

A construction worker wearing a grey baseball cap, a dark t-shirt, and a bright yellow safety vest with reflective stripes is looking down at a tablet computer. He is standing on a city street with brick buildings in the background. A network diagram with white nodes and lines is overlaid on the sky. The Cartegraph logo is in the top right corner.

Cartegraph

THINKING BEYOND ASSET MANAGEMENT

A Guide for Public Works

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A GUIDE FOR PUBLIC WORKS

As a public works professional, a lot is resting upon your shoulders. The work you perform and the decisions you make directly impact the quality of life of your citizens. And, while your residents don't necessarily know what it takes to maintain millions of dollars in infrastructure—you do. So, you're there around the clock, rain or shine, building a safe, strong, and resilient community.

Your job as a public works professional is so important, it's timeless. In fact, ancient Roman aqueducts were inspected and maintained by patrol crews who repaired cracks and cleared debris. The Romans even appointed a high-profile curator aquarum—or water commissioner—to care for and govern the aqueducts.

For as long as public works operations have been around, however, the hard truth is that many departments today are struggling to keep up. The goal of this guide is to help your public works department better understand modern operations management—what it is, why it works—and begin thinking about implementing its strategies and technologies to become more effective, efficient, and productive for your citizens.

“From providing clean water to disposing of solid waste; to building roads and bridges or planning for and implementing mass transit; to removing snow on roadways or devising emergency management strategies to meet natural or manmade disasters, public works services determine a society's quality of life.”

AMERICAN PUBLIC WORKS ASSOCIATION

WHY DOES MY CREW NEED TO BECOME MORE EFFECTIVE AND EFFICIENT?

Simply put: a lot has changed since the times of the Roman aqueducts. Dark-Age methods—like pen-and-paper approaches, best guesses, and outdated systems—just can't hack it anymore. Over the last year alone, the following factors have challenged the public works landscape:

"This is a multi-million-dollar business. There's a lot of money out there—taxpayer dollars. We need to be efficient, we need to be competitive, and we need to put out quality work and have good outcomes. That's what the citizens expect, and it's what we should expect of ourselves, too."

JEREMY REICHERT

PUBLIC WORKS DEPARTMENT
OPERATIONS MANAGER
ADAMS COUNTY, CO

INFRASTRUCTURE IS CRUMBLING AND IN DESPERATE NEED OF REPAIR.

The U.S. infrastructure received a near-failing grade of D+ from the American Society of Civil Engineers in their [2017 Infrastructure Report Card](#). The report noted assets across the country are mostly below standard and exhibiting significant deterioration, with many elements approaching the end of their service life. Public works teams need to act fast to avoid failures and strategically invest in maintenance—repairing the right assets at the right time.

CITIZENS ARE LOOKING FOR A CONSUMER-QUALITY EXPERIENCE.

In an age of mobile apps and ecommerce, residents now think of themselves as the end users and government services as a "product" they have "purchased" with their taxes. What's more, they want a personalized experience with platforms that support two-way communication and a quick response: the basics of quality customer service.

SLUGGISH REVENUES EQUAL MID-YEAR BUDGET CUTS.

According to the National Association of State Budget Officers' [Fall 2017 Fiscal Survey of States](#), lackluster revenue performance prompted 22 states to make net mid-year budget cuts totaling \$3.5 billion. This represents the highest number of states reporting net mid-year cuts since fiscal 2010 and the Great Recession. In an uncertain world, [agile, data-driven public works departments will come out on top](#).

THE “SILVER TSUNAMI” IS MAKING A BIG SPLASH.

The Center for State and Local Government Excellence’s [2016 survey](#) found 54 percent of local governments have experienced an uptick in retirements and 40 percent have seen a rise in quit rates. With fewer skilled workers pitching in with day-to-day public works operations, local governments need to do more with less just to keep up. Additionally, with most maintenance knowledge hidden away in paper work orders or lost to the memory of former crew members, communities are shifting to mobile solutions that provide a digital archive of maintenance history.

CITIZENS ARE CALLING FOR MORE OPEN DATA INITIATIVES.

By law, government data is public, and citizens want more transparency and accountability when it comes to their local government. In fact, the single biggest fear of American citizens is the corruption of government officials, according to Chapman University’s [2017 Study of American Fears](#). To make positive strides, communities not only need to make more data open and available, but also ensure the info they’re sharing is crystal clear and easy for citizens to understand.

To overcome these hurdles, public works departments must make an active effort to track their data accurately, and in a way that’s easy to share with citizens. Many high-performance teams are accomplishing this with mobile tools, like iPads and smartphones.



HIGH-PERFORMANCE GOVERNMENT *IN ACTION*

With over 13,000 annual vehicle inspections, the Village of Buffalo Grove Public Works team sought to streamline their paper-based fleet reporting and repair workflows. Combining Cartegraph mobile inspections and automated workflows, crews are now reporting on daily vehicle conditions and generating fleet repair tasks in real time.

What seems like a simple solution is saving the Village 13,145 sheets of paper, 35 days, and about \$20,000 labor hours every year.

WHY IS MODERN OPERATIONS MANAGEMENT SO EFFECTIVE?

Whether you're in the public or private sector, operations management is focused on maintaining the highest level of efficiency possible to achieve the greatest outcomes for your organization and its stakeholders. Homing in on public works, the fundamental goal of operations management strategies—and the technologies that support them—is to extend the service life of infrastructure assets and proactively streamline the processes by which those assets are managed.

Modern operations management is particularly effective for public works teams that oversee a large number of physical, technological, and personnel assets. There are several major reasons for this. Operations management:

- **Defines and documents long-term goals.** Public works departments that seek positive change must challenge their processes through a systematic analysis of what works well, what needs improvement, and how these areas relate to overarching, organization-wide goals. A smart operations management plan defines goals, objectives, strategies, and priorities for public works departments.
- **Aligns leadership within the organization.** Operations management not only assists in the decision-making process, but also enables fact-based dialogue between local government officials, directors, managers, crews, contractors, and more. By establishing clear goals, a department outlines a well-defined path of progress for its public works leaders.
- **Fuels smart, data-driven decisions.** Operations management draws its power from real-time asset, work, and resource data. Modern solutions help local governments inventory their infrastructure and keep tabs on where assets are located, the condition they're in, what they're worth, and related maintenance activities. Operational data also shines light onto labor, equipment, and material trends—helping teams uncover hidden inefficiencies, and make the most of their time and tax dollars.
- **Integrates departments, initiatives, and budgets.** Local government agencies often have multiple departments that use separate solutions to manage their assets. This results in a system that is complex, multi-layered, and inefficient. A successful operations management solution will seamlessly integrate with other systems and share data cross-departmentally. This helps your team maintain assets, deliver services, and improve its overall performance.

- **Creates benchmarks and measures outcomes.** A successful operations management approach focuses on outcomes instead of outputs. Leveraging self-assessment tools allows public works departments to set benchmarks to increase operational efficiency and effectiveness. It also introduces the ability to assess and measure outcomes that meet the goals and objectives set forth.
- **Promotes long-term operational improvement and system integrity.** Greater attention to system-wide assets and their conditions can reduce unexpected failures of physical assets, not to mention minimize lawsuits and negative feedback from the public. Plus, operations management helps organizations and public works teams continually improve with access to the most reliable, real-time data available.



HIGH-PERFORMANCE GOVERNMENT *IN ACTION*

When an infrastructure network is built for twice your current population, you need to make educated decisions on how time and taxpayer dollars are spent. That's why the City of Pittsburgh is using their work and asset data to build equitable street paving budgets based on practical—not political—infrastructure improvements. **Staff have become more compelling, data-driven storytellers, resulting in a \$1 million paving budget increase, more informed city planners, safer streets, and improved transparency and citizen engagement.**

DON'T GO IT ALONE:

TOOLS AND PARTNERS TO HELP YOU ON YOUR HIGH-PERFORMANCE JOURNEY

Lewis and Clark. Marco Polo. They're all renowned explorers, but do you know what else they had in common? They leveraged the right equipment and tapped into trusted guides to help them navigate uncharted waters.

For example, with the latest high-performance technology you can now:

- Track how quickly you respond to citizen requests.
- Monitor infrastructure performance with detailed reports and dashboards.
- Gain visibility on spending—and whether you're on track with your budget.
- Analyze data to find opportunities to increase efficiencies.
- Prepare budgets and capital improvement plans.
- Measure the ROI of your maintenance methods and plan accordingly.
- Prioritize projects based on budget or asset criticality.
- Develop emergency response plans for your critical assets.
- Run projections to see the impact of budget on asset condition.

Outdated asset management technologies are no longer efficient, nor sufficient, for meeting modern public works goals. Here are 7 characteristics you should look for in your operations technology:

1 USER-CENTRIC DESIGN

When choosing software for your team, consider the ease of use and intuitiveness of its design. A clean, simple interface allow public works crews to concentrate on the task at hand, rather than trying to muddle their way through clunky software that makes tasks more difficult to manage and complete. You don't want your team wishing they were still using paper work orders or refusing to use the new system.

2 MOBILITY

The system you choose needs to provide optimal power and functionality for your mobile workforce. Look for a system that performs as well, or better, on a mobile device as it does in the office. That way, no matter where the asset is located, your crews have everything they need to access to complete work accurately and on time.

3

DATA ORGANIZATION

Does your software make it easy to input, view, and export data? If not, look elsewhere. Quick, easy access to well-organized data, such as a particular asset's work and inspection history, helps your team to make smart decisions when performing their work in the office or on the go.

4

ADAPTABILITY

Identify your technology needs today. Now, consider how those needs might evolve five years down the road. Use that knowledge to choose a system that has the ability to expand and grow with the needs of your community and the public works operations that service it.

5

INTEGRATION

It takes more than one system to keep a public works department running efficiently. High-performance operations technology is the place where those enterprise systems connect. The right system integrates easily with everything from your fuel management system to your 311 request platform and will share data with them in real time.

6

CROSS FUNCTIONALITY

A system should make it easier to connect and share information with other departments, not harder. Organization-wide thinking—along with the communication and collaboration that makes it successful—isn't possible using a system that creates data silos. When every user has access to the same data, productivity and decision-making improve.

7

AUTOMATION

To be more effective and efficient, high-performance crews must accomplish more with less energy. Look for automation features that let the system do some of the heavy lifting for you when it comes to data entry and repeatable actions. You'll be out creating more of an impact while the system saves you time, keeps you organized, and reduces data entry errors.

WHAT SHOULD I LOOK FOR IN A TRUSTED PARTNER?

Building a high-performance public works department means that you have the right tools and ongoing monitoring to keep your operations at peak levels. It also means choosing the right partner to help navigate the road ahead.

A partnership is more than just a software purchase. It's the start of a new way to do business, and you'll need experts that can help you set and achieve goals. Look for an organization that's as invested in your journey as you are, and one that offers a thorough combination of training, support, coaching, and consulting. With the right partner, you should never feel alone. They should be beside you every step of the way.

NOW YOU KNOW

Your citizens count on you to manage your infrastructure assets effectively, deploy resources efficiently, and take care of their community. Your elected officials put their trust in you to execute those tasks and use taxpayer resources for maximum return.

By using the insights and best practices outlined in this paper, your public works team can begin your journey to smart, state-of-the-art operations management. Remember, it's all about striving to be better today than you were yesterday.

***IF YOU LIKED THIS GUIDE, YOU'LL LIKE THESE
ADDITIONAL RESOURCES:***

ABOUT CARTEGRAPH

Cartegraph is in the business of building high-performance government. They offer software solutions that help local government agencies manage their physical assets and associated operations. With Cartegraph, users optimize the life of their infrastructure, deploy maintenance resources efficiently, and increase productivity.

To build high-performance governments, Cartegraph uses a comprehensive, three-pronged approach that combines success coaching, expert consulting, and state-of-the-art software solutions for asset, work, and resource management to help agencies capture data, analyze it, and prepare for the future. For more information, visit cartegraph.com.