

Challenges and Lessons Learned from Establishing Schedule Review and Monitoring Process in a Public Organization

1. Abstract

A public organization asked the author and his consultant team to provide schedule review support and to improve the scheduling management procedure. This is a change at organization level moving towards proactive management and control, which requires good planning, effective communication, and vigorous implementation. The task involves lots of challenges such as how to fit into an organization, how to identify areas for improvement, how to develop new schedule review and monitoring procedures, and how to implement each of those. As a result of strong support from senior management, good planning, and hard teamwork, the new schedule review and monitoring process has reduced the schedule review duration, improved the quality of schedule updates, made it possible for the first time to maintain contemporaneous schedules for all projects, and recovered the project delays. The project managers in the public organization developed the trust in the scheduling and begin actively using the new process to manage their projects. This paper shared the challenges, solutions, outcomes, and lessons learned from this task.

2. Author's Brief Profile

Dr. Pei Tang has 10 years of experience in program and project controls of infrastructure projects, including planning and scheduling, cost control, delay analysis, and qualitative and quantitative risk analysis. He has led the project controls team to control high-profile engineering and construction projects for both contractors and owners that have met mission-critical and demanding cost and time restraints. He is currently Director of Project Controls Scheduling at TYLin International and serves as the President of AACE International New Jersey Section.

3. Introduction of Problem and Solution

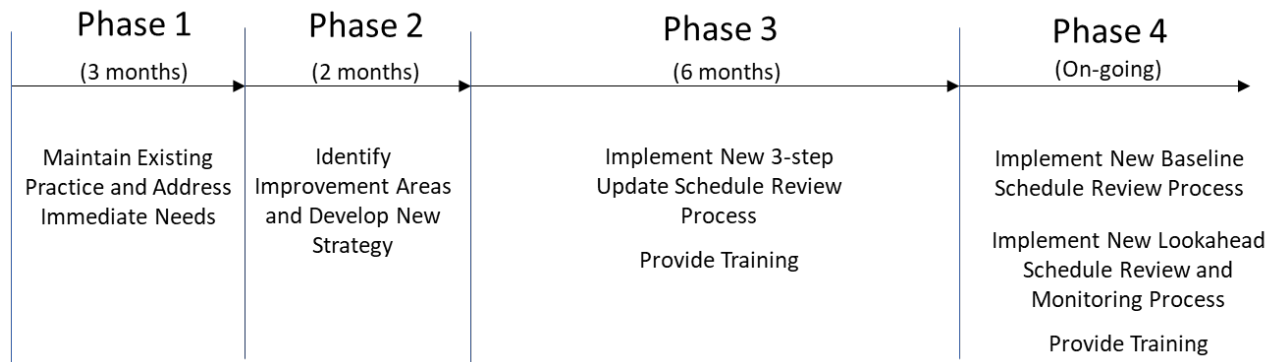
3.1. Introduction of Problem

Many public organizations develop and manage construction projects to meet public needs. Scheduling is an important tool to manage the projects to complete on time and also serves as a key document for delays and claims. Due to a lack of scheduling staffing, a public organization brought a scheduling consulting team on board to support the schedule and delay reviews as well as to revamp the whole process of schedule review and monitoring process for the agency. This paper shared the challenges, solutions, outcomes, and lessons learned from this task.

3.2. Overview of the Task

The task involves four phases:

Figure 1 Summary of Implementation Plans



- Phase 1: Understand the existing practice, address immediate needs, and maintain the existing scheduling management practice.
- Phase 2: Identify areas for improvement and develop schedule review and monitoring strategies.
- Phase 3: Implement a new update schedule review process.
- Phase 4: Implement a new baseline schedule review process and implement a new lookahead schedule review and monitoring process.

3.3. Phase 1– Familiarity and Fit-in Phase (3 Months)

The immediate task is to catch up with the overdue schedule reviews. The consulting team determined that the priorities of the first phase are to:

- Understand the existing schedule management procedure.
- Maintain the existing schedule management practice to minimize the disruptions and build relationships with the project managers in the organization.
- Catch up with the overdue schedule reviews.

Before performing the first schedule review, the consulting team discussed with this organization’s internal analyst regarding the existing schedule management process (schedule review process, schedule review reporting format, communication style with the project managers, and the status of all existing construction projects). In addition, recognizing that it will take time to establish new work relationships with all project managers, the consulting team appointed an experienced senior scheduler as the point of contact to communicate with all the project managers, instead of having each scheduler communicate with each project managers. Once that was established, the consulting team started reviewing the baseline and monthly update schedules following the

existing review template and procedure to maintain continuity. At the end of this phase (approximately 3 months), the review of overdue schedules (including the revisions) was completed.

3.4. Step 2 – Develop Schedule Review and Monitoring Process (2 Months)

During the first phase, the consulting team identified several issues and challenges:

- The submissions of monthly update schedules are falling behind, most of which are 2 to 4 months behind the data date. Consequently, most projects do not have a realistic contemporaneous schedule update to accurately forecast the project status and develop mitigation plans. Even just in the first three-month period, the consulting firm saw a few time extension requests where the public organization could have mitigated the full or partial delay had the contractor provided a contemporaneous schedule correctly showing the critical path of change order work.
- The existing schedule management procedure involved limited control actions. The existing schedule review procedure missed key review items, such as not verifying the actual dates and cost, not reviewing if the existing plan matches the real plans in the field, and not verifying the reasons for schedule changes (changed relationships, open-ended activities, out-of-sequence activities, etc.), and not providing a recommendation for actions. One reason is that the existing schedule review procedure is set up for processing the payment application rather than project controls. In addition, the organization's internal analysts have limited scheduling experience.
- The baseline schedule took very long to develop and approve (3 to 7 months), causing schedule updates to be submitted very late. Given the duration of some construction projects is less than one year, this issue made the scheduling function ineffective.
- Some project managers were reluctant to use scheduling to manage the project because they lacked confidence in the schedule analysis, lacked time, or rely on their intuition or observation to manage the project.
- The agency underestimated the efforts needed to review the schedules. The initial staffing plan was not enough to complete all the monthly schedule update reviews on time for all the construction projects. More scheduling effort is needed in the first two weeks of the month because that is the time when most monthly schedule updates are submitted.

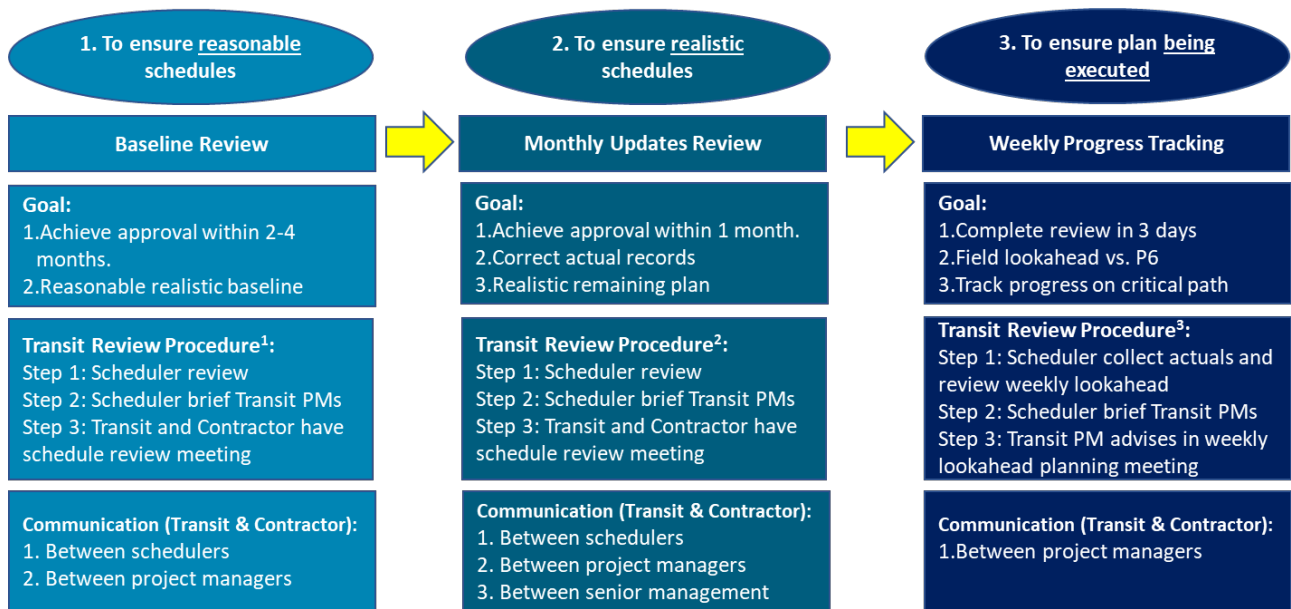
The consulting team developed a new schedule review and monitoring process (**Figure 2**) to:

- 1) Reduce the duration to develop, review, and approve baseline.

- 2) Reduce the duration to review and approve monthly schedule updates.
- 3) Improve the quality of the baseline.
- 4) Ensure the update schedules reflect the reality.
- 5) Maintain contemporaneous schedules (Submission Date – Data Date < 30 Calendar days).
- 6) Develop plan to mitigate the project delay.

In addition, a performance matrix (**Table 1**) was developed to track the effectiveness of the implementation. After the senior management of the public organization approved the new schedule review and monitoring process, the consulting team started implementation.

Figure 2 Schedule Review Process



Note: 1, 2, 3 – The process or tool is applied to both schedules and its resubmissions.

Table 1 Performance Matrix of Implementation

No.	Description	Measurement Unit	Measurement Frequency
1	The review duration from the schedule submission date to the schedule review completion date.	Calendar Days	Monthly
2	The duration to schedule and conduct internal schedule review meetings.	Calendar Days	Monthly
3	The duration to schedule and conduct external schedule review meetings.	Calendar Days	Monthly
4	The number of project delays in each project schedule update.	Calendar Days	Monthly
5	The difference between the update schedule submission date and its data date (to evaluate if it is contemporaneous).	Calendar Days	Monthly
6	The number of mitigation planning meetings.	Times	Monthly

3.5. Step 3 – Implement New Update Schedule Review Process (6 Months)

Since the major issues are associated with the monthly update schedule reviews, the consulting team decided to implement the new update schedule review process first. The actions include:

- In addition to appointing a senior scheduler as the point of contact to communicate with all the project managers, the consulting team discussed using a flexible team with more part-time schedules with the public organization. Most of the update schedules come in the early weeks of the month. This staffing arrangement allows more schedulers to work at the same time at beginning of the month to finish the scheduler review in a timely manner.
- The consultant schedulers visited the construction sites to understand the project status, progress, and existing issues; more importantly, to meet and discuss the new monthly update schedule review procedure with the project manager before the implementation. The project managers have different communication styles such as preferring email, phone calls, official virtual meetings, or in-person meetings, reporting styles, etc., which the consultant schedulers will customize.
- The monthly update schedule review involves three steps:

- Step 1 – Schedule review. This is the step for the schedulers to review the baseline or update schedule and produce the review report.
- Step 2 – Internal schedule review meeting. In this internal schedule review meeting, owner’s scheduler will discuss with the owner’s project management team regarding the project status in this update period, root causes of delay or progress, the critical and near-critical items, and action items to avoid further delay or to improve the progress. This meeting was planned as an official meeting but later changed to a hybrid of official and unofficial meetings to adapt to owner’s project manager’s agenda and needs. This meeting usually takes about 30 minutes.
- Step 3 – External schedule review meeting. In this schedule review meeting, the owner’s project management team, owner’s scheduler, the contractor, and contractor’s scheduler will discuss the detailed comments for the schedule updates, the action items for the contractor’s scheduler, and action items for the contractor’s project managers.

For each of those steps, a new review report template has been developed to ensure all the necessary scheduling items have been reviewed and recommendations are provided. In addition, three levels of communication and coordination of issues have been implemented, between owner and contractor’s schedulers, between owner and contractor’s project managers, and between owner and contractor’s senior management.

- Provide the project managers in organization with training regarding the importance of maintaining contemporaneous schedules. Ask the contractors to submit the project schedule updates on time and catch up with submitting the missing schedule updates. Strategies have been used such as combining schedule updates into one update for the months when the critical path did not change; or associating the payments with the approval of schedule updates to press the contractors to submit the update schedules on time.
- A daily planning meeting was held to evaluate the performance matric for corrections.

After implementing the above process for approximately six months:

- The review duration was reduced from 15-45 calendar days to 7-10 calendar days.
- 75% of the projects were able to conduct internal schedule review meetings.

- 65% of the projects were able to conduct external schedule review meetings.
- All the construction projects' schedule updates stay current, which means the difference between schedule update submission and the data date is less than 30 calendar days. Those contemporaneous schedules will enable more accurate forecasting and effective management strategy development.
- The trend of project delays started decreasing and mitigation has been implemented to improve the progress.
- The consultant team received good feedback that project managers in the organization saw the benefits of this new scheduling process and started asking the scheduling team to help manage the project. This public organization manages the construction schedules with two different approaches. For small projects, in-house schedulers are used; for large projects, external scheduling consultants are used. As a result of the confidence built in the procedures, the project managers asked the consultant team to take over and manage all the construction projects (including the ones used to be handled by more experienced external scheduling consultants).

3.6. Step 4 – Implement New Baseline and Lookahead Schedule Review Process (Ongoing)

Given that project managers in the organization have embraced the new scheduling process and that the consultant team continues implementing the new schedule update review process, the consulting team started implementing the next phase change. The issues to be resolved are:

- The baseline schedules take a long time (3 to 7 months) to develop, review, and approve, causing issues in payment management and schedule management. An investigation reveals that the longer it takes to submit the first update, the more delays were observed.
- The predicted project completion keeps delaying in the monthly update schedules.

The consultant team is currently implementing the new baseline schedule review process and the new lookahead schedule review and monitoring process.

- The new baseline schedule review process involves three steps, reviewing the baseline schedules and producing review reports, conducting internal baseline schedule review meetings, and conducting external baseline schedule review meetings. The 3-step review

process for the baseline is similar to that of the update schedule review. The purpose is to ensure that the baseline is developed in the quality to be approved within 2 to 4 months.

- The new lookahead schedule review process involves three steps as well, collecting field data to analyze the actual progress/productivity and to verify the reality of the lookahead schedules; briefing owner's project managers with the findings and action items; and owner's project managers discussing the action items with contractor's project managers in the weekly lookahead planning meeting. The purpose is to ensure the contractor breaks down the long-term monthly schedules into short-term lookahead schedules, plans the critical path work, executes the work, and coordinates with other projects, resources, and constraints.
- A daily planning meeting was held to evaluate the performance of the above items for corrections.

4. Conclusion

Changing the scheduling management process in an organization is challenging. The consultant team has developed a two-phase strategy with detailed step-by-step implementation plans. The first phase (6-month period) has achieved the goals of reducing review duration, maintaining contemporaneous schedules, and implementing mitigation actions. The second phase is being implemented to improve the baseline schedule development and approval process as well as oversee the execution of the lookahead schedule/plan (especially for the critical path work). The key to the success of implementation is:

- Support from senior management.
- Development of a detailed implementation plan.
- Tracking on daily basis of the implementation process and its effectiveness.
- A flexible team of schedulers with strong schedule analysis and communication skills.
- Training and working with the project managers as a team, letting them feel the scheduling team is a tool that is there to support them with managing the projects instead of a burden.
- Sticking with the goal but be flexible with the approach.