

Quick Guide – Risk Management

Follow the process described in the [WSDOT Project Risk Management Guide](#).

Risk = uncertainty that, if it occurs, would affect the budget and/or schedule (positively or negatively).

1. Risk Management Planning

- a. Determine the level of risk assessment for your project
- b. Incorporate risk management activities into the project schedule
- c. Make risk management an agenda item for regularly scheduled project meetings
- d. Communicate the importance of risk management to the entire project team
- e. Establish the expectation that risk will be managed, documented, and reported
- f. Report on the status of project risk at regularly scheduled project meetings
- g. Continually reassess the Risk Matrix

Risk management is also a key component of project cost estimating and scheduling, and the application of the Cost Risk Assessment (CRA) and the Cost Estimate Validation Process® (CEVP®) processes.

Risk Management Process



2. Risk Identification

Risk identification involves determining which risks can affect the project. A risk can be negative (threat) or positive (opportunity) – both are important to track.

Information Gathering:

- Brainstorming with team members, specialty groups, stakeholders, and regulatory agencies
- Searching the Lessons Learned database
- Examine similar past projects
- Other Methods – questionnaires/surveys, interviews, checklists, examination of the work breakdown structure, and asking “what if” questions

Risk Matrix: [Project Mgmt - Risk Matrix Template](#), is spreadsheet-based and allows for sorting of risks and categories

Follow the Risk Breakdown Structure to categorize each risk by Level 1 and Level 2 categories.

RISK BREAKDOWN STRUCTURE

Major Project Risks

Level 1	ENV - Environmental	STG - Structures & Geotechnical	DES - Design / PS&E Roadway, Hydraulics, etc.	ROW - Right-of-Way Acquisition & Access	UTL - Utilities	RR - Railroad	PSP - Partnerships & Stakeholders	MGT - Management / Funding	CTR - Contracting & Procurement	CNS - Construction
Level 2	ENV 10 - NEPA/SEPA – documentation completion, Section 4(f)/6(f) challenges	STG 10 - Structure Design Change – bridge superstructure, retaining walls	DES 10 - Roadway Design Change – vertical / horizontal alignment, earthwork, pavement	ROW 10 - Plan Development Issues – easements: temporary construction/subterranean, FHWA approval	UTL 10 - Plan Development Issues – design coordination, agreements	RR 10 - Plan Development Issues – design coordination, agreements, right-of-entry	PSP 10 - Tribal Issues	MGT 10 - Project Management Issues – change in managers / other key leadership	CTR 10 - Project Delivery Method – changes or issues	CNS 10 - Traffic Control & Staging – MOT / WZTC, multimodal traffic management
	ENV 20 - ESA Issues – consultation, Biologic Assessments / Biological Opinions, Fish Passage	STG 20 - Geotechnical Design Change – foundations, ground improvements, unsuitable materials	DES 20 - Roadway Design Criteria Change – Design Manual, design analysis approval, practical design considerations	ROW 20 - Project ROW Cost Change – change in land use/zoning, urbanization, market conditions	UTL 20 - Practical Issues (in the field) – relocation, conflicts, discoveries	RR 20 - Construction Coordination Issues – flagging, work restrictions / windows, right-of-entry requirements	PSP 20 - Public Involvement Issues	MGT 20 - Delay – indecision, submittal review	CTR 20 - Contract Language warranties, liquidated damages, DBE, insurance/bonding	CNS 20 - Construction Permitting – work restrictions
	ENV 30 - Environmental Permitting – delays, appeals, unanticipated conditions	STG 30 - Structural Design Criteria Change – seismic, hydraulic, geometric, building codes	DES 30 - Aesthetic Design Changes – Architectural, CSS, Landscaping	ROW 30 - Limited Access Issues – Access Revision Report (ARR), access hearing, permanent construction easement		RR 30 - Property Rights Issues – challenges in acquiring from RR, considerations for delivery method (DB vs DBB)	PSP 30 - Scope / Design Changes – artwork, shared-use pathways, arterial/intersection improvements	MGT 30 - Funding – availability, cash flow restrictions	CTR 30 - Contract Procurement Process Issues – addenda / extensions, protests	CNS 30 - Work Window Coordination – weather, in/over-water
	ENV 40 - Discoveries – cultural resources (Section 106), historic property impacts & mitigation	STG 40 - Geotechnical Design Criteria Change – soil stabilization, hydraulic codes	DES 40 - Hydraulic Design Changes – flow control, water quality, criteria changes	ROW 40 - Managed Access Issues – appeal hearing			PSP 40 - Interagency Issues (Sound Transit, USFS, cities, counties, etc.) – design coordination, agreements	MGT 40 - Political / Policy Changes	CTR 40 - Market Conditions – non-competitive bidding environment, lack of qualified bidders, bids exceed upset price or budget	CNS 40 - Schedule Uncertainty (general)
	ENV 50 - Hazardous Materials / groundwater contamination, building / structure abatement/ lead paint		DES 50 - Traffic Design Changes – ITS, illumination, signals, intersections	ROW 50 - Acquisition Issues – appraisals, condemnation, relocations, demolitions			PSP 50 - Multimodal Considerations – design coordination, agreements, bicycle, pedestrians, transit	MGT 50 - State Workforce Limitations	CTR 50 - Procurement Delays & Premiums – specialty materials/ equipment, "Buy America"	CNS 50 - Marine / Over-Water
	ENV 60 - Habitat Mitigation Issues – wetlands/ stream/ floodplain		DES 60 - WSDOT Initiated Changes – maintenance request, change to purpose and need					MGT 60 - Project Phasing / Packaging Changes	CTR 60 - Contractor Performance Issues – productivity, quality	CNS 60 - Constructability (non-geotech or marine) – site access, staging/ material handling, differing site conditions, etc.
	ENV 70 - Environmental Justice (disadvantaged communities) – traffic mgmt, access, temp construction impacts		DES 70 - Tolling Design Changes – infrastructure requirements, toll collection, back-office					MGT 70 - Inadequate Quality Verification – VECP, ATC, review error	CTR 70 - Labor Issues – availability of specialty labor, labor / productivity disruptions	CNS 70 - Material Handling / Earthwork Issues – re-use, haul, disposal; hazardous materials, lead paint
	ENV 80 - Construction Impacts – water quality, TESC		DES 80 - External Initiated Changes (contractor or other party) – innovation, ATC						CTR 80 - Schedule Uncertainty – timing of award	CNS 80 - Adjacent Projects – coordination among contractors, limited staging, sequencing
	ENV 90 - Noise (permanent mitigation)		DES 90 - ADA – curb ramp modifications require R/W, MEF approval							CNS 90 - Site Security – vandalism, encampments, damage CNS 100 - Construction Accidents
	ENV 900 - Other ENV Issues	STG 900 - Other STG Issues	DES 900 - Other DES Issues	ROW 900 - Other ROW Issues	UTL 900 - Other UTL Issues	RR 900 - Other RR Issues	PSP 900 - Other PSP Issues	MGT 900 - Other MGT Issues	CTR 900 - Other CTR Issues	CNS 900 - Other CNS Issues – change orders, disputes, claims

3. Qualitative Risk

Qualitative Risk Analysis involves assessing risks for probability of occurrence and impact on project objectives. Risks are measured by their “quality” in words rather than quantity in numbers.

Evaluate the **probability** of the risk occurring:

- “How likely is it that this risk will occur?”
 - Very High
 - High
 - Medium
 - Low
 - Very Low

4. Quantitative Risk

Quantitative risk analysis numerically estimates the probability that a project will meet its cost and time objectives.

<u>Project Value</u>	<u>Risk Cost Assessment Recommendation</u>
\$10M to \$25M	Informal workshop using the self-modeling spreadsheet
\$25M to \$100M	Cost Risk Assessment (CRA) Workshop
Greater than 100M	Cost Estimate Validation Process® (CEVP®) Workshop

Evaluate the **impact** if the risk does occur:

- “How many dollars will the occurrence impact the budget?”
- “How many days/months will the occurrence impact the schedule?”
- “Why?”

5. Risk Response

Risk response involves developing options and determining actions to reduce threats or enhance opportunities. The Project Manager and the project team identify a strategy that is best for each risk, and then select specific actions to implement that strategy.

<u>Threats</u>	<u>Opportunities</u>
1. Avoid	1. Exploit
2. Transfer	2. Share
3. Mitigate	3. Enhance
4. Accept	

AVOID - (Threat) Changing the Project Management Plan to eliminate a threat. Two types of action: (1) remove the cause of the risk (risk trigger), or (2) execute the project in a different way while still aiming to achieve project objectives.

TRANSFER - (Threat) Transfer the risk ownership to another party who is in a better position to manage the risk. This almost always involves payment of a risk premium to the party taking the risk.

MITIGATE - (Threat) Reduction in the probability and/or impact of a risk event to an acceptable threshold. Measures to target linkages to the severity may reduce the impact.

EXPLOIT - (Opportunity) Ensure a positive impact or realize an opportunity; make the opportunity happen. Eliminate the uncertainty of an opportunity occurring.

- SHARE -** (Opportunity) Allocating ownership to a third party who is best able to capture the opportunity, maximize the probability of occurrence, and increasing the potential benefits if it does occur.
- ENHANCE -** (Opportunity) Modifies the “size” of an opportunity by increasing probability and/or impact by targeting and reinforcing its trigger conditions.
- ACCEPT -** Risks that remain after response actions and/or for which response is not cost-effective are accepted; risks that are uncontrollable (no response actions are practical) are also accepted.

Actions are identified and assigned to parties that take responsibility for the risk response. This process ensures each risk requiring a response has an “owner”.

6. Risk Monitoring and Control

Risk monitoring and control tracks identified risks, monitors residual risks, and identifies new risks - ensuring the execution of risk plans and evaluating their effectiveness in reducing risk.

Risk monitoring and control is an ongoing process for the life of the project:

- Measure project risk management performance, and determining whether a project is tracking to plan or deviating
- Identify new risks throughout the project phases
- Re-evaluate existing risks – they can change quantitatively and qualitatively
- Adjust risk response strategy if needed