



California Immunization Registry (CAIR) 2.0

Project # 4265-21

Special Project Report 1

August 2015

Version 1.3

California Department of Public Health

Center for Infectious Diseases

Division of Communicable Disease Control

Immunization Branch

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Information Technology Project Request

Special Project Report

Executive Approval Transmittal




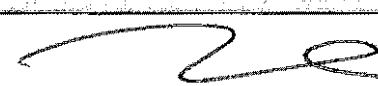
| | | | |
|------------------|---|---------------------|-----------------|
| Department Name: | California Department of Public Health | | |
| Project Title: | California Immunization Registry (CAIR) 2.0 | | |
| Project ID | FSR Approval Date | Department Priority | Agency Priority |
| 4265-21 | December 10, 2012 | 1 | N/A |

I am submitting the attached Special Project Report (SPR) in support of our request for the California Department of Technology's approval to continue development and/or implementation of this project.

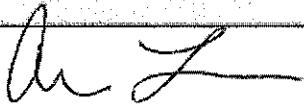
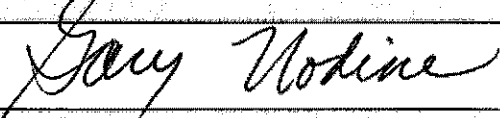
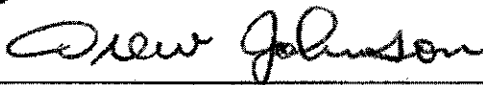
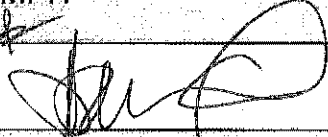
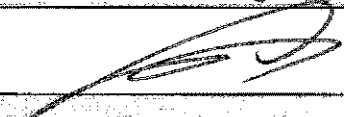
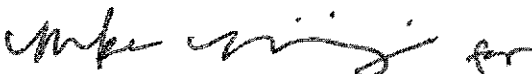
I certify that the SPR was prepared in accordance with the State Administrative Manual Sections 4945-4945.2 and that the proposed project changes are consistent with our information management strategy as expressed in our current Agency Information Management Strategy (AIMS).

I have reviewed and agree with the information in the attached Special Project Report.

I also certify that the acquisition of the applicable information technology (IT) product(s) or service(s) required by my department that are subject to Government Code 11135 applying Section 508 of the Rehabilitation Act of 1973 as amended meets the requirements or qualifies for one or more exceptions (see following page).

| | |
|---|-------------|
| Approval Signatures | |
| Information Security Officer: Charles Lano | Date Signed |
|  | 4-28-15 |
| Enterprise Architect: Van Vu | Date Signed |
|  | 4-24-15 |

Executive Approval Transmittal: California Immunization Registry (CAIR) 2.0

| Approval Signatures | |
|---|-------------|
| Budget Officer: Alan Lum | Date Signed |
|  | 5/5/15 |
| Deputy Director, Chief Information Officer: Gary Nodine (acting) | Date Signed |
|  | 4/30/15 |
| Deputy Director, Project Sponsor: Gilberto F. Chávez, MD, MPH | Date Signed |
| for  | 4/28/15 |
| Department Director & State Health Officer: Karen Smith, MD, MPH | Date Signed |
|  | 6/12/15 |
| Agency Chief Information Officer: Amy Tong | Date Signed |
|  | 7/30/15 |
| Agency Secretary: Diana Dooley | Date Signed |
|  | 8/17/2015 |

Executive Approval Transmittal

IT Accessibility Certification

Yes or No

| | |
|-----|--|
| Yes | The Proposed Project Meets Government Code 11135 / Section 508 Requirements and no exceptions apply. |
|-----|--|

Exceptions Not Requiring Alternative Means of Access

| Yes or No | Accessibility Exception Justification |
|-----------|---|
| N/A | The IT project meets the definition of a national security system. |
| N/A | The IT project will be located in spaces frequented only by service personnel for maintenance, repair, or occasional monitoring of equipment (i.e., "Back Office Exception"). |
| N/A | The IT acquisition is acquired by a contractor incidental to a contract. |

Exceptions Requiring Alternative Means of Access for Persons with Disabilities

| Yes or No | Accessibility Exception Justification |
|-----------|--|
| N/A | <p>Meeting the accessibility requirements would constitute an "undue burden" (i.e., a significant difficulty or expense considering all agency resources).</p> <p>Explain:</p> <p>Describe the alternative means of access to be provided to allow individuals with disabilities to obtain the information or access the technology.</p> |
| N/A | No commercial solution is available to meet the requirements for the IT |

| Yes or No | Accessibility Exception Justification |
|-----------|--|
| | <p>project that provides for accessibility.</p> <p>Explain:</p> <p>Describe the alternative means of access to be provided to allow individuals with disabilities to obtain the information or access the technology.</p> |
| N/A | <p>No solution is available to meet the requirements for the IT project that does not require a fundamental alteration in the nature of the product or its components.</p> <p>Explain:</p> <p>Describe the alternative means of access to be provided to allow individuals with disabilities to obtain the information or access the technology.</p> |

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1 ACRONYM GLOSSARY

For a complete list of Vaccine Acronyms & Abbreviations, see:

<http://www.cdc.gov/vaccines/about/terms/vacc-abbrev.htm>

ACIP - Advisory Committee on Immunization Practices

AIRA - American Immunization Registry Association

AIMS - Agency Information Management Strategy

BOM - Bill of Materials

CAIR - California Immunization Registry

CAIR 2.0 - New California Immunization Registry

CAIR 7 - Seven California Immunization Registries being consolidated into a single registry by CAIR 2.0

CDC - Centers for Disease Control and Prevention

CDPH - California Department of Public Health

CHHS - California Health and Human Services Agency

CID - Center for Infectious Diseases

CIO - CDPH Chief Information Officer

CMS - Centers for Medicare & Medicaid Services

COTS - Commercial Off-the-Shelf Software

CPT - Current procedure terminology

CRA - Countermeasure and Response Administration

CVX - Vaccine Administered

DCDC - Division of Communicable Disease Control

DCOSB - CDPH ITSD Data Center Operations and Services Branch

DD&I - Design, Development and Implementation

DHCS - Department of Healthcare Services

EAW - Economic Analysis Worksheet

FSR - Feasibility Study Report

GOTS - Government Off-the-Shelf Software

HBIG - Hepatitis B Immune Globulin

HEDIS - Healthcare Effectiveness Data & Information Set

HIE - Health Information Exchange

HITECH - Health Information Technology for Economic and Clinical Health

HL7 - Health Level Seven International

HP - Hewlett Packard

IAA - Interagency Agreement

IAPD - Implementation Advance Planning Document

i.e. - "in other words"

IFB - Invitation for Bid

IG - Immunoglobulin

IIS - Immunization Information System

IISAR - Immunization Information Systems Annual Report

IPO - Independent Project Oversight

ISO - CDPH Information Security Office

IT - Information Technology

ITSD - CDPH Information Technology Services Division

IV&V - Independent Verification and Validation

iWEB - Immunization Registry software

IZB - Immunization Branch

J2EE - Java 2 Enterprise Edition application platform

LHD - State, Local Health Departments

M&O - Maintenance and Operations

MD - Medical Doctor

MIROW - Modeling of Immunization Registry Operations Work Group

MMWR - Morbidity & Mortality Weekly Report

MOGE - Moved or Gone Elsewhere

MOTS - Modified Off-the-Shelf Software

MPH - Master of Public Health degree
MRN - Medical record number
MU - Meaningful Use
N/A - not applicable
NCB - Non-competitive bid
NDC - National Drug Code
NIS - National Immunization Survey
OTech - California Department of Technology, Office of Technology Services
PCP - Pneumocystis pneumonia
PHIN - Public Health Informaion Network
PMBOK - Project Management Body of Knowledge
PMM - Project Management Methodology
PMO - Project Management Office
PMP - Project Management Plan
PPMB - CDPH ITSD Planning and Project Management Branch
QBP/RSP - Query/response
RAC - Oracle Real Application Cluster
RTM - Requirmenets Traceability Matrix
SDIR - San Diego Immunization Registry
SDLC - System Development Lifecycle
sFTP - Secure File Transfer Protocol
SIIS - Statewide Immunization Information System
SIMM - Statewide Informaiton Management Methodology
SLA - Service Level Agreement
SME - Subject Matter Expert
SOW - Statement of Work
SPR - Special Project Report
STPD - Department of Technology Statewide Technology Procurement Division

TMSP - Tenant Managed Services, Premium

TRP - Technology Recovery Plan

UAT - user acceptance testing

USPS - UnitedStates Postal Service

VAER - Vaccine Adverse Effect Report

VAR - Vaccine Administration Records

VFC - Vaccines for Children

VIS - Vaccine Information Statements

VXU - Vaccine Update

VZIG - Varicella Zoster Immune Globulin

WebIZ - Immunization Registry Software

WIC - Women, Infants, and Children

WIR - Wisconsin Immunization Registry

2 Information Technology Project Summary Package

2.1 Section A: Executive Summary

| | | |
|---|----------------|-------------|
| 1 | Submittal Date | August 2015 |
|---|----------------|-------------|

| | | | | | |
|---|------------------|---------|-----|----------|--------|
| | | FSR | SPR | PSP Only | Other: |
| 2 | Type of Document | | X | | |
| | Project Number | 4265-21 | | | |

| | | | | |
|---|-----------------|--------------------------------------|-------------------------|--------|
| | | | Estimated Project Dates | |
| 3 | Project Title | California Immunization Registry 2.0 | Start | End |
| | Project Acronym | CAIR 2.0 | 12/2012 | 6/2017 |

| | | |
|---|-----------------------|---|
| 4 | Submitting Department | California Department of Public Health |
| 5 | Reporting Agency | California Health and Human Services Agency |

| 6 | Project Objectives |
|----|--|
| 1. | Provide CAIR 2.0 software users access to statewide immunization information by June 2017. |
| 2. | Reduce the time required to produce the CDC annual IISAR report from 1 week to 4 hours by June 2017. |
| 3. | Enable CAIR 2.0 to directly insert patient records and vaccine doses-containing HL7 messages by December 2017. |
| 4. | Reduce the time to compile a statewide report of Tdap/Pertussis booster doses administered from 1 week to 4 hours by December 2017. |
| 5. | Reduce the time to produce a cross-regional or statewide Healthcare Effectiveness Data & Information Set (HEDIS) patient match report from 1 week to 4 hours by December 2017. |
| 6. | |

| 8 | Major Milestones | Est. Complete Date |
|---|--|-----------------------|
| | Project Start | December 2012 |
| | Solicitation Document Preparation | April 2014 - Complete |
| | Conduct Solicitation | June 2014 - Complete |
| | Evaluate Responses | July 2014 - Complete |
| | Vendor On-Board | October 2014-Complete |
| | Requirements Complete | June 2015-Complete |
| | Design Complete | June 2015-Complete |
| | Approve IAPD-Update | September 2015 |
| | Approve Special Project Report (SPR) 1 | August 2015 |
| | Approve Control Section 11 | October 2015 |
| | Execute HP Contract Amendment | October 2015 |
| | Approve Inter-Agency Agreement (IAA) | October 2015 |
| | Execute IV&V Purchase Order | October 2015 |
| | Establish IPOC Service Request | October 2015 |
| | Establish TMSP Hosting Environment | January 2016 |
| | System Build Complete | June 2016 |
| | System Testing Complete | June 2016 |
| | User Acceptance Testing Complete | July 2016 |
| | Training Complete | September 2016 |
| | System Go Live | November 2016 |
| | Phase 1 Rollout | November 2016 |
| | Phase 2 Rollout | February 2017 |
| | Phase 3 Rollout | April 2017 |
| | Formal Acceptance Project Complete | June 2017 |

| | |
|---|--|
| 7 | Proposed Solution |
| | <p>The California Department of Public Health (CDPH) will implement the Wisconsin Immunization Registry (WIR) software for California. CDPH entered into an Interstate Agreement with the state of Wisconsin for the use of the WIR software. Customization and integration of WIR will result in a new Immunization Information Registry System for California and will be referred to as CAIR 2.0 in this document. CDPH plans to combine seven existing regional immunization information systems, replace them with a single immunization registry (CAIR 2.0), and establish patient search and data exchange capabilities with the three independent registries.</p> <p>The system integration consultant, Hewlett Packard (HP), will be responsible for customizing and implementing CAIR 2.0 at the State Data Center, Tenant Managed Services, Premium (TMSp) for CDPH. The Contractor will be responsible performing all tasks, completing all Deliverables, and customizing the software to meet all the Mandatory Requirements Specifications listed in the contract. Mandatory (Optional) requirements implementation is at the State's sole discretion, and may be postponed to after project implementation.</p> |

| Key Deliverables | Est. Complete Date |
|--|-------------------------|
| Solicitation Document | April 2014 - Complete |
| Vendor Final Proposals | June 2014 - Complete |
| Notification of Intent to Award | July 2014 - Complete |
| Approved Contract, Consultant Starts | October 2014 - Complete |
| Requirements Specification Documents (final acceptance of contract task 2A deliverables) | June 2015 -Complete |
| Design Documents (final acceptance of contract tasks 8 and 9 deliverables) | June 2015 - Complete |
| Approved IAPD-Update | August 2015 |
| Approved Special Project Report (SPR) 1 | August 2015 |
| Approved Control Section 11 | October 2015 |
| Executed HP Contract Amendment | October 2015 |
| Approved Inter-Agency Agreement (IAA) | October 2015 |
| Executed IV&V Purchase Order | October 2015 |
| IPOC Service Request Established | October 2015 |
| TMSp Hosting Environment Established | January 2016 |
| System Build (final acceptance of contract tasks 5 & 6 deliverables) | August 2016 |
| System Testing (final acceptance of contract task 7 deliverables) | June 2016 |
| User Acceptance Testing Sign-off (final acceptance of contract task 8 deliverables) | July 2016 |
| Training Material / User Manuals (final acceptance of contract tasks 9 & 10 deliverables) | September 2016 |
| Go / No-Go Document Approved (final acceptance of contract task 11 deliverables 11.1 through 11.6) | August 2016 |

| |
|--|
| |
| |

| Key Deliverables | Est. Complete Date |
|--|---------------------------|
| Phase 1 Rollout (final acceptance of contract task 11 deliverable 11.7A) | November 2016 |
| Phase 2 Rollout (final acceptance of contract task 11 deliverable 11.8.A) | February 2017 |
| Phase 3 Rollout (final acceptance of contract task 11 deliverable 11.9A) | April 2017 |
| Formal Acceptance Project Complete (final acceptance of all contract deliverables) | June 2017 |
| PIER | June 2018 |

2.2 Section B: Project Contacts

| | |
|-----------|---------|
| Project # | 4265-21 |
| Doc. Type | SPR 1 |

| | First Name | Last Name | Area Code | Phone # | Electronic mail |
|-----------------------------------|-------------|-----------------|-----------|----------|-------------------------|
| Agency Secretary | Diana | Dooley | 916 | 654-3454 | DDooley@chhs.ca.gov |
| Director and State Health Officer | Karen | Smith, MD, MPH | 916 | 558-1700 | Karen.Smith@cdph.ca.gov |
| Budget Officer | Alan | Lum | 916 | 440-7117 | Alan.Lum@cdph.ca.gov |
| Deputy Director, CIO | Gary | Nodine | 916 | 440-7219 | Gary.Nodine@cdph.ca.gov |
| Project Sponsor | Gilberto F. | Chávez, MD, MPH | 916 | 445-0062 | Gil.Chavez@cdph.ca.gov |

| | First Name | Last Name | Area Code | Phone # | Electronic Mail |
|----------------------|------------|-------------|-----------|----------|---------------------------------|
| Document prepared by | Shelley | Leide-Lynch | 916 | 445-5958 | Shelley.Leide-Lynch@cdph.ca.gov |
| Primary contact | Liz | Gaffney | 916 | 650-6407 | Liz.Gaffney@cdph.ca.gov |
| Project Manager | Liz | Gaffney | 916 | 650-6407 | Liz.Gaffney@cdph.ca.gov |

2.3 Section C: Project Relevance to State and/or Departmental Plans

| | | | |
|---|---|----------|-------------|
| 1 | What is the date of your current Technology Recovery Plan (TRP)? | Date | July 2014 |
| 2 | What is the date of your current Agency Information Management Strategy (AIMS)? | Date | August 2014 |
| 3 | For the proposed project, provide the page reference in your current AIMS and/or strategic business plan. | Document | AIMS |
| | | Page # | 45 |

| | |
|-----------|---------|
| Project # | 4265-21 |
| Doc. Type | SPR 1 |

| | | Yes | No |
|---|--|-----|----|
| 4 | Is the project reportable to control agencies? | X | |
| | If YES, CHECK all that apply: | | |
| | The project involves a budget action. | | |
| | A new system development or acquisition that is specifically required by legislative mandate or is subject to special legislative review as specified in budget control language or other legislation. | | |
| X | The estimated total development and acquisition cost exceeds the departmental cost threshold and the project does not meet the criteria of a desktop and mobile computing commodity expenditure (see SAM 4989 – 4989.3). | | |
| | The project meets a condition previously imposed by Finance. | | |

2.4 Section D: Budget Information

| | | | | | | | | | | | |
|-------------------------------|-----|---|--|--|----|--|----|--|----|-----------|---------|
| Budget Augmentation Required? | | | | | | | | | | | |
| | No | N | | | | | | | | Project # | 4265-21 |
| | Yes | | If YES, indicate fiscal year(s) and associated amount: | | | | | | | Doc. Type | SPR 1 |
| | FY | | FY | | FY | | FY | | FY | | |
| | \$ | | \$ | | \$ | | \$ | | \$ | | |

PROJECT COSTS

| 1 | Fiscal Year | FY 12/13 | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 | TOTAL |
|---|-----------------------------|------------|------------|--------------|--------------|-------------|-------------|--------------|
| 2 | One-Time Cost | \$ 186,688 | \$ 403,546 | \$ 1,402,410 | \$ 5,119,203 | \$2,259,540 | 0 | \$9,371,387 |
| 3 | Continuing Costs | 0 | 0 | 0 | \$ 90,205 | \$852,690 | \$1,542,558 | \$2,485,454 |
| 4 | TOTAL PROJECT BUDGET | \$186,688 | \$403,546 | \$1,402,410 | \$5,1209,408 | \$3,112,230 | \$1,542,558 | \$11,856,841 |

PROJECT FINANCIAL BENEFITS

| | | | | | | | | |
|---|-------------------------|--------------|--------------|--------------|----------------|----------------|----------------|-----------------|
| 5 | Cost Savings/Avoidances | \$ (126,901) | \$ (298,918) | \$ (998,196) | \$ (4,753,222) | \$ (2,638,712) | \$ (1,275,555) | \$ (10,091,504) |
| 6 | Revenue Increase | \$ 0 | \$ 0 | \$ 0 | \$ 0 | \$ 0 | \$ 0 | \$ 0 |

2.5 Section E: Vendor Project Budget

| | |
|---|-----|
| Vendor Cost for SPR Development (if applicable) | N/A |
| Vendor Name | N/A |

| | |
|-----------|---------|
| Project # | 4265-21 |
| Doc. Type | SPR 1 |

VENDOR PROJECT BUDGET (One-Time)

| 1 | Fiscal Year | FY 12/13 | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 | FY TOTAL |
|---|-----------------------------------|-----------|------------|-------------|--------------|--------------|----------|-------------|
| 2 | Primary Vendor Budget | 0 | 0 | \$ 583,380 | \$ 1,210,467 | \$ 1,114,464 | 0 | \$2,908,311 |
| 3 | Independent Oversight Budget | 0 | 0 | \$ 37,520 | \$ 112,560 | \$ 93,800 | 0 | \$243,880 |
| 4 | IV&V Budget | 0 | 0 | 0 | \$ 55,263 | \$ 61,404 | 0 | \$116,667 |
| 5 | Other Budget (UCSF and OTech/DGS) | \$ 89,788 | \$ 134,628 | \$ 434,214 | \$ 486,186 | \$ 380,155 | 0 | \$1,524,971 |
| 6 | TOTAL VENDOR BUDGET | \$ 89,788 | \$134,628 | \$1,055,114 | \$1,864,477 | \$1,649,823 | 0 | 4,793,829 |

PRIMARY VENDOR HISTORY SPECIFIC TO THIS PROJECT

| | | |
|-----|-------------------------------|-------------------------------------|
| 7. | Primary Vendor | Hewlett Packard Enterprise Services |
| 8. | Contract Start Date | October 2014 |
| 9. | Contract End Date (projected) | April 2017 |
| 10. | Amount | \$ 2,908,311 |

PRIMARY VENDOR CONTACT

| | Vendor | First Name | Last Name | Area Code | Phone # | E-mail |
|----|------------------------|------------|-----------|-----------|----------|---------------------|
| 11 | HP Enterprise Services | John | Ferreri | 949 | 204 7335 | john.ferreri@hp.com |

2.6 Section F: Risk Assessment Information

| | | |
|---|-----|----|
| Has a Risk Management Plan been developed for this project? | Yes | No |
| | X | |

| | |
|-----------|---------|
| Project # | 4265-21 |
| Doc. Type | SPR 1 |

| |
|--|
| General Comment(s) |
| A new complexity assessment was completed and is included with this SPR. The project remains at medium complexity. |

3 Proposed Project Change

3.1 Executive Summary – Narrative

The Department of Public Health (CDPH) has prepared this Special Project Report (SPR) for the California Immunization Registry 4265-021 project (CAIR 2.0). The purpose of this SPR is to communicate and request Department of Technology approval for the proposed solution selected by CDPH and the associated budget and schedule changes.

The CAIR 2.0 Feasibility Study Report (FSR) was approved by the Department of Technology on December 10, 2012 with the following parameters:

- Schedule: Start date – December 2012; Implementation date – November 2015
- Budget: One-time cost - \$4,649,394; Continuing - \$2,347,305; Annual Maintenance and Operations (M&O) - \$1,393,009
- Complexity: Rating – Medium; Zone – II
- Funding sources: Federal grant, Special grant, Reimbursement, Redirection

The FSR proposed the initiation of a business-based procurement seeking a technical solution to consolidate seven of the ten California Immunization Registries (known as “CAIR 7”) into a single registry covering 87 percent of the state. The recommended solution will replace current CAIR software, add Health Level Seven International (HL7) messaging to support the Health Information Technology for Economic and Clinical Health (HITECH) Meaningful Use (MU) and allow interoperable connectivity to the remaining independent registries.

The CDPH conducted an extensive evaluation of four immunization registry software applications currently in use in 29 states, as well as 10 cities, counties, and territories. As a result of the evaluation, CDPH selected the Wisconsin Immunization Registry (WIR) as the preferred solution.

Subsequent to the solution selection, CDPH conducted a “best value” procurement for implementation services and selected Hewlett Packard (HP) as the implementation contractor for the Wisconsin Immunization Registry (WIR). Concurrently, CDPH was in the midst of completing a Special Project Report (SPR) to request approval from the Department of Technology for the selected solution and project schedule revisions. At that time, CDPH did not anticipate any budget changes. In order to complete procurement before the vendor offer expired, CDPH requested that Department of Technology approve the contract before the final version of the SPR was submitted and approved. Recognizing the importance of providing statewide access to immunization information, and risk of further delays if the offer expired, the Department of Technology granted permission to execute the implementation services contract. The required approvals from CDPH, California Health and Human Services Agency

(Agency), Department of Technology and the Centers for Medicare and Medicaid (CMS) were obtained and the contract was executed in October 2014.

In November 2014, CDPH prepared a draft SPR, requesting approval of WIR as the project solution, and revised schedule estimates and very small cost changes, based on information gained through the selection and procurement processes. The SPR was submitted to Agency in November 2014. The SPR proposed the following costs and schedule:

- Schedule: Start date – December 2012; Implementation date – September 2016
- Budget: One-time cost - \$4,695,783; Continuing - \$2,342,712; Annual Maintenance and Operations (M&O) - \$1,285,827
- Complexity: Rating – Medium; Zone – II (no change)

In December 2014, HP provided a complete list of the hardware and software that would be required to implement the WIR in California. The magnitude of projected budget requirements for the hardware and software went well beyond what had been anticipated prior to HP's work, and in January, 2015, Agency returned the SPR to CDPH for revisions.

From January 2015 to August 2015, SPR revisions have been in progress. The most substantial issues and barriers that have impacted the SPR delivery schedule include:

- February 2015 - Project leadership changed when the CDPH project manager abruptly retired and the former IPOC took her place.
- March 2015 to June 2015 - CDPH and Department of Technology engaged in extensive discussions and analysis to determine the technical architecture for the WIR environment.
- March 2015 to August 2015 - CDPH and Statewide Technology Procurement Division (STPD) engaged in extensive discussions and analysis regarding the procurement of additional services from HP. The additional services are required due to the extension of the project duration. After several discussions, STPD determined that a Non Competitive Bid (NCB) would be required.
- With very limited resources, in parallel with the SPR development, CDPH has developed the following:
 - An Implement Advance Planning Document Update (IAPDU) for the additional federal funding (March 2015 to June 2015),
 - A Control Section 11.00 Report for California legislative approval of the additional spending (June 2015 to August 2015), and
 - The above-mentioned NCB and associated contract amendment (July 2015 to August 2015).
- Each of the activities and documents has required multiple drafts and several levels of approval.

Throughout the development, CDPH has worked closely with their partners, Department of Health Care Services (as the point of contact for the IAPDU submission to CMS for funding), Agency, Department of Finance, and Department of Technology's IT Project Oversight Division, Enterprise Architecture Division and STPD. All partners have played a significant role to ensuring that the completed SPR would be in alignment with the IAPDU, Control Section 11.00 Report, and NCB and ready for approval.

The requested budget changes are mainly driven by costs for hardware and software that were not known in the FSR. The budget developed for the FSR was based on a standard CDPH hardware and software configuration using virtual servers, Microsoft Windows and SQL Server database. The WIR system runs on an Oracle database and Linux operating system. There are also some additional costs driven by the proposed schedule changes.

The schedule changes have been caused by several unanticipated events.

- The time required for review and approval by federal CMS and the California Department of Health Care Services (DHCS) was substantially longer than originally estimated by CDPH.
- Additional time was required to accommodate changes in the procurement methodology.
- In response to vendor feedback and to reduce project risks, the proposed production rollout schedule has been extended.

The business objectives, scope, and risk level have not changed since the original FSR. The procurement for integration services is completed. The initial contract for these services is within the budget approved in the FSR, has been executed by the Department of Technology, and the contractor has started work. HP has submitted a contract amendment to cover additional costs associated with the project delays.

The original plan, the FSR, was approved by California Department of Technology on December 10, 2012. This is the first SPR for this project.

3.2 Project Background/Summary

The following FSR excerpt provides a brief synopsis of the CDPH Immunization Program and the CAIR 2.0 project goals. The CAIR 2.0 business case and objectives have not changed from the original FSR.

The CDPH Center for Infectious Diseases (CID), Division of Communicable Disease Control (DCDC), and Immunization Branch's (IZB) mission is to provide leadership and support to public and private sector efforts to protect the population against vaccine-preventable diseases. The CDPH IZB tracks and monitors immunizations and diseases throughout the state; works in

partnership with health officials, health care providers, and the public to administer state and national immunization efforts; and provides epidemiological assessments and analyses. CDPH utilizes immunization data for epidemiological assessments and mandatory reporting.

While immunization protects children and adults alike, most immunizations are given to young children, and many of these are required by law for the child to enter kindergarten or licensed childcare facilities. In 2013, 31percent of children between the ages of 19-35 months in California were not fully up-to-date with their immunizations. These children and their under-immunized or unimmunized contacts of any age are at risk of hospitalization and possible death from whooping cough, influenza, measles, and other vaccine-preventable diseases.

The complexity of the evolving immunization schedule, the migration of children among health care providers through childhood, and the constraints of traditional medical record systems make tracking children's immunizations difficult. These factors contribute to both the lack of immunizations and to over-immunization, which occurs when records cannot be found to verify prior vaccinations. Many of these issues are especially difficult in California given its size and diversity.

An effective tool in achieving high vaccination levels is an immunization information system. Immunization registries are confidential, population-based, computerized information systems used to capture, store, track, and consolidate vaccination data from multiple sources and serve as an important tool in preventing and controlling vaccine preventable diseases and in increasing and sustaining vaccination coverage rates.

California currently has 10 regional registries and seven of these are managed for the regions by CDPH IZB. However, because these registries are not linked, when a child moves to another region of the state, their complete immunization record will not be available to the registry user, leaving the registry user in the same quandary as the non-user whether to immunize, perhaps redundantly, to assure protection or risk leaving the child unprotected. Similarly, immunizations given outside the region are not readily available to local public health departments trying to control disease outbreaks or determine immunization rates of local residents. Aggregated immunization data would increase the completeness of individual records and assist registry users in protecting their clients.

CDPH's vision is for any authorized user anywhere in the state of California to obtain comprehensive immunization information immediately on any California child to ensure the secure, electronic exchange of immunization records to support the elimination of vaccine preventable diseases. Participating providers and other authorized users are able to review immunizations on a new patient recorded in their regional registry easily.

CAIR users include health care providers, public health departments, schools, child care facilities, family child care homes, Women Infants and Children (WIC) service providers, foster care agencies, welfare departments, juvenile justice facilities, and other programs either providing, tracking or promoting immunization.

There are currently about 20,000 clinical healthcare providers (users) in the seven CAIR regional registries combined. These seven CAIR regions contain 87 percent of California's general population.¹

The CAIR 2.0 project will consolidate data from the seven CAIR software regions (CAIR 7), with the other three independent registries continuing to use their existing software or migrating to the consolidated system if they choose. Interoperability will be enabled via HL7 among the consolidated region, remaining regions, and providers. The existing CAIR software will be replaced with new software that will include patient indexing and HL7 import and export messaging capability, as well as enhanced capability for data export, analysis and reporting.

Key attributes of CAIR 2.0 include:

- Data from the current CAIR 7 will be consolidated into one database which covers 87 percent of California's zero through five year olds.
- Other regions may continue with their own systems or migrate to the consolidated system.
- If other regions choose to stay independent, they have agreed to send patient and vaccine doses updates to CAIR 2.0 so that all state immunization data will reside in the CAIR 2.0 'hub'.
- All software will be internet accessible.

¹ State of California. Department of Public Health. California Immunization Registry (CAIR) Project Feasibility Study Report (FSR) Version 3.0. July 14, 2011.

- HL7 will be enabled between the new centralized system and providers for query/response (QBP/RSP) messaging as well as vaccine update (VXU) messaging. Stand-alone regions will need to scale-up their existing HL7 capabilities.
- Data export, analysis and reporting capabilities will be enhanced.

3.2.1 Business Objectives & Measures

Table 3-1 describes the CAIR 2.0 project business objectives and success metrics.

Table 3-1 CAIR 2.0 Project Business Objectives and Success Metrics

| # | Business Objective | Recipient of Value | Metric | Baseline | Target | By Date | Methodology |
|---|--|---|---|--|--|--------------------------|--|
| 1 | Provide CAIR 2.0 software users access to statewide immunization information by June 2017 | Public, State, Local Health Departments (LHD) | Example test case: Can CAIR 2.0 NorCal Region access records in other regions? PASS/FAIL | FAIL | PASS | June 2017 | The requirements traceability process will ensure that one or more test cases address this requirement. After the user acceptance testing process, the CDPH IZB Chief signs off on the system acceptance form signifying that this key requirement has been met. |
| 2 | Reduce the time required to produce the CDC annual Immunization Information Systems Annual Report (IISAR) from 1 week to 1 hour by December 2017 | Public, State, CDC | Amount of time it takes to produce the CDC annual IISAR | 1 week | 4 hours | December 2017 | Produce the IISAR report. (This report includes aggregated, statewide, and current immunization data from California to meet requirements of the Comprehensive Child Immunization Act of 1993. ²) Note: The target for this metric has been lengthened slightly in consideration of normal factors that might affect the processing time. |
| 3 | Increase the number of California birth records being added to the CAIR 2.0 database from 45,000 records to 250,000 records by December 2017. | Public, State, CDC | Count the number of new birth records being added to the CAIR 2.0 database | 45K birth records months prior to importing new records | 250K birth records after implementation | December 2017 | Produce a report that counts the number of new birth records in CAIR 2.0 on December 2015 then December 2016. Compare to the total records. Note: This objective will be removed because it has been met through alternate means. |

² "Progress in Immunization Information Systems --- United States, 2009." Morbidity and Mortality Weekly Report (MMWR) January 14, 2011: 60(01); 10-12. 17 March 2011 <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6001a3.htm?s_cid=mm6001a3_w>.

| # | Business Objective | Recipient of Value | Metric | Baseline | Target | By Date | Methodology |
|---|--|------------------------------------|---|--------------|--|--------------------------|---|
| 4 | CAIR 2.0 can directly insert patient records and vaccine doses-containing HL7 messages by December 2017. | Public, State, LHD, CDC | Ability of CAIR 2.0 to directly consume HL7 messages (without aid of add-on translator) | FAIL | PASS | December 2017 | The requirements traceability process will ensure that one or more test cases address this requirement. After the user acceptance testing process, the CDPH IZB Chief signs the system acceptance form signifying that this key requirement has been met. |
| 5 | Reduce the time to compile a statewide report of Tdap/Pertussis booster doses administered from 1 week to 1 hour by December 2017. | Public, State, LHD, CDC | The amount of time it takes for CDPH to create the Tdap/Pertussis Report. | 1 week | 4 hours | December 2017 | Produce this report in four hours or less. Note: The target for this metric has been lengthened slightly in consideration of normal factors that might affect the processing time. |
| 6 | Reduce the time to produce a cross-regional or statewide Healthcare Effectiveness Data (& Information Set (HEDIS) patient match report from 1 week to 1 hour by December 2017. | Public, State | The amount of time to create the HEDIS report. | 1 week | 4 hours | December 2017 | Run a standard HEDIS patient match report in four hours or less. Note: The target for this metric has been lengthened slightly in consideration of normal factors that might affect the processing time. |
| 7 | Increase the number of HIEs exchanging data with the Immunization Information System (IIS) from 1 to 5 by December 2017. | Public, State, LHD, CDC | Number of HIEs exchanging data with CAIR | 1 | 5 (assumes >=5 HIEs exist) | December 2017 | Query CAIR system for the number of HIEs exchanging data. Query result must equal 5 or more exchanges. Note: This objective will be removed because it has been met through alternate means. |

3.2.2 Current Technical Environment

Immunization information is recorded, tracked or analyzed in California by thousands of health care providers and other parties, including A) providers not using a registry; B) regional registries and their users; and C) the State.³

- **Providers not using a registry:** Immunization information for individuals in the U.S. is stored by health care providers in medical charts, either as paper copies or in electronic health records. Paper records provided to parents are often lost or incomplete, especially if immunizations have been given by multiple providers throughout early childhood as is common for California's highly mobile population. When information is missing, providers either give possibly redundant shots to assure protection or choose not to administer a vaccine, which may result in under-immunization.
- **Regional registries:** Historically, California's Immunization Information System (IIS) strategy has been a de-centralized regionalized approach where the State provides funding to the autonomous regional registries. As a result, the current CAIR is not a network of registries; it is a collaboration of ten separate regions. Seven of the regions (CAIR 7) are managed by CDPH and are using a standardized single instance of the CAIR software application. The remaining independent registries each use their own system.

The CAIR software is not capable of consuming HL7-formatted messages, needed to support MU-compliant immunization reporting. However, as an interim solution, CDPH has installed an open source tool that translates HL7 messages into the CAIR native flat file format to enable consumption by the CAIR software.

The CAIR IZ Portal web application has recently become part of the CDPH Health Information Exchange (HIE) Gateway, providing an additional CAIR enhancement to support MU. Portal development was funded by the cooperative HIE agreement between CHHS and California Health eQuality/Institute for Population Health Improvement (IPHI)/University of California Davis (UCD). The CAIR IZ Portal acts as a single point of entry for CAIR 7 providers to submit HL7 immunization data. Some legacy submitters (59) are continuing to submit data via secure File Transfer Protocol (sFTP) but these sites will eventually be transitioned to HL7 data submission through the IZ Portal. Of the 4,919 data owner sites that have registered to submit patient data, 3,006 (61 percent) are now submitting 'production' data to one of the CAIR 7 registries. An additional 1,925 sites remain in testing. To date, over 13 million production HL7 messages have been received through the CAIR IZ Portal and imported into one of the CAIR 7 registries.

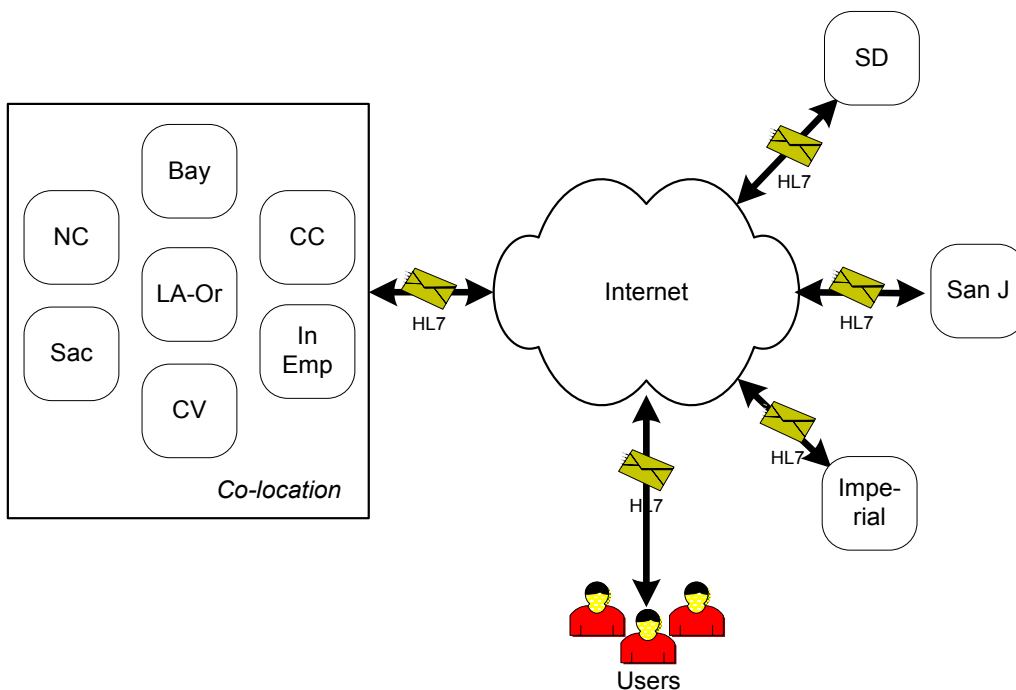
³ State of California. Department of Public Health. Statewide Immunization Information (SIIS) Project Feasibility Study Report (FSR) Version 1.0. July 23, 2008.

- State of California:** CDPH currently uses paper immunization records collected by each primary school to retrospectively assess immunization rates around the state. “Blue Card” data are reviewed by CDPH to determine immunization status at various ages. CDPH also obtains immunization rate estimates from the CDC’s annual National Immunization Survey (NIS), a random telephone sampling from all states. Aggregated Statewide Immunization Information System (SIIS) data would be valuable to CDPH for epidemiological studies and legislative and public health reports. It would also support improved monitoring and accountability of publicly-financed vaccines for children enrolled in Medi-Cal.

3.2.2.1 Current High-Level CAIR Architecture

The CAIR 7 registries are currently accessed through a web-based application using a standardized single instance of the CAIR software application. The three independent regions use their own registry software. The CAIR 7 servers are all co-located at the University of California Berkeley Data Center; however the databases are not linked, so the regional registries cannot easily share information with one another. See Figure 3-1.

Figure 3-1: Current High-Level CAIR Architecture



Legend

NC: Northern California
Bay: Bay Area
CC: Central Coast
In Emp: Inland Empire
CV: Central Valley
Sac: Greater Sacramento Area

La-Or: Los Angeles-Orange
SD: San Diego
San J: San Joaquin Valley
Imperial: Imperial County
HL7: Health Level Seven

3.2.2.2 Key Attributes

Key attributes of the current CAIR architecture include the following:

- Ten separate, isolated regional registries that cannot exchange data with one another.
- Seven regions use one product (CAIR software) co-located in one facility at the University of California Berkeley Data Center.
- CAIR software is developed with older, unsupported tools.
- All registries are internet accessible.
- All regions have demonstrated HL7 messaging exchange capability.

3.3 Project Status

CDPH conducted formal market research to determine the best CAIR 2.0 technical solution. All states' immunization registries are federally funded and overseen by the Centers for Disease Control (CDC). States must adhere to the mandatory CDC functional requirements; therefore, all state registries meet the same basic requirements.

Based on the functional requirements in the FSR, CDPH developed the evaluation method and criteria to test four alternative technical solutions. A rigorous market survey was performed over six months wherein experienced registry software users from across the state were asked to evaluate four different registry systems: iWeb, WebIZ, SDIR, and WIR. (More details on these systems are shown in Table 3-10, in section 3.5.4.1.)

The survey included internal and external stakeholders. CDPH collected the survey results and prepared a report on the findings. The WIR software was the solution with the highest survey points. The resulting survey showed a clear preference for the usability and features provided by the WIR software.

Based on extensive analysis, CDPH chose WIR for the technical solution, and entered into an Interstate Agreement with the State of Wisconsin for the use of the WIR software. The agreement grants CDPH the right to use, modify, and enhance the functionality of WIR at no cost. WIR is maintained and enhanced by a consortium of states. The consortium meets regularly to share costs, code, and lessons learned. California is able to freely exchange new functionality with other states. The licensing agreement for the public domain WIR software allows all states in the 17-states consortium to share enhancements developed or funded by any of the WIR states.

In July 2014, under the direction of the Department of Technology Division of Procurement, CDPH completed a lengthy procurement to provide integration services for CAIR 2.0. The procurement was very successful and HP won the contract. The agreement is a strict deliverables-based contract. Under the terms of the contract, HP will:

- Consolidate the seven (7) regional immunization registries into a single registry (CAIR 2.0).

- Establish interoperable connectivity between CAIR 2.0 and three other independent regional registries.
- Modify and install the WIR software as the single consolidated CAIR 2.0 (state hub) for the State of California.

The Department of Technology planned to execute the contract on July 30, 2014, however CMS did not approve the contract until October 2014. This delayed the contractor start date for two months past the planned date. HP started work in November 2014.

3.3.1 Accomplishments

- Gained approval for FSR and first Implementation Advance Planning Document (IAPD) in December 2012.
- Finalized the Project Plan and assigned a full time CDPH Project Manager.
- Established project team, roles and responsibilities.
- Developed and executed an Interagency Agreement (IAA) between DHCS and CDPH and to secure funding.
- Conducted formal market research for technical solution and selected the solution preferred by the stakeholders.
- Compiled the final set of CAIR 2.0 functional requirements based on market research and other states' lessons learned.
- Executed Interstate Agreement with Wisconsin for use of WIR.
- Revised procurement strategy for the integration services, developed the Invitation for Bid (IFB) and Statement of Work (SOW), completed the successful open solicitation and selected an integration services contractor.
- Gained CDPH, CMS, and DHCS approval for the implementation contract. Department of Technology executed contract.
- Updated Project Management Plan.
- Conducted weekly project team meetings.
- Conducted regular executive steering committee meetings.
- Completed requirements review sessions. Reviewed and approved an updated Requirements Traceability Matrix (RTM).
- HP has completed 31 deliverables on schedule (as of 6/23/15).
- Submitted IAPD-Update to DHCS to gain approval and federal funding for project changes.
- Prepared the SPR1.

3.4 Reason for Proposed Change

The CAIR 2.0 FSR specified that CDPH would implement a technical solution to consolidate the CAIR 7 into a single registry and establish interoperable connectivity to the three stand-alone registries. Based on our evaluation of the feasible options, CDPH has chosen to implement the WIR.

The purpose of this SPR is to gain approval from Agency and Department of Technology for the selected technical solution (WIR), and the budget and schedule changes required to implement the system.

3.4.1 Related Mandates

Some federal funding is contingent on the specific level of IIS completeness:

- **Comprehensive Child Immunization Act of 1993** – Provide aggregated, statewide, and current immunization data from California.
- CDC's Minimum Functional Standards for Registries – CAIR does not currently meet these standards.

3.5 Proposed Project Change

3.5.1 Proposed Solution

The proposed solution is to implement the WIR system for the CAIR 7 on virtual servers installed and set-up at the Department of Technology, Office of Technology Services (OTech) Tenant Manages Services – Premium (TMSp), running RedHat Linux operating system and an Oracle database. The CDPH has contracted with HP to provide implementation services.

3.5.2 Solution Description

The CAIR 2.0 system will be based on the Oregon implementation of the WIR application. WIR has been successfully implemented in 17 states, including New York and Texas, the two states closest in size to California. The software has been acquired through an interstate agreement which grants CDPH the right to use, modify, and enhance the functionality of WIR at no cost. All states in the consortium share enhancements paid for by any of the WIR states. The Oregon implementation was selected because Oregon's business rules and processes most closely match the California-specific requirements. HP, the implementation contractor, will be making enhancements to this base to meet the California requirements as they have been defined in the Implementation SOW.

In December 2014, as Deliverable 1.1 of the implementation contract, HP provided a hardware and software sizing recommendation for the CAIR 2.0 system⁴ based on the following criteria:

- User Volume (via User Interface) – standard user volumes, peak user volumes, and total potential user volumes
- System Interfaces – includes real-time updates and queries of immunization data; also includes number of interfaces and usage within each interface
- Data Volumes – total number of patients and immunizations stored within the system
- Service Levels – defined service levels and availability as outlined in the solicitation; also user expectations drive by real-time interface and MU requirements
- Scalability – proposed solution should be usable for at least 10 years.
- Comparability – review of current installations of WIR at other large states
- Failover requirements – each server is sized to be able to process the entire workload if necessary

The CDPH CAIR 2.0 plan to host the Linux/Oracle application in a virtual environment hardware plan will support the rapidly expanding needs of a modern IIS through 2020, maintaining high levels of system performance and availability, while accommodating increasing numbers of users, patients, vaccine doses, and greater and greater numbers of electronic transactions.

The recommended CAIR 2.0 conceptual infrastructure configuration is separated into an end-user facing type of environment for Production and Training and a non-end-user facing type of environment for Development, Test and Staging. The HP recommendation uses three-tier architecture to separate the web, application, and data tiers. The operating environment for this implementation is RedHat Linux. Software being used is Oracle WebLogic Server 12c and Oracle Relational Database Management System 11g.

CDPH has developed a high level architectural diagram, and saved it to the project SharePoint site. The architectural diagram is not included in this document per request by the CDPH Information Security Officer (ISO).

3.5.2.1 Hardware

The virtual infrastructure is built around a pair of HP c7000 blade enclosures. These enclosures can host a mix of different form factor server blades while providing redundant uplinks into the core network and the SAN using Virtual Connect modules. Up to 16 Intel CPU based half-height form factor blades can be hosted in a single HP c7000 blade enclosure.

⁴ HP's Deliverable 1.1, *Recommended Hardware and Software Architecture Requirements*

CDPH currently does not have any hardware for the CAIR project. CDPH will procure all hardware listed below to implement the proposed solution:

Table 3-2 CAIR 2.0 Hardware - Bill of Materials (BOM)

| Device Type | Device Description | Device Qty | CPU Cores |
|-------------------------------------|--|------------|-----------|
| Blade Server Enclosure | HP c7000 Blade Enclosure, N+N power supply and fan trays, 2 X Virtual Connect Flex-10/10D interconnect modules, 2 X Virtual Connect 8Gb 20-port modules, 20 X 10GbE SR SFP+, 8 X 8Gb FC shortwave SFP+ | 2 | n/a |
| Web Servers - Prod/Training | HP BL460c Gen9 w/ E5-2623v3 processor (4c, 3GHz), 16GB RAM (2 X 8GB DIMMs), FlexFabric 10Gb 2P FlexLOM, 16Gb FC 2P HBA, 2 X 400GB SSD | 2 | 8 |
| Application Servers - Prod/Training | HP BL460c Gen9 w/ 2 X E5-2623v3 processors (4c, 2.3GHz), 256GB RAM (8 X 32GB DIMMs), FlexFabric 10Gb 2P FlexLOM, 16Gb FC 2P HBA, 2 X 400GB SSD | 2 | 64 |
| Database Servers - Prod/Training | HP BL460c Gen9 w/ 2 X E5-2640v3 processors (8c, 2.6GHz), 256GB RAM (8 X 32GB DIMMs), FlexFabric 10Gb 2P FlexLOM, 16Gb FC 2P HBA, 2 X 400GB SSD | 2 | 32 |
| Web Server - Dev/Test/Stg | HP BL460c Gen9 w/ E5-2623v3 processor (4c, 3GHz), 16GB RAM (2 X 8GB DIMMs), FlexFabric 10Gb 2P FlexLOM, 16Gb FC 2P HBA, 2 X 400GB SSD | 2 | 8 |
| Application Servers - Dev/Test/Stg | HP BL460c Gen9 w/ 2 X E5-2640v3 processors (8c, 2.6GHz), 256GB RAM (8 X 32GB DIMMs), FlexFabric 10Gb 2P FlexLOM, 16Gb FC 2P HBA, 2 X 400GB SSD | 2 | 32 |
| Database Servers - Dev/Test/Stg | HP BL460c Gen9 w/ 2 X E5-2623v3 processor (4c, 3GHz), 256GB RAM (8 X 32GB DIMMs), FlexFabric 10Gb 2P FlexLOM, 16Gb FC 2P HBA, 2 X 400GB SSD | 2 | 16 |

3.5.2.2 Software

RedHat Linux is the recommended operating system. Oracle WebLogic 12c will be used to serve all the Java 2 Enterprise Edition (J2EE) components of the CAIR 2.0 project. Oracle Database Enterprise Edition 11g and Oracle Real Application Cluster (RAC) will be used as the database.

Table 3-3 CAIR 2.0 Operating System BOM

| Software | Part # | Qty | License | License Description |
|---|----------|-----|---|---|
| RedHat Enterprise Linux (RHEL) | G3J32AAE | 12 | * RHEL Svr 2 Sckt/2 Gst 5yr 24x7 E-LTU | RHEL 5-year 24x7 support license for 1-2 socket servers |
| * Note that the above RedHat license is for servers with up to 2 CPU sockets or maximum of 2 guests in virtual machine (vm) configurations. | | | | |

Table 3-4 CAIR 2.0 Oracle Processor Licensing - BOM for Prod/Training Environment

| Software Description | Oracle Part # | CPU Cores | License Factor | Processor Licenses |
|---|---------------|-----------|----------------|--------------------|
| Oracle Database Enterprise Edition - Processor Perpetual | A90611 | 32 | 0.5 | 16 |
| Oracle Real Application Clusters - Processor Perpetual | A90619 | 32 | 0.5 | 16 |
| Oracle Advanced Security - Processor Perpetual | A90622 | 32 | 0.5 | 16 |
| Oracle Partitioning - Processor Perpetual | A90620 | 32 | 0.5 | 16 |
| Oracle Diagnostic Pack - Processor Perpetual | A90649 | 32 | 0.5 | 16 |
| Oracle Tuning Pack - Processor Perpetual | A90650 | 32 | 0.5 | 16 |
| Oracle WebLogic Server Enterprise Edition - Processor Perpetual | L58978 | 64 | 0.5 | 32 |

Table 3-5 CAIR 2.0 Oracle Processor Licensing - BOM for Dev/Test/Staging Environments

| Software Description | Oracle Part # | Processor Licenses | Minimum Named User Per Processor | Named User Licenses |
|--|---------------|--------------------|----------------------------------|---------------------|
| Oracle Database Enterprise Edition – Named User Plus Perpetual | L10001 | 16 | 25 | 400 |
| Oracle Real Application Clusters - Named User Plus Perpetual | L10005 | 16 | 25 | 400 |
| Oracle Advanced Security - Named User Plus Perpetual | L10010 | 16 | 25 | 400 |

| Software Description | Oracle Part # | Processor Licenses | Minimum Named User Per Processor | Named User Licenses |
|---|---------------|--------------------|----------------------------------|---------------------|
| Oracle Partitioning - Named User Plus Perpetual | L10006 | 16 | 25 | 400 |
| Oracle Diagnostic Pack - Named User Plus Perpetual | L10012 | 16 | 25 | 400 |
| Oracle Tuning Pack - Named User Plus Perpetual | L10013 | 16 | 25 | 400 |
| Oracle WebLogic Server Enterprise Edition - Named User Plus Perpetual | L58970 | 32 | 25 | 800 |

Table 3-6 CAIR VMWare

| Software Description | Processor Licenses |
|----------------------------|--------------------|
| VMWare vCenter Standard | 3 |
| VMWare ESX Enterprise Plus | 10 |

3.5.2.3 Technical Platform

To reduce the risk of project delays, initial development will be done on the HP infrastructure while project changes are being reviewed and approved by control agencies. Ultimately, the development, testing, staging, production and training environments will be hosted at the OTech Tier III data center in the CDPH TMSp environment.

3.5.2.4 Development Approach

Based on formal market research and with participation from internal and external stakeholders, CDPH selected the WIR software for the technical solution and entered into an Interstate Agreement with the State of Wisconsin for the use of the WIR software. Implementation and custom development will be provided by the HP, the implementation contractor. In order to provide additional post-implementation stability, the contract with HP also includes two years of M&O support.

Table 3-7 Development Approach and Percentage

| Approach | Percentage (must add to 100%) |
|--|-------------------------------|
| Commercial Off-the-Shelf (COTS) | 0% |
| Modified Off-the-Shelf (MOTS) | 0% |
| Government Off-the-Shelf (GOTS) | 90% |

| Approach | Percentage (must add to 100%) |
|---------------------------|----------------------------------|
| Open Source | 0% |
| Custom Development | 10% |
| Other [briefly describe] | 0% |

3.5.2.5 Security

The CAIR 2.0 project is subject to the information security requirements as specified in the State Administrative Manual (SAM) Sections 5100 and 5300. As the state follows the federal cyber security standards, by following SAM, the CAIR 2.0 project will also comply with applicable FISMA, NIST and FIPS security requirements and controls.

3.5.3 Impact of Proposed Change on the Project

The requested changes will provide California with the tools necessary to consolidate seven CAIR regional registries serving 87 percent of the state, and establish interoperable connectivity to the three remaining independent regional registries.

The proposed changes will increase the project budget and lengthen the project schedule. The original project scope has not changed.

3.5.3.1 Schedule Changes

The CAIR 2.0 project schedule has been impacted by project approval delays, and an updated plan for system rollout to production. The following explains why changes to the CAIR 2.0 are being requested.

- Project maturity:** The FSR schedule was approved in December 2012, when many of the project details were unknown and the specific technical solution had not been selected. Additional information indicates that the original project time estimates were too short. Since selecting WIR, CDPH has collected project information such as “lessons learned” reports, costs, schedules, solicitation documents, tasks, schedules, contracts, resource requirements, technical specifications, and detailed functional requirements from other states. This additional experience and information has enabled CDPH to elaborate the project plan, develop a correct schedule and verify that the project scope and costs are on target.
- Procurement delays:** A change to the procurement approach triggered a late start for the implementation contractor. CDPH initially planned to execute a “lowest-cost” IFB because the requirements and technical solution were clearly defined, so a vendor proposal would not be needed, only a competitive cost. This appeared to be the quickest and most efficient procurement process available to CDPH.

However, the IFB required extensive revisions based on vendor feedback after CDPH released the draft in February 2014. Vendors criticized the aggressive schedule and restrictive mandatory vendor qualifications. Based on other states’ “lessons learned”, CDPH knew that for a successful implementation, the selected vendor must have WIR experience, or something very similar. CDPH could not risk an unqualified vendor winning the contract with the lowest costs and vendor comments revealed this was likely to happen. The Department of Technology, Procurement Division advised CDPH to switch to a “best-value” IFB.

This new strategy required a substantial amount of time and effort. CDPH released the final IFB on May 1, 2014. A successful solicitation was completed in July 2014, CMS and DHCS approved the contract in October 2014 and the Contractor started work on the project in November 2014.

- **Approval time:** Procurement approvals have driven additional schedule variances. CDPH underestimated the time required for DHCS, CMS and the Department of Technology to approve the IAA, the IFB, and the final implementation contract.
- **More time needed for roll-out to production:** Multiple vendors indicated CDPH underestimated the length of time needed to successfully roll out CAIR 2.0 to production. Consequently, CDPH revised the IFB to extend roll-out from two months to six months and split it into three sequential phases. The winning bidder agreed that the revised durations were reasonable. The proposed schedule is based on these durations and they are incorporated in the contract.

Table 3-8 below shows a comparison of the FSR-approved project schedule and the SPR-proposed schedule.

Table 3-8 Schedule Comparison - FSR to SPR

| Event [<i>Deliverable</i>] | FSR Estimated Completion Date <i>[Deliverable, if different]</i> | SPR Estimated Completion Date | Variance |
|---|---|-------------------------------|-----------|
| Project Start | December 2012 | December 2012 | 0 |
| Solicitation Document Preparation [<i>Solicitation Document</i>] | May 2013 | April 2014 - Complete | 11 months |
| Conduct Solicitation [<i>Vendor Final Proposals</i>] | September 2013 <i>[November 2013]</i> | June 2014 - Complete | 7 months |
| Evaluate Responses [<i>Notification of Intent to Award</i>] | December 2013 | July 2014 - Complete | 7 months |
| Vendor On-Board [<i>Acquisition Approved, Approved Contract, Consultant Starts</i>] | April 2014 <i>[March 2014]</i> | October 2014- Complete | 6 months |

| Event [<i>Deliverable</i>] | FSR Estimated Completion Date <i>[Deliverable, if different]</i> | SPR Estimated Completion Date | Variance |
|---|---|-------------------------------|------------------|
| Requirements Complete [<i>Requirements Specification Documents (final acceptance of contract task 2A deliverables)</i>] | July 2014 | June 2015-Complete | 11 months |
| Design Complete [<i>Design Documents (final acceptance of contract tasks 8 and 9 deliverables)</i>] | October 2014 | June 2015-Complete | 8 months |
| Approve IAPD-Update [<i>Approved IAPD-Update</i>] | Not in FSR | August 2015 | N/A |
| Approve Special Project Report (SPR) 1 [<i>Approved SPR 1</i>] | Not in FSR | August 2015 | N/A |
| Approve Control Section 11 [<i>Approved Control Section 11</i>] | Not in FSR | October 2015 | N/A |
| Execute HP Contract Amendment [<i>Executed HP Contract Amendment</i>] | Not in FSR | October 2015 | N/A |
| Approve Inter-Agency Agreement (IAA) [<i>Approved IAA</i>] | Not in FSR | October 2015 | N/A |
| Execute IV&V Purchase Order [<i>Executed IV&V Purchase Order</i>] | Not in FSR | October 2015 | N/A |
| Establish IPOC Service Request [<i>IPOC Service Request Established</i>] | Not in FSR | October 2015 | N/A |
| Establish TMSp Hosting Environment [<i>TMSp Hosting Environment Established</i>] | Not in FSR | January 2016 | N/A |
| System Build Complete [<i>System Build (final acceptance of contract tasks 5 & 6 deliverables)</i>] | April 2015 | June 2016 | 14 months |
| System Testing Complete [<i>System Testing (final acceptance of contract task 7 deliverables)</i>] | June 2015 | June 2016 | 12 months |
| User Acceptance Testing Complete [<i>User Acceptance Testing Sign-off (final acceptance of contract task 8 deliverables)</i>] | September 2015 | July 2016 | 10 months |
| <i>Deliverable - Go / No-Go Document Approved (final acceptance of contract task 11 deliverables 11.1 through 11.6)</i> | November 2015 | August 2016 | 9 months |
| Training Complete [<i>Training Material / User Manuals (final acceptance of contract tasks 9 & 10 deliverables)</i>] | November 2015 | September 2016 | 10 months |
| <i>Data Migration</i> | <i>September 2015</i> | <i>September 2016</i> | <i>12 months</i> |
| System Go Live | November 2015 | November 2016 | 12 months |
| Phase 1 Rollout [<i>Phase 1 Rollout (final acceptance of contract task 11 deliverable 11.7A)</i>] | Not in FSR | November 2016 | N/A |
| Phase 2 Rollout [<i>Phase 2 Rollout (final acceptance of contract task 11 deliverable 11.8.A)</i>] | Not in FSR | February 2017 | N/A |

| Event [<i>Deliverable</i>] | FSR Estimated Completion Date <i>[Deliverable, if different]</i> | SPR Estimated Completion Date | Variance |
|--|---|-------------------------------|------------------|
| Phase 3 Rollout [<i>Phase 3 Rollout (final acceptance of contract task 11 deliverable 11.9A)</i>] | Not in FSR | April 2017 | N/A |
| <i>Transition to M&O</i> | <i>November 2015</i> | <i>April 2017</i> | <i>17 months</i> |
| <i>Conduct Lessons Learned</i> | <i>November 2015</i> | <i>June 2017</i> | <i>19 months</i> |
| Formal Acceptance Project Complete [<i>Formal Acceptance Project Complete (final acceptance of all contract deliverables)</i>] | November 2015 | June 2017 | 19 months |
| <i>Decommission Old System</i> | <i>November 2015</i> | <i>June 2017</i> | <i>19 months</i> |
| <i>Administrative Closure</i> | <i>November 2015</i> | <i>June 2017</i> | <i>19 months</i> |
| <i>Deliverable - PIER</i> | November 2016 | June 2018 | 19 months |

See also, Exhibit 1: Original Schedule and Exhibit 2: Proposed Schedule.

3.5.3.2 Cost Changes

The CAIR 2.0 project budget has increased due to hardware and software costs that were not known when the FSR was approved. A small part of the increase is due to the extended project duration.

- Hardware/software:** When the FSR was developed in 2012, CDPH had not identified the specific immunization registry software solution. The original hosting budget was developed based on the assumption that the CAIR 2.0 would be hosted on the standard CDPH infrastructure. Anticipated costs for additional hardware and software were included in the hosting costs (one-time and continuing) on the FSR EAWs. After the project was approved, CDPH executed a rigorous selection process, soliciting requirements, evaluation and feedback from both internal and external stakeholder. WIR was selected as the system that met California’s requirements and had an extensive track record with 17 successful state implementations.

One month after starting their implementation contract, HP provided a complete list of all the hardware and software required to implement and support CAIR 2.0. HP based their recommendations on their experience successfully implementing WIR in multiple states, and platform requirements to meet the CAIR 2.0 contract Service Level Agreement (SLA).

“The following minimum SLAs shall be in effect for the duration of the contract.

- a) *Software uptime must be 24 x 7, 99.5% uptime excluding infrastructure incidents and scheduled system maintenance. This performance metric will be measured as an average over a calendar month and reported monthly to CDPH.*
- b) *Enable access to and retrieval of immunization information in the registry at the time of encounter.*
- c) *Allow a minimum of 3000 concurrent CAIR 2.0 application users.*
- d) *Standard query response time from production database should not exceed 30 seconds 99% of the time. Response time will be measured from the time the database server receives the query until the time the database server returns a response. Standard queries and performance requirements are defined in Exhibit 7.7 [of the IFB], and will be documented in the requirements and design deliverables of this Scope of Work (SOW). CAIR 2.0 application failures must be responded to within four hours.”*

The cost of the required hardware and software proposed by HP to meet the minimum SLAs in the contract exceeds CDPH original estimates, with the largest part of the expense being for Oracle licenses. IZB does not have funds budgeted for the additional licenses, so the issue was escalated to the Project Sponsor and the CDPH Director’s Office. Because CAIR 2.0 is a high priority and extremely important project, CDPH decided to request additional CMS funding to pay for the new expenses. The DHCS believed the request could be justified and that the approval of additional CMS funds would be likely. The IAPD-Update requesting additional federal funding is being moved forward in parallel with this SPR. The hardware, software and infrastructure costs for WIR increased the one-time project costs by \$2.6M over the FSR.

- **Short-term hosting costs:** CDPH cannot procure the servers and Oracle licenses, or build the hosting infrastructure until the SPR and project funding are approved. Some tasks will be postponed, but CDPH has mitigated some of the delay risk by revising the project schedule to enable work to continue on tasks not dependent on the OTech environment. Documenting functional and design requirements, training and test preparations, and data cleansing and migration discussions will continue to move forward until the OTech site is available.

HP will host the development environment at their site so CAIR 2.0 customizations can continue. Formal testing, system acceptance, training and rollout will not start until CDPH has prepared the OTech production environment. (Hosting costs are summarized in the total costs associated with the lengthened project schedule, below.)

- **Personnel Costs:** Personnel costs are driven by the lengthened project schedule, and additional staffing requirements. Based on feedback from potential vendors and other states’ “Lessons Learned”, CDPH has extended the rollout schedule from two

months to six months, and split it into three sequential phases. This will trigger a small increase in the contractor’s project management costs and CDPH staff costs. HP has submitted a contract amendment to cover the additional costs for hosting and the lengthened project schedule. Additional ITSD resources will be required to provide Oracle and Linux support, and one resource has been added to the CDPH project management team to mitigate project staffing risks. This combination of factors has increased the one-time project costs by \$992K over the FSR.

- **Independent Project Oversight (IPO) Services:** The IPO costs in the FSR were based on using CDPH internal resources to perform IPO. The IPO role has been transferred to Department of Technology. This increased the one-time project costs by \$243,880 over the FSR.
- **Continuing IT project costs:** Overall, the continuing IT project costs increased by \$149,549 per year over the FSR estimate. Staffing (state plus UCSF contract staff), and software licenses costs show increases, while contract services and data center services show substantial decreases.

See also, Exhibit 3: Original EAW and Exhibit 4: Proposed EAW.

3.5.3.3 Program Costs and Benefits

Detailed costs are shown in the proposed EAW (Exhibit 4). The estimated one-time and continuing costs of implementing the proposed solution are identified in Table 3-9 below.

Table 3-9 Proposed Solution – Cost Changes

| | SPR1 AMT | FSR AMT | Difference | Explanation of Changes |
|-----------------------------|-------------|-----------|-------------|--|
| ONE-TIME COST | | | | |
| Staff (Salaries & Benefits) | \$1,878,841 | \$851,547 | \$1,027,294 | Due to lengthened project schedule. Additional staffing for server and Linux support and PM support. |
| Hardware Purchase | \$588,156 | 0 | \$588,156 | Virtual servers required to support Linux/Oracle solution, SAN storage and disaster recovery backup storage. |
| Software Purchase/Licenses | \$1,941,351 | 0 | \$1,941,351 | Oracle, Linux, VMWare and MS licenses and one year annual maintenance. (FSR included Microsoft infrastructure in bundled Data Center Services) |

| | SPR1 AMT | FSR AMT | Difference | Explanation of Changes |
|------------------------------------|---------------------|--------------------|--------------------|---|
| Software Customization | \$2,908,311 | \$2,400,000 | \$508,311 | Contract amendment for Integration Contractor (HP) to provide hosting and extended project management and support services due to extended project schedule. |
| Project Oversight (Dept. of Tech.) | \$243,880 | 0 | \$243,880 | Project oversight conducted by Department of Technology. |
| IV&V Contract Services | \$116,667 | \$116,667 | 0 | |
| Other Contract Services* | \$1,524,971 | \$1,255,000 | \$269,971 | Additional UCSF costs due to lengthened project schedule; also STPD assistance with contracts. |
| Data Center Services | \$169,210 | \$26,180 | \$143,020 | One-time costs associated with additional infrastructure. |
| TOTAL ONE-TIME COST | \$9,371,387 | \$4,649,394 | \$4,721,994 | |
| CONTINUING COST | | | | |
| Staff (Salaries & Benefits) | \$470,353 | \$219,163 | \$251,190 | Comparison skewed due to timing of first full year. Annual cost difference \$138,419 (FSR) minus \$223,187 (SPR) equals \$84,768 for Linux support. |
| Software Maintenance/Licenses | \$764,397 | 0 | \$764,397 | Annual Oracle and Linux license renewals. |
| Contract Services | \$750,000 | \$1,741,667 | (\$991,667) | Comparison skewed due to timing of first full year. Annual cost difference \$1,100,000 (FSR) minus \$600,000 (SPR) equals (\$500,000). FSR estimate for M&O higher than actual HP contract. |
| Data Center Services | \$175,000 | \$386,475 | (\$211,475) | FSR included projected costs for Windows infrastructure. |
| Other (UCSF) | \$325,704 | 0 | \$325,704 | |
| TOTAL CONTINUING COST | \$2,485,454 | \$2,347,305 | \$138,149 | |
| YEARLY CONTINUING COST | \$1,542,558 | \$1,393,009 | \$149,549 | |
| TOTAL PROJECT COST | \$11,856,841 | \$6,996,699 | \$4,860,142 | |

*Other Contract Services represents the project costs of existing CAIR technical staff who are CDPH contract employees.

3.5.3.4 *Resource Requirements*

State staff resources required for this project are provided in the Proposed Alternative Economic Analysis Worksheets (EAW), on the two Staff (Salaries & Benefits) rows, under One-Time IT Project Costs and under Continuing IT Project Costs. Additional information is provided in the associated Details worksheet.

3.5.3.5 *Project Scope Changes*

No changes from FSR.

3.5.4 Feasible Alternatives Considered

3.5.4.1 Alternatives Considered

IR Systems: Through rigorous market research, CDPH identified the following IR systems used by other states, cities, territories and one California county. A group of internal and external stakeholders tested and evaluated each of the IR systems for usability and function.

Table 3-10 Immunization Registry Systems

| System | Platform | Installations | Advantages | Disadvantages |
|---|----------|---|--|--|
| iWeb (Scientific Technologies Corp.) | Oracle | States of Alaska, Arizona, Indiana, Louisiana, Mississippi, Washington, West Virginia, and Wyoming | <ul style="list-style-type: none"> Preferred for daily use by two of 19 reviewers. | <ul style="list-style-type: none"> Non-standard architecture (Oracle) Rated “unacceptable” by two or more reviewers participating in the CAIR Software Evaluation. |
| WebIZ (Envision Technology Partners, Inc.) | Windows | States of Colorado, Delaware, Kansas, and Nevada; Cities of Philadelphia, and San Antonio; Also Guam, Palau, Federated States of Micronesia, Marshall Islands, and American Samoa | <ul style="list-style-type: none"> CDPH standard operating system (Windows operating system) Preferred for daily use by two of 19 reviewers. | <ul style="list-style-type: none"> Rated “unacceptable” by two or more reviewers participating in the CAIR Software Evaluation. Not as scalable as WIR. Technical review by the CAIR Technical Team of each software’s “backend” database structure revealed weaknesses in the WebIZ when compared to the Oracle-based data structures. |

| System | Platform | Installations | Advantages | Disadvantages |
|---------------------------------|----------|---------------------|--|---|
| SDIR (Software Partners LLC) | Oracle | County of San Diego | <ul style="list-style-type: none">• Preferred for daily use by five of 19 reviewers. | <ul style="list-style-type: none">• Non-standard architecture (Oracle)• Rated unacceptable by two or more reviewers participating in the CAIR Software Evaluation. |

| System | Platform | Installations | Advantages | Disadvantages |
|--|---------------|--|--|--|
| <p>WIR (Wisconsin Immunization Registry)</p> | <p>Oracle</p> | <p>States of Arkansas, Georgia, Hawaii, Idaho, Iowa, Maryland, Maine, Minnesota, Montana, Nebraska, New Mexico, New York, North Carolina, Oregon, Virginia, Texas, and Wisconsin; Territories of Puerto Rico and U. S. Virgin Islands.</p> | <ul style="list-style-type: none"> • Successfully implemented in 17 states. Notably, the two states closest in size to California (New York and Texas) have chosen the WIR solution. • Clear preference of the reviewers participating in the CAIR Software Evaluation. Overall score of 3.88 (“very good” out of 5) compared to 2.87, 2.84, and 2.95 for other systems reviewed. • Preferred for daily use by 10 of 19 reviewers. • The interstate agreement grants CDPH the right to use, modify, and enhance the functionality of WIR at no cost. All states in the consortium share enhancements paid for by any of the WIR states. • Oracle is very secure and can be easily scaled to | <ul style="list-style-type: none"> • Non-standard architecture (Oracle) |

Infrastructure: After receiving the initial hardware and software recommendation from HP, CDPH did a thorough analysis of several infrastructure configurations designed to address different scenarios and collaborated with the Department of Technology and the California Health and Human Services Agency in order to select the best configuration for the CAIR 2.0 Project. Scenarios included:

- Reducing the size of the Test/Dev environment
- Reducing the size of the Production and Test/Dev environments
- Building for 2017 or 2020 anticipated demand
- Dedicated or virtual servers.

Based on the anticipated growth in users, patients, vaccines, and transactions, the risks associated with failing to adequately meet performance requirements, and the financial and procedural barriers to rapidly deploying additional capacity on an “as needed” basis, CDPH elected to follow HP’s sizing recommendation, deployed in a virtual server environment.

3.5.4.2 Rationale for Selection

The CAIR 2.0 Project will consolidate seven CAIR regional registries serving 87% of the state, implement a customized version of the WIR software in a virtualized Oracle-platform hosting environment, and will establish interoperable connectivity to the 3 ‘independent’ regional registries (CAIR San Joaquin, CAIR San Diego, and CAIR Imperial Valley). The WIR software is currently being used by 17 other US states, including Texas and New York, as well as multiple US territories.

The CDPH CAIR 2.0 Hardware/Software Plan will support the rapidly expanding needs of a modern IIS through 2020, maintaining high levels of system performance and availability, while accommodating increasing numbers of users, patients, vaccine doses, and greater and greater numbers of electronic data transactions. Growth projections for CAIR 2.0 are summarized below in Table 3-11: **CAIR Projected Growth**.

As noted in Table 3-11, all measurable system parameters will increase significantly through 2020, so the system capacity and performance supported by the CDPH Hardware/Software Plan are necessary. All parameters (except those noted by ^) are based on actual yearly increases we have observed from 2014 to 2015 projected out to 2017, 2020, and beyond 2020. This represents a conservative (low) estimate for the growth of CAIR 2.0.

One significant growth factor will be the transition of data exchange providers from one-way data submission to real-time, bidirectional messaging. Beginning in 2017, in addition to the one-way vaccine messages that CAIR currently receives from over 3,000 data exchange providers (VXU messages), Stage 3 of the federal EHR Incentive Program (‘Meaningful Use’) will require that IISs be capable of receiving HL7 patient queries messages (QBP, see ‘Real-time DX queries’ in Table 3-11) from provider electronic health record (EHR) systems

and returning HL7 response messages (RSP) containing patient information and vaccine recommendations (see 'Real-time DX updates' in Table 3-11) back to the submitting provider. This will significantly increase electronic transaction loads on CAIR 2.0 beginning in 2017.

Additionally, the planned initiation of data loading from the three 'independent' regional registries beginning in late 2017 will also represent a significant increase in CAIR load, necessitating adequate system capacity. CAIR has recently met with representatives of the three 'independent' CAIR registries and they have all agreed to begin sending their patients and doses to CAIR 2.0 beginning in late 2017 after the scheduled implementation of CAIR 2.0. Initially, CAIR 2.0 will receive an estimated 4.3M patients and 43M existing historical doses from the three regions. It is critical for CAIR 2.0 to have sufficient data volume and transactional capacity to consume this added data. Having all state immunization data reside in CAIR 2.0 will greatly benefit users, while at the same time allow the three independent registries to continue to use their own software.

An additional growth factor anticipated with CAIR 2.0 is the addition of many new schools and school users who have not previously been able to use CAIR 1 because of Macintosh browser incompatibility issues.

Another recent development is the impending mandate by the CA Board of Pharmacy for pharmacies in California to report immunizations to CAIR. There are an estimated 6,000 pharmacy sites in CA that will begin submitting data to CAIR electronically so additional transactional capacity will be necessary.

Additional critical features of the CDPH CAIR 2.0 Hardware/Software Plan are the following:

- Flexibility: The plan's reliance on the CDPH-standard, 'virtualized' hardware environment will allow flexible scale-up if projected growth exceeds expectations.
- Scalability: The plan would support a potential future move to cloud computing (State Cloud Computing Policy Technology Letter 14-04).
- High availability and reliable software performance: The proposed plan will satisfy the very high levels of system performance and availability described in the CAIR 2.0 Service Level Agreements (SLAs) that are needed to support the many thousands of clinical and non-clinical users of CAIR.
- Federal 'Meaningful Use' Incentive Program Support: The fact that the project was able to obtain a limited-term, 90%/10% federal /state funding match from CMS validates the role of CAIR 2.0 in supporting the more than 54,000 eligible providers (EPS), hospitals (EHs), and critical access hospitals (CAHs) in California who have already received EHR Incentive /MU Program payments for their demonstration of

'meaningful use', including for most, the ongoing submission of patient immunization data to CAIR.

Table 3-11 CAIR Projected Growth, 2015-2020

| Metrics | | CAIR 1 | | CAIR 2.0 | | CAIR 2.0 | | CAIR 2.0 | |
|---|---------------------|-----------------|--------------|------------------|--------------|------------------------|--------------|-----------------|--------------|
| | | Current Actual | | 2017 Projected * | | 2020 Projected* | | >2020 Projected | |
| | | # | % of CA Pop. | # | % of CA Pop. | # | % of CA Pop. | # | % of CA Pop. |
| 0-5 yr olds w/2 doses in CAIR (Healthy People 2020 objective is 95%) | | 2,000,337 | 68% | 2,244,000 | 75% | 2,842,517 | 95% | 2,992,123 | 100% |
| Total Doses | All Ages | 150,668,921 | | 194,765,429 | | 260,910,191 | | >300,000,000 | |
| | 0-18 yrs | 111,437,185 | | 132,257,477 | | 163,487,915 | | >200,000,000 | |
| | 19+ yrs | 39,231,736 | | 62,507,952 | | 97,422,276 | | >100,000,000 | |
| Total Patients | All Ages | 17,273,454 | | 24,613,585 | | 33,236,569 | | 34,248,477 | |
| | 0-18 yrs | 8,196,110 | 100% | 8,333,400 | 100% | 8,333,400 | 100% | 8,333,400 | 100% |
| | 19+ yrs | 9,077,344 | 27% | 14,826,000 | 57% | 23,448,984 | 90% | 25,915,077 | 100% |
| Active User Sites –Clinical (not DX) | | 3,805 | | 4,177 | | 4,735 | | >4,735 | |
| Active User Sites –Non-Clinical | | 4,036 | | 5,489 | | 8,118 ^{&} | | >8,118 | |
| Active Individual User – Clinical | | 24,885 | | 29,665 | | 33,250 | | >33,250 | |
| Active Individual User – Non-Clinical | | 15,761 | | 22,551 | | 34,736 [§] | | >37,736 | |
| Concurrent Users | | 3,000 | | 3,864 | | 5,031 | | >5,031 | |
| Cores | Development/Test | 4 | | 28 | | 56 | | >56 | |
| | Production/Training | 42 [#] | | 72 | | 104 | | >104 | |

[#] For all seven CAIR regional registries combined.

| Metrics | | CAIR 1 | | CAIR 2.0 | | CAIR 2.0 | | CAIR 2.0 | |
|--|--|-----------------|--------------|------------------------|--------------|-----------------|--------------|-----------------|--------------|
| | | Current Actual | | 2017 Projected * | | 2020 Projected* | | >2020 Projected | |
| | | # | % of CA Pop. | # | % of CA Pop. | # | % of CA Pop. | # | % of CA Pop. |
| Electronic Transactions | UI Search | 14,500,000 | | 24,100,000 | | 48,200,000 | | >48,200,000 | |
| | UI Client evaluation | 36,000,000 | | 58,100,000 | | 72,000,000 | | >72,000,000 | |
| | DX Sites Submitting Data | 3,166 | | 5,030 ^{&} | | 6,110 | | >6,110 | |
| | Total DX Updates | 13,534,754 | | 21,503,415 | | 26,120,451 | | >26,120,451 | |
| | Real-time DX Queries [^] | | | 72,000,000 | | 240,000,000 | | >240,000,000 | |
| | Real-time DX Updates [^] | | | 96,000,000 | | 288,000,000 | | >288,000,000 | |
| EHR Incentive Program | # of Individual providers (EPs), hospital(EHs), critical access hospitals (CAHs) participating | 54,000 | | 85,792 | | 88,692 | | | |
| Pharmacy Reporting Mandate (electronic submission) | # of pharmacy sites | | | 6,000 | | 6,000 | | 6,000 | |
| CAIR SJ, CAIR SD, and CAIR Imperial Regional Updates | | | | | | | | | |
| | Active Sites | 0 ^{**} | | 1,966 | | >2,000 | | >2,000 | |
| | Historical Patients | 0 | | 4,302,423 | | | | | |
| | Historical Doses | 0 | | 43,337,103 | | | | | |
| | Total DX Updates | 0 | | 1,674,330 | | 2,047,851 | | >2,047,851 | |

*Based on actual yearly increases observed from 2014 to 2015.

[^]CA does not currently engage in real-time bidirectional messaging so these numbers are projected based on the State of Oregon's current level of data exchange (DX) activity (80% data exchange) extrapolated to CA projected rate of DX by 2017 (80%, current =64% data exchange).

[&] Current enrollees at CAIR IZ Portal.

^{**} Not currently linked as a statewide registry. Will begin provider and client data uploads in late 2017.

[§] 500 additional school sites and 2,000 additional users added to yearly increase projections to account for new schools previously unable to access CAIR via Macintosh computers.

The rationale for selection of the WIR system was based on the following:

- The solution will meet the California requirements.
- The solution has been successfully implemented in 17 other states.
- The solution has been successfully implemented in other large states, including New York and Texas.
- Through the interstate agreement, California has the right to use, modify and enhance the functionality of WIR.
- Through the consortium of states, California shares in the experiences, lessons learned, and enhancements to WIR.
- WIR will be running on Linux and Oracle, which are well-established, reputable, and robust platforms that provide stability, security, and extensibility.

3.5.5 Implementation Plan

The Implementation Plan is the contract between HP and CDPH. The contractor will be responsible for customizing and implementing CAIR 2.0 at the State Data Center TMSp for CDPH. The contractor will be responsible for performing all tasks, completing all deliverables, and customizing the software to meet all the **Mandatory Requirements Specifications**.

The CDPH CAIR 2.0 project team will include Immunization Registry Program staff and Information Technology Services Division (ITSD) staff.

Contractor's approach, methodology and any assumptions shall be consistent with CDPH's security and privacy policies as described herein.

3.5.5.1 Implementation Contractor Responsibilities

HP is responsible for:

- Analysis and Design
- Implementing the technical architecture at TMSp. This includes installation of all hardware and software. HP must implement a J2EE-compliant application environment and an Oracle database. CDPH is responsible for all the hardware and software costs required to support the production system at the data center. There is no cost for WIR software.
- System build and configuration.
- Configuration management.
- Configuration management, system documentation, maintenance and operations manual, disaster recovery plan, and user manuals.

- Security.
- Data transformation and migration.
- Quality management - All quality management deliverables will be verified by the Independent Verification and Validation (IV&V) consultant.
- Testing.
- Training (HP will develop training plan and materials that the IZB will use to train users following a “train the trainers” approach.)
- Rollout to production.
- Maintenance and operation of CAIR 2.0 for the term of the contract.

The implementation plan will be updated as required to reflect any changes or amendments to the implementation contract.

3.5.5.2 Support, Ongoing Maintenance, and Knowledge Transfer

According to the terms of the implementation contract, HP will install, configure, program, support and provide ongoing Oracle database administration tasks throughout the life of the contract.

The HP contract has firm contract requirements to provide technical training to CDPH IT staff as specified in the **Technical Training Plan**. The following has been extracted from the HP contract:

“Contractor Roles and Responsibilities

- a.) Prepare the Technical Training Plan including training schedule (dates, times, locations).*
- b.) Identify the prerequisite training CDPH technical staff need prior to CAIR 2.0 technical training and knowledge transfer.*
- c.) Develop a Systems Documentation and Operations Manual for the CDPH Technical Team. The manual must include detailed tasks and instructions for supporting, maintaining, and enhancing the CAIR 2.0 system and the CAIR Oracle Database. The manual must include a CAIR 2.0 staffing plan for CAIR 2.0 on-going support and enhancements. The staffing plan should include a description of each role, required staffing levels, team organization structure, required knowledge, required skill level, duty descriptions with the percent of a full-time work, prerequisite training, and required CAIR training.*
- d.) Prepare instructor guide for CDPH to use for training future technical staff.*
- e.) Prepare Technical Training Materials.*
- f.) Conduct walk-through of Deliverables as needed.*
- g.) Conduct training.*

- h.) *CDPH will conduct internal and external training sessions using the new training program and materials developed by the contractor. At the conclusion of training, feedback from the users will be collected and assessed. Depending on the results of the feedback, the contractor shall modify the training program and materials to address negative concerns, if any, before CDPH accepts the final deliverable*

At the end of the base contract term, it is the State’s discretion whether to use the two one-year optional extensions for on-going maintenance and operation services and knowledge transfer to CDPH technical staff. The contractor will provide CAIR 2.0 maintenance and operation services, program mandatory requirements if authorized by CDPH, and continue knowledge transfer to CDPH technical staff.

3.5.5.3 Disaster Recovery Plan

CDPH will work closely with HP on contract deliverable (number 11.4) - Develop Business and System Disaster Recovery Plan.

4 Updated Project Management Plan

The CDPH is committed to a structured, methodical approach to project management and recognizes that this is required to ensure a successful outcome for this project. The Project Management Plan (PMP) has been developed to ensure a successful implementation and is compliant with the state’s Information Technology Project Management Methodology, the CA-PMM, managed by the Department of Technology. Details of the CA-PMM are found within the Statewide Information Management Methodology (SIMM) [Section 17.](#)

4.1 Project Manager Qualifications

There has been no change since the FSR in the required project manager qualifications. A new CA-PMM Complexity Assessment (Exhibit 5) was completed after selection of the preferred solution and the project remains at medium complexity.

Understanding the project’s complexity helps in assembling the right sponsors, project leadership and team and provides the measure of oversight required for the project. This project’s complexity scores, provided in Table 4-1 below, indicate that a Level 2 project manager is required and the Complexity Assessment should be done periodically, every two to three months and/or at the conclusion of each phase of the project. The Complexity Assessment detail can be found in Exhibit 6.

Table 4-1: Complexity Scores

| | | | |
|---|------------|--|------------|
| Business Complexity: | 2.2 | Technical Complexity: | 2.4 |
| Project Zone (Oversight Required on Zone IV): | | <input type="checkbox"/> I <input checked="" type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV | |

| | |
|---|--------------------------------|
| Project Manager Skill Set Level Recommendation based on CA-PMM: | Project Manager Level 2 |
|---|--------------------------------|

A qualified experienced project manager is critical to the success of any project, and this project’s complexity and risk levels will warrant an experienced project manager, assigned by the Planning and Project Management Branch (PPMB), working collaboratively with a Design, Development & Implementation (DD&I) lead, identified by the selected Project Implementation Contractor, and a business lead and technical lead assigned by DCDC.

Consistent and professional project management techniques and policies are necessary to complete this project. The PPMB-Project Management Office (PMO), in collaboration with the CDPH IZB, has assigned a well-qualified state project manager with proven experience planning and managing California IT projects of equivalent scope and complexity. The project manager will be responsible for managing the project schedule, budget, quality, and scope, assessing deliverables, tracking issues, managing risks and confirming that the appropriate IZB staff members and resources are involved with the project. To assure project success, the project manager meets or exceeds the minimum qualifications required by the CA-PMM for a Level 2 project manager:

- Experience: Three to five years as a key team member on a medium or large IT project or as a project manager on a small or medium IT project. Technical experience commensurate with the proposed technology.
- Professional Knowledge: Strong working knowledge of the CA-PMM, department’s methodology, system development life cycle (SDLC). Familiar with California budgeting, procurement, and contracting processes.

4.2 Project Management Methodology

There are no changes from the project management methodology documented in the FSR. The project management will adhere to the following guidelines:

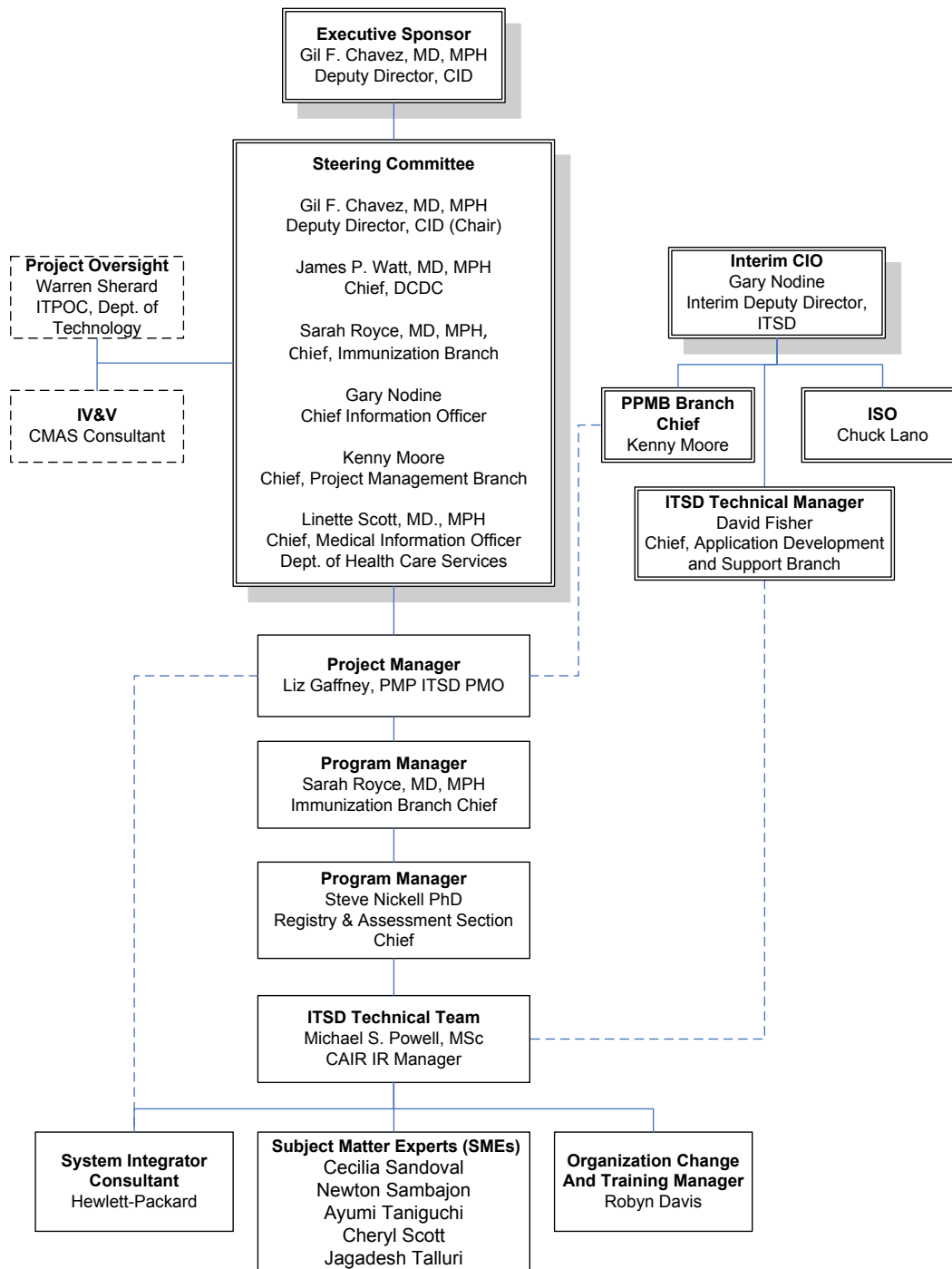
- CA-PMM, SIMM Section 17.
- The recommended project management and risk management practices from the State’s IT Project Oversight Framework, SIMM Section 45.
- The Project Management Body of Knowledge (PMBOK), latest edition, from the Project Management Institute.

Within each stage, the project work plan, risk management plan, communication plan, and contracts must be carefully monitored to mitigate changes to project scope, budget, and resource requirements. Adhering to a sound project management methodology at each stage of the project – from planning to evaluation – ensures that the project will achieve desired business outcomes, meet end-user expectations, and conclude on schedule and within budget.

4.3 Project Organization

This section describes the project team and oversight organization. The following figure indicates a few changes in the project structure that have occurred since the approval of the FSR. A description of the project team roles and responsibilities is provided in the FSR.

Figure 4-1: Project Team Structure



4.4 Project Priorities

The project priorities are unchanged from the FSR.

The terminology used is defined as:

- **Improved:** The component is most flexible, and will probably change if needed.
- **Constrained:** The component is least flexible, and is least likely to change.
- **Accepted:** The component is somewhat flexible, and may change somewhat if needed.

The following table represents the trade-off matrix for the project schedule, scope, and resources.

Table 4-2: Project Trade-off Matrix

| Schedule | Scope | Resources |
|----------|----------|-------------|
| Accepted | Improved | Constrained |

4.5 Project Plan

The PMP describes the project schedule and the methods and approaches to be taken for project management activities, including change management, quality control, human resources, communications, and risk management. The PMP helps ensure the timely and successful completion of the project goals and objectives through the definition of the activities and resources required to accomplish them and the means to perform them. The project plan defines each major task, estimates the time and resources required and provides a framework for tracking, monitoring, and reporting the progress to goals.

The original PMP was recorded in the FSR. The overall structure has not substantially changed, but the plans are being updated to reflect changes driven by the selected solution. For example, additional tasks have been added to the project schedule for the development and approvals of the SPR and IAPD-U, and procurement of software and hardware. Plans will continue to be updated throughout the duration of the project, as needed.

The PMP includes the following key subsidiary plans:

- Communication Plan
- Risk and Issue Management Plan
- Configuration Management Plan
- Change Control Plan
- Contract Management Plan

- Procurement Management Plan
- Cost Management Plan
- Schedule Management Plan
- Scope Management Plan
- Human Resource Management Plan
- Organization Change Management Plan
- Quality Management Plan
- Implementation Management Plan
- M&O Transition Plan

4.5.1 Project Scope

No change from FSR.

4.5.2 Project Assumptions

No change from FSR.

4.5.3 Project Roles and Responsibilities

IZB and Information Technology Services Division (ITSD) personnel resources will be involved in various activities of the project phases including, but not limited to: business requirements analysis, technical requirements analysis, acceptance testing and training. Other key project team members have been contracted through a procurement process and selection of HP as implementation contractor.

The project roles and responsibilities are unchanged from the FSR, except for the IPO representative, which is shown below. Project Team Roles and Responsibilities are detailed in the FSR Table 6-3 ([Link here](#)) pages 111-117. The IPO role has been transferred from CDPH to Department of Technology.

Table 4-3: Project Team Roles & Responsibilities

| ROLE | • RESPONSIBILITIES | REPRESENTATIVE |
|-------------------------------------|---|---------------------------------|
| Independent Project Oversight (IPO) | • <i>Provides adherence to SIMM 45, IT Project Oversight Framework.</i> | <i>Department of Technology</i> |

4.5.4 Project Schedule

See Exhibit 2, Proposed Schedule. The project start date is December 2012. Due to multiple factors, including extended times for federal and state reviews and approvals, changes to procurement methodology, and response to expert advice from potential implementation

vendors, the planned system go-live and project acceptance have been moved out to June 2017.

4.6 Project Monitoring and Oversight

Project activities will include monitoring and controlling the project’s schedule, budget, and scope. The process for tracking and reporting on the status of project deliverables, project schedule, and project budget is described in this section.

The project manager is responsible for overseeing all aspects of the project. The nature of the project warrants formal monitoring. A core component of the project plan is identifying deliverables, scheduling, and assigning them to contractor or project staff members. Actual delivery dates will be compared with scheduled due dates to aid in tracking and control. The project plan also mandates distribution of status updates and scheduling of checkpoint meetings.

The project manager will be responsible for monitoring the success of the system implementation within scheduling and fiscal constraints. The project will use the department’s existing budgeting and procurement mechanisms to track and control progress. The project manager will maintain copies of all budgetary and procurement documents related to the project and post them to a centralized project repository for reference.

The project manager will track and report on project status on an ongoing basis and will conduct regularly scheduled status meetings with HP and team members to discuss project progress, issue resolution, change requests, and next steps.

The Communication Plan within the PMP describes the meetings and reports that will be conducted to monitor, control and communicate project status.

Table 4-4 Meetings

| Meeting Title | Distribution List/ Participants | Frequency |
|--|---|-------------------|
| Project Management Team Status Meeting | Project Team, CIO, PPMB Chief, optional IPO & IV&V | Weekly |
| Partnership Meeting | Agency, Department of Technology, CDPH Chief Information Officer (CIO), PPMB Chief, Project Manager, (Others as needed) | Monthly |
| Project Websites | Public | Monthly |
| Change Committee Meeting | Change Coordinator, Project Manager, Project Team Leads and if necessary Steering Committee | Weekly as needed. |

| Meeting Title | Distribution List/ Participants | Frequency |
|--|--|-----------|
| Executive Steering Committee Meeting | Executive Steering Committee, State Project Manager, ISO, IPO, IV&V Consultant, Integrator, and Project Team | Monthly |
| CDPH / HP Collaborative Leadership Meeting | CDPH / HP Executives, Project Sponsor, PPMB Chief, CIO, State Project Manager, Application Development and Support Branch (ADSB) Chief, Data Center Operations and Services Branch (DCOSB) Chief | Monthly |
| CAIR 2.0 CHHS/Dept. of Technology Status Meeting | State PM, HP PM, CHHS, Department of Technology, Program Participants (Optional) | Weekly |

Table 4-5 Reports

| Report Title | Prepared By | Distribution List/ Participants | Frequency |
|--|-----------------------|--|-----------|
| Project Status Report (PSR) | State Project Manager | CIO, Steering Committee, Department of Technology, CHHS | Quarterly |
| Schedule & Risk reports to Technology Agency. | State Project Manager | CIO, Steering Committee, Department of Technology, CHHS | Monthly |
| IPO | IPO resource | CIO, Steering Committee, Department of Technology, CHHS, State Project Manager | Quarterly |
| IV&V Report | IV&V Consultant | Executive Steering Committee, State Project Manager, IPO resource, HP Project Manager, CHHS., and Department of Technology | Quarterly |
| Hewlett Packard (HP) Integrator Status Reports | HP Integrator | State Project Manager, IPO resource, Project Team, and IV&V Consultant | Monthly |

4.7 Project Quality

Quality Management planning is the process of identifying which quality standards are relevant to the project and determining how to satisfy them. Fundamentally, quality and quality management are planned, designed, and incorporated within the process and not added as an afterthought.⁵ No amount of inspection – after a product is produced – can put quality into a product. In order to have a quality product, the system integrator, HP, has been tasked with preparing all quality management deliverables as specified in the contract. The state project manager, state IPO manager and IV&V consultant will validate the quality of HP’s quality methods, processes and deliverables. The HP’s quality management deliverables will include:

- Develop Quality Management Plan

⁵ Ibid., p.183-184.

- Develop and maintain a Requirements Traceability Matrix
- Develop Test Plan, including process and metrics
- Develop system and user test scripts and scenarios
- Prepare testing environment and data
- Facilitate testing
- Record and report on testing errors
- Resolve system and data errors

4.8 Change Management

Change is an inevitable occurrence in any project. A change is defined as any alteration to the project including direction, requirements, hardware, software, application, network, operations or environment that adds to, deletes from, or in any way modifies the scope of work. In order to effectively manage change for this project, the PMP includes a Change Management Plan that defines the process, procedures, and outputs for all change-related project activities. The plan identifies the parties responsible for identifying, resolving, supporting, approving, making, tracking, and reporting project changes. The major goal of this change management strategy is to ensure changes are made using a standardized consistent methodology and procedures that minimize negative impacts and maximize positive impacts to the requirements, design, development, implementation, and maintenance of the system.

The Change Management Plan defines the processes and procedures for reporting an identified need for change; how the change request will be analyzed and documented; how the change will be acted upon for review, approval or denial; and, how the change will be incorporated into the project. The plan is designed to:

- Minimize project risk.
- Provide documentation for all changes.
- Minimize disruption to the project due to rework.
- Measure project volatility.
- Provide open disclosure of changes.
- Communicate changes and status of changes to stakeholders.
- Maximize system/application value.
- Minimize unanticipated impacts to schedule and/or budget.

The formal change management process will provide a mechanism for the review and approval of system functional requirements, schedule, or costs changes. This process will allow the project team to review and prioritize changes during the SDLC. All issues that cannot be resolved by the team level will be escalated to the steering committee. A well-defined and

properly executed change management process reduces risk and increases the likelihood of project success.

The PMP defines the change control process and how changes are prioritized. It also addresses successful implementation by planning for organizational change management.

4.9 Authorization Required

Authorization for this project will follow a reportable project process with authorization required from the Sponsoring Deputy Director, CDPH CIO, CDPH Budget Officer, CDPH Director, CHHS Agency, and Department of Technology.

5 Updated Risk Management Plan

Although CDPH knows more about the project since the FSR and the team is much more confident that the project will be successful, the updated Project Management Methodology (PMM) Complexity Assessment revealed that the project will remain at medium complexity level. See Exhibit 5 for the updated Complexity Assessment spreadsheet.

Table 5-1 Risk Register

| #-Level | Risk | Mitigation |
|--------------|--|---|
| 12 Yellow | Delays in approvals of funding and approval documents may cause delays in the implementation of a TMSP hosting environment. | The TMSP hosting environment is planned to be in place by January 4, 2016. HP in providing the hosting environment on a temporary basis. Department of Technology and CHHS are working closely with CDPH on critical documents (including the SPR, Control Section 11, IAPDU, and HP Contract Amendment) that may impact the January 4, 2016 TMSP hosting delivery if not approved as planned. Monthly status meetings have been established with CDPH, HP, Department of Technology and Agency to monitor the status on the schedule. |
| 31 Yellow | Delays in hardware/software procurement and establishing the TMSP hosting environment may cause project delays. | The TMSP hosting environment is planned to be in place by January 4, 2016. The project schedule for procurement, product delivery, and establishing the virtual environment have been evaluated and verified by the Data Center Operations Services Branch (DCOSB). Hardware/software procurement process will begin early and agreement documentation will be developed up to execution in order to be prepared for funding availability and project approvals. CDPH will work closely with HP to understand processes, establish Access, etc. |
| 15 Yellow | CDPH has no direct visibility into external processes and little influence on external resources. This may delay approval of documents required prior to purchase of hardware and/or | Department of Technology, CHHS, and DHCS have collaborated with CDPH on developing a realistic plan. The project manager is collaborating closely with resources on task activities and continues to provide resources with a thorough explanation of critical dependencies. CDPH, |

| #-Level | Risk | Mitigation |
|--------------|---|--|
| | software and establishment of the TMSp hosting environment. Some resources such as STPD, DHCS, and CMS are assigned to tasks with critical dependencies. | CHHS and Department of Technology meet on a weekly basis to collaborate on resources, the project schedule and project risks. |
| 29 Yellow | Changes in SPR after final IAPDU information is transmitted to DHCS (Sent June 18, 2015) may cause IAPDU to be pulled back for additional revisions and re-submission, thus beginning another 60 day review cycle by CMS. | Risk discussed with DHCS, Department of Technology and CHHS. Draft SPR and EAWs sent to Department of Technology and CHHS. Hardware/Software configuration meeting was held with Department of Technology and CHHS and the SPR was updated with outcome of the meeting. Meeting is planned to walk through project costs and executive briefings will be scheduled. |
| 11 Yellow | The use of Linux technology unfamiliar to the project team could cause project delays. | This risk has been partially mitigated in the HP contract amendment by adding a resource for Linux support. A CDPH resource has been added to the CDPH Staffing Plan and will receive knowledge transfer from HP prior to assuming ongoing Linux support activities. |
| 30 Green | The use of virtual environment technology unfamiliar to the HP team could cause project delays. | Since the initial HP plan was to host on physical servers, CDPH is working closely with HP on activities and related risks to hosting the CAIR 2.0 application in a virtual environment. |
| 6 Green | California public health crises could require the focus of the project sponsor and other high-level department management. | The project manager will work with the sponsor, steering committee, and project team to assess and possibly revise the project plan to accommodate the situation. If the delay is significant, this may require a new schedule, budget and approvals before continuing. |
| 17 Green | Data may require more transformations than anticipated delaying migration to new system. | Develop a rigorous training and quality assurance plan, test scripts, use IV and V services, and conduct wide spread user acceptance testing to minimize this risk. The CDPH and HP project managers will work with the project team to assess and propose a revised plan to accommodate the situation. |
| 8 Green | Regional stakeholders may not have the resources to support the CAIR 2 project implementation, training, testing and other project activities. | The project manager will monitor the risk and adjust the project plan as needed, such as, assign alternative resources. If necessary this issue will be raised to the project sponsor and a contingency plan will be developed. A program SME has been assigned to oversee all organizational change management, training and outreach activities. This will insure regional stakeholders get consistent and timely information from the CAIR 2.0 project team and vice versa. |

6 Economic Analysis Worksheets (EAWs)

See also, Exhibit 3 for the complete Original Approved EAW and Exhibit 4 for the complete Proposed EAW.

| SIMM 20C30C, Rev. 03/2011 Department: Public Health Project: CAIR 2.0 Strategy | EXISTING SYSTEM/BASELINE COST WORKSHEET | | | | | | | | | | | | Date Prepared FSR: 07/14/11 | |
|--|---|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|-----------------------------|-------------------|
| | All costs to be shown in whole (unrounded) dollars. | | | | | | | | | | | | Updated FSR: 11/20/12 | |
| | | | | | | | | | | | | | Updated SPR1: 6/16/2015 | |
| | FY 2012/2013 | | FY 2013/2014 | | FY 2014/2015 | | FY 2015/2016 | | FY 2016/2017 | | FY 2017/2018 | | TOTAL | |
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| Continuing Information | | | | | | | | | | | | | | |
| Technology Costs | | | | | | | | | | | | | | |
| Staff (salaries & benefits) | 0.2 | 34,662 | 0.2 | 34,662 | 0.2 | 34,662 | 0.2 | 34,662 | 0.2 | 34,662 | 0.2 | 34,662 | 1.2 | 207,974 |
| Hardware Lease/Maintenance | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| Software Maintenance/Licenses | | 42,000 | | 42,000 | | 42,000 | | 42,000 | | 42,000 | | 42,000 | | 252,000 |
| Contract Services | | 984,000 | | 984,000 | | 984,000 | | 984,000 | | 984,000 | | 984,000 | | 5,904,000 |
| Data Center Services | | 20,000 | | 20,000 | | 20,000 | | 20,000 | | 20,000 | | 20,000 | | 120,000 |
| Agency Facilities | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| Other | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total IT Costs | 0.2 | 1,080,662 | 0.2 | 1,080,662 | 0.2 | 1,080,662 | 0.2 | 1,080,662 | 0.2 | 1,080,662 | 0.2 | 1,080,662 | 1.2 | 6,483,974 |
| Continuing Program Costs: | | | | | | | | | | | | | | |
| Staff | 0.1 | 9,770 | 0.1 | 9,770 | 0.1 | 9,770 | 0.1 | 9,770 | 0.1 | 9,770 | 0.1 | 9,770 | 0.6 | 58,620 |
| Other | | 922,000 | | 922,000 | | 922,000 | | 922,000 | | 922,000 | | 922,000 | | 5,532,000 |
| Total Program Costs | 0.1 | 931,770 | 0.1 | 931,770 | 0.1 | 931,770 | 0.1 | 931,770 | 0.1 | 931,770 | 0.1 | 931,770 | 0.6 | 5,590,620 |
| TOTAL EXISTING SYSTEM COSTS | 0.3 | 2,012,432 | 0.3 | 2,012,432 | 0.3 | 2,012,432 | 0.3 | 2,012,432 | 0.3 | 2,012,432 | 0.3 | 2,012,432 | 1.8 | 12,074,594 |

**CAIR 2.0 Budget
Special Project Report 1
Version(June 2015)**

SIMM200300, Rev. 03/2011
Department: Public Health
Project: CAIR 2.0 Strategy

**PROPOSED ALTERNATIVE Corresponds to Alternative #2B - Partial Consolidation w/New Registry Software
CAIR 2.0**

Date Prepared FSR:07/14/11
A.R.P. Updated: 6/16/2015

All Costs Should be shown in whole (unrounded) dollars.

| | FY 2012/2013 | | FY 2013/2014 | | FY 2014/2015 | | FY 2015/2016 | | FY 2016/2017 | | FY 2017/2018 | | SPR1 TOTALS | |
|--|---------------|------------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------|------------------|-------------|-------------------|
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| One-Time IT Project Costs | | | | | | | | | | | | | | |
| Staff (Salaries & Benefits) | 0.6 | 96,901 | 1.7 | 268,918 | 2.5 | 347,296 | 3.6 | 556,010 | 3.9 | 609,717 | 0.0 | 0 | 12.1 | 1,878,841 |
| Hardware Purchase | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 588,156 | 0 | 0 | 0 | 0 | | 588,156 |
| Software Purchase/License | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,941,351 | 0 | 0 | 0 | 0 | | 1,941,351 |
| Telecommunications | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Contract Services | | | | | | | | | | | | | | |
| Software Customization | - | - | - | - | 583,380 | 583,380 | 1,210,467 | 1,210,467 | 1,114,464 | 1,114,464 | 0 | 0 | | 2,908,311 |
| Project Management | - | - | - | - | - | - | - | - | - | - | 0 | 0 | | - |
| Project Oversight (Dept. of Tech) | - | - | - | - | 37,520 | 37,520 | 112,560 | 112,560 | 93,800 | 93,800 | 0 | 0 | | 243,880 |
| IV&V Services | - | - | - | - | - | - | 55,263 | 55,263 | 61,404 | 61,404 | 0 | 0 | | 116,667 |
| Other Contract Services (DGS/OTech and UCSF) | 89,788 | 89,788 | 134,628 | 134,628 | 434,214 | 434,214 | 486,186 | 486,186 | 380,155 | 380,155 | 0 | 0 | | 1,524,971 |
| TOTAL Contract Services | 89,788 | 89,788 | 134,628 | 134,628 | 1,055,114 | 1,055,114 | 1,864,477 | 1,864,477 | 1,649,823 | 1,649,823 | 0 | 0 | | 4,793,829 |
| Data Center Services | 0 | 0 | 0 | 0 | 0 | 0 | 169,210 | 169,210 | 0 | 0 | 0 | 0 | | 169,210 |
| Agency Facilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Total One-time IT Costs | 0.6 | 186,688 | 1.7 | 403,546 | 2.5 | 1,402,410 | 3.6 | 5,119,203 | 3.9 | 2,259,540 | 0.0 | 0 | 12.1 | 9,371,387 |
| Continuing IT Project Costs | | | | | | | | | | | | | | |
| Staff (Salaries & Benefits) | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.6 | 90,205 | 1.0 | 156,961 | 1.5 | 223,187 | 3.1 | 470,353 |
| Hardware Lease/Maintenance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Software Maintenance/Licenses | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 382,198 | 382,198 | 382,198 | 382,198 | | 764,397 |
| Telecommunications | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Contract Services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150,000 | 150,000 | 600,000 | 600,000 | | 750,000 |
| Data Center Services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 87,500 | 87,500 | 87,500 | 87,500 | | 175,000 |
| Agency Facilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Other (UCSF) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 76,031 | 76,031 | 249,673 | 249,673 | | 325,704 |
| Total Continuing IT Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.6 | 90,205 | 1.0 | 852,690 | 1.5 | 1,542,558 | 3.1 | 2,485,454 |
| Total Project Costs | 0.6 | 186,688 | 1.7 | 403,546 | 2.5 | 1,402,410 | 4.1 | 5,209,408 | 4.9 | 3,112,230 | 1.5 | 1,542,558 | 15.2 | 11,856,841 |
| Continuing Existing Costs | | | | | | | | | | | | | | |
| Information Technology Staff | 0.2 | 34,662 | 0.2 | 34,662 | 0.2 | 34,662 | 0.2 | 34,662 | 0.1 | 17,331 | 0.1 | 17,331 | 1.0 | 173,311 |
| Other IT Costs (UCSF) | 986,212.40 | 986,212.40 | 941,371.70 | 941,371.70 | 641,785.90 | 641,785.90 | 589,813.75 | 589,813.75 | 589,813.75 | 589,813.75 | 796,327.50 | 796,327.50 | | 4,545,325 |
| Total Continuing Existing IT C | 0.2 | 1,020,875 | 0.2 | 976,034 | 0.2 | 676,448 | 0.2 | 624,476 | 0.1 | 607,145 | 0.1 | 813,659 | 1.0 | 4,718,636 |
| Program Staff | 0.1 | 9,770 | 0.1 | 9,770 | 0.1 | 9,770 | 0.1 | 9,770 | 0.1 | 9,770 | 0.1 | 9,770 | 0.6 | 58,620 |
| Other Program Costs | 922,000 | 922,000 | 922,000 | 922,000 | 922,000 | 922,000 | 922,000 | 922,000 | 922,000 | 922,000 | 922,000 | 922,000 | | 5,532,000 |
| Total Continuing Existing Pro | 0.1 | 931,770 | 0.1 | 931,770 | 0.1 | 931,770 | 0.1 | 931,770 | 0.1 | 931,770 | 0.1 | 931,770 | 0.6 | 5,590,620 |
| Total Continuing Existing Costs | 0.3 | 1,952,645 | 0.3 | 1,907,804 | 0.3 | 1,608,218 | 0.3 | 1,556,246 | 0.2 | 1,538,915 | 0.2 | 1,745,429 | 1.6 | 10,309,256 |
| TOTAL ALTERNATIVE COSTS | 0.9 | 2,139,333 | 2.0 | 2,311,350 | 2.8 | 3,010,628 | 4.4 | 6,765,654 | 5.1 | 4,651,145 | 1.7 | 3,287,987 | 16.8 | 22,166,097 |
| INCREASED REVENUES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |

| PROJECT FUNDING PLAN | | | | | | | | | | | | | | |
|---|--------------|----------------|--|----------------|--------------|------------------|--------------|------------------|----------------------------|------------------|--------------|------------------|-------------|-------------------|
| SIMM 20C30C, Rev. 03/2011 | | | All Costs to be in whole (unrounded) dollars | | | | | | Date Prepared FSR:07/14/11 | | | | | |
| Department: Public Health | | | | | | | | | SPR 6/16/2015 | | | | | |
| Project: CAIR 2.0 Strategy | | | | | | | | | | | | | | |
| | FY 2012/2013 | | FY 2013/2014 | | FY 2014/2015 | | FY 2015/2016 | | FY 2016/2017 | | FY 2017/2018 | | TOTALS | |
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| TOTAL PROJECT COSTS | 0.6 | 186,688 | 1.7 | 403,546 | 2.5 | 1,402,410 | 4.1 | 5,209,408 | 4.9 | 3,112,230 | 1.5 | 1,542,558 | 15.2 | 11,856,841 |
| RESOURCES TO BE REDIRECTED | | | | | | | | | | | | | | |
| Staff | 0.6 | 96,901 | 1.7 | 268,918 | 2.5 | 347,296 | 4.1 | 556,010 | 4.9 | 609,717 | 1.5 | 223,187 | 15.2 | 2,102,028 |
| Funds: | | | | 0 | | | | | | | | | | |
| Existing System | | 89,788 | | 134,628 | | 434,214 | | 486,186 | | 456,186 | | 249,673 | | 1,850,675 |
| Other Fund Sources | | 0 | | 0 | | 620,900 | | 4,167,212 | | 2,046,327 | | 1,069,698 | | 7,904,138 |
| TOTAL REDIRECTED RESOURCES | 0.6 | 186,688 | 1.7 | 403,546 | 2.5 | 1,402,410 | 4.1 | 5,209,408 | 4.9 | 3,112,230 | 1.5 | 1,542,558 | 15.2 | 11,856,841 |
| ADDITIONAL PROJECT FUNDING NEEDED (PER FY) | | | | | | | | | | | | | | |
| One-Time Project Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| Continuing Project Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| TOTAL ADDITIONAL PROJECT FUNDS NEEDED BY FISCAL YEAR | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| TOTAL PROJECT FUNDING | 0.6 | 186,688 | 1.7 | 403,546 | 2.5 | 1,402,410 | 4.1 | 5,209,408 | 4.9 | 3,112,230 | 1.5 | 1,542,558 | 15.2 | 11,856,841 |
| Difference: Funding - Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| Total Estimated Cost Savings | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| FUNDING SOURCE* | | | | | | | | | | | | | | |
| General Fund | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 |
| Federal Fund | 30% | 56,006 | 30% | 121,064 | 30% | 420,723 | 32% | 1,653,028 | 57% | 1,786,359 | 100% | 1,542,558 | 47% | 5,579,738 |
| Special Fund | 7% | 13,068 | 7% | 28,248 | 7% | 98,169 | 7% | 355,638 | 4% | 132,587 | 0% | 0 | 5% | 627,710 |
| Reimbursement (CMS) | 63% | 117,614 | 63% | 254,234 | 63% | 883,518 | 61% | 3,200,743 | 38% | 1,193,284 | 0% | 0 | 48% | 5,649,392 |
| TOTAL FUNDING | 100% | 186,688 | 100% | 403,546 | 100% | 1,402,410 | 100% | 5,209,408 | 100% | 3,112,230 | 100% | 1,542,558 | 100% | 11,856,841 |
| *Type: If applicable, for each funding source, beginning on row 29, describe what type of funding is included, such as local assistance or grant funding, the date the funding is to become available, and the duration of the funding. | | | | | | | | | | | | | | |
| Federal Fund - Immunization Registry Funds- Available - Ongoing | | | | | | | | | | | | | | |
| Special Fund - Health Statistics Special Fund (\$325,458) and a CDPH fund (\$302,252)- Available - Funding needed through Implementation of Project | | | | | | | | | | | | | | |
| Reimbursement - Federal CMS through DHCS - Available at IAPD and IAA approval - Through Implementation of Project | | | | | | | | | | | | | | |

7 Schedule

See also, Exhibit 1 for the Original Approved Schedule and Exhibit 2 for the Proposed Schedule.

| CAIR2.0Schedule [Read-Only] | | | | | | |
|-----------------------------|-------|--|------------|--------------|--------------|----------------|
| | % Com | Task Name | Duration | Start | Finish | Resource Names |
| 1 | 46% | CAIR 2.0 Project (4265-21) | 1157 days | Mon 12/10/12 | Fri 6/23/17 | Deb Wong |
| 2 | 41% | Planning Phase | 806 days | Mon 12/10/12 | Tue 2/9/16 | Deb Wong |
| 32 | 100% | Procurement Phase | 509.5 days | Wed 12/19/12 | Fri 12/5/14 | Deb Wong |
| 100 | 100% | Project Schedule and Budget development | 55 days | Thu 1/22/15 | Wed 4/8/15 | LizG |
| 103 | 82% | IAPD update | 124 days | Mon 3/16/15 | Tue 9/8/15 | LizG |
| 115 | 71% | Special Project Report | 115 days | Mon 3/16/15 | Tue 8/25/15 | LizG |
| 175 | 39% | Control Section 11 Review | 80 days | Tue 6/23/15 | Wed 10/14/15 | LizG |
| 193 | 37% | HP Contract Amendment (with NCB for new Scope) | 127 days | Fri 5/1/15 | Thu 10/29/15 | LizG |
| 242 | 0% | IAA Amendment | 75 days | Fri 8/14/15 | Tue 12/1/15 | Maria,LizG |
| 248 | 7% | IV&V Services | 281 days | Mon 11/3/14 | Mon 12/14/15 | LizG |
| 253 | 0% | IPOC Service Request - OTech | 10 days | Thu 10/15/15 | Wed 10/28/15 | LizG |
| 256 | 0% | TMSP/OTECH Hosting Environment | 111 days | Wed 7/15/15 | Mon 1/4/16 | Gary |
| 271 | 0% | Security Evaluation after TMSP Environment established | 10 days | Tue 1/5/16 | Tue 1/19/16 | ISO |
| 272 | 40% | External Integration Schedule | 612 days | Mon 11/3/14 | Fri 4/14/17 | HP |
| 427 | 0% | Implementation Complete | 0 days | Fri 4/14/17 | Fri 4/14/17 | HP |
| 428 | 0% | Transition to Maintenance and Operations | 0 days | Fri 4/14/17 | Fri 4/14/17 | LizG |
| 429 | 0% | Project Closeout | 50 days | Mon 4/17/17 | Fri 6/23/17 | LizG |
| 434 | 0% | PROJECT COMPLETE | 0 days | Fri 6/23/17 | Fri 6/23/17 | LizG |
| 435 | 0% | Maintenance and Operations | 523 days | Mon 4/17/17 | Wed 4/17/19 | LizG |
| 436 | 0% | PIER | 262 days | Mon 6/26/17 | Tue 6/26/18 | LizG |
| 437 | 43% | CDPH CAIR 2.0 Project Status Reporting | 956 days | Tue 1/15/13 | Mon 10/17/16 | LizG |
| 438 | 40% | Quarterly Reporting | 900 days | Wed 4/3/13 | Mon 10/17/16 | LizG |
| 535 | 45% | Monthly Reporting | 956 days | Tue 1/15/13 | Mon 10/17/16 | LizG |
| 653 | 50% | Annual Reporting | 741 days | Tue 7/30/13 | Thu 6/30/16 | LizG |
| 658 | 34% | CDPH Review of Deliverables | 626 days | Mon 11/3/14 | Thu 5/4/17 | LisaM |

Exhibit 1: Original Schedule

Exhibit 2: Proposed Schedule

Exhibit 3: Original EAW

Exhibit 4: Proposed EAW

Exhibit 5: Updated Complexity Assessment