

# Using an Enterprise P6 System to Manage Transportation Agency Projects Statewide: Operations for NYSDOT Enterprise System

Construction CPM Conference – TUE45  
January 21, 2020

# Sherif Elkhoully, PMP, RMP, PSP, PRMG

## – **Project Controls Engineer**

### – Industry Focus:

- Industrial, Energy, Infrastructure, Transportation and Commercial

### – Specialties:

- Portfolio Management, Program Management, Standing-Up PMO's, Project Controls, CPM Scheduling, Risk Assessments, Delay Assessment and Claim Analysis

### – Delivery Method:

- Design-Build, Design-Bid-Build, and EPC



# Matthew Freih, PE (NY), PSP

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# NYSDOT PMO & Enterprise P6 System

# Topics of Discussion

## **How NYSDOT manages \$3B in yearly construction contracts statewide using an enterprise P6 system.**

- How system is set up
- What it does
- How it was implemented
- How it's really used
- How we encourage users
- Training
- How we maintain quality schedules
- Daily operations
- Lessons learned

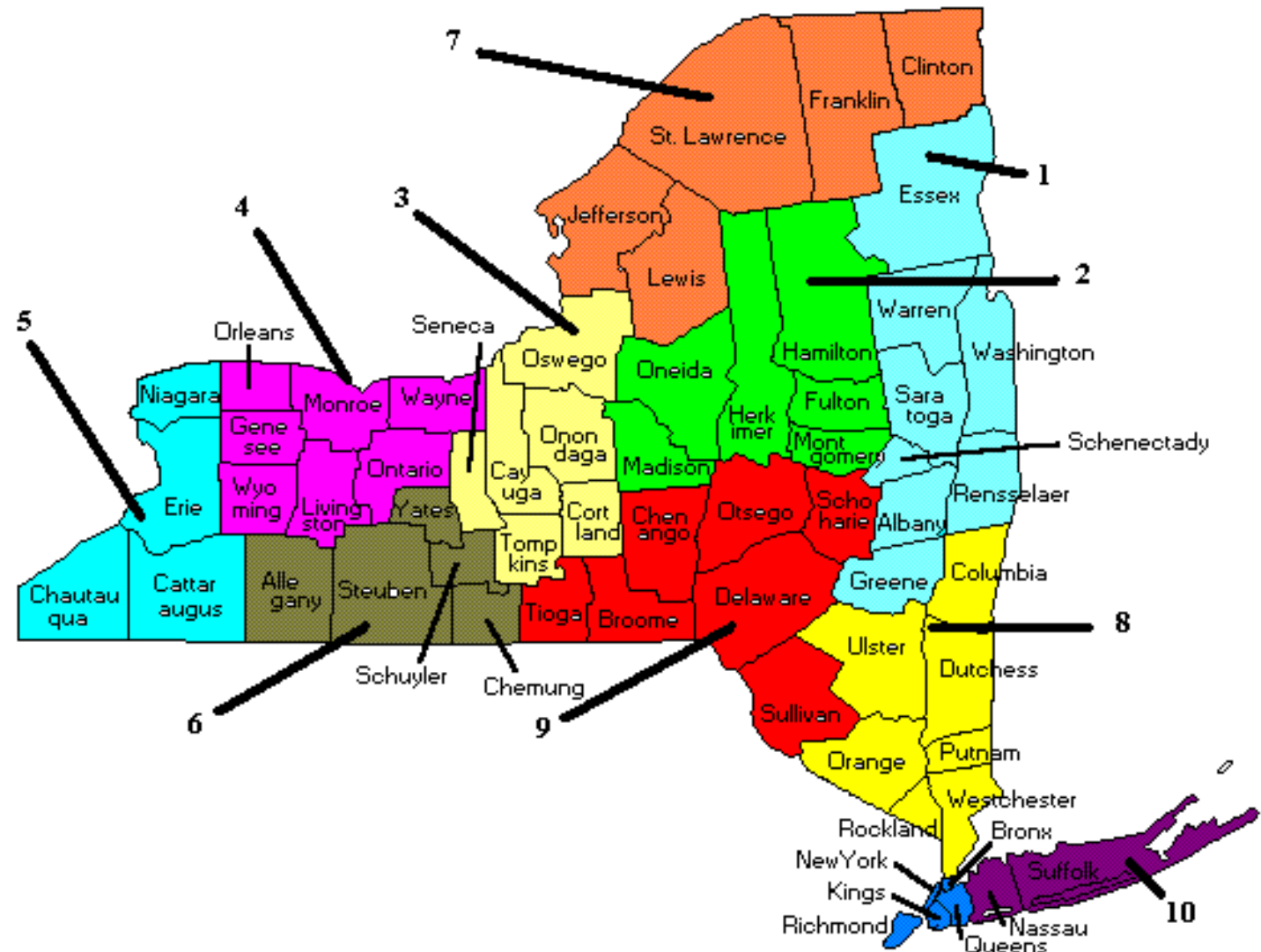
# NYSDOT Regions – 2019 Construction Plan

## – Design-build

- 10 active projects
  - 4 cost loaded schedules
- \$1.3-billion

## – Design-bid-build

- 66 active projects
- \$1.6-billion
- Select best value contracts



# Goals of the Enterprise System

- Completing projects on time and on budget
- Monitoring & providing help before projects get into trouble
- Maintenance of schedules throughout project lifecycle
  - Keep schedules relevant so we can use them to help manage projects successfully
  - Uniformity and consistency across projects
  - Keep schedules at forefront of project discussions
- Simplify user access
- Get project teams to rely on schedules to plan work and assess progress

# NYSDOT Project Management Office (PMO) & AECOM Structure

## Oversight

- PMO Director
  - Oversight of D/B projects and CPM Section
- D/B Coordinators
  - Oversight of design-build projects
- AECOM Project Controls Manager
  - Frank A. Perricelli PE (NY, NJ, TX), PSP

## CPM Section & Regional Support

- Statewide CPM Section Coordinator
  - Oversight of enterprise system & Consultant staff
- Regional CPM Coordinators
  - 10 CPM Coordinators – NYSDOT Staff
- Statewide CPM Section
  - 3 AECOM Consultant Staff
- Regional CPM Coordinator
  - 1+ CPM Coordinator – AECOM Consultant
- Core PT Consultant staff
  - 5+ AECOM Detailed Schedule Reviewers
  - Perform detailed reviews on complex, high profile, or higher value projects



# NYSDOT Enterprise System Overview

- User access through Oracle P6 Web v19.1
- Everyone works in system
  - Contractor's build schedules in system
  - Allows limited importing with assistance from PMO
    - Mostly for Design/Build or Best Value Contracts that require proposal schedules
    - Bulk upload Activity IDs, Activity Names, Activity Relationships
  - P6 web used for: user access, security, reporting
    - Multi-step user access procedure to limit access – security
    - Requires notary signature, corporate signature, regional signature and PMO signature

# NYSDOT Enterprise System Setup

## – P6 Web used as main access point

- EPS Structure is setup by NYSDOT PMO Staff
- Split into Contractor Work Area (CWA) and NYSDOT Area
- Access to CWA limited to 1-2 NYSDOT PMO staff
- Contractor works in CWA to develop Baseline & Updates & submits schedule via Email
- Once loaded, NYSDOT Staff/Consultants can access schedule for review/use

Project ID	Project Name	Responsible Manager
NYSDOT_	Office of Regional Affairs (Vacant)	Director, Office of Regional Affairs
Downstate	Downstate Zone	Downstate Resource Manager
Region 8	NYSDOT Region 8 Office - Poughkeepsie	R8, Regional Director
R8 Construction	Region 8 Construction	R8, Regional Construction Engineer
R8, ACS1	Area Construction Supervisor 1	R8, ACS1
D263441	D263441 - Asphalt Concrete Overlay (4.7 miles) on I-684	D263441 - Asphalt Concrete Overlay (4.7 mi) on I-684
+ D263441-CWA	D263441 - Contractor's Work Area	D263441 - Contractor's Project Scheduler
+ D263441-FBS	D263441 - Final Baseline Progress Schedule @ Award	D263441 - NYSDOT Archive (Read Only)
D263441-CPS	D263441 - Current Progress Schedule	D263441 - NYSDOT Archive (Read Only)
+ D263441-PPS	D263441 - Past Progress Schedules	D263441 - NYSDOT Archive (Read Only)
+ D263441-ABPS	D263441 - As-Built Progress Schedule	D263441 - NYSDOT Archive (Read Only)
+ D263441-WI	D263441 - What-If Progress Schedules	D263441 - NYSDOT What-If (Read/Write)

# NYSDOT Enterprise System Setup

- PMO sets up projects
- 36 Global Calendars
  - Require use of NYSDOT Standard Workday Calendar and 7-day Calendar
  - Contractor's can use other Global Calendars to create Project Calendars
- Require standard activities and WBS format
  - Provided in a template
- Standard Global Codes
  - **RESPONSIBLE PARTY (DOT GLOBAL)**
  - **TYPE OF WORK (DOT GLOBAL)**
  - STAGE (DOT GLOBAL)
  - AREA (DOT GLOBAL)
  - CHANGED (ADDED/DELETED) WORK (DOT GLOBAL)
  - TIME RELATED CLAUSES (DOT GLOBAL)
  - DELAY (DOT GLOBAL)

# NYSDOT CPM Spec. Overview – Immediate Rejection

## – Schedules must meet following criteria or immediately rejected

- Failure of the Project Scheduler to “schedule” the project, as of the data date.
- Failure to attach a copy of the complete Scheduling/Leveling Report (SCHEDLOG.TXT file generated by the Department’s Oracle-Primavera software application).
- Any activities without predecessors, or activities without successors, appearing in the Scheduling/Leveling Report with the exception of the first and last activity in the schedule.
- Any activity constraints appearing in the Scheduling/Leveling Report that have not been approved in writing by the EIC, or that are not specifically allowed by this specification.
- Any Activities with Actual Dates > Data Date appearing in the Scheduling/Leveling Report.
- Any Milestone Activities with invalid relationships appearing in the Scheduling/Leveling Report.
- Failure to have a clearly defined Critical Path from the Data Date to the last activity in the schedule, using the Longest Path method. This would reflect logic errors in the project schedule.
- Failure to attach the schedule Narrative and required appendices.
- Repeated failure to correct “Out-of-sequence” activities.

# NYSDOT CPM Specification Overview – Schedule Types

## Type 1 – Bar Chart with Logic

- Limited logic in bar chart
- Used for maintenance, work order, where & when, bridge washing, painting contracts
- Typically scope not completely defined
- Require baseline submission, updates, as-built schedules
- Typically reviewed regionally





# NYSDOT CPM Specification Overview – Schedule Types



## **Type 2 – Fully Developed CPM**

- 2A – Monthly submissions
- 2B – Bi-monthly submission, crew & equipment resources
- 2C – Weekly submission, labor, equipment, pay item resources
- Requires Weekly Status Report
  - Updated PDF look-ahead
  - A lot of work can happen in 1-week
  - Keep schedule at forefront of project

# NYSDOT CPM Specification - Details

– Information on how to use & access enterprise system

– Schedule Deadlines

- Goal: baseline acceptance within 40-workdays of Award
- 10-workdays for detailed review of baseline
- Contractor submits Update 3-workdays after Data Date
- 5-workdays for detailed review of updates
- Contractor submits As-Built 10-workdays after Project Acceptance

– Enforcement:

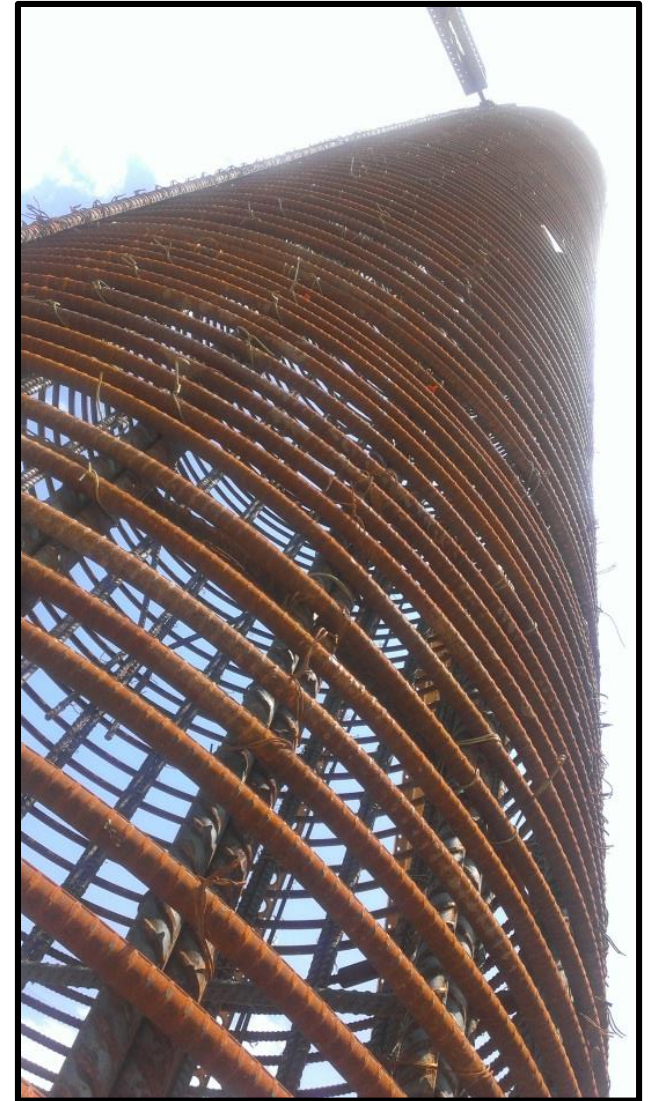
- Lump sum payment for schedule – sometimes minimum bid
- No payment for Progress Update submissions more than 21-days late
- Liquidated damage provision for lack of schedule submissions
- No time extension considered if no approved baseline

# Project Schedule Lifecycle



# Project Schedule Lifecycle – Pre-let/Pre-award

- Discussions with regions
- Figuring out what projects are Type 1 or 2
  - Type 1 – where & when, maintenance, paving contracts
  - Type 2 – GT \$20 construction cost, complex, high priority, larger user costs, major utility relocations, design-build
- Expand detailed reviews when project experiences issues/time impacts
- Decrease detailed reviews when project running smoothly
- Proposal Schedules, if required, are submitted/reviewed



# Project Schedule Lifecycle – Post Award Setup

- PMO sets up & provides schedule template
- Process user access requests
- Contractors start building schedules when access granted
- Set pre-construction schedule meeting
  - Separate from pre-construction meeting
  - Schedule is important enough to warrant separate meeting
  - Review schedule specification requirements & compliance



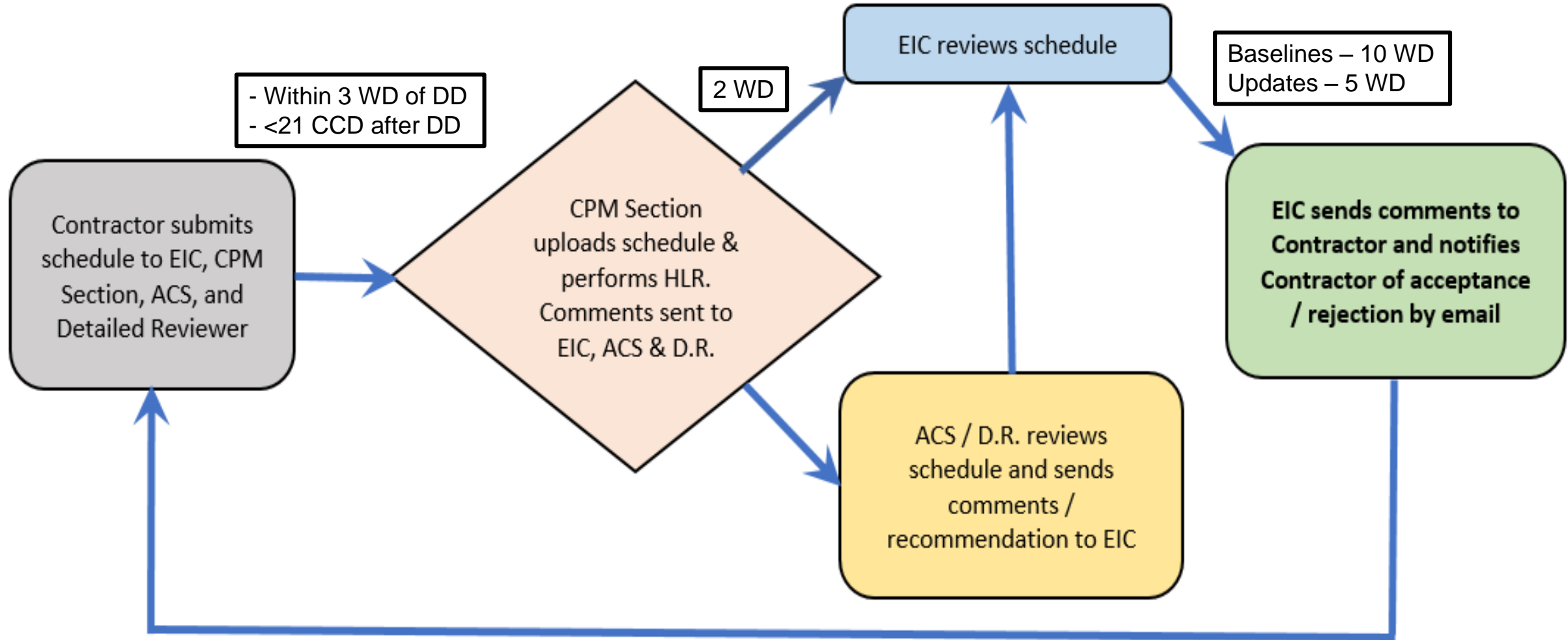
# Project Schedule Lifecycle – Pre-construction Schedule Meeting

- WebEx or in-person meeting hosted by PMO or Regional CPM Coordinators
  - NYSDOT: EIC, ACS, Regional CPM Coordinator
  - Consultant (if applicable): RE, Office Engineer, Detailed Reviewer
  - Contractor: PM, superintendent, scheduler
  - Design-builder: PM, construction superintendent, scheduler, designer
  - Very important for new contractors/schedulers
  - Important to remind all of scheduling requirements
- Contractor can present WBS, Calendars, Codes, schedule setup, issues

# Project Schedule Lifecycle – Pre-construction Schedule Meeting

- Pre-Construction Schedule Meeting topics
  - All items fully covered in detail for new contractors/users
  - Blue items are covered for experienced contractors/users
- 
- Access to Primavera P6
  - Submittal Naming Convention
  - **Baseline Progress Schedule**
  - **Critical Items in the Schedule**
  - **Work Breakdown Structure/Key Plan**
  - **Milestone Activities**
  - **Calendars**
  - **Activity Coding**
  - **Narrative**
  - Submission Cycle
  - **Progress Schedule Submissions**
  - Global Filters/Layouts
  - **Immediate Rejection Criteria**
  - Schedule Acceptance
  - **Project Specifics/Contractual Requirements**

# Project Schedule Lifecycle – Submission Cycle





# Project Schedule Lifecycle – Baseline and Update Submissions

## – High Level Review (HLR)

- Performed for all projects
- Performed by CPM Section
- Turn around: 2-workdays

- Select projects get a detailed review

- Larger or complex projects
- Design-build projects
- High-profile projects
- Turn around: 5-workdays

- Once Baseline finalized – 1<sup>st</sup> Update within 3-workdays



# Project Schedule Lifecycle – HLR Upload Process

## – Daily Operations

- Flag/categorize/save email submission
- Review submission documents (schedule log, narrative, attachments)
- Review comments from previous High Level Review / Detailed Review
- Upload new schedule and move submission from Contractors Work Area to NYSDOT Area for review & record
- Verify current progress schedule data is accurate and up to date
- Assign previous schedule as a target, update security settings and check scheduling options of current schedule

# Project Schedule Lifecycle – HLR Upload Process

## – Perform High Level Review:

- Follows standard process
- Check Global Filters
  - Run through list of 20+ filters. Add comments/figures to email
- Check Global Layouts
  - Run through Global Layouts #1-22 Layouts: Add comments/figures to email
  - Create PDFs of Global Layouts and combine into one PDF report

## – Transmit comments & review documents to EIC, ACS, Contractor, Detailed Reviewer, CPM Scheduling Section

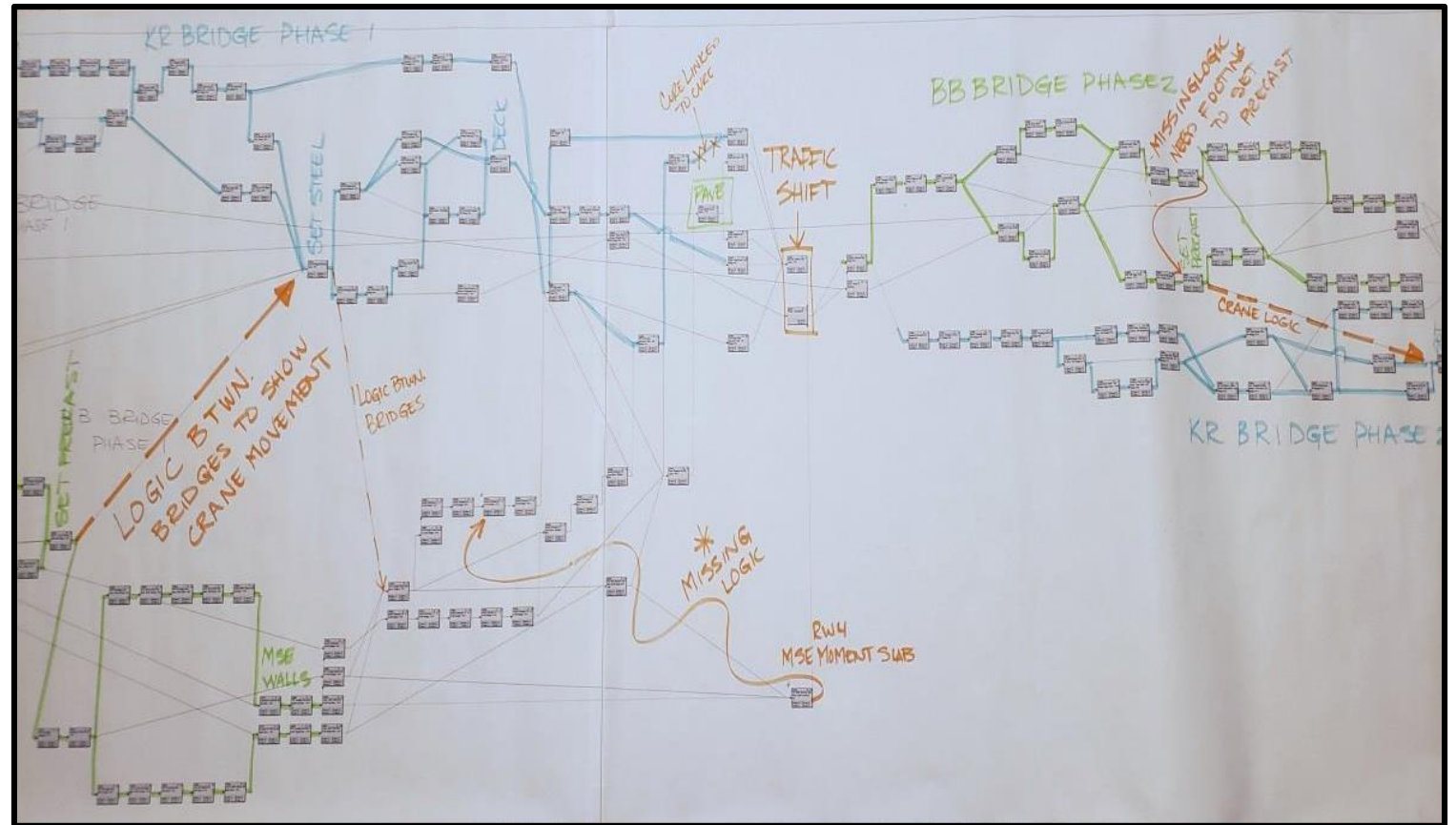
## – File correspondence and reports

## – Clear email Category and check Flag as complete



# Project Schedule Lifecycle – Detailed Baseline Review

- Plan, specifications, addendums
- Robust baseline review report
- Full scope of work included
  - Special Contract provisions
  - Construction logic review
  - Submittal logic review
  - Staging review
- Usable WBS
- Calendar check
- Unique Activity Descriptions
- Summary milestones & LOE



# Project Schedule Lifecycle – Detailed Update Review

- Critical Path changes
- Schedule slip/gain
- Delay assessment/Assign responsibility
- Contract milestone status

Schedule Update	Data Date	Scheduled Contract Completion Date	Var. from Previous (CCD) *	Var. from Contract (CCD) *	Negative Float Resp. Party				Apparent Cause of Gain / Delay to Negative Float (Including Driving Critical Path Activity)
					Contractor		NYSDOT		
					This Period (CCD)	Net Cum. (CCD)	This Period (CCD)	Net Cum. (CCD)	
Contract	n/a	19-Aug-19	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Baseline	1-Dec-17	19-Aug-19	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Update #1	11-Dec-16	25-Oct-19	-67	-67	-67	-67	0	0	Update 1 calculates significant slippage, largely due to winter calendars. We disagree with Contractor that slippage is due to availability of staging area. Analysis indicates slippage is due to Contractor's less-than-expected progress on preparation of design & shop drawings for Ramp E temp. towers. Activity P1000 (Prepare & Submit Temporary Support Towers - Ramp E) is driving the Critical Path and has not finished.
Update #2R	21-Apr-18	25-Oct-19	-63	-67	0	-67	0	0	Update 2R calculates the same completion dates as Update 1. Activity P2000 (Fabricate/Deliver Temporary Support Towers -Ramp E) is driving CP and has not started. This is the activity that we stated was driving the Update #1 CP and is responsible for the slippage to date.
Update #3	1-Jun-18	28-Oct-19	-3	-70	-3	-70	0	0	Update 3 calculates the schedule slipped 3-days despite several mitigation measures modeled by Contractor. Slippage is due to Contractor's less-than-expected progress on design & fabrication of temporary towers and decision to make Ramp E Begin Abutment work a successor to the completion of Pier E19. Activity P2000 (Fabricate/Deliver Temporary Support Towers -Ramp E) is driving the CP.
*Positive Variance indicates that the milestone is ahead of schedule or that the schedule has gained time.									

# Project Schedule Lifecycle – Detailed Update Review

## – Track & respond to project issues

- Owner & Contractor issues
- Show how modeled in schedule

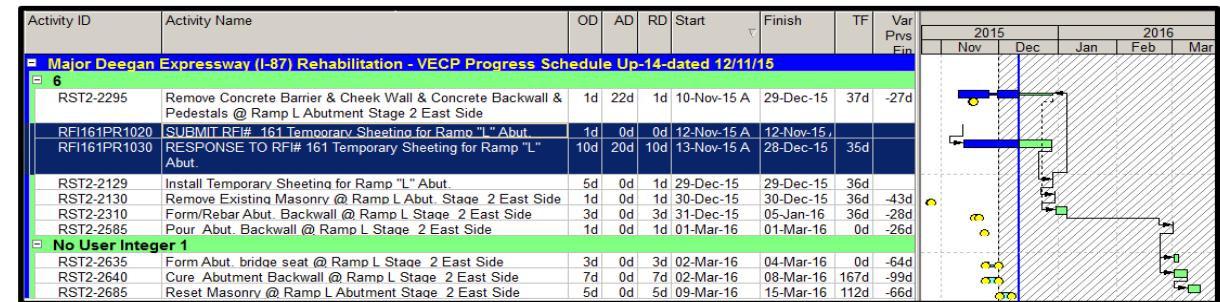
### Issue 8: RFI 161 Ramp L Sheeting - NEW

This issue is related to the processing of the RFI 161 for Ramp L sheeting. Contractor|stated the following in their narrative with respect to this issue:

The Contractor submitted RFI#161 on November 12, 2015. This RFI must be answered by NYSDOT before the Contractor can proceed with the work on the East Side of the Ramp L Abutment. Currently, the RFI remains unanswered.

The sheeting issue noted is being resolved. An initial plan to install deep sheeting was rejected due to interference with the foundation of the Ramp L abutment. The following figure shows the activities related to this issue. Note that these activities have positive float.

Figure 13: Activities Related to RFI 161



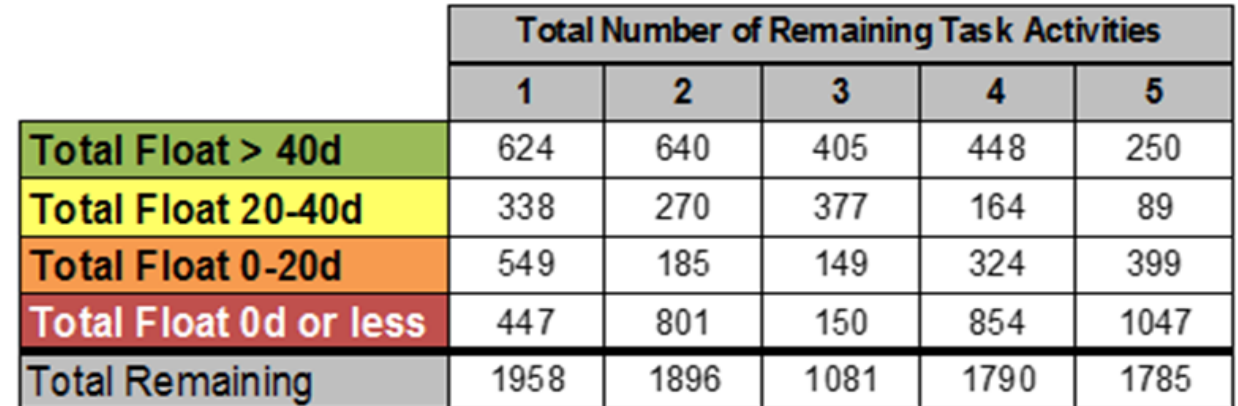
## 3. Issues

The following issues are reported in the Contractor's schedule narrative (it is assumed that the reader is aware of these issues and knows the background information). Only open issues or issues that we want to discuss are shown in this list. For details on all issues, see Exhibit 2.

- Issue 1: Local Street Permits
- Issue 2: Access to RR Areas
- Issue 3: Ramp A Fascia/Overhang RFIs
- Issue 4: Ramp A Watermain
- Issue 5: Precast Panel Details
- Issue 6: Structural Steel Shop Drawings
- Issue 7: Precast Panel Change Order
- Issue 8: RFI 161 Ramp L Sheeting
- Issue 9: Access to RR North Viaduct
- Issue 10: Span 1 Precast Panel Design

## – Float density

**Figure 17: Float Density – Negative Float has been Increased Significantly**



- Total Float > 40d
- Total Float 20-40d
- Total Float 0-20d
- Total Float 0d or less

# Project Schedule Lifecycle – Cost Loaded Schedules

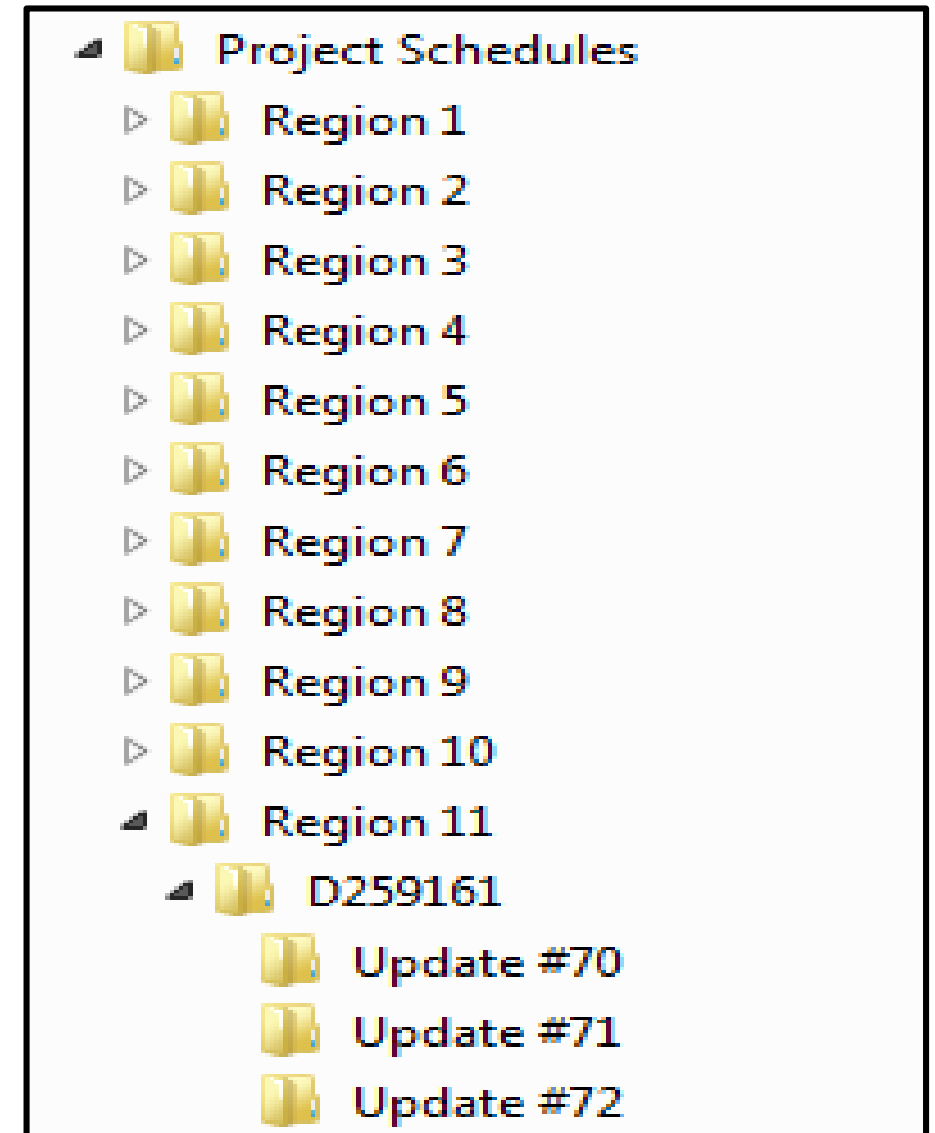
- 4 Active Projects w/ Cost Loaded Schedules
  - Larger/Complex Projects
  - Design-Build Projects
  - High Profile Projects
- Cost is used to generate payment
- Cost is added once Baseline Schedule is 90% Complete
- Contractor/Design-Builder has flexibility w/ reflecting cost
  - Resources
  - Cost Accounts
- Proposed Method is agreed upon by NYSDOT
- Must reflect the SOV/SOP as shown in RFP

# Managing the Process

How schedule submissions are managed

# Managing the Process – Document Control

- Standard network file structure maintained
- Sorted by Region and then Contract #
- Standard location for
  - Schedule related documents
  - Project/Contract information
  - Correspondence – e-mails



# Managing the Process - Correspondence

- Uses centralized CPM Section Outlook e-mail address for all correspondence
  - Noted in specification
  - Discussed at preconstruction schedule meeting
- All correspondence funneled to uncategorized section
- Multiple staff have access to e-mail account
- Lead CPM Section Scheduler manages inbox
  - Classifies and assigns correspondence to PMO staff



# Managing the Process - Correspondence

The screenshot displays the Outlook interface for managing correspondence. The top ribbon includes tabs for New, WebEx, Delete, Respond, Quick Steps, Move, Tags, and Find. The left sidebar shows the 'Favorites' section with folders like 'Freih, Matthew (DOT)', 'dot.sm.mo.cpm.scheduling.section', 'Inbox 2', 'Drafts [3]', 'Sent Items', 'Deleted Items', 'Archive', 'Cabinet', 'Conversation History', 'Junk E-Mail [14]', 'Managed Folders', 'Outbox', 'Retain', 'Search Folders', 'Online Archive - Matthew.Freih@dot.ny.gov', and 'RSS Feeds'.

The main pane shows a list of emails under the 'Inbox 2' folder. The selected email is from 'Freih, Matthew (DOT)' with the subject 'Test Email' and a size of 40 KB, dated 11:15 AM. The email body contains the text: 'Test Email to show CPM Scheduling Section Inbox. Matthew'.

The right pane shows the email details for 'Freih, Matthew (DOT)'. It includes the email address 'dot.sm.mo.cpm.scheduling.section', the subject 'Test Email', and the body text: 'Test Email to show CPM Scheduling Section Inbox. Matthew'. Below this, the contact information for Matthew Freih, PE, is displayed, including his title, company, address, phone number, and email addresses.

**Matthew Freih, PE**  
AECOM Consultant  
CPM Scheduling Section  
Project Management Office  
NYS Department of Transportation  
4 Burnett Blvd.  
Arlington, NY 12603  
845-392-7905 (Cell)  
[Matthew.Freih@dot.ny.gov](mailto:Matthew.Freih@dot.ny.gov)  
[CPMSchedulingSection@dot.ny.gov](mailto:CPMSchedulingSection@dot.ny.gov)

# Managing the Process – Types of Correspondence

- Schedule submissions – assigned to HLR and detailed reviewers
- Project issues – addressed by Lead CPM Section Scheduler or elevated
- User access issues:
  - E-mail or helpdesk phone line
  - Keep users happy and working
  - Setting up what-if schedules, assigning baselines
  - Access requests



# PMO Statewide Portfolio Status Meeting

## – All Project Status Report

- Shows status of all active projects
  - What projects are behind schedule
  - Days since last update submission
  - Projects missing accepted baselines
- Looking for projects trending in wrong direction
- Verify status of CPM Staff assignments

- User issues/access problems

- Assign tasks, to-do's, and follow-up assignments to CPM Staff

[illegible]

# Schedule Meetings – PMO Section – Task Tracker Layout

– Task Tracker Layout is setup to keep track of assignments

Project ID	Project Name	Reg	EIC	ACS	Data Date	Loaded Date	Review Status	Action Items
+ High Level Schedule Reviewer:								
- High Level Schedule Reviewer: Matthew Freih								
D900036-1SU22-1	D900036 - 1SUD21 - Region 8 Bridge	R8	Hilton	Ahmed	Aug-01-19	Aug-15-19	Accepted As Noted	3rd Time Impact Analysis Package was submitted on November 18, 2019
D263881-1SU03-1	D263881 - Route 66 over Kline Kill Dr	R8	VanAlstyne	Pinheiro	Aug-10-19	Aug-13-19	Accepted As Noted	
D263528-1SU11-1	D263528 - Lower Hudson Transit Link	R8	Theodore	Chu	Nov-01-18	Jan-30-19	Accepted As Noted	
D263289-2AB-1	D263289 - As-Built Progress Schedule	R11	Diaz	Camille	Feb-08-19	Apr-26-19	Accepted As Noted	J Varughese: Following Up with EIC
D263671-1SU08-1	D263671 - NYS Route 100C over Ro	R8	Hynes	Priebe	Sep-05-19	Oct-07-19	Accepted As Noted	Time Extension Request Submitted and Pending? No. w/Out EC or LC
D263825-1SU07-1	D263825 - Regional Bridge Washing	R11	Abouyousef	Patel	Sep-30-19	Oct-15-19	Accepted As Noted	
D263873-1SU06-1	D263873 - Taconic State Parkway/C	R8	Leonard	Pinheiro	Nov-01-19	Nov-11-19	Accepted As Noted	
D263945-1SU1-1	D263945 - At Award - Taconic State I	R8	Zheng	Pinheiro	Dec-01-19	Dec-10-19	Accepted As Noted	
D263772-1SU08-1	D263772 - Pavement Preservation (A	R11	Diaz	Abraham	Nov-30-19	Dec-11-19	Rejected w/ Comments	
D263626-2AB-1	D263626 - Southbound West Shore E	R11	Awad	Patel	Nov-27-19	Dec-04-19	Submitted For Review	
D263864-1SU07-1	D263864 - Rte 115 Bridge and Culver	R8	Wiedman	Pinheiro	Jan-01-20	Jan-03-20	Submitted For Review	
D263747-1SU012-1	D263747 - Arthur Sheridan Expresswa	R11	Colucci	Rodriguez	Sep-30-19	Oct-15-19	Accepted As Noted	Time Extension Request Submitted and Pending? No.
D900043-1SU11-1	D900043 - Kew Gardens Interchange	R11	Reis	Camille	Nov-30-19	Dec-02-19	Submitted For Review	
D263682-1SU14-1	D263682 - Lower Hudson Transit Link	R8	Theodore	Chu	Oct-31-19	Dec-05-19	Submitted For Review	
D263361-2AB	D263361 - Pavement Preservation (C	R11	Parisi	Patel	Aug-06-19	Oct-18-19	Submitted For Review	
D263821-1SU02-1	D263821 - Rth. of 3 MDE Bridges ove	R11	Santana	Alvarez	Dec-01-19	Dec-20-19	Submitted For Review	
D263261-1AB-1	D263261-1SU25-Corrective & Preven	R11	Reis	Augustine	Oct-15-19	Oct-24-19	Accepted As Noted	
D263452-1SU26D-1	D263452 - Replacement of the Kosci	R11	George	Shah	Dec-29-19	Dec-17-19	Submitted For Review	
+ High Level Schedule Reviewer: Sherif Elkhoully								
+ High Level Schedule Reviewer:								
+ High Level Schedule Reviewer:								

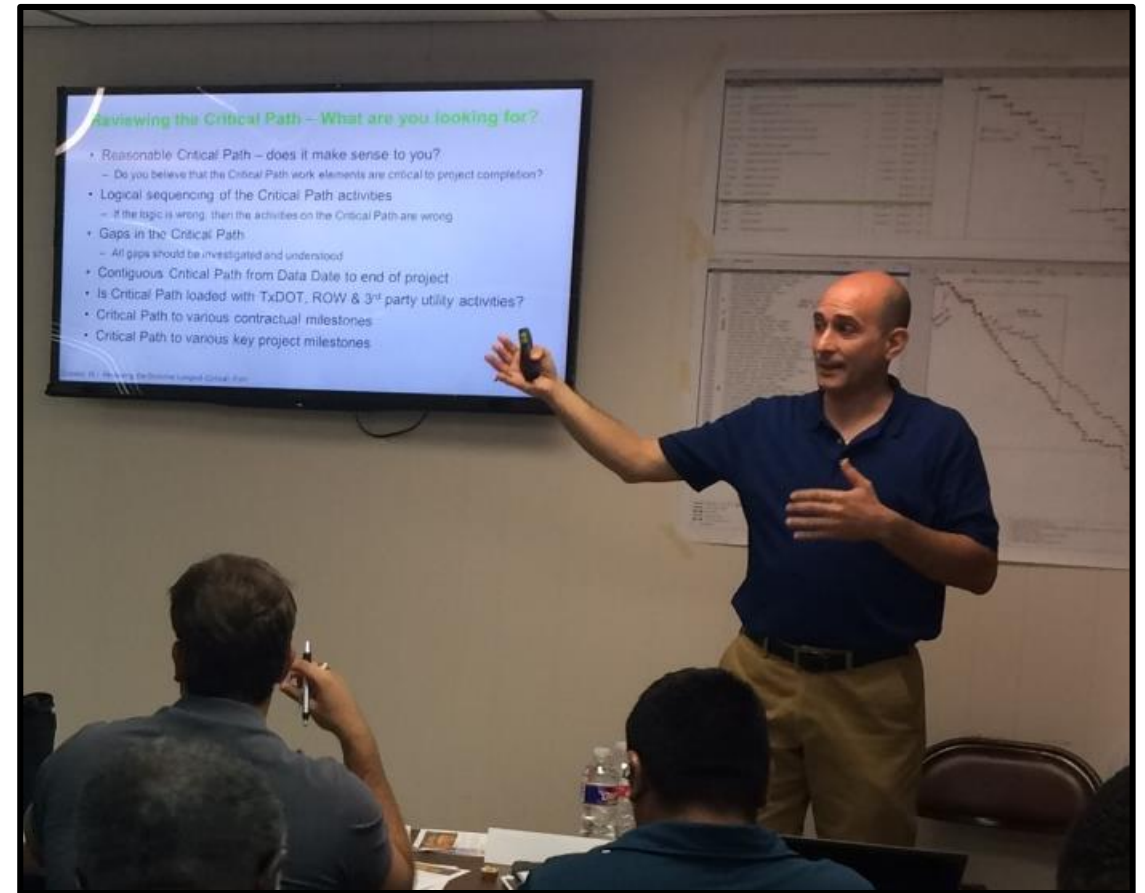
# Encouraging Users

Statewide and regional  
Project Level



# Encouraging Users - Training

- Intermediate Schedule Course
  - 3-day hands-on using P6 to review schedules
- Intermediate Course for Managers 1-day
  - What to expect from your schedule and scheduler
- Introduction to CPM Scheduling (2-days)
  - Basics
- Best Practices for Contractor CPM Spec. Compliance (1-day)
  - Educating new Contractor's
- NYSDOT EIC Training (1-day)
  - How to use HLR, Global layouts, Global filters
- **NYSDOT Reg. CPM Coordinator Training (3-days)**
- **Face-to-Face training with CPM Coordinators**



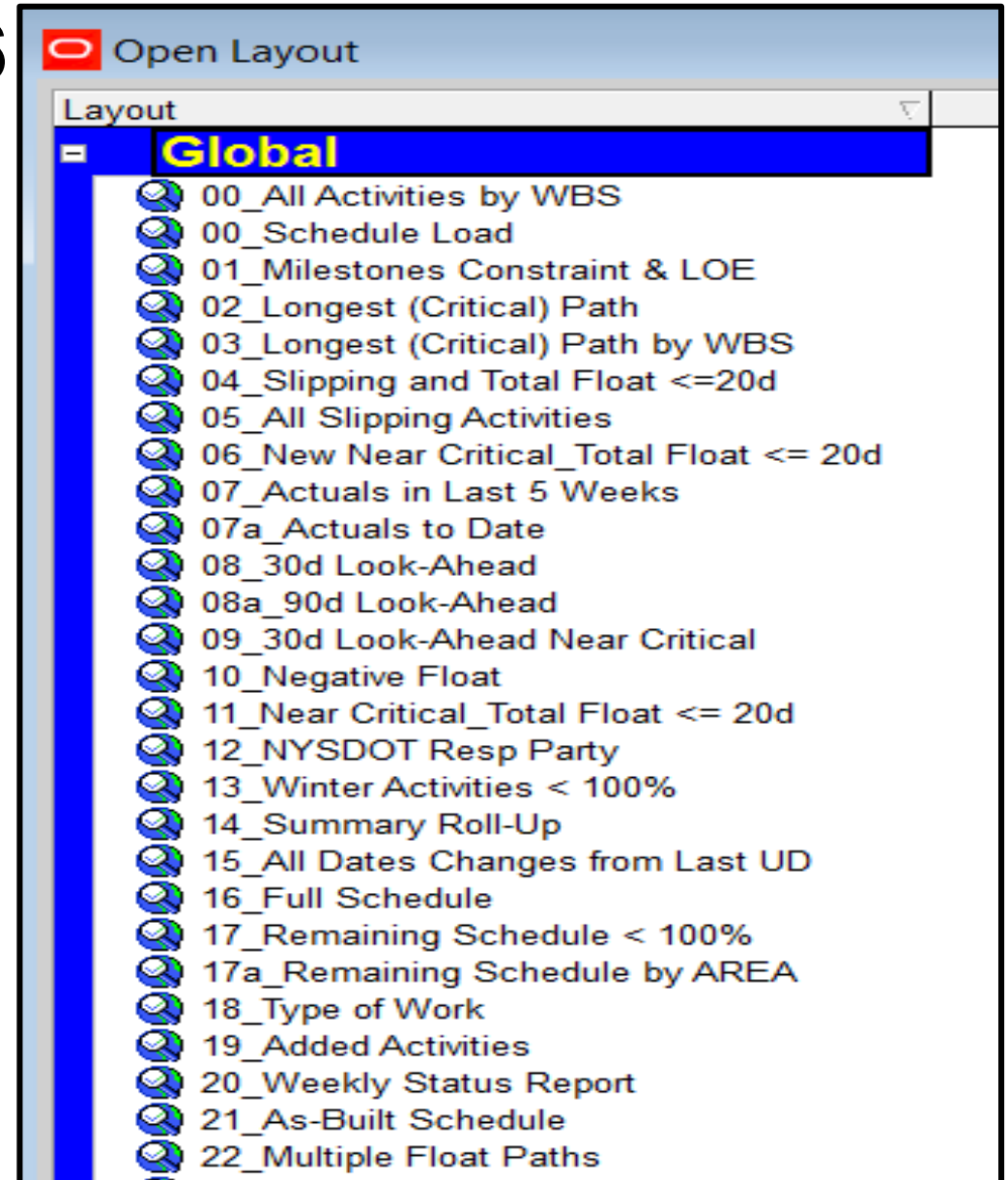
# Encouraging Users - Training

- Global Layouts are available on the NYSDOT Server
- Aids with the use of Schedule within P6
- Provide standardization across projects & Contractors
- Available to all users:
  - Contractors
  - Consultants
  - NYSDOT Employees
- Provided in PDF form with all HLR
  - Contains notes on how to use each layout



# Encouraging Users - Simplifying P6

- Global Layouts are available on the NYSDOT Server
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  - Contractors
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  - NYSDOT Employees
- Provided in PDF form with all HLR
  - Contains notes on how to use each layout





# Project Schedule Lifecycle – Baseline and Update Submissions

## – Layouts for Progress Meetings:

- Layout 01: Milestones Constraints & LOE
- Layout 03: Longest (Critical) Path by WBS
- Layout 04: Slippage & TF  $\leq 20d$
- Layout 08: 30d Look-Ahead
- Layout 10: Negative Float
- Layout 11: Near Critical TF  $\leq 20d$
- Layout 20: Weekly Status Report

## • Layouts for Internal Use

- Layout 12: NYSDOT Resp. Party
- Layout 16: Full Schedule
- Layout 18: Type of Work
- Layout 21: As-Built Schedule

## • Layouts for Detailed Reviews

- Layout 05: All Slipping Activities
- Layout 06: New Near-Critical TF  $\leq 20d$
- Layout 07: Actuals in Last 5 Weeks
- Layout 15: All Date Changes from last Update
- Layout 19: Added Activities
- Layout 22: Multiple Float Paths

## • Layouts to Update Progress

- Layout 14: Summary Roll-Up
- Layout 17: Remaining Schedule  $< 100\%$

# Encouraging Users – Simplifying P6

## Using Layouts and Monthly Schedule Reports for Construction...prepared reports

The screenshot displays the Primavera P6 software interface. On the left, a 'Bookmarks' pane lists 18 report categories, with '03\_Longest (Critical) Path by WBS' selected and highlighted in blue. The main window shows a detailed schedule report for 'D262058 - Rte 17 @ Exit 122 - Update No. 26'. The report is organized into sections: 'Construction', 'Project Milestones', 'PHASE 5', 'RTE. 17 WESTBOUND PHASE 5', 'Traffic Control Rte. 17 WB Phase 5', 'Highway Work Rte. 17 WB Phase 5', 'Bridge Work Rte. 17 WB Phase 5', 'Rte. 17 over Phillipsburg Creek Rte. 17 WB Phase 5 Substructures', 'RAMP C & D PHASE 5', 'Drainage Work Ramps C & D Phase 5', and 'Highway Work Ramps C & D Phase 5'. Each section contains a table of activities with columns for Activity ID, Activity Name, Resp Party, Duration, Start, Finish, Total Float, Late Finish, and Var - Last Update. The right side of the report shows a Gantt chart for the months of April and May. A 'Layout Description' box on the right explains the report's purpose and provides instructions on how to interpret the data. A 'What To Look For' box on the far right lists key items to monitor, such as links between different activities, the longest path, late finish dates, duration doubts, and scheduled changes.

**Bookmarks**

- 00\_Schedule Report Intro
- 01\_Constraints & Level of Efforts
- 02\_Longest (Critical) Path
- 03\_Longest (Critical) Path by WBS**
- 04\_Slipping and Total Float less than 20d
- 05\_All Slipping Activities
- 06\_New Near Critical\_Total Float less than 20d
- 07\_Actuals in Last 5 Weeks
- 08\_30d Look-Ahead
- 09\_30d Look-Ahead Near Critical
- 10\_Negative Float
- 11\_Near Critical\_Total Float less than 20d
- 12\_NYSOT Resp Party
- 13\_Winter Activities
- 14\_Summary Roll-Up
- 15\_All Dates Changes from Last UD
- 16\_Full Schedule
- 17\_Remaining Schedule less than 100%
- 18\_Type of Work

**Layout: 03 Longest (Critical) Path by WBS**

TASK filter: Longest Path.

**Layout Description**

- Shows only activities on the Longest (Critical) Path from Data Date (04-May-15) to the end of the project.
- Late Finish column and black "underline" Float Bars show how late an activity can finish without delaying Project Completion or an Interim Contract milestone.
- Light blue bars with yellow dots represent the previous update.
- Longest Path can be affected by Interim constraint dates.

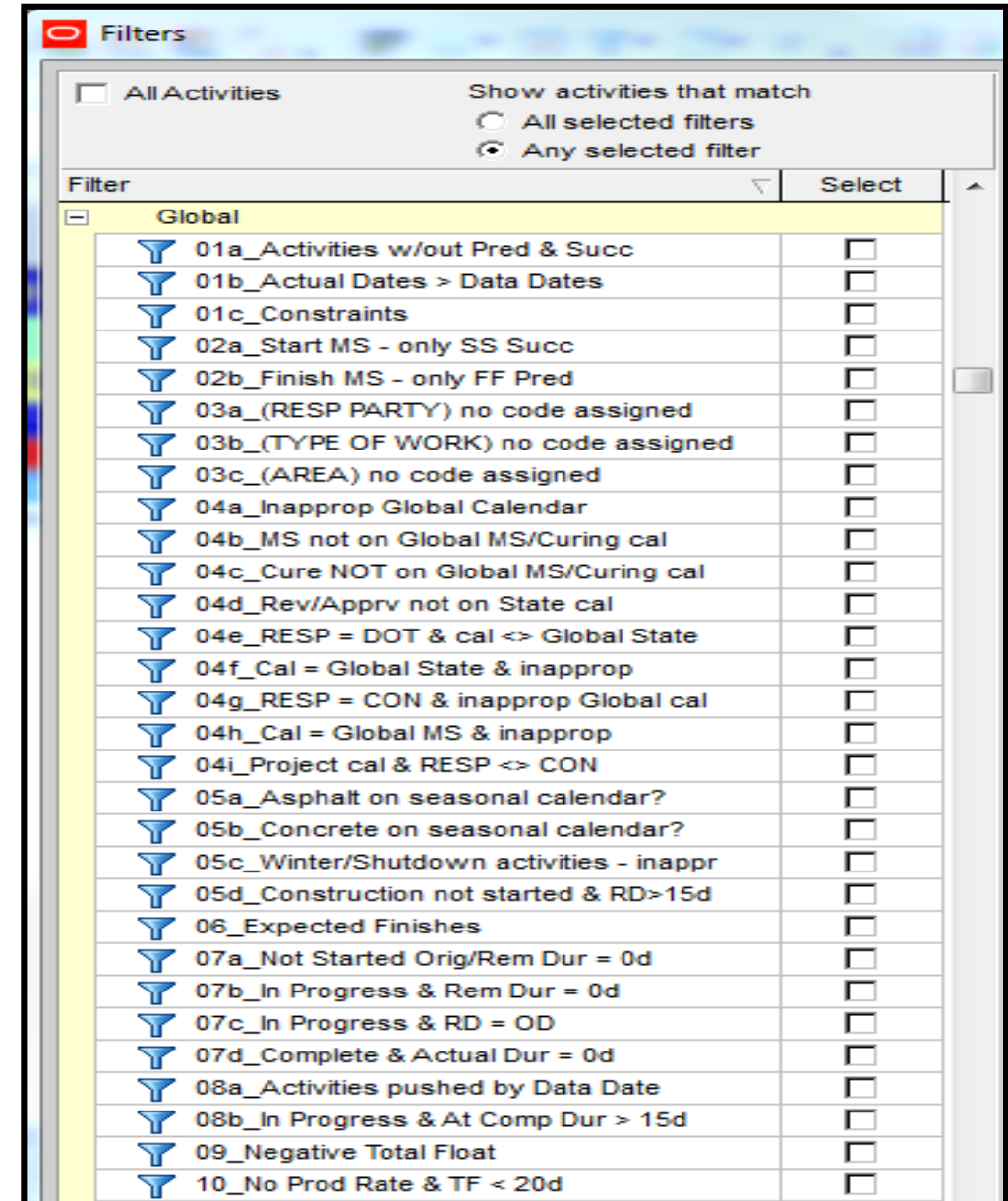
**What To Look For**

- Do links between different
- Does Longest Path make
- Late Finish shows the late
- Look for duration doubts.
- Are scheduled durations a
- Look for changes from las

Activity ID	Activity Name	RESP PARTY	Duration	Start	Finish	Total Float	Late Finish	Var - Last Update
<b>D262058 - Rte 17 @ Exit 122 - Update No. 26</b>								
<b>Construction</b>								
<b>Project Milestones</b>								
01020	INCENTIVE MILESTONE 3 - PHASES 4, 5, & 6 COMPLETE	.PCON.G	0d		03-Aug-15*	3d	06-Aug-15	9d
09000	Substantial Completion	.PCON.G	0d		25-Aug-15*	4d	29-Aug-15	9d
10000	Contract Completion	.PCON.G	0d		13-Oct-15*	3d	16-Oct-15	9d
<b>PHASE 5</b>								
<b>RTE. 17 WESTBOUND PHASE 5</b>								
<b>Traffic Control Rte. 17 WB Phase 5</b>								
CS-1010	TRAFFIC SHIFTED FROM 17WB TO EB FOR PHASE 5 WORK	.PCON.G	72d	19-Mar-15 A	29-Jun-15	3d	02-Jun-15	7d
CS-1190	RETURN TRAFFIC TO ORIG. RTE. 17 CONFIGURATION (PHASE 5 TO 6 SH	.PCON.G	4d	24-Jun-15	29-Jun-15	3d	02-Jun-15	7d
<b>Highway Work Rte. 17 WB Phase 5</b>								
CS-2010	CONST. 37.5MM ASPH PHILLIPSBURG CULVERT 17 WB PHASE 5	.PCON.G	1d	18-Jun-15	18-Jun-15	3d	23-Jun-15	-6d
CS-2020	CONST. 25MM ASPH PHILLIPSBURG CULVERT 17 WB PHASE 5	.PCON.G	1d	19-Jun-15	19-Jun-15	3d	24-Jun-15	-6d
C3-1250	RTE 17 WB RESURFACING	.PCON.G	2d	22-Jun-15	23-Jun-15	3d	26-Jun-15	-57d
<b>Bridge Work Rte. 17 WB Phase 5</b>								
<b>Rte. 17 over Phillipsburg Creek Rte. 17 WB Phase 5</b>								
<b>Rte. 17 over Phillipsburg Creek Rte. 17 WB Phase 5 Substructures</b>								
CS-B1270	DEMO EXISTING CULVERT 17 OVER PHILLIPSBURG PHASE 5	.PCON.G	5d	04-May-15	08-May-15	3d	13-May-15	14d
CS-B1285	FRP WALL K1 CLOSURE POUR @ PHILLIPSBURG CREEK PHASE 5	.PCON.G	4d	11-May-15	14-May-15	3d	19-May-15	14d
<b>RAMP C &amp; D PHASE 5</b>								
<b>Drainage Work Ramps C &amp; D Phase 5</b>								
C2-D130	INSTALL UNDERDRAIN RAMP D PHASE 2	.PCON.G	3d	15-May-15	19-May-15	3d	22-May-15	-32d
<b>Highway Work Ramps C &amp; D Phase 5</b>								
C2-1255	CONST. ASPH 37.5MM RAMP D PHASE 2	.PCON.G	3d	20-May-15	22-May-15	3d	28-May-15	-31d
C2-1275	CONST. ASPH 25MM RAMP D PHASE 2	.PCON.G	2d	26-May-15	27-May-15	3d	01-Jun-15	-31d
CS-600	EXC./GRADE TEMP. RAMP D PHASE 5	.PCON.G	2d	28-May-15	29-May-15	3d	03-Jun-15	-31d
CS-610	CONST. SUBBASE TEMP. RAMP D STG 5	.PCON.G	1d	01-Jun-15	01-Jun-15	3d	04-Jun-15	-31d
CS-620	PAVE TEMP. RAMP D STG 5	.PCON.G	2d	02-Jun-15	03-Jun-15	3d	08-Jun-15	-31d
C2-1210	CONST. ASPH 37.5MM RAMP DD PHASE 2	.PCON.G	3d	11-Jun-15	15-Jun-15	3d	18-Jun-15	-17d
C2-1220	CONST. ASPH 25MM RAMP DD PHASE 2	.PCON.G	2d	16-Jun-15	17-Jun-15	3d	22-Jun-15	-17d
<b>EAST MAIN ST/CRYSTAL RUN RD. PHASE 5</b>								

# Encouraging Users - Simplifying P6

- Global Filters are available on NYSDOT Server
- Checks for CPM Spec. Compliance
  - Helps Contractors make good submittals
  - Helps NYSDOT quickly assess submittals
- Checks for Immediate Rejection
- Available to all users:
  - Contractors
  - Consultants
  - NYSDOT Employees



# Lessons Learned



# 1. Monitor Health of Project and Step in to Help

- Push for accountability on resolving issues
- Push for mitigation of impacts





# Mitigation Example

– \$407 million Alexander Hamilton Bridge & Highbridge Interchg. Ramp Rehab

## – Project Scope

- Replaced and widened 1,525' of mainline bridge deck pavement
- Repaired 505' steel arch main span
- Replaced ramp with a steel tub girder bridge
- Replaced Undercliff Avenue bridge
- Rehabilitation of Highbridge interchange ramps



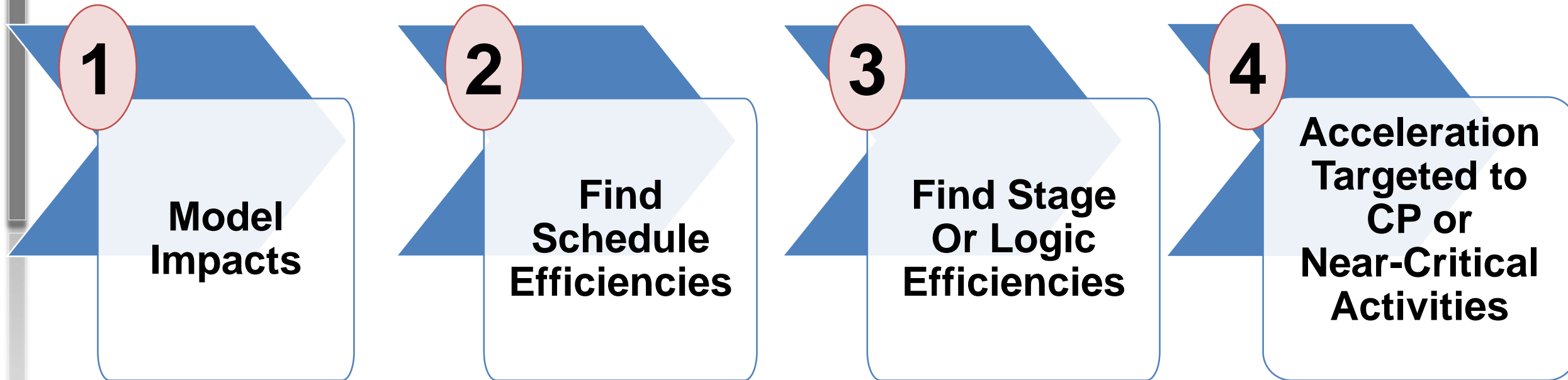
# Mitigation Example

- Issue: Inaccessible double floorbeam deterioration discovered after Stage 2 deck demo.
- Part of arch top cord double floorbeam sections had to be replaced
- Issue required design, detailing, fabrication and constructability analysis
- 42,000-LBS of additional steel
- \$2.7M additional cost
- Initial assessment: 216 Workdays (11-months)
- Schedule Activities: 6,300
- Contract Duration: 1,665 Calendar Days





# Mitigation Process



Low To No Cost Solutions    Low To Higher Cost Solutions

- *All Steps Rely On A Well-Maintained Schedule*



# Mitigation Process

- **Saved 2 Months:** Mitigated shop drawing process (low cost)
- **Saved 3 Months:** Stages 2 and 3 worked concurrently (low cost)
- **Saved 2 Months:** Less Than \$400K acceleration costs
- **Saved 2 Months:** Built in contract incentive stages
- **Saved 2 Months:** Acceleration & reduced last stage duration based on past progress
- **Total Mitigation: 11 Months**
- No Time Extension
- No Extended Overhead

	Data Date	Substantial Completion			Notes	Mitigation Effort
		Date	Variance to Contract	Variance to Previous		
Contract		2-Oct-13				
Update 17	1-Feb-11	11-Dec-13	-70	-70	Project behind schedule due to various reasons	
Update 18	1-Mar-11	29-Jun-14	-270	-200	Initial impact of double floorbeam issue	
Update 22	2-Jul-11	15-Jul-14	-286	-16	Maximum impact of double floorbeam issue	
Update 23	30-Jul-11	21-May-14	-231	55	Mitigation - allow fabrication and installation to begin before signature shop drawings - adjust critical cure times	Simple schedule adjustments - coordination
Update 24	3-Sep-11	27-Feb-14	-148	83	Allow part of Stage 3 to start concurrently with Stage 2 Phase 1	Review of stage changes - traffic control review - extra temporary barrier movement
Update 30	2-Mar-12	16-Jan-14	-106	42	Acceleration	Cost of acceleration
Update 31	31-Mar-12	23-Dec-13	-82	24	Stage 4 Incentive	Built into contract
Update 37	28-Sep-12	17-Dec-13	-76	6	Acceleration	Cost of acceleration
Update 38	3-Nov-12	13-Nov-13	-42	34	Stage 5 Incentive	Built into contract
Update 45	1-Jun-13	2-Oct-13	0	42	Adjust Stage 6 durations based on past progress & acceleration	Simple schedule adjustments - coordination - Cost of acceleration

## 2. Sometimes you have to get dirty

- Send expert staff into regional offices to help push implementation and use of schedules
  - Not an occupying army
  - Get buy-in from regional staff – we are here to help you
  - Training regional staff
  - Helping track status of regional projects/issues

### 3. Employ Experienced Schedulers

- No P6 jockeys
- Get schedulers out in the field
- Scheduler needs to:
  - Understand highway bridge construction process
  - Review construction plans and specifications
  - Communicate
  - Suggest options to construction team
  - Become key part of pushing NYSDOT projects and helping identify projects at risk before it is too late
- Train schedulers with construction experience in P6 – easier to teach P6 and scheduling than construction practices



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