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| [Insert Product Icon Here] |
| [Product Name]Maintenance, Support, and EnhancmentWork Plan |
| For the Period: Month, Day, Year – Month, Day, Year[Document Date][Document Version] |
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Instructions: This is a standard template for creating annual AASHTOWare Maintenance, Support, and Enhancement (MS&E) Work Plans for existing AASHTOWare products. The blue italicized text in this document provides instructions for entering data into the template.

The front cover page may be modified as needed; however, the cover shall include the work plan title, work plan period, document date, and document version.

All sections of the document shall be completed unless noted as optional. If a section is not applicable, note that the section is “Not Applicable” instead of removing the section.

The “⇒” character in most of the sections and subsections, indicates the location where text should be entered, and should be replaced by the text entry. Many sections also include tables that should be completed. Lines may be added or removed from the tables as required.

After completing this document, delete all instruction text and unused example text, including the text in this paragraph.

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# MSE Overview

## Purpose

Briefly describe the purpose of this Maintenance, Support, and Enhancement (MS&E) work plan and the work effort that this plan addresses.

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## Goals and Objectives

Describe the business/technical goals and objectives that this MS&E work effort is intended to achieve.

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## Scope

Describe the scope of the MS&E work effort by defining what the work effort will and will not accomplish. Provide a narrative or bulleted list of products, services, deliverables, and/or other outcomes expected from the work effort. In order to clearly define the boundaries of the effort also provide information that describes what is outside the scope of the effort. The items listed as excluded should be limited to those items that a reviewer of the work plan might reasonably assume to be included within the scope if not specifically identified as being excluded.

Note: The work activities for the effort will be described in detail in the following sections.

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| MSE Work Includes |
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| MSE Work Excludes |
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## Assumptions

Describe any MS&E work effort assumptions related to business, technology, resources, scope, expectations, or schedules.

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| Assumptions |
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## Constraints

Describe the limiting factors, or constraints, that restrict the contractor project team’s options regarding scope, staffing, scheduling, and management of the MS&E work effort, as well as any other identified constraints.

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| Constraints |
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# Time and Materials Services

This section is used to describe all areas of product work that will be charged as time and materials services. Describe each area in appropriate detail in the first subsection; and then define the estimated hours and budget for each area, total time and materials budget, and schedule in the next subsections. If needed, provide an overview of all time and materials services below prior to describing each work area.

The time and material activities described below, as well as other activities that have been historically considered as time and materials services, may also be considered for development and payment as fixed price items as directed by the task force and/or SCOJD. In this case, these activities should be documented in the Fixed Price Service Section in a reasonable and understandable manner using naming and numbering schemes similar to that used below.

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## Time and Materials Major Activities

### Project Management and Administrative Services

Describe the project management and administrative activities performed by the contractor that are associated with product maintenance, support, enhancements, and new development. Examples of these activities include: general planning; preparation of monthly invoices and status reports; preparation and participation in task force meetings; and routine clerical activities.

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### Customer Support

Describe the customer support activities that will be performed by the contractor, including time spent educating clients in the proper installation of the software, responding to usage questions, monitoring and maintaining the status of support calls, and determining whether a user problem requires maintenance work to remedy.

Support for agency customizations should not be included as Customer Support Services. These services are normally funded through service units which are described later in this document.

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### Maintenance Services

Software maintenance is the modification of a software product after implementation to correct faults, to improve performance or other attributes. Maintenance involves changing program code in response to the discovery of program errors or changes in the program’s operating environment that cause the program to work incorrectly. Maintenance also includes the analysis and testing associated with the changed code, management of these activities, maintenance of the development environments and code repositories, modification of documentation, and all other work associated with changing the code.

Describe the maintenance process and tools that will be used to identify, log, track, analyze, prioritize, implement, test, deliver, and communicate changed components. Also describe the type of activities that will be covered by the maintenance process.

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### Application Infrastructure Upgrade Services

As described in the Critical Application Infrastructure Currency Standard, task forces and contractors shall ensure AASHTOWare products are tested with new versions of development tools, operating systems, utilities, databases, and other related infrastructure components. Describe the process and the planned work activities that will be performed to ensure compliance with this standard, including maintaining the Application Infrastructure Component List; testing products with new application infrastructure components; and implementing new versions of components and/or dropping support for outdated versions of components.

The current version of the Application Infrastructure Component List shall be included in this section of the work plan or the Appendices, or a separate document may be attached and referenced. This list needs to be maintained and is shall be submitted as an annual deliverable.

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### Work Plan and Long Range Plan Development

Describe the contractor work activities required to develop the long range plan and annual work plan.

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### Meetings

Describe the contractor work activities to prepare for and participate in task force meetings, user group meetings, and other meetings.

⇒

### Publications

Describe the contractor work activities to prepare and update newsletters, marketing materials, and other product publications.

⇒

### Task Force Directed Tasks

Describe the process that will be used to perform task force directed tasks that are not in this work plan. Also describe the type of task that will be performed using this process.

⇒

### Quality Assurance Reviews

Describe contractor work activities associated with the planning, reporting, review, and participation in AASHTOWare Quality Assurance reviews.

⇒

### Other Time and Materials Services

Describe any other time and materials services that are not included in this template.

⇒

## Time and Materials Budget

Provide details and a summary of the time and materials services budget in the following subsections. If needed, provide an overview of the time and materials budget below prior to completing each budget subsection.

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### Time and Materials Services Hours and Labor Cost by Major Activity

Provide the estimated hours and cost for each type of time and materials services activities listed above.

| Time and Materials Budget Item | Estimated Hours | Estimated Cost |
| --- | --- | --- |
| Project Administration |  |  |
| Customer Support |  |  |
| Maintenance Services |  |  |
| Application Infrastructure Upgrade Services  |  |  |
| Work Plan and Strategic Plan Development |  |  |
| Meetings |  |  |
| Publications |  |  |
| Task Force Directed Tasks |  |  |
| Quality Assurance Reviews |  |  |
| Other Time and Materials Services |  |  |
| Total Estimated Hours and Costs |  |  |

### Time and Materials Services Rate/Hours/Cost by Personnel Level

Provide the hourly rate, planned hours and total cost for the types of personnel that will perform work on the MSE effort. Include subcontractor personnel where applicable.

| Personnel Level | Hourly Rate | Planned Hours | Total Labor Cost |
| --- | --- | --- | --- |
| Personnel Type 1 |  |  |  |
| Personnel Type 2 |  |  |  |
| Personnel Type 3 |  |  |  |
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|  |  |  |  |
|  |  |  |  |
| Estimated Total Labor Cost |  |  |  |
| Estimated Average Hourly Rate |  |  |  |

### Time and Materials Services Total Direct Charges

Provide a list of direct expenses associated with the contract services that will be billed to the MSE work effort and the estimated cost for each item. The items in the table represent example direct expense items.

| Item | Estimated Cost |
| --- | --- |
| Hardware |  |
| Software |  |
| Technology Upgrade |  |
| Travel/Living Expenses |  |
| Reproduction |  |
| Shipping |  |
| Telephone |  |
|  |  |
| Estimated Total Direct Cost |  |

## Budget Summary of All Time and Materials Services

Provide the total for all time and materials services costs.

| Estimated Time & Materials Labor Cost |  |
| --- | --- |
| Estimated Total Direct Cost |  |
| Time and Materials Services Total Cost |  |

## Time and Materials Services Schedule

Include a summary level schedule (Gantt chart) with each time and material major activity discussed above.

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# Fixed Price Services

## Fixed Price Services Description

Describe the fixed price maintenance and enhancements services for this work plan and the expected deliverables for these services. If needed, reference the requirements and/or enhancements documentation that the fixed price services will address in the Appendices or in a separate document.

In general, enhancements are improvements that are made to the software product that substantially increase the capabilities of the software product. While enhancements may include bug fixes or minor “tweaking” of the software code, the focus of an enhancement should be to substantially increase the product’s capabilities. Enhancements may be individually listed or may be grouped together to form a larger enhancement.

An enhancement or group of enhancements where there is an insufficient detail or scope to develop a firm fixed price may also be included in Fixed Prices Services under a separate aggregated/pooled line item as a “placeholder” for planned enhancements. A budget amount shall be included with placeholder item. The description of the placeholder line item should include a notation that the fixed price fee amount for the anticipated enhancement(s) is a placeholder amount, and that the amounts/monies budgeted for the placeholder line item are not eligible for expenditure without direct authorization of the task force. At the direction of the task force(s), funds may be moved from/to this placeholder line item to other fixed price services for delivery for those services by a contractor.

The task force and contractor(s) should make every effort to include all needed enhancements as sufficiently detailed enhancements with firm fixed prices as much as possible. The use of placeholders should be kept to a minimum.

⇒

## Fixed Price Services Budget

Provide the budget for the fixed priced services described above.

⇒

| Fixed Price Services Budget Item | Estimated Hours | Estimated Cost |
| --- | --- | --- |
| Item 1 |  |  |
| Item 2 |  |  |
| Item 3 |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| Total Estimated Hours and Costs |  |  |

## Fixed Price Services Schedule

Include a summary level schedule (Gantt chart) for the fixed priced services described above.

⇒

When directed by the task force and/or SCOJD, the Fixed Price Services Section may also include any of the activities described in the Time and Materials Services Section of this document, as well as other services that have historically been considered as time and materials services. Naming and numbering schemes should be adjusted to accommodate all fixed price services and presented in a reasonable and understandable manner similar to that used in the Time and Materials Services Section.

# Service Units

AASHTO has established an arrangement with several of its contractors to offer the opportunity for agencies to acquire special fixed-fee increments or units of contractor-provided service for consultation and support to assist an agency in implementing and/or supporting AASHTOWare products or projects. Service units may be used for the execution of work at an agency’s site or at the contractor’s site depending upon need. Further details on the purchase and use of service units are contained in the annual AASHTOWare catalog.

## Service Unit Work Description

In general, a contractor, on a scheduled or ad hoc basis, may provide additional assistance to users to assist in product/project implementation, support, and/or training processes. Examples of service unit activities include, but are not limited to, the following activities:

* Planning and conducting training events;
* Implementation planning;
* Technical assessment/technical planning;
* Application installation and configuration;
* Data mapping and/or interface development of current agency systems data to a product;
* Configuring of generic field windows;
* Configuring of custom templates;
* Conversion development to take data from existing agency systems and load into a product.

If service unit work is to be provided as part of the MSE, provide a budget for the work as described in section 4.2.

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## Service Unit Work Budget

Provide the budget for service unit work described above.

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# Other Work Activities

If applicable, describe other areas of work that are not covered in sections 3-5 below.

## Other Work Description

Provide an overview of the other work to be accomplished under this work plan. If needed, reference additional information in the Appendices or in a separate document.

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## Other Work Budget

Provide the budget for the other work described above.

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## Other Work Schedule

Include a summary level schedule for the other work described above.

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# MSE Schedule, Milestones, and Cost

This section provides a summary of the schedule, review gates, deliverables, budget, and estimates for the total work effort defined by this work plan.

## Work Effort Schedule

Include a Gantt chart of the total MSE work effort schedule. If a detailed schedule has been developed, reference the location of the schedule.

The schedule is developed using the work activities, tasks, deliverables, and the level effort; and then establishing precedence relationships among activities, assigning resources, and establishing the start and end date of each activity and task.

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## Milestones, Review Gates, and Deliverables

Identify all major milestones from the MSE schedule and the planned completion date for each item. Also, identify each deliverable that will be submitted to the task force for approval and the estimated completion date for each. In addition, define the MSE review gates (go/no-go approval points in the MSE lifecycle) and the estimated approval date for each gate.

Document each milestone, review gate, deliverable, and completion date in the table below. These items should be in time line sequence and the dates should be consistent with the MSE schedule. Refer to the “Review Gates” section in of the Deliverable Planning and Acceptance standard for a description of the standard review gates, required deliverables, and required artifacts for MSE work efforts.

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| Major Milestone, Review Gate, Deliverable, or Artifact | Planned Completion Date |
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## Total Work Plan Budget Summary

List the estimated hours and cost for each type of work (Time and Materials, Fixed Price, Service Units, and Other Services) and each work activity within the type in the following table. Include the subtotal for each type of work and total cost for all types of work.

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| Work Plan  | Estimated Hours | Estimated Cost |
| --- | --- | --- |
| Time and Material Services |  |  |
| Project Administration |  |  |
| Customer Support |  |  |
| Maintenance Services |  |  |
| Application Infrastructure Upgrade Services  |  |  |
| Work Plan and Strategic Plan Development |  |  |
| Meetings |  |  |
| Publications |  |  |
| Task Force Directed Tasks |  |  |
| Quality Assurance Reviews |  |  |
| Other Time and Materials Services |  |  |
| Direct Charges |  |  |
| Total Time and Material Services |  |  |
| **Fixed Price Services** |  |  |
|  |  |  |
|  |  |  |
| Total Fixed Price Services |  |  |
| Service Units |  |  |
|  |  |  |
|  |  |  |
| Total Service Units |  |  |
| Other Services |  |  |
|  |  |  |
|  |  |  |
| Total Other Services |  |  |
| Total MSE Budget |  |  |

## Estimation Methods and Estimates

### Estimation Methods

Describe the methods used to estimate the level of effort, schedule, and cost. Include any tools and techniques used to obtain these estimates. If applicable, include how the use of subcontractors influences these estimates.

⇒

### Estimates

Provide the estimates of effort, schedule, and any other estimate that was used to determine the total MS&E work effort cost.

|  |
| --- |
| Project Estimates |
| Total effort estimate in person-months or person-hours |  |
| Schedule estimate in calendar months |  |
| Other estimate in xxx units (if applicable) |  |

# MSE Organization and Staffing

## Organizational Structure

Provide a diagram of the contractor organizational structure for the MSE work effort, including the use of subcontractors. Show the reporting relationship to the AASHTOWare product task force and other AASHTO stakeholder groups. Example stakeholders include technical review teams, technical advisory groups, user group representatives, AASHTO Staff, T&AA liaisons, and SCOJD liaisons. The diagram should show all roles defined in Roles and Responsibilities subsection below.

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## Roles and Responsibilities

Describe the roles and responsibilities for the organization structure defined above, including contractor roles, subcontractor roles, task force, and other AASHTO stakeholder roles.

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| Role | Responsibility | Organization |
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## Contractor Staffing

Using the table below, list of all contractor and subcontractor personnel by the roles listed above that the contractor plans to use to accomplish the work contained in this work plan. Include the percent of each person’s time committed to the project; and differentiate between contractor and subcontractor personnel. Provide a reference to the location of the resumes for each person.

If needed, provide additional information to clarify the use of personnel or the substitution of alternative personnel. After submittal of the work plan, any staffing changes shall be reported to the task force.

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| Contractor Personnel Role | Name | % Time on Project |
| --- | --- | --- |
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Note: In most cases, the majority of information in this section of the work plan and in the Monitoring and Control, Quality Management, Communication Management, Configuration Management and Project Repository, and Risk Management sections will be defined once and then referenced with revisions and additions included, as required, for the current work plan.

# Technical Process and Technologies

Define the technical methods, standards, tools, and technologies for the MSE work effort that will be used for system analysis, system design, development, integration, deployment, and operation. Proprietary tools and exceptions to AASHTOWare standard are also defined.

Processes and tools for issue management, change management, status reporting, quality management, testing, communication management, configuration management, and risk management are described in other sections of the work plan.

## Methods and Standards

Identify the development methodology and other technical procedures and techniques that will be used to analyze, design, develop, and/or deploy the products and/or services for the MSE work effort. In addition, identify the technical standards, policies, and procedures governing development and/or modification of the artifacts, including the AASHTOWare Standards and Guidelines (S&G) Notebook. All AASHTOWare standards in the S&G Notebook shall be complied with unless an exception to one or more standards is documented below and approved by the product task force and the Special Committee on Joint Development (SCOJD).

If the work effort continues to use methods and procedures used for previous product work efforts, this should be noted and along with a brief description of these methods and procedures.

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## Life Cycle

Describe and provide a diagram of the lifecycle model that will be used for the MSE work effort. Use the AASHTOWare standard lifecycle and, if needed, tailor it to accommodate the specific needs of the project. Include the review gates in the diagram that will be used as approval points during the MSE lifecycle.

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## Tools and Technologies

Identify the programming languages, operating systems, database systems, and other tools and technologies to be used to analyze, design, develop, integrate, build, deploy, operate, and maintain the MS&E work effort’s technical products. If the work effort continues to use the same tools and technologies used for previous product work efforts, this should be noted and along with a brief description of these tools and technologies.

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### Proprietary Tools and Technologies

Note any tools or technologies from above that are proprietary and the issues/solutions to ownership and licensing of these products.

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### Proprietary Tools and Technologies Approval Process

Describe the process that will be used to obtain permission for any other proprietary tools and technologies identified during the execution of the work plan. The AASHTO Cooperative Computer Software Policies, Guidelines, and Procedures requires approval by the Special Committee on Joint Development (SCOJD) before any tools or technologies that may affect AASHTO's ownership of a product are employed.

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## Exceptions to AASHTOWare Standards

Describe any exceptions to AASHTOWare standards that will occur during the MS&E work effort and the reasons or justification of each exception.

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If any of the above items are not included or referenced in the work plan, they shall be planned as deliverables in the work plan and included in the table of Milestones, Review Gates, and Deliverables in Section 8. In this case the, each item shall be prepared and approved early in the project lifecycle prior to or with the Planning and User Requirements Review Gate. In addition, the section of the work plan where the item is normally described shall refer to Section 8.

# Monitoring and Control

Define or reference a separate document that defines the processes for managing issues, controlling changes, and reporting status of the MSE work effort.

## Issue Management

Describe the process for managing issues. Include the methods, tools, and resources used to document, submit, analyze, prioritize, and handle project issues. Also include how the issues will be tracked and managed to closure.

An issue is basically anything that might impact the ability of the project to meet its goals or deliver its intended product(s). Issues should be differentiated from risks in that a risk is a potential occurrence whereas an issue is something that has actually occurred.

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## Change Management

Describe the process for controlling changes. Include the methods, tools, and resources used to document, submit, log, track, prioritize, analyze for impact, and approve change requests. The change control process is used controlling changes such as changes to the scope, schedule, budget, and previously approved deliverables. The process should include a description of the roles involved in determining specific resolution actions such as approval, rejection, or delay of a change request.

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## Status Reporting

Describe the process for reporting status of enhancement development in the MSE effort. This process shall describe the frequency of status reports, the distribution of the status reports, and the content that will be provided in each status report or reference example report. At a minimum, status reports shall be created and delivered to the task force once a quarter during the fiscal year. When possible the quarterly reporting intervals should be planned in conjunction with task force meetings. The status reports shall include but not be limited to the following content: Date of Report, Dates of Reporting Period, Summary View, Accomplishments for this Period, Planned Activities for Next Reporting Period, Budget Status, Milestones/Deliverables, Change Requests, Risks, and Issues. The Summary View shall provide a quick view of the status of key areas such as schedule, scope, budget, deliverables, changes, communication, risks and issues. Green, Yellow, or Red or another similar method should be used in the Summary View.

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# Quality Management

Define or reference a separate document that defines the approach to be used for quality management, including the processes for quality assurance, quality control, and testing.

## Quality Assurance

Describe the quality assurance process that will be used. This process shall include activities to determine if required deliverables, artifacts, and approvals comply with standards. This process shall also describe the contractor’s plans to follow the process described in the AASHTOWare Quality Assurance Standard, including the scheduling and participation in an annual Quality Assurance meeting.

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## Quality Control

Describe the quality control process that will be used. Include the approach for reviewing deliverables and artifacts to find problems and issues and to ensure that requirements are met; and the approach for approving/accepting deliverables and review gates.

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### Review Gate Approval Procedure

Describe the procedure used by the contractor and task force during the MSE work effort to submit, approve, and reject review gates and major deliverables submitted with the review gates, and to document the approval decision.

⇒

### Major Deliverable Approval Procedure

If major deliverables will be approved prior to or independent of the review gates, describe the procedure that will be used to submit, approve, and reject major deliverables prior to their designated review gates; and to document the approval decision.

⇒

### Reviews and Assessments

Describe procedures used by the contractor and task force, in addition to those listed above, for reviewing and assessing artifacts, deliverables, and other outcomes and for documenting these reviews and assessments.

⇒

## Product Test Plan

Describe or reference a separate document that describes the test plan to be used by this work effort. The Product Test Plan is a planning document that defines the overall testing approach and methodology, description of test phases, testing responsibilities, testing deliverables, and the target schedule for the phases and deliverables. The required content of the Product Test Plan is defined is the AASHTOWare Testing Standard.

Note: The Product Test Plan does not define the details and test procedures for alpha and beta testing. These are defined in separate deliverables prepared during later stages of the work effort.

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# Communication Management

Describe or reference a separate document that describes the approach for communicating information between the contractor’s organization, the task force, and other stakeholders. This approach should include a Communication Register (or Matrix) that includes what information will be communicated, to whom it is communicated, when it will be communicated, and how it will be communicated. An example Communication Register is provided below.

|  |  |  |  |
| --- | --- | --- | --- |
| What? | Who? | When? | How? |
| Information | Provider/Stakeholder | Recipient/Stakeholder | Timeframe/Frequency/Trigger | Format | Medium/Distribution Method | Storage/Disposition Method |
|  |  |  |  |  |  |  |
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# Configuration Management and Project Repository

## Configuration Management

Describe the approach for configuration management or reference a separate document that describes the approach, including the methods, tools, and resources that will be used for configuration management. Configuration management describes the activities for formally identifying, tracking, and controlling configuration items; defining baselines, version control; and associated auditing and reporting. Configuration items may be intermediate or final outputs (including executable systems, executable code components, source code components, user documentation, databases, test cases, test plans, specifications, project management artifacts, and data) and elements of the support environment (including compilers, operating systems, and tools).

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## Project Repository

Describe or reference a separate document that describes methods, tools, and resources that will be used to establish, access, and maintain the project repository. All document-based artifacts, deliverables, submittals, approvals, documentation, and other work products created during the MSE work effort shall be stored in project repository that may be accessed by the task force, TRTs, TAGS, and other stakeholders identified by the task force.

If not included in the above configuration management approach, this section shall also describe the procedure for naming, versioning, storing and revising deliverables, artifacts, and other work products that are stored in the project repository. When a deliverable is approved by the task force, TRT, or TAG, it shall named, versioned, dated, and stored in the project repository using the conventions described in this procedure. Each time a deliverable or artifact is changed and reapproved, the name, version, and date shall be updated in the project repository.

Microsoft SharePoint is the preferred tool for creating, maintaining, and accessing the repository; however, other tools may be used if approved by the task force and SCOJD.

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# Risk Management

Describe or reference a separate document that identifies the approach for managing risks, including the roles, activities, methods, and tools. Include the methods used to identify, analyze, prioritize, and report risks that may occur during the lifecycle of the work effort. Also include how the risks will be tracked and managed to closure.

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# Backup and Disaster Recovery

## Backup Plan

Reference a separate document that describes the Backup Plan or include the plan below. The Backup Plan includes what will be backed up, the frequency of backups, type and retention of each backup, type of media and software used for backup and recovery, roles and responsibilities, backup procedures, procedures to recover individual files or the complete development environment; and any specific needs of the project or product. Refer the Backup and Disaster Recovery standard for the requirements of the Backup Plan.

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## Disaster Recovery Plan

Reference a separate document that contains the Disaster Recovery plan that will cover the operational maintenance, development, and support environment for this MSE work effort. The Backup and Disaster Recovery Standard requires the contractor organization to have a Disaster Recovery Plan in place that includes actions for protecting the AASHTOWare development or maintenance environment against a disaster; and actions for restoring the complete environment at an alternate site and resuming normal operations within a specified number of days following a disaster event. The specified number of days will be agreed upon by both AASHTO and the contractor organization.

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# Revision History

Identify changes to the work plan in the table below.

| Version | Date | Name | Description |
| --- | --- | --- | --- |
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# Appendices

If needed, include Appendices for change requests, requirements, design specifications, plans, resumes, or other documents referenced in the body of the work plan. Number the first as Appendix as A, second Appendix B, and so on.

## Appendix A – TBD

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