Project Scoping and Cost Management:
Office Overview and Integration with Environmental Processes

April 1, 2009
Mn/DOT Environmental Stewardship and Streamlining Workshop
Jean Wallace, Mn/DOT PSCM Office
Peter Harff, Mn/DOT District 7
Objectives

▶ Overview of PSCM Office and Initiatives
▶ The Mn/DOT Scoping Process
▶ Scoping and NEPA/MEPA
▶ Scoping and Cost Estimates
▶ Project Applications
▶ Q&A
PSCM Office

► Engineering Services Division
► Michael Ginnaty, Office Director
► Office Focus: Better Define a Project so we can have a more accurate cost estimate
► Office Activities:
  ▪ Scoping Process
  ▪ Cost Estimating/Cost Management
  ▪ Involvement with Project Management
  ▪ Some overlap with Cost Risk Analysis, Value Engineering
Scoping and Cost Management

- **Project:** You Need a New House
- **Scope:** Define the need for a new house (location, size, requirements of occupants/users, access, utilities, etc.)
  - How would you obtain this information?

- **Develop a blueprint to meet your needs**
- **Accurately Estimate costs for materials & labor** (foundation, framing, sheetrock, roof, windows, flooring, electrical, finish work, plumbing, mechanical, landscaping, etc.)
  - How would you obtain the estimate?
  - What happens to the estimate over time?
Mn/DOT Scoping Process Principles

Mn/DOT developed a best-practices Scoping Model with these Principles:

▶ Early
▶ Comprehensive
▶ Documented
▶ Includes a Change Process
The Scoping Process
Goals of Each Phase

Project Planning
- Analyze performance gaps
- Determine potential projects’ performance-based need & purpose
- Determine which to scope

Project Scoping
- Determine detailed scope
- Determine cost estimate
- Build schedule

Programming
- Determine which projects to forward to ATP
- Prepare STIP
The Scoping Process

**PROJECT PLANNING**

- Identify Needs (Huge List)
- Select Candidate Projects (Long List)
- Select Projects to Scope (Short List)

**PROJECT SCOPING**

- Assign Project Manager
- Scoping Worksheets
- Scoping Report
- Scope Approval

**PROGRAMMING & PROJECT DELIVERY**

- Amendments
- STIP
- Project Delivery
- LETTING
The Scoping Process

Planning - Scoping - Programming Process 2008

(Refer to Scoping Narrative for detail)

Project Planning

Needs Identification

- ID Needs
- Compiled List of Needs ("Needs" List)
- Define Purpose
- Identify Alternatives
- Develop Cost Estimate Range
- Fiscal/other constraints

Candidate Projects

- Compiled List of Projects ("Short" List)

Selected Projects

- Create project in PPMIS, obtain SRS
- Project Planning Report
- Listing Planned and 15 Years Out
- HIP

Project Scoping

Alternative Selection

- Scoping Worksheets
- Issues + cost compiled by topic on Draft Scoping Report
- Issue Resolution and Agreement on Scope

Detailed Scoping

- Prepare Final Cost Estimate
- Refine project schedule
- Finalize Project Scoping Report
- Approved of First Scoping Report

Project Programming

- Compile List of Approved Scope Projects
- Analysis of effect on performance trends
- Fiscal constrained list / ATTP Process

STIP

- Fund
- Don't Fund

Letting

- Project Development
- Scope, Cost, Time Change
- Purpose & Need Change

Project Change Process

- Program Evaluation Form
- Change Approved
- No - Project Needs Rescoping

Yes - Approved Or No - Remains Unchanged

October 13, 2008
Timeline

Years from Letting

- Major Reconstruction
- Bridge
- Safety
- Preservation
- BARC and other set-asides

Project Planning
Scoping
Programming
Project Delivery
Benefits of Good Scoping

- Early identification of what a project is and isn’t
- Early identification of issues and potential conflict points
- Presents a critical path for project managers
- Alignment with Performance Goals
- Improved cost estimates
- Less Rework
- Improved Coordination with Partners
- GREATER PUBLIC TRUST
Mn/DOT Scoping Parallels CEQ

Mn/DOT Scoping Process
- Early (before programming in the STIP)
- Emphasizes collaboration with stakeholders
- Identifies “what’s in, what’s out” of a project
- Provides a process and time line
- Comprehensive & Documented

CEQ (40 CFR 1501)
- Integrated “at the earliest possible time”
- “Emphasizes cooperative consultation”
- Identifies significant environmental issues, de-emphasize insignificant issues
- Provides a mechanism and appropriate time limits
- Systematic & Documented
Mn/DOT Scoping and 23 CFR 771.105 (c)

It is the policy of the Administration that:...

...Public involvement and a systematic interdisciplinary approach be essential parts of the development process for proposed actions.
Timing of Scoping & NEPA – CE’s

Establish Project’s Purpose & Need

CE Development

Final Design

Planning - Scoping - Programming Process 2008 (Refer to Scoping Narrative for detail)
Timing of Scoping & NEPA – EA

- Establish Project’s Purpose & Need
- NEPA Purpose & Need Statement, Alternatives Evaluation, Impact Assessments
- Develop EA, EIS Need Decision
- Final Design
Timing of Scoping & NEPA - EIS

Establish Project’s Purpose & Need, Begin NEPA Scoping

NEPA Scoping, NEPA Purpose & Need Statement, Alternatives Evaluation, Impact Assessments, Draft EIS

Final EIS & ROD (timed with STIP)
Question: When Does Planning End and Scoping Begin?

Answer:

a. At a distinct point when you have an approved plan but before you start a formalized process to initiate a project

b. Planning and scoping are a seamless, harmonious process in the circle of the project development lifecycle

c. It depends...
Scoping Worksheets

- Project Manager
- Planning Section
- State-Aid
- Land Management
- Surveys
- State Patrol
- Environmental Documentation
- Access Management
- Bridge
- Construction
- Design
- Hydraulics
- Maintenance
- Materials
- Traffic
# Scoping Worksheets

Example – Project Management Scoping Worksheet

<table>
<thead>
<tr>
<th>ITEM</th>
<th>YES</th>
<th>NOT NEEDED</th>
<th>If Yes, Describe (or see below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination on CSS with Tech Support Landscape Architecture Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Information Plan</td>
<td></td>
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<tr>
<td>Coordination with city, county, township</td>
<td></td>
<td></td>
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<tr>
<td>Coordination with other external and likely stakeholder groups</td>
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<tr>
<td>Coordination with FHWA</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Coordination with permitting agencies</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Coordination with utilities</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Coordination with CO Rail office</td>
<td></td>
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<tr>
<td>Coordination with Aeronautics office</td>
<td></td>
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<tr>
<td>Coordination with CO Bikes &amp; Peds section</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Coordination with Transit Agencies</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Coordination with Bridge Office</td>
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</tr>
</tbody>
</table>
The purpose of this form is to record on potential social, economic, and environmental impacts associated with the project. Also include a Geometric Design Table with the existing and standard columns completed. Maps are very useful.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Yes</th>
<th>No</th>
<th>Maybe</th>
<th>If Yes, Describe (or see below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trails, Parks or other Recreation (4(f)) areas</td>
<td></td>
<td></td>
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<tr>
<td>Wildlife/Waterfowl Refuges</td>
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<tr>
<td>Historic Sites</td>
<td></td>
<td></td>
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<tr>
<td>LAWCON (6(f)) sites</td>
<td></td>
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<tr>
<td>Extensive Cultural/Historical work</td>
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<tr>
<td>Bicycle accommodation</td>
<td></td>
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<tr>
<td>Pedestrian &amp; ADA accommodations</td>
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<tr>
<td>Environmental Justice populations</td>
<td></td>
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<tr>
<td>Noise concerns</td>
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<tr>
<td>Wetlands present</td>
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<tr>
<td>Public waters</td>
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<tr>
<td>Floodplain</td>
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<tr>
<td>Sensitive erosion areas</td>
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<td></td>
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</tbody>
</table>
Results of the Scoping Process

The Scoping Report

- Summary of information obtained from the scoping process through the functional group scoping worksheets
- Documents input on issues included as part of project scope and reasons why other issues are not included in the project scope
- Includes functional group cost estimates
- Any conflict of issues are resolved through meetings
- Total Project Cost Estimate (TPCE) is Prepared
- Approved Scoping Report allows project to be programmed into the STIP
Total Project Cost Estimate or “TPCE”

- Total Project Cost Estimate = Construction + R/W + Engineering

- Includes contingency and is inflation-adjusted to year of expenditure dollars or mid-year of construction (if multi-year project)

- Prior to entering the STIP, TPCE is expressed as a range
Total Project Cost Estimate

Base Estimate:
- Pre-letting Engineering
- Construction Engineering
- Project Construction Costs
- Detours & Haul Roads
- Traffic Management
- Communications/Public Involvement
- Right-of-Way
- Utilities
- Railroads
- Municipal/Local Issues
- Turn-backs
- Landscaping
- Environmental Cleanup/Mitigation
- Incentives
Total Project Cost Estimate

Contingency

✓ Pre-letting Contingency
  ► Total for Base Estimate Elements

✓ Post-Letting Contingency
  ► Supplemental Agreements/Change Orders
  ► Cost Overruns
  ► Incentives

Total Project Cost Estimate = Base Estimate + Contingency
MnDOT over-budget on many projects

Associated Press

MINNEAPOLIS — The Minnesota Department of Transportation was $140 million over-budget on road projects in the last seven years, due to ineffective management and insufficient controls, an internal audit of the agency shows.

The 2007 audit, which was not made public but was obtained by the Star Tribune, found that MnDOT managers often expanded construction contracts without written justification or itemization, a violation of contract regulations.

“We believe our concerns are significant, as they also involve complying with requirements, maintaining the public trust, and maintaining good public relations,” Auditor Daniel Kahne wrote in a March cover letter to Transportation Commissioner Carol Molnau.

The audit, which reviewed projects from 1999 through mid-2006, shows contractors and consultants often received millions beyond their original bids. That, while MnDOT delayed projects because of a lack of funding.

MnDOT said it is training managers to be more vigilant.

The audit, requested by Molnau, found that supplemental contracts were almost always arranged by MnDOT without competitive bids because managers are rushed to complete jobs.

The review came about after a road project south of Hastings on Highway 316 in fiscal 2005. The job’s original contract was for $5.5 million, but the cost rose to more than $8.6 million after three supplemental agreements. A third of the project’s value never went to competitive bids, the audit said.

Kahne recommended that MnDOT create a task force to address its lack of controls. The task force hasn’t finished its work, but MnDOT plans to train managers to be more vigilant after projects start, said Lisa Freese, deputy commissioner of MnDOT.

“We feel like we are working hard with a process of continuous improvement,” Freese said.

Kahne also warned that supplemental costs could rise even more because 40 percent of the projects he examined were still going on.

The report has yet to be distributed to legislators, who will start a new session in February.

Rep. Ron Erhardt, R-Edina and vice chairman of the House Transportation Finance Division, said legislators should examine the overrun.

“The decision-making process on the money that they have might not be going in the right direction,” Erhardt said.
NCHRP Report 574 Key Principles to Overcome Cost Escalation
Cost Estimating Process Improvement and Organizational Integration Project

Vision

- Department-wide priority on estimating, managing and controlling costs
- Reliable and accurate estimates
- Statewide Uniformity and consistency
- Improved communication and credibility with external stakeholders
- Clear accountability
Cost Estimating Process Improvement and Organizational Integration Project

Resulting Recommendations

6 Policy Statements

- Cost Estimate Policy
- Uncertainty, Risk and Contingency Policy
- Cost Estimate Communication Policy
- Project Cost Management Policy
- Program Cost Management Policy
- Other Emerging Policies – to be determined
Cost Estimating Process Improvement and Organizational Integration Project

Project Gates
1. Entry into 10 year plan
2. Proceed to Scoping
3. Entry into STIP (Baseline Estimate)
4. Remain in STIP
5. Proceed to Letting
6. Solicit/Approve Contractor’s Bid Price
7. Proceed to Construction
So, What Does Cost Estimation and Cost Management Have to Do with Environmental Management?

- Earlier identification of impacts and mitigation through scoping leads to early and collaborative development of alternative solutions and earlier cost estimates for mitigation (and includes risk and contingency)

- Better transparency and accountability for individual project elements and overall project delivery
CE/CM Planned Activities

▶ Training Development
  • 2 Modules: Cost Estimating & Cost Management
  • Delivery to begin this summer

  • Details new CE/CM policies and procedures
  • Available on the Mn/DOT Scoping and Cost Estimating Website
PSCM Office

Other Activities...

► Training, Estimating Support and Tool Development

► Managing Continued Policy Development (accelerated projects, D/B, etc.)

► Involvement with Tech Support on CRAVE (Cost Risk Assessment + Value Engineering)

► Involvement with Project Management (Earned Value, Project Level Risk, etc.)
Scoping and Cost Management

So...how’s this actually working where “the rubber meets the road?”

Glad you asked!
Scoping and Cost Management

Summary

- Scoping process: early, comprehensive, documented, change process
- Scoping mirrors and meshes with NEPA/MEPA
- Scoping Report helps develop TPCE
- Cost Estimating/Cost Management: reliability, accuracy, consistency, accountability, credibility
Office of Project Scope & Cost Management

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More information:
http://www.dot.state.mn.us/cost-estimating/index.html
Questions?