

Saving \$1 billion in construction and maintenance

Better management of construction and maintenance can yield major savings opportunities.

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A series on operations transformation in a public-sector organization

With demand for services rising faster than tax revenues, public entities around the world face unprecedented pressure to do more with less. Many think they must make a stark choice: cut service quality, cut availability—or cut both. This series of articles follows a large US public agency that chose another option: find radically better ways to deliver services by completely transforming its operations. Within 36 months, the agency booked nearly \$2 billion in cost efficiencies, while also building the capabilities of more than 10,000 people to make those changes sustainable.

Infrastructure accounts for [\\$2.5 trillion in annual spending](#) globally; of this, the lion's share is spent on construction. Managing contractors and sub-contractors, and the rest of the process, is complicated. It is therefore critical to develop standardized methods to keep track of operations. Because infrastructure projects tend to be expensive, even small improvements can bring substantial savings.

For one large government agency, the first step was to understand itself better. A detailed map of its operations uncovered underlying issues in three related functions: letting (when a project moves from the engineering phase into construction), construction, and maintenance. For example, it found a lack of clear goals that related to the agency's overall objectives. Second, portfolio management and resource planning were ineffective, resulting in inefficient use of resources and a failure to manage total project costs. Finally, different parts of the department had different ways to review contractors, conduct inspections, and coordinate action—too often leading to project delays and cost overruns.

To estimate how much value was at stake, analysts looked at cost variances between similar construction projects. That required examining the sample unit costs for particular projects, such as removing concrete. A study of 3,000 different projects, across the agency's territory, revealed substantial differences in costs, with the most expensive (on a per-unit basis) costing four times as much as the least. If the department could cut the higher costs down to the 25th percentile, it estimated it would uncover \$1 billion in improvements.

Common problems in three functions

Because the stakes were so substantial, the agency sought to understand the specific issues in each function.

Problems of letting: The detailed study found that some contractors worked consistently to a high standard, while others just as consistently ran past deadline and over budget.

It also found that finance and project design functions were not on the same page when planning the letting schedules. This inconsistency made it difficult to forecast cash flows; it also increased the pressure to let projects as early as possible. As a result, projects were under construction before they had right-of-way or environmental clearances. Sometimes they were dropped from the schedule altogether when development milestones were missed.

Further analysis revealed three root causes:

The agency lacked a set of consistent and adhered-to processes that would keep a project on schedule prior to letting.

Contractor screening was based solely on financial health, without regard to performance, quality, or other considerations.

During letting, bid design was typically limited to lump-sum, turnkey contracts. These can be appropriate, but it makes sense to consider legal structures that offer incentives that reward efficiency with the chance for higher profits.

Problems of construction: The agency's analysis also found significant performance deviations among contractors at the construction stage, in terms of time, material, and labor efficiency. This was true not only both different types of projects, but also for similar projects executed by different subunits.

Furthermore, inspection resources were unbalanced across the agency's territory, with some regions having a large number and others relatively few. Where agents were scarce, the evaluations that did take place were often hurried. Instead of checking that projects were going according to plan, inspectors commonly came in only to react to problems that either the contractor or the agency had already reported.

A related issue was the high volume of change orders. Better inspection processes might have avoided many of these; at any rate, they translated into higher-than-expected costs. While standard criteria for change orders existed, they were applied inconsistently. In fact, it was common for a specific change order to get approved in one place and denied in another.

Problems of maintenance: Indeed, standardization was not the norm for planning or selecting maintenance projects and resourcing maintenance crews, either. There was no statewide mechanism in place to share maintenance best practices. In addition, resource imbalances and staff shortages hurt the agency's ability to develop a long-term maintenance culture and far too often resulted in a "quick fix" mindset. These factors inevitably led to a general lack of coordination, and therefore poor outcomes.

Common solutions that add value

With the scale and the shape of the problem now clarified, the department could undertake solutions. Among them:

- **Increasing project bundling:** Packaging small projects with larger ones increased competitive bidding and boosted economies of scale.
- **Refining selection criteria:** Developing higher, better standards for project qualification, for example by devising relevant metrics and looking at past performance, created opportunities for bringing in more competition and enhancing contractor quality.
- **Introducing more aggressive cost benchmarks:** Setting higher thresholds for contractors based on an enhanced understanding of project costs helped reduce price ceilings for particular types of project bids.
- **Upgrading contractor capabilities:** Developing training, digital-construction, and lean-strategies programs with contractors improved efficiency and reduced variants in outcomes.
- **Increasing inspector pool:** Hiring more inspectors who are equipped with a clear set of guidelines to evaluate projects can ensure better consistency and coverage—with savings that more than justify the initial added cost.
- **Improving change-order management:** Thanks to greater standardization, change orders that agency policy says should be rejected are now rejected consistently, regardless of region or type of project.

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As a result of these efforts, the agency saved 8 percent on its capital budget■

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