# Project Management Procedure

| | |
|---|---|
| SUBJECT:<br>PROJECT RISK MANAGEMENT | NUMBER:<br>PMO- 15.0 |
| RESPONSIBILITY:<br>PROJECT MANAGER/COORDINATOR | EFFECTIVE DATE:<br>February 1, 2015 |
| | SUPERSEDES: |
| **CHIEF ENGINEER APPROVAL:** | Original with signature on file in Project Management Office<br>Chief Engineer |

This procedure is in response to the May 2014 Commonwealth Transportation Board (CTB) Project Risk resolution and outlines the systematic process of identifying, analyzing and responding to project risks throughout the Plan Development Process (PDP) for all Tier II Projects and for any projects deemed high risk by the Commissioner (See IIM-LD-249 2-TIERED APPROACH TO PROJECT OVERSIGHT for more information on Tier II projects). It is imperative that Project Managers treat compliance with this Project Management Procedure as a requirement.

## GENERAL

**Project Risk Management**

In practical terms, project risk is inevitable. It is a function of probability and may be defined as an uncertain event, activity or condition that, if it occurs, negatively affects a defined project goal. That negative effect may be expressed in terms of impact to scope, schedule, cost and quality. For VDOT projects we manage project risk by utilizing project development processes refined over many years to minimize commonly encountered risk items. A large part of project success and failure is dependent upon how we manage risk throughout the project life.

Risk Management is deeply interwoven within the VDOT Project Development Process (PDP) including scope development utilizing multi discipline teams of experts. Risks are identified and systematically managed through a process controlled by policies, procedures and statutory requirements including: design standards and approvals, constructability reviews, environmental regulations, financial reviews, scoping approval, public involvement requirements, right of way acquisition, relocations and utility regulations and policies, interagency review and coordination, etc.

As the project moves through the PDP, more project details are fleshed out and risk items are addressed and are either no longer a problem because they didn't occur or because sufficient information is available to better assess the concern. Additional risk items may also be discovered later during the development process. These should be added to the list of previously known risk items, strategies developed and worked as development continues. Remember, the risk management process can be executed anytime for instances where project specific or unique risks could occur that are not identified and managed as stated previously.

Examples of typical project risks include: Environmental approvals, Geotechnical/Subsurface conditions, Right of Way issues, Permits (Water Quality, etc.), Differing Site Conditions, Utilities, Railroads, Third-Party

Requirements and Agreements, Elected Officials, Local Jurisdictions, Citizen support, and Funding/Budget issues. Typically, many of these risks are outside of VDOT's direct control and therefore represent potential high risk areas for projects. These types of risks are pre-populated in Risk Analysis Matrix to ensure consistent consideration by all internal stakeholders.

**Project Risk Management Process**

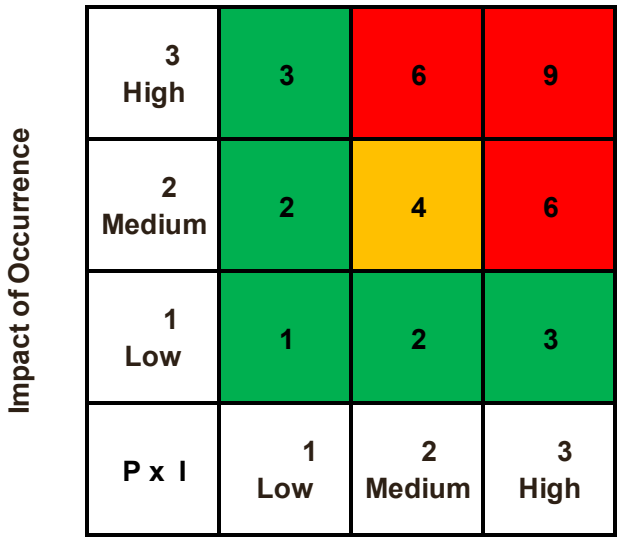
Under this method, the process is broken into four components:

- Risk identification – determination of risk events that, if they occur, are likely to affect the overall project objectives.
- Risk assessment – determination of the both the probability a given risk event will occur and the impact of the occurrence to the project scope, schedule, cost and quality.
- Risk response development – identification of specific processes or actions in order to maximize opportunities and minimize the occurrence of specific risks on a project.
- Risk response control – process of documenting risk, developing and implementing risk strategies and responding to changes in risk during the life of a project

The individual tools used for each of these components vary based on project cost and delivery method.

- **Risk Identification**
    1. Each project team member identifies the Risks and Opportunities within their field of expertise of the project development.
    2. Identified risks are compiled into a Project Assessment Matrix which includes
        - List of identified risks
        - List of potential responses to the risk event.
- **Risk Assessment**
    1. Assessments should be made against the planned project budget, schedule, and scope definition.
    2. Acceptable variance from planned values for cost and schedule are established by the agency for different phases of project development.
    3. Acceptable changes to the project scope must be established by the project sponsor and stakeholders prior to assessment of scope impacting risks.
    4. A scale will be established by the project manager and under the guidance of organizational policies and direction from project stakeholders.
    5. Assess probability of each risk occurring.
    6. Assess impact of each individual risk according to the project specific established rating scheme.
    7. Risk Assessment Matrices are available to document the assessment process.
    8. See top of page 3 for the Probability and Impact Chart (P&I Chart).

**Overall Risk Rating**




9. The acceptable risk level is established.
10. Every event that rates above the acceptable level must be addressed in the response development phase.

- **Risk Response Development**
  1. There are only 4 responses when dealing with Risks
     - *Accept* the Risk (Ignoring the Risk is the same as accepting it.)
     - *Mitigate* the risk by applying controls that reduce the impact of the occurrence on the project, the probability of the risk occurring, or both.
     - *Transfer* the risk to another entity. (For Example outsource or insurance.)
     - *Avoid* the risk. (Try another way.)
  2. The proposed responses are documented and communicated to team members and stake holders.
  3. Resulting changes to planned schedule, budgets, or project scope are formalized following any change management procedures.
  4. Complete Risk Assessment Matrix is created with final risk decisions and responses.
- **Risk Response Control**
  1. The Project Manager monitors all identified risks
  2. The Project Manager initiates any Risk Response actions when alerted that a risk event occurs.
  3. As the Project Evolves the Risks and Opportunities Evolve and Change. Re-identification and re-assessment of risks should be conducted at each of the project development phase milestones.

## DETAILS

**Scoping Phase**

As part of the project scope development all team members must conduct intensive information gathering and discovery of project characteristics within their field of expertise. Communication and sharing of all information is crucial during this phase. Team members should anticipate any risks and present them to the project team during the scope development. All risks identified should have a Risk Response prior to scoping completion. The

risks must be evaluated prior to developing the Scoping Budget and Schedule, and prior to the Design Scoping Approval.

**Preliminary and Detailed Design Phase**
Risk management during this phase of project development will involve executing any identified risk responses, and re-identifying and assessing any new risks. Project Development performance should be measured against the planned budgets and schedules to identify variance. Reviews of plans should be conducted to determine that original scope is being achieved. Risks to the construction phase execution goals of the project should be continually identified and incorporated into the project by plan design or specifications.

**Final Design and Advertisement Phase**
Risk management during this phase of project development involves validation that Risk Responses were executed for identified risks that occurred. Extra emphasis is placed on identification and assessment of any additional risks that may affect the construction phase execution goals and ensuring the bid documents are inclusive of risk responses.

**Construction Phase**
Risk Management during the construction phase is directed by the Construction Division.

**PROCEDURE**

**For Design-Bid-Build (DBB) projects**

1. Potential risk items should be formally discussed at each milestone meeting:
    a. Final Scoping/Preliminary Field Inspection
    b. Public Hearing Team Meeting/Design Approval
    c. Field Inspection
    d. Pre-Advertisement Conference

2. Prior to each meeting, the Project Manager, as assigned by the District Project Development Engineer, should ensure that the Scoping Worksheet – Risk Analysis Matrix PM-103B has been developed prior to discussion at the milestone meeting.
    a. Ensure that the Scoping Worksheet-Risks are on the meeting agenda.
    b. When the Scoping Worksheet-Risks comes up on the agenda, the Project Manager facilitates the project team in identifying and listing the project risks. The project risks must be specific and detailed. During facilitation, the Project Manager will progress from discipline to discipline identifying, listing and discussing each risk.
    c. The Project Manager facilitates a group assessment, ranking and method of response to each specific risk. The Project Manager focuses on each specific risk to assess each as to their perceived level of "Probability of Occurrence" (Probability=P) and "Impact" (Impact=I) if the risk were to occur. The Probability and Impact of each risk are used as inputs to the P&I Chart which results in an overall rank for the risk.
    d. The Project Manager facilitates a group discussion of cost and time impact of each specific risk.
    e. A risk response and mitigation action plan is developed to eliminate or mitigate risks rated either medium or high level. The documented actions should reflect the detail necessary to eliminate ambiguity or interpretation.
    f. The Project Manager is responsible for updating the Risk Analysis Matrix PM-103B which provides documentation for all risks identified during the course of a project. The Risk Analysis Matrix PM-103B includes an identification numbering structure for the risks, the risk name with description, the date the risk was identified, the functional activity (such as Utility, Environmental,

etc.), the probability and impact scores and total score, the estimated cost and time necessary to implement the proposed risk response action, and the detailed response, mitigation strategy actions and the residual risk rating after controls/mitigations are applied. NOTE: Impact quantified in terms of cost and time/integrated into project estimate where applicable.

h. All elements of the Risk Analysis Matrix PM-103B should be completed.
i. During each subsequent project team meeting, each risk is reviewed and the status is updated and modified as necessary.
j. The Risk Analysis Matrix provides a record of every risk identified and the steps taken throughout the project to mitigate or eliminate the risks. Risks that are eliminated are maintained on the Matrix and become part of the end of project archival documentation. Once eliminated, the risk is "grayed" out, but not deleted, on the Risk Analysis Matrix.
k. The Risk Analysis Matrix PM-103B and Risk Summary and Authorization Form PM-103A are stored in iPM Documents.

3. Once the milestone meeting is concluded, the Project Manager updates the Risk Analysis Matrix PM-103B and prepares to present the findings/progress to management.

4. The Project Manager reviews identified risk items and proposed response and mitigation strategies with district management.
   a. Project Manager reviews all risk items identified by project team with PE Manager (PDE, Program Investment Manager (PIM) and District Administrator (DA).
   b. Project Manager discusses risk mitigation strategy for dealing with each identified risk item.
   c. Project Manager updates risk management strategies as needed.
   d. It is the Project Manager's responsibility to manage and solve/mitigate risk as the project moves through PDP.
   e. At, or before, the last milestone meeting prior to advertisement, the PM and DA sign the Risk Summary and Authorization Form PM-103A indicating that all identified risk have been satisfactorily mitigated. The PM and the DA also note any risk where the risk response or mitigation strategy should be brought to the attention of the Deputy Chief Engineer.

5. The PM and the District provides the Risk Analysis Matrix PM-103B to the Chief Deputy Engineer and where warranted, meet to review high risk items and associated mitigation strategies with Deputy Chief Engineer.
   a. Risk management strategies updated as needed.
   b. Process occurs at each PDP Milestone leading up to CTB action, i.e. – location approval, location/design approval, construction contract award.
   c. At the last milestone meeting prior to advertisement, if the Deputy Chief Engineer is recommending a CTB risk briefing, the Deputy Chief Engineer signs the Risk Summary and Authorization Form recommending this to the Chief Engineer.

6. The Chief Engineer reviews the Risk Analysis Matrix PM-103B, the Risk Summary and Authorization Form PM-103A, and the risk recommended by the Deputy Chief Engineer for review to determine which risk, if any, warrant discussion with the Commissioner.

7. The Chief Engineer and Commissioner meet to discuss the risk presentation for CTB.
   a. The Chief Engineer and Commissioner discuss the high risk items and determine which risks are to be summarized for discussion with CTB. It is expected that most high risk items will have been mitigated at this point and will be grayed out on the matrix. However, the Chief Engineer and

Commissioner will decide which risks will be presented to CTB. As these briefings begin to occur, a decision may be made to include the entire Risk Analysis Matrix to CTB for each project being briefed.

b. The number of risks will vary, but should include all of the risks that are scored as high on the Risk Analysis Matrix. Other risks, as well as risks which have been mitigated (as per the Risk Summary and Authorization Form), may also be identified for discussion with the CTB. This Chief Engineer has discretion to request a CTB risk briefing, even if the project does not meet the dollar or risk threshold.
c. The Chief Engineer communicates the identified risks to the Project Manager and the Deputy Chief Engineer. The CTB presentation should include a discussion of the mitigation efforts. For example, if a project is being recommended for award and it does not have a particular permit, the presentation might include things like awarding the project with a limited Notice to Proceed or a limit on what will be paid, until the contractor obtains the permit.
d. If a decision is made to not move forward with a risk briefing, the Chief Engineer will document the reasons on the Risk Analysis Matrix.

8. Develop CTB Project Risk Presentation
    a. Project Manager develops Project Risk Presentation for Commissioner to deliver to CTB.
    b. Presentation contains remaining high risk items (as well as mitigated high risks or other risks) and associated mitigation strategies approved by the Commissioner and Chief Engineer.
    c. Project Manager summarizes the risks in a PowerPoint document for the CTB meeting.
    d. Each risk summary will include:
        i. Risk item name
        ii. The function impacted (utilities, environmental, etc.)
        iii. A description of the risk
        iv. An overview of the actions required to mitigate the risk (differing alternatives reviewed)
        v. The estimated cost to mitigate the risk
        vi. The estimated time necessary to implement the action plan outlined
        vii. The probable impact to the project if the risk is not mitigated in a timely manner
        viii. The residual risk level after controls/mitigations are applied.

**For Design- Build (DB)**

See IIM-APD-1, IIM-APD-2, IIM-APD-3 and the Alternate Project Delivery Office Design-Build Risk Analysis Process.

**For Public-Private Partnerships (P3)**

See Risk Management Process:
http://www.virginiadot.org/office_of_transportation_public-private_partnerships/resources/UPDATED_PPTA_Implementation_Manual_11-07-14