2.7.1 Colorado Department of Transportation

www.codot.gov/business/project-management/scoping/risk-management

Documentation

- Design-Build Manual, September 2016: Contains risk management processes
- P3 Management Manual, November 2020: Contains risk management processes
- Risk management guidance directly on CDOT website pages

Tools

- Project Delivery Selection Matrix (PDSM): Used for assessing project delivery method
- Risk Assessment Tool: Provides the risk register template
- Risk Library: Database within Risk Assessment Tool of over 70 common risks
- Project Cost Planner Tool: Develops risk-based cost estimates (RBCE) using historical data in a statistical format
- @Risk: Third-party software utilized for Monte Carlo analysis on major projects

Risk Process

- Follows five-step process (identification, analysis, planning, allocation, control)
- Risk library to populate risk register
- Qualitative: Adapted from FHWA with 5-point scale; probability > 90% added to estimate
- Scalable: Low-risks project areas require low level of development to address; high-risk project areas need more significant development
- Risk registers: Required for major DB projects and region decision to maintain for smaller projects; required for all P3 projects
- Risk register is used as a checklist during RFP development

Phased Approach

- Initial Project Development: PDSM process to determine delivery method; develops RM Plan as part of project delivery plan
- For P3 recommendation, report with key risks presented to the High Performance Transportation Enterprise Board
- For P3, risk register updates and workshops in six phases: project development, pre-procurement, procurement, implementation, operations, and handback
- Implementation: Maintain risk register through construction; regular risk meetings

Risk Management Organization

- Alternative Delivery Program: DB projects
- High Performance Transportation Enterprise: P3 projects
- State divided among five CDOT Regions that support each department. Each region develops projects and leads cost estimating and risk assessment efforts for their projects
- Workshops facilitated by each department; regions provide subject matter experts (SME)

Training

- Developed training program for all major DB projects

Cost Estimates and Schedules

- Parametric estimating using Project Cost Planner Tool during initial design development
- 30% contingency is standard
- Probabilistic RBCE using @Risk P70 level to determine contingency

2.7.2 Florida Department of Transportation

www.fdot.gov/programmanagement
www.fdot.gov/designsupport/toolbox/default.shtm

Documentation

- Project Delivery Methodology Risk Initiation Review Checklist, May 17, 2013
- Risk Based Graded Approach Worksheet Development Guidelines, March 29, 2019
- Guide to Including Project Risks/Unknowns in Long Range Estimate

Tools

- Risk Based Graded Approach Worksheet Template
- Risk Register Template
- Risk Analysis Modeling Tool: Determines Project Risks/Unknowns in Long Range Estimate based on risks

Risk Process

- No formal guidance/procedure or mandate
- Follows four-step process (identification, assessment, response, monitoring)
- Risk assessment required only if adding contingency amount to the long range estimate
- Qualitative: Risk Based Graded Approach Worksheet; probability in 20-25% increments
- Scalable by project cost
- Cost < $100M and if not requiring workshop: Use Risk Analysis Modeling Tool; qualitative
- Cost between $100M - $500M: Workshop; quantitative register; commercial risk modeling
- Complex project or cost > $500M: Consultant-led risk analysis workshop
- Acquires permits and ROW prior to DB contract award

Phased Approach

- Project Planning: Use Project Delivery Methodology Risk Initiation Review Checklist so processes are covered
- Project Initiation: Use Risk Based Graded Approach Worksheet
- Procurement: P3 RFP templates; some risk mitigation built in

Risk Management Organization

- Centralized office with seven districts and the Florida Turnpike Enterprise
- Statewide Risk Management Team: Implement quantitative analysis at the project level during project development; includes State Value Eng, State Estimates Eng, State PM Eng, District Util Admin, District Court Eng
- Regional Risk Management Teams: Includes District Value Eng, District Estimates Eng, Design PM, Construction PM; monthly teleconferences with Statewide Risk Management Team; identifies and supports workshops

Training

- Initially provided quarterly training to directors, PMs, and design engineers
- Holds training expo on entire risk management process once a year
- Provides quarterly training on its recorded modeling tool

Cost Estimates and Schedules

- Utilizes initial contingency at 5% increments up to 25% for estimating
- Uses RBCE; replacing the traditional cost contingency with a risk-based contingency

2.7.3 Georgia Department of Transportation

www.dot.ga.gov/PS/Innovative/DesignBuild
www.dot.ga.gov/PS/Innovative/P3

Documentation

- Plan Development Process, Revision 3.2, December 16, 2019
- Design-Build Manual, March 1, 2018
- P3 Manual, October 22, 2020

Tools

- Utility Risk Matrix
- Risk Allocation Matrix Template: Located within the Design-Build Suitability Assessment; not qualitative or quantitative; identify risks, assign owner, and provide mitigation strategy
- Design-Build Suitability Assessment: Used for DB candidacy
- Design-Build Project Scalability Memo: Project ranking system to categorize DB projects representing varying levels of complexity and risk ranging from low to high
- Comprehensive Risk Assessment for Transportation software – use at GDOT Office of Innovative Delivery to perform systematic risk analysis; incorporates typical risks in planning estimates

Risk Process

- No formal guidance/procedure; risk management is located within DB documentation
- Provides outline for early risk management for DBB delivery
- Develop independent utility RM Plan to identify utility risk factors
- Follows four-step process (identification, assessment, response, monitoring), although template does not provide qualitative or quantitative assessments
- Project team meets frequently to update the RM Plan

Phased Approach

- Preliminary/Scoping Phase: Risk discussion during Project Team Initiation Process
- Innovative Delivery PM prepares Design-Build Suitability Report and Risk Matrix
- Pre-Procurement: Initial workshop for comprehensive risk analysis; consider facilitator

Risk Management Organization

- Office of Innovative Delivery: DB delivery
- P3 Division

Training

- Training not identified that covers risk or estimating processes

Cost Estimates and Schedules

- Uses RBCE using percentage-based contingency
- Integrates risk management decisions into cost estimates and project schedules

2.7.4 Minnesota Department of Transportation

www.dot.state.mn.us/designbuild/index.html
www.dot.state.mn.us/pm/processes.html
www.dot.state.mn.us/pm/cost.html

Documentation

- Guidance is not consolidated; processes across several individual documents
- Cost Estimating and Cost Management Technical Reference Manual
- Cost Estimation Process Improvement and Organizational Integration Project – Risk and Contingency
- Project Risk Management Process
- Project Risk Management Reference
- Risk and Contingency Fact Sheet
- Total Project Cost Estimating Potential Guidelines
- Length, Width and Depth Cost Estimating Guidance

Tools

- Risk Register Template
- Risk Checklists
- Total Project Cost Estimate Template
- Length, Width and Depth Cost Estimating Template
- Acumen Risk: Monte Carlo for small and medium projects and works well with scheduling
- @Risk – Third-party software utilized for Monte Carlo analysis on major projects

Risk Process

- Risk management is located within short documentation on website
- Follows four-step process (identification, assessment, response, monitoring)
- Utilizes red flag lists and risk checklists
- Four-Tiered Scalability: Uses risk and complexity and not cost to define a project and determine quantitative requirements; split into minor, moderate, and major
- Minor: Identification
- Moderate: Risk register; response; qualitative assessment
- Major: Workshop; quantitative assessment; RM Plan; Monte Carlo

Phased Approach

- Delivery Method Selection Approach: Initial risk assessment
- Plan Project Development Phase: Complete risk register

Risk Management Organization

- DB part of MnDOT Office

Training

- Available for the cost estimating module

Cost Estimates and Schedules

- Uses RBCE with percentage-based contingency
- Minor: Percentage-based contingency
- Moderate: Contingency based on three-point estimating; possible use of Acumen Risk
- Major: Three-point estimate and Monte Carlo simulation

2.7.5 Missouri Department of Transportation

www.modot.org/design-build-information
epg.modot.org/index.php/Category:149_Project_Delivery_Method_Determination_and_Risk_Assessment

Documentation

- Engineering Policy Guide, Category 149, March 28, 2014

Tools

- Risk Assessment Brainstorm Worksheet: Register list
- Risk Assessment Worksheet: Calculate risk factor to sequence risks

Risk Process

- No formal guidance/procedure; documentation located within Engineering Policy Guide
- Follows three-step process (identification, assessment, allocation)
- Qualitative assessment: Calculate Risk Factor using impact (0-6), effort (0-6), and probability (0-1)
- Scalable by project cost
- Cost > $10M and high-risk project: Monte Carlo
- Cost > $25M: Workshop
- Risk management process is not built into DBB delivery

Phased Approach

- Project Delivery Method (PDM) Determination Process: Utilizes high-level risk assessment
- Procurement: Risk Assessment Workshop: Detailed risk assessment; includes core team members, SMEs, and optional facilitator

Risk Management Organization

- DB part of MoDOT Office

Training

- Training not identified that covers risk or estimating processes

Cost Estimates and Schedules

- Cost and schedule impacts are not identified

2.7.6 Nevada Department of Transportation

www.nevadadot.com/doing-business/documents-and-publications

Documentation

- Project Delivery Selection Approach
- Risk Management and Risk-Based Cost Estimation Guidelines
- Project Management Guidelines, 2010
- Project Estimation Wizard Instructions

Tools

- Risk Register Template
- Risk Tracking and Analysis Tool for Small and Medium Size Projects: Quantitative Risk Tool
- Project Estimation Wizard

Risk Process

- Independent thorough risk management guidelines
- Applies to DBB and DB delivery
- Provide risk assessments on all projects; develop RM Plan
- Follows four-step process (identification, assessment, response, monitoring)
- Scalable by project cost
- Cost < $10M: Qualitative assessment
- Cost from $10M - $25M: Qualitative required; suggests quantitative workshop
- Cost between $25M - $100M: Qualitative required; Cost Risk Assessment (CRA) workshop
- Major projects and costs > $100M: CRA workshop; quantitative assessment; consultant-facilitated; internal and external SMEs in time slots

Phased Approach

- Use project delivery selection approach with high-level review of risk components.
- Project risk cost updates every one to two years with possible CRA workshop

Risk Management Organization

- Centralized agency
- Project Management Division for major projects > $100M and innovative delivery

Training

- Training not identified that covers risk or estimating processes

Cost Estimates and Schedules

- Qualitative risk allowance percentages are set between 3% (low risk) up to 15% (high risk)

2.7.7 South Carolina Department of Transportation

www.scdot.org/business/design-build.aspx

Documentation

- Design-Build Procurement Manual, February 28, 2017
- 2018 Design-Build Peer Exchange, February 4, 2019

Tools

- Project Delivery Selection Matrix Template (SCDOT internal only)
- Risk Matrix (SCDOT internal only)
- Project Cost Estimate Guidelines and Template (SCDOT internal only)

Risk Process

- Processes are not documented
- Utilize feedback from SMEs to determine high, moderate, and low risks.
- Allocate risks to either SCDOT, DB team, or both and discuss mitigation strategies
- Does not typically acquire permits, early ROW acquisition, or early utility relocation prior to DB contract execution.

Phased Approach

- Project Definition Report: Review goals and discuss project risks
- PDM selection process or workshop: Perform risk assessment
- Risk matrix developed that refines assessment from project selection process
- Pre-Procurement: Finalize risk matrix prior to request for qualifications advertisement or one-phase RFP
- Procurement: Utilize risk matrix in the development of the scope of work in the RFP

Risk Management Organization

- Design-Build Group: Administers DB and Alternative Delivery Methods Program

Training

- Training not identified that covers risk or estimating processes

Cost Estimates and Schedules

- Cost and schedule impacts are not identified

2.7.8 Texas Department of Transportation

www.txdot.gov/inside-txdot/division/transportation-programs/ppm.html
www.txdot.gov/inside-txdot/division/debt.html

Documentation

- Design-Build Procurement Overview Manual, April 11, 2017
- Procedure 114 – Risk Management, December 19, 2019
- Risk Management Guide for Alternative Delivery Program, December 2019
- Risk Management Guide for Alternative Delivery Program (O&M), December 2019
- Design-Build Estimate User Reference Guide, December 8, 2017

Tools

- Alternative Delivery Support Tool: Determine suitability of DB delivery method
- Risk and Issue Register
- Project Cost Estimate

Risk Process

- Independent thorough risk management guidelines
- Follows four-step process (identification, assessment, response, monitoring)
- Risk team of 8-12; District and Alternative Delivery Division identify risk “champion”
- Focus on project-specific risks and scalable by project cost
- Qualitative: Use 1-3 or 1-5 scale
- Quantitative: Monte Carlo for FHWA cost estimate review; not used for internal analysis
- Risk register updated semi-annually; quarterly on major projects
- Programmatic DB contract language: shift risk allocation to party best to manage
- Major project or cost > $500M: Consultant-led risk analysis workshop

Phased Approach

- Project Delivery: Utilize Alternative Delivery Support tool to determine DB candidacy
- Planning/Pre-Procurement: Workshop 1 or combined with Design Concept Conference; qualitative; initial risk register; optional workshop 2
- Procurement: Workshop 3 for major projects; quantitative; update risk register
- Implementation: Workshop 4; update risk register
- Maintenance: Workshop 5; update risk register

Risk Management Organization

- Project Finance, Debt and Strategic Contracts Division
- Strategic Contracts Management Section: Alternative Delivery Division and alternative delivery projects
- Districts: Manage risk register

Training

- Risk-Based Construction Cost Estimating: Offered monthly on virtual platform
- Project Scope Management: Risk management offered monthly

Cost Estimates and Schedules

- Uses RBCE
- Utilizes percentage-based agency costs based on historical trends
- Calculates contingency based upon event-driven risks estimating

2.7.9 Virginia Department of Transportation

www.virginiadot.org/business/alternative_project_delivery.asp
www.virginiadot.org/business/design-build.asp

Documentation

- Design-Build Procurement Manual, April 2017
- Project Risk Management, PMO-15.0, February 1, 2015
- Design-Build Requirements for Advertisement, IIM-APD-1.2, November 9, 2017
- P3 Risk Management Guidelines, March 2015

Tools

- Risk Management Worksheet: Qualitative risk register template
- Risk Register: Modified to account for qualitative and quantitative analysis

Risk Process

- Independent thorough risk management guidelines
- Risk analysis performed for all DB projects regardless of value, by law
- Follows five-step process (identification, assessment, response, allocation, monitoring)
- Finding of Public Interest (FOPI) must be in place prior to project development and a high-level preliminary risk assessment is part of this process
- After FOPI approval, quantitative assessment with risk allocation matrix and RM Plan
- Tier II projects and construction cost > $5M: Apply project risk management practices
- Provides compensation for ROW; purchases high-risk properties up front to mitigate risk

Phased Approach

- Risks and register are reassessed at each project development phase milestone
- High-Level Screening: Initial risk discussions; seek input for list of critical risks
- Detailed-Level Screening: Informal risk workshop; initial risk register; preliminary qualitative assessment; develop Detailed-Level Screening Report
- Development: Initial risk workshop; qualitative assessment with 1-5 scale; quantitative expected value analysis; Monte Carlo analysis if desired; develop RM Plan
- Procurement: Second risk workshop; update register and plan; Risk Analysis Meeting prior to RFP release; review risks with impacts before commercial close
- Implementation: Monitor risk register quarterly
- Operations: Monitor risk register quarterly

Risk Management Organization

- Design-Build Program part of Alternative Project Delivery Division
- FOPI must be approved by the Chief Engineer and Commissioner
- High-risk or cost > $100M: Risk Mitigation Plan developed and Commissioner provides briefing to the Commonwealth Transportation Board (CTB)
- All P3 projects regardless of risk profile are briefed to the CTB

Training

- Training programs, including project management, through web-based learning system

Cost Estimates and Schedules

- Used RBCE

2.7.10 Washington Department of Transportation

wsdot.wa.gov/construction-planning/project-management/risk-assessment/home

Documentation

- Project Management Online Guide: Web-based documentation
- PDM Selection Guidance, September 2019
- Project Risk Management Guide, February 2018
- Cost Estimate Validation Process
- Project Risk Analysis Model Users Guide, March 2018

Tools

- Risk Breakdown Structure
- Sample Risk Elements
- RBCE Self-Modeling Tool
- Risk Workshop Report Summary
- Qualitative Risk Assessment Spreadsheet
- Project Risk Analysis Model

Risk Process

- Independent thorough risk management guidelines
- All projects have an RM Plan
- PM decides how to ensure risks are being eliminated or mitigated
- Follows six-step process (planning, identification, qualitative, quantitative, response, monitoring)
- Scalable by project cost
- Cost < $10M: Qualitative spreadsheet in the Project Management Online Guide
- Cost between $10M - $25M: Quantitative; informal workshop using the self-modeling spreadsheet
- Cost between $25M - $100M: Self-modeling spreadsheet in scoping phase and quantitative CRA workshop in subsequent phases
- Costs > $100M: Cost Estimate Validation Process workshop; quantitative assessment; consultant-facilitated; internal and external SMEs; DB model is recommended

Phased Approach

- PDM Selection Process: Includes risk assessment

Risk Management Organization

- Sophisticated approach with a core team of internal experts; mandated from legislature

Training

- Previously held probability and risk assessment design and cost estimation classes

Cost Estimates and Schedules

- Cost < $3M: informal process based on significant risks
- Cost between $3M - $10M: RBCE on project-by-project decision based on complexity
- Cost > $10M: RBCE
- Projects with more than a 15% contingency must go through RBCE process