California Budget Impasse Payroll System

Alternative Solutions Assessment Report

July 11, 2010

PRIVILEGED AND CONFIDENTIAL

California Budget Impasse Payroll System Alternative Solutions Assessment Report

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1 Executive Summary

1.1 Background

The California State Controller's Office (SCO) retained Kaye Scholer LLP (Kaye Scholer) to represent the office in Gilb v. Chiang, Sacramento County Superior Court, Case No. 34-2008-80000026, and related appeals. Kaye Scholer engaged Crowe Horwath LLP (Crowe) to perform an independent assessment. Specifically, Crowe was engaged to:

1. Assess the feasibility of SCO's payroll and personnel systems to comply with the Fair Labor Standards Act (FLSA) and the California Supreme Court ruling in White v. Davis (2003) 30 Cal 4th 528 Supreme Court (White v. Davis); and
2. Identify and assess alternative solutions, if any, to satisfy the Budget Impasse requirements, including the payroll recovery requirements associated with the budget approval, assuming the existing legacy payroll system is the core payroll system.

A separate report, the July 2010 *California Budget Impasse Payroll System – Feasibility Assessment Report*, provides analysis of the ability of the SCO to comply with business requirements that are premised upon the application of FLSA and White v. Davis to a Budget Impasse. As a supplemental report to the Feasibility Assessment Report, this Alternative Solutions Assessment Report provides analysis of alternative solutions that, if effectuated, would partially satisfy the Budget Impasse Business Requirements (see *Appendix A*), as well as an outline of a strategy for implementing the alternatives.

Crowe initiated the identification and assessment of alternative (partial) solutions with the understanding that, in accordance with Finding #2 in the Feasibility Assessment Report, any alternative "solution" identified by Crowe would **not** provide SCO with the ability at all times to satisfy simultaneously all Budget Impasse Business Requirements.[1] Finding #2 is referred to in this report, as it is in the Feasibility Assessment Report, as the "Unsolvable Puzzles." While this Alternative Solutions Assessment Report will use the term "solution" repeatedly in its description of assessed alternatives, it is critical for the reader to note the following:

> For purposes of this report, a "solution" is defined as a set of new or changed systems and business processes that, when implemented, address the high-level gaps identified in SCO's current systems and processes and move SCO closer toward the capability to satisfy simultaneously all Budget Impasse Business Requirements at all times, while recognizing that the set of new or changed systems and business processes comprising the solution would **not** provide SCO with the ability to satisfy simultaneously all business requirements at all times, given Finding #2 in Section 4 of the Feasibility Assessment Report.[2]

As a result, even the most promising solutions identified in this assessment are only partial solutions.

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[1] Finding #2 from the Feasibility Assessment Report states the following: "The Budget Impasse payroll and payroll recovery Business Requirements, when taken as a collective whole, create problems of logical mutual exclusivity whereby no solution can simultaneously satisfy all Budget Impasse Business Requirements at all times, regardless of the level of technical automation. Therefore, even if all current technical gaps were resolved in the SCO's existing payroll system, the overarching infeasibility problems remain, unless the Business Requirements are changed."

[2] In the July 2, 2010 Feasibility Assessment Report, Crowe has discussed the high-level gaps in the SCO's current systems and processes as to which Crowe reached its Finding #1: "The SCO cannot satisfy the payroll and payroll recovery Business Requirements by utilizing the SCO's existing systems and processes. Based upon the results of the SCO Budget Impasse Business Requirements High-Level Gap Analysis, there are numerous and substantial gaps in the SCO's existing systems and processes to satisfy the Budget Impasse payroll and payroll recovery Business Requirements. It is, therefore, infeasible for SCO to satisfy the Budget Impasse payroll and payroll recovery Business Requirements without significant new development and/or modification of systems and processes to resolve the identified gaps." These high-level gaps are summarized in *Appendix B* to the Feasibility Assessment Report and discussed in Section 3 of that report.

1.2 Summary of Findings

Crowe identified Budget Impasse solutions considered in the past by both the Department of Personnel Administration (DPA) and the SCO, as well as any other solutions that might address the Budget Impasse requirements. Eleven potential solutions were identified. Crowe conducted an initial assessment of the 11 identified potential solutions to narrow the alternatives to the three that appeared at a high-level to most completely address the requirements in a way that was practically feasible in terms of implementation and potential risk and disruption to State operations. The three alternatives that were found to have the most potential of satisfying the Budget Impasse Business Requirements in a practically feasible manner were the following:

Alternative 1: Minimum Wage Pay Differential	This alternative is implemented by establishing a pay differential in the Premium Pay field of the Employment History (EH) system[3] to define a new minimum wage amount. Alternative 1 is similar to the "DPA Option 1" suggested by the DPA in past discussions with the SCO, which relied on a pay differential as the primary mechanism to pay minimum wage during a Budget Impasse.
Alternative 2: Payroll Solution with Modified Payroll Modules	This alternative modifies the normal pay process to create a modified pay status that reflects the appropriate minimum wage, full wage or no wage amount to be issued to each employee during a Budget Impasse.
Alternative 3: Payroll Solution with External Minimum Wage Code	This alternative uses the same process described for Alternative 2, **except** that the code written to create the modified pay status would be externalized (i.e., program logic would be created as new programs outside the existing payroll programs to minimize the impact to existing programs).

These three alternatives were studied in more depth. In Crowe's assessment of the three alternative solutions, Crowe concluded the following:

Budget Impasse Payroll System – Assessment of Alternatives – Finding #3

Based upon Crowe's analysis of all alternative solutions identified as part of this Budget Impasse Payroll System Assessment Project, Alternative 3, the Payroll Solution with External Minimum Wage Code, is the most promising alternative for SCO to satisfy the Budget Impasse Business Requirements that are remediable.

[3] The Employment History (EH) system serves as the official record of employment and the source of employee and position information. The system is maintained through online real-time updating for individual transactions and batch processing for mass updating.

In assessing Alternatives 2 and 3, Crowe concluded the following with respect to the implementation of these solutions:

Budget Impasse Payroll System – Assessment of Alternatives – Finding #4

Based upon Crowe's analysis of Alternative 2, the Payroll Solution with Modified Payroll Modules, and Alternative 3, the Payroll Solution with External Minimum Wage Code, and presuming the implementation approach and assumptions described in *Appendix B* of this report, Crowe estimates that either (partial) solution can be implemented at SCO with the following parameters:

- 22–48 elapsed months in duration, beginning with the pursuit of implementation of the alternative solution (most likely duration would be 27.5 months)
- Approximately 33,000–69,000 hours of resource effort (most likely estimate of effort would be 50,847 hours); and
- Approximately $5,600,000–$11,700,000 of cost for resources (most likely estimate would be $8,695,021)

2 Introduction

2.1 Report Context and Objective

As a supplemental report to the Feasibility Assessment Report, this Alternative Solutions Assessment Report provides analysis of alternative (partial) solutions to satisfy the Budget Impasse Business Requirements, as well as an outline of a strategy for implementing the alternatives.

In addition to analysis of the ability of the SCO to comply with the business requirements that are derivative of the FLSA and White v. Davis, the Feasibility Assessment Report, provides the following:

- Background information pertaining to the Budget Impasse Payroll System Assessment project
- Project objectives and scope for the Budget Impasse Payroll System Assessment project
- The assessment methodology used to conduct the Budget Impasse Payroll System Assessment project

To that end, this supplemental Alternative Solutions Assessment Report will not seek to reiterate the background, objectives, scope, or approach for the Budget Impasse Payroll System Assessment Project. The following section, Section 3, Assessment of Alternative Solutions, details the identification and evaluation of alternative solutions to satisfy the Budget Impasse Business Requirements, to the extent that the requirements can be satisfied.

In the Feasibility Assessment Report, Crowe concluded its assessment in two findings, as follows:

Budget Impasse Payroll System – Feasibility Assessment – Finding #1

The SCO cannot satisfy the payroll and payroll recovery Business Requirements by utilizing the SCO's existing systems and processes. Based upon the results of the SCO Budget Impasse Business Requirements High-Level Gap Analysis, there are numerous and substantial gaps in the SCO's existing systems and processes to satisfy the Budget Impasse payroll and payroll recovery Business Requirements. It is, therefore, infeasible for SCO to satisfy the Budget Impasse payroll and payroll recovery Business Requirements without significant new development and/or modification of systems and processes to resolve the identified gaps.

Budget Impasse Payroll System – Feasibility Assessment– Finding #2

The Budget Impasse payroll and payroll recovery Business Requirements, when taken as a collective whole, create problems of logical mutual exclusivity whereby no solution can simultaneously satisfy all Budget Impasse Business Requirements at all times, regardless of the level of technical automation. Therefore, even if all current technical gaps were resolved in the SCO's existing payroll system, the overarching infeasibility problems remain, unless the Business Requirements are changed.

The Feasibility Assessment Report provides details about the business requirements that create the independent problems of logical mutual exclusivity and the scenarios that specifically cannot be satisfied when considering the business requirements.

2.2 Basis for Technical Feasibility Assessment

Despite having reached the conclusion expressed in the Feasibility Assessment Report's Finding #2, Crowe conducted its Phase 4 activities (as described in Section 3, Assessment Methodology, of the Feasibility Assessment Report) with the Steering Committee, recognizing that the alternative solutions assessed as part of this report will provide a solution that does not enable the SCO to satisfy all business requirements.

In order to implement any payroll solution, including a minimum wage payroll and payroll recovery solution, a determination must be made to use either a Negative/Anticipatory Pay system (where employees are paid for anticipated time worked, in order to process payroll in time for the regular payday) or a Positive Pay system (where employees are paid retrospectively for actual time worked). Upon examining these two alternatives against the Budget Impasse Business Requirements, Crowe noted the following:

	Negative/Anticipatory Pay	Positive Pay
Advantages	▪ Allows SCO to pay individuals on pay dates that coincide with the last day of the pay period (i.e., allows SCO to satisfy Business Requirement 2.3 at all times)	▪ Allows SCO to pay individuals based on actual hours worked (i.e., allows SCO to satisfy Business Requirement 2.2 at all times)
Disadvantages	▪ Creates potential for SCO to pay individuals for hours not actually worked (i.e., violation of Business Requirement 2.2)	▪ Guarantees that SCO cannot pay individuals on pay dates that coincide with the last day of the pay period (i.e., violation of Business Requirement 2.3)

Presented with these two alternatives, and the fact that the Negative Pay system processes payroll for the vast majority (82%) of employees, Crowe decided to proceed with alternatives based upon Negative/Anticipatory Pay with the caveat that the SCO will not be able to satisfy all of the Budget Impasse Business Requirements when: (i) nonexempt employees who have a Shortage Variance (i.e., work less time than expected) would receive pay for hours not actually worked; and (ii) nonexempt employees who work unanticipated (i.e., emergency) overtime after payroll is processed would not receive their full regular rates of pay on the regular payday for that period.

As was discussed in the Feasibility Assessment Report's Finding #2, it is not feasible for any system to satisfy all of the Budget Impasse Business Requirements. The only solution to the problem of logical mutual exclusivity would be to seek changes to the business requirements, which we understand may require a legislative and/or constitutional resolution.

The alternative solutions identified and assessed as part of this Budget Impasse Payroll System Assessment Project are discussed in the following sections, Sections 3.2 through 3.6, of this document. The solutions identified were assessed against their respective capabilities to conceptually satisfy the business requirements. However, given the Unsolvable Puzzles discussed in more detail in the separate Feasibility Assessment Report, and the decision made to conclude this assessment despite the total infeasibility described in Finding #2, it is crucial to note that these partial solutions all create the potential for SCO to pay individuals for hours not actually worked - a failure to fully satisfy Business Requirement 2.2.

3 Assessment of Alternative Solutions

3.1 Alternative Solutions Identification

During Phase 4 of the project, Crowe performed analysis and research to identify viable alternative solutions to provide SCO with options to satisfy the Budget Impasse Business Requirements, to the extent possible given the issue of the Unsolvable Puzzles in Finding #2. Crowe leveraged the High-Level Gap Analysis completed during Phase 1 of the project to inform the alternative solutions identification sessions. The project team participants evaluated the strengths and weaknesses of new alternative solution concepts, as well as previously discussed solutions, such as those recommended to the SCO by the DPA in connection with the 2008 Budget Impasse.

Throughout this document, the partial alternative solutions are referred to as:

- **Employment History (EH) Solutions (Alternatives 2, 3 and 4):** Solutions that are primarily driven by modifications to or creation of EH data files and programs, even though there may be modifications to the Payroll data files and programs as well.
- **Payroll Solutions (Alternatives 5 and 7):** Solutions that are primarily driven by modifications to or creation of Payroll system[4] data files and programs, even though there may be modification to EH data files and programs as well.
- **External Solutions (Alternatives 1, 6, 8, 9, 10 and 11):** Solutions that require the establishment of an entirely new system(s) that do not exist within the current legacy system.

Each of the viable alternative solutions identified are briefly described below:

1. **Legacy Payroll System Replacement (i.e., 21st Century Project):** This is an External Solution that represents the ongoing, legislatively-generated initiative of the SCO to replace the legacy payroll and personnel systems with new technology.

2. **Minimum Wage Pay Differential (a modified extension of DPA Option 1):** This is an EH Solution that would update the Pay Differential data value in the EH system to reduce pay during a Budget Impasse to minimum wage. The Minimum Wage Pay Differential solution requires changes to both the EH and Payroll systems, data and operations. Of importance, it is designed to also address the 54,000 California State University employees who were not considered as part of the DPA's originally proposed pay differential solution.

3. **Reduction of Salary Ranges to Minimum Wage (DPA Option 2[5]):** This is an EH Solution that would replace the current salary range minimum and maximum values with those values that would enable designated employees to be paid minimum wage.

4. **Addition of Alternate Salary Range for Minimum Wage (DPA Option 3[6]):** This is an EH Solution that would add a new salary range with minimum wage values to be used only for those employees subject to minimum wage.

[4] Primary functions of the Payroll system are computation, certification (auditing), and creation of employee pay and reporting. The system maintains records of all payments and deductions including employee and state contributions.

[5] DPA Option 2 refers to the recommendation made to the SCO during the 2008 Budget Impasse that relied on modifying salary ranges as the primary mechanism to pay minimum wage during a Budget Impasse.

[6] DPA Option 3 refers to the recommendation made to the SCO during the 2008 Budget Impasse that relied on adding a new minimum wage salary range as the primary mechanism to pay minimum wage during a Budget Impasse.

5. **Payroll Solution with Modified Payroll Modules:** This is a Payroll Solution that would modify existing code and/or automated processes to amend Pay Status records generated as part of the current payroll processing to reflect the new minimum wage payment amounts for designated employees.

6. **Dual Masters:** This is a External Solution that would run two versions of a modified Master Payroll process, one for payments to minimum wage employees and those receiving full pay under a minimum wage scenario, and one that would not generate actual payments but would effectively represent the baseline pay that employees would be due in the absence of a Budget Impasse and could, therefore, be used to facilitate payroll recovery at the conclusion of a Budget Impasse period. Operationally, SCO would significantly change its job streams to add and execute additional Master Payroll cycles, while not interfering with Daily Payroll and Green Payroll cycles. Dual daily cycles would also be required to mirror payroll processed during those cycles.

7. **Payroll Solution with External Minimum Wage Code:** This is a Payroll Solution that would add new, segregated code to modify the Pay Status records generated as part of the current payroll process to reflect the new minimum wage payment amounts for designated employees. This alternative is functionally similar to Alternative 5 discussed above, with modifications to the architectural approach (from a system architecture perspective).

8. **Separate Minimum Wage-only Payroll System (COTS):** This is an External Solution that would require the SCO to purchase a new commercial, off-the-shelf (COTS) payroll application to process only the minimum wage payments during Budget Impasse. Under this scenario, the current payroll systems would continue to operate, with the notable exception that no actual minimum wage payments would be generated during a Budget Impasse from the current system. The COTS solution would generate minimum wage payments and the current Payroll system would effectively represent the baseline pay that employees would be due in the absence of a Budget Impasse and could, therefore, be used to facilitate payroll recovery at the conclusion of a Budget Impasse period.

9. **Separate Minimum Wage-only Payroll System (Custom):** This is an External Solution that would develop a new custom application to process only the minimum wage payments during Budget Impasse. Under this scenario, the current payroll systems would continue to operate, with the notable exception that no actual minimum wage payments would be generated during a Budget Impasse from the current system. The custom-developed payroll solution would generate minimum wage payments and the current Payroll system would effectively represent the baseline pay that employees would be due in the absence of a Budget Impasse and could, therefore, be used to facilitate payroll recovery at the conclusion of a Budget Impasse period.

10. **Separate Outsourced Minimum Wage-only Payroll System:** This is an External Solution that would outsource the minimum-wage-only payroll function to an outside provider, such as ADP. Under this scenario, the current payroll systems would continue to operate, with the notable exception that no actual minimum wage payments would be generated during a Budget Impasse. The outsourced payroll administrator would generate minimum wage payments and the current Payroll system would effectively represent the baseline pay that employees would be due in the absence of a Budget Impasse and could, therefore, be used to facilitate payroll recovery at the conclusion of a Budget Impasse period.

11. **Separate Duplicate Minimum Wage-only Payroll System:** This is an External Solution that would maintain two separate copies of the existing SCO Payroll system by replicating the existing system onto a parallel computing environment. One copy of the existing systems would be used to satisfy minimum wage pay requirements as part of the Budget Impasse, and the other copy would not generate actual payments to employees but would, for payroll minimum wage recovery purposes, generate payroll records based upon regular pay rates that would facilitate the eventual recovery needed at the conclusion of a Budget Impasse.

All alternatives were studied as to whether or not they had the **potential** to satisfy the Budget Impasse Business Requirements (to the extent possible given the Unsolvable Puzzles). At this point in the analysis, two options were removed from consideration.

Legacy Payroll System Replacement
Alternative 1, Legacy Payroll System Replacement, refers to a complete replacement of the information technology system that is used to issue payroll. The current 21st Century Project is intended to achieve this outcome when implemented. In effect, this alternative solution is already actively being implemented by SCO and does not require further analysis as part of this project.

Dual Masters
Alternative 6, Dual Masters, was eliminated from consideration because Crowe determined that the concept of having two Masters feeding information into the system of record was a poor architectural system design that would increase system complexity and the risk of failure. Therefore, it was removed from future consideration.

The remaining nine alternatives were further assessed by Crowe and the Steering Committee.

3.2 Assessment of Alternative Solutions

Crowe assessed each of the nine remaining alternative solutions against the eight criteria described in the following section. It has been Crowe's experience that these first six criteria reflect the priorities and concerns of almost every organization when evaluating alternative solutions. The seventh criterion, Implementation Timeline, while not unique, is not typically a priority or concern for every system assessment. However, given the requirement for SCO to be able to quickly implement the changes that enable them to satisfy the Budget Impasse Business Requirements associated with a Budget Impasse and then quickly implement the changes that enable them to satisfy the Budget Impasse Business Requirements associated with an approved budget, this criterion was added to the assessment The Difficulty to Recover criterion is quite unique to this set of business requirements and clearly should be included in this assessment due to the same constraints described above that require the SCO to quickly implement minimum wage payments and recover wages unpaid during the Budget Impasse within the time required.

Please note that during the initial assessment of alternative solutions, Crowe and the Steering Committee rated each solution on the **relative** strengths and weaknesses for each criterion across the nine alternative solutions. For example, the goal of this exercise was not to quantify the estimated cost of each option; rather, each solution was ranked on a Low-Medium-High scale for relative cost across the nine Alternative Solutions. *Figure 3 – Relative Assessment of Alternative Solutions* provides a summary of this assessment.

Figure 3 – Relative Assessment of the (Partial) Alternative Solutions

No.	Alternatives	Risk	Cost	Dev Time	SCO Impact	Dept Impact	Inflexibility	Imp Time	Difficulty to Recover
1	Legacy Payroll System Replacement	*Not assessed as interim solution – will be future solution*							
2	Minimum Wage (MW) Pay Differential	MH	MH	HH	M	H	M	L	L
3	Reduction of Salary Ranges to MW	M	M	H	M	H	M	L	H
4	Addition of Alternate Salary Range for MW	M	M	H	M	H	M	L	H
5	Payroll Solution with Modified Payroll Modules	L	M	HH	L	L	L	L	L
6	Dual Masters	*Not assessed – could not define working alternative*							
7	Payroll Solution with External MW Code	L	M	H	L	L	L	L	L
8	Separate MW-only Payroll System (COTS)	H	H	HH	H	L	H	M	M
9	Separate MW-only Payroll System (Custom)	H	H	HH	H	L	H	M	M
10	Separate Outsourced MW-only Payroll System	H	H	HH	H	L	H	M	M
11	Separate Duplicate MW-only Payroll System	H	H	HH	H	L	H	M	M

LEGEND
LL = Low-Low
L = Low
ML = Medium-Low
M = Medium
MH = Medium-High
H = High
HH = High-High

Crowe used the following criteria to assess the alternative solutions. For each criterion below, a summary of the considerations is provided.

Risk

The assessment of risk considers the **relative** likelihood of failure associated with each alternative (i.e., how unknown or untried the new process or technology would be). When evaluating the alternatives related to risk, the solutions that leveraged current technology and processes to the greatest extent were rated as lower risk than those that would require new development and implementation activities, which would inherently introduce more risk of failure.

The Payroll Solutions (Alternatives 5 and 7) incorporate many processes and technologies used today and were determined to pose the least risk of failure, followed by the EH Solutions (Alternatives 2, 3 and 4), which incorporate some technology used today, but in new ways that introduce more risk than those leveraging the Payroll system. Those determined to introduce the highest risk of failure were the solutions that would require the establishment of new parallel systems and be subject to comprehensive design and implementation efforts (Alternatives 8, 9, 10 and 11).

Cost

The assessment of cost included the **relative** cost of implementation, maintenance and recovery, for each of the alternative solutions. The relative cost of the alternatives discussed was determined to be highest for those that would require procurement of new systems and/or would require substantial use of contracted employees to implement (Alternatives 8, 9, 10 and 11), while those modifying technology already in use where a great deal of the Budget Impasse Business Requirements are already satisfied (i.e., all of the remaining alternatives) would have a lower relative cost. The Minimum Wage Pay Differential solution (Alternative 2) has a relatively higher cost due to the number and complexity of system modifications and new code that would be required to address the "downstream" effects of making most of the changes to the EH system, which is an input early in the payroll process having substantial downstream impact.

Development Time

To assess the **relative** time to implement a new solution of this magnitude, Crowe considered both the time it takes to initially develop the solution to be ready for use (Development Time) and the time it would take to make the solution operational once it is needed to address a Budget Impasse (Implementation Time, a separate criterion). Development Time is most heavily influenced by the amount of change and the amount of new technology required for the solution. As evidenced by the High and High-High ratings in this category, the development time for every solution will be significant and will cause disruption to the current operations of the SCO, DPA and Human Resource departments throughout the State.

The State's employment and payroll legacy systems were designed more than 30 years ago and use a combination of development languages, tools, and technologies, such as COBOL, Mark IV and ClientBuilder. The SCO's developers employed today have a great deal of expertise in how these technologies could be used to implement new functionality within the legacy Payroll and EH systems. However, these SCO developers are committed to maintaining and updating current operations and participating in the design of the replacement system that will be implemented in the coming years (i.e., the 21st Century Project). Therefore, development of new functionality to satisfy the Budget Impasse Business Requirements will need to be performed by new resources (e.g., new hires, temporary staff augmentation or contracted workers) or new resources will need to back-fill the work that the SCO developers currently perform.

The relative cost difference between the alternatives with High-High ratings (Alternatives 2, 5, 8, 9, 10 and 11) and those with High ratings (3, 4 and 7) reflects the initial high level estimate of the complexity of the code changes required and/or the amount of new technology associated with the alternative. Note, at the time of the initial rating (Figure 3), detailed level estimates had not yet been developed.

SCO Organizational and Operational Impact

An important factor related to preparation for and implementation of any Budget Impasse solution is the impact on SCO operations. As stated previously, the SCO's technology employees already are fully dedicated to ongoing operations and the 21st Century Project. Likewise, the staff who handle administrative or management functions are also fully committed to the day-to-day operations of the State of California payroll. In California's current fiscal situation, SCO staff are taking on more duties as hiring limitations continue to impact their ability to maintain the day-to-day operations.

The implementation of any Budget Impasse solution will challenge the SCO's ability to support the day-to-day payroll operations. SCO staff will be needed in the development of a system and

process to satisfy the Budget Impasse Business Requirements, while they are also needed to lead the implementation of the 21st Century Project and support of the day-to-day operations. This will be true even if outside resources are used to develop a new Budget Impasse solution.

In determining the **relative** impact on SCO operations, Payroll Solutions (Alternative 5 and 7) had the lowest SCO organizational and operational impact, due to the fact that the modifications being considered at a high-level are the most similar to modifications made to the systems in the past (e.g., no pay groups and furloughs). The EH Solutions (Alternative 2, 3 and 4) were considered to have a relatively higher impact on SCO operations because of the breadth of changes to the EH and Payroll systems. The EH Solutions impact the earliest stages of the payroll process. Modifications and process changes would have to be made to accommodate the downstream effects of these EH Solutions changes. Finally, the External Solutions (Alternatives 8, 9, 10 and 11) were rated as having the highest relative impact on the SCO staff because they will require a re-examination of any/all processes or systems that would be temporarily halted while the new system processes payroll during the Budget Impasse. These External Solutions rely upon dual systems, which require that SCO staff not only deal with the impact to current systems, but also requires that procedures and training be developed to implement and maintain the secondary system.

Departmental Human Resources (HR) Impact

In addition to the impact on SCO employees, it is important to consider the potential impact on departmental and campus HR departments across the State of California. The solutions vary in terms of how much the HR departments will be involved in modified or new processes, as well as in adjustments and recovery activities and workload during and after the Budget Impasse.

The Departmental HR Impact was determined to be **relatively** higher for the EH Solutions (Alternatives 2, 3 and 4) because HR departments are very involved in entering and maintaining the EH records of their employees. For example, the minimum wage amount would be entered into the third Premium Pay field within the EH system. Many State employees currently have a third premium pay amount in the third Premium Pay field. This third premium pay amount will be deleted to provide space for the minimum wage amount. HR departments will need to remain aware of the premium payment amount that was deleted. The recovery of those third premium pay amounts is a complex, highly manual process for the HR departments and SCO. Similarly, challenges exist for any and all employment actions that occur during a Budget Impasse but cannot be processed during the Budget Impasse. HR departments will need to be aware of these employment actions and manually enter them once a budget is enacted.

In comparison, the Payroll Solutions (Alternatives 5 and 7) would modify the pay rates to minimum wage rates or no pay later in the payroll process and, therefore, would not affect the EH system. Most of the adjustments and recovery activities would be handled by the SCO in the Payroll Solutions. The External Solutions (Alternatives 8, 9, 10 and 11) were also assessed to have a Low HR Impact due to the fact that the minimum wage payroll would be processed in a separate system that would not involve HR departments directly.

Inflexibility

Changes in the Budget Impasse Business Requirements may be driven by a variety of factors outside of the SCO's control, such as legislative changes, union contracts, litigation, and administrative decisions. The Payroll system needs to be flexible to respond to changing business requirements. In order to rate the alternatives on a common scale where High is a less favorable rating than Low, this criterion was rated as Inflexibility (i.e., High indicates a high degree of inflexibility, or little flexibility).

The Payroll Solutions (Alternatives 5 and 7) were assessed to be **relatively** more flexible (i.e., Low Inflexibility) due to the ability of SCO staff to directly modify the data that would be used in these solutions (e.g., if the minimum wage amount changed, SCO could modify that rate directly in the data table). The EH Solutions (Alternatives 2, 3 and 4) were assessed to be moderately less flexible (i.e., Medium Inflexibility) because the changes being made in the EH system affect many processes and systems downstream in the payroll process. Each time a change is made to EH,

SCO must consider every potential outcome of that change in the payroll process. Finally, the External Systems (Alternatives 8, 9, 10 and 11) were assessed to be the least flexible (i.e., High Inflexibility) because of the more indirect role of SCO employees in executing any necessary changes affecting those solutions and the relative complexity of change definition, execution and quality assurance, when using an outside system or personnel. Outside solutions would inherently be off-the-shelf solutions, which typically offer flexibility in implementing standard processes, but inflexibility in implementing unique requirements. As the Budget Impasse Business Requirements represent a unique set of requirements not typical to payroll solutions, it is more likely that off-the-shelf solutions will not be flexible to satisfy the potential future changes in Budget Impasse Business Requirements and would require substantial time, effort, and cost to satisfy these requirements.

Implementation Time
Once the Budget Impasse functionality has been developed, it will be held in suspense until the minimum wage payment requirement of a Budget Impasse is declared. Therefore the Implementation Time is an important factor, because it must be capable of being put into place quickly once a Budget Impasse occurs. The implementation time could also be termed the "setup time" or "startup time" to put the systems into a position to operate under a Budget Impasse and to satisfy Budget Impasse Business Requirements.

The only significant **relative** difference in Implementation Time would occur when considering an internal solution that leverages established technology, whether EH or Payroll (Alternatives 2, 3, 4, 5, and 7), which were rated as Low, versus an External Solution that relies on a new system or outside personnel to implement (Alternatives 8, 9, 10 and 11), which were rated as Medium. The implementation of external systems requires data from the current SCO systems to be migrated to these external systems in order for the external systems to reflect the current state of data. Therefore, regardless of which External Solution was chosen, Implementation Time would be longer than that of an internal solution.

Difficulty to Recover
The ability to reverse the changes made to implement minimum wage and restore employees' full wages are critically important to the SCO fulfilling its payroll responsibilities and satisfy the Budget Impasse Business Requirements. A timely recovery (during the next pay period or within 30 days of the enactment of the new budget) is essential to a successful Budget Impasse implementation. Upon budget enactment, the payroll process must stop processing minimum wage rates under Budget Impasse requirements, restore regular pay rates, and recover all variations in pay that were forced by the Budget Impasse (e.g., differential between the minimum wage and regular rate, leave pay, separation pay, and other non-wage payments that were not issued during the Budget Impasse).

Again, in order to rate each criterion on the same scale, recovery was assessed on Difficulty to Recover, where a High rating indicates that it would be relatively difficult to recover from Budget Impasse and a low rating indicates less difficulty during recovery.

The issue of kick-outs (payroll transactions that do not complete successfully and must be corrected manually by SCO staff) illustrates the complexity of recovery processing. As an example, manual processing of kick-outs after the 12-month State Compensation Insurance Fund (SCIF) furlough generated almost 1,500 hours of work for SCO staff. This limited furlough impacted some 8,000 employees. This effort expended by SCO staff does not take into account a significant workload assumed by SCIF staff to accomplish the furlough recovery for SCIF employees. Without SCIF assistance, this effort by SCO could have doubled. By contrast, a Budget Impasse could impact roughly 240,000-314,000 employees, presumably over a shorter period of time. Crowe and the Steering Committee estimated that simply processing the kick-outs generated by a three-month Budget Impasse could generate an additional 7,500-15,000 hours of work for SCO staff, depending on the level of support during recovery available from the department and campus HR staff. The effort required for SCO staff to process Budget Impasse recovery kick-outs was taken into account in this Difficulty to Recover assessment.

In considering the **relative** complexity of recovery across the alternatives, the two Payroll Solutions (Alternatives 5 and 7) and the first EH solution (Alternative 2) were considered the most conducive to recovery activities (i.e., Low Difficulty to Recover). In the case of the Payroll Solutions (Alternative 5 and 7), the recovery functionality already built into the current system (e.g., suspended transactions and tax withholding calculations) would satisfy many of the Budget Impasse recovery requirements with little to no modification. In the case of Alternative 2 (EH), the pay differential is applied during the generation of the Pay Status file. After the budget is enacted, the pay differential adjustment to restore the regular pay rate is made to the EH record, which then flows through the normal payroll systems and processes.

The remaining two EH Solutions (Alternatives 3 and 4) do not offer the same capability for downstream corrections inherent in Alternative 2. They require significant effort to return the employees to their previous salary before adjustments can be made and, therefore, have been rated as High on the Difficulty to Recover scale. Finally, the External Solutions (Alternatives 8, 9, 10 and 11) would generate a moderate level of relative complexity during recovery (i.e., Medium Difficulty to Recover) because all of the payroll activities would have occurred outside the legacy systems during Budget Impasse. The legacy systems would be ready to begin normal pay processing again; however, they would need to be updated with any relevant pay information for state employees during the Budget Impasse to assure that the employees' retirement contributions, tax information and related annual processing account for regular payments and Budget Impasse activities.

It is standard practice in technical assessments like this one to develop weighting criteria to adjust for the relative importance of different criteria taken into consideration. Although each criterion listed above was considered relevant to this analysis, some elements were more important than others in predicting the potential success of the solution. Therefore, Crowe applied weighting factors to those criteria considered by the Steering Committee to be more critical than others. The most critical criteria – Development Time, Implementation Time and Ability to Recover – were weighted most heavily (multiplied by a factor of 3). One additional criterion, Risk, was given a moderately higher weight (multiplied by a factor of 2). The remaining four criteria were un-weighted in the analysis.

The relative rankings from Figure 3 were converted to a numerical value ranging from 1 to 7 (see Legend in Figure 4). Please note that the criteria imply a negative impact; therefore a relative ranking of High is worse than a relative ranking of Low. The weighting factors were then applied to calculate the relative, total scores. Figure 4 illustrates the weighted scores for each of the assessed alternatives. As Figure 4 also shows the weighting did not affect the resulting top three alternative solutions.

Figure 4 – Weighted Scores of the (Partial) Alternative Solutions

No.	Alternatives	Risk (x2)	Cost	Dev Time (x3)	SCO Impact	Dept Impact	Inflexibility	Imp Time (x3)	Difficulty to Recover (x3)	Unweighted Score	Weighted Score
1	Legacy Payroll System Replacement	*Not assessed as interim solution – will be future solution*									
2	Minimum Wage (MW) Pay Differential	5	5	7	4	6	4	2	2	**35**	**62**
3	Reduction of Salary Ranges to MW	4	4	6	4	6	4	2	6	**36**	**68**
4	Addition of Alternate Salary Range for MW	4	4	6	4	6	4	2	6	**36**	**68**
5	Payroll Solution with Modified Payroll Modules	2	4	7	2	2	2	2	2	**23**	**47**
6	Dual Masters	*Not assessed – could not define working alternative*									
7	Payroll Solution with External MW Code	2	4	6	2	2	2	2	2	**22**	**44**
8	Separate MW-only Payroll System (COTS)	6	6	7	6	2	6	4	4	**41**	**77**
9	Separate MW-only Payroll System (Custom)	6	6	7	6	2	6	4	4	**41**	**77**
10	Separate Outsourced MW-only Payroll System	6	6	7	6	2	6	4	4	**41**	**77**
11	Separate Duplicate MW-only Payroll System	6	6	7	6	2	6	4	4	**41**	**77**

LEGEND
1 = Low-Low
2 = Low
3 = Medium-Low
4 = Medium
5 = Medium-High
6 = High
7 = High-High

As a result of this assessment, the Payroll Solution with Modified Pay Modules (Alternative 5) and Payroll Solution with External Minimum Wage Code (Alternative 7) score the best (i.e., the lowest score) by a relatively substantial variance (15 points and 18 points, respectively) compared to the Alternative Solution with the next closest score (Alternative 2). Typically, this score variance would lead to an in-depth analysis of only the top two Alternative Solutions. However, given that Alternative Solutions 5 and 7 are both Payroll Solutions and, therefore, similar in conceptual design, Crowe chose to include the third highest scoring Alternative Solution, Minimum Wage Pay Differential (Alternative 2), in the in-depth analysis, as well. Crowe examined more detailed information, including potential costs and implementation timeline for each

of the three highest scoring Alternative Solutions. Each of the three Alternative Solutions is described in a Solution Profile in the following Sections 3.3 through 3.5 of this report.

3.3 Alternative Solution Profile 1 – Minimum Wage Pay Differential

3.3.1 Solution Conceptual Design

Conceptually, the Minimum Wage Pay Differential alternative solution would be implemented by establishing a pay differential in the Premium Pay field of the Employment History (EH) system that would require the Payroll system to pay a new minimum wage amount rather than the regular pay rate maintained in the EH system. The pay differential would be established through a mass update to the EH system. The mass update would be designed to insert a minimum wage code and amount, which would be determined by such factors as Work Week Group (a code defining work week and overtime classifications), agency code and class code. Employees who are to receive full pay or no pay during the Budget Impasse would be excluded from the mass update. Those who are not to be paid during the impasse would be assigned a new WWG which would cause pay to be suspended for the duration of the Budget Impasse.

The solution is different for employees of CSU, which does not have the same level of functionality built into the EH system. Due to the absence of a Premium Pay field in the CSU EH screens, the Red Circle Rate and 957 fields (two fields in the CSU EH screens that can be coded to work in unison to modify a salary rate) would be used to implement minimum wage, as appropriate, during Budget Impasse.

The following table provides a more detailed description of how the Minimum Wage Pay Differential alternative solution would address each of the relevant Budget Impasse Business Requirements. The Requirement column below briefly describes the Business Requirement that drives the operational change needed. Because requirements are not fully re-stated below due to space limitations, it may be helpful to cross-reference the Requirement Number with *Appendix A, SCO Budget Impasse Requirements*. NOTE: Only those requirements that necessitate a system or procedural change are included in the table below.

Category	Requirement	No.	Summary Description of Key System and Process Changes
Issuing Payroll during Budget Impasse			
General	System-wide Civil Service Changes	N/A	• SCO will create a mass update program to remove any premium pay values in the third Premium Pay field and notify departments of any deleted premiums. • SCO will create a mass update program to establish a new minimum wage (MW) amount in the Premium Pay field for selected employees. • SCO will select employees subject to full pay, no pay or minimum wage pay, using Work Week Group (WWG), class code and agency code (see below for details).
General	System-wide CSU Changes	N/A	• Since CSU records do not contain the Premium Pay fields, SCO will use the Red Circle Rate and 957 fields to reduce selected employees' pay to minimum wage. • NOTE: The same field is used for furloughs that are scheduled to end in August 2010. This process could not be used at the same time a furlough is underway for CSU employees.
Full Pay	Constitutionally Protected Salaries	1.1	• SCO will use class codes to exclude employees with constitutionally-protected salaries from the mass update that inserts the minimum wage value in the Premium Pay field and from the mass update that creates the WWG for suspend pay and from the CSU Red Circle Rate mass update.

Category	Requirement	No.	Summary Description of Key System and Process Changes
Full Pay	Continuous Appropriations	1.2	• Each year, SCO will update the list of funds that are continuously appropriated. • SCO will exclude employees paid by these funds (using fund information on the payroll header file) from the mass update that inserts the minimum wage amount into the Premium Pay field. • If transfers move employees into or out of these departments, the Premium Pay value will have to be removed or added, respectively (departments will be asked to notify SCO of such transfers).
Full Pay	Federally Required Payments (CDCR medical employees)	1.3	• SCO will exclude CDCR medical employees (using class code and agency code) from the mass update that inserts the minimum wage value into the Premium Pay field.
Full Pay	Prior Year Appropriations	1.4	• SCO will use effective-date-driven payment procedures (as they do today) to issue prior fiscal year payments at full rate. (NOTE: The date effective capability must apply to the solution.)
MW Pay	Nonexempt - No Overtime	2.1	• SCO will select employees to receive minimum wage using WWG. • SCO will establish a new MW value in the Premium Pay field.
MW Pay	Hours Worked Basis for Payment	2.2	• SCO will establish a new dock transaction type to differentiate between unpaid time off and leave usage for negative pay employees (to apply leave after Budget Impasse). • SCO will establish a new transaction type and process for departments/campuses to report non-work pay to be paid to positive pay employees.
MW Pay	Minimum Pay for Exempt Employees	2.4	• SCO will establish a second MW Premium Pay value for exempt (WWGE) employees. • NOTE: SCO must not apply docks to these employees for time not worked, because their pay cannot drop below $455/week (or $27.63/hour for computer-related employees).
No Pay	Not Covered - Elected, Legislative, Appointed	3.1	• SCO will identify elected, legislative and appointed employees individually and move to a new WWG to suspend pay. • Claims submitted to pay legislative staff will need to be adjusted appropriately by the legislature's HR department to pay the appropriate amounts for those staff during a Budget Impasse.
No Pay	Exempt - Doctors, Lawyers, Teachers	3.2	• SCO will create a mass update program to move doctors, lawyers and teachers (by class codes) into a new WWG to suspend pay. • NOTE: SCO must have enough advance notice to make sure there's enough space in the suspense area to hold the suspended pay records (i.e., VSAM file size).
Overtime	Anticipated Overtime	4.1	• If overtime-likely agencies are excluded from minimum wage treatment, SCO will exclude selected employees (using class code and agency code) from the mass update that inserts the minimum wage value into the Premium Pay field and from the mass update that creates the WWG for suspend pay and from the CSU Red Circle Rate mass update. • NOTE: SCO will need to ensure that non-wage payments are not made for the Budget Impasse period.

Category	Requirement	No.	Summary Description of Key System and Process Changes
Overtime	Emergency Overtime	4.2	• If an overtime transaction is submitted for a MW employee, SCO will issue a payment for the difference between minimum wage and full regular pay for actual time worked during that pay period. • SCO's replacement of the MW Premium Pay value with full pay amount in the EH system will not automatically adjust when out-of-sequence transactions occur during the impasse period. • Employees with Emergency Overtime during impasse may require manual adjustments to issue regular pay. • NOTE: SCO will need to ensure that non-wage payments are not made for the emergency overtime pay period. • For 7(k) exemption employees who incur overtime on a 28-day cycle rather than by month, departments will be required to notify PPSD of the pay period in which overtime occurred so that full pay can be issued for that pay period.
Other Payments	**Make** Wage Payments at MW	5.1	• SCO will identify wage-related payments and replace the wage rate in pay status file with the MW rate. • Campuses will enter hours worked and the MW rate for student assistants.
Other Payments	**Don't Make** Non-Wage Payments	5.2	• SCO will create a table of payment types that identifies which are non-wage payments and suspend them.
Other Payments	**Withhold** Federal Deductions	5.3	• SCO will continue to apply appropriate federal deductions using federal tax tables.
Other Payments	**Withhold** State Tax Deductions	5.4	• SCO will continue to apply appropriate state tax deductions using state tax tables.
Other Payments	**Deduct** Garnishments	5.5	• SCO will apply all garnishments in their required order. • NOTE: Garnishments that cannot be processed due to insufficient funds will be applied to recovery payment for that pay period, if there are sufficient funds in the recovery payment.
Other Payments	**Withhold** State Retirement Contributions	5.6	• SCO will need to modify the system to calculate, remit, and withhold employee and state (i.e., employer) retirement contributions based upon regular pay rate, not MW pay rates, and generate Accounts Receivable transactions as necessary. • Retirement contributions should be made for leave-eligible dock time (indicated by new dock type transaction), but not for dock time associated with unpaid time off. • NOTE: For employees in overtime departments (if excluded from MW), SCO must be able to calculate retirement contributions without a reduction for leave credits.
Other Payments	**Don't Withhold** Voluntary Contributions	5.7	• SCO will modify the deduction apply process in the Payroll system to ignore voluntary deductions. However, contributions will remain in the system to be made during recovery.

Category	Requirement	No.	Summary Description of Key System and Process Changes
Scenarios	Employee Transfers	N/A	• If EH changes are effective at the start of a pay period, the system changes should allow for appropriate pay. • If EH changes are effective mid-month, PPSD will need to work with the department or campus to adjust pay manually for each portion of the month. (NOTE: Pay can be suspended for a partial month **if** the employee works a normal shift. If the employee works a different shift from normal, SCO's manual intervention will be required.)
Scenarios	Impasse Period >90 days	N/A	• SCO will pay CalPERS the full employer contribution for what the employee should have been paid during impasse. • SCO will provide an updated pay history file to provide full contributions once a budget is enacted.
Recovery upon Budget Enactment			
General	System-wide Civil Service Changes	N/A	• SCO will run a mass update program to remove the MW Premium Pay values and replace the MW Premium Pay values, when appropriate, with those deleted at the start of the Budget Impasse. • SCO will perform a series of manual adjustments to fix items that cannot be adjusted automatically (e.g., mid-month transfers and separations, emergency overtime pay periods, disability-related transactions, and certain other adjustments and transfers). • SCO will need a new process to automate the suspension and restoration of non-wage payments.
General	System-wide CSU Changes	N/A	• SCO will remove the Red Circle Rate/957 value used to pay minimum wage and allow the EH system to trigger payments to restore employee to full pay for past and future periods.
New Budget	Restore Regular Pay (including Leave) by next pay period or 30 days of new budget	7.1	• SCO will release suspended pay status for those with no pay during the Budget Impasse [by (a) removing the WWG code or (b) adding a retroactive termination date to the code]. • SCO will remove MW Premium Pay value (Civil Service) and Red Circle Rate (CSU) to restore the difference in pay (performed automatically by the system). • SCO will create a new process to certify attendance for the past pay periods and issue recovery payments.
New Budget	Restore Separation Pay within 72 hours of new budget	7.3	• SCO will create a new process to suspend lump sum payments for separated employees submitted during the Budget Impasse (except for those for constitutionally protected salary, continuous appropriation and CDCR medical employees), so that they can be quickly restored after budget enactment.
New Budget	Restore Voluntary Deductions by next pay period or 30 days of new budget	7.4	• SCO will apply voluntary deductions that haven't been deducted by reversing the deduction apply process modifications made at start of impasse.

Category	Requirement	No.	Summary Description of Key System and Process Changes
New Budget	Restore Mandatory Deductions (Federal & State Taxes) by next pay period or 30 days of new budget	7.5	• System should process appropriately without modification as payments are issued.
New Budget	Restore Mandatory Deductions (State Retirement) by next pay period or 30 days of new budget	7.5	• SCO will need to modify the retirement module to ensure that employee retirement contributions are not made from recovery payments.
New Budget	Restore Garnishments by next pay period or 30 days of new budget	7.6	• System will apply garnishments to recovery payments to be made if they were not previously applied due to insufficient funds. • SCO will create an exception report for any garnishments unable to be applied due to the split payments (i.e., neither payment was sufficient to cover the garnishment amount).

3.3.2 Solution Business Case

Generally, the Minimum Wage Pay Differential solution impacts the overall payroll process very early (i.e., in the initial stages) due to its use of the EH system to perform most of the required changes during a Budget Impasse. This difference yields both advantages and disadvantages of this solution when compared to the two other alternative solutions. It is important to emphasize that the advantages and disadvantages are relative to the two other solutions assessed.

Advantages
The primary advantage of using an EH solution, such as the Minimum Wage Pay Differential, is that upon budget enactment, when the employee's pay information is restored to pre-budget-impasse values, the EH system can be corrected generating transactions to restore the difference between minimum wage paid during the Budget Impasse and what should have been paid.

One additional advantage is the shorter implementation time. PPSD currently uses pay differentials and conducts mass updates regularly. Therefore, there is a high level of familiarity with and understanding of these processes. Additionally, PPSD would be responsible for and have full control over the implementation, rather than an outside vendor, and thus would be able to implement much more quickly. These factors should lower implementation time compared to the other alternative solutions.

Disadvantages
A structural constraint of the EH system is that the CSU EH screens are much less robust than those for Civil Service. There are no Premium Pay fields to use to implement a pay differential; therefore, the solution requires use of the Red Circle Rate and 957 fields, which are also used in the implementation of furloughs. Should a CSU furlough and Budget Impasse occur simultaneously, this solution would need to be redesigned to accommodate both conditions simultaneously.

The Pay Differential solution also has disadvantages when considering Emergency Overtime business requirements. Because the value in the Premium Pay field will need to be replaced retroactively to reinstate full pay for that period and then be restored to the minimum wage for the pay periods remaining in the Budget Impasse (when no overtime is worked), there is the potential for out-of-sequence transactions, which would require manual corrections. The process of temporarily replacing the Premium Pay value cannot be automated for these individuals, so every employee with Emergency Overtime will require manual adjustments in this solution.

Employee transfers occurring mid-month will also require manual intervention on the part of SCO, and will require department and campus HR departments to notify the SCO when these transfers occur. More broadly, any EH changes that occur during the Budget Impasse period that affect how employees are paid will require manual adjustments. These complications could be minimized if the administration restricts EH changes made during the Budget Impasse period (e.g., departmental transfers and promotions); however, it seems impractical that all EH activity will be or can be suspended during a Budget Impasse. Normal EH activity will complicate recovery. The State processes over 50,000 EH transactions each month. As this activity continues, it will make recovery more difficult, since the State does not have the ability to delete a Premium Pay value retroactively once another transaction has been posted.

Development time would also be a disadvantage of the Pay Differential solution. As previously mentioned, this solution would require using the Red Circle Rate for CSU and the Premium Pay field for Civil Service employees. Neither of these fields has been used historically by SCO to pay a flat amount. These fields have been used to either reduce or increase pay by a percentage rate, a flat rate or to withhold pay. Changing the purpose and function of these fields in the system would require substantial development time, especially when considering the number of downstream processes affected by changes in the EH system. Additionally, there are only three Premium Pay fields on the Civil Service EH screen. If all three fields are being used, this solution would require one of the premiums to be deleted and then restored once the budget is enacted.

Another substantial disadvantage would be the impact to the departmental and campus Human Resources (HR) employees. These employees enter information into the EH system directly to establish Premium Pay values, which is derived from the pay differential field. As discussed previously, if one of the pay differential fields is replaced to pay minimum wage, the HR staff will be responsible for processing the premium pay each month as a payroll transaction. Once the budget is enacted, the HR employee will be required to re-establish the premium pay on the EH database, and ensure that any premium deleted was paid properly.

In summation, the relative disadvantages of the Pay Differential Solution primarily relate to the complexity involved when considering the downstream processes. The data within EH is tied to many other systems and, therefore, the difficulty in planning for and executing recovery is amplified. These disadvantages result in the Minimum Wage Pay Differential solution being rated as the least attractive of the top three alternative solutions.

3.3.3 Solution Implementation

Based upon the conceptual design, Crowe completed analysis of the Minimum Wage Pay Differential alternative solution to determine a high-level approach for implementing the solution. Crowe used a size-based estimating technique to establish an estimate of the effort required to implement the alternative solution and then used resource loading and resource costing models to derive overall estimates for the cost and implementation schedule. The methodology and assumptions used for estimating the solution implementation are described in more detail in *Appendix B* of this report.

In order to determine the size of the software development life cycle (SDLC) – that is, the amount of effort required to complete the software engineering required for implementation of the alternative solution – Crowe facilitated a more detailed analysis of the conceptual design to arrive at a “size estimate” – that is, a quantitative estimate of the components that would need to be completed in order to implement the solution as contemplated in the conceptual design.

Crowe's analysis for implementation the Minimum Wage Pay Differential alternative solution yielded the following estimate in terms of the number of components to be created or modified, by component type, including the relative complexity of each:

	Complexity of SDLC					
Component Type/SDLC Action	**High**	**Medium-High**	**Medium**	**Medium-Low**	**Low**	**Grand Total**
Batch Program (COBOL)						
Create	1	6	3		1	11
Modify			4		1	5
Mark IV Program						
Create	1			3		4
Modify				2		2
Mass Update Program (COBOL)						
Create	1		1			2
Modify				1		1
Online program (CICS or ADSO)						
Create			1			1
Modify		2	4		1	7
Report/Exception Report (COBOL)						
Create			1	1		2
Table						
Create					3	3
Modify				1	1	2
Grand Total	**3**	**8**	**14**	**8**	**7**	**40**

Using the methodology and assumptions described in *Appendix B*, Crowe used the above size estimate and estimates of the other implementation components (e.g., Project Management Life Cycle, Project Approval Life Cycle, Procurement Life Cycle, Organizational Change Management), to compute an estimate for implementation of the Minimum Wage Pay Differential alternative solution. The following table summarizes the effort, cost, and implementation schedule estimated for the Minimum Wage Pay Differential alternative.

Alternative:	1	Minimum Wage (MW) Pay Differential

	Effort Estimate (hrs)			Cost ($)			Duration (months)		
Implementation Phase	**Optimistic**	**Most Likely**	**Pessimistic**	**Optimistic**	**Most Likely**	**Pessimistic**	**Optimistic**	**Most Likely**	**Pessimistic**
Project Approval Life Cycle	3,328	5,120	6,912	$402,798	$619,689	$836,580	5.0	5.0	20.0
Procurement Life Cycle	3,250	5,000	6,750	$416,393	$640,604	$864,816	5.0	6.0	7.0
Software Development Life Cycle	17,475	26,884	36,293	$3,099,647	$4,768,688	$6,437,728	14.0	20.0	27.0
System Test/Pilot	5,408	8,320	11,232	$866,915	$1,333,716	$1,800,516	2.5	3.0	3.5
Organizational Change Management Life Cycle	2,231	3,432	4,633	$424,080	$652,431	$880,782	6.5	10.0	13.5
Project Management Life Cycle	9,507	14,627	19,746	$1,940,211	$2,984,940	$4,029,669	26.5	34.0	57.5
Resource Learning (Investment in Ramp-up)	2,964	4,560	6,156	$517,218	$795,720	$1,074,222	--	--	--
Total	**44,163**	**67,943**	**91,722**	**$7,667,262**	**$11,795,788**	**$15,924,313**	**26.5**	**34.0***	**57.5**

*Note that the total duration estimated for the project (that is, the elapsed duration from inception of the project until the solution is ready for operation in a production environment) is not the sum of the duration for all phases because there is assumed overlap of some phases. See *Appendix B* for a more detailed description of the assumed implementation methodology.

3.4 Alternative Solution Profile 2 – Payroll Solution with Modified Payroll Modules

3.4.1 Solution Conceptual Design

Conceptually, the Payroll Solution modifies the current pay process once a pay status record is generated from EH. The pay status record for each employee is processed through a series of programs to determine to whom to pay full pay or a minimum wage pay amount (including the hourly minimum wage for nonexempt employees, $455 per week for many exempt employees, and $27.63 per hour for computer-related exempt employees). A selection criteria table will be developed to define by WWG, agency code class code, and/or Social Security Number which employees should receive which rate of pay during Budget Impasse. These programs will modify the salary field on this record to reflect the appropriate minimum wage rate. As in the EH solution, employees who should not receive pay during the Budget Impasse will have pay suspended using a new WWG posted on their record through a mass update. The SCO will suspend pay for employees with that new WWG during the impasse period.

In order to improve the SCO's ability to pay employees for actual hours worked (Requirement 2.2), the SCO will develop new dock types to allow the SCO to differentiate between unpaid time off and leave usage during a Budget Impasse period.

The most significant difference between treatment of Civil Service and CSU employees is that the CSU system does not currently include mass update functionality; therefore, a new mass update process must be created to apply this solution to CSU employees.

The following description provides a more detailed description of how the Payroll Solution with Modified Payroll Modules would address each of the operational changes needed to accommodate the Budget Impasse requirements.

Category	Requirement	No.	Summary Description of Key System and Process Changes
Issuing Payroll during Budget Impasse			
General	System-wide Civil Service Changes	N/A	• SCO will modify the normal payroll process once the pay status is created and modify the pay status record by processing through a series of programs to determine whom to pay full pay, minimum wage, $455/week, $27.63/hour, or no pay. For those receiving a MW payment, their salary field will be changed to reflect the new rate. • SCO will build a selection criteria table to define how specific employee groups should be paid. • SCO will establish new dock transaction types to differentiate between unpaid time off and leave usage. Departments will be required to enter the dock transactions prior to executing Master. • SCO will select employees subject to full pay, no pay or minimum wage pay, using Work Week Group (WWG), class code and agency code (see below for details).
General	System-wide CSU Changes	N/A	• Same as Civil Service, except that the WWG entry is currently generated from the pay scale record, so system changes will be needed and CSU does not possess a mass update.
Full Pay	Constitutionally Protected Salaries	1.1	• SCO will use class code(s) in the selection criteria table to issue full pay to constitutionally-protected salary employees.

Category	Requirement	No.	Summary Description of Key System and Process Changes
Full Pay	Continuous Appropriations	1.2	• Each year, SCO will update the list of funds that are continuously appropriated. • SCO will use fund code(s) or agency codes in the selection criteria table to issue full pay to employees paid from continuously appropriated funds.
Full Pay	Federally Required Payments (CDCR medical employees)	1.3	• SCO will use class code(s) and/or agency code(s) in the selection criteria table to issue full pay to CDCR medical employees.
Full Pay	Prior Year Appropriations	1.4	• SCO will use effective-date-driven payment procedures (as they do today) to issue prior-year payments at full rate. (NOTE: The effective-date capability must apply to the solution.)
MW Pay	Nonexempt - No Overtime	2.1	• SCO will use WWG in the selection criteria table to issue MW pay to nonexempt employees with no overtime. • MW payments will be tagged with a MW indicator.
MW Pay	Hours Worked Bases for Payment	2.2	• SCO will establish new dock transactions to differentiate unpaid time off and leave usage.
MW Pay	Minimum Pay of Exempt ($455/wk or $27.63/hr)	2.4	• SCO will use WWG in the selection criteria table to issue $455/week (or $27.63/hour for computer-related employees) payment to exempt employees.
No Pay	Not Covered - Elected, Legislative, Appointed	3.1	• SCO will create a mass update program to move elected, legislative and appointed employees (by class codes) into a new WWG to suspend pay.
No Pay	Exempt - Doctors, Lawyers, Teachers	3.2	• SCO will create a mass update program to move doctors, lawyers and teachers (by class codes) into a new WWG to suspend pay.
Overtime	Anticipated Overtime	4.1	• DPA will provide a list of agencies with anticipated overtime (if excluded from MW). • SCO will use class code(s) and agency code(s) in the selection criteria table to issue full pay to employees with DPA-approved anticipated overtime. • NOTE: SCO will need to ensure that non-wage payments are not made for anticipated overtime pay periods.
Overtime	Emergency Overtime	4.2	• SCO will identify those who work overtime in the overtime pay file. • SCO will identify those paid minimum wage in the selection criteria table and through each pay record. • SCO will process a transaction to adjust pay for employees who worked overtime and were paid minimum wage. • NOTE: SCO will need to ensure that non-wage payments are not made for the emergency overtime pay periods.
Other Payments	**Make** Wage Payments at MW	5.1	• SCO will identify wage-related payments and replace the wage rate in the pay status file with the MW rate. • Campuses will enter hours worked and MW rate for student assistants.

Category	Requirement	No.	Summary Description of Key System and Process Changes
Other Payments	**Withhold** Non-Wage Payments	5.2	• SCO will identify non-wage payments and automatically suspend such payments. • SCO will create a new process to suspend lump sum payments submitted during the Budget Impasse (except for those for constitutionally protected salary, continuous appropriation and CDCR medical employees), so that they can be quickly restored after budget enactment. • SCO will create a Mark IV program to strip out the lump sum payment transactions to prevent them from being sent to CLAS.
Other Payments	**Withhold** Federal Taxes	5.3	• SCO will withhold federal tax deductions from actual pay as during normal payroll process.
Other Payments	**Withhold** State Tax Deductions	5.4	• SCO will withhold state tax deductions from actual pay as during the normal payroll process.
Other Payments	**Deduct** Garnishments	5.5	• SCO will deduct garnishments from actual pay as during the normal payroll process.
Other Payments	**Withhold** State Retirement Contributions	5.6	• SCO will create full pay salary tables from which to calculate state retirement contributions. • SCO will withhold state retirement contributions based on full pay from employees' actual pay (full pay, minimum wage, $455/wk or $27.63/hr). • NOTE: For employees in overtime departments (if excluded from MW), SCO must be able to calculate retirement contributions without a reduction for leave credits.
Other Payments	**Don't Withhold** Voluntary Contributions	5.7	• SCO will modify the deduction apply process in the Payroll system to ignore voluntary deductions, and to have contributions remain in the system to be made during recovery.
Scenarios	Employee Transfers	N/A	• If EH changes are effective at the start of a pay period, the system changes should allow for appropriate pay. • If EH changes are effective mid-month, PPSD will need to work with the department or campus to adjust pay manually for each portion of the month. • NOTE: The system does not always combine payments for both positions into one pay status record. It will not combine payments if they are for two different departments.
Scenarios	Impasse Period >90 days	N/A	• SCO will create full pay tables from which to calculate state retirement contributions. • SCO will create and send to CalPERS a pay history file showing full pay for employees and calculate the employer state retirement contribution.
Recovery upon Budget Enactment			
General	System-wide Civil Service Changes	N/A	• SCO will interrogate the pay status record and payment history file to determine what should have been paid, automatically or manually create a recovery payment, apply deductions, and then issue the adjustment amount.
General	System-wide CSU Changes	N/A	• Same as Civil Service.

Category	Requirement	No.	Summary Description of Key System and Process Changes
New Budget	Restore Regular Pay (including Leave) by next pay period or 30 days of new budget	7.1	• SCO will initiate process to interrogate payment history file and enter a termination date to cease application of the minimum wage by building a new routine to identify payments with a MW indicator in the record. • SCO will create transactions to issue adjustment pay and apply deductions and garnishments. • SCO will issue recovery payments. • SCO will release suspended payments. • SCO will reverse leave docks.
New Budget	Restore Separation Pay within 72 hours of new budget	7.3	• SCO will create a new process to suspend lump sum payments submitted during the Budget Impasse (except for those for constitutionally protected salary, continuous appropriation and CDCR medical employees), so that they can be quickly restored after budget enactment. • SCO will create a Mark IV program to strip out the lump sum payment transactions to prevent them from being sent to CLAS.
New Budget	Restore Voluntary Deductions by next pay period or 30 days of new budget	7.4	• SCO will apply voluntary deductions that haven't been deducted by reversing the deduction apply process modifications made at start of impasse.
New Budget	Restore Mandatory Deductions (Federal & State Taxes) by next pay period or 30 days of new budget	7.5	• System should process appropriately without modification.
New Budget	Restore Mandatory Deductions (State Retirement) by next pay period or 30 days of new budget	7.5	• SCO will need to modify the retirement module to ensure that employee retirement contributions are not made from recovery payments.
New Budget	Restore Garnishments by next pay period or 30 days of new budget	7.6	• SCO will apply any garnishments to recovery payments, where possible. • SCO will create an exception report for any garnishments unable to be applied due to the split payments (i.e., neither payment was sufficient to cover the garnishment amount).

3.4.2 Solution Business Case

As in the case of the Minimum Wage Pay Differential solution described in Section 3.3, the Payroll Solution yields both advantages and disadvantages when considered against other alternative solutions assessed.

Advantages
The primary advantage of the Payroll Solution with Modified Payroll Modules is that it most effectively leverages current technology and processes used for normal payroll processing. Making use of available technology and processes reduces the risk, cost, development time and testing time associated with the solution. The code and mass updates being used in this solution are familiar to SCO personnel and should generate results as expected.

Another advantage of this Payroll Solution is that the intervention to change pay amounts occurs much later in the payroll process, which, unlike the Pay Differential solution, allows EH changes to be made without causing significant problems in the recovery process. This reduces the impact on department and campus HR employees who enter information into EH.

The flexibility to adapt to changes in requirements is another distinct advantage of the Payroll Solution with Modified Payroll Modules. Because most of the functionality would be built in external tables, changes in requirements could be accommodated with relative ease by updating the tables. For example, if there were a change in the minimum wage rate, this Payroll Solution could easily accommodate the change because this rate is applied dynamically throughout the payroll process through a single program, as opposed to widespread modifications to underlying EH records.

Disadvantages
The primary disadvantage of any payroll solution is that recovery is complex due to the necessity to design programs that review all payments made or suspended during the Budget Impasse to correct or restore them once a budget is enacted. Recovery is a more automatic process in the EH solution in which the downstream effects that can complicate pay become a strategic advantage as they automatically adjust subsequent payments when the retroactive EH change is made.

The complexity of recovery also increases development time, another distinct disadvantage. Although SCO attempted a similar payroll solution in the past, the previously created programs were never actually implemented and will need to be assessed and rewritten to accommodate the current Budget Impasse Business Requirements. The earlier programs do not comply with all of the current requirements.

3.4.3 Solution Implementation

Crowe also completed analysis of the Payroll Solution with Modified Payroll Modules alternative solution to determine a high-level approach for implementing the solution. Again, Crowe used the size-based estimating technique to estimate the effort required to implement the alternative solution and then used resource loading and resource costing models to derive overall estimates for cost and implementation schedule (see *Appendix B* for more detail).

Crowe's analysis for implementation the Payroll Solution with Modified Payroll Modules alternative solution yielded the following estimate in terms of the number of components to be created or modified, by component type, including the relative complexity of each:

	Complexity of SDLC					
Component Type/ SDLC Action	**High**	**Medium-High**	**Medium**	**Medium-Low**	**Low**	**Grand Total**
Batch Program (COBOL)						
Create	2	5	1	5		13
Modify		1	2	3		6
Mark IV Program						
Create	1			2		3
Mass Update Program (COBOL)						
Create	1			2		3
Online program (CICS or ADSO)						
Create		1		1		2
Modify			1			1
Report/Exception Report (COBOL)						
Create				1		1
Table						
Create			1	1		2
Grand Total	**4**	**7**	**5**	**15**	**0**	**31**

Using the methodology and assumptions described in Appendix B, Crowe used the above size estimate and estimates of the other implementation components (e.g. Project Management Life Cycle, Project Approval Life Cycle, Procurement Life Cycle, Organizational Change Management), to compute an estimate for implementation of the Payroll Solution with Modified Payroll Modules alternative solution. The following table summarizes the effort, cost, and implementation schedule estimated for the Payroll Solution with Modified Payroll Modules alternative.

Alternative:	2	Payroll Solution with Modified Payroll Modules

	Effort Estimate (hrs)			Cost ($)			Duration (months)		
Implementation Phase	**Optimistic**	**Most Likely**	**Pessimistic**	**Optimistic**	**Most Likely**	**Pessimistic**	**Optimistic**	**Most Likely**	**Pessimistic**
Project Approval Life Cycle	3,328	5,120	6,912	$402,798	$619,689	$836,580	5.0	5.0	20.0
Procurement Life Cycle	3,250	5,000	6,750	$416,393	$640,604	$864,816	5.0	6.0	7.0
Software Development Life Cycle	11,580	17,816	24,052	$2,054,133	$3,160,204	$4,266,276	10.0	14.0	18.0
System Test/Pilot	3,744	5,760	7,776	$600,172	$923,342	$1,246,511	2.0	2.5	3.0
Organizational Change Management Life Cycle	1,815	2,792	3,769	$344,997	$530,765	$716,533	6.5	10.0	13.5
Project Management Life Cycle	7,115	10,946	14,778	$1,452,014	$2,233,868	$3,015,722	22.0	27.5	48.0
Resource Learning (Investment in Ramp-up)	2,218	3,413	4,607	$381,257	$586,549	$791,841	--	--	--
Total	**33,050**	**50,847**	**68,644**	**$5,651,764**	**$8,695,021**	**$11,738,279**	**22.0**	**27.5***	**48.0**

*Note that the total duration estimated for the project (that is, the elapsed duration from inception of the project until the solution is ready for operation in a production environment) is not the sum of the duration for all phases because there is assumed overlap of some phases. See *Appendix B* for a more detailed description of the assumed implementation methodology.

3.5 Alternative Solution Profile 3 – Payroll Solution with External Minimum Wage Code

3.5.1 Solution Conceptual Design

Conceptually, the Payroll Solution with External Minimum Wage Code is precisely the same as the Payroll Solution with Modified Payroll Modules discussed in Section 3.4 – that is, they utilize the same conceptual design for satisfying Budget Impasse Business Requirements. The two solutions differ only in their underlying technical implementation.

The Payroll Solution with External Minimum Wage Code presumes that all new programs created to interrogate and modify pay status records as part of the payroll process would be externalized – that is, they would be created as new programs outside of the existing payroll programs. By externalizing the programs, this minimizes the impact to existing programs and, in doing so, minimizes the amount of re-testing and verification for existing payroll processes.

In comparison, the Payroll Solution with Modified Payroll Modules presumes that programs needed to interrogate and modify pay status records as part of the payroll process would be modified versions of existing payroll programs, resulting in a minimal number of new programs and jobs.

The conceptual framework for the system and process changes required for this solution are basically the same as the solution description for the Payroll Solution with Modified Payroll Modules described in Section 3.4.1, and are not repeated here.

3.5.2 Solution Business Case

As in the case of the Payroll Solution with Modified Payroll Modules solution, the Payroll Solution with External Minimum Wage Code yields the same advantages and disadvantages when considered against other alternative solutions (namely, the Minimum Wage Pay Differential solution). The advantages and disadvantages discussed below are **relative** disadvantages when compared to the two conceptually similar solutions (i.e., the Payroll Solution with Modified Payroll Modules and the Payroll Solution with External Minimum Wage Code).

Advantages
As discussed above, the Payroll Solution with External Minimum Wage Code presumes that all new programs created to inspect and modify pay status records as part of the payroll process would be created as new programs outside of the existing payroll programs. While both the Payroll Solution with Modified Payroll Modules and the Payroll Solution with External Minimum Wage were initially evaluated to have a Low Risk, upon detailed analysis, the External Minimum Wage alternative has a lower relative risk, when comparing just these two alternatives. By externalizing the programs, the SCO minimizes the impact to existing programs and, in doing so, minimizes the amount of re-testing and verification for existing payroll processes. This is advantageous in terms of developing and testing the new solution.

Disadvantages
As discussed above, the Payroll Solution with External Minimum Wage Code presumes that all new programs created to inspect and modify pay status records as part of the payroll process would be created as new programs outside of the existing payroll programs. Externalizing the programs requires that new jobs be created or that existing jobs be modified. This would require a nominal amount of effort above and beyond that required for the Payroll Solution with Modified Payroll Modules to develop and test the new or changed jobs.

3.5.3 Solution Implementation

Based upon the conceptual design, Crowe completed analysis of the Payroll Solution with External Minimum Wage Code alternative solution to determine an approach for implementing the solution. As mentioned above, however, the Payroll Solution with External Minimum Wage Code is basically the same (conceptually) as the Payroll Solution with Modified Payroll Modules discussed in Section 3.4 – that is, they

utilize the same conceptual design for satisfying Budget Impasse Business Requirements. The two solutions differ only in their underlying technical implementation.

To that end, Crowe assessed the methodology and assumptions used for estimating the solution implementation (described in more detail in *Appendix B*) to determine whether there is a difference in the estimated effort, cost, or schedule for implementation.

While our initial high level assessment of the Payroll Solution with Modified Payroll Modules was evaluated to have a High-High Development Time and the Payroll Solution with External Minimum Wage was evaluation to have a High Development Time, upon detailed analysis, the development time estimate for the Payroll Solution with External Minimum Wage Code is exactly that of the Payroll Solution with Modified Payroll Modules in that the same programs must be modified or created to implement this Alternative 3 as those modified or created to implement this Alternative 2.

Crowe determined that, while subtle differences may exist between the implementation efforts for Alternatives 2 and 3, these are not discernable at this level of analysis. Because these two solutions are conceptually identical, the only difference that exists in implementing these two alternatives is the technical architecture selected for implementation of new or modified code. In Alternative 2, this would constitute programs built upon modifications to existing/legacy technology used for implementing the personnel and payroll systems at SCO (namely, COBOL). For Alternative 3, this would constitute the use of any development language (e.g, COBOL, Java, .NET) to develop new programs.

3.6 Alternative Solutions Summary

The following provides a summary comparing the three alternative solutions assessed by Crowe:

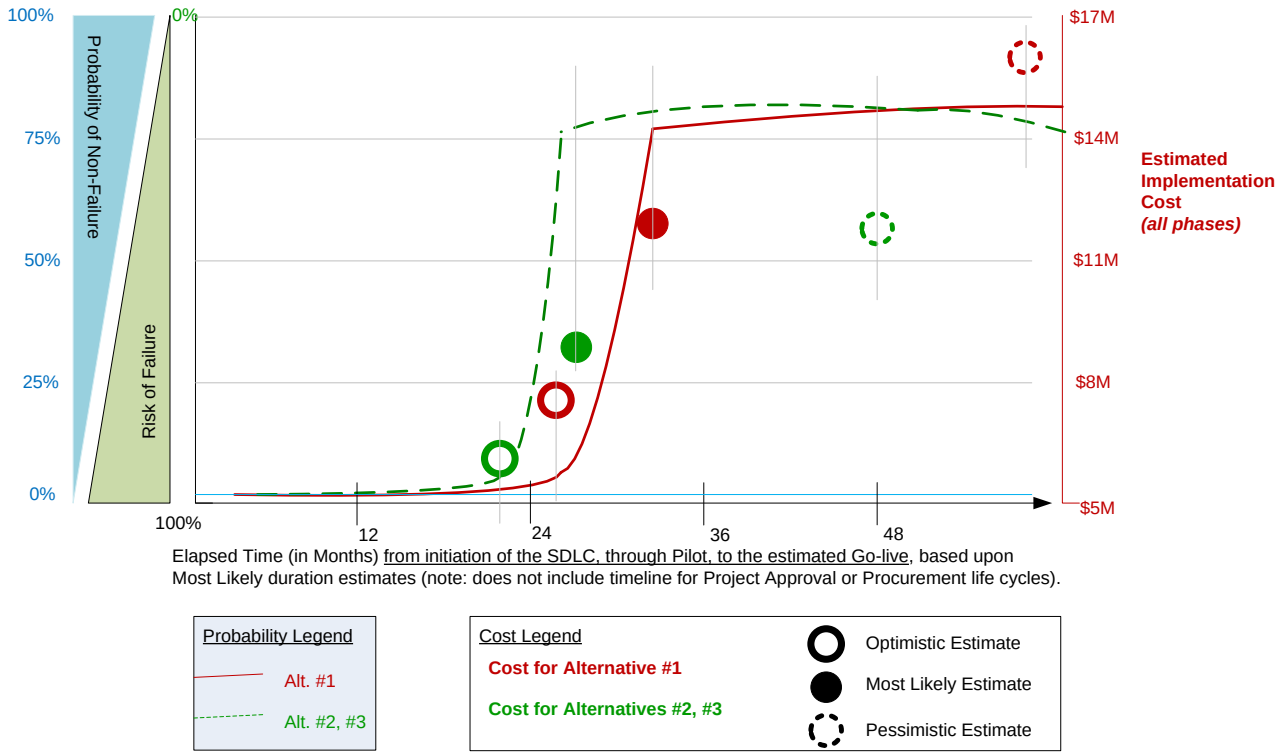
Alternative	Relative Strengths/Advantages	Relative Weaknesses/Disadvantages, Issues, or Constraints
1 – Minimum Wage (MW) Pay Differential	• Ability to recover and restore wages upon budget enactment • Shorter implementation time due to SCO experience using pay differentials and mass updates • Shorter implementation time due to SCO control over the implementation, rather than an outside vendor, which should facilitate a more aggressive implementation schedule	• Lack of Premium Pay fields in CSU EH screens, which requires modification of two additional fields (Red Circle Rate and 957 field) to generate the pay • Inability to support a CSU furlough and Budget Impasse simultaneously (due to the fact that both situations require use of these two fields) • SCO manual adjustments required for every instance of Emergency Overtime due to the retroactive changes to Premium Pay values • SCO manual adjustments required for any employee transfers occurring mid-month, in addition to notification requirements for the department and campus HR departments where these transfers occur • Recovery complications as a result of any normal EH transactions (typically 50,000 per month), due to the inability to delete a Premium Pay value retroactively once another transaction has been posted • Longer development time due to the new uses of Red Circle Rate for CSU and the Premium Pay field for Civil Service

Alternative	Relative Strengths/Advantages	Relative Weaknesses/Disadvantages, Issues, or Constraints
		• Downstream effects of the EH system change, due to the change being made so early in the payroll process that involves many interrelated systems • Complications that result from replacing values in the Premium Pay field which need to be used during the Budget Impasse (while the field is being used to contain the MW value) • Increased workload for departmental and campus HR staff who enter information into the EH system directly and will be required to work with SCO to report Budget Impasse-relevant actions (separations, emergency overtime, transfers, premium pays in the third Premium Pay field, etc.)
2 – Payroll Solution with Modified Payroll Modules	• Most effectively leverages current technology and processes used for normal payroll processing • Allows EH transactions to occur without affecting Budget Impasse wage changes • Minimizes impact on departmental and campus HR departments due to lack of involvement of EH system • Greater flexibility to adapt to changes in requirements, due to ability to quickly update tables used to implement this solution	• Increased complexity during recovery due to the necessity to review all payments made or suspended during the Budget Impasse to correct or restore them once a budget is enacted • Increased development time to support recovery activities
3 – Payroll Solution with External MW Code	• Most effectively leverages current technology and processes used for normal payroll processing • Allows EH transactions to occur without affecting Budget Impasse wage changes • Minimizes impact on departmental and campus HR departments due to lack of involvement of EH system • Greater flexibility to adapt to changes in requirements, due to ability to quickly update tables used to implement this solution • Minimizes impact to existing programs, as well as time required for re-testing and verification of existing payroll processes	• Increased complexity during recovery due to the review of all payments made or suspended during the Budget Impasse to correct or restore them upon budget enactment • Increased development time to support recovery activities • Additional effort to create, test and implement new “jobs” (scheduling programs that drive execution of other programs) and modify existing jobs to accommodate the new, externalized programs

The following table provides a summary comparing the overall implementation efforts, costs, and schedule estimated for all Implementation Phases of the three alternative solutions assessed in depth by Crowe:

	Effort Estimate Range (hrs)			Cost Estimate Range ($)			Implementation Schedule Estimate Range (months)		
Alternative	**Opti-mistic**	**Most Likely**	**Pessi-mistic**	**Optimistic**	**Most Likely**	**Pessi-mistic**	**Opti-mistic**	**Most Likely**	**Pessi-mistic**
1 – Minimum Wage (MW) Pay Differential	44,163	67,943	91,722	$7,667,262	$11,795,788	$15,924,313	26.5	34.0	57.5
2 – Payroll Solution with Modified Payroll Modules	33,050	50,847	68,644	$5,651,764	$8,695,021	$11,738,279	22.0	27.5	48.0
3 – Payroll Solution with External MW Code	33,050	50,847	68,644	$5,651,764	$8,695,021	$11,738,279	22.0	27.5	48.0

To place the "optimistic" and "pessimistic" estimates into context, consider the following graph:



Industry trends indicate that nearly 20% of all software projects fail. It is important to align the project scope with the right mix of resources (i.e., cost) and timeframe in order to minimize risk of failure. As illustrated above, the most likely estimates minimize the project risk at the lowest cost. Efforts to reduce timeframe from the most likely estimate will increase project risk of failure. Increases in project timeframe add to overall project cost but do not provide significant improvements in project risk.

Based upon the estimating methodology used by Crowe (see *Appendix B*), the optimistic estimate represents a "best case" scenario, where numerous project activities are proven that they can be conducted well below the most likely estimates and/or there is an absence of project risks or unknowns that otherwise

would be cause for increased efforts, costs, and duration. In practice, this rarely occurs. As depicted in the graph, the optimistic scenarios will lead to project success only 5-10% of the time.

Likewise, the pessimistic estimate represents a "worst case" scenario, where numerous project activities are proven that they cannot be conducted at or below the most likely estimates and/or there is a presence of project risks or unknowns that are cause for increased efforts, costs, and duration.

3.7 Conclusion

To set the context for Crowe's findings with respect to assessment of the Alternative Solutions, it is important to reiterate that, because of the finding of infeasibility, should the SCO elect or be required to implement any solution, including those studied as part of this assessment, no technical solution will satisfy all Budget Impasse Business Requirements simultaneously at all times.

In Crowe's assessment of the three alternatives, Crowe concluded the following:

Budget Impasse Payroll System – Assessment of Alternatives – Finding #3

Based upon Crowe's analysis of all alternative solutions identified as part of this Budget Impasse Payroll System Assessment Project, Alternative 3, the Payroll Solution with External Minimum Wage Code, is the most promising alternative for SCO to satisfy the Budget Impasse Business Requirements that are remediable.

Although each of the alternatives has both relative advantages and disadvantages, Alternative 3, upon Crowe's detailed analysis, proved to be the most promising alternative solution due the following features of the solution:

- Leverage of existing processes and systems
- SCO control of development, implementation and maintenance activities (when compared to External Solutions implemented by outside vendors)
- Allowance for continued Employment History changes as personnel transactions naturally occur during Budget Impasse
- Minimal impact to workload of departmental and campus HR departments
- Greater flexibility to adapt to changes in requirements
- Minimal impact on existing payroll systems and processes, due to externalization of new programs

The risks associated with this solution – namely, the higher volume of adjustment activities during recovery, additional development needed to support recovery, and additional modification to the "jobs" that support program execution – may be mitigated by comprehensive planning and monitoring during development and implementation.

Alternative 2 was determined to be less promising because the externalization of code included in Alternative 3 provides an advantage to SCO in minimizing the impact on existing payroll systems and process.

By comparison, the assessed EH Solution, Minimum Wage Pay Differential, presents significant disadvantages:

- Required development of new and untested technology to support minimum wage payments for both CSU and Civil Service employees;
- The inability to support a CSU furlough and Budget Impasse simultaneously;
- Thousands of manual adjustments that would be required for Emergency Overtime, separations, transfers and other EH transactions;
- Downstream effects of EH changes made so early in the payroll process; and
- Increased workload for SCO and department/campus HR staff to manage premium pays that are deleted to support Budget Impasse minimum wage payments.

Although the EH solution presents an advantage during recovery due to the ability of the EH system to recover and restore regular wage rates more automatically than a Payroll Solution, this advantage does not outweigh the significant disadvantages above which would translate into increased costs, longer development and implementation cycles, and a greater impact on SCO and department/campus HR staff.

In assessing Alternatives 2 and 3, Crowe concluded the following with respect to the implementation of these solutions:

Budget Impasse Payroll System – Assessment of Alternatives – Finding #4

Based upon Crowe's analysis of Alternative 2, the Payroll Solution with Modified Payroll Modules, and Alternative 3, the Payroll Solution with External Minimum Wage Code, and presuming the implementation approach and assumptions described in *Appendix B* of this report, Crowe estimates that either (partial) solution can be implemented at SCO with the following parameters:

- 22–48 elapsed months in duration, beginning with the pursuit of implementation of the alternative solution (most likely duration would be 27.5 months)
- Approximately 33,000–69,000 hours of resource effort (most likely estimate of effort would be 50,847 hours); and
- Approximately $5,600,000–$11,700,000 of cost for resources (most likely estimate would be $8,695,021)

4 Attachments

Appendix A: SCO Budget Impasse Business Requirements

Appendix B: Estimating Methodology

Appendix A: SCO Budget Impasse Business Requirements

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MEMORANDUM

TO: Brent Ehrman and Neal Baumeyer of Crowe Horwath LLP

FROM: Richard J. Chivaro, Esq, Chief Counsel,
State Controller's Office, State of California
and
Steven S. Rosenthal, Marc S. Cohen and Jay W. Waks, Esqs.
Kaye Scholer LLP

DATE: May 21, 2010

SUBJECT: Business Requirements of the State's Uniform Payroll System in Regard to Crowe Horwath's Budget Impasse Assessment Study

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The following summary has been prepared by counsel to state the principal business requirements in regard to the application of the State of California's uniform payroll system administered by the State Controller's Office to the payment of California state employees during a budget impasse and the recovery of the payroll system upon subsequent enactment of the new budget. This document has been prepared by counsel in connection with the *Gilb v. Chiang* litigation currently pending before the California 3rd District Court of Appeal. The information in this document confirms the discussions that counsel has had with Crowe Horwath in connection with Crowe Horwath's retention as expert consultant to Kaye Scholer LLP. This document outlines the budget impasse assessment business requirements that Crowe Horwath may rely upon in preparing its assessment, report and roadmap of recommended solutions to facilitate the appropriate operation of the payroll system during and after a California budget impasse. This document and the information contained herein are privileged and confidential and not to be disclosed except as necessary to provide for the defense of the State Controller and State Controller's Office in the *Gilb v. Chiang* case or as otherwise authorized by Kaye Scholer LLP.

By way of background, the State Controller is constitutionally responsible for drawing warrants upon of the State Treasury, as authorized by law, to pay (a currently estimated population of) approximately 314,184 State employees. Most General Fund appropriations are contained in the budget act for the fiscal year enacted by the Legislature and signed into law by the Governor. The State of California's fiscal year runs from July 1 to June 30. Although the Constitution requires the budget to be enacted by June 15 of each year, as a practical matter, in

order to commence the fiscal year with a budget in place, the budget must be signed on or before July 1. When a budget is late, and since most appropriations are contained in the budget act, the issue arises as to which payroll payments may be made by the Controller during the budget impasse.

The indeterminate nature of any budget impasse can be a major impediment to the appropriate operation of the payroll system in conformance with law. The first time a budget was passed untimely was in 1969 and, since that time, late budgets have become the norm and ranged from one day late in 1976 to 66 days in 2002. The 2008 budget was enacted eighty-four days late.

Post-1987, the number of days without a budget has increased. During this period, the Controller's Office formulated four criteria upon which an appropriation could be found to authorize continued payment despite the absence of a budget. The four criteria were: (1) prior year appropriations; (2) continuous appropriations; (3) appropriations required by the State Constitution, and (4) payments required by federal law. This practice ultimately was challenged in the *White v. Davis* case. In its 2003 decision, the California Supreme Court upheld the Controller's practice of relying upon these criteria, expressly in regard to the later three criteria that had been addressed by the parties on appeal. The first criterion was not in issue on appeal, and its application is appropriate under the Supreme Court's decision in *White* and its reliance upon the statutory authorization of payments of unexhausted specific appropriations.

The payroll system administered by the State Controller's Office is fairly complex. As of the April and May 2010 pay periods, the State Controller's Office pays 240,990 Civil Service employees (which total includes elected officials, their policymaking appointees, and Judicial Council employees), in addition to 73,194 employees of the California State University (including CSU student assistants), for the grand total of approximately 314,184 employees. The payroll process normally includes establishing the individual's gross pay, performing the gross-to-net calculations; reporting taxes and retirement calculations; applying, reporting and remitting mandatory and voluntary deductions; maintaining leave balances and applying leave usage; complying with requirements for various disability programs; and dealing with the differences in some 33 employee organization bargaining units.

Moreover, the State Controller's Office operates a variety of pay plans to pay the State's Civil Service employees (**Table A**):

Table A
Approximate Number of Exempt and Non-Exempt Employees Covered by Basic SCO Pay Plans

BASIC SCO PAY PLANS	APPROX. NUMBER OF EMPLOYEES	
	No. Exempt	No. Non-Exempt
A. A monthly/semi-monthly anticipatory plan otherwise known as a "negative" pay system, where monthly/semi-monthly paid employees are issued their pay on the last day of the pay period.	69,501	187,932
B. A monthly plan with a lag, otherwise known as "positive" pay system, where pay is issued after the close of the pay period based on attendance reporting.	4,586	40,766
C. A semi-monthly positive plan, a semi-monthly plan with a lag.	18	11,249
D. A bi-weekly plan with a lag.	0	134

Further complicating this picture in terms of designating employees who, during a budget impasse, would be paid at other than full pay, approximately 16,000 employees (some on the "negative" pay system, and others on the "positive" system) have been grouped with the non-exempt counts in the above table because the SCO has been unable to identify their FLSA designation from Payroll and Employment History data.

In support of the above textual background, **Table B** outlines the key business requirements for the budget and impasse payroll assessment study:

Table B

Key Budget Impasse Assessment Business Requirements

Cat.	Functional Category	Functional No.	Requirement Concept	Description of Requirement
0	Payroll Payment Authorization Requirements	0.1	Issuing Warrants	Controller draws warrants to be paid out of the State Treasury, only when authorized by law and sufficient and specific appropriations are available.
		0.2	Pay Periods and Pay Dates	Pay dates for monthly salaried employees -- no more than 10 calendar days after close of payroll period. Pay dates for semimonthly and biweekly employees -- no more than 15 calendar days after close of payroll period. Pay period changes for employees in collective bargaining units must be negotiated in the MOU for each unit.
1	Full Pay Categories during Budget Impasse	1.1	Constitutionally Required Payments	Controller must fully pay employees with constitutionally protected salaries and other payments authorized in self-executing provisions of the State Constitution (such as employee and employer retirement contributions covered in 5.6 below).
		1.2	Continuous Appropriations	Controller must fully pay employees funded by continuous appropriations.
		1.3	Federally Required Payments	Controller must fully pay employees' wages as required by federal law, and subject to court interpretation (*e.g.*, minimum wage and overtime payments of nonexempt employees, as mandated by Fair Labor Standards Act; certain medical delivery personnel of the California Department of Corrections & Rehabilitation as mandated by federal receivership).
		1.4	Prior Year Appropriations	Controller must fully pay employees of agencies operating under prior year appropriations where payment is charged to that prior year appropriation.

Cat.	Functional Category	Functional No.	Requirement Concept	Description of Requirement
2	Minimum Wage Payment during Budget Impasse	2.1	Payment of Nonexempt Employees – No Overtime	Controller must pay nonexempt employees who work no overtime in a pay period the minimum wage rate mandated by FLSA for all straight-time hours worked by employee.[a]
		2.2	Hours worked Bases for Payment	Controller must calculate all payments based on the actual number of hours worked by non-exempt employees within a pay period.
		2.3	Timely Prompt Payment	Employer must pay on regular payday of non-exempt employees.
		2.4	Minimum Payment of Exempt Employees	Controller must pay (on regular payday) at least the full amount of FLSA's salary level minimum pay to exempt Executive, Administrative, Professional (except doctors, lawyers, teachers) and Computer employees.
3	No Pay during Budget Impasse	3.1	Employees Not Covered by FLSA -- Elected Officials, Appointees of Elected Officials & Legislative Employees	Controller must not pay non-covered personnel.
		3.2	Employees Exempted by FLSA From Salary Basis/ Level Test -- Doctors, Lawyers & Teachers	Controller must not pay non-covered personnel.

[a] There is an issue in the pending litigation whether the actual minimum wage rate is the higher of the federal nationwide minimum wage or the California minimum wage. For purposes of the assignment, we assume that the actual required minimum wage rate is not material. The payroll system's flexibility and functionality in adapting to any mandated minimum wage requirements in effect during a future budget impasse, however, is the business requirement.

Cat.	Functional Category	Functional No.	Requirement Concept	Description of Requirement
4	Overtime during Budget Impasse	4.1	Payment of Nonexempt Employees - Working Anticipated Overtime	Controller must pay nonexempt employees who work in excess of 40 hours per week their regular pay for all straight-time hours plus 1.5 times regular pay rate for all overtime hours worked (calculated per FLSA rules, *e.g.*, time worked over 40 hours per 7-day period or time worked over expected hours per 28-day work period for employees subject to the FLSA exception for fire protection and law enforcement activities).
		4.2	Payment of Nonexempt Employees – Working Emergency Overtime	Controller must pay, in the pay period, the employees who work unanticipated, emergency overtime in that pay period their regular wage rates for all straight-time hours worked in that pay period, pursuant to FLSA rules. If the correct amount of overtime compensation cannot be determined until after the pay period in which the overtime hours are worked, Controller must make payment for such overtime compensation in the pay period immediately following the pay period in which the employees worked such overtime.
5	Other Payments, Deductions & Garnishments during Budget Impasse	5.1	Required Payments	Controller must only make payments considered "wages", at minimum wage rate, as mandated by FLSA.[b]
		5.2	Non-Wage Payments	Controller must refrain from making any payment not considered "wages" under FLSA (including voluntary deductions).[c]

[b] Specifically, Controller must issue at the minimum wage: Regular Pay and any pay at premium rates (reverting to full pay, if overtime is worked); Shift Pay; Student Assistance/Trainee Pay; Fire Mission Pay; and Out-of-State Pay.

[c] Specifically, Controller must withhold issuance of non-wage payments: Lump Sum Overtime, CTO, Holiday Credit, PH or Excess Hours; Vacation Leave Pay; Lump Sum Vacation; Lump Sum Sick Leave; Industrial Disability Leave; Military Leave and Military Pay Differential; Awards; Folio Pay; Final Settlement; Fringe Benefits; Labor Code 4800 Tax Refund; Maternity Leave; Deduction Refunds; Emergency Pay (not including Emergent Overtime); Non-Industrial Disability Indemnity; Supplemental Temporary Disability; Separation Payments; and Miscellaneous Payments.

Cat.	Functional Category	Functional No.	Requirement Concept	Description of Requirement
		5.3	Federal Deductions	Controller must withhold federal income taxes, Social Security taxes and Medicare taxes and remit timely to federal government (calculated on actual pay).
		5.4	State Tax Deductions	Controller must withhold state income tax and disability insurance (calculated on actual pay received).
		5.5	Garnishments	Controller must deduct garnishments from pay (as applicable to actual pay received).
		5.6	State Retirement Contributions	Controller must calculate and withhold retirement contributions as if the employee received full regular salary.
		5.7	Employee Voluntary Contributions	Employee voluntary contributions, such as to credit union or long-term disability, are suspended during budget impasse except for employees receiving full pay.
6	Budget Impasse Period	6.1	Indeterminate Duration	Controller's payroll system must be capable of supporting and promptly recovering from a budget impasse of indeterminate length until date of enactment.
7	Enactment of New Budget	7.1	Restoration of Regular Pay	Full restoration (retroactively and prospectively) of all regular salaries, withholdings and deductions must be made no later than employee's next payday or within 30 days of new budget enactment.
		7.2	Restoration of Overtime Pay	For overtime worked in preceding pay period, payment may not be delayed longer than reasonably necessary to compute and arrange for payment (but payment may not be delayed beyond the next pay period).
		7.3	Restoration of Separation Pay	Controller must issue separation pay within 72 hours of new budget enactment.
		7.4	Restoration of Voluntary Deductions	Controller must retroactively restore voluntary deductions that were not withheld during budget impasse.
		7.5	Restoration of Mandatory Deductions	Controller must apply mandatory deductions that were not withheld due to pay insufficiency.

Cat.	Functional Category	Functional No.	Requirement Concept	Description of Requirement
		7.6	Restoration of Garnishments	Controller must restore garnishments to any restoration pay, in the full amounts permitted by law.

Appendix B: Estimating Methodology

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Introduction

Crowe used a set of methods, along with many assumptions, to estimate the effort, cost, and timeline associated with the implementation of the alternative solutions. The following section will describe the methods and assumptions used in estimating the implementation required for each of the alternative solutions.

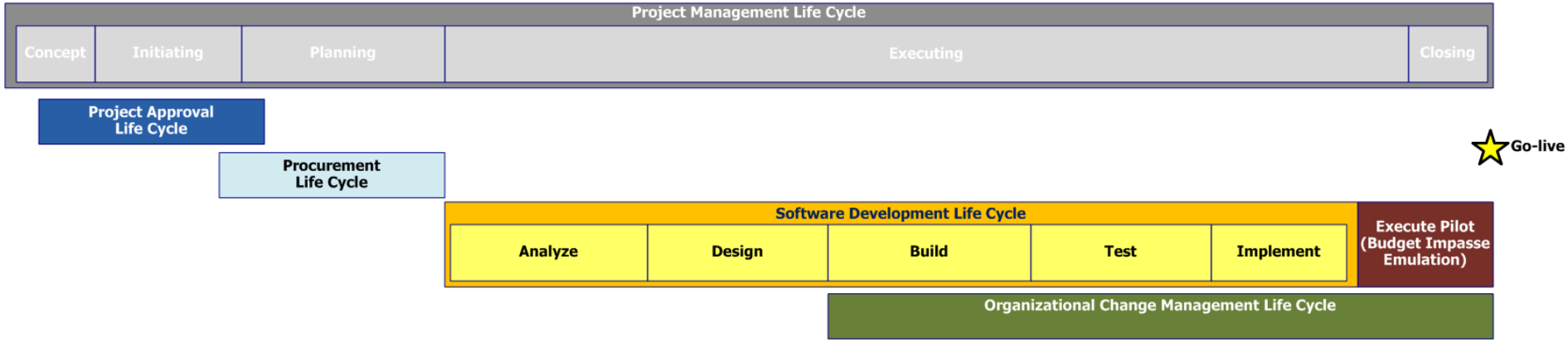
Background - Implementation Methodology Assumption

In order to estimate the effort, cost, and timeline, Crowe first standardized the methodology presumed for implementation of the alternative solutions. Based upon the State of California Project Management Methodology (see http://www.cio.ca.gov/Government/IT_Policy/SIMM_17/index.html), the implementation methodology comprises a set of phased activities with defined outputs that, when combined, contribute to the successful implementation of software-based solutions.

To that end, Crowe computed estimates for each phase of the implementation methodology. The implementation estimate components, which largely align with the implementation methodology phases, were as follows:

Implementation Phase	Description
Project Approval Life Cycle	Key tasks in seeking approval to initiate a project and to receive the funding and resources needed.
Procurement Life Cycle	Key tasks where goods and/or services will be purchased from vendors and includes executing the procurement plan.
Software Development Life Cycle	Phases and key tasks involved in building the end product of the project.
System Test/Pilot	Key tasks involved in piloting the end product to ensure that it: (i) does not adversely affect current operations; and (ii) operates per specifications (i.e., it satisfies specified requirements and design specifications).
Organizational Change Management Life Cycle	Key tasks involved in integrating the solution into the organization and affecting change within the organization (e.g. new/changed business processes).
Project Management Life Cycle	Key tasks involved in planning, managing, and closing all project activities, including all phases and tasks defined by other Implementation Phases.
Resource Learning (Investment in Ramp-up)	Resource learning is indirect effort associated with a project whereby resources new to an organization and/or new to a particular problem or solution domain must get ramped up. These activities reflect the effort spent in ramping up (i.e. making productive) staff and the less-than-full productivity levels assumed during that ramp-up period.

The phased implementation of the alternative solutions would appear as follows, based upon the methodology described above. The figure below depicts the phases relative to one another as they are assumed to progress over time.



Note: This Life Cycle Approach is based upon a modified State of California Project Management Methodology (modified to include Organizational Change Management Life Cycle and the Execute Pilot Phase)

Estimating Assumptions

Crowe developed estimates for effort, cost, and timeline for each Implementation Phase using Size Estimating techniques prescribed by the California Project Management Methodology's Concept Phase of the Project Management Life Cycle. Crowe summarized the individual estimates together to arrive at overall estimates.

In addition to the assumed, common methodology that would be used to implement all alternative solutions (described above), Crowe applied a number of assumptions as a basis for computation of its estimates. A change to any of these assumptions may change the resulting estimates.

1. For the SDLC, the estimates of efforts were allocated across the phases of the SDLC according to the following percentages:

25%	20%	25%	20%	10%
Analysis	Design	Build	Test	Implement

2. Project Management Life Cycle effort was calculated as 30% of the effort for all other Life Cycles, not including Resource Learning. This includes Project Management time at 20%, which is based upon the CA PMM, Rev. May 2010, which indicates the range of project management effort to be 5%-20% of project effort. The high end of the range was used based upon overall complexity of project relative to other SCO projects. The other 10% of project management effort is provided for Executive Management on the Contractor side plus Contract Management on the SCO side.
3. Using the deviation factor from the CA PMM, Rev. May 2010, Concept Phase, the Optimistic and Pessimistic deviation from the Most Likely estimate has been computed as -35%/+35% respectively. The Concept Phase estimate represents what would typically be termed in the industry as a "ballpark estimate," which, depending upon the organization, typically ranges from ±25% to ±50%. The ±35% used for this estimate fits squarely within the typical range and, therefore, constituted a reasonable range for purposes of this estimate.
4. Allocation of Hours to internal (i.e. existing SCO staff) vs. external (i.e. contracted) staff was computed by project role. Crowe worked with SCO to understand its staffing levels and availability, or lack thereof, for SCO resources to be made available. Staffing estimates for roles were based on the assumption that any solution alternative would not require reallocation of SCO staff working on the 21st Century project and assumed that SCO staff will continue to support ongoing operation and production of existing systems, in addition to any emerging legislation and bargaining unit changes.
5. All estimates assume the skill levels of resources is "somewhat" knowledgeable, which connotes not new, but also not highly experienced. Resource learning time has been factored into the estimates to get project resources to the "somewhat" knowledgeable level and all Life Cycle effort estimates presume this level of knowledge. Resource learning (i.e., ramp-up) time for resources is assumed to be half of a resource's time for six months, under the assumption that the resource would begin the project at 0% productivity and that the resource would gain productivity on a linear scale over a six month period to reach the assumed level of productivity for resources on the project. The net result is that ramp-up is half of a half-year, or, mathematically, three month's time.
6. For contracted resources, the implementation approach assumes that an RFP will be issued for a prime contractor to provide all necessary project resources, versus procurement of individual resources in staff augmentation mode. This assumes that the prime contractor can manage its resources and can commit to phased delivery of key project outputs, as opposed to SCO managing and owning all project milestones.
7. To estimate the Project Approval Life Cycle – i.e, the FSP, BCM, RFP Process (for Projects over $1M) – recent projects with the same Life Cycle were referenced. The following is an example:

o Duration would vary, totaling as much as 12 months or more	Period of time to prepare the Feasibility Study Report (FSR) document; the duration and effort of this activity vary by the size and complexity of the project

o	July 19, 2010	Submit FSR to Office of CIO (OCIO)
o	September 13, 2010	Submit Budget Change Proposal (BCP) to Department of Finance (DOF) (note $'s come from State General Fund)
o	February 1, 2011	Develop and gain approval for the Information Technology Procurement Plan (ITPP) from Department of General Services (DGS)
o	June 1, 2011	Develop and finalize Procurement Documents
o	June 30, 2011	Project "approval" through passage of 2011/12 Budget
o	Duration would vary totaling as much as 24 months, or more	Time from submittal of FSR to Project Approval (Same Cycle Regardless of Year of FSR submittal) is 12 months; plus the period of time required to create the FSR must be added to derive the total duration for Project Approval Life Cycle

Crowe estimated the project approval life cycle for implementation of the contemplated alternative solutions to be 20 months, which presumes the 12 months from FSR submittal to Project Approval, plus eight months for preparation of the FSR. Crowe has assumed this 20 month approval lifecycle for its pessimistic estimate.

8. Funding for emergency initiatives does not utilize the normal Project Approval Life Cycle as described in Assumption #7 above. The emergency initiative approval process still requires that a Feasibility Study Report be created, but budgetary approval is not made through the same process described in Assumption #7. Crowe understands that for a project with the funding requirements and complexity of the alternative solutions contemplated, the duration of the emergency initiative approval process is estimated to be five months.

   Given the political and historical environment under which this Budget Impasse Payroll System is being considered, Crowe has assumed this “Emergency Initiative” funding process for both the optimistic and most likely estimates.

9. To estimate the Procurement Life Cycle – i.e, FSP, BCM, RFP Process (for projects over $1M) – recent projects with the same Life Cycle were referenced. The following is an example:

o	July-11	Issue procurement documents
o	August-11	Vendors submit questions
o	September-11	Vendors submit draft proposals
o	September-11	Review vendors’ draft proposals
o	October-11	Vendors submit final proposals
o	October-11	Review vendors’ final proposals
o	October-11	Submit IT Capital Plan
o	December-11	Open sealed cost proposals
o	January-12	Select Vendor - Notice of intent to award
o	February-12	Contract award
o	February-12	Project start date
o	6 months	Total elapsed duration for Procurement Life Cycle
o	$35,000+	Department of General Services (DGS) charges the greater of $35K or 1% of total budget

10. SCO will incur additional expenditures for computer hardware and software and facilities to support the SDLC, Pilot, and OCM activities as outside contractors are assumed to require workstations, printers, and workspace. Based upon the approximate number of resources new to SCO and the additional needs this creates for hardware, software, and workspace, Crowe estimates that an additional $247,500 - $525,000 of cost will be incurred to support implementation of the alternative solutions contemplated as part of this assessment.
11. A standard work year, in terms of productive, available hours for project work for SCO Staff is assumed to be 1776 hours, which equates to a 32-hour work week and 134-hour work month (in terms of hours available for project work). For external contractors those figures are 1824, 35, and 147, respectively.
12. The following table was used for computing the SDLC effort required for various types of technical components to be created or modified as part of the implementation of the conceptual design contemplated for each alternative solution:

	Complexity Level				
Components of Change	Low	Medium -Low	Medium	Medium High	High
	(hrs)	(hrs)	(hrs)	(hrs)	(hrs)
Create Mark IV Program/Report	80	160	320	480	640
Modify Mark IV Program/Report	20	40	80	120	160
Create Batch Program (Cobol)	160	320	640	960	1280
Modify Batch Program (Cobol)	80	160	320	480	640
Create Online Program (CICS or ADSO)	240	480	960	1440	1920
Modify Online Program (CICS or ADSO)	80	160	320	480	640
Create Report/Exception Report (Cobol)	160	320	640	960	1280
Modify Report/Exception Report (Cobol)	80	160	320	480	640
Create TIM Table	100	200	300	400	500
Modify TIM Table Structure (not data)	80	160	240	320	400
Create Mass Update Program (Cobol)	360	720	1440	2880	5760
Modify Mass Update Program (Cobol)	80	160	320	480	640
Create JCL Job/Job Stream	28	56	112	168	224
Modify JCL Job/Job Stream	16	32	64	96	128
Manual Procedure (Manual Adjustments)	32	64	128	192	256