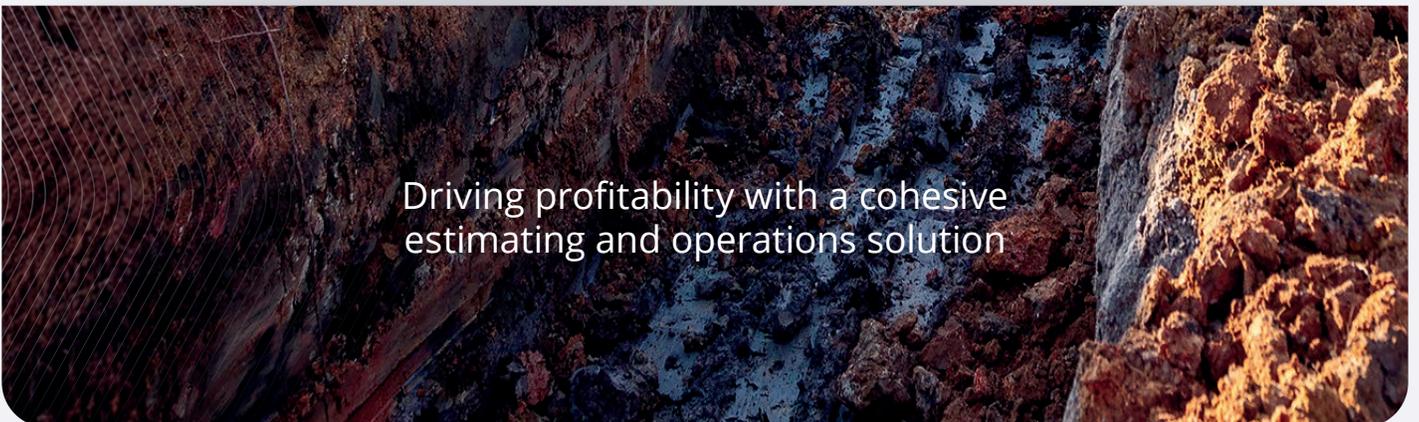




# The Ultimate Guide

HEAVY CIVIL CONSTRUCTION MANAGEMENT SOFTWARE



Driving profitability with a cohesive  
estimating and operations solution



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# Introduction

## Software drives profitability

Not too long ago, software and data tools were secondary considerations in the heavy construction business. Paper and spreadsheet-based management tools put competitors on equal footing. Winning bids and earning profits hinged more on hands-on experience, industry expertise and gut feeling. Now we are seeing digital adoption at a rapid pace.

Purpose-built heavy construction software is creating imperative opportunities to increase accuracy, agility and efficiency across estimating, operational and maintenance workflows. Aggregating, analyzing and acting on the vast amount of available data can be the difference between profit and loss. Companies that do not have a proactive and cohesive software strategy are finding it increasingly difficult to compete for new jobs and talent against the ones that do.

**This guide looks at the options and approaches that heavy construction contractors should consider in order to stay on the winning side of this dividing line.**



# Heavy construction outlook

## Opportunity

North America's heavy civil construction sector is expanding. Growing demand to update aging infrastructure, expand urban development, transform the energy grid and implement climate-resilient projects is driving higher project volumes. At the same time, emerging technologies like BIM, drones, AI and automation are helping contractors work smarter, improving efficiency, safety and overall productivity.

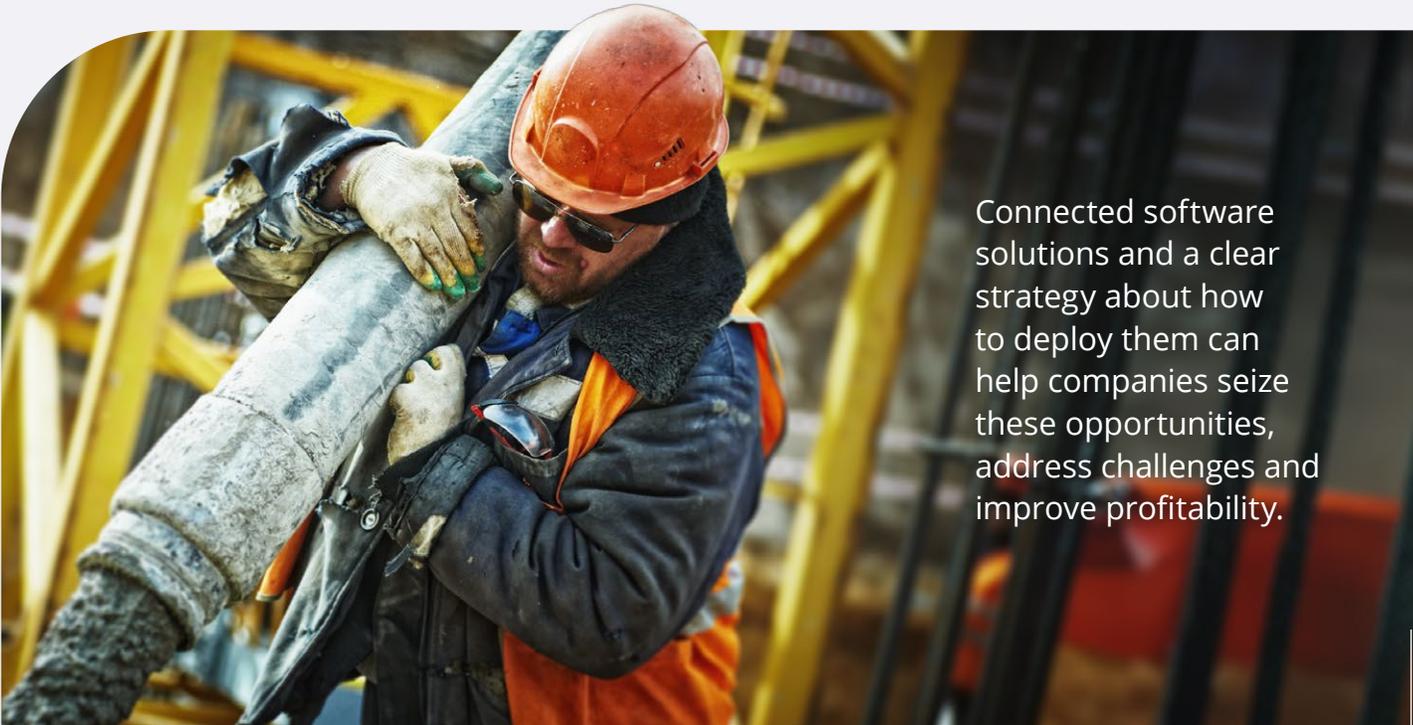
## Key challenges facing civil contractors

### Business & economic pressures

- Tighter margins and rising competition make winning complex projects harder
- Labor shortages are making it difficult to attract and retain talent, limiting productivity and impacting project delivery
- Material cost volatility, inflation and cash flow uncertainty put budgets and schedules at risk
- Regulatory compliance and contract management add complexity to project execution

### Technology & operational pressures

- Fragmented systems and lack of integration create inefficiencies and "dark data"
- Rapidly evolving technologies require digital skills and agile adoption
- Cybersecurity and data management challenges threaten operational stability
- Resistance to change and high costs of technology adoption slow digital transformation



Connected software solutions and a clear strategy about how to deploy them can help companies seize these opportunities, address challenges and improve profitability.



# Embracing Technology

## Four approaches to software deployment

Keeping up with technology and making the right software investments at the right time can be challenging. Start by stepping back and reviewing the four basic approaches.

# 01

### Stay old school

Spreadsheets are familiar, comfortable and easily customized. The investment is minimal, and so is the learning curve. However, limitations can emerge as your business and job complexity grows especially with fluctuating material costs and increasing margin pressures and performance expectations. All of these challenges drive competitors to look for technology solutions to solve these problems and gain a competitive edge.

# 02

### Piece things together

Independent, stand-alone software tools can be very effective for estimating, field management, scheduling and other key functions, but managing multiple solutions, keeping them in sync and getting them to talk to each other often requires IT expertise, redundant databases and complex integration steps. Challenges with integrating and syncing multiple applications can outweigh the benefits they deliver. Niche software providers can also struggle to help their customers scale up as they grow or keep up as new technology emerges.



# 3

## Go with financial management and accounting derivatives

All-in-one solutions from accounting and resource planning software providers often include add-on applications for estimating, field management and equipment, but if the offerings aren't purpose-built for construction they can create more frustration than value. It is also important to understand how the data flows and syncs between the back office and field within these solutions. The frequent complaint from estimators, project managers, foremen and crews is "They just don't work the way we work".

# 4

## Adopt a connected solution

A connected software ecosystem for estimating, operations and maintenance is comprised of individual applications designed from the outset to work together. Workflows are optimized for specific functions, and integrated applications share and update real-time data, without the need for redundant databases. This eliminates silos and connects every phase of a heavy construction project—from estimating to invoicing—where project profits are won and lost. The best technology solutions for contractors are built to bridge the end to end phases of a construction project—from estimating to field production to invoicing—where profits are won and lost.



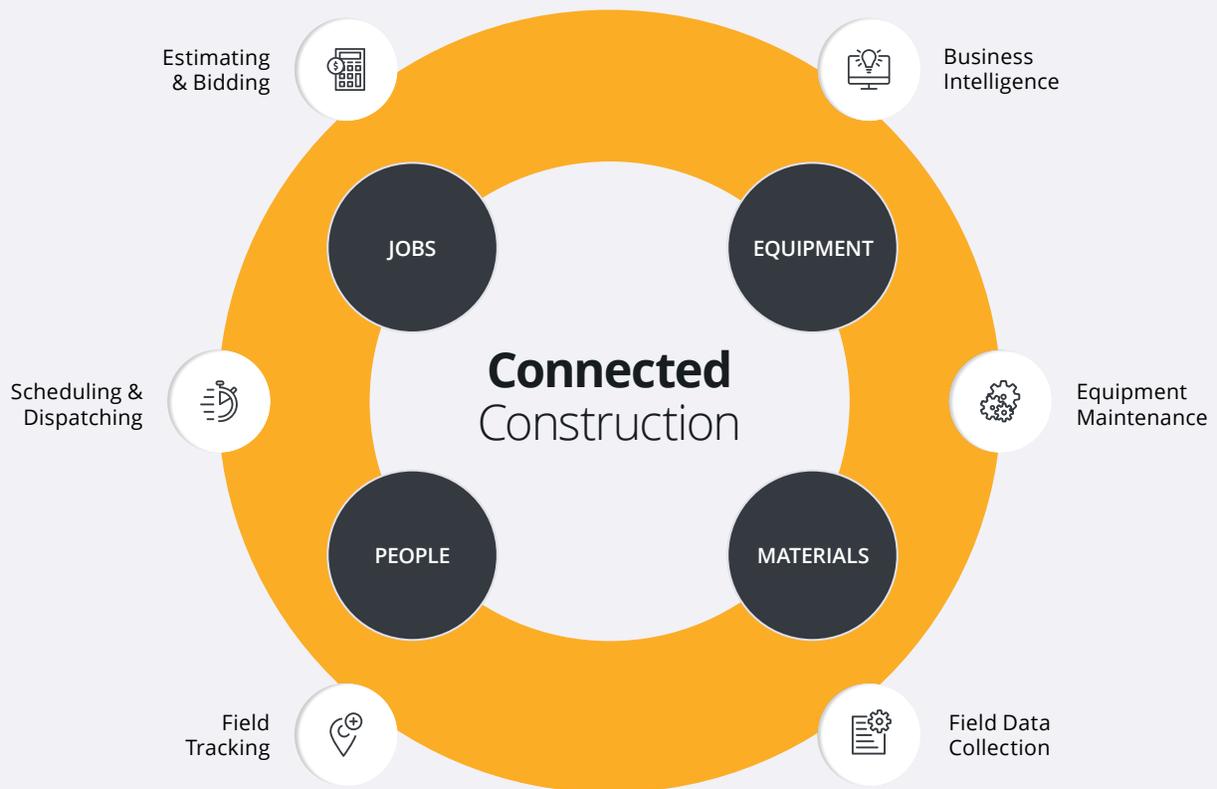
# Leverage a connected ecosystem

## Connecting applications and data

Software specifically designed for the heavy construction contractor improves individual functions like estimating, scheduling, dispatching, field tracking and maintenance.

But the real advantage comes when these workflows operate as one. A connected construction solution makes that possible—creating a shared foundation where data flows seamlessly across teams and applications. With information on employees,

equipment and jobs stored in one place, redundancy and errors disappear, and everyone stays on the same page. Update a record once and it's instantly reflected everywhere; keeping the entire operation in sync and moving forward together.





# Getting buy-in

## Retain and attract talent

A big reason many construction companies hesitate to invest in software is the expected push back. Owners and managers often look at employees entrenched in a “this is the way we’ve always done it” mentality and perceive a barrier that’s just too big to overcome.

Fortunately, when they choose software designed specifically for construction, they are pleasantly surprised by how short the learning curve is and how quickly it is embraced.

### The critical questions to ask in the selection process are:

- Is it easy to learn and intuitive to use, even for people with little or no computer skills?
- Will it give employees the added satisfaction of being able to do their jobs better in a relatively short amount of time?

### Appealing to the next generation

Attracting skilled younger talent is one of the biggest challenges in construction today. This new generation grew up with computers and software; technology is second nature to them, and they know how much it can accelerate their work.

They also expect to use digital solutions to help them succeed and grow in their careers. As competition for top talent intensifies, contractors who invest in the right technology will stand out and gain a major advantage in recruiting and retaining the next generation of builders.

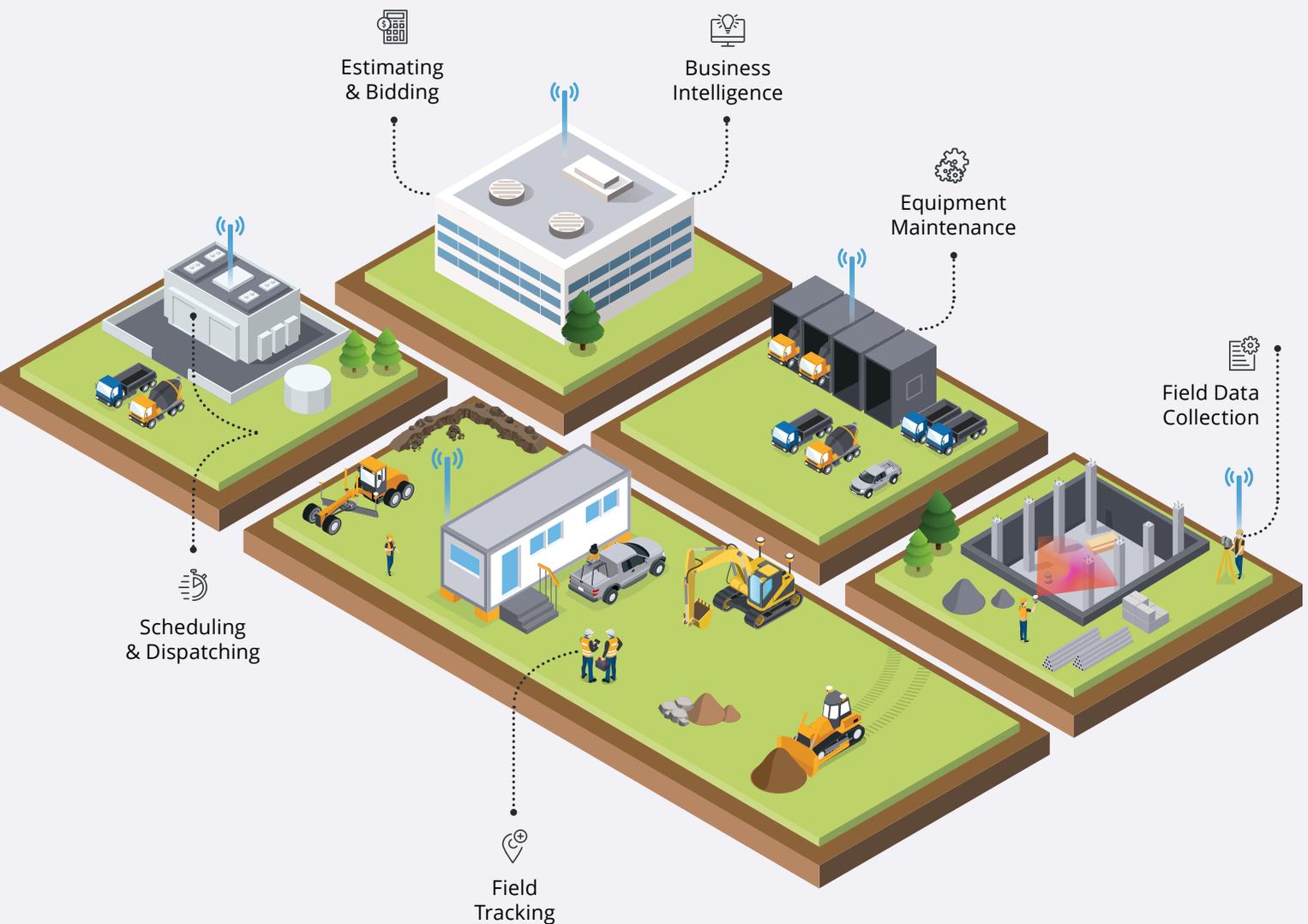


# Mobile tools

## Field-to-office efficiency

When a significant portion of your team is in the field or moving from site to site, mobile access is essential so teams can track and submit employee hours, production data, equipment usage and work logs from any device—online or offline. When that data syncs back to a single connected solution, it becomes even more valuable. Office teams can immediately access accurate field data for scheduling, dispatching, payroll and job costing.

This eliminates duplicate data entry and gives both field crews and office staff a real-time, shared view of project progress. Teams can collaborate faster, make informed decisions sooner and stay aligned from estimate through execution—no matter where the work is happening.





# Estimating and takeoff

## Win more of the right jobs

Earning a profit begins with estimating. Construction companies that step up from spreadsheets or outdated software complete more bids in less time. They also achieve levels of accuracy, flexibility and analysis that's required to win the right jobs at favorable margins.

Essential requirements in estimating software include:

- A single, centralized cost database so every estimator works from the same up-to-date labor, material, equipment and unit rates
- Features that make it easy to pull the right cost structures into each bid based on project requirements
- Scalable and reliable performance that grows with the business whether supporting one estimator or hundreds

## Comprehensive estimating solution

Estimators need software that works the way they work. Creating item databases, crew and task templates and reusable cost structures should be intuitive, and building estimates from these components should feel logical and efficient.

Additional features to look for include:

- **Flexibility** – Bid at any level of detail, from pay items to WBS levels
- **Collaboration** – Multiple estimators working on a bid simultaneously
- **Mobility** – Access resources remotely and sync seamlessly with the server
- **Bid Management** – Easily apply built-in markup and pricing schemes
- **Market Analysis** – Compare and evaluate bids on public projects
- **Management Reporting** – Aggregate estimate data for powerful insights
- **Audit Trail** – Track estimate history and recover previous versions easily





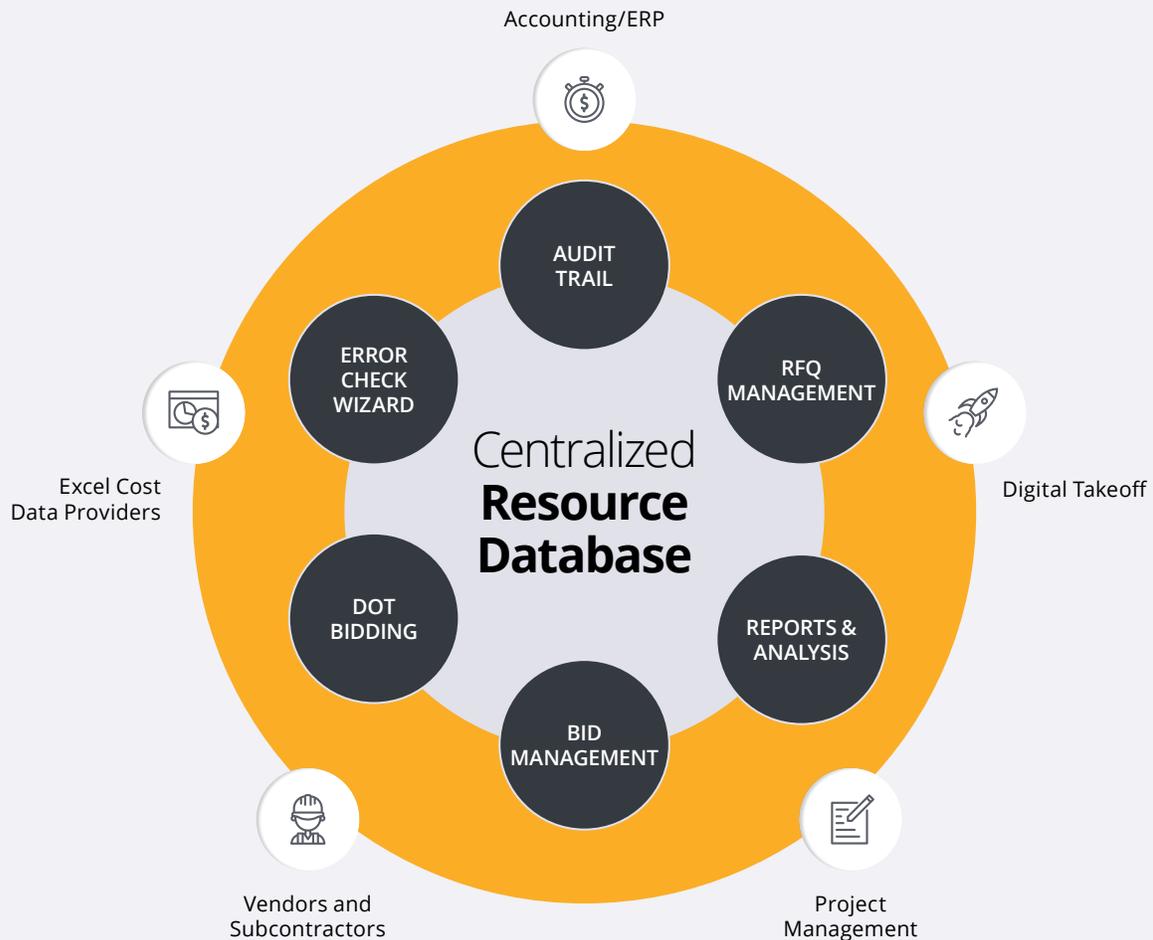
## Integration is essential

A viable estimating solution should offer integrations for improved accuracy and time savings.

Key integration capabilities to consider in your evaluation includes:

- **Takeoff solutions** – pull in 2D and 3D quantities to bids
- **Excel and other cost databases** – import and use existing data easily
- **Electronic bidding systems** – including built-in DOT capabilities
- **Vendors and subcontractors** – automate communication to speed up the bid process
- **Project management and accounting/ERP systems** – ensure estimates flow smoothly into broader business workflows

## Estimating solution

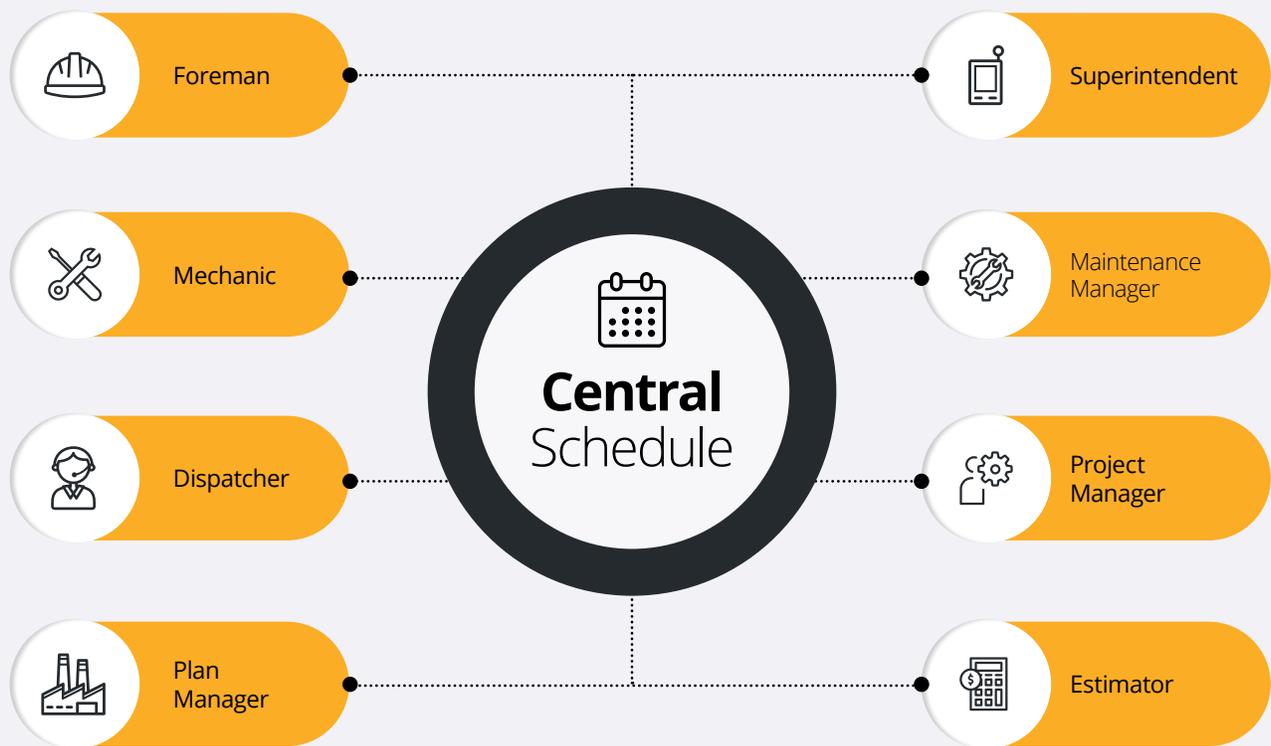




# Scheduling & dispatching

## Visibility and collaboration are essential

In construction, coordinating people, equipment and materials over extended time periods is a critical, complex and continuously evolving challenge. Replacing a disconnected mix of spreadsheets, phone calls, whiteboards and messages with a specialized software solution simplifies the process and provides real-time visibility. Teams can collaborate more effectively, keeping projects on track and running at peak efficiency.





# Be proactive instead of reactive

The right software makes scheduling and resource assignments easy and intuitive. Schedulers receive advance alerts about labor, equipment or materials conflicts, helping prevent last-minute emergencies and minimize interruptions or downtime.



## Increase visibility

Electronic scheduling ensures that resource status and updates are visible enterprise-wide, tailored to each role. Flexible calendar views and real-time updates keep everyone on track, while map views with location-based information add even more value.



## Access data everywhere

Access to a centralized schedule on mobile tablets is essential, enabling employees to work from anywhere to create requests, fill assignments, coordinate moves or resolve conflicts.



## Add value with reports

Reporting allows managers to drill deeper, analyze moves, view crew availability, track production targets and summarize activity. Subscriptions can also be configured so that employees receive the reports they need, exactly when they need them.



# Field performance tracking

## Real-time data and streamlined processes

Once a project is underway, field tracking software captures job performance data and compares it to the bid, helping teams better manage costs. Immediacy is critical. The faster a company gains an accurate picture of field activity, the faster it can make operational adjustments. Minimizing inefficiency, redundancy and delays in capturing and analyzing this data is equally important.

Customizable electronic field logs with full mobile capabilities support accurate daily reporting of:

-  Production Quantities
-  Employee Hours
-  Equipment Hours
-  Materials
-  Trucking
-  Subcontractor Activities

Mobile functionality empowers employees to manage field logs and timecards, sign-off electronically and view data anytime and anywhere. Additional features to look for include customizable dashboards and reporting, as well as the ability to manage production and time-and-materials (T&M) work within the same log.





# Asset management

## Maximize equipment uptime and cut costs

With so much financial risk and reward tied to equipment, it's no wonder so many companies are moving from fragmented paper- and spreadsheet-based systems to specialized maintenance management programs. A strong maintenance program provides enterprise-wide visibility and enables companies to...

### Centralize Information

Establish a single source for equipment status, history and documentation

### Manage Maintenance Processes

Streamline creation and execution of repair requests and work orders

### Drive Preventive Maintenance

Set up and stay on top of proactive, user defined programs to prevent unplanned work, increase uptime, cut costs and improve safety

### Plan and Schedule

Assign maintenance labor, parts, materials and tools on a central schedule with drag-and-drop ease, enabling ongoing adjustments that maximize efficiency and uptime

### Gain Mobile Agility

Access documentation and manage repair requests, work orders and time cards in the field and in real time

### Leverage Telematics and GPS Data

Aggregate data coming directly from equipment – automatically – and use it to drive maintenance and prevention intervals

### Improve Reporting and Analytics

Track key indicators and leverage data to make more informed repair, replacement and rental decisions

### Maximize Warranty Coverage

Savings generated by a Warranty Tracking feature alone could justify the cost of a Maintenance Management Program

## How do you measure up?

Industry leaders hold maintenance costs to around five percent of revenue. For others with reactive approaches, that total can climb to fifteen percent or more.





# Maintenance solution





# Data capture & analysis

## Unlock the power of data

Information is an underutilized asset in construction. Most companies waste too much time collecting, searching and organizing data, and too little time using data to drive better decisions and higher profitability.

A secure and comprehensive cloud-based software solution can reverse the “content chaos” allowing companies to:

Easily create customized electronic forms and capture rich content such as photos, videos, attachments, e-signatures, timestamps and GPS coordinates.

Establish an organization-wide system—leveraging mobile capabilities—to bring immediacy and efficiency to how employees work on a daily basis.

Mine data from forms and other electronic sources to create analytical reports and dashboards.

Generate immediate alerts and notifications by text message or by email.

The right information  
given to the right people  
at the right time empowers  
the right decisions





# Bringing it all together: Connected workflows for profitable civil projects

Civil construction projects are complex, with dispersed systems, data silos and growing margin pressures. A unified estimating and operations platform bridges the gap between the office and the field, connecting every workflow—from bid to build and beyond.

By consolidating scheduling, dispatching, field tracking, equipment maintenance and reporting in a connected ecosystem, teams gain real-time visibility into costs and resource utilization.

Mobile capabilities extend this connectivity to crews on the job site, ensuring data flows easily back to the office for payroll, job costing and invoicing.

#### **With connected workflows, contractors can:**

- Deliver bids faster and with greater accuracy to win more projects
- Optimize scheduling, dispatch and resource allocation to reduce delays and stay on budget
- Capture field data electronically for precise production tracking and streamlined reporting
- Integrate accounting and operational data to

manage cash flow and project profitability

- Make smarter decisions based on accurate, real-time insights across all projects
- Bid information and phase codes can be imported from the estimating software
- Progress tracking on electronic field logs flows directly to management reports
- Repair requests created in the field flow directly to the Maintenance Management System
- Payroll, production and equipment data flows directly to the accounting system
- Status and location of resources is available in real-time from the systems used for scheduling, dispatching and maintenance

A connected construction platform simplifies the technology stack, enables collaboration and ensures every team member—field or office—works from the same, up-to-date information. The result: more productive teams, fewer errors and better profits.





**Explore** how Trimble's connected tools make civil construction more efficient and profitable.

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