MnDOT Project Management Office Presents:

Impact Schedules

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DRMcNatty & Associates, Inc.

Housekeeping Items

- Lines will be muted during the webinar
- Questions can be submitted thru the GoToWebinar Questions box on right of your screen and posted on webiste within 5 days
- Questions will be made available “Live” for this webinar, can download pdf on how to submit live questions for next weeks webinar on the MnDOT Website
- Webinar slides available in pdf on MnDOT webiste within 5 days
- Webinar is being recorded and will be available on the MnDOT website within 5 days
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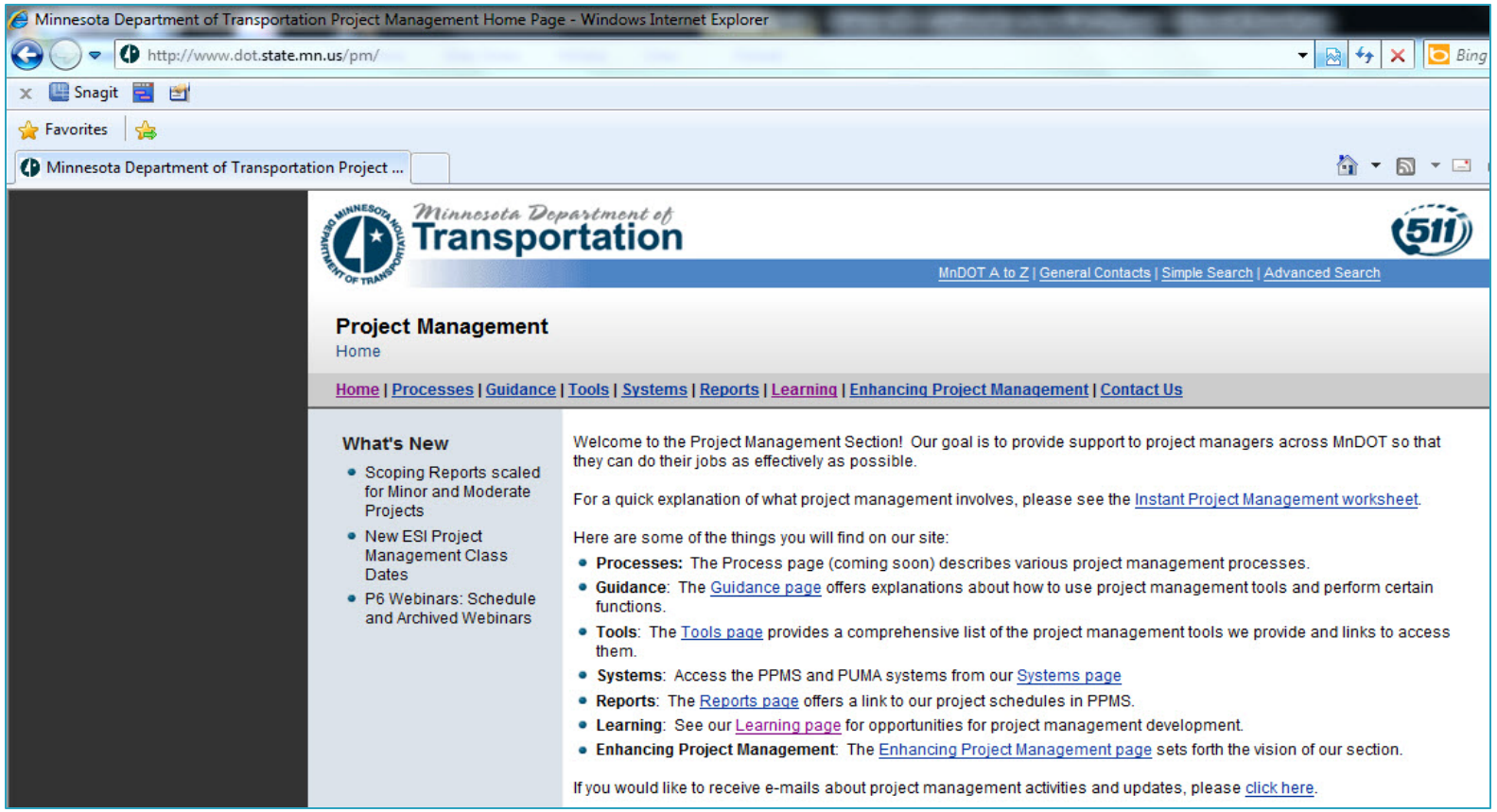
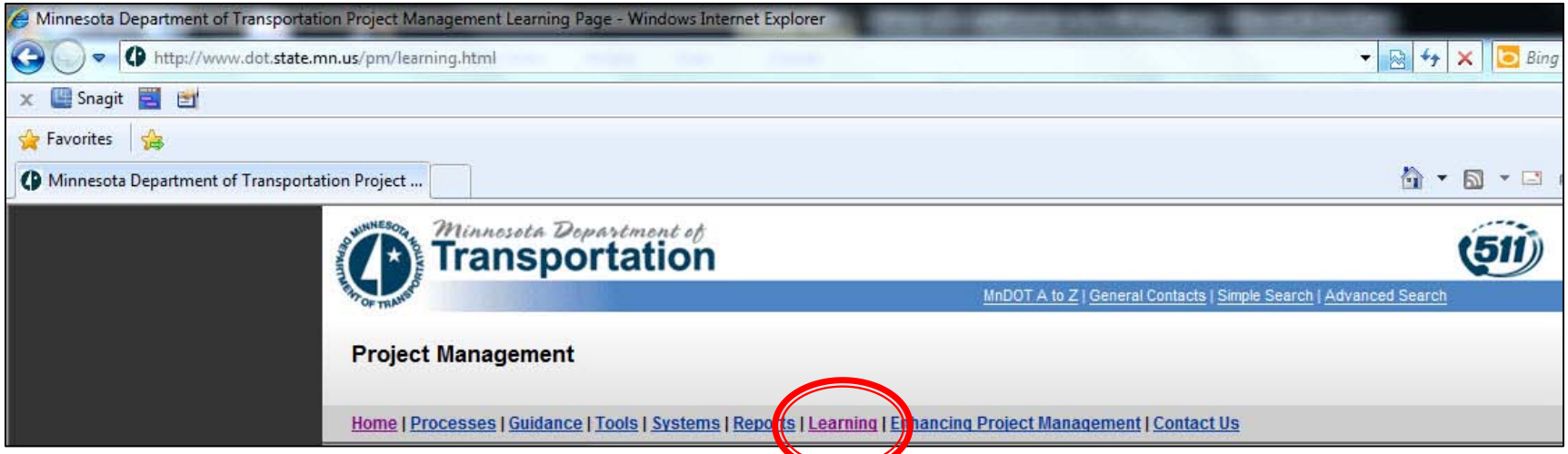
MnDOT Webinars

- http://www.dot.state.mn.us/pm/



MnDOT Webinars

- http://www.dot.state.mn.us/pm/learning.html

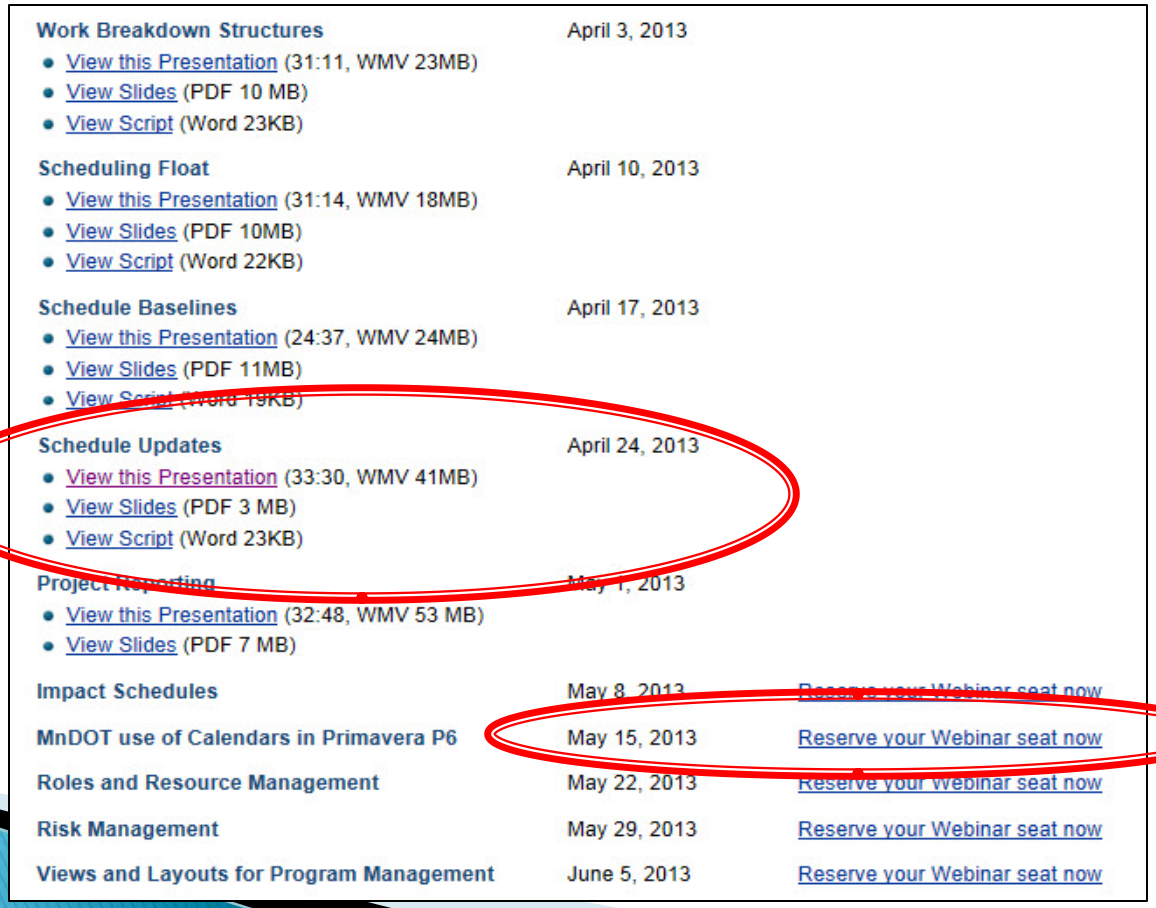


- Click on the “Learning” link

MnDOT Webinars

Primavera P6 Webinars: Each webinar will start at 1:00 p.m. and last 1/2 hour. Click the links below to register for a session. After each webinar, a recording will be made available from this page. Live questions (PDF 2MB) can also be submitted by attendees during each webinar.

To request ASL or a foreign language interpreter or other resonable accomodations for the live webinars, call Janet Miller at 651-336-4720 or 1-800-657-3774 (Greater Minnesota). You may send an email to janet.rae.miller@state.mn.us (please request at least one week in advance).



Work Breakdown Structures — April 3, 2013
- View this Presentation (31:11, WMV 23MB)
- View Slides (PDF 10 MB)
- View Script (Word 23KB)

Scheduling Float — April 10, 2013
- View this Presentation (31:14, WMV 18MB)
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- View Script (Word 22KB)

Schedule Baselines — April 17, 2013
- View this Presentation (24:37, WMV 24MB)
- View Slides (PDF 11MB)
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Schedule Updates — April 24, 2013
- View this Presentation (33:30, WMV 41MB)
- View Slides (PDF 3 MB)
- View Script (Word 23KB)

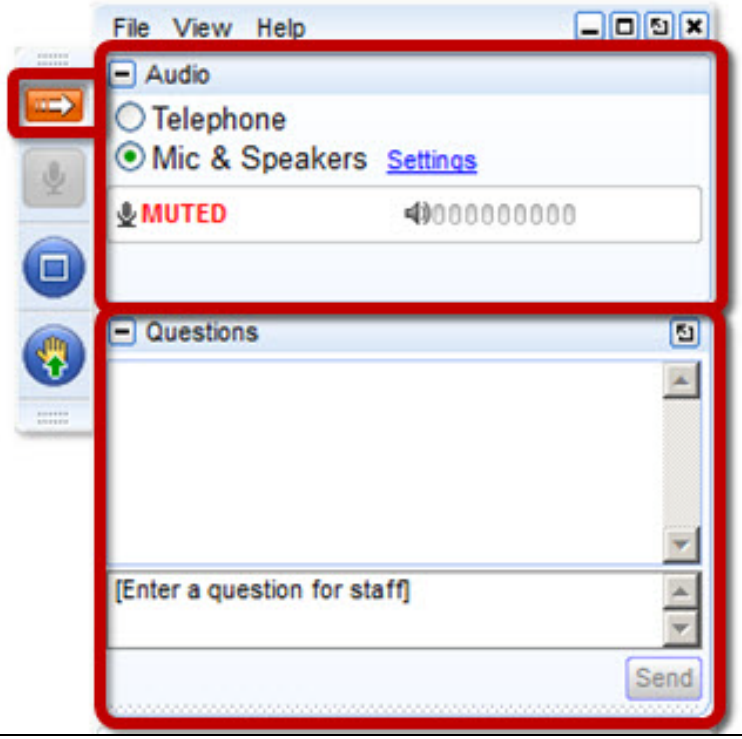
Project Reporting — May 1, 2013
- View this Presentation (32:48, WMV 53 MB)
- View Slides (PDF 7 MB)

Impact Schedules	May 8, 2013	Reserve your Webinar seat now
MnDOT use of Calendars in Primavera P6	May 15, 2013	Reserve your Webinar seat now
Roles and Resource Management	May 22, 2013	Reserve your Webinar seat now
Risk Management	May 29, 2013	Reserve your Webinar seat now
Views and Layouts for Program Management	June 5, 2013	Reserve your Webinar seat now

Webinar “Live” Questions

- Live questions will now be available for MnDOT weekly webinars
- Live questions can be submitted during the webinar and will be answered in the final 10 minutes of the webinar
- Use the “Questions” box in the GoToMeeting dialog box during the webinar
- Use the “Raise Hands” to ask a “Live” questions during the questions and answer session, the lines will be un-muted

MnDOT Webinars



Your Participation

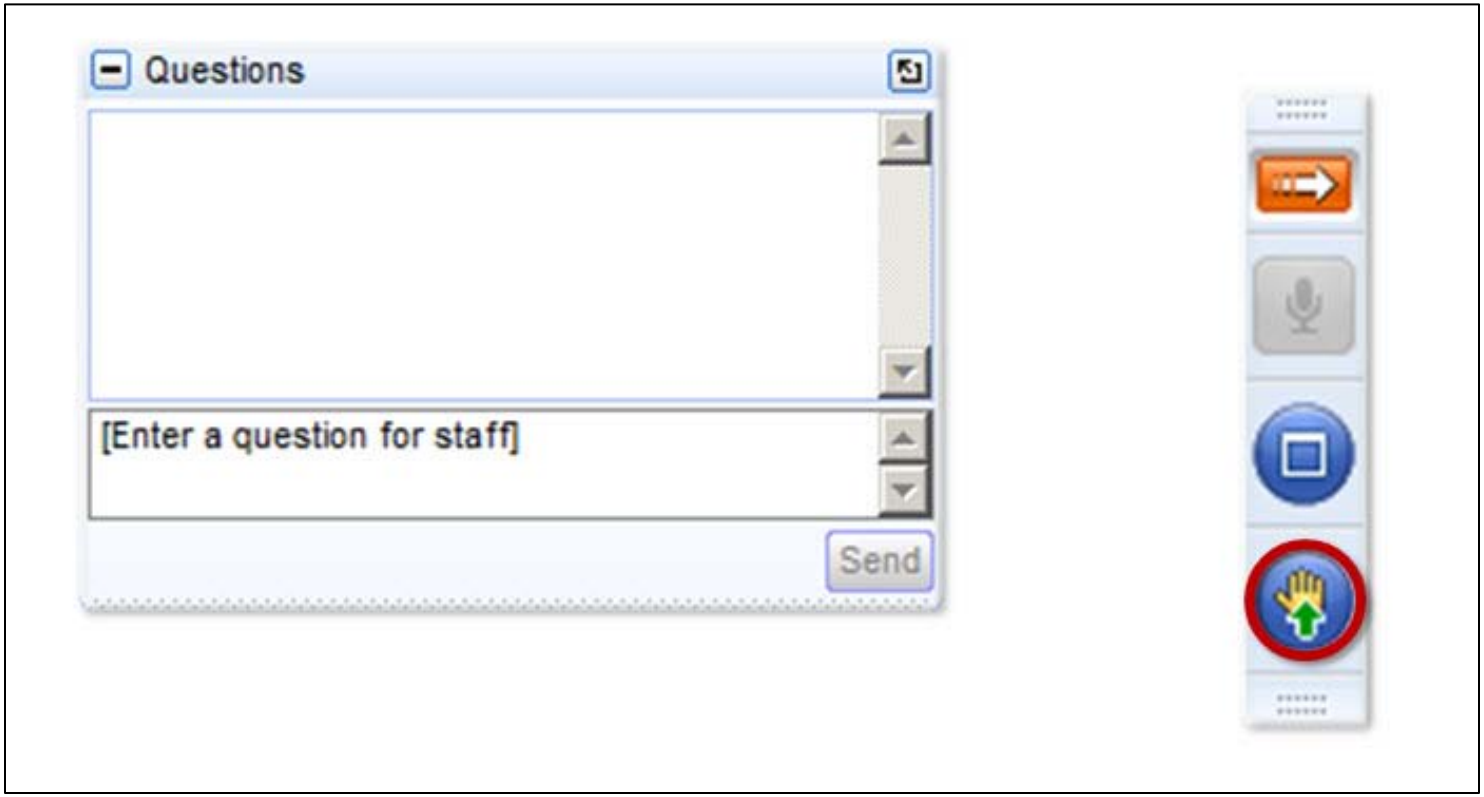
Open and hide your control panel

Join audio:

- Choose "Mic & Speakers" to use VoIP
- Choose "Telephone" and dial using the information provided

Submit questions and comments via the Questions panel

Submit Webinar Questions



Raise Hand for Question

Introduction to Webinar

Impacting events causing interruption and change occur regularly on projects, frequently resulting in disagreement over the true time and cost related to the impact. See how using an Impact Schedule can bring clarity to a schedule.

Impact Schedules

- Not all construction projects finish on time, within budget.

- Delays and changes occur during construction that impact the schedule, consequently impacting the project completion.

- Schedule impact analysis is the process of quantifying the effect of delay or change on a project schedule.

Impact Schedules

❖ From a scheduling standpoint, the goal of every project is to be delivered on time and within budget.

❖ In an ideal world, projects follow early starts and early finishes, float is not consumed, deadlines are met, the contractor never files claims for time extension, and the owner never assesses liquidated damages.

❖ Such a scenario rarely exists on construction projects, therefore requiring an Impact Analysis.

Impact Schedule Analysis

❖ The *As-Planned (Baseline) schedule includes the* entire planned duration of the project.

❖ The *As-Built to Date represents the duration* of work that has been completed to the present time.

❖ At this "present time", it is realized that the project may not finish on time, and the owner wants to know when the project will be delivered.

Impact Schedule Analysis

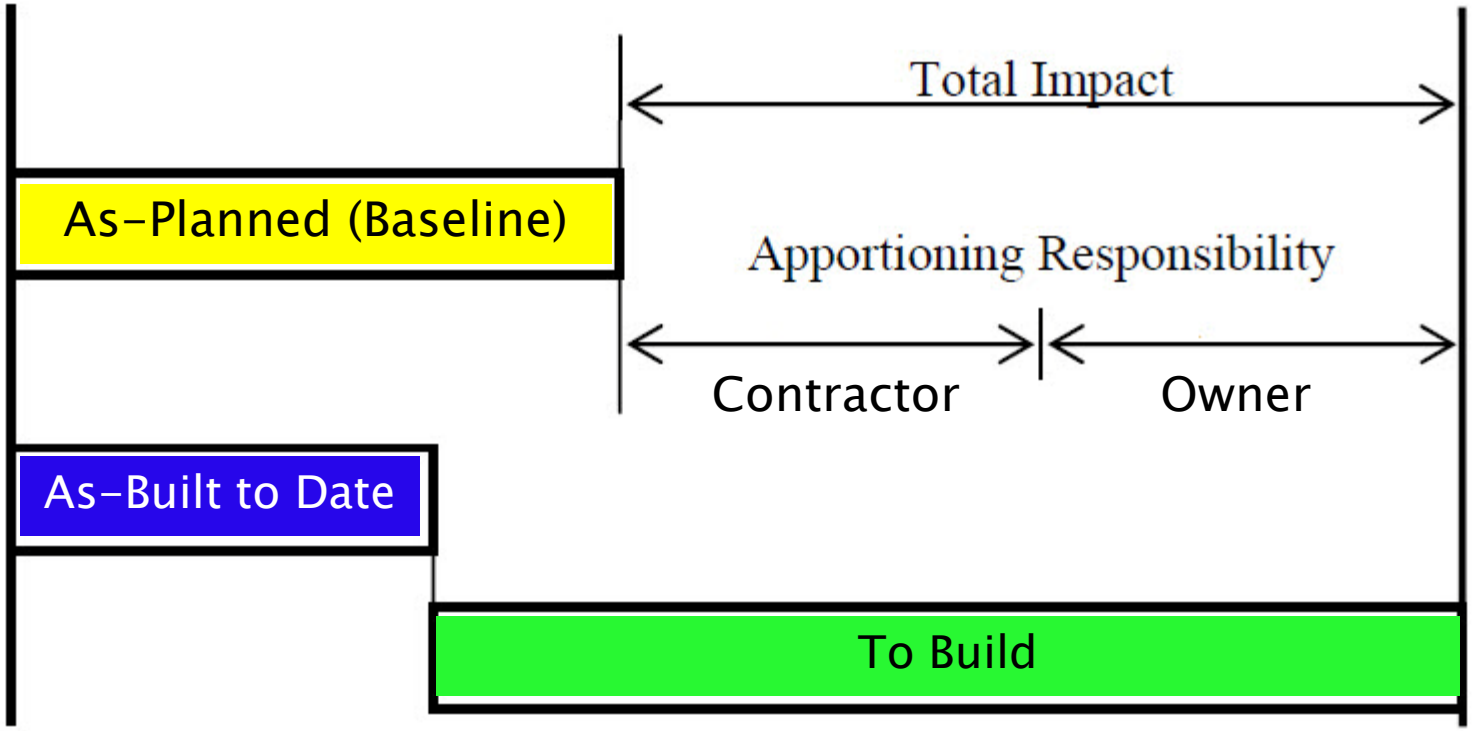


Figure 1: Overview of Schedule Impact Analysis

Types of Impacts

DISRUPTIONS

❖ A *disruption can be defined as an impact that alters the contractor's planned work* sequence or flow of work expected at the time of bidding, which results in increased difficulty, cost, and/or time.

❖ When this occurs, the contractor cannot perform work in the manner anticipated during bid preparation, thus resulting in a schedule impact.

Types of Impacts

DELAYS

- A *delay is an event that prevents the contractor from completing the work within* the contractually specified performance period, a slowing down of the work without stopping it entirely, triggered by something other than a formal directive from the owner to stop work.

- Simply put, a delay is a loss of time.

Types of Impacts

CHANGES

❖ Owner Change – A change order involving a directed written modification to the contract that directs the contractor to make specific changes to the work required by the project plans and specifications.

❖ Contractor Change – A change order involving the contractor submitting a Change Request to the Owner for work that may be perceived by the contractor to deviate from the plans & specifications.

Types of Impacts

SUSPENSIONS

❖ A *suspension of work is a written directive by the owner to stop all work on the* project, either because the contractor has failed to perform in accordance with contract documents, or at the owner's convenience.

❖ Work will not continue until the owner has raised the suspension of work.

Types of Impacts

TERMINATION

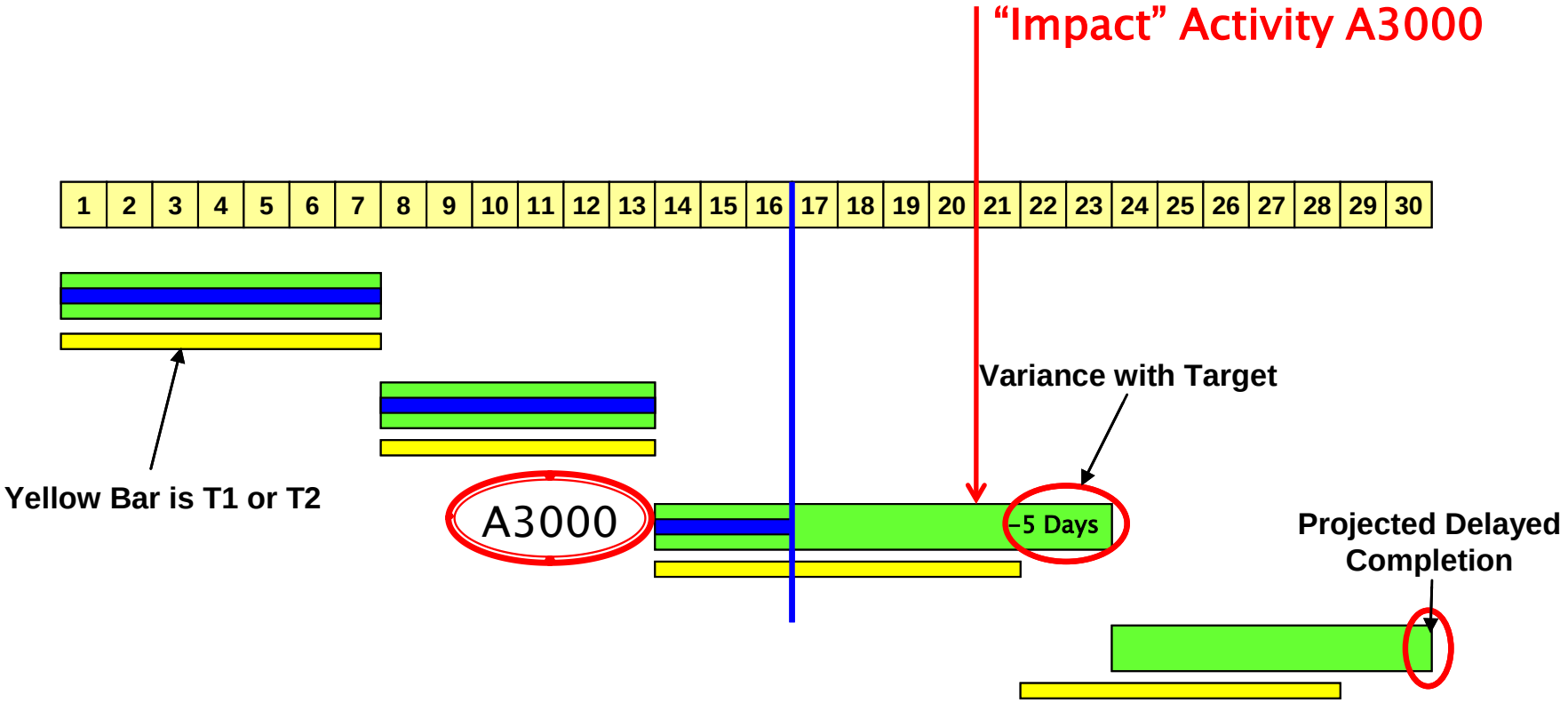
- *Termination is a permanent stoppage of work of all or a portion of the contract,* and the contract is terminated. For a party to possess the right for termination, a termination clause must be specifically included in the contract.

Classify a Delay

❖ Once recognized that an event has occurred in the as-built completion of a project that differs from the established schedule of record, which potentially has an impact on the schedule and is attributable to a party, the next step is to classify the delay, so that a schedule impact technique can be applied.

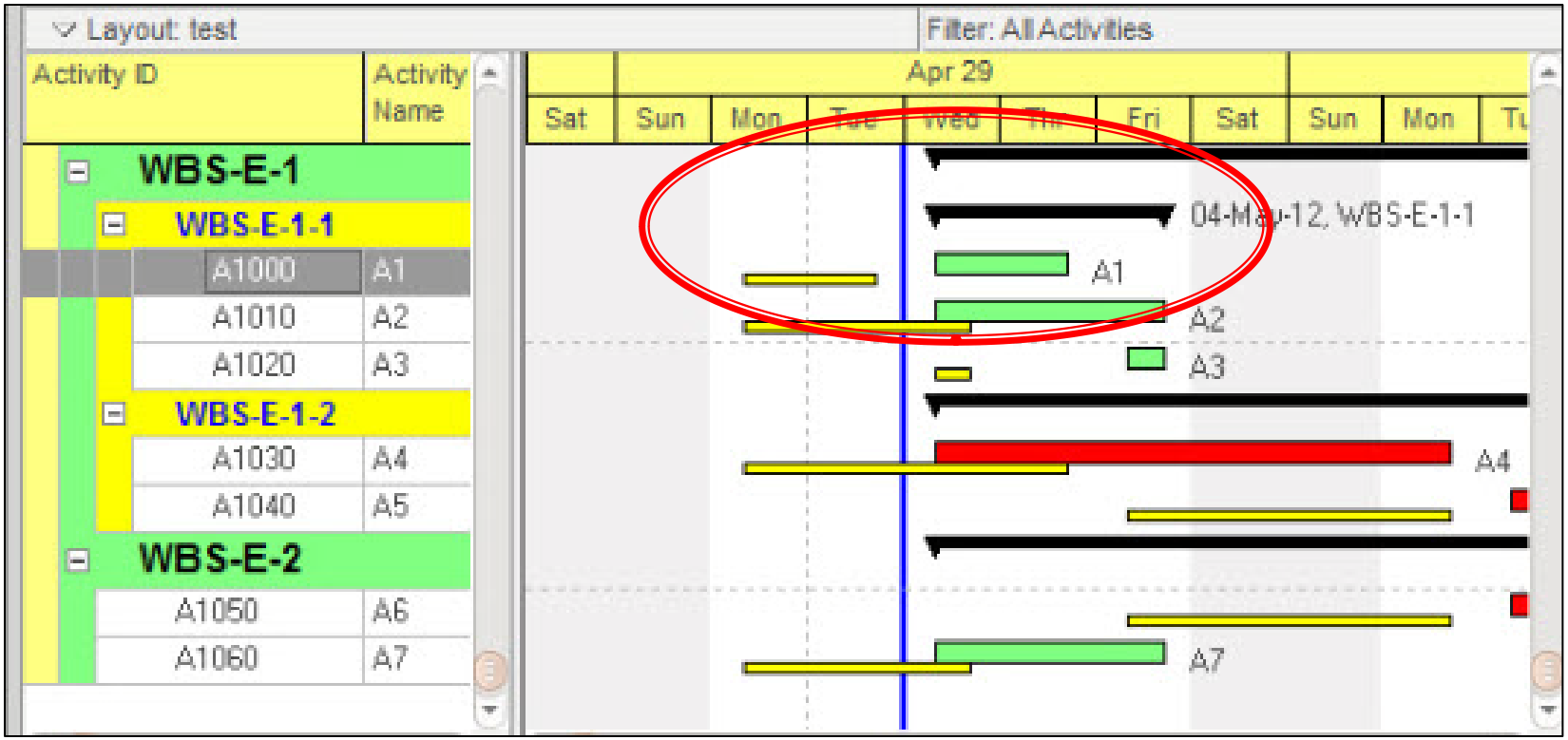
❖ Excusable, Non-Compensable Delays
❖ Excusable, Compensable Delays
❖ Non-Excusable, Non-Compensable Delays
❖ Non-Excusable, Compensable Delays

Analyze the Delay



Baseline vs Actual Comparison – Bars

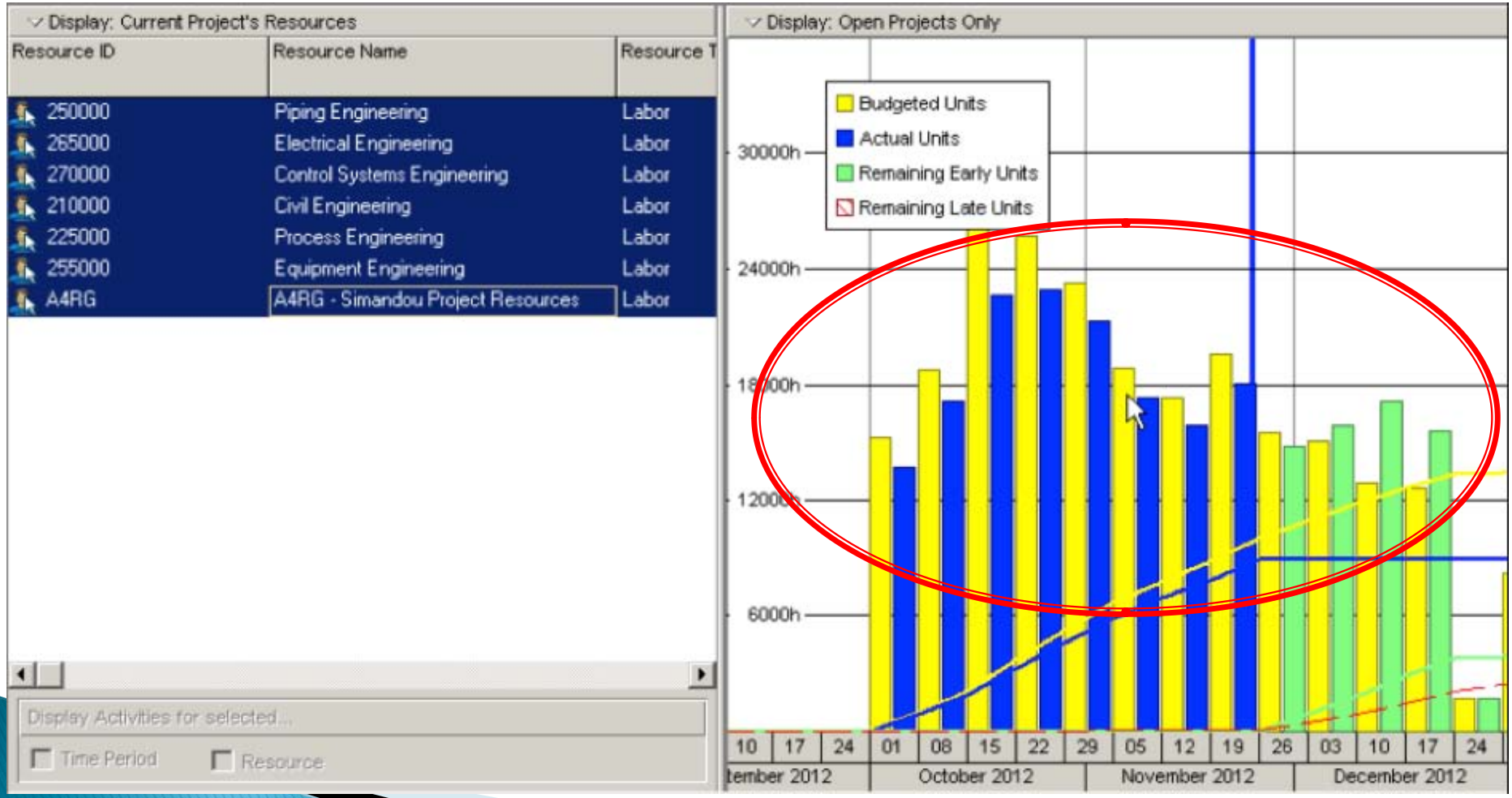
- Compare the Baseline vs the Current Update for impact analysis



Baseline vs Actual Comparison

Baseline vs Actual Comparison – Graphs

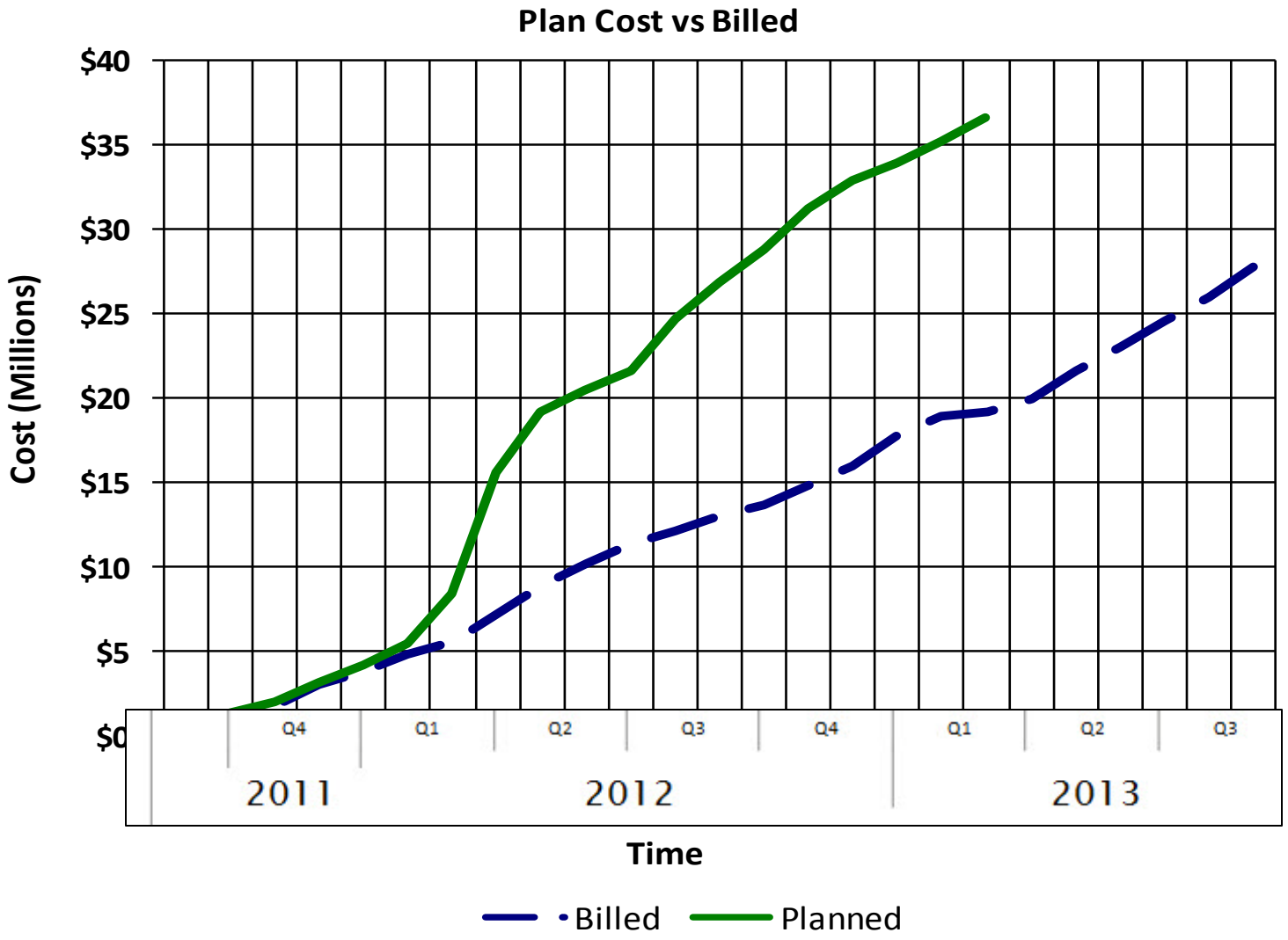
- Compare the Baseline vs Actual to view the impact

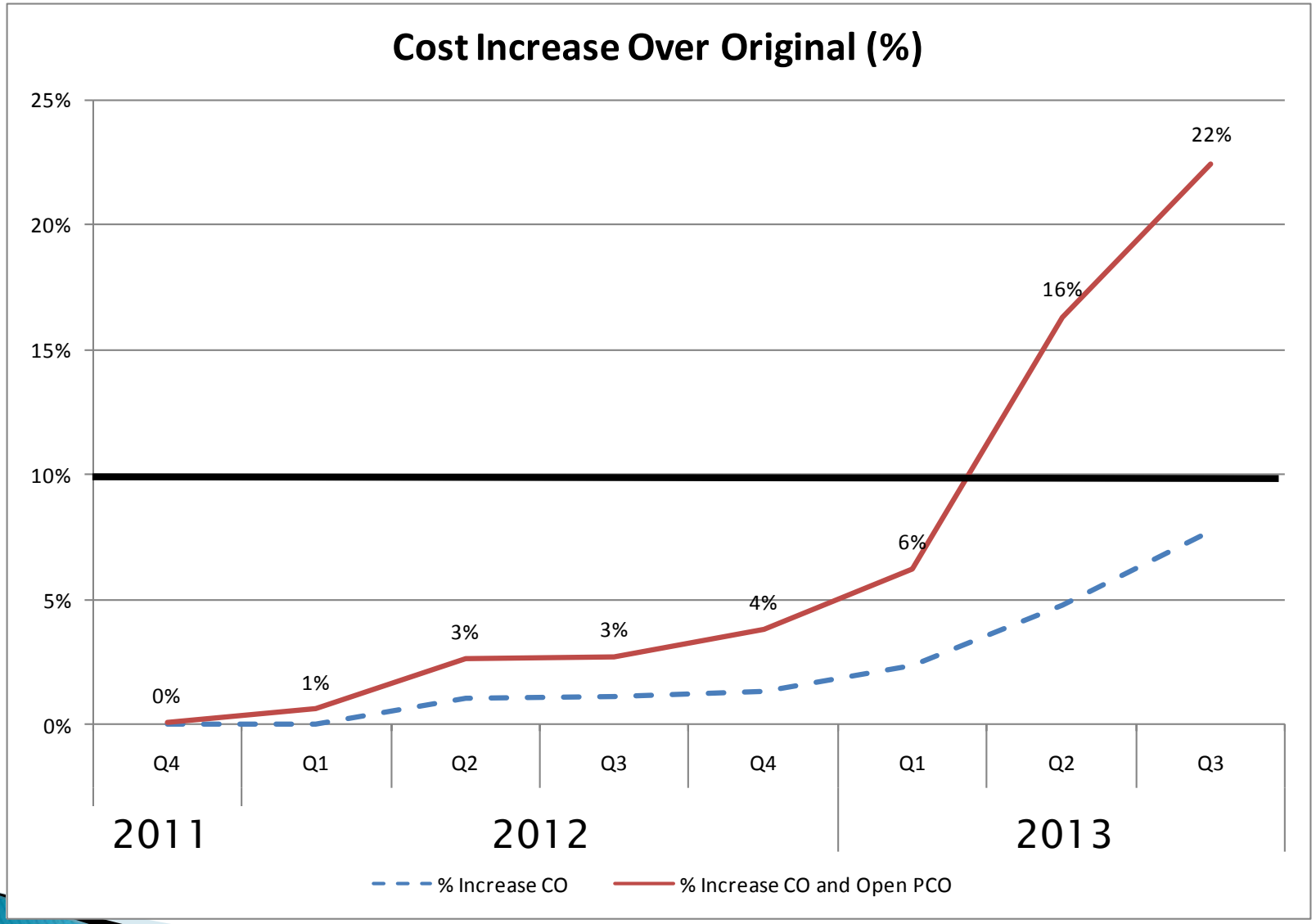


Schedule Baseline Comparison

- Compare the Impact Dates

Scheudle Dates	Baseline	Update 01
Contract Start Date	4/24/2013	4/24/2013
Data Date	4/24/2013	5/8/2013
Finish Date	12/31/2013	1/15/2013
Total Float	0	-11


Plan Cost vs Billed
Cost (Millions)
$40
$35
$30
$25
$20
$15
$10
$5
$0
Q4
Q1
Q2
Q3
Q4
Q1
Q2
Q3
2011
2012
2013
Time
Billed
Planned


Cost Increase Over Original (%)
25%
20%
15%
10%
5%
0%
22%
16%
6%
4%
3%
3%
1%
0%
Q4
Q1
Q2
Q3
Q4
Q1
Q2
Q3
2011
2012
2013
% Increase CO
% Increase CO and Open PCO

Questions or Comments

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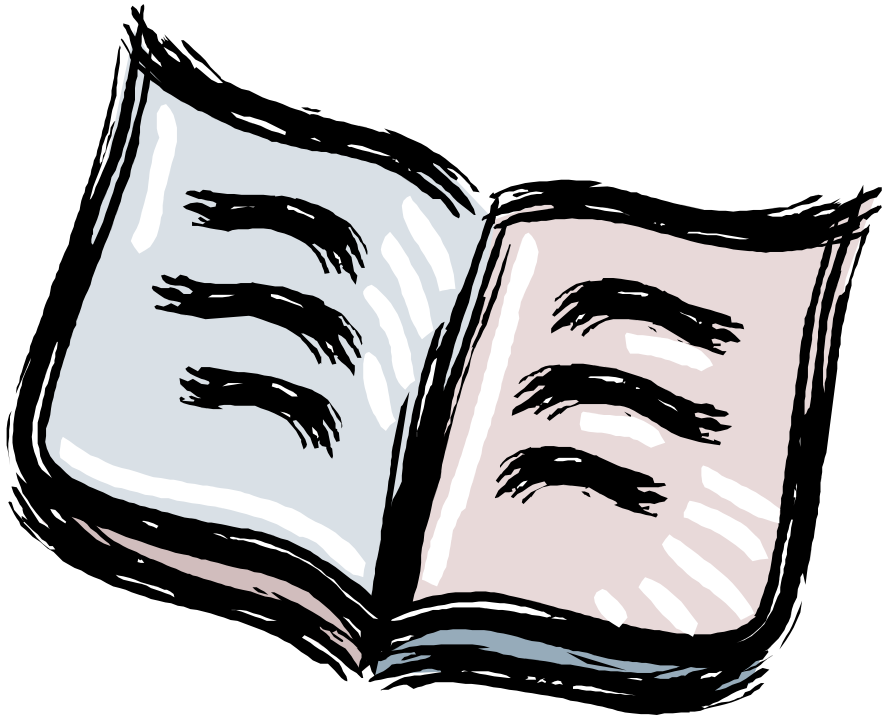
Next Webinar: Wednesday, May 15, 2013
Time: 1:00 p.m.
Topic: MnDOT use of Calendars in Primavera P6
Presenter: Jonathan McNatty
DRMcNatty & Associates, Inc.

Glossary of CPM Terms



Glossary of CPM Terms

Activity - An individual work task that is the basic component of a project.

Activity Codes - Values assigned to project activities to organize then into manageable groups for updating, analyzing, reporting, plotting, and summarizing.

Actual Cost - The cost incurred to date for a resource or activity.

Actual Dates - Start (AS) and Finish (AF) dates that you record for an activity that has progress or is complete.

Actual Quantity - The amount of a resource used to date.

Backward Pass - The calculation of a network's late dates.

Bar Chart - The graphical display of activities according to time. Relationships between activities are not shown. A bar chart is also called a Gantt Chart.

Baseline Schedule -The original planned schedule for a project.

Budget - The estimate of the total units or costs required by a resource or cost account for an activity.

Glossary of CPM Terms

Calendar - The workdays and holidays defined for a project that determine when an activity can be scheduled.

Completion - The date on which a project is to be finished.

Constraint - A restriction imposed on the start or finish of an activity.

Critical Activity - An activity that has the least amount of total float.

Critical Path - The series of activities in a project that will take the longest to complete.

Critical Path Method (CPM) - The calculation of the earliest and latest start and finish dates of activities based on their duration and relationships to other activities.

Data Date - The date used as the starting point for schedule calculations.

Driving - A predecessor/successor relationship in which the predecessor

Relationship - Determines the successor's early dates.

Duration - The amount of time (in workdays) needed to complete an activity.

Glossary of CPM Terms

Early Start (ES) - The earliest date when an activity can begin after its predecessors have been completed.

Earned Value - The value of work performed rather than actual work performed.

Exception - A day when work must occur that was originally designated as a nonworkday.

Finish to Finish - A type of relationship in which a successor activity finish depends on its **(FF)** predecessor activity's finish.

Finish-to Start - A type of relationship in which a successor activity can begin only when its **(FS)** predecessor activity finishes.

Float - The amount of time that the start or finish of an activity can be delayed without affecting the project finish date.

Forward Pass - The calculation of the network's early dates.

Free Float - The amount of time that an activity's early start can be delayed without delaying the early start of a successor activity.

Lag - An offset or delay from an activity to its successor.

Late Finish (LF) - The latest date when an activity can start without delaying the project's completion.

Glossary of CPM Terms

Late Start (LS) - The latest date when an activity can start without delaying the project's completion.

Loop - Circular logic within a network.

Milestone - An activity that represents a significant point in time, that has no duration.

Negative Float - The total number of days that the start or finish of an activity exceeds the time allowed. Negative float indicates a delay in the schedule.

Negative Lag - An offset or lead time from an activity to its successor in which the successor's start date is earlier than the predecessor's start date.

Network - The series of activities required to complete a project.

Nonworkperiod - A period of time when work may not occur.

Open End - An activity that has no successor or predecessor relationships to other activities in the network.

Out-of-Sequence Progress - Work completed for an activity before it is logically scheduled to occur.

Percent Complete - The proportion of an activity that is complete.

Glossary of CPM Terms

Performance Measurement - The comparison of the current plan to a target plan to assess whether it is progressing as intended.

Planning Unit - The increment of time used to schedule a project. The planning unit can be in hours, days, weeks, or months.

Predecessor - An activity that must logically occur before another activity.

Progress - The completion of work.

Resources - The people, materials, equipment or services required to complete a project.

Schedule - A list of the activities needed to complete a project, along with their start and finish dates.

Schedule Calculation - The calculation of early and late dates for each activity in the project.

Slack - See Float**.**

Slippage - Lateness determined by measuring the target finish of an activity from its actual or current early finish.

Sorting - The arrangement of data in a specific sequence.

Glossary of CPM Terms

Start-to Start (SS) - A type of relationship in which a successor's start depends on the start of its predecessor.

Status - The process of updating a project by indicating progress at regular intervals.

Successor - An activity that must logically occur after another activity.

Target - A project plan that can be compared to the current schedule to measure progress.

Task - A unit of work. Also called an activity.

Total Float (TF) - The total number of days that the start or finish of an activity can be delayed without affecting the project finish date. Float can be negative,zero, or positive.

Updating - The process of recording progress in a project at regular intervals.

Variance - The difference between the current and target schedule dates.

Work Breakdown Structure (WBS) - The graphical depiction of the hierarchy of work needed to complete a project.

Workday - Any day of the week when work can be scheduled.

MnDOT Goals Going Forward

Projects in Construction Phase

- Contractor's Build Their Schedule in our Network 1/1/13
- Piloting Providing BIM Models and CTD Schedules to Contractors 3/1/13
- Select "Unit Rate" project- Resource and Cost Loaded 3/1/13
- Role and Resource Loaded of CE&I staff 6/1/14

MnDOT Goals Going Forward

Projects in Scoping and Design Phase

- "Active Projects" Role and Resource Loaded 6/30/13
- All planned projects Role loaded by June 30, 2014
- Taxpayer Transportation Accountability Act