**Cost Management Plan**

**[Agency Name]**

**[PROJECT NAME]**

[Publish Date]

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# Using this Template

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# Revisions

| Revision | Description of Change | Author | Effective Date |
| --- | --- | --- | --- |
| v1 | Initial document upload to TBSM intranet site | BSD Team | 01/28/13 |
| v2 | Revised based on practical feedback | BSD Team | 10/28/14 |
|  |  |  |  |

# Introduction

The TBSM Cost Management plan details the processes for managing project financial resources that are to be followed through all stages of the project. Managing cost focuses on tracking costs for all resource types needed to complete the activities of the project such as people, equipment, hard goods, soft goods and facilities. Managing cost also involves the processes of estimating, budgeting, and controlling costs. The Cost Management Plan should establish the management activities required to ensure that project activities can be completed within the defined budget. The Plan should contain information regarding cost estimation activities, budget determination and procedures to establish a baseline, as well as project cost control measures.

The Project Management Book of Knowledge (PMBOK) defines the three project cost management processes as follows:

* Estimate Costs - Estimation of the monetary resources needed to complete the project
* Determine Budget - Aggregation of costs and activities to determine a cost baseline
* Control Costs - Monitoring project status to update budget and manage changes to the cost baseline

The Cost Management Plan should contain information regarding the activities, procedures, and roles and responsibilities for these processes. Use of the companion Standard Project Cost Tracking and Management tool is highly recommended and provides:

* Support for planning and tracking spending on a monthly basis
* Comparison of planned spending to actual spending at multiple levels of detail over multiple time periods
* A dashboard view of project performance with key cost and schedule metrics color-coded to indicate the nature of performance (e.g., green is as planned)
* Automatic calculation of all metrics discussed in this document with minimal data entry required
* Graph of the ongoing budgeted spending versus actual spending throughout the life of the project

The Standard Project Cost Tracking and Management tool is located on the Tennessee Business Solutions Methodology (TBSM) intranet site.

The purpose of this Cost Management Plan is to define the methodology by which costs associated with [PROJECT NAME] will be managed throughout the project lifecycle. To ensure the successful completion of the project within the allotted budget, this plan sets the format and standards by which the project costs are measured, reported and controlled. Several cost components are associated with this project. Metrics, cost variance considerations, and reporting activities will be outlined in this plan. To complete this project successfully, all key project members and stakeholders must adhere to and work within this Cost Management Plan and the overall project plan it supports.

This Cost Management Plan will:

* Outline the overall project cost management approach
* Outline how the project cost, budget and source of funding will be determined
* Identify who is responsible for managing costs, including who has the authority to approve changes to the project, its budget or sources of funding
* Identify the methods to be used for quantitatively measuring and reporting on cost performance
* Identify the reporting formats, frequency and to whom they are presented

# Project Cost Management Approach

This section should contain an explanation of the approach to cost management for the project. Explain the steps that will be part of the project plan for managing and controlling costs in all of the project phases, and include the types of meetings and reviews that will be held. This section should also briefly describe the approach to reviewing and approving expenditures, and for escalating cost issues to senior management.

The Cost Management Plan approach for [PROJECT NAME] requires that the project resources assist in establishing and managing the total cost of ownership of the project. This includes establishing the estimated budget and measuring actual spending against the planned budget for the following items:

* Agency project team staff and all of their associated costs
* STS resources
* Other external resources/contractors
* Infrastructure costs
* Software and hardware
* Vendor contracts

The Cost Management Plan establishes the activities and criteria for planning, structuring, and controlling project costs. Cost estimating and cost controls are the most important evaluation and control items for State projects. Actual costs and cost variances must be reported regularly to oversight committees and project sponsors. Any cost change over five percent requires project steering committee approval.

The Senior Project Director and the Project Sponsor(s) for [PROJECT NAME] will jointly create the cost baseline and the Cost Management Plan. Beginning with the preliminary cost estimates identified in the Initiation phase, the Senior Project Director will develop updated cost estimates to perform the work included in the revised schedule.

# Cost Estimation

Cost estimation involves developing an approximation of the monetary resources needed to complete project activities. These estimates are a prediction based on the information known at a given point in time, and should include the identification and consideration of costing alternatives to initiate and complete the project. Cost trade-offs and risks must be considered, such as develop versus buy, buy versus lease, and the sharing of resources in order to achieve optimal costs for the project. Costs are estimated for all resources that will be charged to the project. This includes, but is not limited to labor, materials, equipment, hardware, software, services, and facilities.

Inputs into the cost estimation process include:

* Scope baseline
* Project schedule
* Human resource plan
* Risk register
* Enterprise environmental factors
* Organizational process assets

Outputs of the cost estimation process include:

* Estimates of cost for all project activities
* Documentation of the basis for the cost estimates
* Updates to project documents as necessary (e.g., Project Management Plan, Communication Management Plan, etc.)
* Total cost of ownership model

The Cost Management Plan for [PROJECT NAME] documents the methods to be used to manage and control the many internal and external cost components. Metrics and variance analysis must be applied to these cost components throughout the project lifecycle for tracking, re-estimating and adjusting the project budget if needed. These cost components include:

Internal

* Project management/project team resources
* Recruiting and hiring for additional staffing
* Hardware and other equipment
* Software and licensing
* Housing and facilities

External

* Vendor contract costs
* Construction costs

A ‘bottom-up’ approach will be used for preparing a detailed cost estimate of each cost component involved with each project activity. Costs estimates will be prepared using the best information available at the time of estimation. The basis for the estimate must be fully documented so that if better information becomes available at a later time in the project, the cost estimate can be adjusted.

# Budget Determination

Budget determination involves the process of aggregating the estimated costs of individual activities or work packages to establish a baseline for the project budget. The project budget consists of the sum total of the monetary resources necessary to successfully execute the project, including the use of internal resources, such as existing staff who will work on the project. A budget baseline should be established for the entire project in an amount equal to the total cost of ownership calculated during cost estimation. A time-phased budget baseline should be established as well; it will depict how the estimated costs will be incurred over time.

Consideration should also be given to the source of funding for each cost component, project activity, and work package. Many times, a single funding source will be used to fund all cost components, project activities and work packages. Sometimes, however, there are limitations or constraints on how a given funding source can be spent. For example, it may be that the grant being used as a funding source for the project can be used to purchase hardware and software for the project, but cannot be used to pay salaries for staff. Any limitations or constraints on how a funding source can be spent must also be documented in the project budget.

Project cost performance will be measured against the project’s baseline budget, both in total and time-phased. So the project’s baseline budget should include all authorized expenditures, but should exclude management reserves (i.e., the excess of available funding over the estimated amount required to complete the project. A common application of creating a management reserve is the use of a confidence factor in the State’s Information Systems Plan project proposal document). If a vendor contract is to be utilized to acquire goods and/or services critical to the successful completion of the project, it is recommended that an allowance for change orders is also included in the project’s baseline budget (typically 5% to 10% of the total contract cost).

Inputs to determining the budget include project activity cost estimates, basis of estimates, funding sources (including any limitations or constraints), scope baseline, project schedule, resource calendars, contracts (including change order allowance), and organizational process assets.

Tools to use with the budget determination process include:

* Cost aggregation
* Reserve analysis
* Expert judgment
* Historical relationships

Outputs from the budget determination process include:

* Project funding requirements
* Updates to project documents as necessary (e.g., Project Management Plan, Communication Management Plan, etc.)
* Project budget baseline
* Time-phased budget baseline

Once the needs of the [PROJECT NAME] have been determined, the project team will finalize the resource and staffing requirements necessary for the successful completion of the project. The Senior Project Director and Project Manager will complete the internal and external Work Breakdown Structure (WBS) respectively. Control accounts and staff labor categories will be created in each WBS element. Based on the labor costs and planned duration of each WBS element, an estimate will be determined. WBS element costs will then be totaled and verified against the allotted project budget. Once the project budget is approved, the Senior Project Director will compare the allocation for each WBS element against the overall budget and adjust allocations as necessary to comply with the project budget. Once all allocations have been reviewed and approved by the Project Manager, the project budget will be baselined. The project budget baseline may only be changed with authorization by the Project Sponsor.

# Cost Management Roles & Responsibilities

This section should contain the various project roles associated with cost management activities. These roles should include a brief summary of the responsibilities for each role as they relate to cost management for the lifecycle of the project. The level of involvement and role of the agency’s Budget Officer and/or Fiscal Officer should be defined here as well.

The Senior Project Director will work with the Project Sponsor to define various roles and expectations for resources involved in managing the overall project cost. These role definitions should define ownership for review and approval of all project expenses, project cost establishment, review of budget tracking system details, and day-to-day cost detail management. In most cases, the Senior Project Director will be intimately involved in managing these details. Using a disciplined project management approach to manage project costs will help ensure that the project is delivered on time and within budget.

The Senior Project Director will be responsible for managing and reporting on the project costs throughout the duration of the project. During the monthly project status meeting, the

Senior Project Director will present and review the project’s cost performance for the preceding month. Performance will be measured using earned value, as defined below. The Senior Project Director is responsible for accounting for cost deviations and presenting the Project Sponsor, Project Steering Committee and Change Control Board with options for resolving project budget shortages or overages. The Project Sponsor has the authority to make changes to the project to bring it back within budget.

# Cost Performance Measurement

This section defines how project costs will be measured. Cost performance will be measured at two levels:

* Overall total cost of ownership : To track and budget spending of all project cost factors
* Earned Value Management: To measure and control costs at a detailed work level

Cost control is the process of monitoring the status of project spending, updating the project budget, and managing changes to the budget baseline. Updating the budget involves recording on a monthly basis the actual costs spent to date, as well as tracking those costs which have been approved but not yet realized (accrued liabilities). Any adjustments to the baselined budget to address any overages in spending should only occur through an integrated Change Control Process. Inputs to Cost Control include the Project Management Plan, project funding requirements, work performance information, and organizational process assets.

The approach for cost performance measurement is to use **Earned Value Management (EVM)** for measuring and controlling the project costs. EVM is a broad and powerful tool. It integrates project scope, cost, and schedule data to help the project management team assess and measure project performance and progress.

The Senior Project Director and/or project resources will review the following earned value measurements:

* Schedule Variance
* Cost Variance
* Schedule Performance Index
* Cost Performance Index
* To Complete Cost Performance Index
* Estimated Actual Cost at Completion

Definitions of these six measurements are provided in the glossary at the end of this document. These measurements provide adequate insight for effective management without overburdening the Senior Project Director with manual calculations and measurements. Use of the Standard Project Cost Tracking and Management tool located on the Tennessee Business Solutions Methodology (TBSM) intranet site automates the calculation of these measurements. The measurements may also be provided by information and calculations contained within a tool such as Microsoft Project. For additional information about earned value measurements, refer to the Financial Management Glossary of Terms document located on the Tennessee Business Solutions Methodology (TBSM) intranet site.

The Senior Project Director will build a total cost of ownership model for [PROJECT NAME]. This model will capture all vendor software and implementation costs, plus internal costs for staffing and related administrative and overhead costs, infrastructure, resources and other hardware needs. It will establish the total project baseline budget and a time-phased baseline budget by month and fiscal year for the development and implementation phases. Inputs are contract deliverable payments, project team staffing costs, budgeted amounts for infrastructure costs, and all other anticipated costs to the project.

The approach for cost performance measurement is to use Earned Value Management (EVM) for measuring and controlling the project costs. EVM integrates project scope, cost, and schedule measures to help the project management team assess and measure project performance and progress. The Senior Project Director and/or project resources will review the following earned value measurements: Schedule Variance, Cost Variance, Schedule Performance Index, Cost Performance Index, To Complete Cost Performance Index and Estimated Actual Cost at Completion.

# Cost Variance Response Process

This section of the Cost Management Plan defines the control thresholds for the project and what actions will be taken if the project triggers a control threshold. As a part of the response process, the Senior Project Director typically presents options for corrective action to the Project Sponsor and Change Control Board in accordance with the project’s Change Control Process. The Senior Project Director may propose to increase the budget for the project, reduce scope or quality, or some other corrective action.

There are two types of control thresholds. The first threshold is met if at any given point in time, any one of the indexes (i.e., SPI, CPI or TCPI) varies from a value of 1 by an amount greater than that agreed to by the Project Sponsor and/or Project Steering Committee. The second threshold is met if any one of the indexes varies by an amount greater than that agreed to between reporting periods. The corrective action to be taken when either of these thresholds are met should take into consideration the severity of the condition level.

With each threshold, there are two condition levels, as shown in the table below. In the example shown in the table below, a threshold of 10% was set for the yellow condition and 20% for the red condition. For a large project, this will likely be too lenient, whereas for a small project, this could very well be too constraining. The key point to understand is that this variance threshold translates into real dollars. The thresholds should be set as appropriate based on the agency’s tolerance for potential budget overruns. If is it set too leniently, the project may go over budget and opportunities for corrective action are missed; if it is set too tight, the project may experience ‘churn’ as a result of having to take corrective action too frequently.

|  |  |  |
| --- | --- | --- |
| **Performance Measure** | **Yellow Condition** | **Red Condition** |
| Schedule Performance Index (SPI) | Between 0.9 and 0.8 or Between 1.1 and 1.2 | Less Than 0.8 or Greater than 1.2 |
| Cost Performance Index (CPI) | Between 0.9 and 0.8 or Between 1.1 and 1.2 | Less Than 0.8 or Greater than 1.2 |
| To Complete Performance Index (TCPI) | Between 0.9 and 0.8 or Between 1.1 and 1.2 | Less Than 0.8 or Greater than 1.2 |

Additionally, a cost variance response process should be defined if any of the indexes varies by 10% or more between reporting periods. A suggested response process is for the Senior Project Director to report to the Project Sponsor the reason for the exception, if the SPI, CPI or TCPI has a variance or change in a measured value between 0.1 and 0.2 since the prior reporting period. If, however, the SPI, CPI or TCPI has a variance of greater than 0.2, the Senior Project Director must report the reason for the exception and provide executive management with a detailed corrective plan to bring the project’s performance back to acceptable levels.

Cost management measures will be reported in the monthly [PROJECT NAME] Status Report. All cost variances outside of the thresholds identified in this Cost Management Plan will be identified, along with any planned corrective actions. Change requests triggered by project cost overruns will be identified and tracked in the monthly status report.

Control Thresholds Established for [PROJECT NAME]:

If the project reaches one of the control thresholds of CPI, SPI or TCPI between 0.8 and 0.9 or between 1.1 and 1.2, or if the SPI, CPI or TCPI has a variance of between 0.1 and 0.2 since the prior reporting period, the Senior Project Director must report to the Project Sponsor the reason for the exception.

If the project reaches one of the control thresholds of CPI, SPI or TCPI less than 0.8 or greater than 1.2, or if the SPI, CPI or TCPI has a variance of greater than 0.2, the Senior Project Director will report the reason for the exception and provide executive management with a Cost Variance Corrective Action Plan to bring the projects performance back to acceptable levels.

Cost Variance Corrective Action Plan:

The Senior Project Director will present the Project Sponsor with options for corrective actions within five business days from when the cost variance is first reported. Within three business days from when the Project Sponsor selects a corrective action option, the Senior Project Director will present the Project Sponsor with a formal Cost Variance Corrective Action Plan. The Cost Variance Corrective Action Plan will detail the actions necessary to bring the project back within budget and the means by which the effectiveness of the actions in the plan will be measured. If the corrective actions to be taken result in a change, the project’s overall Change Control Process must be followed as well. Upon acceptance, the Cost Variance Corrective Action Plan will become a part of the Project Schedule and the project will be updated to reflect the corrective actions.

# Cost Change Control Process

Typically the Cost Change Control Process follows the project’s overall Change Control Process. Special requirements for the cost change control process should be detailed in this section.

For additional information about Change Control, refer to the Change Control Process document located on the Tennessee Business Solutions Methodology (TBSM) intranet site.

The cost change control process will generally follow the established project change request process. Approvals for project budget/cost changes must be approved by the Project Sponsor. A summarization of the change control process is as follows:

* Identify and assess the change (typically generated from a cost variance analysis or corrective action report).
* Complete a Change Request Form and submit the form, along with required supporting documentation, to the Senior Project Director.
* The Senior Project Director will review the change request and may request additional documentation prior to review with the Project Manager.
* Using the Change Request Form, the Project Manager will mark the change as:
  + Approved, in which case both the Senior Project Director and Project Manager will sign off on the change request and adjust other project planning factors as necessary.
  + Approved, pending additional supporting documentation, in which case both the Senior Project Director and Project Manager will mark the change as approved / pending in the change control system, and sign off on the change request. The Project Manager will specify and coordinate gathering of the required documentation, incorporate the change and adjust other project planning factors as necessary.
  + Denied, in which case both the Senior Project Director and Project Manager will mark the change as denied in the change control, and sign off on the change request. The Project Manager will notify the requestor of the status and reason for denial.
* The project manager will document the change request outcome as necessary (update WBS, schedule and budget documentation if impacted). If there is a change in the total cost of ownership or in how the estimated costs will be incurred over the remaining life of the project, a new project budget baseline, and time-phased budget baseline should be set (i.e., these are “re-baselined”).

# Acceptance

(This section should be modified for best application to specific projects. Include all project team members that should have some level of authority regarding document review and approval.)

Approved by:

Date:

<Name of Approver>

[PROJECT NAME] Executive Sponsor

Date:

<Name of Approver>

[PROJECT NAME] Business Sponsor

Date:

<Name of Approver>

[PROJECT NAME] Project Director/Manager

Date:

<Name of Approver>

[PROJECT NAME] Stakeholder

# Glossary

(This section includes definitions for the standard Earned Value Management terms. This section should be modified for best application to specific projects. Include all terms that may be needed to ensure complete understanding by those who are responsible for document review and approval.)

**Cost Performance Index (CPI)** measures the value of the work completed compared to the actual cost of the work completed. CPI is calculated as EV/AC.

* If CPI is equal to 1 the project is considered to be *on budget*.
* If CPI is greater than 1, the project is considered to be *under budget.*
* If CPI is less than 1, the project is considered to be *over budget*.

**Cost Variance (CV)** is a measurement of the budget performance for a project. CV is calculated by subtracting Actual Costs (AC) from EV. As explained in the paragraph above, EV is the actual value earned in the project. AC represents actual costs incurred to date. Subtracting AC from EV provides a measurement to indicate the status of the project as it relates to budget and cost.

* If CV is zero, the project is considered to be *on budget*.
* If CV is greater than zero, the project is earning more value than planned and is considered to be *under budget*.
* If CV is less than zero, the project is earning less value and is considered to be *over budget*.

**Estimated Actual Cost at Completion (EAC)** provides a forecast of actual cost to complete the project based on cost performance metrics. There are three ways to calculate EAC:

* Actual Cost plus Total Project Budget (TPB) minus Earned Value (AC + TPB – EV).
* Total Project Budget divided by Cost Performance Index (TPB/CPI).
* Actual Cost plus the result of dividing the difference between the Total Project Budget and Earned Value by the product of Cost Performance Index and Schedule Performance Index (AC + ((TPB – EV)/(CPI\*SPI))).

**Schedule Performance Index (SPI)** is a measurement of the progress achieved against that which was planned. SPI is calculated as EV/PV. If EV is equal to PV the value of the SPI is 1.

* If EV is less than the PV then the value is less than 1, which means the project is behind schedule.
* If EV is greater than the PV the value of the SPI is greater than one, which means the project is ahead of schedule.
* A well performing project should have its SPI as close to 1 as possible.

**Schedule Variance (SV)** is a measurement of the schedule performance for a project, and is calculated by subtracting the Planned Value (PV) from Earned Value (EV). EV is the actual value earned in the project, and PV is the value the project schedule tool indicates should have been earned at the measurement point. Subtracting PV from EV provides a measurement to indicate the status of the baseline schedule according to the project plan.

* If SV is zero, the project is considered to be *on schedule*.
* If SV is greater than zero, the project is earning more value than planned and is considered to be *ahead of schedule*.
* If SV is less than zero, the project is earning less value than planned and is considered to be *behind schedule*.

**To Complete Performance Index (TCPI)** measures the efficiency at which resources on the project should be utilized for the remainder of the project. TCPI is calculated as (Total Project Budget – EV)/(Total Project Budget – AC).

* If TCPI is equal to 1, the utilization of resources on the project *can continue at the current level*.
* If TCPI is greater than 1, the utilization of resources on the project *should be more stringent than the current level.*
* If TCPI is less than 1, the utilization of resources on the project *can be more lenient than at the current level.*