Review (CDR) depends on PDR.	+
— Code and Unit Test depends on CDR.	+
— Integration & Integration Testing (I&IT) depends on the acquisition of Integration Equipment and completion of the Code.	+
— Systems Acceptance Testing (SAT) depends on I&IT.	+
— Pilot depends on SAT and the acquisition of Production Equipment.	

General Cost Assumptions (Continued)

General Cost Assumptions	ROI Risk Mitigation
– Pilot of Subrelease 1.3 occurs at MCC, ATCSC, OSC, and Jacksonville and is operational for 4.5 months.	+
– Pilot of Subrelease 1.4 occurs at MCC, ATCSC, OSC and Jacksonville and is operational for 4.5 months.	+
– Pilot of Subrelease 1.5 occurs at MCC, ATCSC, OSC, and Jacksonville and is operational for 5.5 months.	+
— Nationwide rollout begins immediately after Post Pilot Review and Investment Evaluation.	
– Nationwide rollout is 5.5 months for Subrelease 1.3 and is across 21 Customer Service sites and 9 IRIS sites.	+
– Subrelease 1.4 & 1.5 rollout together across 21 Customer Service Sites.	0
• COCOMO Estimation	
— Software development will be completed by a SEI CMM Level 3 contractor.	+
— The SEI CMM Level 3 contractor will provide staff that have experience with the technology and development process "75th percentile" (COCOMO setting).	+
— There is good cooperation (COCOMO setting) among the stakeholders.	+

Program Management and Planning Investment Cost Assumptions

Program Management and Planning Investment Cost Assumptions	ROI Risk Mitigation
Development Investment Assumptions	
• Program Management and Planning Assumptions	
— Labor Assumptions	
• IS	
— IS PM&C labor will be performed by GPMO PM&C staff years at a rate of $89.5K (GS14/7) per staff year.	+
— IS PM&C labor was calculated by taking 20% of the total Contractor staff years (this calculation did not include the Contractor Acquisition staff years).	+
— IS AE&I labor was calculated by taking 15% of the total Contractor staff years at a rate of $75.5K (GS13/6) per staff year (this calculation did not include the Contractor Acquisition staff years).	+
— IS SS&E labor was calculated by taking 10% of the total Contractor staff years to ensure that IRS methodology and standards are enforced at a rate of $75.7K per staff year (this calculation did not include the Contractor Acquisition staff years).	+
• Non-IS	
— Non-IS planning labor for the Business user staff years is 5% of the Contractor staff years at a rate of $75.7K per staff year to support reviews of deliverables and to participate in walkthroughs.	+
• Contractor	
— Contractor planning Labor was calculated by COCOMO II.	+
— Contractor planning will commence at the beginning of each Subrelease.	+
— Contractor program management was calculated by taking 20% of the total Contractor staff years (this calculation did not include the Contractor acquisition staff years).	+
— Contractor labor to conduct the Subrelease 1.1 and 1.2 SRR and SDR was calculated as 25% of the labor for planning and product design and was applied to Subrelease 1.1 costs.	+
— Contractor labor to conduct the Subrelease 1.3 – 1.5 SRR and SDR was calculated as 25% of the labor for planning and product design and was applied to Subrelease 1.3 costs.	+
— Contractor Labor for planning and program management is $260K per year per staff year.	+
— Non-Labor Assumptions	
• Planning Non-labor costs includes the cost for the planning tool needed by GPMO for managing Phase I/Release 1.	+
• The planning tool will be acquired in FY1999. (There are no labor costs associated with acquiring the planning software for the GPMO.)	0

Acquisition Investment Cost Assumptions

Acquisition Investment Cost Assumptions	ROI Risk Mitigation
Development Investment Assumptions	
• Acquisition Assumptions	
— Labor Assumptions	
• IS	
— IRS will be responsible to acquire the maintenance equipment to support the IRS maintenance programmers.	-
• Non-IS	
— IRS labor to acquire the maintenance equipment is 6% of the maintenance equipment cost and is displayed under Labor Non-IS.	+
• Contractor	
— The Contractor will be responsible to acquire the production hardware and COTS products.	+
— The labor to acquire the hardware (HW) and COTS equipment is 6% of the total HW/COTS cost.	+
— The Contractor will be responsible to acquire the Contractor development and integration environment.	+
— The labor to acquire the development and integration testing equipment is 6% of the total development and integration testing equipment cost.	+
— Non-Labor Assumptions	
• Business Environment	
— There is one Computing Center for Release 1 which houses the Corporate databases.	-
— There are 11 IRIS sites.	+
— There are 2 National Infrastructure sites co-located with Computing Centers	+
— There are 24 Customer Service Centers: 10 Service Centers and 14 District Offices.	+
— Acquisition Non-Labor costs include the costs of the HW and COTS for the IRIS sites, the national infrastructure sites, the Computing Center, and the Customer Service Sites, as well as all development, integration testing and maintenance equipment.	+
— The corporate computing mainframe to house the databases will be purchased in Subrelease 1.4 at $60.5M.	0
— Each Primary Screening VRU site is capable of handling 60% of the nationwide volume based on FY2004 estimates.	+
— The cost of the primary screening VRU's in Subrelease 1.1 is $15.4M.	0
— Subrelease 1.3 will require that approximately 60K IRS desktop computers be retrofitted with security software at a cost of $11.8M.	+
— Customer Service workstations and LANs will be purchased through Phase 0; this Business Case contains no CS workstations or LAN equipment.	-

Acquisition Investment Cost Assumptions (Continued)

Acquisition Investment Cost Assumptions	ROI Risk Mitigation
Development Investment Assumptions	
• Acquisition Assumptions	
— Non-Labor Assumptions	
• Software Development Environment (SDE) and Integration Environment	
— Development equipment includes the Software Development Environment (SDE) and Integration Environment, the maintenance equipment, as well as an additional cost for development and integration testing on the production mainframe.	0
— Software Development and Integration Environment is $20K per Development contractor staff year.	
— The cost per staff year for the SDE is calculated by taking the number of person months divided by the number of months for development and integration test multiplied by $20K.	0
— The Software Development and Integration Test Environment is for the Contractor only; there are sufficient development workstations for the IS:AD legacy modifications programmers.	-
— The Development and Integration Test Environment will be procured by the Contractor in FY1999	+
• Production Mainframe	
— The Production Mainframe will require an additional cost of 20% of the total mainframe purchase price.	0
– 10% to support the development of Phase I/Release 1	
– 10% to support the Integration Testing	
— Development of the mainframe applications and databases, as well as integration testing, will be performed on a physical partition of the Production Mainframe and will not require the purchase of an additional mainframe	-
• Maintenance Environment	
— All equipment for maintenance will be purchased by the IRS the last year that Release 1 is fully implemented.	-
— All SDE equipment for maintenance will be new; the Contractor will NOT be turning over SDE equipment to the IRS for maintenance.	+
— Each IS:AD staff year will require a development workstation for maintenance at a rate of $20K per WS.	+
— Subrelease 1.3 will require the purchase of $12.55M of telecommunications equipment to support the IRS telecommunications network.	+

Development Investment Cost Assumptions

Development Investment Cost Assumptions	ROI Risk Mitigation
Development Investment Assumptions	
• Development Assumptions	
— Labor Assumptions	
• IS	
— IS:AD will be responsible for all legacy modifications at a rate of $75.7K per year per staff year.	-
— IRS Product Assurance will test all software (SW) before it is deployed. PA participation is 15% additional to the total developer staff years. Of the 15%, 25% of their resources are for the Development component and 75% are for SAT.	+
— The cost for Subrelease 1.2 data conversion is 15 IRS staff years at a rate of $75.7K per staff year over 6 months.	+
— The cost for Subrelease 1.3 data conversion is 1 IRS IS staff year per CS site (24 staff year total) at a rate of $75.7K per staff year over 6 months.	+
— The cost for Subrelease 1.4 data conversion is 2 IRS IS staff years per CS site plus 5 IRS IS staff years (53 staff year total) at the computing center at a rate of $75.7K per staff year over 6 months.	+
— The IRS labor to install the mainframe computer for Subrelease 1.4 is 5 IS staff years for 2 months.	+
• Non-IS	
— Business costs applied to Planning, SAT, & Pilot.	+
• Contractor	
— All Build and Integration Testing will be performed by the Contractor at a rate of $260K per year per staff year.	+
— Contractor Labor for Build and Integration Test was calculated by COCOMO II.	+
— The Contractor labor to support the SAT function is 1 IRS staff year per 1 Contractor staff year at a rate of $260K per Contractor staff year. 25% of their resources are for the Development component and 75% are for SAT.	+
— The Contractor Development Labor depicts the cost for designing and building the software, as well as to provide support to deploy the Integration test equipment.	0
— Deploying the Integration Test environment will require a team of 5 persons over 1 month at a ratio of 4 Contractors to 1 IRS for Subreleases 1.1 and 1.2.	0
— Subreleases 1.3 and 1.4 will require 4 months each for Integration Test Environment deployment.	0
— Non-Labor Assumptions	
• There are no Development Non-Labor costs; all equipment costs to support development are listed under Acquisition Non-Labor.	0

QA Test & Pilot Investment Cost Assumptions

QA Test & Pilot Investment Cost Assumptions	ROI Risk Mitigation
Development Investment Assumptions	
• SAT & Pilot Assumptions	
— Labor Assumptions	
• IS	
— IRS Product Assurance and the Contractor will perform all Systems Acceptance Testing.	+
— IRS Product Assurance will test all SW before it is deployed. PA participation is 15% additional to the total developer staff years. Of the 15%, 25% of their resources are for the Development component and 75% are for SAT.	+
• Non-IS	
— National Office business user staff year participation for SAT are 5% of the IS:PA and Contractor staff years at a rate of $75.7K per year per staff year.	+
— Each pilot site in Subrelease 1.3 & 1.5 will host 4 units of 15 CSRs each at 3 sites for a total of 180 CSRs per pilot.	+
— The labor cost to conduct the pilot was calculated as 180 CSRs times 6 months times the CSR monthly rate of $3.1K.	+
• Contractor	
— General Information	
— All Subreleases will be piloted separately.	+
— Pilot deployment will be performed by the Contractor and IRS IS.	+
— Customer Service Site	
– There are 3 Pilot CS sites in Subrelease 1.3, 1.4, & 1.5: Atlanta SC, Ogden SC, and Jacksonville.	+
– Pilot deployment for Subrelease 1.3 & 1.5 will require a team of 5 persons over 2 months at the ratio of 4 Contractor to 1 IRS for CS site pilot installation.	0
— Infrastructure Sites	
– There are 2 Pilot National Infrastructure sites for Subreleases 1.1 & 1.2.	0
– Each IRIS Pilot will require a team of 5 persons at a ratio of 3 Contractors to 2 IRS to conduct the Pilot.	0
– Subrelease 1.3 will require a double team for the IRIS pilot installation.	+
— Non-Labor Assumptions	
• The Production Mainframe will require an additional cost of 10% of the total mainframe purchase price to support Systems Acceptance Testing.	0
• SAT of the Mainframe applications and databases will be performed on a physical partition of the Production Mainframe and will not require the purchase of an additional mainframe.	-
• IRS PA for SAT will use the ITCC equipment.	+
• All Pilot equipment is identified as part of Acquisitions.	0

Rollout Investment Cost Assumptions

Rollout Investment Cost Assumptions	ROI Risk Mitigation
Development Investment Assumptions	
• Rollout Assumptions	
— Labor Assumptions	
• General	
— Twenty-one CS sites will be rolled out (4 per month) for a total time period of 5 months for Subreleases 1.3 and 1.5.	0
— Subrelease 1.4 will be rolled out with Subrelease 1.5, so there are no Subrelease 1.4 rollout costs.	+
— Rollout deployment will be performed by the Contractor and IRS IS.	+
— There are 9 IRIS rollout sites for Subrelease 1.3.	+
— The other Subreleases will not require an IRIS rollout.	+
• IS	
— Installation of the mainframe equipment in the computing center will require 5 IRS staff years for 2 months.	0
• Non-IS	
— Subreleases 1.3 and 1.5 will require CSR training and/or procedural updates.	+
• Contractor	
— Each CS site deployment will take 1 month with a team of 5 persons at the ratio of 4 Contractor to 1 IRS.	0
— Subrelease 1.3 will require 2 teams of 14 persons at a ratio of 10 contracting to 4 IRS to deploy the IRIS equipment.	+
— Non-Labor Assumptions	
• There are no Non-Labor Rollout costs; all equipment costs are included under Acquisition Non-Labor.	0

Training & Procedures Investment Cost Assumptions

Training & Procedures Investment Cost Assumptions	ROI Risk Mitigation
Development Investment Assumptions	
• Training & Procedures Assumptions	
— Labor Assumptions	
• IS	
— IS costs for knowledge transfer was calculated by the number of IS:AD staff years X $75.7K per staff year for 6 months.	+
• Non-IS	
— Development of CSR training for the new system for Subrelease 1.3 will be performed by M&A @ a cost of 2 PMs X $75.7K per staff year.	+
— Development of CSR training for the new system for Subrelease 1.5. will be performed by M&A @ a cost of 4 PMs X $75.7K per year per staff year.	+
— Procedure and IRM updates for Subrelease 1.3 will require 2 Non-IS PMs at a rate of $75.7K per year per staff year.	+
— Procedure and IRM updates for Subrelease 1.5 will require 4 Non-IS PMs at a rate of $75.7K per year per staff year.	+
— Pilot Training for Subrelease 1.3 is calculated as the hourly CSR wage rate ($18.15/hr) times 1 week times the number of Pilot CSRs (180) plus the cost of the instructors.	+
— Pilot Training for Subrelease 1.5 is calculated as the hourly CSR wage rate ($18.15/hr) times 2 weeks times the number of Pilot CSRs (180) plus the cost of the instructors.	+
— The cost of the instructors is calculated as the number of CSRs to be trained divided by the class size (30 CSRs per class) times 3 instructors per class times the CSR wage times the number of weeks of training.	+
— Rollout Training costs are for Subreleases 1.3 and 1.5 only; there is no significant training for the other subreleases.	+
— Rollout Training for Subrelease 1.3 is calculated as the hourly CSR wage rate ($18.15/hr) times 1 week times the number of Rollout CSRs (19,820) plus the cost of the instructors.	+
— Rollout Training for Subrelease 1.5 is calculated as the hourly CSR wage rate ($18.15/hr) times 2 weeks times the number of Rollout CSRs (19,820) plus the cost of the instructors.	+
— The total number of CSRs needing training is assumed to be 20K.	+
— Other IRS Training costs are 2.4% of the total labor costs of IS and Non-IS labor.	+
• Contractor	
— Knowledge transfer by the Contractor to the IS maintenance programmers will occur the last year of Phase I/Release 1, at an additional training rate of 2 Contractors per IS:AD staff year times the contractor rate of $260K per year for 6 months. This cost is listed as a Contractor Labor cost.	+
— General training for the Contractor is assumed to be within the standard $260K per staff year rate and is not explicitly listed.	-

Management and Administration Investment Cost Assumptions

Management and Administration Investment Cost Assumptions	ROI Risk Mitigation
Development Investment Assumptions	
• M&A Investment Assumptions	
— Travel for IRS is 5.4% of the total labor costs of IS and Non-IS labor.	+
— Supplies for IRS is $100 per staff year per year of the total labor staff years of IS and Non-IS labor.	+
— It is assumed that there are no significant facility modifications required by Phase I/Release 1.	-
— Supplies, travel, space, and training l costs for the contractor are assumed to be covered in the $260K Contractor rate and is not explicitly listed.	-

Operations and Maintenance Investment Cost Assumptions

Operations and Maintenance Cost Investment Assumptions	ROI Risk Mitigation
O&M Investment Assumptions	
• Maintenance	
— Labor Assumptions	
• IS	
— IS:AD will be responsible for maintaining all Contractor developed software once Phase I/Release 1 is entirely deployed.	-
— IS:AD staff years per year for maintenance are 15% of the Contractor & IS:AD Development staff years at a rate of $75.7K per year.	-
— Maintenance costs of the SDE for IRS maintenance programmers are included here as Maintenance costs, not Phase I/Release 1 Investment Costs.	0
— All maintenance workstations will be procured by the IRS the last year that Phase I/Release 1 is fully implemented.	-
— The maintenance for the maintenance workstation and LAN equipment is 15% of the original purchase cost each year.	+
— Maintenance for HW begins the year after purchase at a rate of 15% of the original purchase price per year.	+
— Maintenance for COTS begins the year after purchase at a rate of 4% of the original purchase price per year.	+
— Infrastructure maintenance support at each of the 11 regional sites begins after Subrelease 1.1 is deployed at a rate of 2 staff years per site at $75.7K per staff year until Phase I/Release 1 is deployed.	+
— Maintenance for the 2 National Infrastructure sites begins after Subrelease 1.1 is deployed at a rate of 2 staff years per site at $75.7K per staff year until Phase I/Release 1 is deployed.	+
— Maintenance for the corporate mainframe begins after it is installed in Subrelease 1.4 at a rate of 10 staff years at $75.7K per staff year until Phase I/Release 1 is deployed.	+
— Software maintenance costs for annual tax law changes are not included.	-
• Non-IS	
— There are no Business (Non-IS) costs for maintenance.	-
• Contractor	
— The Contractor will maintain all subrelease software until the entire Phase I/Release 1 is deployed.	+
— Contractor software maintenance begins the year the subrelease is piloted until all subreleases are deployed at an staff year rate of 15% of the Contractor Development labor staff years for each subrelease at a rate of $260K per staff year.	+
— Maintenance costs for the Contractor SDE are included, at 15% per year following the year it was purchased, until all Subreleases are deployed nationwide.	+
— Non-Labor Assumptions	
• Maintenance for all Software Development and Integration equipment is included as an O&M Investment.	+
• Maintenance for recurring telecommunications is an ongoing operational cost and is not included in this Business Case. Expected decreases in this cost, however, are included in the benefits.	+
• Telecom maintenance for the webserver begins the year Subrelease 1.1 is deployed and recurs yearly at a rate of $1M per year.	+
• Training & Procedures	
— Other IRS Training costs are 2.4% of the total labor costs of IS and Non-IS labor yearly.	+

Operations and Maintenance Investment Cost Assumptions (Continued)

Operations and Maintenance Cost Investment Assumptions	ROI Risk Mitigation
O&M Investment Assumptions	
• M&As	
— Travel for IRS is 5.4% of the total labor costs of IS and Non-IS labor.	+
— Supplies for IRS is $100 per staff year per year of the total labor staff years of IS and Non-IS labor.	+
— It is assumed that there are no significant facility modifications required by Phase I/Release 1.	-

Nationwide Hardware Software Costing

Subrelease 1.1

MCC	#
VRU - Screening (192 ports + 48)*	22
VRU - Primary&Backup Gateways	22
RCR's TYPE 1	3
RCR - Microlog Peripheral Gateway SW	3
Infra Server - Sun10000	1
Infra Server - DASD	100 GIG
Infra Server - BGS Best/1 SW	1
Infra Server - Solaris	1
Infra Server - Oracle	1
Infra Server - Tuxedo	1
Infra Server - Runtime per Unix Node	1
Infra Server - IBM MQSeries	1
Infra Server - TME 10 SW Distribution	1
Web Server - UE6000	2
Web Server - Netscape SuiteSpot	2
Web Server - Solaris	2
Web Server - CheckPoint Firewall-1	1
Web Server - Search Engine	1
Web Server - BGS Best/1	2

TCC/MSC	
VRU - Screening (192 ports + 48)*	22
VRU - Primary&Backup Gateways	22
RCR's TYPE 1	3
RCR - Microlog Peripheral Gateway SW	3
Infra Server - Sun10000	1
Infra Server - DASD	100 GIG
Infra Server - BGS Best/1 SW	1
Infra Server - Solaris	1
Infra Server - Oracle	1
Infra Server - Tuxedo	1
Infra Server - Runtime per Unix Node	1
Infra Server - IBM MQSeries	1
Infra Server - TME 10 SW Distribution	1
Web Server - UE6000	2
Web Server - Netscape SuiteSpot	2
Web Server - Solaris	2
Web Server - CheckPoint Firewall-1	1
Web Server - Search Engine	1
Web Server - BGS Best/1	2

I&IT	
VRU - Screening (48 ports)	1
VRU - Primary&Backup VRU Gateway	1
RCR's TYPE 1	1
RCR - Microlog Peripheral Gateway SW	1
Infra Server - Sun10000 (10% of full cost)	1
Infra Server - DASD	35 GIG
Infra Server - BGS Best/1 SW	1
Infra Server - Solaris	1
Infra Server - Oracle (10% of full cost)	1
Infra Server - Tuxedo	1
Infra Server - Runtime per Unix Node	1
Infra Server - IBM MQSeries	1
Infra Server - TME 10 SW Distribution	1
Web Server - UE6000	2
Web Server - Netscape SuiteSpot	2
Web Server - Solaris	2
Web Server - CheckPoint Firewall-1	1
Web Server - Search Engine	1
Web Server - BGS Best/1 SW	1

* 48 Additional Ports per VRU for sparing (backup)

Subrelease 1.2

MCC	#
RADB Server - UE3000	1
RADB Server - DASD	1 TB
RADB Server - Tivoli Plus Modules	1
RADB Server - Solaris	1
RADB Server - BGS Best/1	1
RADB Server - Oracle	1
Web Server - Tivoli Plus Modules	2
Infra Server - Tivoli Plus Modules	1
Infra Server - CAINet	1
Infra Server - CMDS Server SW	1
Infra Server - CMDS Target SW	10
Infra Server - Tivoli Enterprise Console	1
Infra Server - CAI CL7	1
Vendor Consultation fee for CMDS	1
Corporate - Interlink TCP/IP for MVS	1
Legacy - CICS	1

TCC/MSC	
RADB Server - UE3000	1
RADB Server - DASD	1 TB
RADB Server - Tivoli Plus Modules	1
RADB Server - Solaris	1
RADB Server - BGS Best/1	1
RADB Server - Oracle	1
Web Server - Tivoli Plus Modules0	2
Infra Server - Tivoli Plus Modules	1
Infra Server - CAINet	1
Infra Server - CMDS Server SW	1
Infra Server - CMDS Target SW	10
Infra Server - Tivoli Enterprise Console	1
Infra Server - CAI CL7	1

I&IT	
RADB Server - UE3000	1
RADB Server - DASD	35 GIG
RADB Server - Tivoli Plus Modules	1
RADB Server - Solaris	1
RADB Server - Oracle	1
RADB Server - BGE Best/1	1
Web Server - Tivoli Plus Modules	2
Infra Server - Tivoli Plus Modules	1
Infra Server - CAINet	1
Infra Server - CMDS Server SW	1
Infra Server - CMDS Target SW	10
Infra Server - Tivoli Enterprise Console	1
Infra Server - CAI CL7	1

Subrelease 1.3

MCC	#
ATCSC & OSC	
ANSC, AUSC, BSC, CSC, FSC, KCSC, PSC DCC & NCFB	
RADB Server - UE3000	1
RADB Server - DASD	1 TB
RADB Server - Tivoli Plus Modules	1
RADB Server - Solaris	1
RADB Server - Oracle	1
RADB Server - TME 10 SW Distribution	1
RADB Server - BGS Best/1	1
Transaction & Security Server (w/out TIM)	1
Transaction & Security Server - Solaris	1
Transaction & Security Server - TME 10 SW Distribution	1
Transaction & Security Server - BGS Best/1	1
Transaction & Security Server - Tivoli Plus Modules	1
Transaction & Security Server - CMDS Server SW	1
Transaction & Security Server - CMDS Target SW	10
Transaction & Security Server - Tuxedo	1
Transaction & Security Server - Runtime per Unix Node	1
Transaction & Security Server - CAI CL7	1
Transaction & Security Server - Tivoli Enterprise Console	1
Jacksonville	
District Office/Customer Service Sites -Baltimore, Buffalo, Cleveland, Dallas, Denver, Indianapolis, Nashville, Oakland, Pittsburgh, Portland, Richmond, Seattle, and St. Louis	
CIDS Sites - Bloomington, Richmond Warehouse, Sacramento	
Workstations to multiple sites	
Secure WS - CAINet	60,000
Terminal Emulation	43,000

Subrelease 1.4

MCC	#
PCM - Mainframe	1
PAAS - NCR 5100 + 2 Suns Teradata	1
PAAS - PAAS SW	1
SADB - SADB SW	1
SADB - Sun 10000	1
SADB - DASD	8 TB
Corporate - Apriori	1
Corporate - SAIC Computer Misuse Detection	1
ATCSC & OSC	
ANSC, AUSC, BSC, CSC, FSC, KCSC, PSC DCC & NCFB	
Jacksonville	
District Office/Customer Service Sites -Baltimore, Buffalo, Cleveland, Dallas, Denver, Indianapolis, Nashville, Oakland, Pittsburgh, Portland, Richmond, Seattle, and St. Louis	
CIDS Sites - Bloomington, Richmond Warehouse, Sacramento	

Subrelease 1.5

MCC	#
SAS	**1**
ATCSC & OSC	
ANSC, AUSC, BSC, CSC, FSC, KCSC, PSC DCC & NCFB	
Jacksonville	
District Office/Customer Service Sites -Baltimore, Buffalo, Cleveland, Dallas, Denver, Indianapolis, Nashville, Oakland, Pittsburgh, Portland, Richmond, Seattle, and St. Louis	
CIDS Sites - Bloomington, Richmond Warehouse, Sacramento	

Infrastructure Site Pilot
Customer Service Site Pilot
Infrastructure &Customer Service Site Pilot
Integration & Integration Test Site

BENEFIT ASSUMPTIONS

General Benefit Assumptions

General Benefit Assumptions	Value	ROI Risk Mitigation
General Assumptions:		
• Current Functional Equivalent (CFE) is based on FY1996 actuals, except for telephone activities (FY1997).		-
• FY1996 Cost structure is assumed to remain stable through out life of project.		+
• Growth rate is based on Compliance Research "Calendar Year Return Projections for Districts and Regions 1996-2003, Update 1996." Growth rate is applied for all years through FY2006 and then leveled off. This is used to determine Cost Avoidance calculations.		+
• Salary cost of a CSR per CFO model is $37,760 per year.		0
• All CSRs performing IMF adjustments and/or handling telephone calls will have a workstation with new applications. This can be achieved by either diverting all IMF work to specific population or every CSR having a terminal.		+
• Risk adjusted benefits begin to accrue one year after deployment to either pilot site or nationwide rollout.		+

Phase I/Release 1 Benefit Assumptions

Phase I/Release 1 Subrelease 1.1 Benefit Assumptions	Value	ROI Risk Mitigation
Subrelease 1.1		+
• Functionality being delivered is Automated Tax Law for VRU which include the following applications:		
— Personal Exceptions		
— Interest Income		
— Dependents		
— Filing Status		
— Earned Income Credit		
— Filing Requirements		
— Standard Deductions		
— Other Income		
— Capital Gains		
— Who must file		
— Customer Survey		
— Estimated Tax		
— Extension to File		
— Basis of Real Estate Property		
— IRA Distributions		
— IRA Contributions and Deductions		
— Social Security and Railroad Retirements Benefits		
— Medical Expenses		
— Self Employment Tax		
— Credit for Elderly or Disabled		
— Adjustments to Income		
• FY1997 Total 1040 Assistor Calls.	23,536,236	
• 33.6% of Assistor Calls which are Tax Law based on WITS Data.	7,908,175	0
• Tax Law volume reduced by 10% due to expected default at Master Menu.	7,117,358	+
• 20% default for taxpayers not making selection from 21 ATL application.	5,693,887	+
• 20% default to CSR's for taxpayers who fail to complete an application.	4,555,110	+
• FTE savings equate to balance of Tax Law calls divided by "fully loaded" Assistor calls/FTE (6,307).	722	+
• Functionality being delivered is Primary Screening VRUs integrated with Customer Service Call Router.		+
• FY1997 Total Assistor Calls.	40,381,076	
• Estimate 10% decrease in CSR screening due to voice recognition.		
• Total calls no longer requiring initial CSR screening.	4,038,000	
• Projected staff year saving equals number of calls times length of call divided by 60 divided by 2088, plus 50% overhead (4,038,000x1 min.)/60 = 6,700 hours/2088 x 1.5 = FTE saved).	48.3	+

Phase I/Release 1 Benefit Assumptions (Continued)

Phase I/Release 1 Subrelease 1.2,1.3,&1.4 - Benefit Assumptions	Value	ROI Risk Mitigation
Subrelease 1.2		
• Applications being delivered are as follows:		+
— Refund Inquiry		
— Fact of Filing		
• Applications already available on legacy systems, therefore no new labor benefits will be accrued.		+
• Non-labor savings accrued from maintenance of Teletax machines retired after 1.2.	$ 975K	
Subrelease 1.3		
• There are minimal quantifiable benefits assumed for Workstation Emulation .		+
• Tax Law functionality to CSR.		
— Number of tax law calls answered by CSRs in FY1997.	7,908,175	
— Subtract estimated Tax Law calls answered by ATL applications equals number of calls answered by CSR. (7,908,175- 4,555,110).	3,353,065	
— FTE required to answer calls at current productivity rate (3,353,065/ 6307).	532	
— FTE required with 6% increase productivity rate (3,353,065/6,685).	501	+
— Projected staff year saving (532 -501).	31	+
Subrelease 1.4		
• Benefits included in Subrelease 1.5.		0

Phase I/Release 1 Benefit Assumptions (Continued)

Phase I/Release 1 Subrelease 1.5 - Benefit Assumptions	Value	ROI Risk Mitigation
Subrelease 1.5		
• Benefits for On-line Adjustments are as follows:		
— Workload volumes for impacted functions were obtained from FY1996 WP&C data, FY1997 Snapshot report, FY1997 WITS and PAS data.		+
— Tax Account PAS data is used to determine ratio of volume dedicated to adjusting IMF accounts.		+
— Estimated change in production rates due to new technology is based on focus group interviews of section and branch level personnel responsible for function.		+
— AUR volumes are not included in calculations since AUR system already has functionality.		+
— Three Tax years, up front issue detection and nationwide implementation are assumed.		-
— Decrease in written referrals:		
• FY1996 CS Account call written referral volume @ 2.2 hr.	908,245	
• Project 20% decrease in written referrals volume.	181,649	+
• Projected staff years savings (181,649 divided by 2.2hr. divided by 2088) x 1.5 overhead.	59.3	+
— Increase productivity in telephone account calls due to on-line adjustments, GUI & DDR:		
• Total Assistor IMF account call volume.	10,158,239	
• Total 8815 Assistor IMF account call volume.	11,684,231	
• Total 4262 Assistor IMF account call volume.	5,160,609	
• FY1997 Total Assistor IMF calls.	27,003,079	
• FTEs required to handle volume @ 6,090/callsper FTE.	4,434	
• FTEs required to handle volume with 9% productivity increase (6,638 calls per FTE).	4,068	+
• Staff year savings (4434 FTEs -4068 FTEs).	366	+
— Increase paper production rate due to on-line adjustments:		
• Adjustments:		
— Total FY1997 Nationwide TACS PAS sample.	32,114	
— TACS PAS sample involving IMF tax/credit change.	8,181	
— Percentage of Service Center paper with IMF tax/credit adjustment.	25.5%	
— Total Service Center paper cases.	31,663,522	
— Adjustments paper IMF tax/credit volumes (31,663,522x 25.5%).	8,074,198	

Phase I/Release 1 Benefit Assumptions (Continued)

Phase I/Release 1 Subrelease 1.5 - Benefit Assumptions	Value	ROI Risk Mitigation
— Service Center Collection Branch:		
• Total SCCB Workload.	3,784,453	
• Ratio.	5.0%	
• Total SCCB workload for IMF adjustments.	189,223	
• Total SCCB workload for IMF adjustments.	189,223	
— Correspondence Exam:		
• Total Correspondence Exam.	938,049	
• Ratio (From TACS PAS IMF adjustments).	58.5%	
• Total Correspondence Exam workload for IMF adjustments.	549,051	
— Total paper adjustment workload for IMF adjustments:	8,812,472	
• Existing production rate.	3.2	
• New production rate with tool.	5.5	+
• Direct staff hour savings.	1,151,630	+
• Direct staff year savings.	551	+
• Staff year savings with 50% overhead.	827	+
• ASSA – EIC		
— Assumes automated on-line adjustments will be in place.		
• Total paper workload for IMF adjustments per calculation above.	8,812,472	
• Estimated EIC portion of workload is 15%.	1,321,871	+
• Projected EIC volume diverted to ASSA.	462,655	
• New production rate with IMF on-line adjustments (Note: if on-line adjustment is not available rate is 3.2).	5.5	
• Direct staff hour savings.	84,119	
• Staff year savings with overhead (84,119 /2088x1.5).	61	+
• ASSA – Levy		
• Levy response volume (from OFP 64120).	2,016,022	
• Levy response hours.	304,213	
• Based on AUCC non-remit levies is 60% of hours used.	182,528	
• Project 50% of non-remit levies diverted to ASSA.	91,264	+
• Direct staff year savings.	43.7	
• Total staff year savings with overhead.	65.5	
• Reinvestment with LOA assumptions.		
— Projected increase in cost for additional calls answered is calculated based on 10 minute average call length multiplied by 6 cents.		+

AMORTIZED CONFIGURATION ITEM (CI) ASSUMPTIONS

Phase I/Release 1 Subrelease 1.1 Amortized Software CI Rate

CI ID	CI Name	Sub-Release	%	Rationale
IS.05.10.01	Voice Response Unit	1.1	50%	The Voice Response Units provide part of the telephone infrastructure that is used throughout subsequent phases and releases. Assume that we've implemented 50% of the total automated applications by the end of Release 1, so the VRUs will provide additional benefit in later releases as they host more applications.
IS.05.18.03	Administrative Services	1.1	80%	Virtually all telephone traffic comes through RCS, etc. by the end of Phase I/Release 1, so most benefit is derived early on.
IS.05.21.03	Regional Call Router Communications and Control	1.1	80%	Virtually all telephone traffic comes through RCS, etc. by the end of Phase I/Release 1, so most benefit is derived early on.
IS.05.21.04	Regional Call Router Post Routing Support	1.1	80%	Virtually all telephone traffic comes through RCS, etc. by the end of Phase I/Release 1, so most benefit is derived early on.
CP.07.02.01	Reference Data Access Services	1.1	25%	Reference Data Access Services are built initially in Subrelease 1.1 to support retrieval of tax law data in support of the automated applications. These services provide the foundation (e.g., retrieval capabilities for the REFDB) for subsequent applications (e.g., case analysis and resolution) in later phases. In other words, they provide part of the “infrastructure” for maintaining and accessing reference data. For now, we’re only using these for tax law data for automated applications. Eventually they will be used to support CSRs in case analysis and resolution when case management and case resolution capabilities are implemented by the modernized system.
REFDB.01	Establish Reference Database	1.1	25%	The Reference Database is established in Subrelease 1, but is used throughout all subsequent phases and releases to support the applications built during those phases and releases. It provides part of the “infrastructure” for maintaining and accessing reference data, along with CP.07.02.01. At this point, we’re only using REFDB for tax law data for automated applications. Eventually it will be used to support CSRs in case resolution by including IRMs and other reference materials when case management and case resolution capabilities are implemented by the modernized system. Note that this CI is for establishing the REFDB structure, not populating it with data.
STATDB.01	Establish Statistics Database	1.1	80%	The STATDB is used to store MIS data related to telephone and Internet automated self-service applications. Since most of the telephone traffic, and a significant percentage of the Internet traffic is handled beginning in Subrelease 1.1, most of the benefit is derived early on.

Phase I/Release 1 Subrelease 1.1 Amortized COTS CI Rate

CI ID	CI Name	Sub-Release	%	Rationale
IS.05.10.01	Voice Response Unit	1.1	50%	The Voice Response Units provide part of the telephone infrastructure that is used throughout subsequent phases and releases. Assume that we've implemented 50% of the total automated applications by the end of Release 1, so the VRUs will provide additional benefit in later releases as they host more applications.
IS.05.21.01	Regional Call Router Host	1.1	80%	Virtually all telephone traffic comes through Regional Call Router host by the end of Phase I/Release 1, so most benefit is derived early on.
IS.05.21.02	Regional Call Router Software	1.1	80%	Virtually all telephone traffic comes through Regional Call Router host by the end of Phase I/Release 1, so most benefit is derived early on.
IS.03.01.02	Regional Platform Performance and Capacity Management	1.1	25%	Regional platform handles about a quarter of the transaction-based traffic (to the modernized systems) by the end of Phase I/Release 1.
IS.03.01.08	Regional Platform Configuration Management	1.1	25%	The Regional platform hosts only about a quarter of the automated applications (and no other applications) by the end of Phase 1/Release 1.
IS.05.01.02	Regional Platform Primitive Operating System Services	1.1	25%	Regional platform handles about a quarter of the transaction-based traffic (to the modernized systems) by the end of Phase I/Release 1.
IS.05.03.02	Regional Platform DBMS	1.1	25%	Regional platform handles about a quarter of the transaction-based traffic (to the modernized systems) by the end of Phase I/Release 1.
IS.05.06.02	Regional Platform Transaction Processing Services	1.1	25%	Regional platform handles about a quarter of the transaction-based traffic (to the modernized systems) by the end of Phase I/Release 1.
IS.05.15.01	Regional Hardware Platform	1.1	25%	Regional platform handles a small percentage of the application traffic (e.g., for security checking and auditing) by the end of Phase I/Release 1.
IS.05.22.01	IRS Web Server	1.1	25%	The modernized IRS Web Server hosts about a quarter of the expected number of automated applications at this point.
IS.05.22.02	Internet Firewall	1.1	80%	Even though only about a quarter of the expected number of applications are implemented at this point, they are the high volume applications, so most of the expected volume of Internet traffic (through the firewall) occurs early.
IS.05.22.03	Search Engine	1.1	25%	The only data to search at this point is the tax law and tax topic data stored on the REFDB. Eventually, it could be used to search IRM and other reference materials as they are loaded in tot he REFDB.
	GPMO Planning Tool	1.1	70%	70% of GPMO PM&C work will be to oversee development of Phase I/Release 1.

Phase I/Release 1 Subrelease 1.2 Amortized Software CI Rate

CI ID	CI Name	Sub-Release	%	Rationale
CS.06.01.01	Case Analysis and Resolution Framework	1.2	5%	The Case Analysis and Resolution Framework configuration item (CS.06.01.01) interacts with the Legacy Transaction Processing Services to determine the transaction type and invoke the appropriate application and services to process account analysis and resolution requests supported by other configuration items within the Case Analysis and Resolution subsystem (CS.06.01) (e.g., Automated Account-Related Taxpayer Assistance (CS.06.01.07) and Case Analysis (CS.06.01.01) applications). This CI thus provides a key piece of the on-line case analysis and resolution "infrastructure" that supports the applications that are built in subsequent phases and releases. The only application this supports now is refund and fact of filing inquiries. Most benefit comes later when CSRs go on-line using modernized case analysis and resolution applications.
IS.05.06.02	Regional Platform Transaction Processing Services	1.2	5%	The Regional Platform Transaction Processing Services CI provides capabilities to ensure transactional data integrity at the regional platform and across a distributed computing environment. These services are provided to applications to ensure that the 4 properties of a transaction (Automicity, Consistency, Isolation, and Durability) are maintained for each transactional unit of work. These services provide a part of the on-line transaction processing infrastructure that is used to support the applications built in subsequent phases and releases. The only transactions this supports now are refund and fact of filing inquiries. Most benefit comes later when CSRs go on-line using modernized applications.
IS.04.01.08	Regional Platform Security Audit Management	1.2	25%	The Regional Platform Security Audit Management CI provides capabilities to consolidate audit trail data and to produce reports based on that data. At this point, the only audit data collected is for the IRS support personnel (e.g., system operators) and taxpayers using the automated self-service applications. Eventually, the audit data will include audit records resulting from CSRs using the modernized applications.

Phase I/Release 1 Subrelease 1.2 Amortized COTS CI Rate

CI ID	CI Name	Sub-Release	%	Rationale
IS.03.01.02	Regional Platform Performance & Capacity Management	1.2	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.
IS.03.01.06	Regional Platform Operations Management	1.2	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.
IS.04.01.06	Regional Platform Authentication and Access Control Management	1.2	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.
IS.05.01.02	Regional Platform Primitive Operating Services	1.2	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.
IS.05.03.02	Regional Platform Database Management System	1.2	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.
IS.05.15.01	Regional Hardware Platform	1.2	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.
IS.04.01.08	Regional Platform Security Audit Management	1.2	25%	By the end of Phase 1/Release 1, CSRs have access to limited modernized applications, so the only audit data collected is for the use of those applications.
IS.05.05.01	Corporate Platform Telecommunications Support Services	1.2	5%	Corporate platform isn't really used for much "mission critical" operations in Phase I/Release 1.
IS.03.01.08	Regional Platform Configuration Management	1.2	25%	The Regional platform hosts only about a quarter of the automated applications (and no other applications) by the end of Phase I/Release 1.
TR.05.01.01	Modernization/Legacy Protocol Conversion	1.2	25%	The Modernization/Legacy Protocol Conversion CI supports the connectivity from new universal workstations to legacy systems for IMF only. Later releases allow access to BMF and other Master Files.

Phase I/Release 1 Subrelease 1.3 Amortized Software & COTS CI Rate

CI ID	CI Name	Sub-Release	%	Rationale
CS.06.02.01	Interface Management	1.3	5%	Launches and manages the GUI processing which includes the execution and display of screens, menus, forms, templates, images, and queries for workstation transactions, and where appropriate provides input validation. Formulates on-line transactions and forwards them to appropriate subsystems for execution and processing. This CI provides the framework for the “client" piece of the case analysis and resolution applications that are built in subsequent phases and releases. At this point, it only provides terminal support to legacy systems and initial CSR applications (e.g., refund inquiry and fact of filing). Real benefit comes later when new applications are built.
REFDB.01	Establish Reference Database	1.3	25%	The Establish Reference Database CI in this subrelease adds additional reference data to support the applications implemented in this subrelease. (Most of the benefit has already been accounted for in Subreleases 1.1 and 1.2).
IS.05.02.01	User Platform Computer Human Interface Services	1.3	5%	Provides CHI Security, CHI Desktop, CHI Run-time, and CHI Application Services. These IS services support all of the screens, menus, forms, etc. that are built in subsequent phases and releases as new on-line applications are built. At this point, it provides terminal support to legacy systems. The real benefit comes in later releases when new applications are built using the services.
TR.05.01.01	Modernization/Legacy Protocol Conversion	1.3	25%	The Modernization/Legacy Protocol Conversion CI supports the connectivity from new universal workstations to legacy systems for IMF only. Later releases allow access to BMF and other Master Files.
TR.05.01.02	Legacy System Access Management	1.3	25%	The Legacy System Access Management CI supports the connectivity from new universal workstations to legacy systems for IMF only. Later releases allow access to BMF and other Master Files.
TR.05.01.03	Modernization On-Demand User Interface to Legacy Systems	1.3	25%	The Modernization On-Demand User Interface to Legacy Systems CI supports the connectivity from new universal workstations to legacy systems for IMF only. Later releases allow access to BMF and other Master Files.
IS.04.01.06	Regional Platform Auth, Access Control Mgmt, & Universal Secure WS	1.3	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.

Phase I/Release 1 Subrelease 1.3 Amortized Software & COTS CI Rate (Continued)

CI ID	CI Name	Sub-Release	%	Rationale
IS.05.01.08	Regional Platform Extended Security Services	1.3	25%	The Regional Platform Extended Security Services CI provides the capability for applications to create audit records. In Phase 1/Release 1, only a limited number of applications can take advantage of the auditing capabilities.
TR.05.01.09	Corporate Platform Extended Security Services	1.3	25%	The Corporate Platform Extended Security Services CI provides the capability for applications to create audit records. In Phase 1/Release 1 only a limited number of applications can take advantage of the auditing capabilities.
IS.03.01.06	Regional Platform Operations Management	1.3	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.
IS.03.01.02	Regional Platform Performance and Capacity Management	1.3	25%	Regional Platform handles about a quarter of the transaction-based traffic by the end of Phase I/Release 1.
IS.03.01.08	Regional Platform Configuration Management	1.3	25%	The Regional platform hosts only about a quarter of the automated applications (and no other applications) by the end of Phase I/Release 1.
IS.05.03.02	Regional Platform DBMS	1.3	25%	Regional platform handles about a quarter of the transaction-based traffic (to the modernized systems) by the end of Phase I/Release 1.
IS.05.01.02	Regional Platform Primitive Operating System Services	1.3	25%	Regional platform handles about a quarter of the transaction-based traffic (to the modernized systems) by the end of Phase I/Release 1.
IS.04.01.08	Regional Platform Security Audit Management	1.3	25%	The Regional Platform Security Audit Management CI provides capabilities to consolidate audit trail data and to produce reports based on that data. At this point, the only audit data collected is for the IRS support personnel (e.g., system operators) and taxpayers using the automated self-service applications. Eventually, the audit data will include audit records resulting from CSRs using the modernized applications.
IS.05.06.02	Regional Platform Transaction Processing Services	1.3	25%	The Regional Platform Transaction Processing Services CI provides capabilities to ensure transactional data integrity at the regional platform and across a distributed computing environment. These services are provided to applications to ensure that the four properties of a transaction—Atomicity, Consistency, Isolation, and Durability—are maintained for each transactional unit of work. These services provide a part of the on-line transaction processing infrastructure that is used to support the applications built in subsequent phases and releases. The only transactions this supports now are refund and fact of filing inquiries. Most benefit comes later when CSRs go on-line using modernized applications.

Phase I/Release 1 Subrelease 1.4 Amortized Software CI Rate

CI ID	CI Name	Sub-Release	%	Rationale
CCDB.01	Establish Corporate Case Database	1.4	20%	Establishes a database for storing data supporting the work done by IRS personnel to resolve issues, answer inquiries, process special applications from filers, and perform other submission and account activities that require specialized skill. The CCDB is an integral part of the customer service and compliance applications built in subsequent phases and releases. The CCDB is "read only" at this point. The real benefit comes later when CSRs start managing and working cases from the CCDB.
CP.01.01.01	Tax Return Data Processing	1.4	20%	Accepts perfected tax return character data (source return transactions and corrections) in batch from Submissions Processing and transitional subsystems via the Corporate Data Routing subsystem. Validates tax return character data using tax return validation rules. Stores tax return character data in the TRDB using the update provided by CP.01.06.08. This CI provides the framework for the batch updates that will eventually be received from the submissions processing pipeline and stored into the TADB. At this point, it supports the synchronization of legacy account data (for individuals) to the TADB, but most benefit comes later when the TADB becomes authoritative for individuals, and when the Submissions Processing pipeline feeds it directly.
CP.01.02.02	Individual Tax Account Data Processing	1.4	20%	The Individual Tax Account Data Processing configuration item manages the batch storage of individual tax account data. It accepts batch tax return data and receipt data regarding an individual filer from Submissions Processing and transitional subsystems via Internal Data Routing subsystem (CP.01.07.01). This is a key part of the TADB batch update "infrastructure" that supports virtually all applications. Most benefit comes later when TADB becomes authoritative and when it is fully populated with all individual accounts.

Phase I/Release 1 Subrelease 1.4 Amortized Software CI Rate (Continued)

CI ID	CI Name	Sub-Release	%	Rationale
CP.01.05.02	Perfection Results Management	1.4	20%	Receives perfection results including issues and notice codes from Submissions Processing and transitional subsystems via the Corporate Data Routing subsystem. In addition, receives case data from IDRS and other legacy systems via the Corporate Data Routing subsystem. Updates the CCDB with perfection results and case data from legacy systems using the update services provided by CP.01.06.08. This is a key part of the CCDB batch update "infrastructure" that supports virtually all applications. Most benefit comes in later releases when issue processing (e.g., notice processing) and case resolution activities are driven from the corporate databases.
CP.01.07.01	Internal Data Routing	1.4	20%	The Internal Data Routing CI routes all internal batch data targeted for storage into the five major corporate databases. It accepts tax return information return receipt, application, and tax account data, and perfection results received from pipeline. This is a key part of the batch update "infrastructure" for the "Big 5" databases that supports virtually all applications, but most benefit comes later when the databases become authoritative.
CP.05.01.02	SADB Data Archiving	1.4	20%	In Release 1, the SADB includes only audit data generated by the automated self-service applications and the initial CSR applications. Subsequent phases and releases add a significant amount of audit data as more modernized applications are built.
CP.05.01.03	TADB Data Archiving	1.4	20%	In Release, the TADB includes only IMF data, and has not yet replaced the Master File. It is not until subsequent phases and releases that the TADB becomes the only source of taxpayer account data.
CP.05.01.04	CCDB Data Archiving	1.4	20%	The CCDB is mainly "read only" at this point, except for the ability to store case notes and case history, so the benefits of archiving are limited to the case notes and case history. The real benefit comes later when the CCDB becomes the authoritative repository for case data and CSRs start managing and working cases from the CCDB.
CP.05.01.05	TRDB Data Archiving	1.4	20%	In Release, the TRDB includes only electronically filed returns. It is not until subsequent phases and releases that the TRDB becomes the repository for tax return data received both electronically and on paper.
CP.05.01.06	Data Archiving for Support Databases	1.4	20%	In Release 1, only a small portion of the support databases are built, e.g., the REFDB and STATDB. The remainder of the support databases are built in later phases and releases.

Phase I/Release 1 Subrelease 1.4 Amortized Software CI Rate (Continued)

CI ID	CI Name	Sub-Release	%	Rationale
CP.05.03.01	Migration, Backup and Recovery Management	1.4	20%	Since most of the authoritative, mission critical data is not yet stored on modernized systems, most of the benefit provided by automated migration, backup and recovery management capabilities is derived in later phases and releases.
CP.07.01.02	Corporate Case Access Services	1.4	20%	Provides receive/send services for access to Corporate data from the CCDB. It provides the framework for retrieving data from the CCDB and supports virtually all customer service applications that use the CCDB. Most applications built in later releases require CCDB access via these services.
CP.07.01.03	Tax Return Access Services	1.4	20%	Provides receive/send services for access to Corporate data from the Tax Return Database. It provides the framework for retrieving data from the TADB and supports virtually all customer service applications that use the TADB. Most applications built in later releases require TADB access via these services.
TADB.01	Establish Tax Accounts Database	1.4	30%	Establishes a database for storing the IRS official account of record for individual, business, employee plan, and exempt organization filers. The TADB is initially established in Subrelease 1.2 and expanded in Subrelease 1.4 to include the complete structure for individual filers only. It is a key part of the "data engine" infrastructure used to support virtually all customer service and compliance applications built in subsequent phases and releases.
TR.01.01.01	Convert Legacy Data to Corporate Database Formats	1.4	20%	Receives case, account, return, and payment information from legacy systems. Converts each of these into a Corporate subsystem compatible format, and then sends the converted data to Corporate for inclusion in the corporate databases. This is a key part of the batch update "infrastructure" for the "Big 5" databases that supports virtually all applications, most of which are built in later releases.
TRDB.01	Establish Tax Return Database	1.4	20%	Establishes a database for storing data defining the contents of a submission(s) for a filer(s) to meet a legal requirement to file a tax return for a particular tax type and tax period. The CI is expanded in Subrelease 1.4 to included the structures necessary for the line item adjustments. It is a key part of the "data engine" infrastructure used to support virtually all customer service and compliance applications built in subsequent phases and releases.
CDADB.01	Establish Character Data Archive	1.4	20%	Since most of the authoritative, mission critical data is not yet stored on modernized systems, most of the benefit provided by archive capabilities is derived in later phases and releases.
CP.01.07.02	External Data Inbound Routing	1.4	20%	The External Data Inbound Routing CI handles data coming from external sources (e.g., SSA) that needs to be routed and stored on modernized systems. In Release 1, only a small percentage of the external data that will ultimately be stored on the modernized systems is processed.

Phase I/Release 1 Subrelease 1.4 Amortized Software CI Rate (Continued)

CI ID	CI Name	Sub-Release	%	Rationale
CP.07.02.02	Reference Data Server	1.4	20%	The Reference Data Server CI supports the synchronization across the enterprise of the multiple copies of the REFDB. Since the REFDB is not completely populated yet (mainly to support the automated self-service applications and the initial modernized CSR applications), most of the benefit derived from keeping the multiple copies in synch is realized in later releases.
CP.09.01.01	Reference Data Update Services	1.4	20%	The Reference Data Update Services CI supports the capability to update of the master copy of the REFDB. Since the REFDB is not completely populated yet (mainly to support the automated self-service applications and the initial modernized CSR applications), most of the benefit derived from update capabilities is derived in later releases.
CP.09.01.02	Reference Data Management	1.4	20%	The Reference Data Management CI supports the synchronization across the enterprise of the multiple copies of the REFDB. Since the REFDB is not completely populated yet (mainly to support the automated self-service applications and the initial modernized CSR applications), most of the benefit derived from keeping the multiple copies in synch is realized in later releases.
IS.04.01.03	Enterprise Security Audit Management	1.4	20%	The Enterprise Security Audit Management CI provides the capability to perform enterprise level security audit management and reporting. Since most CSR activity still occurs using legacy systems, most of the benefit derived from analyzing audit trails from modernized systems occurs later, when more of the legacy systems have been eliminated and replaced with modernized systems.
REFDB.01	Establish Reference Database	1.4	20%	The Establish Reference Database CI in this subrelease adds additional reference data to support the applications implemented in this subrelease.

Phase I/Release 1 Subrelease 1.4 Amortized COTS CI Rate

CI ID	CI Name	Sub-Release	%	Rationale
IS.03.01.09	Corporate Platform Problem Management	1.4	20%	Corporate platform isn't really used for much "mission critical" operations in Phase I/Release 1. Most of the applications it supports (and therefore the problems to be resolved and tracked) are built later.
IS.05.14.01	Corporate Processors	1.4	20%	Corporate platform isn't really used for much "mission critical" operations in Phase I/Release 1. Most of the applications it supports are built later.
IS.05.15.01	Regional Hardware Platform (SADB/PAAS HW & SW)	1.4	20%	SADB platform isn't significantly used for "mission critical" operations in this release.
IS.04.01.02	Corporate Platform Realtime Security Event Handling/ Intrusion Detection	1.4	20%	Corporate platform isn't really used for much "mission critical" operations in Phase I/Release 1.
IS.04.01.03	Enterprise Security Audit Management	1.4	20%	The Enterprise Security Audit Management CI provides the capability to perform enterprise level security audit management and reporting. Since most CSR activity still occurs using legacy systems, most of the benefit derived from analyzing audit trails from modernized systems occurs later, when more of the legacy systems have been eliminated and replaced with modernized systems.
IS.05.06.01	Corporate Platform Transaction Processing Services	1.4	5%	Corporate Platform isn't really used for much "mission critical" operations in Phase I/Release 1.

Phase I/Release 1 Subrelease 1.5 Amortized Software & COTS CI Rate

CI ID	CI Name	Sub-Release	%	Rationale
CP.01.06.01	Tax Return On-line Update Services	1.5	20%	Provides the capability to update tax return data on-line. Initially built in Subrelease 1.5, it provides the framework for handling on-line updates to the TRDB by applications built in subsequent phases and releases. The only application supported at this point is on-line adjustments. Supports many more applications in later releases.
CP.01.06.02	Case Data On-line Update Services	1.5	20%	Provides the capability to update case data on-line. Initially built in Subrelease 1.5, it provides the framework for handling on-line updates to the CCDB by applications built in subsequent phases and releases. Part of on-line update "infrastructure," but the only application supported at this point is on-line adjustments. Supports many more applications in later releases.
CP.01.06.07	Individual Filer Account On-line Update Services	1.5	20%	Provides the capability to update individual filer account data on-line. Initially built in Subrelease 1.5, it provides the framework for handling on-line updates to individual filer data in the TADB by applications built in subsequent phases and releases. Part of on-line update "infrastructure," but the only application supported at this point is on-line adjustments. Supports many more applications in later releases.
CP.01.06.08	Update Execution Services	1.5	20%	The Update Execution Services configuration item provides the common services to the on-line and batch Corporate Processing subsystems for storing data into the five major corporate databases. These common services are used by on-line update applications built in subsequent phases and releases. Part of on-line update "infrastructure," but the only application supported at this point is on-line adjustments. Supports many more applications in later releases.
CP.04.01.02	Correspondence Template Access Services	1.5	20%	Provides the capability to generate corporate correspondence including notices. Part of notice generation "infrastructure," but only supports adjustment notices at this point. Eventually supports many other notices.
CP.04.01.03	Correspondence Template Update Services	1.5	20%	Provides the capability to generate corporate correspondence including notices. Part of notice generation "infrastructure," but only supports adjustment notices at this point. Eventually supports many other notices.
CS.01.01.01	Data Directed Routing	1.5	20%	Provides Data Directed Routing (DDR) to route calls to the appropriate Customer Service Representative or a group of Representatives when the taxpayer 'opts out' of the self-service applications. In a sense, this is part of the telephone infrastructure (data directed routing "infrastructure") that supports applications built in subsequent phases and releases, but the only application supported at this point is line item adjustments. Supports many more applications in later releases.

Phase I/Release 1 Subrelease 1.5 Amortized Software & COTS CI Rate (Continued)

CI ID	CI Name	Sub-Release	%	Rationale
CS.06.01.06	Data Directed Routing Support	1.5	20%	Provides support to the DDR by accessing and analyzing data from the TADB and CCDB to determine the appropriate Customer Service employee or group of employees to resolve a call. This also is part of the telephone infrastructure (data directed routing "infrastructure") that supports applications built in subsequent phases and releases, but the only application supported at this point is line item adjustments. Supports many more applications in later releases.
IS.05.05.11	Regional Platform Non-IRS User Authentication Services	1.5	25%	The Regional Platform Non-IRS User Authentication Services CI supports the capability to authenticate non-IRS users (e.g., taxpayers). At this point, however, only a limited number of applications that require authentication (e.g., account inquiries) are available to taxpayers, so much of the benefit accrues later, when more automated self-service applications are implemented.
CP.02.01.01	Account Settlement Calculation	1.5	20%	Provides on-line common settlement services to determine trial settlements based on adjustments made to a taxpayer account. On demand it computes items such as tax penalty and interest, collection statute expiration date, assessment statute expiration date, date calculations (return due date), and deferral/tolerance limits. This is a common business service that supports many applications built in subsequent phases and releases, but at this point, it only supports on-line line item adjustment applications.
MCDB.01	Establish Master Correspondence Database	1.5	25%	The MCDB ultimately includes notice generation templates for all notice types. In Release 1, however, it is used only to support notices generated as a result of performing line item adjustments to individual tax returns.
CP.08.02.01	MIS Report Generation & Statistical Analysis	1.5	20%	Most MIS reporting will be done later, when cases are worked from the new databases.
CP.08.02.02	MIS Data Access Services	1.5	20%	Provides on-line services to allow users to access Management Information Systems data, stored in the MISDB, through one of the OLTP subsystems. Provides part of the MIS “infrastructure” that supports MIS data collection and reporting application built in subsequent releases.
CP.09.02.02	MIS Data Management	1.5	20%	Retrieves event log data from the TECHDB entered by all subsystems via CP.09.02.03 services. Uses event log data to perform rollups and aggregates it into statistical data. Provides part of the MIS “infrastructure” that supports MIS data collection and reporting application built in subsequent releases.

Phase I/Release 1 Subrelease 1.5 Amortized Software & COTS CI Rate (Continued)

CI ID	CI Name	Sub-Release	%	Rationale
CP.09.02.03	MIS Event Log Generation Services	1.5	20%	Provides common services used by other applications to write the event logs. These services are used by all subsystems whether they are operating at a regional or corporate level. Provides part of the MIS "infrastructure" that supports MIS data collection and reporting application built in subsequent releases.
MISDB.01	Establish MIS Database	1.5	20%	Establishes a database for storing data used to analyze quantitatively Internal Revenue Service (IRS) processes and performance, as well as customer behavior. Includes the collection of descriptive statistics observed for technical system and human resource performance, as well as analyses and information summaries rolled up into management reports. Provides part of the MIS "infrastructure" that supports MIS data collection and reporting application built in subsequent releases.
TECHDB.01	Establish Technical Database	1.5	20%	Establishes a database for storing data used by the system software and support software in order to provide a technical infrastructure for the Internal Revenue Service (IRS). Provides part of the MIS "infrastructure" that supports MIS data collection and reporting application built in subsequent releases.

APPENDIX D
COST AND BENEFIT ANALYSIS

APPENDIX D: Cost and Benefit Analysis

1. Return on Investment

This Business Case represents the investment justification for Phase I/Release 1 of the ***Modernization Blueprint***. In accordance with the IRS Investment Justification Handbook, members of the Business Case Working Group (BCWG) performed a Cost Benefit Analysis (CBA) to determine the Return on Investment (ROI) for Phase I/Release 1 and Projected Funding Requirements (PFR) required for each fiscal year (FY) of the project. The CBA projects cost and staff year personnel estimates for a fifteen year life cycle from FY1999 through FY2013.

The CBA compares two alternative project solutions (scenarios) to determine benefits which are then used in the ROI calculations.

Scenario 1 - Without Project or Current Functional Equivalent (CFE)

- ✦ No change in either cost or productivity; and,
- ✦ Productivity and levels of service actually achieved in FY1996 remain constant over the fifteen year planning period.

Scenario 2 - With Project

- ✦ Phase I/Release 1 is implemented.

The two alternatives are measured in terms of Investment Cost, Operations & Maintenance (O&M) and Normal Business Operations (NBO).

- ✦ **Investment Costs** - The personnel and infrastructure (hardware/software/ telecommunications, etc.) costs required to implement Phase I/Release 1. Sunken costs are not included in the calculation of ROI.
- ✦ **O&M Costs** - Labor and non-labor costs for business, support services, and information systems required to operate and maintain the current systems.
- ✦ **NBO Costs** - Support services and business activities required to perform the mission of the IRS.

Phase I/Release 1 includes the investment in the infrastructure and the development of the first new corporate databases which support all future phases of Modernization. Since infrastructure and other reusable components span multiple releases beyond Phase I/Release 1, the cost of the reusable components is amortized to its respective Phase I releases. The amortized costs are referred to as "cost" when calculating ROI. For fiscal year PFR purposes the non-amortized costs are used and presented in "V. Phase I/Release 1, Subreleases 1.2 – 1.5 Risk Adjusted Projected Funding Requirements (PFR)" in the Executive Summary.

The ROI prior to savings reinvestment was calculated as **4.1**. Two reinvestment alternatives were proposed. The first reinvestment proposal assumed that the 85% Level of (telephone) Access (LOA) mandated by Congress will be achieved using IRS resources. Therefore, this alternative requires reinvesting a portion of the Customer Service Representative (CSR) staff year savings to achieve 85% LOA and the rest of the savings to Compliance programs. The ROI after savings reinvestment including LOA Goal was calculated as **53.1**. The second reinvestment proposal

assumed that the 85% Level of (telephone) Access (LOA) is achieved through the FY1999 PFR request for additional CSR staff years. Therefore, all staff year savings are available for reinvestment in Compliance programs. The ROI after savings reinvestment excluding LOA Goal was calculated as **64.5**. These data are illustrated by fiscal year in the "Phase I/Release 1 Cost Benefit Summary" chart and the "Phase I/Release 1 Cost Benefit Summary by Category" chart.

To mitigate schedule, cost, and PFR risk, Monte Carlo Probability Risk Analyses were performed. The results of the analyses, as described in Appendix G, "Monte Carlo Probability Analysis," indicated the **schedule, cost and PFR were well within the general project management best practices allowing for maximum 10% deviation.** Specifically, the schedule, cost and PFR estimates were close to the median (50th percentile). The analyses indicated a maximum potential schedule slip of **6.5%** or **four** months, a maximum potential cost overrun of **3.98% or $13,273,000, and a maximum potential PFR overrun of 4.79% or $32,414,100.** Therefore, the benefits, cost, and PFR were adjusted for these risks.

To compensate for a maximum potential **four** month schedule slip, application of benefits were adjusted by postponing accrual for 12 months to begin a year after the production rollout, and also by ensuring that production rollout did not occur during or adversely impact tax season operations. The cost and PFR were adjusted to the maximum potential overrun amount calculated by the Monte Carlo cost and PFR analyses. Consequently, the Risk Adjusted ROI prior to Savings Reinvestment was calculated as **3.7**; the Risk Adjusted ROI after Savings Reinvestment including LOA Goal was calculated as **47.3;** the Risk Adjusted ROI after Savings Reinvestment excluding LOA Goal was calculated as **60.0**. These data are illustrated by fiscal year in the "Phase I/Release 1 Risk Adjusted Cost Benefit Summary" chart and in the "Phase I/Release 1 Risk Adjusted Cost Benefit Summary by Category" chart.

- **Risk Adjusted Net Present Value**

  Net Present Value (NPV) is a method of capital investment appraisal. NPV is an important economic analysis tool when considering either mutually exclusive proposals or in capital rationing because the value of future expenditures or receipts is lower the further in the future they are.

  In capital budgeting decisions, the usual way of comparing one stream of payments with another is to discount both streams of payments back to their present value. Since a dollar in the future is worth less than a dollar today, future dollars must be weighted in the summation of the net benefits. The traditional way of doing this is to compute the present value using a discount rate that everybody agrees is fair.

The advantages of NPV as a capital expenditure appraisal technique are that:

- It recognizes the time value of money for **all expenditures or receipts**.
- It recognizes the time value of money **by converting future expenditures and receipts to their corresponding present** value based on the date on which they are expected to be made or received; and
- Alternative **proposals can be ranked** in order of attractiveness.

The major disadvantage of NPV as a method of appraising capital expenditure proposals is that it requires an organization to determine an interest rate to use for discounting expenditures and receipts to account for the time period in which they will be made or received**. The NPV calculation is only valid for the interest rate that has been used**.

The technique for computing NPV is a three-stage process (Note that only cash expenditures and incomes are considered. Non-cash items such as depreciation are ignored.):

- Calculate the present value of each element of cash expenditure in a proposal (amount of expenditure times the cumulative discount rate corresponding to the time period of the expenditure) and add these individual present values together to provide a total present value of the expenditures;
- Calculate the present value of each element of cash income in a proposal (amount of income times the cumulative discount rate corresponding to the time period of the income) and add these individual present values together to provide a total present value of the incomes; and
- Deduct the total present value of the expenditures from the total present value of the incomes to determine the net present value.

As prescribed by the Chief Financial Officer, risk adjusted future costs and risk adjusted future benefits were discounted by 3.5% per year for the fifteen year life of the Business Case. NPV equals the sum of discounted benefits over the life of the project minus the sum of discounted expenditures over the life of the project. Refer to “Phase I/Release 1 Risk Adjusted Net Present Value Cost Benefit Summary” for a detailed presentation of these data by fiscal year.

The table below presents a summary of all the ROI figures (Original, Risk Adjusted, and NPV).

Alternatives	Original ROI	Risk Adjusted ROI	Present Value
I. No Reinvestment of Savings and Cost Avoidance	4.1	3.7	3.1
II. Reinvestment in Customer Service and Compliance	53.1	47.3	39.2
III. Reinvestment in Compliance Only	64.5	60.0	51.3

2. Cost Methodology

✦ Cost Data Sources

In order to calculate the Phase I/Release 1 cost estimates, the architectural subsystems defined in the target Technical Architecture were decomposed into Configuration Items (CIs). Each CI was categorized as a COTS product, new development, or as modifications to the IRS legacy systems.

For CIs expected to be satisfied by a COTS hardware or software product, sample products were identified that provided similar functionality of the required CI. Where possible, the unit and total cost for the number of hardware and software COTS products required was estimated using one of three sources:

1) Previously completed business cases
2) Already expended infrastructure COTS costs
3) Vendor quotes.

For CIs identified as new development, a software estimation model was used for sizing the new software development by estimating Source Lines of Code (SLOC). Legacy SLOC for some systems were obtained and used as a cross check.

For CIs identified as modifications to the IRS legacy systems, the IRS assembled a team of IRS and contractor senior managers and specialists to derive and validate the estimates and assumptions based on their expert knowledge of the ***Modernization Blueprint***, legacy systems, and emerging technology.

The estimates for each of the CIs were applied to the Constructive Cost Model II (COCOMO) software estimation model to determine workload and schedule estimates. See Appendix F, “COCOMO II Estimation Model” for more detail. The IRS used historical costs and rates to determine the remaining costs for the project.

✦ Cost Investment Categories

The results of the COCOMO II labor estimates, legacy modification labor estimates, and the non-labor costs were used to build a cost model. The cost model was developed based on the following major Systems Life Cycle (SLC) categories:

- Program Management & Planning
- Acquisition
- Development
- Systems Acceptance Test (SAT) & Pilot
- Rollout
- Training & Procedures
- Management & Administration (M&A)
- Investment Operating and Maintenance (O&M) Costs

Costs to develop the new system (Development Investment Costs) as well as to maintain the new system (O&M Investment Costs) were identified by Subrelease and Fiscal Year. Outlined below are definitions of each of the costs for the model. See Appendix C, "Cost and Benefit Assumptions" for assumptions related to the costs.

▲ Program Management & Planning

Program Management and Planning includes Government and Contractor costs to plan the development of each subrelease. It also includes Government and Contractor costs to manage all aspects of system development (e.g., the SLC)

▲ Acquisition

Acquisition includes the procurement of the hardware and COTS products necessary for the production system which will be deployed for the sites. It also includes the procurement of the development equipment, the integration testing equipment, and the maintenance equipment. These costs include the equipment and software costs for the planned 13 IRIS Regional centers, the IRS Primary Computing Center, and the 24 Customer Service sites.

▲ Development

Development costs include the design, programming, unit testing, and integration testing of the system being developed. It includes Preliminary Design Reviews (PDRs), Critical Design Reviews (CDRs), and Test Readiness Reviews (TRRs) SLC activities.

▲ SAT and Pilot

SAT and Pilot costs include the costs necessary for the IRS Product Assurance organization to test the system after it has completed integration testing, to obtain the security certification and accreditation, and for the pilot of the subrelease.

▲ **Rollout**

Rollout includes the costs to deploy the system nationwide.

▲ **Training & Procedures**

Training and Procedures costs include general training for IRS employees while the system is being built and system maintenance transfer of knowledge training for IRS and Contractor employees. Contractor training is assumed to be incorporated in the contractor rate. Training costs also include the costs to train the CSRs as Subreleases 1.3 and 1.5 are deployed nationwide.

▲ **Management & Administration**

M&A costs include travel, supplies, facilities, and any miscellaneous costs.

▲ **Investment O&M Costs**

In addition to the cost of developing and deploying the new system, there are O&M costs for the new system which include the following:

- Maintenance

  Maintenance includes the costs to maintain all hardware; COTS purchased software, developed software, and the development and maintenance equipment.

- Training & Procedures

  Training costs include general training for IRS employees while the system is being maintained and updates to the IRM procedures and handbooks.

- Management & Administration

  M&A costs include travel, supplies, facilities, and any miscellaneous costs to maintain the system.

3. Benefit Methodology

✦ **Benefit Data Sources**

Data used to derive benefits were extracted from the following data sources:

- **Automated Financial System (AFS)**

  The Automated Financial System was used to determine O&M costs. The expenditures included in O&M costs are those relevant to Customer Service. AFS data were also used to determine the Sub-Object Codes pertinent to data communications costs. All O&M costs for FY1996 are actual expenditures as represented in the AFS.

- **Work Planning and Control System (WP&C)**

  The Work Planning and Control System (WP&C) is the primary workload tracking system used in the Service Centers. It is structured by Organization, Function, and Program (OFP) codes which describe in substantial detail the type of work being performed. The WP&C is compiled from time sheets. The time sheets are totaled by OFP code, which is the activity or activities to which the time was charged. The WP&C data were available for all of FY1996.

  The OFP structure contained in WP&C was used to determine which codes represented direct work related to taxpayer issues and which represented the indirect work necessary to support the direct work. The volumes for direct work were used to estimate demand. These data were compiled on an annual basis for FY1996.

- **Program Analysis System (PAS)**

  The PAS is the quality review system for Tax Account and Customer Service operations in the Service Centers. Data from the PAS systems were used as a representation of the type (categories) and mix of work that is being performed at the Service Centers below the OFP level. The percentage of each category to the total volume was applied to the universe of workload volume.

- **Resource Management Information System**

  The Resource Management Information System is the primary workload tracking system for Taxpayer Services. It consists of data on calls answered, forms distributed, and staff hours expended at Taxpayer Service call sites for all of FY1996.

- **Workload Information Tracking System (WITS)**

  WITS data were used to separate the demand for Taxpayer Services into one of four categories: Tax Law, Procedural Inquiries, Refund Inquiries, and Other Account Inquiries. Call volume data from the WITS Category reports were compiled for FY1996 and FY1997.

- **Snap Shot Report**

  The Snap Shot report is a manual system used by Customer Service which provides information on call volumes by product line.

✦ Benefit Categories

In the context of implementing Phase I/Release 1, the relevant benefits are broken down into the following measures:

- Labor Savings and Labor Cost Savings;
- Labor Cost Avoidance;
- Non-Labor Cost Savings; and
- Revenue Benefits.

▲ Labor Savings and Labor Cost Savings

Labor utilization scenarios are significantly different between the CFE and the Phase I/Release 1 alternatives. For the CFE scenario, actual FY1996 labor utilization and volumes were used to establish baseline data. Productivity rates and workload growth were held constant at FY1996 levels through out the planning horizon (FY1996 to FY2013). The assumption used is that without the addition of functionality provided by new applications and hardware, there should be no increase in productivity expected.

In contrast, labor utilization under Phase 1/Release 1 was adjusted by the projected impact of the new technology on business operations. Workload growth was held constant at FY1996 levels. Actual rates of productivity were assumed to increase by fixed amounts as particular applications or hardware were installed. Impact of the new technology will also be measured through performance measures discussed in Appendix B, "Performance Measures."

The staff year labor saving was calculated as the difference between the levels of labor utilized under these two scenarios. Likewise, labor cost savings were calculated by multiplying the staff years savings by the IRS CSR standard salary ($37,760).

▲ Labor Cost Avoidance

Labor cost avoidance was calculated by identifying the labor costs avoided by not having to hire additional staff to meet projected workload increases. Workload volume was increased each year by the same rate as the expected increase in the number of returns filed. Once the revised volume was determined, the FY1996 productivity rate was applied to the new volume to determine the number of direct staff years required to meet rising demand. Since no change in paper processing is expected during Phase I/Release 1, clerical staff were assumed to continue to support Customer Service activities at the same ratio as in FY1996.

- **Non-Labor Cost Savings**

  Non-Labor costs are those costs associated with supporting the infrastructure of Customer Service under the new environment, or supporting the CFE infrastructure. To complete the non-labor cost structure of the CFE alternative, the FY1996 cost structure was assumed to be representative of the operating costs that support today's IRS program activities. Expected changes in infrastructure operations costs were calculated and the difference reflected as non-labor cost savings.

- **Non-Labor Cost Avoidance**

  Non-labor cost avoidance refers to the costs avoided by the IRS as a result of not having to upgrade and replace existing plant and equipment as the result of Phase I/Release 1. It is assumed that there will be minimal impact on the current operating costs and therefore no benefits in this category resulting from Phase I/Release 1 implementation.

- **Revenue Benefits**

  The Customer Service function has two principal program areas: Taxpayer Service and Compliance. The Compliance program is charged with the majority of the revenue-generating activities. It is divided into Examination and Collection. Examination is responsible for reviewing taxpayer information to identify returns for which additional information may be required to substantiate claims. Within Examination, the Underreporter program's activities are dedicated to ensuring consistency in tax-related information among the tax return and information documents from employees, financial institutions, and federal and state agencies. The Collection program mission is to collect balances due and secure delinquent returns. Within the Collection program are the Service Center Collections Branch and the Automated Collection System.

  To estimate the revenue generated by Customer Service activities, the cost to yield reports maintained by Compliance Planning were used. These reports are based on information from the Enforcement Revenue Information System. Revenue estimates were based on the reinvestment of staff years into the following areas:

  - Level of (telephone) Access (LOA);
  - Automated Collection System (ACS);
  - Automated Underreporter (AUR) Program;
  - Service Center Examination (CorrExam);
  - Substitute for Return (SFR) Program; and,
  - Employee Plans and Exempt Organizations (EP/EO).

✦ Benefit Reinvestment Strategy

Two mission critical objectives for the IRS are maximizing customer satisfaction and increasing voluntary compliance. The strategy for reinvesting savings resulting from Phase I/Release 1 supports these objectives. Reinvesting savings will allow the IRS to answer 3.3 million additional assistor calls (annually) and thereby achieve an 85% level of telephone access for taxpayers. Reinvesting savings will also allow the IRS to reinstate compliance programs that ensure equity in the tax system and increase revenue collected by $15 billion dollars in the process.

▲ Priorities

The order of priorities for the programs to which staff year savings should be applied were determined by the Chief Operations Officer. They are as follows:

- Meet the 85% level of telephone access by taxpayers mandated by Congress,
- Make Customer Service functions self-sufficient:
  - Reinstate staff year diversions from Compliance programs that were used to improve level of telephone access, and
  - Reinstate staff year reductions to Compliance programs that resulted from cuts to the IRS PFR in order to reestablish balanced coverage across various program areas (filing, payment, and accuracy compliance).

▲ Program Areas

This section discusses each of the program areas into which staff year savings would be reinvested to calculate potential benefits. Program areas are discussed in the order they were prioritized to meet the business objectives discussed above.

— Level of Access (LOA)

As part of the budget appropriation process, the IRS is mandated to provide taxpayers an 85% level of telephone access as compared to the current LOA rate of 62%. Additional staffing will be required to reach the 85% level. The IRS FY1999 budget submission includes a funding request for the increase. Should the initiative be approved in the FY1999 budget, the staff year savings allocated to this program will be reinvested in the next highest priority program area that has a staffing deficiency.

— Automated Collection System (ACS)

ACS is one of the primary tools used to address taxpayers with known liabilities. The IRS has been unable to work all of its ACS inventory. On average, ACS has a total inventory of about 2.5 million cases, of which about 2 million cases are actually worked annually. The total revenue collected from these cases is $4.1 billion. Each year, ACS inventory is established by a process that determines the “best” set of cases to work. Historical trend analysis is used to estimate expected values of these cases. Although the criteria used to determine the inventory could be modified to generate

more cases, the marginal yield should decrease as criteria are relaxed. Therefore, for purposes of this business case, staff years were reinvested to address the projected unworked inventories generated by the current criteria.

Based on FY1996 data, the number of cases worked per staff year and the average dollars collected per staff year were determined. These rates were applied to the projected unworked inventory to determine the number of staff years to be allocated. The revenue that would be generated for each of the reinvested staff years was projected at the current level.

— **Automated UnderreporterAUR) Program**

AUR is the IRS's primary tool for addressing noncompliance identified through information document matching programs. Over the last several years, AUR consolidated from 10 Service Centers to 6. Staff resources in the remaining sites have been reallocated to support the 85% level of access goal. AUR currently works approximately 3 million cases per year out of a potential 8-10 million cases. However, it is estimated that only an additional 1 million cases would have the same kind of return (revenue generation) as averaged by the current workload. As a result, the reinvestment strategy only funded sufficient resources to work these additional million cases.

The IRS determined the average number of cases worked per staff year and the average dollars generated per staff year using data from current operations. These ratios were then used to determine the staff years needed to work 1 million additional cases and to derive the estimated revenue that would be generated.

— **Service Center Examination (CorrExam)**

The IRS's Service Center Examination program, sometimes referred to as the Correspondence Examination Program, addresses cases that have noncompliance issues that can be resolved without burdening the taxpayer with a face-to-face audit. CorrExam cases are identified through the IRS' Discriminant Function (DIF) scoring system and, generally, do not include cases developed through information document matching programs. Due to IRS's declining budget and Congressional emphasis on increased level of telephone access, the CorrExam program has been scaled back significantly. From FY1996 to FY1998, over 800 staff years were cut from this program. As a result, audit coverage has declined and millions of dollars have gone uncollected. Audit coverage for FY1997 is estimated to be below 1%. Reinvestment in CorrExam will allow for improved audit coverage and additional revenue to be collected.

Potential inventory that could be developed for this program is virtually unlimited. More staff years could be reinvested in the program than remain at this point in the allocation. In order to meet the "balanced coverage" objective mentioned earlier, limited additional resources were applied to allow for reinvestment in the two programs described below.

- **Substitute for Return (SFR) Program**

  The SFR program is one of the IRS's primary tools for addressing nonfilers with a high probability of significant unpaid liabilities. Due to staffing reductions, the SFR program has been eliminated. The reinvestment strategy enables a revival of this program to ensure some level of coverage of this market segment of taxpayers.

  Depending on the outcome of the FY1999 budget initiative to address the 85% level of access, the SFR program will be either 50% or 100% reinstated.

- **Employee Plans and Exempt Organizations (EP/EO)**

  Along with the other programs, EP/EO has undergone staffing cuts due to budget impacts and program prioritization (151 staff years). As with the SFR program, reinvestment hinges on the outcome of the FY1999 budget initiative to address the 85% level of access. If the level of access initiative is funded, reinvestment staff years will be available to restore the EP/EO program to its FY1996 level and allow IRS to address General Accounting Office (GAO) concerns about the $1.3 trillion in outstanding bond issuances and the unacceptable audit coverage of .04%.

Phase I/Release 1 Cost Benefit Summary

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Investment Cost	$333,105	$35,770	$50,339	$37,540	$54,179	$60,805	$22,401	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008
Benefit prior to Savings Reinvestment	$1,350,571	$0	$17,494	$22,302	$58,128	$62,046	$93,936	$116,443	$117,800	$119,150	$120,500	$121,850	$123,220	$124,550	$125,900	$127,250
ROI prior to Savings Reinvestment	4.1	0.0	0.3	0.6	1.1	1.0	4.2	14.5	14.7	14.9	15.0	15.2	15.4	15.6	15.7	15.9
Benefit after Savings Reinvestment including LOA Goal	$17,677,821	$0	$0	$304,089	$430,185	$544,818	$1,393,546	$1,661,782	$1,663,198	$1,664,548	$1,665,898	$1,667,248	$1,668,618	$1,669,948	$1,671,298	$1,672,648
ROI after Savings Reinvestment including LOA Goal	53.1	0.0	0.0	8.1	7.9	9.0	62.2	207.5	207.7	207.9	208.0	208.2	208.4	208.5	208.7	208.9
Benefit after Savings Reinvestment excluding LOA Goal	$21,470,272	$0	$0	$1,112,086	$1,148,732	$1,203,671	$1,648,216	$1,812,081	$1,813,461	$1,814,811	$1,816,161	$1,817,511	$1,818,861	$1,820,211	$1,821,561	$1,822,911
ROI after Savings Reinvestment excluding LOA Goal	**64.5**	0.0	0.0	29.6	21.2	19.8	73.6	226.3	226.5	226.6	226.8	227.0	227.1	227.3	227.5	227.6

PHASE I/RELEASE 1 COST BENEFIT SUMMARY BY CATEGORY

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Investment Cost	$333,105	$35,770	$50,339	$37,540	$54,179	$60,805	$22,041	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008
New Investment	$210,255	$35,770	$42,944	$27,600	$43,340	$46,209	$14,393	$0	$0	$0	$0	$0	$0	$0	$0	$0
Prog Mgmt & Planning	$30,816	$10,432	$5,458	$4,458	$5,674	$4,525	$269	$0	$0	$0	$0	$0	$0	$0	$0	$0
Acquisition	$48,679	$16,535	$24,275	$7,530	$0	$339	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development	$39,056	$7,884	$11,792	$13,487	$5,894	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SAT & Pilot	$26,342	$658	$1,003	$1,747	$11,388	$11,545	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Rollout	$6,680	$0	$0	$0	$2,893	$3,044	$744	$0	$0	$0	$0	$0	$0	$0	$0	$0
Training & Procedures	$54,210	$78	$124	$112	$16,142	$25,086	$12,670	$0	$0	$0	$0	$0	$0	$0	$0	$0
M&A	$4,472	$183	$292	$265	$1,351	$1,671	$711	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$122,850	$0	$7,396	$9,940	$10,839	$14,595	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008	$8,008
Maintenance	$119,623	$0	$7,166	$9,710	$10,588	$14,297	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786	$7,786
Training & Procedures	$976	$0	$69	$69	$76	$90	$67	$67	$67	$67	$67	$67	$67	$67	$67	$67
M&A	$2,251	$0	$160	$160	$175	$209	$155	$155	$155	$155	$155	$155	$155	$155	$155	$155
Benefit prior to Savings Reinvestment	$1,350,571	$0	$17,494	$22,302	$58,128	$62,046	$93,936	$116,443	$117,800	$119,150	$120,500	$121,850	$123,220	$124,550	$125,900	$127,250
Labor FTE Saving	24,071.1	0.0	449.5	770.6	771.7	846.2	1,619.2	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3
Labor Cost Saving	$908,925	$0	$16,973	$29,097	$29,138	$31,952	$61,142	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291
Cost Avoidance FTE Savings	337.8	0	14	15	16	16	27	28	28	28	28	28	28	28	28	28
Cost Avoidance Saving	$12,757	$0	$521	$585	$590	$594	$1,033	$1,041	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049
Non-Labor Saving	$428,890	$0	$0	($7,380)	$28,400	$29,500	$31,760	$33,110	$34,460	$35,810	$37,160	$38,510	$39,880	$41,210	$42,560	$43,910
Revenue Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ROI prior to Savings Reinvestment	4.1	0.0	0.3	0.6	1.1	1.0	4.2	14.5	14.7	14.9	15.0	15.2	15.4	15.6	15.7	15.9
Benefit after Savings Reinvestment including LOA Goal	$17,677,821	$0	$0	$304,089	$430,185	$544,818	$1,393,546	$1,661,782	$1,663,198	$1,664,548	$1,665,898	$1,667,248	$1,668,618	$1,669,948	$1,671,298	$1,672,648
Labor FTE Saving	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Labor Cost Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cost Avoidance FTE Savings	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cost Avoidance Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-Labor Saving	$402,991	$0	$0	($9,575)	$26,425	$27,525	$29,785	$31,135	$32,485	$33,835	$35,185	$36,535	$37,905	$39,235	$40,585	$41,935
Revenue Saving	$17,274,830	$0	$0	$313,664	$403,760	$517,294	$1,363,762	$1,630,647	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713
ROI after Savings Reinvestment including LOA Goal	53.1	0.0	0.0	8.1	7.9	9.0	62.2	207.5	207.7	207.9	208.0	208.2	208.4	208.5	208.7	208.9
Benefit after Savings Reinvestment excluding LOA Goal	$21,470,272	$0	$0	$1,112,086	$1,148,732	$1,203,671	$1,648,216	$1,812,081	$1,813,461	$1,814,811	$1,816,161	$1,817,511	$1,818,861	$1,820,211	$1,821,561	$1,822,911
Labor FTE Saving	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Labor Cost Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cost Avoidance FTE Savings	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cost Avoidance Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-Labor Saving	$428,870	$0	$0	($7,380)	$28,400	$29,500	$31,760	$33,110	$34,460	$35,810	$37,160	$38,510	$39,860	$41,210	$42,560	$43,910
Revenue Saving	$21,041,402	$0	$0	$1,119,466	$1,120,332	$1,174,171	$1,616,456	$1,778,971	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001
ROI after Savings Reinvestment excluding LOA Goal	**64.5**	0.0	0.0	29.6	21.2	19.8	73.6	226.3	226.5	226.6	226.8	227.0	227.1	227.3	227.5	227.6

PHASE I/RELEASE 1 RISK ADJUSTED COST BENEFIT SUMMARY*

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
RISK ADJUSTED INVESTMENT COST	$346,378	$37,195	$52,345	$39,036	$56,337	$63,228	$23,293	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327
Risk Adjusted Benefit prior to Savings Reinvestment	$1,293,212	$0	$0	$17,453	$58,087	$59,232	$65,029	$113,189	$117,800	$119,150	$120,500	$121,850	$123,220	$124,550	$125,900	$127,250
Risk Adjusted ROI prior to Savings Reinvestment	3.7	0.0	0.0	0.4	1.0	0.9	2.8	13.6	14.1	14.3	14.5	14.6	14.8	15.0	15.1	15.3
Risk Adjusted Benefit after Savings Reinvestment including LOA Goal	$16,396,009	$0	$0	($9,868)	$428,511	$431,498	$576,299	$1,626,156	$1,663,211	$1,664,548	$1,665,898	$1,667,248	$1,668,618	$1,669,948	$1,671,298	$1,672,648
Risk Adjusted ROI after Savings Reinvestment including LOA Goal	47.3	0.0	0.0	-0.3	7.6	6.8	24.7	195.3	199.7	199.9	200.1	200.2	200.4	200.5	200.7	200.9
Risk Adjusted Benefit after Savings Reinvestment excluding LOA Goal	$20,776,611	$0	$0	$993,421	$1,078,607	$1,149,933	$1,219,788	$1,789,376	$1,813,461	$1,814,811	$1,816,161	$1,817,511	$1,818,861	$1,820,211	$1,821,561	$1,822,911
Risk Adjusted ROI after Savings Reinvestment excluding LOA Goal	**60.0**	0.0	0.0	25.4	19.1	18.2	52.4	214.9	217.8	217.9	218.1	218.3	218.4	218.6	218.8	218.9

PHASE I/RELEASE 1 RISK ADJUSTED NET PRESENT VALUE COST BENEFIT SUMMARY*

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
RISK ADJUSTED NPV INVESTMENT COST	$303,074	$37,195	$50,575	$36,440	$50,813	$55,099	$19,612	$6,774	$6,545	$6,324	$6,110	$5,903	$5,704	$5,511	$5,324	$5,144
Risk Adjusted NPV Benefit prior to Savings Reinvestment	$950,942	$0	$0	$16,292	$52,391	$51,618	$54,753	$92,079	$92,590	$90,484	$88,415	$86,382	$84,399	$82,425	$80,501	$78,613
Risk Adjusted NPV ROI prior to Savings Reinvestment	3.1	0.0	0.0	0.4	0.9	0.8	2.4	11.1	11.1	10.9	10.6	10.4	10.1	9.9	9.7	9.4
Risk Adjusted NPV Benefit after Savings Reinvestment including LOA Goal	$11,887,044	$0	$0	($9,212)	$386,492	$376,025	$485,228	$1,322,879	$1,307,269	$1,264,077	$1,222,321	$1,181,943	$1,142,913	$1,105,143	$1,068,635	$1,033,331
Risk Adjusted NPV ROI after Savings Reinvestment including LOA Goal	39.2	0.0	0.0	-0.2	6.9	5.9	20.8	158.9	157.0	151.8	146.8	141.9	137.3	132.7	128.3	124.1
Risk Adjusted NPV Benefit after Savings Reinvestment excluding LOA Goal	$15,550,872	$0	$0	$927,370	$972,842	$1,002,101	$1,027,029	$1,455,659	$1,425,364	$1,378,188	$1,332,573	$1,288,467	$1,245,821	$1,204,585	$1,164,713	$1,126,161
Risk Adjusted NPV ROI after Savings Reinvestment excluding LOA Goal	**51.3**	0.0	0.0	23.8	17.3	15.8	44.1	174.8	171.2	165.5	160.0	154.7	149.6	144.7	139.9	135.2

Net Present Value adjustment rate = 3.5%		1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394	0.6178

*NOTE: Sunk costs not included

PHASE I/RELEASE 1 RISK ADJUSTED COST BENEFIT SUMMARY BY CATEGORY

	Total ($K)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Risk Adjusted Investment Cost	$346,378	$37,195	$52,345	$39,036	$56,337	$63,228	$23,293	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327
New Investment	$218,633	$37,195	$44,655	$28,699	$45,067	$48,051	$14,966	$0	$0	$0	$0	$0	$0	$0	$0	$0
Prog Mgmt & Planning	$32,044	$10,848	$5,676	$4,636	$5,900	$4,705	$279	$0	$0	$0	$0	$0	$0	$0	$0	$0
Acquisition	$50,619	$17,194	$25,242	$7,830	$0	$353	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development	$40,612	$8,198	$12,262	$14,024	$6,129	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SAT & Pilot	$27,391	$685	$1,043	$1,817	$11,841	$12,005	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Rollout	$6,947	$0	$0	$0	$3,008	$3,165	$773	$0	$0	$0	$0	$0	$0	$0	$0	$0
Training & Procedures	$56,370	$81	$129	$117	$16,785	$26,085	$13,174	$0	$0	$0	$0	$0	$0	$0	$0	$0
M&A	$4,650	$190	$303	$275	$1,404	$1,737	$739	$0	$0	$0	$0	$0	$0	$0	$0	$0
O&M Investment	$127,745	$0	$7,690	$10,336	$11,271	$15,177	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327	$8,327
Maintenance	$124,389	$0	$7,452	$10,097	$11,009	$14,866	$8,096	$8,096	$8,096	$8,096	$8,096	$8,096	$8,096	$8,096	$8,096	$8,096
Training & Procedures	$1,015	$0	$72	$72	$79	$94	$70	$70	$70	$70	$70	$70	$70	$70	$70	$70
M&A	$2,340	$0	$167	$167	$182	$217	$161	$161	$161	$161	$161	$161	$161	$161	$161	$161
Risk Adjusted Benefit prior to Savings Reinvestment	$1,293,212	$0	$0	$17,453	$58,087	$59,232	$65,029	$113,189	$117,800	$119,150	$120,500	$121,850	$123,220	$124,550	$125,900	$127,250
Labor FTE Saving	22,565.9	0.0	0.0	642.1	770.6	771.7	853.7	2,093.2	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3	2,179.3
Labor Cost Saving	$852,087	$0	$0	$24,248	$29,097	$29,138	$32,236	$79,038	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291	$82,291
Cost Avoidance FTE Savings	324.0	0	0	15	16	16	27	28	28	28	28	28	28	28	28	28
Cost Avoidance Saving	$12,236	$0	$0	$585	$590	$594	$1,033	$1,041	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049	$1,049
Non-Labor Saving	$428,890	$0	$0	($7,380)	$28,400	$29,500	$31,760	$33,110	$34,460	$35,810	$37,160	$38,510	$39,880	$41,210	$42,560	$43,910
Revenue Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Risk Adjusted ROI prior to Savings Reinvestment	3.7	0.0	0.0	0.4	1.0	0.9	2.8	13.6	14.1	14.3	14.5	14.6	14.8	15.0	15.1	15.3
Risk Adjusted Benefit after Savings Reinvestment including LOA Goal	$16,396,009	$0	$0	($9,868)	$428,511	$431,498	$576,299	$1,626,156	$1,663,211	$1,664,548	$1,665,898	$1,667,248	$1,668,618	$1,669,948	$1,671,298	$1,672,648
Labor FTE Saving	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Labor Cost Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cost Avoidance FTE Savings	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cost Avoidance Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-Labor Saving	$402,697	$0	$0	($9,868)	$26,425	$27,525	$29,785	$31,135	$32,485	$33,835	$35,185	$36,535	$37,905	$39,235	$40,585	$41,935
Revenue Saving	$15,993,312	$0	$0	$0	$402,086	$403,973	$546,514	$1,595,021	$1,630,726	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713	$1,630,713
Risk Adjusted ROI after Savings Reinvestment including LOA Goal	47.3	0.0	0.0	-0.3	7.6	6.8	24.7	195.3	199.7	199.9	200.1	200.2	200.4	200.5	200.7	200.9
Risk Adjusted Benefit after Savings Reinvestment excluding LOA Goal	$20,776,611	$0	$0	$993,421	$1,078,607	$1,149,933	$1,219,788	$1,789,376	$1,813,461	$1,814,811	$1,816,161	$1,817,511	$1,818,861	$1,820,211	$1,821,561	$1,822,911
Labor FTE Saving	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Labor Cost Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cost Avoidance FTE Savings	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cost Avoidance Saving	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-Labor Saving	$428,870	$0	$0	($7,380)	$28,400	$29,500	$31,760	$33,110	$34,460	$35,810	$37,160	$38,510	$39,860	$41,210	$42,560	$43,910
Revenue Saving	$20,347,741	$0	$0	$1,000,801	$1,050,207	$1,120,433	$1,188,028	$1,756,266	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001	$1,779,001
Risk Adjusted ROI after Savings Reinvestment excluding LOA Goal	**60.0**	0.0	0.0	25.4	19.1	18.2	52.4	214.9	217.8	217.9	218.1	218.3	218.4	218.6	218.8	218.9

APPENDIX E
SCHEDULE

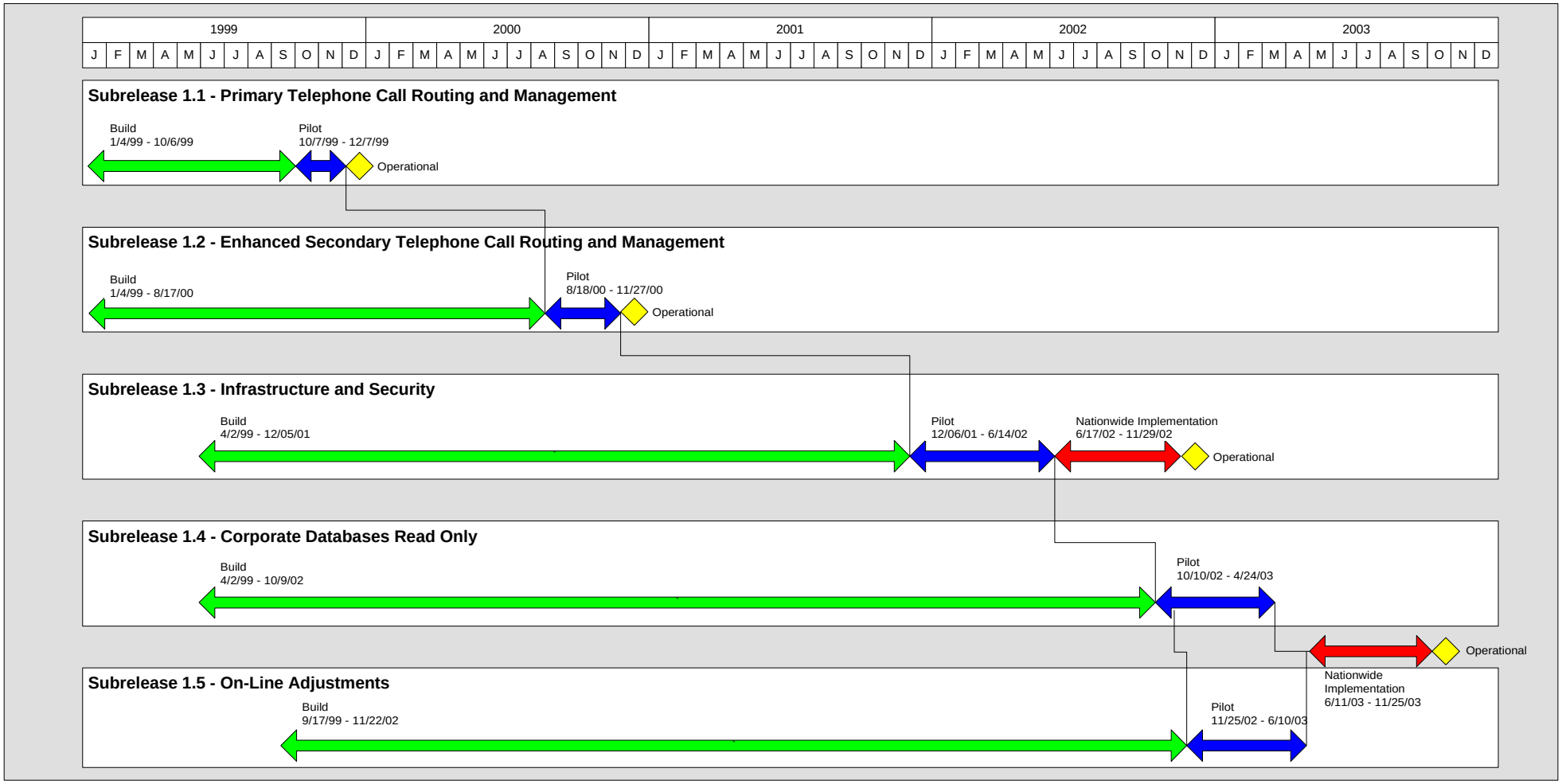
APPENDIX E: Schedule

"Modernization Phase I/Release 1 Schedule Overview" outlines the high level schedule for Phase I/Release 1 by Subrelease. "Modernization Phase I/Release 1 Schedule" lists the detailed schedule.

Modernization Phase I/Release 1 Schedule Overview

Based on risk adjusted government estimates, it is currently projected that Phase I/Release 1 be fully developed in accordance with the schedule below. The Modernization Phase I/Release 1 schedule was developed using the COCOMO (COnstructive COst MOdel) estimation tool for development and using IRS/ISC technical and programmatic expertise for non-development activities. The schedule below was **adjusted to account for schedule risk** pursuant to the application of the Monte Carlo risk simulation tool.

Modernization Phase I/Release 1 Schedule Overview



MODERNIZATION PHASE I/RELEASE 1 SCHEDULE

Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
1		**Start Phase I/Release 1**	**1343d**	**10/1/98**	**11/25/03**	
2		**PRIME Contract**	**0d**	**10/1/98**	**10/1/98**	
3		Contract Award	0d	10/1/98	10/1/98	
4		**Subreleases 1.1 & 1.2**	**562d**	**10/2/98**	**11/27/00**	
5		**Deploy SLC/SRR/SDR for Subreleases 1.1 & 1.2**	**116d**	**10/2/98**	**3/12/99**	
6		**Systems Requirements Review**	**33d**	**10/2/98**	**11/17/98**	
7		Concept of Operations Document	33d	10/2/98	11/17/98	3
8		Management Plan	33d	10/2/98	11/17/98	7SS
9		Master Test Plan	33d	10/2/98	11/17/98	7SS
10		Configuration Management Plan	33d	10/2/98	11/17/98	7SS
11		Quality Assurance Plan	33d	10/2/98	11/17/98	7SS
12		Pilot Rollout Plan	33d	10/2/98	11/17/98	7SS
13		Nationwide Rollout Plan	33d	10/2/98	11/17/98	7SS
14		Acquisition Strategy	33d	10/2/98	11/17/98	7SS
15		Training Strategy	33d	10/2/98	11/17/98	7SS
16		Security Certification Planning	33d	10/2/98	11/17/98	7SS
17		Integration and Integration Test Plan	33d	10/2/98	11/17/98	7SS
18		SAT Plan	33d	10/2/98	11/17/98	7SS
19		System Requirements Specification (Preliminary)	33d	10/2/98	11/17/98	7SS
20		Cost Estimate (Preliminary)	33d	10/2/98	11/17/98	7SS
21		System Requirements Review	0d	11/17/98	11/17/98	20,9,10,11,12,13,14,17,18,19,8,15,16
22		**System Design**	**33d**	**11/18/98**	**1/1/99**	
23		System Requirements Specification (Final)	33d	11/18/98	1/1/99	21
24		Architecture Document	33d	11/18/98	1/1/99	23SS
25		Interface Requirements Specification	33d	11/18/98	1/1/99	23SS
26		Hardware Definition Document	33d	11/18/98	1/1/99	23SS
27		Site System Configuration (Basic)	33d	11/18/98	1/1/99	23SS
28		Bill of Materials (Preliminary)	33d	11/18/98	1/1/99	23SS
29		Work Package Definitions	33d	11/18/98	1/1/99	23SS
30		Cost Estimate (Final)	33d	11/18/98	1/1/99	23SS
31		System Design Review	0d	1/1/99	1/1/99	24,25,26,27,28,29,30,23
32		**Establish Development Environment**	**50d**	**1/4/99**	**3/12/99**	**31**
33		**Subrelease 1.1 – Primary Telephone Call Routing and Management**	**242d**	**1/4/99**	**12/7/99**	
34		**Subrelease 1.1 SSR/PDR**	**22d**	**1/4/99**	**2/2/99**	
35		**Planning & Requirements Analysis**	**11d**	**1/4/99**	**1/18/99**	
36		Software Specification Preparation	11d	1/4/99	1/18/99	31

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
37		Software Specification Review	0d	1/18/99	1/18/99	36
38		**Preliminary Design**	**11d**	**1/19/99**	**2/2/99**	
39		Database Capacity and Performance Analysis Document	11d	1/19/99	2/2/99	37
40		Software Design Description (Preliminary)	11d	1/19/99	2/2/99	37
41		Interface Design Description (Preliminary)	11d	1/19/99	2/2/99	37
42		Application Programming Interface (API) Manual	11d	1/19/99	2/2/99	37
43		Software User Manual (Preliminary)	11d	1/19/99	2/2/99	37
44		Preliminary Design Review	0d	2/2/99	2/2/99	39,40,41, 42,43
45		**Subrelease 1.1 Acquisitions**	**80d**	**1/19/99**	**5/10/99**	
46		**Subrelease 1.1 Integration Environment**	**80d**	**1/19/99**	**5/10/99**	
47	IS.05.10.01	Voice Response Unit Platform	80d	1/19/99	5/10/99	37
48	IS.05.18.02	National Call Router SW (National Call Router Administrative Services)	80d	1/19/99	5/10/99	37
49	IS.05.18.03	National Call Router Administrative Services	80d	1/19/99	5/10/99	37
50	IS.05.21.01	Regional Call Router Host	80d	1/19/99	5/10/99	37
51	IS.05.21.02	Regional Call Router Software	80d	1/19/99	5/10/99	37
52	IS.03.01.02	Regional Platform Performance & Capacity Management	80d	1/19/99	5/10/99	37
53	IS.03.01.04	Regional Predictive Performance and Capacity Modeler	80d	1/19/99	5/10/99	37
54	IS.03.01.08	Regional Platform Configuration Management	80d	1/19/99	5/10/99	37
55	IS.05.01.02	Regional Platform Primitive Operating System Services	80d	1/19/99	5/10/99	37
56	IS.05.03.02	Regional Platform DBMS	80d	1/19/99	5/10/99	37
57	IS.05.06.02	Regional Platform Transaction Processing Services	80d	1/19/99	5/10/99	37
58	IS.05.15.01	Regional Hardware Platform	80d	1/19/99	5/10/99	37
59	IS.05.22.01	IRS Web Server	80d	1/19/99	5/10/99	37
60	IS.05.22.02	Internet Firewall	80d	1/19/99	5/10/99	37
61	IS.05.22.03	Search engine	80d	1/19/99	5/10/99	37
62		**Subrelease 1.1 Production Environment**	**80d**	**1/19/99**	**5/10/99**	
63	IS.05.10.01	Voice Response Unit Platform	80d	1/19/99	5/10/99	37
64	IS.05.18.02	National Call Router SW (National Call Router Administrative Services)	80d	1/19/99	5/10/99	37
65	IS.05.18.03	National Call Router Administrative Services	80d	1/19/99	5/10/99	37
66	IS.05.21.01	Regional Call Router Host	80d	1/19/99	5/10/99	37
67	IS.05.21.02	Regional Call Router Software	80d	1/19/99	5/10/99	37
68	IS.03.01.02	Regional Platform Performance & Capacity Management	80d	1/19/99	5/10/99	37
69	IS.03.01.04	Regional Predictive Performance and Capacity Modeler	80d	1/19/99	5/10/99	37
70	IS.03.01.08	Regional Platform Configuration Management	80d	1/19/99	5/10/99	37
71	IS.05.01.02	Regional Platform Primitive Operating System Services	80d	1/19/99	5/10/99	37
72	IS.05.03.02	Regional Platform DBMS	80d	1/19/99	5/10/99	37
73	IS.05.06.02	Regional Platform Transaction Processing Services	80d	1/19/99	5/10/99	37
74	IS.05.15.01	Regional Hardware Platform	80d	1/19/99	5/10/99	37
75	IS.05.22.01	IRS Web Server	80d	1/19/99	5/10/99	37

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
76	IS.05.22.02	Internet Firewall	80d	1/19/99	5/10/99	37
77	IS.05.22.03	Search engine	80d	1/19/99	5/10/99	37
78		**Subrelease 1.1 I&IT/SAT Prep**	**90d**	**1/19/99**	**5/24/99**	
79		Integration and Integration Test Descriptions	45d	1/19/99	3/22/99	37
80		Integration and Integration Testing Description (Procedures)	45d	1/19/99	3/22/99	37
81		Integration and Integration Test Software	45d	1/19/99	3/22/99	37
82		Integration and Integration Test Database	45d	1/19/99	3/22/99	37
83		Integration and Integration Test Data	45d	1/19/99	3/22/99	37
84		SAT Description (Cases)	30d	1/19/99	3/1/99	37
85		SAT Description (Procedures)	30d	3/2/99	4/12/99	84
86		SAT Data	30d	4/13/99	5/24/99	85
87		**Subrelease 1.1 CDR/Build/I&IT**	**132d**	**2/3/99**	**8/5/99**	
88		**Critical Design**	**33d**	**2/3/99**	**3/19/99**	
89		Software Design Document	33d	2/3/99	3/19/99	44
90		Interface Design Document	33d	2/3/99	3/19/99	44
91		Conduct CI Detail Design	33d	2/3/99	3/19/99	44
92		Work Package Definition document	33d	2/3/99	3/19/99	44
93		Supplier Prepare Work Package Planning Documents	33d	2/3/99	3/19/99	44
94		Bill of Materials	33d	2/3/99	3/19/99	44
95		Test Plans and Test Descriptions	33d	2/3/99	3/19/99	44
96		Software User Manual	33d	2/3/99	3/19/99	44
97		Critical Design Review	0d	3/19/99	3/19/99	89,90,91, 92,93,94, 95,96
98		**Code and Unit Test**	**66d**	**3/22/99**	**6/21/99**	
99	CS.01.01.02	Telephone Interface Management	66d	3/22/99	6/21/99	97
100	CS.01.03.01	Internet Interface Management	66d	3/22/99	6/21/99	97
101	CS.05.01.01	Non-Account Applications	66d	3/22/99	6/21/99	97
102	IS.05.10.01	Voice Response Unit Platform	66d	3/22/99	6/21/99	97
103	IS.05.18.03	National Call Router Host	66d	3/22/99	6/21/99	97
104	IS.05.21.01	Regional Call Router Host	66d	3/22/99	6/21/99	97
105	IS.05.21.02	Regional Call Router Software	66d	3/22/99	6/21/99	97
106	IS.05.21.03	Regional Call Router Communications & Control	66d	3/22/99	6/21/99	97
107	IS.05.21.04	Regional Call Router Post Routing Support	66d	3/22/99	6/21/99	97
108	CP.07.02.01	Reference Data Access Services	66d	3/22/99	6/21/99	97
109	REFDB.01	Establish Reference Database	66d	3/22/99	6/21/99	97
110	REFDB.02	Load Reference Database	66d	3/22/99	6/21/99	97
111	STATDB.01	Establish Statistics Database	66d	3/22/99	6/21/99	97

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
112		Integration Environment Deployment	30d	5/11/99	6/21/99	47,48,49, 50,51,52, 53,54,55, 56,57,58, 59,60,61
113		Subrelease 1.1 Test Readiness Review	0d	6/21/99	6/21/99	99,100, 101,108, 109,110, 102,103, 104,105, 106,107, 79,80,81, 82,83, 112,111
114		**Conduct Integration & Integration Testing**	**33d**	**6/22/99**	**8/5/99**	
115		Conduct Subrelease 1.1 Integration & Integration Testing	22d	6/22/99	7/21/99	113
116		Subrelease 1.1 Integration and Integration Test Reports	11d	7/22/99	8/5/99	115
117		Subrelease 1.1 Build Procedures	11d	7/22/99	8/5/99	115
118		**Subrelease 1.1 SAT**	**44d**	**8/5/99**	**10/6/99**	
119		Subrelease 1.1 SAT Readiness Review	0d	8/5/99	8/5/99	117,116, 84,85,86
120		Subrelease 1.1 SAT	33d	8/6/99	9/21/99	119
121		Subrelease 1.1 SAT Reports	11d	9/22/99	10/6/99	120
122		Subrelease 1.1 Pilot Readiness Report	11d	9/22/99	10/6/99	120
123		Subrelease 1.1 Pilot Configuration Package	11d	9/22/99	10/6/99	120
124		Subrelease 1.1 SAT Acceptance Review	0d	10/6/99	10/6/99	121,122, 123
125		Subrelease 1.1 Pilot Operational Readiness Review	0d	10/6/99	10/6/99	124,63,64 ,65,66,67, 68,69,70, 71,72,73, 74,75,76, 77
126		Subrelease 1.1 Pre-Pilot Investment Evaluation Review	0d	10/6/99	10/6/99	125
127		**Subrelease 1.1 Pilot/Rollout**	**44d**	**10/7/99**	**12/7/99**	
128		Infrastructure Deployment	11d	10/7/99	10/21/99	126
129		Subrelease 1.1 Application Deployment	11d	10/22/99	11/5/99	128
130		Pilot Operational	22d	11/8/99	12/7/99	129
131		Post-Pilot Review	0d	12/7/99	12/7/99	130
132		Post-Pilot Investment Evaluation Review	0d	12/7/99	12/7/99	130
133		Subrelease 1.1 Operational	0d	12/7/99	12/7/99	131,132
134		**Subrelease 1.2 – Enhanced Secondary Telephone Call Routing and Management**	**496d**	**1/4/99**	**11/27/00**	
135		**Subrelease 1.2 SSR/PDR**	**55d**	**1/4/99**	**3/19/99**	
136		**Planning & Requirements Analysis**	**22d**	**1/4/99**	**2/2/99**	
137		Software Specification Preparation	22d	1/4/99	2/2/99	31

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
138		Software Specification Review	0d	2/2/99	2/2/99	137
139		**Preliminary Design**	**33d**	**2/3/99**	**3/19/99**	
140		Database Capacity and Performance Analysis Document	33d	2/3/99	3/19/99	138
141		Software Design Description (Preliminary)	33d	2/3/99	3/19/99	138
142		Interface Design Description (Preliminary)	33d	2/3/99	3/19/99	138
143		Application Programming Interface (API) Manual	33d	2/3/99	3/19/99	138
144		Software User Manual (Preliminary)	33d	2/3/99	3/19/99	138
145		Preliminary Design Review	0d	3/19/99	3/19/99	140,141, 142,143, 144
146		**Subrelease 1.2 Acquisitions**	**160d**	**2/3/99**	**9/14/99**	
147		**Subrelease 1.2 Integration Environment**	**160d**	**2/3/99**	**9/14/99**	
148	IS.03.01.02	Regional Platform Performance and Capacity Management	160d	2/3/99	9/14/99	138
149	IS.03.01.06	Regional Platform Operations Management	160d	2/3/99	9/14/99	138
150	IS.04.01.06	Regional Platform Authentication and Access Control Management	160d	2/3/99	9/14/99	138
151	IS.05.01.02	Regional Platform Primitive Operating System Services	160d	2/3/99	9/14/99	138
152	IS.05.03.02	Regional Platform DBMS	160d	2/3/99	9/14/99	138
153	IS.04.01.08	Regional Platform Security Audit Management	160d	2/3/99	9/14/99	138
154	IS.05.06.02	Regional Platform Transaction Processing Services	160d	2/3/99	9/14/99	138
155	IS.05.15.01	Regional Hardware Platform	160d	2/3/99	9/14/99	138
156	IS.05.20.05	Regional Platform Network Timing Services	160d	2/3/99	9/14/99	138
157	IS.04.01.07	Regional Platform Realtime Security Event Hangling/Browsing and Intrusion Detection Services	160d	2/3/99	9/14/99	138
158	IS.03.01.01	Corporate Platform Performance & Capacity Management	160d	2/3/99	9/14/99	138
159	IS.03.01.03	Corporate Predictive Performance & Capacity Modeler	160d	2/3/99	9/14/99	138
160	IS.03.01.05	Corporate Platform Operations Management	160d	2/3/99	9/14/99	138
161	IS.03.01.07	Corporate Platform Configuraiton Management	160d	2/3/99	9/14/99	138
162	IS.04.01.01	Corporate Platform Authentication & Access Control Management	160d	2/3/99	9/14/99	138
163	IS.04.01.03	Corporate Platform Security Audit Management	160d	2/3/99	9/14/99	138
164	IS.05.05.01	Corporate Platform Application and Telecommunications Support Services	160d	2/3/99	9/14/99	138
165	IS.05.13.06	Wide Area Network Gateway	160d	2/3/99	9/14/99	138
166	IS.05.20.01	Corporate Platform Network Timing Services	160d	2/3/99	9/14/99	138
167		**Subrelease 1.2 Production Environment**	**160d**	**2/3/99**	**9/14/99**	
168	LE.PCM.01	Temporary Corporate Platform (Plug Compatible Mainframe)	160d	2/3/99	9/14/99	138
169	LE.PCM.02	Corporate Platform Primitive Operating System Services	160d	2/3/99	9/14/99	138
170	LE.PCM.03	Legacy PCM Database Management Services	160d	2/3/99	9/14/99	138
171	LE.PCM.04	Legacy PCM Transaction Processing Services	160d	2/3/99	9/14/99	138

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
172	IS.03.01.02	Regional Platform Performance and Capacity Management	160d	2/3/99	9/14/99	138
173	IS.03.01.06	Regional Platform Operations Management	160d	2/3/99	9/14/99	138
174	IS.04.01.06	Regional Platform Authentication and Access Control Management	160d	2/3/99	9/14/99	138
175	IS.05.01.02	Regional Platform Primitive Operating System Services	160d	2/3/99	9/14/99	138
176	IS.05.03.02	Regional Platform DBMS	160d	2/3/99	9/14/99	138
177	IS.04.01.08	Regional Platform Security Audit Management	160d	2/3/99	9/14/99	138
178	IS.05.06.02	Regional Platform Transaction Processing Services	160d	2/3/99	9/14/99	138
179	IS.05.15.01	Regional Hardware Platform	160d	2/3/99	9/14/99	138
180	IS.05.20.05	Regional Platform Network Timing Services	160d	2/3/99	9/14/99	138
181	IS.04.01.07	Regional Platform Realtime Security Event Hangling/Browsing and Intrusion Detection Services	160d	2/3/99	9/14/99	138
182	IS.03.01.01	Corporate Platform Performance & Capacity Management	160d	2/3/99	9/14/99	138
183	IS.03.01.03	Corporate Predictive Performance & Capacity Modeler	160d	2/3/99	9/14/99	138
184	IS.03.01.05	Corporate Platform Operations Management	160d	2/3/99	9/14/99	138
185	IS.03.01.07	Corporate Platform Configuration Management	160d	2/3/99	9/14/99	138
186	IS.04.01.01	Corporate Platform Authentication & Access Control Management	160d	2/3/99	9/14/99	138
187	IS.04.01.03	Corporate Platform Security Audit Management	160d	2/3/99	9/14/99	138
188	IS.05.05.01	Corporate Platform Application and Telecommunications Support Services	160d	2/3/99	9/14/99	138
189	IS.05.13.06	Wide Area Network Gateway	160d	2/3/99	9/14/99	138
190	IS.05.20.01	Corporate Platform Network Timing Services	160d	2/3/99	9/14/99	138
191		**Subrelease 1.2 I&IT/SAT Prep**	**135d**	**2/3/99**	**8/10/99**	
192		Integration and Integration Test Descriptions	45d	2/3/99	4/6/99	138
193		Integration and Integration Testing Description (Procedures)	45d	2/3/99	4/6/99	138
194		Integration and Integration Test Software	45d	2/3/99	4/6/99	138
195		Integration and Integration Test Database	45d	2/3/99	4/6/99	138
196		Integration and Integration Test Data	45d	2/3/99	4/6/99	138
197		SAT Description (Cases)	45d	2/3/99	4/6/99	138
198		SAT Description (Procedures)	45d	4/7/99	6/8/99	197
299		SAT Data	45d	6/9/99	8/10/99	198
200		**Subrelease 1.2 CDR/Build/I&IT**	**264d**	**3/22/99**	**3/23/00**	
201		**Critical Design**	**61d**	**3/22/99**	**6/14/99**	
202		Software Design Document	61d	3/22/99	6/14/99	145
203		Interface Design Document	61d	3/22/99	6/14/99	145
204		Conduct CI Detail Design	61d	3/22/99	6/14/99	145
205		Work Package Definition document	61d	3/22/99	6/14/99	145
206		Supplier Prepare Work Package Planning Documents	61d	3/22/99	6/14/99	145

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
207		Bill of Materials	61d	3/22/99	6/14/99	145
208		Test Plans and Test Descriptions	61d	3/22/99	6/14/99	145
209		Software User Manual	61d	3/22/99	6/14/99	145
210		Critical Design Review	0d	6/14/99	6/14/99	202,203, 204,205, 206,207, 208,209
211		**Code and Unit Test**	**93d**	**6/15/99**	**10/21/99**	
212	CP.01.02.02	Individual Tax Account Data Processing	93d	6/15/99	10/21/99	210
213	CP.01.06.08	Common Update Execution Services	93d	6/15/99	10/21/99	210
214	CP.01.07.01	Internal Data Routing	93d	6/15/99	10/21/99	210
215	CP.07.01.01	Tax Account Access Services	93d	6/15/99	10/21/99	210
216	LE.IDRS.RFIF /FOF.01	Modifications to Legacy RFIF/FOF System	93d	6/15/99	10/21/99	210
217	TADB.01	Establish Tax Accounts Database	93d	6/15/99	10/21/99	210
218	TADB.02	Load Tax Accounts Database	93d	6/15/99	10/21/99	210
219	TR.01.01.01	Convert Legacy Data to Corporate Database Formats	93d	6/15/99	10/21/99	210
220	CS.01.01.02	Telephone Interface Management	93d	6/15/99	10/21/99	210
221	CS.01.03.01	Internet Interface Management	93d	6/15/99	10/21/99	210
222	CS.06.01.01	Case Analysis and Resolution Framework	93d	6/15/99	10/21/99	210
223	CS.06.01.07	Automated Account Related Taxpayer Assistance	93d	6/15/99	10/21/99	210
224	RADB.01	Establish Regional Security audit Database	93d	6/15/99	10/21/99	210
225	REFDB.02	Load Reference Database	93d	6/15/99	10/21/99	210
226	LE.TRIS.01	Modifications to Legacy TRIS	93d	6/15/99	10/21/99	210
227	IS.05.06.02	Regional Platform Transaction Processing Services	93d	6/15/99	10/21/99	210
228		Integration Environment Deployment	27d	9/15/99	10/21/99	148,149, 150,151, 152,153, 154,155, 156,157, 158,159, 160,161, 162,164, 165,166, 163
229		Subrelease 1.2 Test Readiness Review	0d	10/21/99	10/21/99	196,212, 213,214, 215,216, 217,218, 219,220, 221,222, 223,224, 225,226, 192,193, 194,195, 228,227
230		**Conduct Subrelease 1.2 Integration & Integration Testing**	**110d**	**10/22/99**	**3/23/00**	

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
231		Conduct Subrelease 1.2 Integration & Integration Testing	95d	10/22/99	3/2/00	229
232		Subrelease 1.2 Integration and Integration Test Reports	15d	3/3/00	3/23/00	231
233		Subrelease 1.2 Build Procedures	15d	3/3/00	3/23/00	231
234		**Subrelease 1.2 SAT**	**105d**	**3/23/00**	**8/17/00**	
235		Subrelease 1.2 SAT Readiness Review	0d	3/23/00	3/23/00	233,232, 197,198, 199
236		Subrelease 1.2 SAT	90d	3/24/00	7/27/00	235
237		Subrelease 1.2 SAT Reports	15d	7/28/00	8/17/00	236
238		Subrelease 1.2 Pilot Readiness Report	15d	7/28/00	8/17/00	236
239		Subrelease 1.2 Pilot Configuration Package	15d	7/28/00	8/17/00	236
240		Subrelease 1.2 SAT Acceptance Review	0d	8/17/00	8/17/00	237,238, 239
241		Subrelease 1.2 Pilot Operational Readiness Review	0d	8/17/00	8/17/00	240,168, 169,170, 171,172, 173,174, 175,176, 177,178, 180,182, 183,184, 185,186, 188,189, 190,179, 181,187
242		Subrelease 1.2 Pre-Pilot Investment Evaluation Review	0d	8/17/00	8/17/00	241
243		**Subrelease 1.2 Pilot/Nationwide**	**72d**	**8/18/00**	**11/27/00**	
244		Subrelease 1.2 Infrastructure Deployment	11d	8/18/00	9/1/00	242
245		Subrelease 1.2 Application Deployment	11d	9/4/00	9/18/00	244
246		Pilot Operational	50d	9/19/00	11/27/00	245
247		Post-Pilot Review	0d	11/27/00	11/27/00	246
248		Post-Pilot Investment Evaluation Review	0d	11/27/00	11/27/00	246
249		Subrelease 1.2 Operational	0d	11/27/00	11/27/00	247
250		**Subreleases 1.3, 1.4, & 1.5**	**1343d**	**10/2/98**	**11/25/03**	
251		**Deploy SLC/SRR/SDR for Subreleases 1.3, 1.4, & 1.5**	**180d**	**10/2/98**	**6/10/99**	
252		Transition Period	66d	10/2/98	1/1/99	3
253		**Systems Requirements Review**	**21d**	**1/4/99**	**2/1/99**	
254		Concept of Operations Document	21d	1/4/99	2/1/99	252
255		Management Plan	21d	1/4/99	2/1/99	254SS
256		Master Test Plan	21d	1/4/99	2/1/99	254SS
257		Configuration Management Plan	21d	1/4/99	2/1/99	254SS
258		Quality Assurance Plan	21d	1/4/99	2/1/99	254SS
259		Pilot Rollout Plan	21d	1/4/99	2/1/99	254SS
260		Nationwide Rollout Plan	21d	1/4/99	2/1/99	254SS

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
261		Acquisition Strategy	21d	1/4/99	2/1/99	254SS
262		Training Strategy	21d	1/4/99	2/1/99	254SS
263		Security Certification Planning	21d	1/4/99	2/1/99	254SS
264		Integration and Integration Test Plan	21d	1/4/99	2/1/99	254SS
265		SAT Plan	21d	1/4/99	2/1/99	254SS
266		System Requirements Specification (Preliminary)	21d	1/4/99	2/1/99	254SS
267		Cost Estimate (Preliminary)	21d	1/4/99	2/1/99	254SS
268		System Requirements Review	0d	2/1/99	2/1/99	267,256, 257,258, 259,260, 261,264, 265,266, 255,262, 263
269		**System Design**	**43d**	**2/2/99**	**4/1/99**	
270		System Requirements Specification (Final)	43d	2/2/99	4/1/99	268
271		Architecture Document	43d	2/2/99	4/1/99	270SS
272		Interface Requirements Specification	43d	2/2/99	4/1/99	270SS
273		Hardware Definition Document	43d	2/2/99	4/1/99	270SS
274		Site System Configuration (Basic)	43d	2/2/99	4/1/99	270SS
275		Bill of Materials (Preliminary)	43d	2/2/99	4/1/99	270SS
276		Work Package Definitions	43d	2/2/99	4/1/99	270SS
277		Cost Estimate (Final)	43d	2/2/99	4/1/99	270SS
278		System Design Review	0d	4/1/99	4/1/99	271,272, 273,274, 275,276, 277,270
279		**Establish Development Environment**	**50d**	**4/2/99**	**6/10/99**	**278**
280		**Subrelease 1.3 – Infrastructure and Security**	**956d**	**4/2/99**	**11/29/02**	
281		**Planning & Requirements Analysis**	**110d**	**4/2/99**	**9/2/99**	
282		Software Specification Preparation	110d	4/2/99	9/2/99	278
283		Software Specification Review	0d	9/2/99	9/2/99	282
284		**Subrelease 1.3 Acquisitions**	**250d**	**9/3/99**	**8/17/00**	
285		**Subrelease 1.3 Integration Environment**	**250d**	**9/3/99**	**8/17/00**	
286	IS.05.02.01	User Platform Computer-Human Interface Services	250d	9/3/99	8/17/00	283
287	IS.05.16.01	Universal Secure Workstation	250d	9/3/99	8/17/00	283
288	TR.05.01.01	Legacy Application Access from Universal Workstation	250d	9/3/99	8/17/00	283
289	IS.05.06.02	Access Corporate Legacy	250d	9/3/99	8/17/00	283
290	IS.04.01.06	Regional Platform Authentication and Access Control Management	250d	9/3/99	8/17/00	283
291	IS.03.01.02	Regional Platform Performance & Capacity Mgmt	250d	9/3/99	8/17/00	283
292	IS.03.01.08	Regional Platform Configuration Management	250d	9/3/99	8/17/00	283
293	IS.05.01.02	Regional Platform Primitive Operating System Services	250d	9/3/99	8/17/00	283
294	IS.05.03.02	Regional Platform DBMS	250d	9/3/99	8/17/00	283

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
295	IS.05.15.01	Regional Hardware Platform	250d	9/3/99	8/17/00	283
296		**Subrelease 1.3 Production Environment**	**250d**	**9/3/99**	**8/17/00**	
297	IS.05.02.01	User Platform Computer-Human Interface Services	250d	9/3/99	8/17/00	283
298	IS.05.16.01	Universal Secure Workstation	250d	9/3/99	8/17/00	283
299	TR.05.01.01	Legacy Application Access from Universal Workstation	250d	9/3/99	8/17/00	283
300	IS.05.06.02	Access Corporate Legacy	250d	9/3/99	8/17/00	283
301	IS.04.01.06	Regional Platform Authentication and Access Control Management	250d	9/3/99	8/17/00	283
302	IS.03.01.02	Regional Platform Performance & Capacity Mgmt	250d	9/3/99	8/17/00	283
303	IS.03.01.08	Regional Platform Configuration Management	250d	9/3/99	8/17/00	283
304	IS.05.01.02	Regional Platform Primitive Operating System Services	250d	9/3/99	8/17/00	283
305	IS.05.03.02	Regional Platform DBMS	250d	9/3/99	8/17/00	283
306	IS.05.15.01	Regional Hardware Platform	250d	9/3/99	8/17/00	283
307		**Subrelease 1.3 I&IT/SAT Prep**	**225d**	**9/3/99**	**7/13/00**	
308		Integration and Integration Test Descriptions	45d	9/3/99	11/4/99	283
309		Integration and Integration Testing Description (Procedures)	45d	11/5/99	1/6/00	308
310		Integration and Integration Test Software	45d	1/7/00	3/9/00	309
311		Integration and Integration Test Database	45d	3/10/00	5/11/00	310
312		Integration and Integration Test Data	45d	5/12/00	7/13/00	311
313		SAT Description (Cases)	45d	9/3/99	11/4/99	283
314		SAT Description (Procedures)	45d	11/5/99	1/6/00	313
315		SAT Data	45d	1/7/00	3/9/00	314
316		**Subrelease 1.3 PDR/CDR/Build**	**352d**	**9/3/99**	**1/8/01**	
317		**Preliminary Design**	**132d**	**9/3/99**	**3/6/00**	
318		Database Capacity and Performance Analysis Document	132d	9/3/99	3/6/00	283
319		Software Design Description (Preliminary)	132d	9/3/99	3/6/00	283
320		Interface Design Description (Preliminary)	132d	9/3/99	3/6/00	283
321		Application Programming Interface (API) Manual	132d	9/3/99	3/6/00	283
322		Software User Manual (Preliminary)	132d	9/3/99	3/6/00	283
323		Preliminary Design Review	0d	3/6/00	3/6/00	318,319, 320,321, 322
324		**Critical Design**	**88d**	**3/7/00**	**7/6/00**	
325		Software Design Document	88d	3/7/00	7/6/00	323
326		Interface Design Document	88d	3/7/00	7/6/00	323
327		Conduct CI Detail Design	88d	3/7/00	7/6/00	323
328		Work Package Definition document	88d	3/7/00	7/6/00	323
329		Supplier Prepare Work Package Planning Documents	88d	3/7/00	7/6/00	323
330		Bill of Materials	88d	3/7/00	7/6/00	323
331		Test Plans and Test Descriptions	88d	3/7/00	7/6/00	323
332		Software User Manual	88d	3/7/00	7/6/00	323

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
333		Critical Design Review	0d	7/6/00	7/6/00	325,326, 327,328, 329,330, 331,332
334		**Code and Unit Test**	**132d**	**7/7/00**	**1/8/01**	
335	CS.06.01.01	Case Analysis and Resolution Framework	132d	7/7/00	1/8/01	333
336	CS.06.01.14	Taxpayer Account Analysis	132d	7/7/00	1/8/01	333
337	REFDB.01	Establish Reference Database	132d	7/7/00	1/8/01	333
338	REFDB.02	Load Reference Database	132d	7/7/00	1/8/01	333
339	CS.06.02.01	Interface Management	132d	7/7/00	1/8/01	333
340	IS.05.02.01	User Platform Computer Human Interface Services	132d	7/7/00	1/8/01	333
341	LE.ACS.02	ACS access from Universal Workstation	132d	7/7/00	1/8/01	333
342	LE.AUR.02	AUR access from Universal Workstation	132d	7/7/00	1/8/01	333
343	LE.CFOL.02	CFOL access from Universal Workstation	132d	7/7/00	1/8/01	333
344	LE.CIDS.02	CIDS access from Universal Workstation	132d	7/7/00	1/8/01	333
345	LE.IDRS.02	IDRS access from Universal Workstation	132d	7/7/00	1/8/01	333
346	TE.SERP.02	SERP access from Universal Workstation	132d	7/7/00	1/8/01	333
347	TR.05.01.01	Modernization/Legacy Protocol Conversion	132d	7/7/00	1/8/01	333
348	TR.05.01.02	Legacy System Access Management	132d	7/7/00	1/8/01	333
349	TR.05.01.03	Modernization On-Demand User Interface to Legacy System	132d	7/7/00	1/8/01	333
350	CS.05.01.01	Non-Account Applications	132d	7/7/00	1/8/01	333
351	IS.05.01.08	Regional Platform Extended Security Services	132d	7/7/00	1/8/01	333
352	IS.05.06.02	Access Corporate Legacy	132d	7/7/00	1/8/01	333
353	AUTHDB.01	Establish Authentication Database	132d	7/7/00	1/8/01	333
354	IS.05.01.09	Corporate Platform Extended Security Services	132d	7/7/00	1/8/01	333
355		Integration Environment Deployment	90d	8/18/00	12/21/00	312,286, 288,287, 289,290, 291,292, 293,294, 295
356		Subrelease 1.3 Test Readiness Review	0d	1/8/01	1/8/01	355,231, 337,338, 339,341, 342,343, 345,346, 350,353, 336,335, 340,344, 347,348, 349,351, 352,354
357		**Conduct Subrelease 1.3 Integration & Integration Testing**	**132d**	**1/9/01**	**7/11/01**	
358		Conduct Subrelease 1.3 Integration & Integration Testing	117d	1/9/01	6/20/01	356
359		Subrelease 1.3 Integration and Integration Test Reports	15d	6/21/01	7/11/01	358
360		Subrelease 1.3 Build Procedures	15d	6/21/01	7/11/01	358

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
361		**Subrelease 1.3 SAT**	**105d**	**7/11/01**	**12/5/01**	
362		Subrelease 1.3 SAT Readiness Review	0d	7/11/01	7/11/01	359,360, 315
363		Subrelease 1.3 SAT	90d	7/12/01	11/14/01	362
364		Subrelease 1.3 SAT Reports	15d	11/15/01	12/5/01	363
365		Subrelease 1.3 Pilot Readiness Report	15d	11/15/01	12/5/01	363
366		Subrelease 1.3 Pilot Configuration Package	15d	11/15/01	12/5/01	363
367		Subrelease 1.3 SAT Acceptance Review	0d	12/5/01	12/5/01	364,365, 366
368		Subrelease 1.3 Pilot Operational Readiness Review	0d	12/5/01	12/5/01	367
369		Subrelease 1.3 Pre-Pilot Investment Evaluation Review	0d	12/5/01	12/5/01	368,297, 298,299, 300,301, 302,303, 304,305, 306
370		**Subrelease 1.3 Pilot**	**137d**	**12/6/01**	**6/14/02**	
371		Subrelease 1.3 Infrastructure Deployment	22d	12/6/01	1/4/02	369
372		Subrelease 1.3 Application Deployment	15d	1/7/02	1/25/02	371
373		Pilot Operational	100d	1/28/02	6/14/02	372
374		Post-Pilot Review	0d	6/14/02	6/14/02	373
375		Post-Pilot Investment Evaluation Review	0d	6/14/02	6/14/02	373
376		**Subrelease 1.3 Nationwide**	**120d**	**6/17/02**	**11/29/02**	
377		Subrelease 1.3 Nationwide Rollout	120d	6/17/02	11/29/02	374,375
378		Subrelease 1.3 Operational	0d	11/29/02	11/29/02	377
379		**Subrelease 1.4 - Corporate Database Read Only**	**1060d**	**4/2/99**	**4/24/03**	
380		**Planning & Requirements Analysis**	**154d**	**4/2/99**	**11/3/99**	
381		Software Specification Preparation	154d	4/2/99	11/3/99	278
382		Software Specification Review	0d	11/3/99	11/3/99	381
383		**Subrelease 1.4 Acquisitions**	**125d**	**11/4/99**	**4/26/00**	
384		**Subrelease 1.4 Production Environment**	**125d**	**11/4/99**	**4/26/00**	
385		**Corporate Computing Infrastructure**	**125d**	**11/4/99**	**4/26/00**	
386	IS.03.01.09	Corporate Platform Problem Management	125d	11/4/99	4/26/00	382
387	IS.05.01.01	Corporate Platform Primitive Operating System Services	125d	11/4/99	4/26/00	382
388	IS.05.03.01	Corporate Platform database Management Services	125d	11/4/99	4/26/00	382
389	IS.05.06.01	Corporate Platform Transaction Processing Services	125d	11/4/99	4/26/00	382
390	IS.05.14.01	Corporate Processors	125d	11/4/99	4/26/00	382
391	IS.04.01.02	Corporate Platform Realtime security Event Handling/Browsing & Intrusion Detection	125d	11/4/99	4/26/00	382
392	IS.04.01.03	Enterprise Security Audit Management	125d	11/4/99	4/26/00	382
393		**Subrelease 1.4 I&IT/SAT Prep**	**225d**	**11/4/99**	**9/13/00**	
394		Integration and Integration Test Descriptions	45d	11/4/99	1/5/00	382

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
395		Integration and Integration Testing Description (Procedures)	45d	1/6/00	3/8/00	394
396		Integration and Integration Test Software	45d	3/9/00	5/10/00	395
397		Integration and Integration Test Database	45d	5/11/00	7/12/00	396
398		Integration and Integration Test Data	45d	7/13/00	9/13/00	397
399		SAT Description (Cases)	45d	11/4/99	1/5/00	382
400		SAT Description (Procedures)	45d	1/6/00	3/8/00	399
401		SAT Data	45d	3/9/00	5/10/00	400
402		**Subrelease 1.4 PDR/CDR/Build**	**462d**	**11/4/99**	**8/10/01**	
403		**Preliminary Design**	**176d**	**11/4/99**	**7/6/00**	
404		Database Capacity and Performance Analysis Document	176d	11/4/99	7/6/00	382
405		Software Design Description (Preliminary)	176d	11/4/99	7/6/00	382
406		Interface Design Description (Preliminary)	176d	11/4/99	7/6/00	382
407		Application Programming Interface (API) Manual	176d	11/4/99	7/6/00	382
408		Software User Manual (Preliminary)	176d	11/4/99	7/6/00	382
409		Preliminary Design Review	0d	7/6/00	7/6/00	404,405, 406,407, 408
410		**Critical Design**	**114d**	**7/7/00**	**12/13/00**	
411		Software Design Document	114d	7/7/00	12/13/00	409
412		Interface Design Document	114d	7/7/00	12/13/00	409
413		Conduct CI Detail Design	114d	7/7/00	12/13/00	409
414		Work Package Definition document	114d	7/7/00	12/13/00	409
415		Supplier Prepare Work Package Planning Documents	114d	7/7/00	12/13/00	409
416		Bill of Materials	114d	7/7/00	12/13/00	409
417		Test Plans and Test Descriptions	114d	7/7/00	12/13/00	409
418		Software User Manual	114d	7/7/00	12/13/00	409
419		Critical Design Review	0d	12/13/00	12/13/00	411,412, 413,414, 415,416, 417,418
420		**Code and Unit Test**	**237d**	**9/14/00**	**8/10/01**	
421	CCDB.01	Establish Corporate Case Database	172d	12/14/00	8/10/01	419
422	CCDB.02	Load Corporate Case Database	172d	12/14/00	8/10/01	419
423	CP.01.01.01	Tax Return Data Processing	172d	12/14/00	8/10/01	419
424	CP.01.02.02	Individual Tax Account Data Processing	172d	12/14/00	8/10/01	419
425	CP.01.05.02	Perfection Results Management	172d	12/14/00	8/10/01	419
426	CP.01.07.01	Internal Data routing	172d	12/14/00	8/10/01	419
427	CP.05.01.02	SADB Data Archiving	172d	12/14/00	8/10/01	419
428	CP.05.01.03	TADB Data Archiving	172d	12/14/00	8/10/01	419
429	CP.05.01.04	CCDB Data Archiving	172d	12/14/00	8/10/01	419
430	CP.05.01.05	TRDB Data Archiving	172d	12/14/00	8/10/01	419
431	CP.05.01.06	Data Archiving for Support Databases	172d	12/14/00	8/10/01	419

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
432	CP.05.03.01	Migration, Backup and Recovery Management	172d	12/14/00	8/10/01	419
433	CP.07.01.02	Corporate Case Access Services	172d	12/14/00	8/10/01	419
434	CP.07.01.03	Tax Return Access Services	172d	12/14/00	8/10/01	419
435	CS.06.01.01	Case Analysis and Resolution Framework	172d	12/14/00	8/10/01	419
436	CS.06.01.03	Case Research	172d	12/14/00	8/10/01	419
437	LE.ACS.01	Modifications to Legacy ACS	172d	12/14/00	8/10/01	419
438	LE.AUR.01	Modifications to Legacy AUR	172d	12/14/00	8/10/01	419
439	LE.ERCS.01	Modifications to Legacy ERCS	172d	12/14/00	8/10/01	419
440	LE.ICS.01	Modifications to Legacy ICS	172d	12/14/00	8/10/01	419
441	LE.IDRS.AIMS.01	Modifications to Legacy AIMS	172d	12/14/00	8/10/01	419
442	LE.IDRS.CC.01	Modifications to Legacy IDRS	172d	12/14/00	8/10/01	419
443	LE.IDRS.CCA.01	Modifications to Legacy CCA	172d	12/14/00	8/10/01	419
444	LE.IDRS.CF&S.01	Modifications to Legacy CF&S	172d	12/14/00	8/10/01	419
445	LE.IDRS.DC.01	Modifications to Legacy Dishonored Check	172d	12/14/00	8/10/01	419
446	LE.IDRS.EFT	Modifications to Legacy EFT	172d	12/14/00	8/10/01	419
447	LE.IDRS.EOD	Modifications to Legacy IDRS End Of Day	172d	12/14/00	8/10/01	419
448	LE.IDRS.ITIN.01	Modifications to Legacy ITIN System	172d	12/14/00	8/10/01	419
449	LE.IDRS.TDA.01	Modifications to Legacyy TDA Processing	172d	12/14/00	8/10/01	419
450	LE.IDRS.TDI.01	Modifications to Legacy TDI Processing	172d	12/14/00	8/10/01	419
451	LE.IDRS.TIFD.01	Modifications to Legacy TIF Daily Processing	172d	12/14/00	8/10/01	419
452	LE.IDRS.TIFW.01	Modifications to Legacy TIF Weekly Processing	172d	12/14/00	8/10/01	419
453	LE.IDRS.UR.01	Modifications to Legacy Unidentified Remittance System	172d	12/14/00	8/10/01	419
454	LE.IDRS.XSF.01	Modifications to Legacy Excess Collection File Processing	172d	12/14/00	8/10/01	419
455	LE.MFP.IMF.01	Modifications to Legacy IMF Processing	172d	12/14/00	8/10/01	419
456	TADB.01	Establish Tax Accounts Database	172d	12/14/00	8/10/01	419
457	TADB.02	Load Tax Accounts Database	172d	12/14/00	8/10/01	419
458	TR.01.01.01	Convert Legacy Data to Corporate Database Formats	172d	12/14/00	8/10/01	419
459	TRDB.01	Establish Tax Return Database	172d	12/14/00	8/10/01	419
460	TRDB.02	Load Tax Return Database	172d	12/14/00	8/10/01	419
461	LE.GUF.01	Modifications to Legacy GMF	172d	12/14/00	8/10/01	419
462	CS.06.02.02	Case processing Interface	172d	12/14/00	8/10/01	419
463	CDADB.01	Establish Character Data Archive.01	172d	12/14/00	8/10/01	419
464	CP.01.07.02	External Data Inbound Routing	172d	12/14/00	8/10/01	419
465	CP.07.02.02	Reference Data Server	172d	12/14/00	8/10/01	419

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
466	CP.09.01.01	Reference Data Update Services	172d	12/14/00	8/10/01	419
467	CP.09.01.02	Reference Data Management	172d	12/14/00	8/10/01	419
468	REFDB.01	Establish Reference Database	172d	12/14/00	8/10/01	419
469	SADB.01	Establish Corporate Security Audit Database	172d	12/14/00	8/10/01	419
470		Integration Environment Deployment	90d	9/14/00	1/17/01	398
471		Subrelease 1.4 Test Readiness Review	0d	8/10/01	8/10/01	470,398, 421,422, 423,424, 425,426, 427,428, 429,430, 431,432, 433,434, 436,437, 438,439, 440,441, 442,443, 444,445, 446,447, 448,449, 450,451, 452,453, 454,455, 456,457, 458,459, 460,461, 462,463, 468,469, 435,464, 465,466, 467
472		**Conduct Incr 4 Integration & Integration Testing**	**198d**	**8/13/01**	**5/15/02**	
473		Conduct Subrelease 1.4 Integration & Integration Testing	183d	8/13/01	4/24/02	471
474		Subrelease 1.4 Integration and Integration Test Reports	15d	4/25/02	5/15/02	473
475		Subrelease 1.4 Build Procedures	15d	4/25/02	5/15/02	473
476		**Increment 4 SAT**	**105d**	**5/15/02**	**10/9/02**	
477		Subrelease 1.4 SAT Readiness Review	0d	5/15/02	5/15/02	474,475, 401
478		Subrelease 1.4 SAT	90d	5/16/02	9/18/02	477
479		Subrelease 1.4 SAT Reports	15d	9/19/02	10/9/02	478
480		Subrelease 1.4 Pilot Readiness Report	15d	9/19/02	10/9/02	478
481		Subrelease 1.4 Pilot Configuration Package	15d	9/19/02	10/9/02	478
482		Subrelease 1.4 SAT Acceptance Review	0d	10/9/02	10/9/02	479,480, 481
483		Subrelease 1.4 Pilot Operational Readiness Review	0d	10/9/02	10/9/02	482,386, 387,388, 389,390, 391,392
484		Subrelease 1.4 Pre-Pilot Investment Evaluation Review	0d	10/9/02	10/9/02	483
485		**Subrelease 1.4 Pilot**	**141d**	**10/10/02**	**4/24/03**	

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
486		Subrelease 1.4 Infrastructure Deployment	22d	10/10/02	11/8/02	484
487		Subrelease 1.4 Application Deployment	15d	11/11/02	11/29/02	486
488		Pilot Operational	104d	12/2/02	4/24/03	487
489		Post-Pilot Review	0d	4/24/03	4/24/03	488
490		Post-Pilot Investment Evaluation Review	0d	4/24/03	4/24/03	488
491		**Subrelease 1.5 – On-Line Adjustments**	**1093d**	**9/17/99**	**11/25/03**	
492		**Planning & Requirements Analysis**	**132d**	**9/17/99**	**3/20/00**	
493		Software Specification Preparation	132d	9/17/99	3/20/00	278FS+1 20d
494		Software Specification Review	0d	3/20/00	3/20/00	493
495		**Subrelease 1.5 I&IT/SAT Prep**	**225d**	**3/21/00**	**1/29/01**	
496		Integration and Integration Test Descriptions	45d	3/21/00	5/22/00	494
497		Integration and Integration Testing Description (Procedures)	45d	5/23/00	7/24/00	496
498		Integration and Integration Test Software	45d	7/25/00	9/25/00	497
499		Integration and Integration Test Database	45d	9/26/00	11/27/00	498
500		Integration and Integration Test Data	45d	11/28/00	1/29/01	499
501		SAT Description (Cases)	45d	3/21/00	5/22/00	494
502		SAT Description (Procedures)	45d	5/23/00	7/24/00	501
503		SAT Data	45d	7/25/00	9/25/00	502
504		**Subrelease 1.5 PDR/CDR/Build**	**418d**	**3/21/00**	**10/25/01**	
505		**Preliminary Design**	**154d**	**3/21/00**	**10/20/00**	
506		Database Capacity and Performance Analysis Document	154d	3/21/00	10/20/00	494
507		Software Design Description (Preliminary)	154d	3/21/00	10/20/00	494
508		Interface Design Description (Preliminary)	154d	3/21/00	10/20/00	494
509		Application Programming Interface (API) Manual	154d	3/21/00	10/20/00	494
510		Software User Manual (Preliminary)	154d	3/21/00	10/20/00	494
511		Preliminary Design Review	0d	10/20/00	10/20/00	506,507, 508,509, 510
512		**Critical Design**	**105d**	**10/23/00**	**3/16/01**	
513		Software Design Document	105d	10/23/00	3/16/01	511
514		Interface Design Document	105d	10/23/00	3/16/01	511
515		Conduct CI Detail Design	105d	10/23/00	3/16/01	511
516		Work Package Definition document	105d	10/23/00	3/16/01	511
517		Supplier Prepare Work Package Planning Documents	105d	10/23/00	3/16/01	511
518		Bill of Materials	105d	10/23/00	3/16/01	511
519		Test Plans and Test Descriptions	105d	10/23/00	3/16/01	511
520		Software User Manual	105d	10/23/00	3/16/01	511
521		Critical Design Review	0d	3/16/01	3/16/01	513,514, 515,516, 517,518, 519,520
522		**Code and Unit Test**	**159d**	**3/19/01**	**10/25/01**	

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Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
523	CP.01.06.01	Tax Return Online Updata Services	159d	3/19/01	10/25/01	521
524	CP.01.06.02	Case Data Online Update Services	159d	3/19/01	10/25/01	521
525	CP.01.06.07	Individual Filer Account Online Update Services	159d	3/19/01	10/25/01	521
526	CP.01.06.08	Common Update Execution Services	159d	3/19/01	10/25/01	521
527	CP.04.01.01	Process Corporate Notices and Correspondence	159d	3/19/01	10/25/01	521
528	CP.04.01.02	Correspondence Template Access Services	159d	3/19/01	10/25/01	521
529	CP.04.01.03	Corresponcence Template Update Services	159d	3/19/01	10/25/01	521
530	TR.02.01.01	Legacy Data Retrieval Processing	159d	3/19/01	10/25/01	521
531	TR.05.01.02	Legacy System Access Session Management	159d	3/19/01	10/25/01	521
532	CS.01.01.01	Data Directed Routing	159d	3/19/01	10/25/01	521
533	CS.01.03.01	Internet Interface Management	159d	3/19/01	10/25/01	521
534	CS.06.01.01	Case Analysis and Resolution Framework	159d	3/19/01	10/25/01	521
535	CS.06.01.06	Data Directed Routing Support	159d	3/19/01	10/25/01	521
536	CS.06.01.07	Automated Account Related taxpayer Assistance	159d	3/19/01	10/25/01	521
537	CS.06.01.14	Taxpayer Account Analysis	159d	3/19/01	10/25/01	521
538	IS.05.05.11	Regional Platform Non-IRS User Auth Services	159d	3/19/01	10/25/01	521
539	CP.02.01.01	Account Settlement Calculation	159d	3/19/01	10/25/01	521
540	CS.06.01.04	Case and Account Resolution	159d	3/19/01	10/25/01	521
541	CS.06.01.08	Return Adjustment	159d	3/19/01	10/25/01	521
542	CS.06.01.09	Correspondence Applications	159d	3/19/01	10/25/01	521
543	CS.06.01.13	Transition Bridge Interface	159d	3/19/01	10/25/01	521
544	LE.CFOL.01	Modifications to Legacy CFOL	159d	3/19/01	10/25/01	521
545	MCDB.01	Establish Master Correspondence Database	159d	3/19/01	10/25/01	521
546	MCDB.02	Load Master Correspondence Database	159d	3/19/01	10/25/01	521
547	CS.06.02.02	Case Processing Interface	159d	3/19/01	10/25/01	521
548	CP.08.02.01	MIS Report Generation & Statistical Analysis	159d	3/19/01	10/25/01	521
549	CP.08.02.02	MIS Data Access Services	159d	3/19/01	10/25/01	521
550	CP.08.02.03	MIS COTS Configuration	159d	3/19/01	10/25/01	521
551	CP.09.02.02	MIS Data Management	159d	3/19/01	10/25/01	521
552	CP.09.02.03	MIS Event Log Generation Services	159d	3/19/01	10/25/01	521
553	MISDB.01	Establish MIS Database	159d	3/19/01	10/25/01	521
554	TECHDB.01	Establish Technical Support Database	159d	3/19/01	10/25/01	521

Successors are not displayed because of page space limitations. Soft copy can be made available.

Modernization Phase I/Release 1 Schedule						
ID	**CIID**	**Name**	**DU**	**Start**	**Finish**	**Pred**
555		Subrelease 1.5 Test Readiness Review	0d	10/25/01	10/25/01	523,524, 526,527, 528,529, 531,532, 533,535, 536,537, 539,540, 541,542, 543,544, 545,546, 547,548, 549,550, 551,552, 553,554, 525,530, 534,538, 500
556		**Conduct Subrelease 1.5 Integration & Integration Testing**	**176d**	**10/26/01**	**6/28/02**	
557		Conduct Subrelease 1.5 Integration & Integration Testing	161d	10/26/01	6/7/02	555
558		Subrelease 1.5 Integration and Integration Test Reports	15d	6/10/02	6/28/02	557
559		Subrelease 1.5 Build Procedures	15d	6/10/02	6/28/02	557
560		**Subrelease 1.5 SAT**	**105d**	**6/28/02**	**11/22/02**	
561		Subrelease 1.5 SAT Readiness Review	0d	6/28/02	6/28/02	558,559, 503
562		Subrelease 1.5 SAT	90d	7/1/02	11/1/02	561
563		Subrelease 1.5 SAT Reports	15d	11/4/02	11/22/02	562
564		Subrelease 1.5 Pilot Readiness Report	15d	11/4/02	11/22/02	562
565		Subrelease 1.5 Pilot Configuration Package	15d	11/4/02	11/22/02	562
566		Subrelease 1.5 SAT Acceptance Review	0d	11/22/02	11/22/02	563,564, 565
567		Subrelease 1.5 Pilot Operational Readiness Review	0d	11/22/02	11/22/02	566
568		Subrelease 1.5 Pre-Pilot Investment Evaluation Review	0d	11/22/02	11/22/02	567
569		**Subrelease 1.5 Pilot**	**142d**	**11/25/02**	**6/10/03**	
570		Subrelease 1.5 Application Deployment	22d	11/25/02	12/24/02	568
571		Pilot Operational	120d	12/25/02	6/10/03	570
572		Post-Pilot Review	0d	6/10/03	6/10/03	571
573		Post-Pilot Investment Evaluation Review	0d	6/10/03	6/10/03	571
574		**Subrelease 1.4 & 1.5 Nationwide**	**120d**	**6/11/03**	**11/25/03**	
575		Subrelease 1.4 & 1.5 Nationwide Rollout	120d	6/11/03	11/25/03	572,573, 489,490
576		Subrelease 1.4 & 1.5 Operational	0d	11/25/03	11/25/03	575
577		Post-Deployment Investment Evaluation Review	0d	11/25/03	11/25/03	133,249, 378,576
578		End Phase I/Release 1	0d	11/25/03	11/25/03	577

Successors are not displayed because of page space limitations. Soft copy can be made available.

APPENDIX F
COCOMO II ESTIMATION

APPENDIX F: Constructive Cost Model (COCOMO) II Software Cost Estimation Methodology

The COCOMO II software estimation modeling tool was used to determine the estimated workload requirements and schedule for Phase I/Release 1 new software development for Subleases 1.1 through 1.5. Available originally in 1981[1] and upgraded during the ensuing 16 years, COCOMO has been used extensively by the public and private sector. Version 1.4 of the COCOMO model was made available in 1997[2] along with the COCOMO II, 1997.1 tool. They were chosen based on the following:

- **Unlike many models, COCOMO II takes into consideration modern critical development factors such as more complete modeling of the adaptation of existing software into a new environment, and allowances for the specification of development process maturity (i.e., SEI CMM Level);**
- **Unlike some other modeling tools (e.g., CHECKPOINT[3]), COCOMO II 1997.1 uses the requisite decomposition levels to provide the flexibility to apply the model results to complex scheduling situations including the work breakdown structure (WBS) supporting the IRS Systems Life Cycle (SLC); and**
- **COCOMO II modeling software is non-proprietary and readily available. The equations are in the public domain providing the opportunity for Independent Validation and Verification by third parties.**

1. Validation of the Results

The following methods of workload requirements and schedule estimation were used to develop the schedule for Phase I/Release 1:

- **The IRS "Jump Start" team, an assemblage of IRS and ISC lead engineers and architects, developed workload and schedule estimates using traditional top-down estimating methods, relying on the team's extensive and collective large project experience;**
- **Senior Information System (IS) professionals familiar with the legacy systems affected by Phase I/Release 1 determined workload requirements and schedule estimates for the Configuration Items (CIs) of the Subreleases relating to the legacy environment;**
- **ISC lead engineers, in consultation with the IRS "Jump Start" team, developed the COCOMO II parameter inputs and administered the COCOMO II modeling runs based on these inputs; and**
- **Early in the modeling effort a crosscheck was performed using the CHECKPOINT software cost estimation tool to further validate the COCOMO II tool results – the overall CHECKPOINT results came within 10% of the overall COCOMO II results for Phase I/Release 1.**

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1 Boehm, Dr. Barry: Software Engineering Economics, Prentice-Hall Inc., 1981
2 Boehm, Dr. Barry: COCOMO II Model Definition Manual Version 1.4, University of Southern California, 1997
3 CHECKPOINT Version 2.3.1, Software Productivity Research, Burlington, MA, 1996

The results of the COCOMO II estimates were then normalized to the SLC WBS and analyzed by the "Jump Start" team to determine the workload requirements and schedule estimates for the Phase I/Release 1 business case. The COCOMO II results were determined to be the most conservative and pragmatic estimates of workload requirements and schedule for the business case based on the following:

- **The COCOMO II and the top-down results of the "Jump Start" team for workload requirements (i.e., resources) were within 10 to 25 percent, depending on the Subrelease; and**
- **The COCOMO II and the top-down results of the "Jump Start" team for duration (i.e., schedule) were within 10 to 25 percent depending on the subrelease.**

2. COCOMO II Input Parameters

Each subrelease that is to be deployed as a unit was modeled in a separate COCOMO II tool run. The model included factors to take into account that Subreleases 1.2 through 1.5 build upon previous subreleases. The "Subrelease 1.n COCOMO II Inputs" report presents all of the parameters and settings used for each subrelease. A complete description of the COCOMO II parameters can be found in the COCOMO II Model Definition Manual at http://sunset.usc.edu/COCOMOII/ Cocomo.html.

The key input to a parametric software estimation model, including COCOMO II, is the estimate of the size of the software to be built.

- **Sizing Inputs**
  - Source Lines of Code (SLOC) estimates were developed for all new software that must be built for Phase I/Release 1 using architectural materials such as the subsystems, CIs, and interface definitions. CIs were defined for the subsystems to be built in Phase I/Release 1. The CIs that would need to be built or modified to support each subrelease of Phase I/Release 1 were described and allocated to a business need for that subrelease. Each one of the CIs that would be built or modified for a subrelease was ranked from largest to smallest in estimated size. Where possible, the software to be built was compared to similar existing industry or IRS software, to arrive at an SLOC estimate. Legacy lines of code for some systems were obtained and used to verify SLOC estimates. In some cases, estimates of the number of screens or reports were made, and lines of code were estimated by assuming a number of lines per screen or report. Those elements for which there were no comparisons available were estimated using their ranking in relation to those for which more information was available.

- SLOC estimates were included for newly developed operational software as well as software needed to convert existing data to populate new databases. SLOC was included for the code needed to integrate COTS software as well as code that must be developed to adapt the COTS to provide the required functionality within the release and subrelease. The COTS integration effort that could not be estimated via a SLOC estimate was estimated in person months. It was added to the COCOMO II model using reuse adjustment factors as described below.
- COCOMO II reuse adjustment factors were used in the following three cases:
  - Estimates for CIs that would be expected to use either design and/or code from legacy software. In this case an estimate was made of the percentage of modification to legacy design and code. The adjustment to the code size that the COCOMO II model computes was done prior to the tool runs. The adjusted sizes were input into the tool for each CI as new code. The adjusted sizes for each CI that were used are depicted in the "Subrelease 1.n COCOMO II Inputs" reports on the second page of the each report;
  - Estimates for the extra effort involved in adding the functionality of Subreleases 1.2 through 1.5 on to the previous subreleases. The base code was computed by summing the SLOC estimates from the previous subreleases and then using the sum as the base SLOC entry into the model. The design and code modification parameters were set to 0% and the integration modification parameter was set to reflect an estimate of the amount of retest for the particular subrelease. These estimates are depicted for each subrelease, in the "Subrelease 1.n COCOMO II Inputs" reports on the second page of the each report;
  - Estimates to account for COTS integration efforts that could not be estimated directly with SLOC estimates. An estimate was made for the relevant COTS SLOC, setting the design and code modification parameters to 0 percent and the integration modification parameter to reflect the estimated amount of effort. These estimates are depicted for each Subrelease, in the "Subrelease 1.n COCOMO II Inputs" reports on the second page of the each report;

The adjusted SLOC for each CI that was input to the COCOMO II tool for each Subrelease can be found in the COCOMO II Input report for each subrelease.

3. Results and Reports

The reports showing inputs to and the results from COCOMO II are as follows: COCOMO II Input Reports, COCOMO II Results Reports, and COCOMO II Tool Reports.

- **COCOMO II Input Reports**
  - COCOMO II Input Reports include a two-page report for each subrelease entitled "Subrelease 1.n COCOMO II Inputs."

- The first page of the "Subrelease 1.n COCOMO II Inputs" report shows the settings for COCOMO II parameters that were globally set for the entire subrelease and which parameters were specific for each COCOMO II module of the subrelease. The second page shows the adjusted SLOC, and the parameter values for those parameters set independently for each module that represents a CI. (Only CIs that have non-zero SLOC estimates are shown.) The second page also shows the SLOC, reuse adjustment factors and other COCOMO II parameters for the base code retest and COTS integration COCOMO II modules.

- **COCOMO II Results Reports**
  - There are two types of COCOMO II Results Reports. The first is a summary report entitled "Summary of COCOMO II Inputs and Results by Subrelease." This one-page report summarizes the COCOMO II results at the Subrelease level. The second report entitled "Subrelease 1.n – CI Level Effort Results by COCOMO II Phase," depicts the effort estimates by COCOMO II phase for each CI to be built for the subrelease.
  - The "Summary of COCOMO II Inputs and Results by Subrelease" depicts the summarized sizing inputs by subrelease in the upper portion of the report, and the person month and schedule duration results generated by COCOMO II in the lower portion of the report.
  - The "Subrelease 1.n – CI Level Effort Results by COCOMO II Phase" report provides effort estimates by CI by COCOMO II phase based on the COCOMO II outputs, modified by the base code retest/COTS integration factor. The percentage spread over the phases is based on the percentage spread that COCOMO II provided for the COCOMO II phases and an additional 10 percent for the plans and requirements phase.

- **COCOMO II Tool Run Reports**
  - The COCOMO II tool run reports consist of reports generated directly from the COCOMO II tool provided by University of Southern California (USC). These reports show the exact input settings and results that were generated from the tool itself. The reports show rate inputs as zero since the application of rates to the effort estimates was done outside of COCOMO II and is described in Appendices C and D.

REPORTS

COCOMO II Input Reports

Subrelease 1.1 COCOMO II Inputs

Subrelease 1.2 COCOMO II Inputs

Subrelease 1.3 COCOMO II Inputs

Subrelease 1.4 COCOMO II Inputs

Subrelease 1.5 COCOMO II Inputs

COCOMO II Results Reports

Summary of COCOMO II Inputs and Results by Subrelease

Subrelease 1.1 – CI Level Effort Results by COCOMO II Phase

Subrelease 1.2 – CI Level Effort Results by COCOMO II Phase

Subrelease 1.3 – CI Level Effort Results by COCOMO II Phase

Subrelease 1.4 – CI Level Effort Results by COCOMO II Phase

Subrelease 1.5 – CI Level Effort Results by COCOMO II Phase

COCOMO II Tool Run Reports

Subrelease 1.1

Subrelease 1.2

Subrelease 1.3

Subrelease 1.4

Subrelease 1.5

COCOMO II Input Reports

Subrelease 1.1 COCOMO II Inputs

Factor/Parameter	Parameter ID	Value
The following parameters are set once for each subrelease (COCOMO Project):		
• Scale Factors:		
— Precedentedness	• **PREC**	• HI
— Development Flexibility	• **FLEX**	• NOM
— Architecture & Risk Resolution	• **RESL**	• HI
— Team Cohesion	• **TEAM**	• NOM
— Process Maturity	• **PMAT**	• HI
The following parameters are set the same for all CI's (COCOMO Modules) in the subrelease:		
• Module Size Factor:		
— Breakage	• **BRAK**	• 10%
• Product Effort Adjustment Factor (EAF):		
— Documentation	• **DOCU**	• NOM
• Platform EAF's:		
— Platform Volatility	• **PVOL**	• LO
• Personnel EAF's		
— Analyst Capability	• **ACAP**	• HI
— Programmer Capability	• **PCAP**	• HI
— Analyst Experience	• **AEXP**	• HI
— Platform Experience	• **PEXP**	• HI
— Language and Tool Experience	• **LTEX**	• HI
— Personnel Continuity	• **PCON**	• HI
• Project EAF's		
— Tool Usage	• **TOOL**	• HI
— Multi-Site Development	• **SITE**	• HI
— Required Development Schedule	• **SCED**	• NOM
The following parameters are set independently for each CI (COCOMO Module):		
• Product EAF's		
— Required Reliability	• **RELY**	• See Next Page
— Database Size	• **DATA**	• See Next Page
— Product Complexity	• **CPLX**	• See Next Page
— Required Usability	• **RUSE**	• See Next Page
• Platform EAF's		
— Execution Time Constraint	• **TIME**	• See Next Page
— Main Storage Constraint	• **STOR**	• See Next Page

Subrelease 1.1 COCOMO II Inputs

BN ID	CI ID	ADJ SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
1.1.100	CS.01.01.02	10000	LO	LO	NOM	NOM	NOM	NOM
1.1.100	CS.01.03.01	3000	VLO	LO	NOM	HI	NOM	NOM
1.1.100	CS.05.01.01	7500	LO	NOM	NOM	NOM	NOM	NOM
1.1.101	IS.05.10.01	3000	HI	LO	NOM	LO	NOM	NOM
1.1.101	IS.05.18.03	2500	HI	NOM	NOM	NOM	NOM	NOM
1.1.101	IS.05.21.03	3000	HI	HI	NOM	LO	NOM	NOM
1.1.101	IS.05.21.04	2000	HI	HI	NOM	LO	NOM	NOM
1.1.103	CP.07.02.01	7100	LO	NOM	LO	HI	NOM	NOM
1.1.103	REFDB.01	2000	LO	VHI	VLO	NOM	NOM	NOM
1.1.103	REFDB.02	7600	LO	VHI	HI	NOM	NOM	NOM
1.1.104	STATDB.01	2000	LO	VHI	VLO	LO	NOM	NOM

Base/COTS	SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
COTS	500000	LO	NOM	NOM	NOM	NOM	NOM

	SLOC	DM	CM	IM	AA	SU	UNFM
COTS	500000	0%	0%	6%	NOM	NOM	NOM

Subrelease 1.2 COCOMO II Inputs

Factor/Parameter	Parameter ID	Value
The following parameters are set once for each subrelease (COCOMO Project):		
• Scale Factors:		
— Precedentedness	• **PREC**	• HI
— Development Flexibility	• **FLEX**	• NOM
— Architecture & Risk Resolution	• **RESL**	• HI
— Team Cohesion	• **TEAM**	• NOM
— Process Maturity	• **PMAT**	• HI
The following parameters are set the same for all CI's (COCOMO Modules) in the subrelease:		
• Module Size Factor:		
— Breakage	• **BRAK**	• 10%
• Product Effort Adjustment Factor (EAF):		
— Documentation	• **DOCU**	• NOM
• Platform EAF's:		
— Platform Volatility	• **PVOL**	• LO
• Personnel EAF's		
— Analyst Capability	• **ACAP**	• HI
— Programmer Capability	• **PCAP**	• HI
— Analyst Experience	• **AEXP**	• HI
— Platform Experience	• **PEXP**	• HI
— Language and Tool Experience	• **LTEX**	• HI
— Personnel Continuity	• **PCON**	• HI
• Project EAF's		
— Tool Usage	• **TOOL**	• HI
— Multi-Site Development	• **SITE**	• HI
— Required Development Schedule	• **SCED**	• NOM
The following parameters are set independently for each CI (COCOMO Module):		
• Product EAF's		
— Required Reliability	• **RELY**	• See Next Page
— Database Size	• **DATA**	• See Next Page
— Product Complexity	• **CPLX**	• See Next Page
— Required Usability	• **RUSE**	• See Next Page
• Platform EAF's		
— Execution Time Constraint	• **TIME**	• See Next Page
— Main Storage Constraint	• **STOR**	• See Next Page

Subrelease 1.2 COCOMO II Inputs

BN ID	CI ID	ADJ SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
1.2.200	CP.01.02.02	3000	NOM	VHI	NOM	HI	NOM	NOM
1.2.200	CP.01.06.08	2000	NOM	LO	NOM	VHI	NOM	NOM
1.2.200	CP.01.07.01	2000	NOM	LO	VLO	NOM	NOM	NOM
1.2.200	CP.07.01.01	6000	NOM	LO	LO	HI	NOM	NOM
1.2.200	TADB.01	2000	HI	VHI	VLO	LO	NOM	NOM
1.2.200	TADB.02	3200	HI	VHI	HI	NOM	NOM	NOM
1.2.200	TR.01.01.01	5000	NOM	NOM	NOM	NOM	NOM	NOM
1.2.201	CS.01.01.02	2000	LO	LO	NOM	NOM	NOM	NOM
1.2.201	CS.01.03.01	2000	VLO	LO	NOM	NOM	NOM	NOM
1.2.201	CS.06.01.01	6000	NOM	VHI	NOM	NOM	NOM	NOM
1.2.201	CS.06.01.07	2000	NOM	VHI	NOM	NOM	NOM	NOM
1.2.201	REFDB.02	2000	LO	VHI	HI	LO	NOM	NOM
1.2.205	IS.05.06.02	2000	HI	HI	HI	NOM	NOM	NOM
1.2.206	IS.04.01.08	2000	HI	VHI	LO	NOM	NOM	NOM
1.2.206	RADB.01	2000	VLO	VHI	VLO	LO	NOM	NOM

Base/COTS	SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
Base	49700	NOM	HI	NOM	NOM	NOM	NOM
COTS	700000	NOM	HI	NOM	NOM	NOM	NOM

	SLOC	DM	CM	IM	AA	SU	UNFM
Base	49700	0%	0%	5%	NOM	NOM	NOM
COTS	700000	0%	0%	6%	NOM	NOM	NOM

Subrelease 1.3 COCOMO II Inputs

Factor/Parameter	Parameter ID	Value
The following parameters are set once for each subrelease (COCOMO Project):		
• Scale Factors:		
— Precedentedness	• **PREC**	• HI
— Development Flexibility	• **FLEX**	• NOM
— Architecture & Risk Resolution	• **RESL**	• HI
— Team Cohesion	• **TEAM**	• NOM
— Process Maturity	• **PMAT**	• HI
The following parameters are set the same for all CI's (COCOMO Modules) in the subrelease:		
• Module Size Factor:		
— Breakage	• **BRAK**	• 10%
• Product Effort Adjustment Factor (EAF):		
— Documentation	• **DOCU**	• NOM
• Platform EAF's:		
— Platform Volatility	• **PVOL**	• NOM
• Personnel EAF's		
— Analyst Capability	• **ACAP**	• HI
— Programmer Capability	• **PCAP**	• HI
— Analyst Experience	• **AEXP**	• HI
— Platform Experience	• **PEXP**	• HI
— Language and Tool Experience	• **LTEX**	• HI
— Personnel Continuity	• **PCON**	• HI
• Project EAF's		
— Tool Usage	• **TOOL**	• HI
— Multi-Site Development	• **SITE**	• NOM
— Required Development Schedule	• **SCED**	• NOM
The following parameters are set independently for each CI (COCOMO Module):		
• Product EAF's		
— Required Reliability	• **RELY**	• See Next Page
— Database Size	• **DATA**	• See Next Page
— Product Complexity	• **CPLX**	• See Next Page
— Required Usability	• **RUSE**	• See Next Page
• Platform EAF's		
— Execution Time Constraint	• **TIME**	• See Next Page
— Main Storage Constraint	• **STOR**	• See Next Page

Subrelease 1.3 COCOMO II Inputs

BN ID	CI ID	ADJ SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
1.3.202	CS.06.01.01	2000	NOM	VHI	NOM	NOM	NOM	NOM
1.3.202	CS.06.01.14	4000	NOM	VHI	NOM	NOM	NOM	NOM
1.3.202	CS.06.02.01	15000	NOM	LO	HI	NOM	NOM	NOM
1.3.202	REFDB.01	2000	LO	VHI	VLO	NOM	NOM	NOM
1.3.202	REFDB.02	3000	LO	VHI	NOM	LO	NOM	NOM
1.3.203	IS.05.02.01	13000	NOM	NOM	NOM	LO	NOM	NOM
1.3.203	LE.ACS.02	2000	NOM	LO	NOM	LO	NOM	NOM
1.3.203	LE.AUR.02	6000	NOM	LO	NOM	LO	NOM	NOM
1.3.203	LE.CFOL.02	10000	NOM	LO	NOM	LO	NOM	NOM
1.3.203	LE.CIDS.02	2000	NOM	LO	NOM	LO	NOM	NOM
1.3.203	LE.IDRS.02	10000	NOM	VHI	NOM	LO	NOM	NOM
1.3.203	LE.SERP.02	2000	NOM	LO	NOM	LO	NOM	NOM
1.3.203	TR.05.01.01	2500	NOM	VHI	NOM	LO	NOM	NOM
1.3.203	TR.05.01.02	45000	NOM	VHI	NOM	LO	NOM	NOM
1.3.203	TR.05.01.03	5000	NOM	NOM	NOM	NOM	NOM	NOM
1.3.205	CS.05.01.01	2000	LO	NOM	NOM	NOM	NOM	NOM
1.3.205	IS.05.01.08	10000	HI	HI	NOM	LO	NOM	NOM
1.3.205	IS.05.06.02	4000	HI	HI	HI	NOM	NOM	NOM
1.3.206	AUTHDB.01	2400	NOM	VHI	VLO	LO	NOM	NOM
1.3.206	IS.05.01.09	2000	HI	HI	NOM	LO	NOM	NOM

Base/COTS	SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
Base	92900	NOM	HI	NOM	LO	NOM	NOM
COTS	100000	NOM	HI	NOM	LO	NOM	NOM

	SLOC	DM	CM	IM	AA	SU	UNFM
Base	92900	0%	0%	10%	NOM	NOM	NOM
COTS	100000	0%	0%	56%	NOM	NOM	NOM

Subrelease 1.4 COCOMO II Inputs

Factor/Parameter	Parameter ID	Value
The following parameters are set once for each subrelease (COCOMO Project):		
• Scale Factors:		
— Precedentedness	• **PREC**	• HI
— Development Flexibility	• **FLEX**	• NOM
— Architecture & Risk Resolution	• **RESL**	• HI
— Team Cohesion	• **TEAM**	• NOM
— Process Maturity	• **PMAT**	• HI
The following parameters are set the same for all CI's (COCOMO Modules) in the subrelease:		
• Module Size Factor:		
— Breakage	• **BRAK**	• 10%
• Product Effort Adjustment Factor (EAF):		
— Documentation	• **DOCU**	• NOM
• Platform EAF's:		
— Platform Volatility	• **PVOL**	• NOM
• Personnel EAF's		
— Analyst Capability	• **ACAP**	• HI
— Programmer Capability	• **PCAP**	• HI
— Analyst Experience	• **AEXP**	• HI
— Platform Experience	• **PEXP**	• HI
— Language and Tool Experience	• **LTEX**	• HI
— Personnel Continuity	• **PCON**	• HI
• Project EAF's		
— Tool Usage	• **TOOL**	• HI
— Multi-Site Development	• **SITE**	• NOM
— Required Development Schedule	• **SCED**	• NOM
The following parameters are set independently for each CI (COCOMO Module):		
• Product EAF's		
— Required Reliability	• **RELY**	• See Next Page
— Database Size	• **DATA**	• See Next Page
— Product Complexity	• **CPLX**	• See Next Page
— Required Usability	• **RUSE**	• See Next Page
• Platform EAF's		
— Execution Time Constraint	• **TIME**	• See Next Page
— Main Storage Constraint	• **STOR**	• See Next Page

Subrelease 1.4 COCOMO II Inputs

BN ID	CI ID	ADJ SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
1.4.300	CCDB.01	9500	HI	VHI	VLO	LO	NOM	NOM
1.4.300	CCDB.02	30000	HI	VHI	HI	LO	NOM	NOM
1.4.300	CP.01.01.01	36000	LO	VHI	VHI	HI	NOM	NOM
1.4.300	CP.01.02.02	7800	NOM	VHI	NOM	HI	NOM	NOM
1.4.300	CP.01.05.02	6000	NOM	VHI	HI	NOM	NOM	NOM
1.4.300	CP.01.07.01	2000	NOM	LO	VLO	NOM	NOM	NOM
1.4.300	CP.05.01.02	2000	NOM	VHI	LO	NOM	NOM	NOM
1.4.300	CP.05.01.03	3400	NOM	VHI	LO	NOM	NOM	NOM
1.4.300	CP.05.01.04	2500	NOM	VHI	NOM	NOM	NOM	NOM
1.4.300	CP.05.01.05	2500	NOM	VHI	NOM	NOM	NOM	NOM
1.4.300	CP.05.01.06	2400	NOM	VHI	NOM	NOM	NOM	NOM
1.4.300	CP.05.03.01	3000	NOM	VHI	LO	NOM	NOM	NOM
1.4.300	CP.07.01.02	2000	NOM	LO	HI	VHI	NOM	NOM
1.4.300	CP.07.01.03	2000	NOM	LO	HI	VHI	NOM	NOM
1.4.300	CS.06.01.01	2000	NOM	VHI	NOM	NOM	NOM	NOM
1.4.300	CS.06.01.03	10000	NOM	VHI	HI	NOM	NOM	NOM
1.4.300	TADB.01	7300	HI	VHI	VLO	LO	NOM	NOM
1.4.300	TADB.02	20000	HI	VHI	HI	NOM	NOM	NOM
1.4.300	TR.01.01.01	60000	NOM	VHI	NOM	NOM	NOM	NOM
1.4.300	TRDB.01	20000	NOM	VHI	VLO	LO	NOM	NOM
1.4.300	TRDB.02	4000	NOM	VHI	HI	LO	NOM	NOM
1.4.302	CS.06.02.02	17000	NOM	LO	HI	NOM	NOM	NOM
1.4.303	CDADB.01	2000	NOM	VHI	VLO	LO	NOM	NOM
1.4.303	CP.01.07.02	3000	NOM	NOM	LO	LO	NOM	NOM
1.4.303	CP.07.02.02	2000	LO	NOM	NOM	LO	NOM	NOM
1.4.303	CP.09.01.01	7000	LO	NOM	HI	LO	NOM	NOM
1.4.303	CP.09.01.02	15000	LO	NOM	LO	HI	NOM	NOM
1.4.303	REFDB.01	2000	LO	VHI	VLO	LO	NOM	NOM
1.4.305	IS.04.01.03	2000	HI	VHI	NOM	NOM	NOM	NOM
1.4.305	SADB.01	2000	VLO	VHI	VLO	LO	NOM	NOM

Base/COTS	SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
Base	236800	NOM	VHI	NOM	NOM	NOM	NOM
COTS	250000	NOM	VHI	NOM	NOM	NOM	NOM

	SLOC	DM	CM	IM	AA	SU	UNFM
Base	236800	0%	0%	30%	NOM	NOM	NOM
COTS	250000	0%	0%	15%	NOM	NOM	NOM

Subrelease 1.5 COCOMO II Inputs

Factor/Parameter	Parameter ID	Value
The following parameters are set once for each subrelease (COCOMO Project):		
• Scale Factors:		
— Precedentedness	• **PREC**	• HI
— Development Flexibility	• **FLEX**	• NOM
— Architecture & Risk Resolution	• **RESL**	• HI
— Team Cohesion	• **TEAM**	• NOM
— Process Maturity	• **PMAT**	• HI
The following parameters are set the same for all CI's (COCOMO Modules) in the subrelease:		
• Module Size Factor:		
— Breakage	• **BRAK**	• 10%
• Product Effort Adjustment Factor (EAF):		
— Documentation	• **DOCU**	• NOM
• Platform EAF's:		
— Platform Volatility	• **PVOL**	• NOM
• Personnel EAF's		
— Analyst Capability	• **ACAP**	• HI
— Programmer Capability	• **PCAP**	• HI
— Analyst Experience	• **AEXP**	• HI
— Platform Experience	• **PEXP**	• HI
— Language and Tool Experience	• **LTEX**	• HI
— Personnel Continuity	• **PCON**	• HI
• Project EAF's		
— Tool Usage	• **TOOL**	• HI
— Multi-Site Development	• **SITE**	• NOM
— Required Development Schedule	• **SCED**	• NOM
The following parameters are set independently for each CI (COCOMO Module):		
• Product EAF's		
— Required Reliability	• **RELY**	• See Next Page
— Database Size	• **DATA**	• See Next Page
— Product Complexity	• **CPLX**	• See Next Page
— Required Usability	• **RUSE**	• See Next Page
• Platform EAF's		
— Execution Time Constraint	• **TIME**	• See Next Page
— Main Storage Constraint	• **STOR**	• See Next Page

Subrelease 1.5 COCOMO II Inputs

BN ID	CI ID	ADJ SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
1.5.400	CP.01.06.01	10000	NOM	LO	HI	VHI	NOM	NOM
1.5.400	CP.01.06.02	8000	NOM	LO	HI	VHI	NOM	NOM
1.5.400	CP.01.06.07	7000	NOM	LO	HI	VHI	NOM	NOM
1.5.400	CP.01.06.08	6400	NOM	LO	NOM	VHI	NOM	NOM
1.5.400	CP.04.01.01	3000	VLO	VHI	NOM	NOM	NOM	NOM
1.5.400	CP.04.01.02	2000	VLO	VHI	NOM	NOM	NOM	NOM
1.5.400	CP.04.01.03	2000	VLO	VHI	NOM	NOM	NOM	NOM
1.5.400	TR.02.01.01	6600	NOM	VHI	LO	NOM	NOM	NOM
1.5.400	TR.05.01.02	2500	NOM	HI	NOM	LO	NOM	NOM
1.5.401	CS.01.01.01	2400	LO	LO	NOM	NOM	NOM	NOM
1.5.401	CS.01.03.01	2000	VLO	LO	NOM	NOM	NOM	NOM
1.5.401	CS.06.01.01	3000	NOM	VHI	NOM	NOM	NOM	NOM
1.5.401	CS.06.01.06	2000	NOM	VHI	NOM	NOM	NOM	NOM
1.5.401	CS.06.01.07	8000	NOM	VHI	NOM	NOM	NOM	NOM
1.5.401	CS.06.01.14	8000	NOM	VHI	NOM	NOM	NOM	NOM
1.5.401	IS.05.05.11	7000	HI	NOM	HI	LO	NOM	NOM
1.5.402	CP.02.01.01	6000	HI	VHI	VHI	NOM	NOM	NOM
1.5.402	CS.06.01.04	8000	NOM	VHI	VLO	LO	NOM	NOM
1.5.402	CS.06.01.08	25000	NOM	VHI	HI	HI	NOM	NOM
1.5.402	CS.06.01.09	2000	NOM	VHI	NOM	NOM	NOM	NOM
1.5.402	CS.06.01.13	10000	NOM	VHI	HI	NOM	NOM	NOM
1.5.402	MCDB.01	2000	NOM	VHI	VLO	LO	NOM	NOM
1.5.402	MCDB.02	2000	NOM	VHI	NOM	LO	NOM	NOM
1.5.403	CS.06.02.02	16500	NOM	LO	HI	HI	NOM	NOM
1.5.404	CP.08.02.02	2000	NOM	VHI	LO	LO	NOM	NOM
1.5.404	CP.08.02.03	2000	NOM	VHI	LO	LO	NOM	NOM
1.5.404	CP.09.02.02	2800	NOM	VHI	NOM	LO	NOM	NOM
1.5.404	CP.09.02.03	2000	NOM	VHI	NOM	NOM	NOM	NOM
1.5.404	MISDB.01	12500	LO	VHI	VLO	LO	NOM	NOM
1.5.405	TECHDB.01	5600	NOM	VHI	VLO	LO	NOM	NOM

Base/COTS	SLOC	RELY	DATA	CPLX	RUSE	TIME	STOR
Base	523200	NOM	HI	NOM	NOM	NOM	NOM

	SLOC	DM	CM	IM	AA	SU	UNFM
Base	523200	0%	0%	40%	NOM	NOM	NOM

COCOMO II Results Reports

Summary of COCOMO II Inputs and Results by Subrelease*

	Source Code Inputs						
Subrelease Names	**New SLOC**	**Base SLOC**	**% Base Retest (IM)**	**COTS SLOC**	**% COTS Integration (IM)**	**COCOMO Retest/ COTS PM**	**Retest/COTS Factor**
Subr 1.1	49,700	N/A	N/A	500,000	6%	39.6	1.54
Subr 1.2	43,200	49,700	5%	700,000	6%	74.2	2.02
Subr 1.3	143,900	92,900	10%	100,000	56%	57.9	1.18
Subr 1.4	286,400	236,800	30%	250,000	15%	144.5	1.18
Subr 1.5	178,300	523,200	40%	N/A	N/A	206.0	1.43

			COCOMO Distribution by Phase			
	Total COCOMO Months	**Plans & Requirements**	**Prod Des**	**Prog**	**I&T**	**Total Months**
Person Month (PM) Estimates						
Subr 1.1	113	11	19	63	30	124
Subr 1.2	147	15	25	83	40	162
Subr 1.3	376	38	64	206	105	413
Subr 1.4	954	95	162	523	269	1,049
Subr 1.5	688	69	117	378	193	757
Schedule Duration Estimates						
Subr 1.1	14	3	4	7	4	17
Subr 1.2	16	3	4	7	4	19
Subr 1.3	22	5	6	10	6	26
Subr 1.4	30	7	8	13	9	37
Subr 1.5	27	6	7	12	8	33

*Small discrepancies are due to rounding

Subrelease 1.1 – CI Levels Effort Results by COCOMO Phase*

				PM by Phase				
Prop BNID	**CIID**	**Orig COCOMO PM**	**PM Adj for Retest**	**Plans & Req**	**Prod Design**	**Programming**	**I&T**	**Total PM**
1.1.100	CS.01.01.02	12.7	19.6	2.0	3.3	11.0	5.2	21.5
1.1.100	CS.01.03.01	3.7	5.7	0.6	1.0	3.2	1.5	6.3
1.1.100	CS.05.01.01	10.2	15.7	1.6	2.7	8.9	4.2	17.3
1.1.101	IS.05.10.01	4.5	6.9	0.7	1.2	3.9	1.9	7.6
1.1.101	IS.05.18.03	4.5	6.9	0.7	1.2	3.9	1.9	7.6
1.1.101	IS.05.21.03	5.3	8.2	0.8	1.4	4.6	2.2	9.0
1.1.101	IS.05.21.04	3.5	5.4	0.5	0.9	3.0	1.4	5.9
1.1.103	CP.07.02.01	9.7	15.0	1.5	2.5	8.4	4.0	16.5
1.1.103	REFDB.01	2.4	3.7	0.4	0.6	2.1	1.0	4.1
1.1.103	REFDB.02	14.2	21.9	2.2	3.7	12.3	5.9	24.1
1.1.104	STATDB.01	2.2	3.4	0.3	0.6	1.9	0.9	3.7

*Small discrepancies are due to rounding

Subrelease 1.2 – CI Levels Effort Results by COCOMO Phase*

				PM by Phase				
Prop BNID	**CIID**	**Orig COCOMO PM**	**PM Adj for Retest**	**Plans & Req**	**Prod Design**	**Programming**	**I&T**	**Total PM**
1.2.200	CP.01.02.02	6.4	12.9	1.3	2.2	7.2	3.5	14.2
1.2.200	CP.01.06.08	3.8	7.7	0.8	1.3	4.3	2.1	8.4
1.2.200	CP.01.07.01	2.2	4.4	0.4	0.8	2.5	1.2	4.9
1.2.200	CP.07.01.01.	8.8	17.7	1.8	3.0	9.9	4.8	19.5
1.2.200	TADB.01	2.9	5.8	0.6	1.0	3.3	1.6	6.4
1.2.200	TADB.02	7.9	15.9	1.6	2.7	8.9	4.3	17.5
1.2.200	TR.01.01.01	7.8	15.7	1.6	2.7	8.8	4.2	17.3
1.2.201	CS.01.01.02	2.6	5.2	0.5	0.9	2.9	1.4	5.8
1.2.201	CS.01.03.01	2.2	4.4	0.4	0.8	2.5	1.2	4.9
1.2.201	CS.06.01.01	11.2	22.6	2.3	3.8	12.6	6.1	24.8
1.2.201	CS.06.01.07	3.7	7.5	0.7	1.3	4.2	2.0	8.2
1.2.201	REFDB.02	3.4	6.9	0.7	1.2	3.8	1.8	7.5
1.2.205	IS.05.06.02	4.5	9.1	0.9	1.5	5.1	2.4	10.0
1.2.206	IS.04.01.08	3.8	7.7	0.8	1.3	4.3	2.1	8.4
1.2.206	RADB.01	1.9	3.8	0.4	0.6	2.1	1.0	4.2

*Small discrepancies are due to rounding

Subrelease 1.3 – CI Levels Effort Results by COCOMO Phase*

				PM by Phase				
Prop BNID	**CIID**	**Orig COCOMO PM**	**PM Adj for Retest**	**Plans & Req**	**Prod Design**	**Programming**	**I&T**	**Total PM**
1.3.202	CS.06.01.01	5.1	6.0	0.6	1.0	3.3	1.7	6.6
1.3.202	CS.06.01.14	10.2	12.1	1.2	2.0	6.6	3.4	13.3
1.3.202	CS.06.02.01	34.3	40.6	4.1	6.9	22.3	11.4	44.6
1.3.202	REFDB.01	3.4	4.0	0.4	0.7	2.2	1.1	4.4
1.3.202	REFDB.02	6.1	7.2	0.7	1.2	4.0	2.0	7.9
1.3.203	IS.05.02.01	25.3	29.9	3.0	5.1	16.4	8.4	32.9
1.3.203	LE.ACS.02	3.6	4.3	0.4	0.7	2.3	1.2	4.7
1.3.203	LE.AUR.02	10.9	12.9	1.3	2.2	7.1	3.6	14.2
1.3.203	LE.CFOL.02	18.1	21.4	2.1	3.6	11.8	6.0	23.5
1.3.203	LE.CIDS.02	3.6	4.3	0.4	0.7	2.3	1.2	4.7
1.3.203	LE.IDRS.02	23.2	27.4	2.7	4.7	15.1	7.7	30.2
1.3.203	LE.SERP.02	3.6	4.3	0.4	0.7	2.3	1.2	4.7
1.3.203	TR.05.01.01	5.8	6.9	0.7	1.2	3.8	1.9	7.5
1.3.203	TR.05.01.02	104.2	123.2	12.3	20.9	67.7	34.5	135.5
1.3.203	TR.05.01.03	10.7	12.7	1.3	2.1	7.0	3.5	13.9
1.3.205	CS.05.01.01	3.8	4.5	0.4	0.8	2.5	1.3	4.9
1.3.205	IS.05.01.08	24.4	28.8	2.9	4.9	15.9	8.1	31.7
1.3.205	IS.05.06.02	12.3	14.5	1.5	2.5	8.0	4.1	16.0
1.3.206	AUTHDB.01	4.2	5.0	0.5	0.8	2.7	1.4	5.5
1.3.206	IS.05.01.09	4.9	5.8	0.6	1.0	3.2	1.6	6.4

*Small discrepancies are due to rounding

Subrelease 1.4 – CI Levels Effort Results by COCOMO Phase*

				PM by Phase				
Prop BNID	**CIID**	**Orig COCOMO PM**	**PM Adj for Retest**	**Plans & Req**	**Prod Design**	**Programming**	**I&T**	**Total PM**
1.4.300	CCDB.01	20.7	24.4	2.4	4.1	13.4	6.9	26.8
1.4.300	CCDB.02	100.2	118.1	11.8	20.1	64.8	33.2	129.9
1.4.300	CP.01.01.01	130.3	153.6	15.4	26.1	84.2	43.2	168.9
1.4.300	CP.01.02.02	24.7	29.1	2.9	4.9	16.0	8.2	32.0
1.4.300	CP.01.05.02	19.2	22.6	2.3	3.8	12.4	6.4	24.9
1.4.300	CP.01.07.01	3.3	3.9	0.4	0.7	2.1	1.1	4.3
1.4.300	CP.05.01.02	4.9	5.8	0.6	1.0	3.2	1.6	6.4
1.4.300	CP.05.01.03	8.3	9.8	1.0	1.7	5.4	2.8	10.8
1.4.300	CP.05.01.04	6.9	8.1	0.8	1.4	4.5	2.3	8.9
1.4.300	CP.05.01.05	6.9	8.1	0.8	1.4	4.5	2.3	8.9
1.4.300	CP.05.01.06	6.7	7.9	0.8	1.3	4.3	2.2	8.7
1.4.300	CP.05.03.01	7.3	8.6	0.9	1.5	4.7	2.4	9.5
1.4.300	CP.07.01.02	6.4	7.5	0.8	1.3	4.1	2.1	8.3
1.4.300	CP.07.01.03	6.4	7.5	0.8	1.3	4.1	2.1	8.3
1.4.300	CS.06.01.01	5.6	6.6	0.7	1.1	3.6	1.9	7.3
1.4.300	CS.06.01.03	31.9	37.6	3.8	6.4	20.6	10.6	41.4
1.4.300	TADB.01	15.9	18.7	1.9	3.2	10.3	5.3	20.6
1.4.300	TADB.02	73.4	86.5	8.7	14.7	47.4	24.4	95.2
1.4.300	TR.01.01.01	166.6	196.4	19.6	33.4	107.7	55.3	216.0
1.4.300	TRDB.01	37.9	44.7	4.5	7.6	24.5	12.6	49.1
1.4.300	TRDB.02	11.6	13.7	1.4	2.3	7.5	3.8	15.0
1.4.302	CS.06.02.02	42.4	50.0	5.0	8.5	27.4	14.1	55.0
1.4.303	CDADB.01	3.8	4.5	0.4	0.8	2.5	1.3	4.9
1.4.303	CP.01.07.02	5.6	6.6	0.7	1.1	3.6	1.9	7.3
1.4.303	CP.07.02.02	3.7	4.4	0.4	0.7	2.4	1.2	4.8
1.4.303	CP.09.01.01	15.0	17.7	1.8	3.0	9.7	5.0	19.4
1.4.303	CP.09.01.02	30.9	36.4	3.6	6.2	20.0	10.3	40.1
1.4.303	REFDB.01	3.3	3.9	0.4	0.7	2.1	1.1	4.3
1.4.305	IS.04.01.03	6.4	7.5	0.8	1.3	4.1	2.1	8.3
1.4.305	SADB.01	2.8	3.3	0.3	0.6	1.8	0.9	3.6

*Small discrepancies are due to rounding

Subrelease 1.5 – CI Levels Effort Results by COCOMO Phase

				PM by Phase				
Prop BIND	**CIID**	**Orig COCOMO PM**	**PM Adj for Retest**	**Plans & Req**	**Prod Design**	**Programming**	**I&T**	**Total**
1.5.400	CP.01.06.01	31.2	44.5	4.5	7.6	24.4	12.5	49.0
1.5.400	CP.01.06.02	24.9	35.5	3.6	6.0	19.5	10.0	39.1
1.5.400	CP.01.06.07	21.8	31.1	3.1	5.3	17.1	8.7	34.2
1.5.400	CP.01.06.08	17.3	24.7	2.5	4.2	13.6	6.9	27.2
1.5.400	CP.04.01.01	6.0	8.6	0.9	1.5	4.7	2.4	9.4
1.5.400	CP.04.01.02	4.0	5.7	0.6	1.0	3.1	1.6	6.3
1.5.400	CP.04.01.03	4.0	5.7	0.6	1.0	3.1	1.6	6.3
1.5.400	TR.02.01.01	15.6	22.3	2.2	3.8	12.2	6.3	24.5
1.5.400	TR.05.01.02	5.6	8.0	0.8	1.4	4.4	2.2	8.8
1.5.401	CS.01.01.01	4.4	6.3	0.6	1.1	3.4	1.8	6.9
1.5.401	CS.01.03.01	3.1	4.4	0.4	0.8	2.4	1.2	4.9
1.5.401	CS.06.01.01	8.1	11.6	1.2	2.0	6.3	3.2	12.7
1.5.401	CS.06.01.06	5.4	7.7	0.8	1.3	4.2	2.2	8.5
1.5.401	CS.06.01.07	21.5	30.7	3.1	5.2	16.8	8.6	33.8
1.5.401	CS.06.01.14	21.5	30.7	3.1	5.2	16.8	8.6	33.8
1.5.401	IS.05.05.11	19.0	27.1	2.7	4.6	14.9	7.6	29.8
1.5.402	CP.02.01.01	24.1	34.4	3.4	5.9	18.9	9.7	37.8
1.5.402	CS.06.01.04	14.7	21.0	2.1	3.6	11.5	5.9	23.1
1.5.402	CS.06.01.08	88.1	125.8	12.6	21.4	69.0	35.3	138.3
1.5.402	CS.06.01.09	5.4	7.7	0.8	1.3	4.2	2.2	8.5
1.5.402	CS.06.01.13	30.9	44.1	4.4	7.5	24.2	12.4	48.5
1.5.402	MCDB.01	3.7	5.3	0.5	0.9	2.9	1.5	5.8
1.5.402	MCDB.02	4.9	7.0	0.7	1.2	3.8	2.0	7.7
1.5.403	CS.06.02.02	45.4	64.8	6.5	11.0	35.6	18.2	71.3
1.5.404	CP.08.02.02	4.3	6.1	0.6	1.0	3.4	1.7	6.8
1.5.404	CP.08.02.03	4.3	6.1	0.6	1.0	3.4	1.7	6.8
1.5.404	CP.09.02.02	6.8	9.7	1.0	1.7	5.3	2.7	10.7
1.5.404	CP.09.02.03	5.4	7.7	0.8	1.3	4.2	2.2	8.5
1.5.404	MISDB.01	20.2	28.8	2.9	4.9	15.8	8.1	31.7
1.5.405	TECHDB.01	10.3	14.7	1.5	2.5	8.1	4.1	16.2

*Small discrepancies are due to rounding

COCOMO II Tool Run Reports

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##USC COCOMO II.1997.1##

Printed at:  Thu Mar 05 12:06:03 1998


Project Name:  Subrelease 1.1

Scale Factors:    PREC   FLEX   RESL   TEAM   PMAT
                     H      N      H      N      H
                  1.62   3.64   1.69   2.97   1.82


                                  NOM     ACT           RATE
   MODULE NAME    SLOC   EAF      PM      PM  PROD        &  INST   FSWP   RISK
                                  DEV     DEV           COST  COST

                  SLOC                                   0.0
CS.01.01.02_100   11000  0.27    47.6    12.7 866.8        0   0.0    0.9    0.0

                  SLOC                                   0.0
CS.01.03.01_100    3300  0.26    14.3     3.7 892.2        0   0.0    0.3    0.0

                  SLOC                                   0.0
CS.05.01.01_100    8250  0.29    35.7    10.2 806.2        0   0.0    0.7    0.0

                  SLOC                                   0.0
IS.05.10.01_101    3300  0.32    14.3     4.5 728.9        0   0.0    0.3    0.0

                  SLOC                                   0.0
IS.05.18.03_101    2750  0.37    11.9     4.5 616.9        0   0.0    0.3    0.0

                  SLOC                                   0.0
IS.05.21.03_101    3300  0.37    14.3     5.3 621.9        0   0.0    0.4    0.0

                  SLOC                                   0.0
IS.05.21.04_101    2200  0.37     9.5     3.5 621.9        0   0.0    0.3    0.0

                  SLOC                                   0.0
CP.07.02.01_103    7810  0.29    33.8     9.7 803.6        0   0.0    0.7    0.0

                  SLOC                                   0.0
  REFDB.01_103    2200  0.26     9.5     2.4 903.3        0   0.0    0.2    0.0

                  SLOC                                   0.0
  REFDB.02_103    8360  0.39    36.2    14.2 589.1        0   0.0    1.0    0.0

                  SLOC                                   0.0
 STATDB.01_104    2200  0.23     9.5     2.2 992.6        0   0.0    0.2    0.0

                 ADAPT                                   0.0
          COTS   31900  0.29   138.0    39.6 806.2        0   0.0    2.8    0.0

    TOTAL SLOC   86570        TOTALS   112.6 768.9        0   0.0    8.0    0.0
   EFFORT (PM)   374.4        SCHEDULE  14.1
PROD (SLOC/PM)   231.2
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Printed at:  Thu Mar 05 12:06:03 1998


Project Name:  Subrelease 1.1

         MODULE NAME   SIZING DETAILS


     CS.01.01.02_100 BRAK  INITSLOC
                SLOC   10     10000

     CS.01.03.01_100 BRAK  INITSLOC
                SLOC   10      3000

     CS.05.01.01_100 BRAK  INITSLOC
                SLOC   10      7500

     IS.05.10.01_101 BRAK  INITSLOC
                SLOC   10      3000

     IS.05.18.03_101 BRAK  INITSLOC
                SLOC   10      2500

     IS.05.21.03_101 BRAK  INITSLOC
                SLOC   10      3000

     IS.05.21.04_101 BRAK  INITSLOC
                SLOC   10      2000

     CP.07.02.01_103 BRAK  INITSLOC
                SLOC   10      7100

        REFDB.01_103 BRAK  INITSLOC
                SLOC   10      2000

        REFDB.02_103 BRAK  INITSLOC
                SLOC   10      7600

       STATDB.01_104 BRAK  INITSLOC
                SLOC   10      2000

                COTS BRAK  INITSLOC  DM  CM  IM  SU=N  AA=N  UNFM=N  AT   ATPROD
               ADAPT   10    500000   0   0   6    30     4     0.4   0   2400.0
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Printed at: Thu Mar 05 12:06:03 1998

Project Name: Subrelease 1.1

	+ Product				++ Platform			+
MODULE NAME	RELY	DATA	DOCU	CPLX	RUSE	TIME	STOR	PVOL
	L	L	N	N	N	N	N	L
CS.01.01.02_100	0.88	0.93	1.00	1.00	1.00	1.00	1.00	0.87
	VL	L	N	N	H	N	N	L
CS.01.03.01_100	0.75	0.93	1.00	1.00	1.14	1.00	1.00	0.87
	L	N	N	N	N	N	N	L
CS.05.01.01_100	0.88	1.00	1.00	1.00	1.00	1.00	1.00	0.87
	H	L	N	N	L	N	N	L
IS.05.10.01_101	1.15	0.93	1.00	1.00	0.91	1.00	1.00	0.87
	H	N	N	N	N	N	N	L
IS.05.18.03_101	1.15	1.00	1.00	1.00	1.00	1.00	1.00	0.87
	H	H	N	N	L	N	N	L
IS.05.21.03_101	1.15	1.09	1.00	1.00	0.91	1.00	1.00	0.87
	H	H	N	N	L	N	N	L
IS.05.21.04_101	1.15	1.09	1.00	1.00	0.91	1.00	1.00	0.87
	L	N	N	L	H	N	N	L
CP.07.02.01_103	0.88	1.00	1.00	0.88	1.14	1.00	1.00	0.87
	L	VH	N	VL	N	N	N	L
REFDB.01_103	0.88	1.19	1.00	0.75	1.00	1.00	1.00	0.87
	L	VH	N	H	N	N	N	L
REFDB.02_103	0.88	1.19	1.00	1.15	1.00	1.00	1.00	0.87
	L	VH	N	VL	L	N	N	L
STATDB.01_104	0.88	1.19	1.00	0.75	0.91	1.00	1.00	0.87
	L	N	N	N	N	N	N	L
COTS	0.88	1.00	1.00	1.00	1.00	1.00	1.00	0.87

Printed at: Thu Mar 05 12:06:03 1998

Project Name: Subrelease 1.1

	+ Personnel					++ Project			++ User		
MODULE NAME	ACAP	AEXP	PCAP	PEXP	LEXP	PCON	TOOL	SCED	SITE	USR1	USR2
	H	H	H	H	H	H	H	N	H	N	N
CS.01.01.02_100	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CS.01.03.01_100	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CS.05.01.01_100	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
IS.05.10.01_101	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
IS.05.18.03_101	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
IS.05.21.03_101	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
IS.05.21.04_101	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CP.07.02.01_103	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
REFDB.01_103	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
REFDB.02_103	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
STATDB.01_104	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
COTS	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00

##USC COCOMO II.1997.1##

Printed at: Thu Mar 05 12:07:40 1998

Project Name: Subrelease 1.2

Scale Factors:	PREC	FLEX	RESL	TEAM	PMAT
	H	N	H	N	H
	1.62	3.64	1.69	2.97	1.82

MODULE NAME	SLOC	EAF	NOM PM DEV	ACT PM DEV	PROD	RATE & COST	INST COST	FSWP	RISK
	SLOC					0.0			
CP.01.02.02_200	3300	0.44	14.4	6.4	516.7	0	0.0	0.4	0.0
	SLOC					0.0			
CP.01.06.08_200	2200	0.39	9.6	3.8	584.2	0	0.0	0.2	0.0
	SLOC					0.0			
CP.01.07.01_200	2200	0.23	9.6	2.2	1004.9	0	0.0	0.1	0.0
	SLOC					0.0			
CP.07.01.01_200	6600	0.30	28.9	8.8	751.3	0	0.0	0.6	0.0
	SLOC					0.0			
TADB.01_200	2200	0.30	9.6	2.9	750.4	0	0.0	0.2	0.0
	SLOC					0.0			
TADB.02_200	3520	0.51	15.4	7.9	445.4	0	0.0	0.5	0.0
	SLOC					0.0			
TR.01.01.01_200	5500	0.33	24.1	7.8	700.9	0	0.0	0.5	0.0
	SLOC					0.0			
CS.01.01.02_201	2200	0.27	9.6	2.6	856.4	0	0.0	0.2	0.0
	SLOC					0.0			
CS.01.03.01_201	2200	0.23	9.6	2.2	1004.9	0	0.0	0.1	0.0
	SLOC					0.0			
CS.06.01.01_201	6600	0.39	28.9	11.2	589.0	0	0.0	0.7	0.0
	SLOC					0.0			
CS.06.01.07_201	2200	0.39	9.6	3.7	589.0	0	0.0	0.2	0.0
	SLOC					0.0			
REFDB.02_201	2200	0.36	9.6	3.4	639.6	0	0.0	0.2	0.0
	SLOC					0.0			
IS.05.06.02_205	2200	0.47	9.6	4.5	486.2	0	0.0	0.3	0.0
	SLOC					0.0			
IS.04.01.08_206	2200	0.39	9.6	3.8	582.0	0	0.0	0.2	0.0

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                 SLOC                                    0.0
   RADB.01_206    2200  0.20     9.6     1.91150.7        0   0.0    0.1    0.0

                ADAPT                                    0.0
          BASE    3006  0.36    13.2     4.7 643.0        0   0.0    0.3    0.0

                ADAPT                                    0.0
          COTS   44660  0.36   195.5    69.5 643.0        0   0.0    4.5    0.0

    TOTAL SLOC   95186        TOTALS   147.3 646.2        0   0.0    9.5    0.0
   EFFORT (PM)   416.7        SCHEDULE  15.5
PROD (SLOC/PM)   228.4
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Printed at:  Thu Mar 05 12:07:40 1998


Project Name:  Subrelease 1.2

         MODULE NAME   SIZING DETAILS


     CP.01.02.02_200 BRAK  INITSLOC
                SLOC   10      3000

     CP.01.06.08_200 BRAK  INITSLOC
                SLOC   10      2000

     CP.01.07.01_200 BRAK  INITSLOC
                SLOC   10      2000

     CP.07.01.01_200 BRAK  INITSLOC
                SLOC   10      6000

         TADB.01_200 BRAK  INITSLOC
                SLOC   10      2000

         TADB.02_200 BRAK  INITSLOC
                SLOC   10      3200

     TR.01.01.01_200 BRAK  INITSLOC
                SLOC   10      5000

     CS.01.01.02_201 BRAK  INITSLOC
                SLOC   10      2000

     CS.01.03.01_201 BRAK  INITSLOC
                SLOC   10      2000

     CS.06.01.01_201 BRAK  INITSLOC
                SLOC   10      6000

     CS.06.01.07_201 BRAK  INITSLOC
                SLOC   10      2000

        REFDB.02_201 BRAK  INITSLOC
                SLOC   10      2000

     IS.05.06.02_205 BRAK  INITSLOC
                SLOC   10      2000

     IS.04.01.08_206 BRAK  INITSLOC
                SLOC   10      2000

         RADB.01_206 BRAK  INITSLOC
                SLOC   10      2000

                BASE BRAK  INITSLOC  DM  CM  IM  SU=N  AA=N  UNFM=N  AT   ATPROD
               ADAPT   10     49700   0   0   5    30     4     0.4   0   2400.0

                COTS BRAK  INITSLOC  DM  CM  IM  SU=N  AA=N  UNFM=N  AT   ATPROD
               ADAPT   10    700000   0   0   6    30     4     0.4   0   2400.0
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Printed at: Thu Mar 05 12:07:40 1998

Project Name: Subrelease 1.2

	+ Product				++ Platform			+
MODULE NAME	RELY	DATA	DOCU	CPLX	RUSE	TIME	STOR	PVOL
	N	VH	N	N	H	N	N	L
CP.01.02.02_200	1.00	1.19	1.00	1.00	1.14	1.00	1.00	0.87
	N	L	N	N	VH	N	N	L
CP.01.06.08_200	1.00	0.93	1.00	1.00	1.29	1.00	1.00	0.87
	N	L	N	VL	N	N	N	L
CP.01.07.01_200	1.00	0.93	1.00	0.75	1.00	1.00	1.00	0.87
	N	L	N	L	H	N	N	L
CP.07.01.01_200	1.00	0.93	1.00	0.88	1.14	1.00	1.00	0.87
	H	VH	N	VL	L	N	N	L
TADB.01_200	1.15	1.19	1.00	0.75	0.91	1.00	1.00	0.87
	H	VH	N	H	N	N	N	L
TADB.02_200	1.15	1.19	1.00	1.15	1.00	1.00	1.00	0.87
	N	N	N	N	N	N	N	L
TR.01.01.01_200	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.87
	L	L	N	N	N	N	N	L
CS.01.01.02_201	0.88	0.93	1.00	1.00	1.00	1.00	1.00	0.87
	VL	L	N	N	N	N	N	L
CS.01.03.01_201	0.75	0.93	1.00	1.00	1.00	1.00	1.00	0.87
	N	VH	N	N	N	N	N	L
CS.06.01.01_201	1.00	1.19	1.00	1.00	1.00	1.00	1.00	0.87
	N	VH	N	N	N	N	N	L
CS.06.01.07_201	1.00	1.19	1.00	1.00	1.00	1.00	1.00	0.87
	L	VH	N	H	L	N	N	L
REFDB.02_201	0.88	1.19	1.00	1.15	0.91	1.00	1.00	0.87
	H	H	N	H	N	N	N	L
IS.05.06.02_205	1.15	1.09	1.00	1.15	1.00	1.00	1.00	0.87
	H	VH	N	L	N	N	N	L
IS.04.01.08_206	1.15	1.19	1.00	0.88	1.00	1.00	1.00	0.87
	VL	VH	N	VL	L	N	N	L
RADB.01_206	0.75	1.19	1.00	0.75	0.91	1.00	1.00	0.87
	N	H	N	N	N	N	N	L
BASE	1.00	1.09	1.00	1.00	1.00	1.00	1.00	0.87
	N	H	N	N	N	N	N	L
COTS	1.00	1.09	1.00	1.00	1.00	1.00	1.00	0.87

Printed at: Thu Mar 05 12:07:40 1998

Project Name: Subrelease 1.2

	+ Personnel					++ Project			++ User		
MODULE NAME	ACAP	AEXP	PCAP	PEXP	LEXP	PCON	TOOL	SCED	SITE	USR1	USR2
	H	H	H	H	H	H	H	N	H	N	N
CP.01.02.02_200	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CP.01.06.08_200	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CP.01.07.01_200	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CP.07.01.01_200	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
TADB.01_200	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
TADB.02_200	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
TR.01.01.01_200	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CS.01.01.02_201	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CS.01.03.01_201	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CS.06.01.01_201	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
CS.06.01.07_201	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
REFDB.02_201	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
IS.05.06.02_205	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
IS.04.01.08_206	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
RADB.01_206	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
BASE	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00
	H	H	H	H	H	H	H	N	H	N	N
COTS	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	0.92	1.00	1.00

##USC COCOMO II.1997.1##

Printed at: Thu Mar 05 12:10:01 1998

Project Name: Subrelease 1.3

Scale Factors:	PREC	FLEX	RESL	TEAM	PMAT
	H	N	H	N	H
	1.62	3.64	1.69	2.97	1.82

MODULE NAME	SLOC	EAF	NOM PM DEV	ACT PM DEV	PROD	RATE & COST	INST COST	FSWP	RISK
	SLOC					0.0			
CS.06.01.01_202	2200	0.48	10.5	5.1	432.2	0	0.0	0.2	0.0
	SLOC					0.0			
CS.06.01.14_202	4400	0.48	21.0	10.2	432.2	0	0.0	0.5	0.0
	SLOC					0.0			
CS.06.02.01_202	16500	0.44	78.8	34.3	480.9	0	0.0	1.6	0.0
	SLOC					0.0			
REFDB.01_202	2200	0.32	10.5	3.4	654.8	0	0.0	0.2	0.0
	SLOC					0.0			
REFDB.02_202	3300	0.39	15.8	6.1	539.7	0	0.0	0.3	0.0
	SLOC					0.0			
IS.05.02.01_203	14300	0.37	68.3	25.3	565.2	0	0.0	1.2	0.0
	SLOC					0.0			
LE.ACS.02_203	2200	0.34	10.5	3.6	607.7	0	0.0	0.2	0.0
	SLOC					0.0			
LE.AUR.02_203	6600	0.34	31.5	10.9	607.7	0	0.0	0.5	0.0
	SLOC					0.0			
LE.CFOL.02_203	11000	0.34	52.5	18.1	607.7	0	0.0	0.8	0.0
	SLOC					0.0			
LE.CIDS.02_203	2200	0.34	10.5	3.6	607.7	0	0.0	0.2	0.0
	SLOC					0.0			
LE.IDRS.02_203	11000	0.44	52.5	23.2	474.9	0	0.0	1.1	0.0
	SLOC					0.0			
LE.SERP.02_203	2200	0.34	10.5	3.6	607.7	0	0.0	0.2	0.0
	SLOC					0.0			
TR.05.01.01_203	2750	0.44	13.1	5.8	474.9	0	0.0	0.3	0.0
	SLOC					0.0			
TR.05.01.02_203	49500	0.44	236.4	104.2	474.9	0	0.0	4.8	0.0

	SLOC					0.0				
TR.05.01.03_203	5500	0.41	26.3	10.7	514.3	0	0.0	0.5	0.0
	SLOC					0.0				
CS.05.01.01_205	2200	0.36	10.5	3.8	584.4	0	0.0	0.2	0.0
	SLOC					0.0				
IS.05.01.08_205	11000	0.46	52.5	24.4	450.9	0	0.0	1.1	0.0
	SLOC					0.0				
IS.05.06.02_205	4400	0.59	21.0	12.3	356.8	0	0.0	0.6	0.0
	SLOC					0.0				
AUTHDB.01_206	2640	0.33	12.6	4.2	633.2	0	0.0	0.2	0.0
	SLOC					0.0				
IS.05.01.09_206	2200	0.46	10.5	4.9	450.9	0	0.0	0.2	0.0
	ADAPT					0.0				
BASE	7153	0.40	34.2	13.8	518.5	0	0.0	0.6	0.0
	ADAPT					0.0				
COTS	22880	0.40	109.3	44.1	518.5	0	0.0	2.0	0.0
TOTAL SLOC	188323		TOTALS	375.5	501.5	0	0.0	17.4	0.0
EFFORT (PM)	899.3		SCHEDULE	21.6					
PROD (SLOC/PM)	209.4								

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Project Name:  Subrelease 1.3

         MODULE NAME   SIZING DETAILS


     CS.06.01.01_202 BRAK  INITSLOC
                SLOC   10      2000

     CS.06.01.14_202 BRAK  INITSLOC
                SLOC   10      4000

     CS.06.02.01_202 BRAK  INITSLOC
                SLOC   10     15000

        REFDB.01_202 BRAK  INITSLOC
                SLOC   10      2000

        REFDB.02_202 BRAK  INITSLOC
                SLOC   10      3000

     IS.05.02.01_203 BRAK  INITSLOC
                SLOC   10     13000

       LE.ACS.02_203 BRAK  INITSLOC
                SLOC   10      2000

       LE.AUR.02_203 BRAK  INITSLOC
                SLOC   10      6000

      LE.CFOL.02_203 BRAK  INITSLOC
                SLOC   10     10000

      LE.CIDS.02_203 BRAK  INITSLOC
                SLOC   10      2000

      LE.IDRS.02_203 BRAK  INITSLOC
                SLOC   10     10000

      LE.SERP.02_203 BRAK  INITSLOC
                SLOC   10      2000

     TR.05.01.01_203 BRAK  INITSLOC
                SLOC   10      2500

     TR.05.01.02_203 BRAK  INITSLOC
                SLOC   10     45000

     TR.05.01.03_203 BRAK  INITSLOC
                SLOC   10      5000

     CS.05.01.01_205 BRAK  INITSLOC
                SLOC   10      2000

     IS.05.01.08_205 BRAK  INITSLOC
                SLOC   10     10000
```

```
IS.05.06.02_205 BRAK  INITSLOC
           SLOC   10      4000

  AUTHDB.01_206 BRAK  INITSLOC
           SLOC   10      2400

IS.05.01.09_206 BRAK  INITSLOC
           SLOC   10      2000

           BASE BRAK  INITSLOC  DM  CM  IM  SU=N  AA=N  UNFM=N  AT   ATPROD
          ADAPT   10     92900   0   0  10    30     4     0.4   0   2400.0

           COTS BRAK  INITSLOC  DM  CM  IM  SU=N  AA=N  UNFM=N  AT   ATPROD
          ADAPT   10    100000   0   0  56    30     4     0.4   0   2400.0
```

Printed at: Thu Mar 05 12:10:01 1998

Project Name: Subrelease 1.3

	+ Product				++ Platform			+
MODULE NAME	RELY	DATA	DOCU	CPLX	RUSE	TIME	STOR	PVOL
	N	VH	N	N	N	N	N	N
CS.06.01.01_202	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CS.06.01.14_202	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	L	N	H	N	N	N	N
CS.06.02.01_202	1.00	0.93	1.00	1.15	1.00	1.00	1.00	1.00
	L	VH	N	VL	N	N	N	N
REFDB.01_202	0.88	1.19	1.00	0.75	1.00	1.00	1.00	1.00
	L	VH	N	N	L	N	N	N
REFDB.02_202	0.88	1.19	1.00	1.00	0.91	1.00	1.00	1.00
	N	N	N	N	L	N	N	N
IS.05.02.01_203	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00
	N	L	N	N	L	N	N	N
LE.ACS.02_203	1.00	0.93	1.00	1.00	0.91	1.00	1.00	1.00
	N	L	N	N	L	N	N	N
LE.AUR.02_203	1.00	0.93	1.00	1.00	0.91	1.00	1.00	1.00
	N	L	N	N	L	N	N	N
LE.CFOL.02_203	1.00	0.93	1.00	1.00	0.91	1.00	1.00	1.00
	N	L	N	N	L	N	N	N
LE.CIDS.02_203	1.00	0.93	1.00	1.00	0.91	1.00	1.00	1.00
	N	VH	N	N	L	N	N	N
LE.IDRS.02_203	1.00	1.19	1.00	1.00	0.91	1.00	1.00	1.00
	N	L	N	N	L	N	N	N
LE.SERP.02_203	1.00	0.93	1.00	1.00	0.91	1.00	1.00	1.00
	N	VH	N	N	L	N	N	N
TR.05.01.01_203	1.00	1.19	1.00	1.00	0.91	1.00	1.00	1.00
	N	VH	N	N	L	N	N	N
TR.05.01.02_203	1.00	1.19	1.00	1.00	0.91	1.00	1.00	1.00
	N	N	N	N	N	N	N	N
TR.05.01.03_203	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	L	N	N	N	N	N	N	N
CS.05.01.01_205	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	H	H	N	N	L	N	N	N
IS.05.01.08_205	1.15	1.09	1.00	1.00	0.91	1.00	1.00	1.00

	H	H	N	H	N	N	N	N
IS.05.06.02_205	1.15	1.09	1.00	1.15	1.00	1.00	1.00	1.00
	N	VH	N	VL	L	N	N	N
AUTHDB.01_206	1.00	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	H	H	N	N	L	N	N	N
IS.05.01.09_206	1.15	1.09	1.00	1.00	0.91	1.00	1.00	1.00
	N	H	N	N	L	N	N	N
BASE	1.00	1.09	1.00	1.00	0.91	1.00	1.00	1.00
	N	H	N	N	L	N	N	N
COTS	1.00	1.09	1.00	1.00	0.91	1.00	1.00	1.00

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Project Name: Subrelease 1.3

	+ Personnel					++ Project			++ User		
MODULE NAME	ACAP	AEXP	PCAP	PEXP	LEXP	PCON	TOOL	SCED	SITE	USR1	USR2
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.01_202	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.14_202	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.02.01_202	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
REFDB.01_202	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
REFDB.02_202	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
IS.05.02.01_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
LE.ACS.02_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
LE.AUR.02_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
LE.CFOL.02_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
LE.CIDS.02_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
LE.IDRS.02_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
LE.SERP.02_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TR.05.01.01_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TR.05.01.02_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TR.05.01.03_203	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.05.01.01_205	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00

	H	H	H	H	H	H	H	N	N	N	N
IS.05.01.08_205	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
IS.05.06.02_205	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
AUTHDB.01_206	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
IS.05.01.09_206	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
BASE	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
COTS	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00

##USC COCOMO II.1997.1##

Printed at: Thu Mar 05 12:10:56 1998

Project Name: Subrelease 1.4

Scale Factors:	PREC	FLEX	RESL	TEAM	PMAT
	H	N	H	N	H
	1.62	3.64	1.69	2.97	1.82

MODULE NAME	SLOC	EAF	NOM PM DEV	ACT PM DEV	PROD	RATE & COST	INST COST	FSWP	RISK
	SLOC					0.0			
CCDB.01_300	10450	0.38	54.4	20.7	504.8	0	0.0	0.7	0.0
	SLOC					0.0			
CCDB.02_300	33000	0.58	171.9	100.2	329.2	0	0.0	3.3	0.0
	SLOC					0.0			
CP.01.01.01_300	39600	0.63	206.2	130.3	303.8	0	0.0	4.3	0.0
	SLOC					0.0			
CP.01.02.02_300	8580	0.55	44.7	24.7	347.6	0	0.0	0.8	0.0
	SLOC					0.0			
CP.01.05.02_300	6600	0.56	34.4	19.2	344.6	0	0.0	0.6	0.0
	SLOC					0.0			
CP.01.07.01_300	2200	0.28	11.5	3.3	676.0	0	0.0	0.1	0.0
	SLOC					0.0			
CP.05.01.02_300	2200	0.43	11.5	4.9	450.3	0	0.0	0.2	0.0
	SLOC					0.0			
CP.05.01.03_300	3740	0.43	19.5	8.3	450.3	0	0.0	0.3	0.0
	SLOC					0.0			
CP.05.01.04_300	2750	0.48	14.3	6.9	396.2	0	0.0	0.2	0.0
	SLOC					0.0			
CP.05.01.05_300	2750	0.48	14.3	6.9	396.2	0	0.0	0.2	0.0
	SLOC					0.0			
CP.05.01.06_300	2640	0.48	13.7	6.7	396.2	0	0.0	0.2	0.0
	SLOC					0.0			
CP.05.03.01_300	3300	0.43	17.2	7.3	450.3	0	0.0	0.2	0.0
	SLOC					0.0			
CP.07.01.02_300	2200	0.56	11.5	6.4	341.8	0	0.0	0.2	0.0
	SLOC					0.0			
CP.07.01.03_300	2200	0.56	11.5	6.4	341.8	0	0.0	0.2	0.0

	SLOC					0.0				
CS.06.01.01_300	2200	0.48	11.5	5.6	396.2	0	0.0	0.2	0.0
	SLOC					0.0				
CS.06.01.03_300	11000	0.56	57.3	31.9	344.6	0	0.0	1.1	0.0
	SLOC					0.0				
TADB.01_300	8030	0.38	41.8	15.9	504.8	0	0.0	0.5	0.0
	SLOC					0.0				
TADB.02_300	22000	0.64	114.6	73.4	299.6	0	0.0	2.4	0.0
	SLOC					0.0				
TR.01.01.01_300	66000	0.48	343.7	166.6	396.2	0	0.0	5.5	0.0
	SLOC					0.0				
TRDB.01_300	22000	0.33	114.6	37.9	580.6	0	0.0	1.3	0.0
	SLOC					0.0				
TRDB.02_300	4400	0.51	22.9	11.6	378.6	0	0.0	0.4	0.0
	SLOC					0.0				
CS.06.02.02_302	18700	0.44	97.4	42.4	440.9	0	0.0	1.4	0.0
	SLOC					0.0				
CDADB.01_303	2200	0.33	11.5	3.8	580.6	0	0.0	0.1	0.0
	SLOC					0.0				
CP.01.07.02_303	3300	0.33	17.2	5.6	588.8	0	0.0	0.2	0.0
	SLOC					0.0				
CP.07.02.02_303	2200	0.33	11.5	3.7	588.8	0	0.0	0.1	0.0
	SLOC					0.0				
CP.09.01.01_303	7700	0.37	40.1	15.0	512.0	0	0.0	0.5	0.0
	SLOC					0.0				
CP.09.01.02_303	16500	0.36	85.9	30.9	534.1	0	0.0	1.0	0.0
	SLOC					0.0				
REFDB.01_303	2200	0.29	11.5	3.3	659.7	0	0.0	0.1	0.0
	SLOC					0.0				
IS.04.01.03_305	2200	0.56	11.5	6.4	344.6	0	0.0	0.2	0.0
	SLOC					0.0				
SADB.01_305	2200	0.25	11.5	2.8	774.1	0	0.0	0.1	0.0
	ADAPT					0.0				
BASE	33862	0.48	176.4	85.5	396.2	0	0.0	2.8	0.0
	ADAPT					0.0				
COTS	23375	0.48	121.7	59.0	396.2	0	0.0	2.0	0.0
TOTAL SLOC	372277		TOTALS	953.7	390.4	0	0.0	31.7	0.0
EFFORT (PM)	1938.9		SCHEDULE	30.1					
PROD (SLOC/PM)	192.0								

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Printed at:  Thu Mar 05 12:10:56 1998


Project Name:  Subrelease 1.4

         MODULE NAME   SIZING DETAILS


         CCDB.01_300 BRAK  INITSLOC
                SLOC   10      9500

         CCDB.02_300 BRAK  INITSLOC
                SLOC   10     30000

     CP.01.01.01_300 BRAK  INITSLOC
                SLOC   10     36000

     CP.01.02.02_300 BRAK  INITSLOC
                SLOC   10      7800

     CP.01.05.02_300 BRAK  INITSLOC
                SLOC   10      6000

     CP.01.07.01_300 BRAK  INITSLOC
                SLOC   10      2000

     CP.05.01.02_300 BRAK  INITSLOC
                SLOC   10      2000

     CP.05.01.03_300 BRAK  INITSLOC
                SLOC   10      3400

     CP.05.01.04_300 BRAK  INITSLOC
                SLOC   10      2500

     CP.05.01.05_300 BRAK  INITSLOC
                SLOC   10      2500

     CP.05.01.06_300 BRAK  INITSLOC
                SLOC   10      2400

     CP.05.03.01_300 BRAK  INITSLOC
                SLOC   10      3000

     CP.07.01.02_300 BRAK  INITSLOC
                SLOC   10      2000

     CP.07.01.03_300 BRAK  INITSLOC
                SLOC   10      2000

     CS.06.01.01_300 BRAK  INITSLOC
                SLOC   10      2000

     CS.06.01.03_300 BRAK  INITSLOC
                SLOC   10     10000
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     TADB.01_300 BRAK  INITSLOC
            SLOC   10      7300

     TADB.02_300 BRAK  INITSLOC
            SLOC   10     20000

TR.01.01.01_300 BRAK  INITSLOC
            SLOC   10     60000

     TRDB.01_300 BRAK  INITSLOC
            SLOC   10     20000

     TRDB.02_300 BRAK  INITSLOC
            SLOC   10      4000

CS.06.02.02_302 BRAK  INITSLOC
            SLOC   10     17000

   CDADB.01_303 BRAK  INITSLOC
            SLOC   10      2000

CP.01.07.02_303 BRAK  INITSLOC
            SLOC   10      3000

CP.07.02.02_303 BRAK  INITSLOC
            SLOC   10      2000

CP.09.01.01_303 BRAK  INITSLOC
            SLOC   10      7000

CP.09.01.02_303 BRAK  INITSLOC
            SLOC   10     15000

   REFDB.01_303 BRAK  INITSLOC
            SLOC   10      2000

IS.04.01.03_305 BRAK  INITSLOC
            SLOC   10      2000

     SADB.01_305 BRAK  INITSLOC
            SLOC   10      2000

            BASE BRAK  INITSLOC  DM  CM  IM  SU=N  AA=N  UNFM=N  AT   ATPROD
           ADAPT   10    236800   0   0  30    30     4     0.4   0   2400.0

            COTS BRAK  INITSLOC  DM  CM  IM  SU=N  AA=N  UNFM=N  AT   ATPROD
           ADAPT   10    250000   0   0  15    30     4     0.4   0   2400.0
```

Printed at: Thu Mar 05 12:10:56 1998

Project Name: Subrelease 1.4

	+ Product				++ Platform			+
MODULE NAME	RELY	DATA	DOCU	CPLX	RUSE	TIME	STOR	PVOL
	H	VH	N	VL	L	N	N	N
CCDB.01_300	1.15	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	H	VH	N	H	L	N	N	N
CCDB.02_300	1.15	1.19	1.00	1.15	0.91	1.00	1.00	1.00
	L	VH	N	VH	H	N	N	N
CP.01.01.01_300	0.88	1.19	1.00	1.30	1.14	1.00	1.00	1.00
	N	VH	N	N	H	N	N	N
CP.01.02.02_300	1.00	1.19	1.00	1.00	1.14	1.00	1.00	1.00
	N	VH	N	H	N	N	N	N
CP.01.05.02_300	1.00	1.19	1.00	1.15	1.00	1.00	1.00	1.00
	N	L	N	VL	N	N	N	N
CP.01.07.01_300	1.00	0.93	1.00	0.75	1.00	1.00	1.00	1.00
	N	VH	N	L	N	N	N	N
CP.05.01.02_300	1.00	1.19	1.00	0.88	1.00	1.00	1.00	1.00
	N	VH	N	L	N	N	N	N
CP.05.01.03_300	1.00	1.19	1.00	0.88	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CP.05.01.04_300	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CP.05.01.05_300	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CP.05.01.06_300	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	L	N	N	N	N
CP.05.03.01_300	1.00	1.19	1.00	0.88	1.00	1.00	1.00	1.00
	N	L	N	H	VH	N	N	N
CP.07.01.02_300	1.00	0.93	1.00	1.15	1.29	1.00	1.00	1.00
	N	L	N	H	VH	N	N	N
CP.07.01.03_300	1.00	0.93	1.00	1.15	1.29	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CS.06.01.01_300	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	H	N	N	N	N
CS.06.01.03_300	1.00	1.19	1.00	1.15	1.00	1.00	1.00	1.00

	H	VH	N	VL	L	N	N	N
TADB.01_300	1.15	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	H	VH	N	H	N	N	N	N
TADB.02_300	1.15	1.19	1.00	1.15	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
TR.01.01.01_300	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	VL	L	N	N	N
TRDB.01_300	1.00	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	N	VH	N	H	L	N	N	N
TRDB.02_300	1.00	1.19	1.00	1.15	0.91	1.00	1.00	1.00
	N	L	N	H	N	N	N	N
CS.06.02.02_302	1.00	0.93	1.00	1.15	1.00	1.00	1.00	1.00
	N	VH	N	VL	L	N	N	N
CDADB.01_303	1.00	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	N	N	N	L	L	N	N	N
CP.01.07.02_303	1.00	1.00	1.00	0.88	0.91	1.00	1.00	1.00
	L	N	N	N	L	N	N	N
CP.07.02.02_303	0.88	1.00	1.00	1.00	0.91	1.00	1.00	1.00
	L	N	N	H	L	N	N	N
CP.09.01.01_303	0.88	1.00	1.00	1.15	0.91	1.00	1.00	1.00
	L	N	N	L	H	N	N	N
CP.09.01.02_303	0.88	1.00	1.00	0.88	1.14	1.00	1.00	1.00
	L	VH	N	VL	L	N	N	N
REFDB.01_303	0.88	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	H	VH	N	N	N	N	N	N
IS.04.01.03_305	1.15	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	VL	VH	N	VL	L	N	N	N
SADB.01_305	0.75	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
BASE	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
COTS	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00

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Project Name: Subrelease 1.4

	+ Personnel					++ Project		++ User			
MODULE NAME	ACAP	AEXP	PCAP	PEXP	LEXP	PCON	TOOL	SCED	SITE	USR1	USR2
	H	H	H	H	H	H	H	N	N	N	N
CCDB.01_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CCDB.02_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.01.01.01_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.01.02.02_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.01.05.02_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.01.07.01_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.05.01.02_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.05.01.03_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.05.01.04_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.05.01.05_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.05.01.06_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.05.03.01_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.07.01.02_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.07.01.03_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.01_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.03_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00

	H	H	H	H	H	H	H	N	N	N	N
TADB.01_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TADB.02_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TR.01.01.01_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TRDB.01_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TRDB.02_300	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.02.02_302	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CDADB.01_303	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.01.07.02_303	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.07.02.02_303	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.09.01.01_303	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.09.01.02_303	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
REFDB.01_303	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
IS.04.01.03_305	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
SADB.01_305	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
BASE	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
COTS	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00

##USC COCOMO II.1997.1##

Printed at: Thu Mar 05 12:11:54 1998

Project Name: Subrelease 1.5

Scale Factors:	PREC	FLEX	RESL	TEAM	PMAT
	H	N	H	N	H
	1.62	3.64	1.69	2.97	1.82

MODULE NAME	SLOC	EAF	NOM PM DEV	ACT PM DEV	PROD	RATE & COST	INST COST	FSWP	RISK
	SLOC					0.0			
CP.01.06.01_400	11000	0.56	55.5	31.2	353.1	0	0.0	1.2	0.0
	SLOC					0.0			
CP.01.06.02_400	8800	0.56	44.4	24.9	353.1	0	0.0	0.9	0.0
	SLOC					0.0			
CP.01.06.07_400	7700	0.56	38.8	21.8	353.1	0	0.0	0.8	0.0
	SLOC					0.0			
CP.01.06.08_400	7040	0.49	35.5	17.3	406.1	0	0.0	0.6	0.0
	SLOC					0.0			
CP.04.01.01_400	3300	0.36	16.6	6.0	545.8	0	0.0	0.2	0.0
	SLOC					0.0			
CP.04.01.02_400	2200	0.36	11.1	4.0	545.8	0	0.0	0.2	0.0
	SLOC					0.0			
CP.04.01.03_400	2200	0.36	11.1	4.0	545.8	0	0.0	0.2	0.0
	SLOC					0.0			
TR.02.01.01_400	7260	0.43	36.6	15.6	465.2	0	0.0	0.6	0.0
	SLOC					0.0			
TR.05.01.02_400	2750	0.40	13.9	5.6	491.1	0	0.0	0.2	0.0
	SLOC					0.0			
CS.01.01.01_401	2640	0.33	13.3	4.4	595.3	0	0.0	0.2	0.0
	SLOC					0.0			
CS.01.03.01_401	2200	0.28	11.1	3.1	698.4	0	0.0	0.1	0.0
	SLOC					0.0			
CS.06.01.01_401	3300	0.48	16.6	8.1	409.4	0	0.0	0.3	0.0
	SLOC					0.0			
CS.06.01.06_401	2200	0.48	11.1	5.4	409.4	0	0.0	0.2	0.0
	SLOC					0.0			
CS.06.01.07_401	8800	0.48	44.4	21.5	409.4	0	0.0	0.8	0.0

	SLOC					0.0				
CS.06.01.14_401	8800	0.48	44.4	21.5	409.4	0	0.0	0.8	0.0
	SLOC					0.0				
IS.05.05.11_401	7700	0.49	38.8	19.0	404.8	0	0.0	0.7	0.0
	SLOC					0.0				
CP.02.01.01_402	6600	0.72	33.3	24.1	273.8	0	0.0	0.9	0.0
	SLOC					0.0				
CS.06.01.04_402	8800	0.33	44.4	14.7	599.8	0	0.0	0.5	0.0
	SLOC					0.0				
CS.06.01.08_402	27500	0.64	138.6	88.1	312.3	0	0.0	3.3	0.0
	SLOC					0.0				
CS.06.01.09_402	2200	0.48	11.1	5.4	409.4	0	0.0	0.2	0.0
	SLOC					0.0				
CS.06.01.13_402	11000	0.56	55.5	30.9	356.0	0	0.0	1.2	0.0
	SLOC					0.0				
MCDB.01_402	2200	0.33	11.1	3.7	599.8	0	0.0	0.1	0.0
	SLOC					0.0				
MCDB.02_402	2200	0.44	11.1	4.9	449.9	0	0.0	0.2	0.0
	SLOC					0.0				
CS.06.02.02_403	18150	0.50	91.5	45.4	399.6	0	0.0	1.7	0.0
	SLOC					0.0				
CP.08.02.02_404	2200	0.39	11.1	4.3	511.2	0	0.0	0.2	0.0
	SLOC					0.0				
CP.08.02.03_404	2200	0.39	11.1	4.3	511.2	0	0.0	0.2	0.0
	SLOC					0.0				
CP.09.02.02_404	3080	0.44	15.5	6.8	449.9	0	0.0	0.3	0.0
	SLOC					0.0				
CP.09.02.03_404	2200	0.48	11.1	5.4	409.4	0	0.0	0.2	0.0
	SLOC					0.0				
MISDB.01_404	13750	0.29	69.3	20.2	681.6	0	0.0	0.8	0.0
	SLOC					0.0				
TECHDB.01_405	6160	0.33	31.1	10.3	599.8	0	0.0	0.4	0.0
	ADAPT					0.0				
BASE	92083	0.44	464.2	206.0	446.9	0	0.0	7.7	0.0
TOTAL SLOC	288213		TOTALS	688.0	418.9	0	0.0	25.7	0.0
EFFORT (PM)	1452.9		SCHEDULE	26.8					
PROD (SLOC/PM)	198.4								

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Project Name:  Subrelease 1.5

         MODULE NAME   SIZING DETAILS


     CP.01.06.01_400 BRAK  INITSLOC
                SLOC   10     10000

     CP.01.06.02_400 BRAK  INITSLOC
                SLOC   10      8000

     CP.01.06.07_400 BRAK  INITSLOC
                SLOC   10      7000

     CP.01.06.08_400 BRAK  INITSLOC
                SLOC   10      6400

     CP.04.01.01_400 BRAK  INITSLOC
                SLOC   10      3000

     CP.04.01.02_400 BRAK  INITSLOC
                SLOC   10      2000

     CP.04.01.03_400 BRAK  INITSLOC
                SLOC   10      2000

     TR.02.01.01_400 BRAK  INITSLOC
                SLOC   10      6600

     TR.05.01.02_400 BRAK  INITSLOC
                SLOC   10      2500

     CS.01.01.01_401 BRAK  INITSLOC
                SLOC   10      2400

     CS.01.03.01_401 BRAK  INITSLOC
                SLOC   10      2000

     CS.06.01.01_401 BRAK  INITSLOC
                SLOC   10      3000

     CS.06.01.06_401 BRAK  INITSLOC
                SLOC   10      2000

     CS.06.01.07_401 BRAK  INITSLOC
                SLOC   10      8000

     CS.06.01.14_401 BRAK  INITSLOC
                SLOC   10      8000

     IS.05.05.11_401 BRAK  INITSLOC
                SLOC   10      7000
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CP.02.01.01_402 BRAK  INITSLOC
           SLOC   10      6000

CS.06.01.04_402 BRAK  INITSLOC
           SLOC   10      8000

CS.06.01.08_402 BRAK  INITSLOC
           SLOC   10     25000

CS.06.01.09_402 BRAK  INITSLOC
           SLOC   10      2000

CS.06.01.13_402 BRAK  INITSLOC
           SLOC   10     10000

    MCDB.01_402 BRAK  INITSLOC
           SLOC   10      2000

    MCDB.02_402 BRAK  INITSLOC
           SLOC   10      2000

CS.06.02.02_403 BRAK  INITSLOC
           SLOC   10     16500

CP.08.02.02_404 BRAK  INITSLOC
           SLOC   10      2000

CP.08.02.03_404 BRAK  INITSLOC
           SLOC   10      2000

CP.09.02.02_404 BRAK  INITSLOC
           SLOC   10      2800

CP.09.02.03_404 BRAK  INITSLOC
           SLOC   10      2000

   MISDB.01_404 BRAK  INITSLOC
           SLOC   10     12500

  TECHDB.01_405 BRAK  INITSLOC
           SLOC   10      5600

           BASE BRAK  INITSLOC  DM  CM  IM  SU=N  AA=N  UNFM=N  AT   ATPROD
          ADAPT   10    523200   0   0  40    30     4     0.4   0   2400.0
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Project Name: Subrelease 1.5

	+ Product				++ Platform			+
MODULE NAME	RELY	DATA	DOCU	CPLX	RUSE	TIME	STOR	PVOL
	N	L	N	H	VH	N	N	N
CP.01.06.01_400	1.00	0.93	1.00	1.15	1.29	1.00	1.00	1.00
	N	L	N	H	VH	N	N	N
CP.01.06.02_400	1.00	0.93	1.00	1.15	1.29	1.00	1.00	1.00
	N	L	N	H	VH	N	N	N
CP.01.06.07_400	1.00	0.93	1.00	1.15	1.29	1.00	1.00	1.00
	N	L	N	N	VH	N	N	N
CP.01.06.08_400	1.00	0.93	1.00	1.00	1.29	1.00	1.00	1.00
	VL	VH	N	N	N	N	N	N
CP.04.01.01_400	0.75	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	VL	VH	N	N	N	N	N	N
CP.04.01.02_400	0.75	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	VL	VH	N	N	N	N	N	N
CP.04.01.03_400	0.75	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	L	N	N	N	N
TR.02.01.01_400	1.00	1.19	1.00	0.88	1.00	1.00	1.00	1.00
	N	H	N	N	L	N	N	N
TR.05.01.02_400	1.00	1.09	1.00	1.00	0.91	1.00	1.00	1.00
	L	L	N	N	N	N	N	N
CS.01.01.01_401	0.88	0.93	1.00	1.00	1.00	1.00	1.00	1.00
	VL	L	N	N	N	N	N	N
CS.01.03.01_401	0.75	0.93	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CS.06.01.01_401	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CS.06.01.06_401	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CS.06.01.07_401	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CS.06.01.14_401	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	H	N	N	H	L	N	N	N
IS.05.05.11_401	1.15	1.00	1.00	1.15	0.91	1.00	1.00	1.00

	H	VH	N	VH	N	N	N	N
CP.02.01.01_402	1.15	1.19	1.00	1.30	1.00	1.00	1.00	1.00
	N	VH	N	VL	L	N	N	N
CS.06.01.04_402	1.00	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	N	VH	N	H	H	N	N	N
CS.06.01.08_402	1.00	1.19	1.00	1.15	1.14	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CS.06.01.09_402	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	N	VH	N	H	N	N	N	N
CS.06.01.13_402	1.00	1.19	1.00	1.15	1.00	1.00	1.00	1.00
	N	VH	N	VL	L	N	N	N
MCDB.01_402	1.00	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	N	VH	N	N	L	N	N	N
MCDB.02_402	1.00	1.19	1.00	1.00	0.91	1.00	1.00	1.00
	N	L	N	H	H	N	N	N
CS.06.02.02_403	1.00	0.93	1.00	1.15	1.14	1.00	1.00	1.00
	N	VH	N	L	L	N	N	N
CP.08.02.02_404	1.00	1.19	1.00	0.88	0.91	1.00	1.00	1.00
	N	VH	N	L	L	N	N	N
CP.08.02.03_404	1.00	1.19	1.00	0.88	0.91	1.00	1.00	1.00
	N	VH	N	N	L	N	N	N
CP.09.02.02_404	1.00	1.19	1.00	1.00	0.91	1.00	1.00	1.00
	N	VH	N	N	N	N	N	N
CP.09.02.03_404	1.00	1.19	1.00	1.00	1.00	1.00	1.00	1.00
	L	VH	N	VL	L	N	N	N
MISDB.01_404	0.88	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	N	VH	N	VL	L	N	N	N
TECHDB.01_405	1.00	1.19	1.00	0.75	0.91	1.00	1.00	1.00
	N	H	N	N	N	N	N	N
BASE	1.00	1.09	1.00	1.00	1.00	1.00	1.00	1.00

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Project Name: Subrelease 1.5

	+ Personnel					++ Project		++ User			
MODULE NAME	ACAP	AEXP	PCAP	PEXP	LEXP	PCON	TOOL	SCED	SITE	USR1	USR2
	H	H	H	H	H	H	H	N	N	N	N
CP.01.06.01_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.01.06.02_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.01.06.07_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.01.06.08_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.04.01.01_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.04.01.02_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.04.01.03_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TR.02.01.01_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TR.05.01.02_400	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.01.01.01_401	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.01.03.01_401	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.01_401	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.06_401	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.07_401	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.14_401	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
IS.05.05.11_401	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00

	H	H	H	H	H	H	H	N	N	N	N
CP.02.01.01_402	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.04_402	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.08_402	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.09_402	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.01.13_402	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
MCDB.01_402	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
MCDB.02_402	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CS.06.02.02_403	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.08.02.02_404	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.08.02.03_404	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.09.02.02_404	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
CP.09.02.03_404	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
MISDB.01_404	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
TECHDB.01_405	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00
	H	H	H	H	H	H	H	N	N	N	N
BASE	0.83	0.89	0.87	0.88	0.91	0.92	0.86	1.00	1.00	1.00	1.00

APPENDIX G
MONTE CARLO PROBABILITY ANALYSIS

APPENDIX G: MONTE CARLO PROBABILITY ANALYSIS

1. Monte Carlo Schedule, Cost, and Projected Funding Requirements (PFR) Results

A Monte Carlo risk analysis was performed to mitigate the risk of meeting the Modernization Phase I/Release 1 Schedule, Cost and PFR.

- **Schedule Analysis**

  The results of the schedule analysis are consistent with the Modernization Phase I/Release 1 Schedule anticipated completion date of November 25, 2003. The median date from the analysis is November 17, 2003. (The median is that date by which 50% of the estimated schedules have been completed.) The maximum date (95% probability) is March 19, 2004. This maximum date indicates a potential schedule slip of only 6.5%. These results are presented in the table, "Monte Carlo Probabilities for Schedule Completion Dates," and graphically in "Monte Carlo Analysis Probability Distribution for Schedule Completion Dates."
- **Cost Analysis**

  The total Modernization Phase I/Release 1 Cost is $333,107,000. Monte Carlo cost analysis generated a median for the cost estimates of $332,691,800, which is very close to the cost estimate. Fifty percent of the estimates are below the median. The estimate at the 95th percentile is $346,380,000, which is 3.98 percent higher than the Modernization Phase I/Release 1 Cost estimate. These results are presented in the table, "Monte Carlo Probabilities for Cost," and graphically in "Monte Carlo Analysis Probability Distribution for Cost."
- **PFR Analysis**

  The total Modernization Phase I/Release 1 PFR is $676,656,000. Monte Carlo PFR analysis generated a median for the PFR estimates of $677,346,700 which is very close to the PFR estimate. The estimate at the 95th percentile is $709,070,100, which is 4.79 percent higher than the Modernization Phase I/Release 1 PFR estimate. These results are presented in the table, "Monte Carlo Probabilities for PFR," and graphically in "Monte Carlo Analysis Probability Distribution for PFR."

In each analysis, the schedule, cost, and PFR estimates are well within the general project management best practices allowing for a maximum 10 percent deviation.

2. Approach

Monte Carlo analysis requires a set of possible values for multiple items. This analysis used best case, most likely case, and worst case estimates for duration of a set of work breakdown structure (WBS) elements for the schedule analysis and a set of summary items for both the cost and PFR analyses. The Modernization Phase I/Release 1 schedule includes over 500 WBS elements. This granularity was critical to the development of the schedule. To facilitate the Monte Carlo analysis, the WBS elements were rolled up to 40 elements. The roll up was performed in conjunction with the developers of the schedule to ensure that the critical path and dependencies

were preserved and that the duration of combined elements was accurately calculated. Dependencies were as follows:

- **Project start date is 10/1/98 (FY1999)**
- **Deploying the Systems Life Cycle, Systems Requirements Review and Systems Design Review will occur in two stages. Stage 1 for Subreleases 1.1 & 1.2 and Stage 2 for Subreleases 1.3, 1.4 and 1.5.**
- **Subreleases 1.1 & 1.2**
  - PRIME is knowledgeable of requirements and design for Subreleases 1.1 & 1.2 as a result of preparing for the RFP bids, therefore an accelerated schedule for Subreleases 1.1 & 1.2 has been developed.
  - COCOMO settings for Subreleases 1.1 & 1.2 were adjusted to account for previous knowledge acquired.
  - The COCOMO level of effort and duration were used as the baseline. Schedule compression and resource leveling adjustments using COCOMO's level of effort and duration were made to produce the target schedule for Subreleases 1.1 & 1.2.
    - Stage 1 Systems Requirements Review (SRR) starts on 10/2/98.
    - Stage 1 Systems Design Review (SDR) depends on SRR.
    - Software Development Environment (SDE) for Subreleases 1.1 & 1.2 depends on SDR.
    - Planning and Software Specification Review (SSR) depends on SDR.
      - Subreleases 1.1 and 1.2 can be developed in parallel and immediately after SDR.
    - Acquisition depends on SSR.
    - Preliminary Design Review (PDR) depends on SSR.
    - Critical Design Review (CDR) depends on PDR.
    - Code and Unit Test depends on CDR.
    - Integration & Integration Testing (I&IT) depends on the acquisition of Integration Equipment and completion of the Code.
    - Systems Acceptance Testing (SAT) depends on I&IT.
    - Pilot depends on SAT and the acquisition of Production Equipment.
      - Pilot of Subreleases 1.1 & 1.2 occurs at MCC & TCC.
      - Pilot is operational in Subrelease 1.1 for 1 month, then is operational
      - Pilot is operational in Subrelease 1.2 for 50 working days, then is operational.
    - All equipment is deployed during the pilot for Subreleases 1.1 & 1.2, therefore nationwide rollout is not necessary.

- **Subreleases 1.3, 1.4 & 1.5**
  - PRIME is given 66 working days for Transition/Ramp Up for Subreleases 1.3, 1.4, & 1.5 after Contract Award (1/1/1999).
  - Subreleases 1.3, 1.4, & 1.5 schedule duration are extracted directly from COCOMO's duration baseline.
    - Stage 2 Systems Requirements Review (SRR) starts on 1/4/1999 after Transition/Ramp Up.
    - Stage 2 Systems Design Review (SDR) depends on SRR
    - Software Development Environment (SDE) for Subreleases 1.3, 1.4, & 1.5 depends on SDR.
    - Planning and Software Specification Review (SSR) depends on SDR.
      - Subreleases 1.3 and 1.4 can be developed in parallel and immediately after SDR.
      - Subrelease 1.5 begins 120 days after SDR.
    - Acquisition depends on SSR.
    - Preliminary Design Review (PDR) depends on SSR.
    - Critical Design Review (CDR) depends on PDR.
    - Code and Unit Test depends on CDR.
    - Integration & Integration Testing (I&IT) depends on the acquisition of Integration Equipment and completion of the Code.
    - Systems Acceptance Testing (SAT) depends on I&IT.
    - Pilot depends on SAT and the acquisition of Production Equipment.
      - Pilot of Subrelease 1.3 occurs at MCC, ATCSC, OSC, and Jacksonville and is operational for 4.5 months.
      - Pilot of Subrelease 1.4 occurs at MCC, ATCSC, OSC and Jacksonville and is operational for 4.5 months.
      - Pilot of Subrelease 1.5 occurs at MCC, ATCSC, OSC, and Jacksonville and is operational for 5.5 months.
    - Nationwide rollout begins immediately after Post Pilot Review and Investment Evaluation.
      - Nationwide rollout is 5.5 months for Subrelease 1.3 and is across 21 Customer Service sites and 9 IRIS sites.
      - Subrelease 1.4 & 1.5 rollout together across 21 Customer Service Sites.

Similarly, a summary of 50 items was used for both the cost and PFR analyses. Some of these items are dependent on schedule. For example, a primary cost and PFR driver for software development is labor; extending the schedule has a direct effect on increasing the cost and PFR. This dependency is accounted for by using an approach for determining best case and worst case

cost estimates for labor-intensive items based on potential variations in schedule estimates. The same approach was used for both cost and PFR analysis.

Once the values and dependencies were established, a random value from the range between worst case and best case was selected for each item. A cumulative value was then created from the chosen values, preserving indicated dependencies. This cumulative value is a schedule completion date for the schedule analysis, a total cost for the cost analysis, and a total PFR for the PFR analysis. This process was repeated, generating a distribution, until the distribution converged. The distributions generated for the schedule, cost, and PFR risk enabled associating a specific value for any given probability (schedule completion date, cost, and PFR amount).

The @Risk COTS product was used to perform the Monte Carlo analysis. The product generated 1,000 estimates for each analysis. Convergence was achieved prior to the 800th calculation for the schedule estimates and prior to the 900th calculation for both the cost and PFR estimates.

3. Data Sources

The Modernization Phase I/Release 1 schedule was established using the COCOMO II estimation tool. This schedule estimate is used as the most likely case value for all software development items in the schedule. The intent of establishing the best case and worst case estimates for each item is to cover virtually all possible cases (i.e., approximately 90%). This intent is met by using the standard deviation of the estimated values. COCOMO II estimates have a standard deviation of 20%; the objective of covering virtually all cases is met by including values within one-and-one-half standard deviations (i.e., within 30%) of the estimated value. Therefore, the best case value is set at the most likely case estimate minus 30% of the estimated value and the worst case is set at the most likely case estimate plus 30% of the estimated value. Some schedule items are not estimated by COCOMO II. These items include acquisition of the production environment, integration preparation, project pilot duration, and nationwide rollout. These non-COCOMO II items will likely have less variability than the COCOMO II items. Therefore, the best case and worst case estimates were set at most likely case minus 20% and most likely case plus 20%, respectively. The most likely, best case, and worst case schedule estimates are presented in “Schedule Duration Estimates in Months.” The same set of WBS items were used for both the cost and PFR analyses. The best case and worst case numbers were derived using the same rationale as the schedule best case and worst case estimates. The most likely, best case, and worst case cost estimates are presented in “Cost Estimates in $1,000”; the PFR estimates are presented in “PFR Estimates in $1,000.”

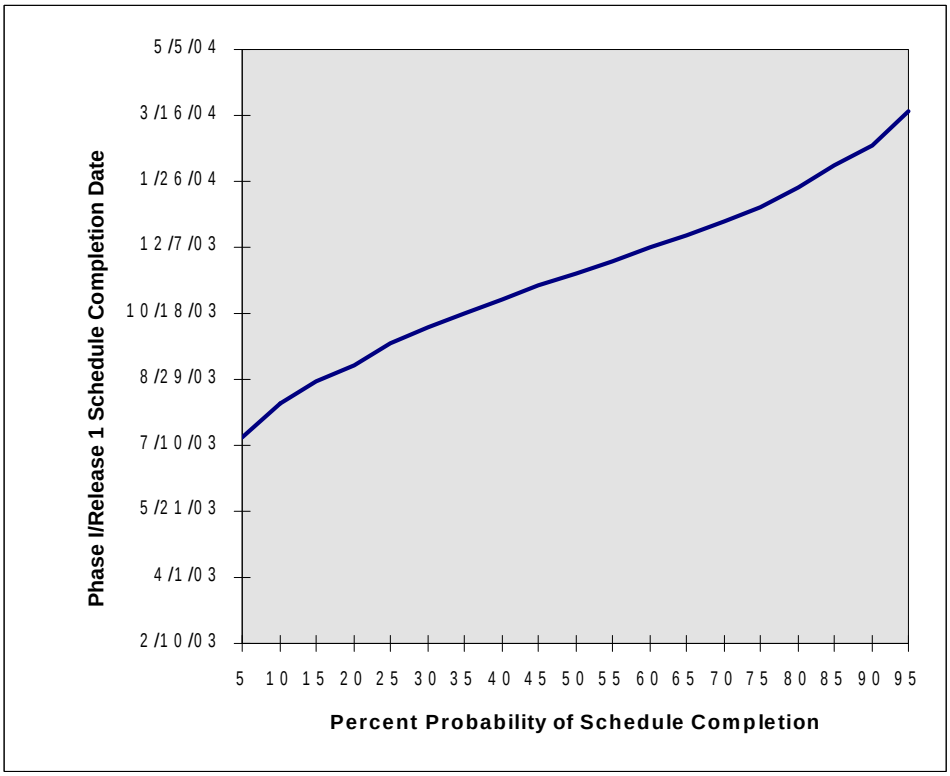
Schedule Duration Estimates in Months

Subrelease	Schedule Item	Best Case	Most Likely	Worst Case
	Deploy SLC/SRR/SDR for Subreleases 1.1 & 1.2	2.1	3	3.9
	Establish Development Environment for 1.1 & 1.2	1.92	2.4	2.88
1.1	Planning and Requirements Analysis	0.35	0.5	0.65
	Preliminary Design	0.35	0.5	0.65
	Acquisitions	2.96	3.7	4.44
	Integration/SAT Preparation	3.2	4	4.8
	CDR/Build/I&IT	4.2	6	7.8
	System Acceptance Test	1.4	2	2.6
	Pilot/Nationwide Rollout	1.6	2	2.4
1.2	Planning and Requirements Analysis	0.7	1	1.3
	Preliminary Design	1.12	1.6	2.08
	Acquisitions	5.92	7.4	8.88
	Integration/SAT Preparation	4.8	6	7.2
	CDR/Build/I&IT	8.4	12	15.6
	System Acceptance Test	3.43	4.9	6.37
	Pilot/Nationwide Rollout	2.72	3.4	4.08
	Deploy SLC/SRR/SDR for Subreleases 1.3,1.4,1.5	4.2	6	7.8
	Establish Development Environment for 1.3,1.4,1.5	1.92	2.4	2.88
1.3	Planning/Requirements Analysis	3.5	5	6.5
	Acquisitions	9.2	11.5	13.8
	Integration/SAT Preparation	8	10	12
	PDR/CDR/Build	11.2	16	20.8
	Integration and Integration Testing	4.2	6	7.8
	System Acceptance Testing	3.43	4.9	6.37
	Pilot	4.8	6	7.2
	Nationwide Rollout	4.4	5.5	6.6
1.4	Planning/Requirements Analysis	4.9	7	9.1
	Acquisitions	4.56	5.7	6.84
	Integration/SAT Preparation	8.24	10.3	12.36
	PDR/CDR/Build	14.7	21	27.3
	Integration and Integration Testing	6.3	9	11.7
	System Acceptance Testing	3.43	4.9	6.37
	Pilot	5.2	6.5	7.8
1.5	Planning/Requirements Analysis	4.2	6	7.8
	Integration/SAT Preparation	8.24	10.3	12.36
	PDR/CDR/Build	13.3	19	24.7
	Integration and Integration Testing	5.6	8	10.4
	System Acceptance Testing	3.43	4.9	6.37
	Pilot	5.2	6.5	7.8
	Nationwide Rollout for 1.4 & 1.5	4.48	5.6	6.72

Monte Carlo Probabilities for Schedule Completion Dates

Probability	Subrelease 1.1	Subrelease 1.2	Subrelease 1.3	Subrelease 1.4	Subrelease 1.5
5%	10/30/99	8/22/00	6/20/02	10/20/02	7/15/03
10%	11/8/99	9/9/00	7/17/02	11/12/02	8/11/03
15%	11/17/99	9/24/00	8/4/02	12/10/02	8/27/03
20%	11/21/99	10/3/00	8/17/02	12/26/02	9/9/03
25%	11/25/99	10/9/00	8/27/02	1/9/03	9/25/03
30%	11/30/99	10/15/00	9/8/02	1/23/03	10/7/03
35%	12/3/99	10/22/00	9/19/02	2/5/03	10/18/03
40%	12/7/99	10/29/00	9/29/02	2/15/03	10/28/03
45%	12/10/99	11/6/00	10/9/02	2/28/03	11/7/03
50%	12/14/99	11/12/00	10/18/02	3/11/03	11/17/03
55%	12/16/99	11/19/00	10/28/02	3/23/03	11/27/03
60%	12/20/99	11/25/00	11/7/02	4/5/03	12/7/03
65%	12/25/99	12/2/00	11/15/02	4/17/03	12/16/03
70%	12/29/99	12/9/00	11/27/02	4/29/03	12/26/03
75%	1/3/00	12/16/00	12/9/02	5/16/03	1/6/04
80%	1/8/00	12/25/00	12/25/02	5/31/03	1/21/04
85%	1/12/00	1/4/01	1/9/03	6/21/03	2/6/04
90%	1/17/00	1/17/01	1/27/03	7/14/03	2/23/04
95%	1/25/00	1/30/01	2/18/03	8/18/03	3/19/04

Monte Carlo Analysis Probability Distribution for Schedule Completion Dates



Cost Estimates ($1,000)

Subrelease	Cost Item	Best Case	Most Likely	Worst Case
1.1	***Development Investment**			
	— Planning	3635.8	5194	6752.2
	— Acquisition	11276.8	14096	16915.2
	— Development	3318.7	4741	6163.3
	— QA Test & Pilot	775.2	969	1162.8
	— Rollout	0	0	0
	— Train & Proc	664.8	831	997.2
	— M & A	81.6	102	122.4
	***O & M Investment**			
	— Maintenance	40736.8	50921	61105.2
	— Train & Proc	189.6	237	284.4
	— M & A	437.6	547	656.4
1.2	***Development Investment**			
	— Planning	1897	2710	3523
	— Acquisition	6756	8445	10134
	— Development	2715.3	3879	5042.7
	— QA Test & Pilot	752.8	941	1129.2
	— Rollout	0	0	0
	— Train & Proc	460.8	576	691.2
	— M & A	87.2	109	130.8
	***O & M Investment**			
	— Maintenance	5316.8	6646	7975.2
	— Train & Proc	74.4	93	111.6
	— M & A	171.2	214	256.8
1.3	***Development Investment**			
	— Planning	5437.6	7768	10098.4
	— Acquisition	5965.6	7457	8948.4
	— Development	3882.9	5547	7211.1
	— QA Test & Pilot	6943.2	8679	10414.8
	— Rollout	3856.8	4821	5785.2
	— Train & Proc	13483.2	16854	20224.8
	— M & A	1128	1410	1692
	***O & M Investment**			
	— Maintenance	6238.4	7798	9357.6
	— Train & Proc	108.8	136	163.2
	— M & A	251.2	314	376.8
1.4	***Development Investment**			
	— Planning	5072.9	7247	9421.1
	— Acquisition	14576	18220	21864
	— Development	10172.4	14532	18891.6
	— QA Test & Pilot	6304	7880	9456
	— Rollout	0	0	0
	— Train & Proc	1601.6	2002	2402.4
	— M & A	487.2	609	730.8

Cost Estimates ($1,000) (Continued)

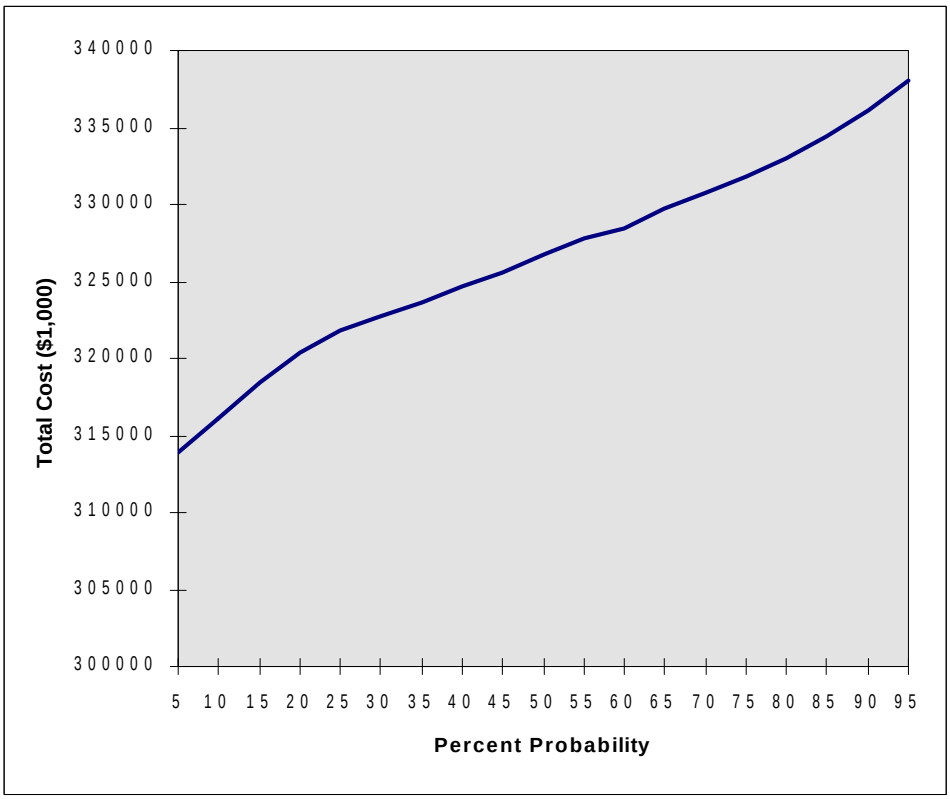
Subrelease	Cost Item	Best Case	Most Likely	Worst Case
	***O & M Investment**			
	— Maintenance	38154.4	47693	57231.6
	— Train & Proc	321.6	402	482.4
	— M & A	740.8	926	1111.2
1.5	***Development Investment**			
	— Planning	5527.9	7897	10266.1
	— Acquisition	368.8	461	553.2
	— Development	7249.9	10357	13464.1
	— QA Test & Pilot	6298.4	7873	9447.6
	— Rollout	1487.2	1859	2230.8
	— Train & Proc	27157.6	33947	40736.4
	— M & A	1793.6	2242	2690.4
	***O & M Investment**			
	— Maintenance	5252	6565	7878
	— Train & Proc	87.2	109	130.8
	— M & A	200.8	251	301.2
	***Total Most Likely Cost**		**333107**	

Monte Carlo Probabilities for Cost ($1,000)*

Probability	Total Cost
5%	319551.3
10%	322745.1
15%	324833.2
20%	326285.2
25%	327517.7
30%	328487.1
35%	329525.5
40%	330607.7
45%	331722.7
50%	332691.8
55%	333782.9
60%	334845.8
65%	336071.2
70%	337168.3
75%	338351.3
80%	339699.1
85%	341203.1
90%	343206
95%	346380

*Note: Figures rounded to nearest $1,000.

Monte Carlo Analysis Probability Distribution for Cost



PFR Estimates ($1,000)

Subrelease	PFR Item	Best Case	Most Likely	Worst Case
1.1	***Development Investment**			
	— Planning	4597.6	6568	8538.4
	— Acquisition	25352	31690	38028
	— Development	4104.1	5863	7621.9
	— QA Test & Pilot	902.4	1128	1353.6
	— Rollout	0	0	0
	— Train & Proc	824.8	1031	1237.2
	— M & A	100	125	150
	***O & M Investment**			
	— Maintenance	67931.2	84914	101896.8
	— Train & Proc	199.2	249	298.8
	— M & A	458.4	573	687.6
1.2	***Development Investment**			
	— Planning	2479.4	3542	4604.6
	— Acquisition	12028	15035	18042
	— Development	3420.9	4887	6353.1
	— QA Test & Pilot	867.2	1084	1300.8
	— Rollout	0	0	0
	— Train & Proc	604	755	906
	— M & A	102.4	128	153.6
	***O & M Investment**			
	— Maintenance	7442.4	9303	11163.6
	— Train & Proc	82.4	103	123.6
	— M & A	190.4	238	285.6
1.3	***Development Investment**			
	— Planning	8898.4	12712	16525.6
	— Acquisition	24127.2	30159	36190.8
	— Development	7275.8	10394	13512.2
	— QA Test & Pilot	7492	9365	11238
	— Rollout	3856.8	4821	5785.2
	— Train & Proc	14175.2	17719	21262.8
	— M & A	1209.6	1512	1814.4
	***O & M Investment**			
	— Maintenance	11095.2	13869	16642.8
	— Train & Proc	148.8	186	223.2
	— M & A	344	430	516
1.4	***Development Investment**			
	— Planning	10034.5	14335	18635.5
	— Acquisition	71662.4	89578	107493.6
	— Development	18263.7	26091	33918.3
	— QA Test & Pilot	11485.6	14357	17228.4
	— Rollout	0	0	0
	— Train & Proc	3239.2	4049	4858.8
	— M & A	653.6	817	980.4

PFR Estimates ($1,000) (Continued)

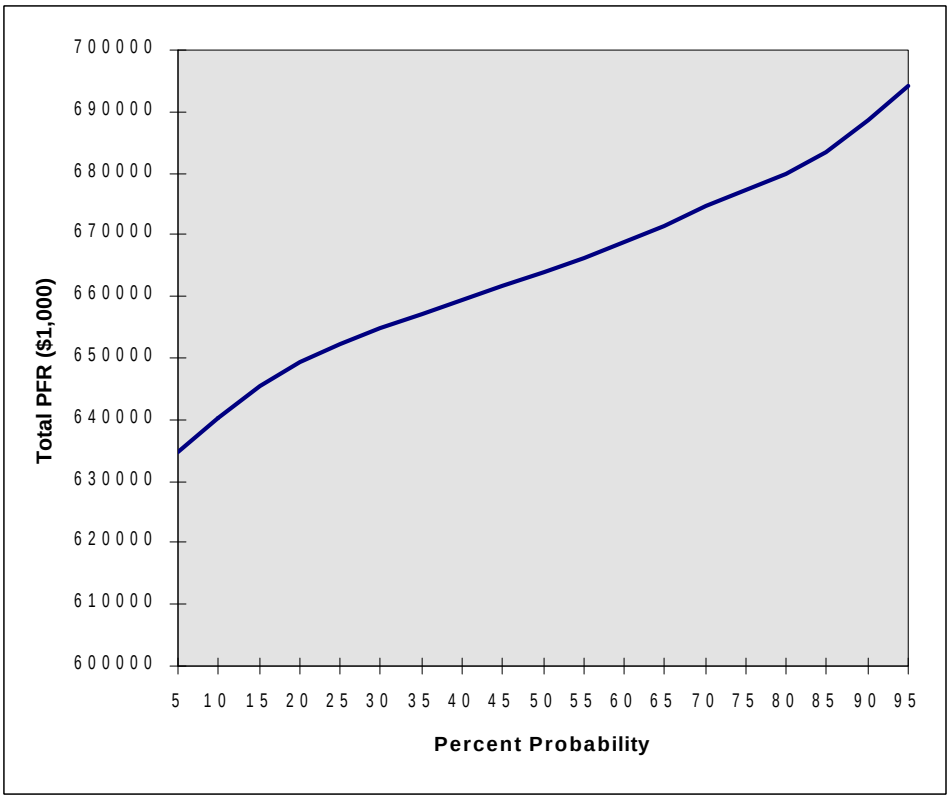
Subrelease	PFR Item	Best Case	Most Likely	Worst Case
	***O & M Investment**			
	— Maintenance	136696	170870	205044
	— Train & Proc	416.8	521	625.2
	— M & A	961.6	1202	1442.4
1.5	***Development Investment**			
	— Planning	7825.3	11179	14532.7
	— Acquisition	589.6	737	884.4
	— Development	10986.5	15695	20403.5
	— QA Test & Pilot	6903.2	8629	10354.8
	— Rollout	1487.2	1859	2230.8
	— Train & Proc	27914.4	34893	41871.6
	— M & A	1870.4	2338	2805.6
	***O & M Investment**			
	— Maintenance	8464.8	10581	12697.2
	— Train & Proc	131.2	164	196.8
	— M & A	302.4	378	453.6
	***Total Most Likely PFR**		**676656**	

Monte Carlo Probabilities for PFR ($1000)*

Probability	Total PFR
5%	647227.1
10%	653053.1
15%	657670.7
20%	660827.4
25%	663812.3
30%	666991.9
35%	670375.9
40%	672346
45%	674937.9
50%	677346.7
55%	679448.8
60%	682056.6
65%	684240.8
70%	687526.8
75%	690813.9
80%	693248.1
85%	696326.1
90%	701746.6
95%	709070.1

*Note: Figures rounded to nearest $1,000.

Monte Carlo Analysis Probability Distribution for PFR



APPENDIX H
RELATED INFORMATION

APPENDIX H: RELATED INFORMATION

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APPENDIX I
ACRONYMS

APPENDIX I: LIST OF ACRONYMS

ACD	Automated Call Distributor
ACS	Automated Collection System
AE&I	Architecture, Engineering & Infrastructure
AFS	Automated Financial System
AIMS	Audit Information Management System
ALC	Assembler Language Code
ASFR	Automated Substitute for Return System
ASSA	Automated Self Service Applications
ATCSC	Atlanta Customer Service Center
ATL	Automated Tax Law
AUCC	Austin Compliance Center
AUR	Automated Underreporter
AUTHDB	Authentication Data Base
BCWG	Business Case Working Group
BMF	Business Master File
BNID	Business Needs Identifier
BNS	Business Needs Statement
CBA	Cost Benefit Analysis
CCB	Change Control Board
CCDB	Corporate Case Data Base
CDR	Critical Design Review
CFE	Current Functional Equivalent
CFO	Chief Financial Officer
CFOL	Corporate Files On Line
CHI	Computer-Human Interface
CI	Configuration Item
CIDS	Centralized Inventory Distribution System
CIO	Chief Information Officer
CM	Configuration Management
CMM	Capability Maturity Model
CO	Compliance
COCOMO	Constructive Cost Model
CONOPS	Concept of Operations
COTS	Commercial Off The Shelf
CRIS	Compliance Research Information System
CRS	Communication Replacement System
CS	Customer Service
CSCRR	Customer Service Call Router Rollout
CSR	Customer Service Representatives
DDR	Data Directed Routing
DIF	Discriminant Function

DO	District Office
DOS	District Organization Study
EFTPS	Electronic Filing Tax Processing System
ELF	Electronic Filing
EIC	Earned Income Credit
EP/EO	Employee Plans/Exempt Organizations
ERS	Error Resolution System
ERCS	Exam Return Control System
ERIS	Enhanced Regional Infrastructure System
FASAB	Federal Accounting Standards Advisory Board
FFRDC	Federally Funded Research and Development Center
FRR	Financial Reporting Release (formerly RGLS)
FTE	Full-Time Equivalent
FY	Fiscal Year
GAO	General Accounting Office
GPMO	Government Program Management Office
GPRA	Government Performance Results Act
GS	General Schedule
GUF	Generalized Unpostable Framework
GUI	Graphical User Interface
HW	Hardware
I&A	Identification & Authentication
I&IT	Integration & Integration Testing
ICA	Independent Cost Analysis
ICP	Integrated Case Processing
ICR	Intelligent Character Recognition
ICS	Integrated Collection System
IDRS	Integrated Data Retrieval System
IDS	Inventory Delivery System
IMF	Individual Master File
IRA	Individual Retirement Account
IRB	Investment Review Board
IRIS	Interim Regional Infrastructure System
IRM	Internal Revenue Manual
IRP	Information Returns Processing
IRS	Internal Revenue Service
IS	Information Systems
IS:AD	Information Systems: Applications Development
IS:PA	Information Systems: Product Assurance
ISA	Information Systems Architecture
ISC	Integration Support Contractor
IT	Information Technology

ITCC	Integration, Test and Control Center
ITMRA	Information Technology Management Reform Act
LAN	Local Area Network
LOA	Level Of Access
M&A	Management & Administration
MCC	Martinsburg Computing Center
MCDB	Master Correspondence Database
MEI	Mission Effectiveness Indicator
MIS	Management Information Systems
MISDB	Management Information Systems Database
MMB	Modernization Management Board
NBO	Normal Business Operations
NPV	Net Present Value
NTEU	National Treasury Employees Union
O&M	Operations and Maintenance
OCR	Optical Character Reader
OFP	Organization Function Program
OLTP	On-line Transaction Processing
OMB	Office of Management and Budget
OSC	Ogden Service Center
PA	Product Assurance
PAAS	Post Audit Analysis System
PAS	Program Analysis System
PIDB	Payment Information Database
PDR	Preliminary Design Review
PFR	Projected Funding Requirements
PM	Program Management
PM&C	Program Management and Control
PYA	Prior Year Actual
RADB	Regional Audit Data Base
RCS	Regional Call System
REFDB	Reference Data Base
RFP	Request for Proposals
RGLS	Revenue General Ledger System (now FRR)
RGS	Report Generation System
ROI	Return on Investment
RTF	Return Transaction File
SA	Software Acquisition
SADB	Security Audit Data Base
SAT	System Acceptance Testing

SC	Service Center
SCCB	Service Center Collection Branch
SCOS	Service Center Organization Study
SDE	Software Development Environment
SDR	System Design Review
SEI	Software Engineering Institute
SERP	Service-wide Electronic Research Project
SFR	Substitute For Return
SLC	Systems Life Cycle
SLOC	Source Lines of Code
SPR	Sequencing Plan Review
SRR	System Requirements Review
SS&E	System Standards and Evaluation
SSA	Social Security Administration
SSR	System Specifications Review
STATDB	Statistics Database
SW	Software
TADB	Tax Account Data Base
TBD	To Be Determined
TCC	Tennessee Computing Center
TECHDB	Technical Database
TIES	Totally Integrated Examination System
TIF	Taxpayer Information File
TPS	Taxpayer Services
TRDB	Tax Return Data Base
TRIS	Telephone Routing Interactive System
TRR	Test Readiness Review
USC	University of Southern California
VRU	Voice Response Unit
WBS	Work Breakdown Structure
WITS	Workload Information Tracking System
WP&C	Workload Planning and Control
WS	Workstation