

21 Tips for Successful Capital Projects

by Thomas Hutka

It looks like the next few years could bring a record number of public works projects to city and county government, despite the otherwise difficult economy. Many local agencies face the need to replace aging infrastructure, improve service capacity, implement cost- and energy-saving green initiatives, enhance security measures, and also comply with increasingly strict U.S. Environmental Protection Agency treatment requirements. To help meet these challenges, the federal government's economic stimulus package will provide additional capital funding needed at the state and local level.

Delays, cost overruns, and quality defects are unfortunately always potential threats to the success of public works projects whether we're building office buildings, treatment plants, parks, libraries, jails, courthouses, streets, utility lines, or any other type of facility. These difficulties are often magnified because capital funding ties up so much of our already limited budgets and because construction can be the most visible sign of our teams' presence in the community.

As managers prepare for all future work, maybe their thoughts turn to past projects. Were they on time? Under budget? Did they end up performing as originally envisioned? Maybe you're contemplating what you would have done differently given a second chance to manage the same public works project: "I'll never do *that*, again!"

After learning a whole lot of things the hard way on more than a few projects, I put together the following list of suggestions based on experience. Some of these concepts might seem pretty basic, maybe even obvious, but they're included here because they address mistakes that just keep happening—much more than they should. Here is

advice on how to avoid the most common and most damaging pitfalls in the construction of new capital projects.

Tip 1: Lock in baselines. Call them baselines, budgets, targets, goals, or whatever you like, but establish key objectives for the project's final outcome early in the process. The three most important—and traditional—areas to track are cost, schedule, and quality. Your first opportunity to publish baselines, as well as advertise project needs, is in your annual council-approved capital improvement plan (CIP). A thoughtfully prepared CIP is integral to a well-planned capital program. If you don't want an overly expensive, late, or poorly built project, lock in baselines to compare against progress throughout the duration of your project.

Tip 2: Play as a team. Literally hundreds of organizations and thousands of people work on even a moderately sized project: from the designer and their many subs to the construction contractor and their subs as well. But don't forget the accountants, attorneys, payment processors, purchasing agents, surveyors, insurers, financial advisers, land agents, building code enforcers, suppliers, inspectors, and many, many others who must complete their assigned jobs for the project to be successful. Make sure you and your team coordinate closely so everyone works together toward the project's goals.

Tip 3: Appoint a team leader. Every project, large or small, needs a single project manager to lead the team to fulfill each individual assignment. The project manager should be the single point of contact for every major aspect of the project for the coordination of the great many varied activities. The assigned project manager could be an experienced member of your engineering office or maybe even you, as the manager, although it's increasingly common for local governments to rely on external program managers to supplement in-house staff.

Make sure your project manager has hands-on experience with similar projects. All too often, to the detriment of public works projects, the new library project is led by the city's assistant librarian, the jail project by one of the sheriff's deputies, and so on. These trusted employees are experts in their chosen professions but not necessarily in managing construction jobs (even if they did recently remodel their home kitchens and have good taste in colors). For these team members, there is a more suitable role, which we'll discuss a little later.

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Tip 4: Share baselines. People can't be expected to help attain project goals if they don't know the project goals. The best way to ensure that team members are on the same page is through the use of properly prepared written agreements. By their very nature, legal contracts define expectations for both parties—especially for cost, schedule, and quality. If a written contract is not appropriate—for an employee in your own organization, for example—try a more informal approach: “Can we agree that all construction pay requests will be paid within 10 days of receipt?” For larger overall project goals, consider including specific milestones in your project manager's annual performance agreements.

Tip 5: Track against baselines. Tracking and adjusting activities is what managing capital projects is all about. If you don't know where you are, you can't know where you're going (and you'll probably end up over budget and past deadline). Communicate with your project manager and project team frequently—preferably in regularly scheduled status meetings. At all times, make sure you and the team know how everyone is doing in reaching individual goals and whether the overall project is (or is not) on track.

Tip 6: Manage “by exception.” This is an old project management technique that puts the emphasis on fixing problems (“exceptions”) in order to meet objectives. Project status meetings should concentrate on just three topics:

- We are meeting our baselines.
- We are *not* meeting our baselines.
- How do we get back to our baselines?

Celebrations and congratulations are important in team play, of course, but spend most of your energies correcting what goes astray (and it will) so you'll have reason to celebrate. Good project management relies on team members helping each other fix problems when necessary to get the project back in shape.

Tip 7: Control quality. Controlling costs and schedules is always a challenge, but tracking can be fairly easy. Is \$24 million greater than \$23 million? Is October 13 earlier than October 14? But how do you track and control the less-tangible targets defining quality?

Start early by telling your design architect and engineer what you require from the project, establishing performance and aesthetic goals for the final facility. If known soon enough, include these expectations right in the contract design scope. Do not assume your designers magically share your organization's vision for what's needed and what's wanted.

Openly communicate your ideas and equally listen to their suggestions. With your designer at your side, check out similar buildings and equipment that have proven successful for other governments. In attempting to correct what's not working in your current facility, don't forget to explore what is working, what you want to keep. There's a baby and some bathwater in most fixes.

Stay engaged throughout the design and construction phases and constantly assess project details against your expectations. Finally, and most importantly, do not compromise your vision of everything the final project should be unless you absolutely have to in order to contain costs.

Tip 8: Facilitate users. Remember the assistant librarian and the sheriff's deputy we talked about earlier? Here's the proper place for their input: include key system operation and maintenance staff—facility users—in preliminary design sessions. Good engineers and architects encourage this input because they want to make sure that the people ultimately using their design are happy with the final product. (Try this acid test for recently constructed facilities: look for perpetually locked doors, covered windows, crushed curbs, trampled landscaping, scratched walls, jury-rigged machinery, and such feedback from staff as, "I coulda told 'em *that* wouldn't work!")

Tip 9: Inflate for inflation. Avoid sticker shock. Make sure all future-year cost estimates include adjustments for inflation. Sounds basic, doesn't it? But, amazingly, many city and county capital improvement plans do not include appropriate (or any) allowance for inflation for future expenditures.

Tip 10: Add a cushion. Modest but carefully managed cost and schedule contingencies are absolutely necessary in order to handle those almost guaranteed unknowns. Include separate line items for contingency amounts in your baselines instead of simply padding estimates. This way, your item-

ized estimates maintain their credibility, and the contingencies will stay intact even when estimates are revised to reflect changing conditions.

Tip 11: Know your permits. Missing even a single permit can really bust a well-planned schedule, but it happens more than you might imagine. Work closely with your designer, contractor, and all relevant permitting agencies to:

- Know which permits are required.
- Understand permitting requirements.
- Schedule appropriate time for the application processes.

Assign a member of your team the responsibility of tracking permit approvals against other project milestones, thus reducing the chance of something important falling between the cracks.

Tip 12: Utility coordination is good. Utility relocation is probably the single biggest culprit in construction schedule delays. It *always* takes longer than expected! Work with all utility agencies early and often throughout both design and construction so that you know (as much as possible) where lines are located and which ones need to be moved. The utility agencies will benefit from this close coordination, as will your project.

Tip 13: Remember land. Make sure your baselines include sufficient time and money for the potential need to acquire easements, construction access, and rights-of-way. The property isn't yours until you own it; do not accept promises or predictions of how willing the seller is or how low the price will be. Although pretty straightforward, land acquisition can be time-consuming for even the most experienced land agent. A lot of construction work has been unnecessarily delayed for lack of a tiny corner clip.

Tip 14: Procurement takes time. Selecting a design consultant and bidding a construction contract take

significant amounts of time. So why do so many capital project schedules leave these steps out? Good rules of thumb are 90 days for selecting consultants and negotiating contract terms and 60 days for advertising, opening, and processing construction bids.

Tip 15: Bid or select. When it comes to signing up your contracted team members, there's a world of difference between bidding and competitive selection. This is a good topic for a separate discussion, but for now let's just say that bidding is not selecting, selecting is not bidding, and the two processes should not be confused. In short, you and all principal team members should know your organization's and your state's purchasing laws.

For specific individual procurements, establish the rules of the game (selection criteria, due dates, and so forth) up front, and stick to them. These are further examples of basic project management concepts all too frequently slighted in practice, often resulting in unnecessary vendor protests, schedule delays, and cost overruns.

Tip 16: Consider alternative contracting. There are a whole lot of new and not so new alternative methods for construction contracting: design-build, design-finance-build, design-build-operate, fast-track, turn-key, at-risk construction manager, agency construction manager, A + B, lease-back, guaranteed energy savings, and the list goes on. These are all great win-win approaches but only when matched with the appropriate type of construction project.

There's too much at stake to try these innovative techniques solely in an attempt to be on the cutting edge. Understand the pros and cons of any contract format you're weighing, and—most important—consider the particular needs of your situation. Because alternative construction delivery methods are constantly evolving, no two contracts turn out the same; make sure your final written agree-

ment serves the specific objectives of your project in every detail.

Tip 17: Change orders are not terrible. In fact, virtually all public works construction contracts require one change order or more. Hey, there's a lot going on in the field—things change, suppliers run out of materials, pipes can be found where they're not supposed to be. Well-documented, well-negotiated contract changes are just as essential as the original contract itself. To streamline what can become a complicated approval process, try including owner-controlled contingencies for both price and due date in the original contract to cover all but the largest changes.

Tip 18: Never give a cost without an explanation. Here's the scenario: you get a telephone call from a councilmember, who asks, "Why did I read in the newspaper that our \$5 million project is now costing \$5 and a half million!?!?" Cost estimates can get a little confusing, what with budgets versus current working estimates versus bid prices versus actuals. With and without inflation. With and without land costs. With and without contingencies, and on and on. Qualify any dollar amount you give for a project: what does the cost estimate include? If in doubt, always give the total project cost estimate that includes everything and then stick to the same number for as long as it's accurate.

Tip 19: Don't rely on your accounting system. That's not to say your government's accounting system isn't good. It is—for payrolls and office supply orders, but not for tracking multi-year, multi-vendor, multi-funding-source activities. Change orders working their way through approvals will by themselves throw off any project costs you might try to glean from a traditional accounting system. Sure, you still have to use your organization's established bookkeeping to pay bills and for auditing purposes (to name just two reasons), but have your project manager keep current working cost estimates on separate, redundant

spreadsheets balanced in sync with official accounts.

Tip 20: Pay your bills. Nothing stops progress in its tracks more than team members not getting paid! Work closely with whomever in your organization pays invoices, and make sure your project manager knows them and the details of their process. If your organization has special forms or other requirements (it is government, after all), announce these details up front in contract specifications and kickoff meetings. If your payment system is notoriously slow, work with staff to improve it. In the long run, you'll get lower construction bids for future work.

Tip 21: Tell everybody. Yes, public information. In addition to citizen-customers, include management staff, news media, and, of course, elected officials in your efforts to ensure that everyone knows how well the job is going. This is particularly true for street and utility-line construction in-

conveniencing residential or commercial neighborhoods as well as any expenditures driving user fee increases. You know why the work is necessary, and you know how great your team is, but does everyone else?

There are the 21 pointers on how to build successful capital projects. Okay, so it's not as simple as all that. But if you follow these guidelines, you'll stand a better chance of avoiding the perils most common to the design and construction industry and be well on your way to making the ribbon cutting a true celebration of a job well done.

If you have suggestions from your own experience you'd like to add to this list, e-mail them to me and perhaps they can be shared in a future issue of PM magazine. **PM**

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PM Census Report by Midcentury

Census data released by the U.S. Census Bureau on August 14, 2008, showed that the United States will be more racially and ethnically diverse as well as much older by midcentury. The data included these highlights:

- Minorities, now roughly one-third of the U.S. population, are expected to become the majority in 2042, with the nation projected to be 54 percent minority in 2050. By 2033, minorities will comprise more than half of all children.
- The nation is expected to reach the 400 million population milestone in 2039.
- The 85 and older population is expected to more than triple, from 5.4 million to 19 million, between 2008 and 2050.
- In 2050, the nation's population of children is expected to be 62 percent minority, up from 44 percent today. Thirty-nine percent are projected to be Hispanic (up from 22 percent in 2008), and 38 percent are projected to be single-race, non-Hispanic white (down from 56 percent in 2008).
- The percentage of the population in the "working ages" of 18 to 64 is projected to decline from 63 percent in 2008 to 57 percent in 2050.
- The working-age population is projected to become more than 50 percent minority in 2039 and be 55 percent minority in 2050 (up from 34 percent in 2008). Also in 2050, it is projected to be more than 30 percent Hispanic (up from 15 percent in 2008), 15 percent African American (up from 13 percent in 2008), and 9.6 percent Asian (up from 5.3 percent in 2008).