

Developing Project Controls for a Large Transit Program

By Vance Tsiamis, PE, CCM, PSP

Project controls are the lifeline of any project. They are particularly critical on mega projects that include a large number of project participants of varying disciplines and requirements for document control. Early in the project life cycle, it is imperative that the project control procedures are developed and implemented. In the following case study, identification of the project control process began during the planning phase.

Project Overview

The Maryland Transit Administration (MTA) is a provider of transportation services such as local buses, Metro subway, light rail and MARC train for the Baltimore metropolitan region and Maryland. MTA has completed draft environmental impact study (EIS) documents for two corridors for potential transit improvements in the region—the Red Line and Purple Line, totaling \$2.2 billion. These consist of two passenger rail lines, one primarily in the City of Baltimore and the other in Montgomery and Prince George’s counties in Maryland, neighboring Washington, D.C. Each corridor will be partially financed and may be owned by MTA, who is responsible for planning and environmental studies and will take the lead in design, acquiring of all property, preparing and executing contracts for construction (as well as implementing the commitments noted in the final EIS and record of decision).

The current Red Line Light Rail locally preferred alternative (LPA), consists of nearly 15 miles of rail, four miles of tunnel, one mile of aerial structures and 10 miles of surface alignment. The east-west alignment will connect the western suburbs and major employment hubs (including the Social Security Administration Headquarters) with Baltimore City’s Inner Harbor and the growing eastern part of the city (including Johns Hopkins University Hospital’s Bayview campus). The Purple Line Light Rail LPA consists of 16 miles, will connect sectors of two urban counties and provide access

to four Metrorail (DC’s subway) lines, two MARC commuter train lines, AMTRAK and local bus routes. The alignment is predominantly surface, with one tunnel section.

Both projects will enter preliminary engineering in 2011, with a Record-of-Decision currently scheduled for late 2013/early 2014. **Accordingly, this is an outstanding example of where an owner engaged the Program Manager early in the pre-design phase to assist managing the myriad of activities required to advance this much-needed project to construction.**

“Early in the project life cycle, it is imperative that the project control procedures are developed and implemented. In this case study, identification of the project control process began during the planning phase.”

The MTA retained a Program Management Consultant (PMC) team and General Engineering Consultant (GEC) team for each project. The PMC is responsible for instituting systems, procedures and reports to assist MTA with cost control and management, funds management, schedule maintenance, document control, progress reports and Construction Management. The GEC is responsible for preparing the Final EIS and design and the preparation of contract documents. Although multiple teams, with multiple firms, constitute the PMC and GEC entities, the MTA requested a centralized document management system (DMS) be implemented for both projects. This system will implement a coordination, approval, control and distribution process for all policies, procedures and documents developed for the program.

In order to determine an acceptable DMS for these programs, a project controls steering committee was created which included scheduling, contract

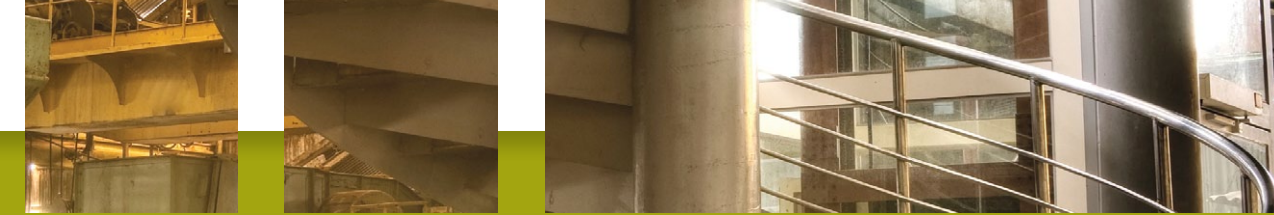


Baltimore’s new Red Line, entering preliminary engineering in 2011, will link western suburbs to major employment centers in the Inner Harbor and eastern parts of the city via 15 miles of new track, both in tunnels and above ground.

PROFESSIONAL PRACTICE CORNER



The proposed Purple Line in Montgomery and Prince George's Counties, Maryland, including a stop on the campus of the University of Maryland, College Park, is an example of an owner engaging the Program Manager early in the pre-design phase to assist managing the myriad of activities required to advance this much-needed project to construction.



administration and cost control experts from MTA and both PMCs. With any such committee, each professional came to the table with their own preferences, lessons learned and ideas for what would work best for the Red and Purple Line program.

Project Controls Scope of Work

The steering committee was charged with leveraging MTA's investment in technology by developing a system that would not only serve the Red/Purple Line programs, but also future projects, and support the agency's current capital program. The committee was formed to determine the technology platform and determine the most appropriate systems. Numerous parameters were studied by the committee, including:

- Industry Standards
- Successful Implementation on Other Programs
- Cost and Licensing Structures
- Compatibility with Other Systems

The group gathered information by assigning team members to attend workshops, invited local firms to make presentations to the committee, dispatched members to interview MTA staff, PMC/GEC staff and other agencies that managed similar programs, and brought back to the committee information learned at conferences and association meetings.

The members shared lessons learned from workshops they attended, conducted phone interviews with owners of similar mega projects and listened to presentations from managers at local mega projects. For example, the \$2.4B award-winning Woodrow Wilson Bridge and \$2.6B Intercounty Connector projects are both very successful, and have very different project controls systems.

Project Control Categories

The steering committee divided into subcommittees to study distinct areas of project controls to include risk/cost management, document control, cost estimating, BIM/CADD and schedule. Each subcommittee performed detailed research, identified risks and made recommendations to the committee. In summary:

- The risk/cost management subcommittee concluded that Primavera Risk Analysis software would offer the best solution along with a data warehouse of costs developed in-house from recent projects and individual experiences.
- The document control subcommittee recommended the use of MTA's current *ProjectWise* system for final storage of all documents; including CADD files/record drawings,

as CADD standards were already in place. The committee also recommended the use of Primavera *Contract Management* software for document control such as submittals, correspondence, RFI tracking and meeting minutes.

- The cost estimating subcommittee did not recommend a single software package, but is considering using Timberline for heavy bid items, and planned to compile historical data for pay items, unit costs and bid tabulations.
- The BIM/CADD subcommittee recommended BIM use on a focused group of projects including maintenance shops, stations and certain sections of track. In selecting the projects, they recommended the users study aspects of existing facilities, the infrastructure, impacts to the community and the stakeholders involved. When BIM made sense, the committee recommended the use of Bentley products.
- The schedule subcommittee's software recommendations included Primavera P6 – latest version, and *P6 Web*. The committee recommended that the PMC should control the master schedule during the design phase, and potentially provide contractor access during the construction phase. Additionally, *P6* should be hosted by a third party.

Implementation

The project controls committee is now in the process of completing their assessment by defining the roles and responsibilities of the various team members in the PMC and GEC teams, along with MTA staff, in regards to each of the five areas for which systems were developed. An outcome of that work will include the reporting requirements, a definition of required hardware and software, and a schedule for deployment along with required training. A Scope of Work and Request for Proposal will be developed, and implementation services will then be procured.

The process to identify and implement the appropriate software and systems for document control is tedious and can take on average anywhere from six to nine months. However, the need is immediate. It takes a collaborative effort to ensure that the implementation occurs quickly and that the needs of all project participants are taken into consideration. Our group insisted that all "egos be checked at the door." It was imperative that all options were explored quickly and concisely. Our primary goal was to provide MTA with the means and method to implement a project control system for their program—a system that is both cost efficient and sustainable. **CM**

Vance Tsiamis, PE, CCM, PSP, is project manager with RK&K, based in Baltimore, MD. He can be reached at vttsiamis@rkk.com.