

## CHAPTER 4 – MONITORING AND CONTROL

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## Introduction

A primary responsibility for a Project Manager (PM) is to project monitoring and control. The objective is to identify and correct problems before they jeopardize the success of the project. The Project Work Plan, as explained in Part I, Chapter 3, provides the benchmarks for monitoring and control. As with the information in Part I, Chapter 3, the material in this chapter must be modified to be applicable to construction and maintenance projects.

Although this chapter is intended for both Florida Department of Transportation (FDOT) and consultant Project Managers PMs, FDOT PMs must understand that they have special and very important monitoring responsibilities. The proper stewardship of state resources is a fundamental responsibility of FDOT managers and staff. Resources must be used in a manner consistent with the FDOT's mission, in compliance with law and regulation, and with a minimum of waste and mismanagement. FDOT employees must ensure that resources are used efficiently and effectively to achieve the desired results.

## Monitoring

Primary monitoring efforts should be directed to the definition of a successful project: namely, meeting objectives, on budget, on time and of acceptable quality.

**Objectives:** Are project objectives being monitored on a routine basis throughout the life of a project to ensure that the project stays focused?

**Budget:** Are the costs of the project under control? For design projects, is the estimated construction cost within that planned?

**Schedule:** Are milestones being met? Are critical path activities anticipated and managed?

**Quality:** Is the Quality Assurance/Quality Control plan being followed? Is the plan working?

Monitoring tools provide both project managers a clear picture of the project status. There are many progress monitoring tools available. Some tools may be more applicable to the Consultant Project Manager or to the FDOT Project Manager. **Figure 1**, Monitoring Tools, shows some of the monitoring tools, and to which PM they are most applicable.

Figure 1  
**Monitoring Tools**



**Progress Reports:** The FDOT and consultant PMs have different monitoring responsibilities. A routine (usually monthly) progress report from the consultant should be the primary monitoring tool for the FDOT PM. The progress report should include the following information:

- Activities during the previous reporting period.
- Activities planned in the next reporting period.

**Progress:** Compare planned percent complete with actual percent complete. **Figure 2**, Sample Progress, demonstrates one method of tracking planned progress compared to actual progress and costs.

**Project Objectives:** Discuss any developments that may impact accomplishment of the project objectives.

**Scope of Services:** Surface any issues that may affect the scope of services.

**Budget:** If it is a cost plus fixed fee contract, report actual and planned expenditures. Compare them with the progress report and discuss any obvious discrepancies. If it is a lump sum project, it is not necessary to report on expenditures. Address any foreseeable needs for supplemental agreements. If the project is for design, point out any project developments that will significantly affect the construction costs.

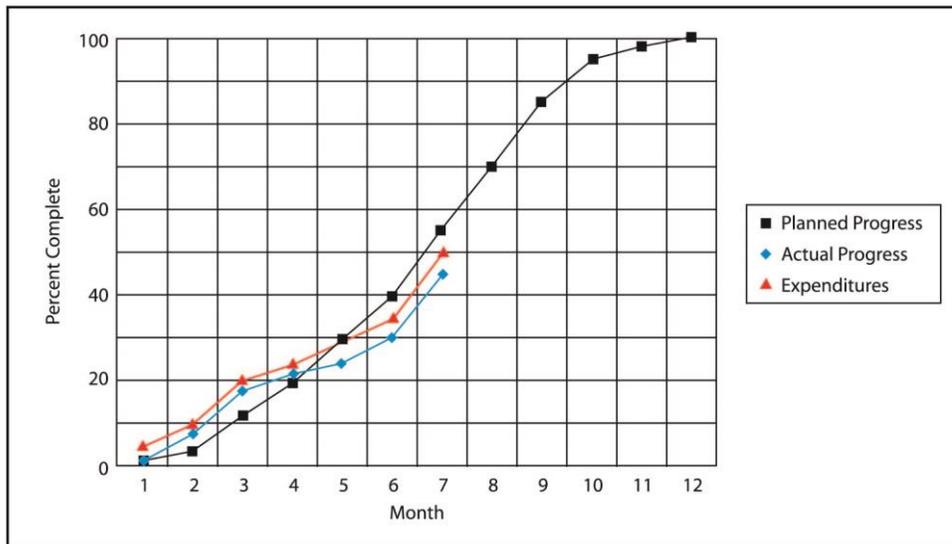
**Schedule:** A milestone list showing the chronology of deliverables and other key events is a simple and helpful way to discuss the schedule. Show detailed

milestones for the coming two months but just the major milestones for future periods. Another useful reporting technique is to list upcoming critical path activities as well as their projected durations and start dates. Include any appropriate discussions about preparations, concerns or other issues related to these activities.

**Quality:** Actions related to the project quality control plan should be reported. They should include submittals currently under quality control review and planned QC activities. This information provides documentation that the QC plan is being followed and that future activities are properly planned.

**Problems:** Explain any unusual events that have occurred or may occur that could affect the project objectives, budget, schedule or quality. Suggest solutions to resolve problems so their impacts are minimized.

Figure 2  
**Sample Progress Chart**



**In-Progress Reviews:** An effective monitoring tool for the FDOT Project Manager is a visit to the office or work site of the consultant performing the project for an in-progress review. In-progress reviews are not effective if the consultant feels it necessary to put on a good show. The purpose should be to get a feel for progress of the work, to gain a first-hand appreciation for significant issues, to offer input into the job as it is progressing and to foster communications. The FDOT PM should give a relatively short notice of the visit, carefully explain the purpose, and expect to see a “work in progress,” not perfection.

**Meetings:** Review meetings are a more formalized variation of the in-progress review. These meetings may be specified in the scope of services. Review meetings should be well planned and well run, using the suggestions found in Part I, Chapter 1. If decisions are needed during a review meeting, the PM must make sure that the requested decision is clearly identified. The decision-maker should be presented with alternatives and the consequences of each as well as the PM's recommendation. Good minutes of review meetings are very important. Someone must be assigned responsibility to record and transcribe minutes. A draft of the minutes should be provided to the FDOT PM for comment before they are published.

**Project Submittals:** The Project Work Plan should include a list of all deliverables. They should also be shown on the milestone list. The consultant Project Manager should ensure that every submittal is made on time, is complete, meets the contract requirements and has undergone the necessary quality control checks before submittal. The FDOT Project Manager should review the submittal to ensure that project requirements are being achieved and that the project is on the right track. It is not necessary to perform a detailed technical check. Part I, Chapter 16 contains information on quality control and submittal reviews. The FDOT Project Manager has an obligation to comply with the allotted review time periods, just as the consultant must meet submittal deadlines.

**Consultant Issues:** The consultant PM must monitor the project on a day-to-day basis. The following recommendations may be of assistance:

- **Time Charges:** The accounting procedures of most firms allow Project Managers to monitor the time charges of the team members. PMs should ensure that the time expended is adequate to accomplish the assigned tasks. Avoid excessive charges because they will adversely affect profitability. Labor costs are the largest project expense under the control of the Project Manager. These costs must be monitored carefully.
- **Team Meetings:** Internal team meetings should be held on a routine basis, using good meeting management techniques. Remember to include subconsultants. Build the agenda around the elements of a successful project: project objectives, schedule, budget and quality.
- **Accounting Reports:** Formal accounting reports vary by firm, but most provide PMs with detailed reports of labor, direct expense, overhead charges and projected profitability. Other important reports may include invoicing and payment data.
- **Project Work Plan:** Review the work plan periodically to evaluate progress. As a project progresses, unforeseen situations and conditions always come up. Update the plan as necessary, and then communicate the revised plan to your team members. If any revision

requires a change in the contract or scope of services, take appropriate contractual actions first.

- **Earned Value Analysis.** Another monitoring tool available to both PM's is Earned Value Analysis. Earned value compares work that has been planned (what has been scheduled to be completed within the measurement period) with work that has been done (work performed within the measurement period), and compares the planned cost of the work completed (what we had planned to pay) with the actual cost of the work (what we actually paid).
- **Earned Value Analysis (EVA)** is a technique used to integrate, measure, and report project performance for the project's scope, schedule, and resources. This technique allows the project manager to relate project schedule, cost and scope using specific mathematical formulas that, when used in calculations, will indicate where variances to the plan exist and where corrective action may be required.

## Control

All the monitoring tools discussed in the preceding pages are available so that the Project Manager can detect problems early and take corrective actions before project success is jeopardized. A common mistake is identifying a problem but failing to take effective corrective action in a timely manner.

**Problem Indicators:** The Project Manager must be alert to signals that there are problems with her/his project. If these indicators are identified and acted on early, they may not jeopardize project success.

**Steady Erosion of Actual vs. Planned Progress:** Actual and planned progress will not always match from one reporting period to another. However, when the actual progress consistently falls behind planned, and the difference grows each reporting period, there is a problem. Usually, this problem needs to be addressed in the first third of the project duration. When a discrepancy occurs, there are two choices: revise the schedule and/or develop a plan to catch up. If the original schedule was not realistic or unforeseen events have delayed the project, it may be appropriate to revise the schedule. Be aware that revising the schedule may require a modification to the contract. If a schedule change is made, be sure it is well documented and the necessary people have been informed of the change. If it is necessary to catch up, don't just say, "We will work harder." Determine why progress is falling behind and specifically address the problem.

**Mismatch of Actual vs. Planned Expenditures:** If the project is a lump sum contract, a mismatch will be an internal concern to a consultant firm only. If it is a cost-reimbursable contract, the FDOT PM should also be concerned. Red flags should be raised if the mismatch is in either direction. If expenditures are lagging, it may be an indication that resources necessary to do the work properly

have not been provided. If expenditures are in excess of the planned rate fairly early in the project, the budget may be in jeopardy.

It is easy to underestimate the work necessary to wrap up a project at its end. Consequently, if expenditures are higher than planned late in a project, there is usually little chance of correcting the situation. Budget problems must be addressed early and aggressively. Labor costs must be controlled. Imposing “loyalty” work time (non-chargeable time during nights and weekends) has only limited benefit. First, it is only useful if the individuals involved are exempt employees. Since others must be paid overtime, there may be little benefit to the budget. And it will be effective only as an exception. When it becomes the norm, people will burn out and production will decrease. In the worst case, they will leave the organization. It is usually better to evaluate the problem honestly and deal with the source. The problem may be inadequately supervised workers, lack of understanding of the budget, too many personnel changes or a host of other possible issues. Ensure that people are not loading the project with non-productive hours in an effort to maintain chargeability.

**Submittal Problems:** Unsatisfactory submittals are perhaps the most important indicator of a problem. An unsatisfactory submittal is cause for dramatic action on the part of a Project Manager because it calls the overall project success into question. Project personnel changes may be necessary. The consultant Project Manager must work hard to repair the loss of trust in her/his ability to complete the project. Missed deadlines are another problem indicator related to the above discussion on progress.

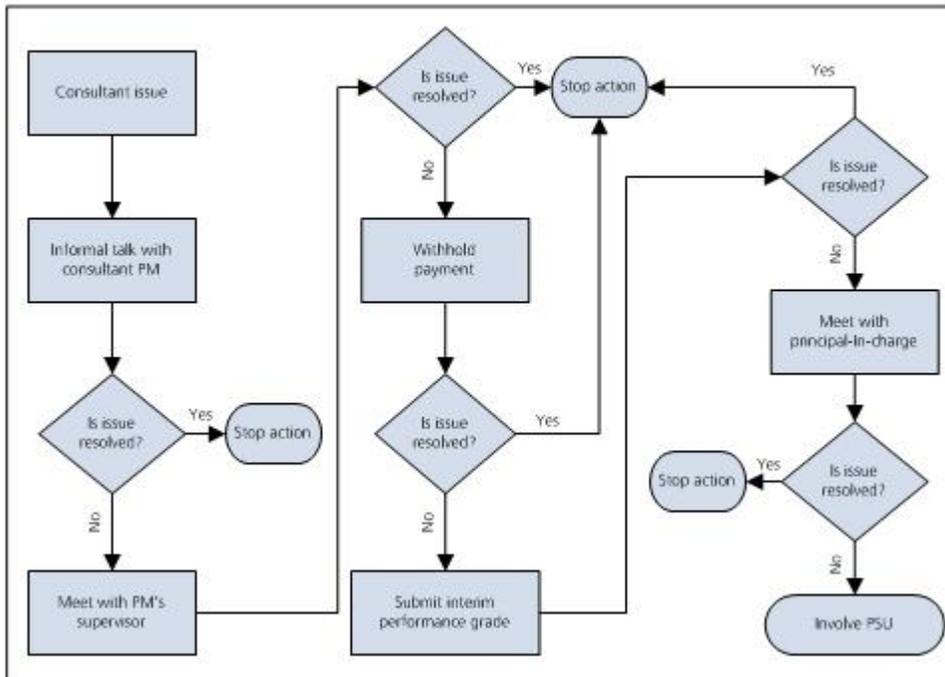
**Control Tools:** The FDOT Project Manager has several project control tools available. **Figure 3**, FDOT Control Tools, outlines the appropriate course of action to take when issues arise.

Have an informal talk with the consultant Project Manager and voice concerns directly and honestly. Most consultant PMs will appreciate the opportunity to fix the problem before more severe actions are taken. In the majority of cases, this conversation should resolve the problem.

The FDOT PM should meet with his/her supervisor and inform her/him of the problem. The supervisor may wish to deal with the issue personally.

After giving the consultant appropriate notice, withhold payments on invoices if the work has not been satisfactorily completed. Follow-up correspondence with the consultant is necessary to clearly explain why payment cannot be authorized.

Figure 3  
FDOT Control Tools



Submit interim consultant work performance evaluations indicating a problem. Since interim performance evaluations can affect selections for other FDOT projects, be completely fair as well as honest in your evaluation. If a poor interim evaluation is submitted, submit a new one as soon as the performance problem is corrected. FDOT Project Managers can submit interim evaluations at any time. Performance evaluations are designed to recognize good performance, provide feedback in an effort to prevent problems as well as to correct sub-par performance. More information on consultant work performance evaluation can be found in Part I, Chapter 14, in this handbook.

Talk to the firm's principal in charge of the consultant Project Manager. This action is going over the head of the consultant Project Manager. Take it only after giving the consultant PM ample opportunity to correct the problem, but to no avail. There are also times when the only solution to a problem is beyond the authority of the consultant PM. In discussions with the PM's principal, be direct about the problem, recommend a solution and explain the consequences to the firm if corrective action is not taken. Be careful not to ask for anything that may be beyond the requirements of the contract and scope of services. Be aware that such a step may result in serious actions against, or even the removal of, the

consultant PM. Before taking this action, the FDOT PM should always check with her/his supervisor. It is usually appropriate for more senior FDOT managers to make contact with the firm principal.

## **When Things Go Wrong**

The discussions above deal with ways to monitor and control a project. When a project is going badly, the best rule of thumb is: "Always give bad news early, rather than late." If the project is in danger of not meeting objectives, of being late, or of being over budget, the PM should let management know as soon as all possible efforts to get it back on track have been exhausted. Neither FDOT nor the management of consultant firms likes unpleasant surprises at the end of a project. When bad news is delivered early, management is likely to work with the PM to redefine the project objectives and minimize the consequences of the problem. In any case, major problems will not go away and will not solve themselves. Surface them as early as possible.

## **When Things Go Right**

It is more common for FDOT projects to be successful than otherwise. When things go right, the Project Manager should share the credit by recognizing team members who contributed to the success. In addition to the conventional personnel procedures (performance ratings, letters of commendation, and so forth), look for ways to recognize high performers publicly. Social events, mementos of the project and praise before co-workers are all appropriate. If the consultant performed well, the FDOT PM should recognize that in the performance evaluations for the project and be willing to make appropriate recommendations to other potential clients of the firm. The consultant PM should remember the contributions of subconsultants. Finally, contributions of stakeholders, either organizations or individuals, should be recognized by the FDOT.