

vitruvi

Construction Management Software



Forecast or Fail:

The Hidden Cost of Poor Planning in Infrastructure Projects



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INTRODUCTION:

The High Price of Uncertainty

Infrastructure is undergoing a transformation. The digital revolution, decarbonization targets, aging assets, and consumer expectations are pushing projects to be faster, smarter, and more cost-effective. But amid the pressure to deliver, something keeps slipping through the cracks: financial control.

Infrastructure projects are notorious for cost overruns. McKinsey reports that 98% of megaprojects experience budget or schedule overruns, with cost overruns averaging 80% of the original budget. Whether it's a \$500,000 trenching miscalculation in a fiber rollout or a billion-dollar oil and gas delay, the consequences of inaccurate forecasting are significant — and increasingly visible to investors, regulators, and the public.

What's more troubling is that these overruns aren't always caused by poor planning. In many cases, they stem from good plans that fail to adapt when conditions change. Delays from permitting, fluctuating material costs, extreme weather, or labor shortages quickly erode even the most carefully crafted budgets.

AI-powered forecasting engines offer a new approach — one rooted in dynamic, real-time visibility. In this eBook, we'll explore the most common causes of cost overruns, why traditional tools fall short, and how these emerging technologies help organizations regain control through predictive intelligence, field integration, and data-driven planning.

*"The biggest risks to project budgets today aren't what you don't know — it's what you don't see until it's too late." — **Infrastructure PMO Leader***

The Most Common Causes of Cost Overruns

Cost overruns are rarely caused by a single factor. Instead, they're the result of a breakdown in visibility, communication, or planning assumptions. Here are some of the most common reasons costs spiral out of control:

01

Outdated Planning Tools

Many infrastructure teams still rely on spreadsheets or siloed systems to track budgets and timelines. These tools aren't designed to adapt in real time. A single missed update can throw an entire phase off course, with no alert system to catch the impact.

02

Delayed Field Reporting

By the time a field team's progress is compiled, cleaned, and uploaded into reporting systems, the damage may already be done. Real-time visibility is crucial — but it's impossible without digital field-to-forecasting integration.

03

Labor and Supply Volatility

Contractor shortages, union schedules, long lead times, and fluctuating material prices all introduce variables that static systems can't model. Projects need tools that forecast against live inputs, not assumptions made three months ago.

04

Permitting and Regulatory Delays

Permitting and inspection delays can derail timelines, especially when multiple agencies are involved. Without scenario modeling, teams can't simulate or prepare for the downstream effects of those delays.

05

Reactive, Not Proactive, Adjustments

Most cost control processes are reactive. Teams respond after a variance has already occurred — often with expensive fixes. AI-driven forecasting flips this model, offering proactive alerts weeks in advance.

Modern forecasting platforms address each of these issues by fusing predictive analytics with field data and schedule intelligence. In the next section, we'll look at how forecasting breaks down across industries — and how AI helps organizations respond faster and smarter.

What Makes Forecasting So Hard?

Forecasting isn't just a math problem — it's a coordination problem. Different teams, timelines, systems, and suppliers must all align for financial projections to remain accurate. And each industry presents unique challenges:

Fiber

Fast-paced builds, high contractor turnover, and regional permitting requirements make it difficult to track accurate progress and forecast delays. One permitting bottleneck can sideline multiple crews.

Oil & Gas

Remote sites, extreme conditions, and layered compliance oversight make oil and gas projects uniquely complex. Materials and equipment must be sourced globally, and idle time for specialized equipment can cost millions per week.

"Unless you can meticulously track every meter of cable laid into the ground, you can very easily end up paying for something twice," says Neil Grose, Lit Fibre. "You don't have an audit trail and ultimately your cost-per-home metric goes up."

Renewables

Weather is the wild card. Solar and wind projects face shifting timelines based on seasonal conditions, interconnection requirements, and local regulatory changes. Missing a delivery window can delay power purchase agreements.

Utilities

Utility projects often span multiple jurisdictions, aging infrastructure, and heavily regulated timelines. Any misstep affects customers and triggers scrutiny from public utility commissions. Forecasting must balance accuracy with transparency.

The takeaway? Forecasting requires real-time, field-informed, and industry-specific intelligence. That's where AI-powered platforms stand out.

A New Approach: AI-Driven Forecasting

Today's AI-powered forecasting platforms empower organizations to shift from static planning to dynamic cost forecasting. They provide a centralized environment where real-time field updates, vendor costs, weather inputs, and permitting timelines all come together to inform the forecast. Let's look at the tools in action:

Forecasting Engine

AI systems use historical benchmarks, live field progress, and supplier inputs to predict when and where costs will diverge from plan. They offer probabilistic forecasts that update daily based on changing project realities.



Scenario Planning

Users can run simulations to explore the impact of a 2-week permit delay, a 15% price increase in conduit, or a storm event. This enables proactive decisions, like resequencing crews or reordering materials in advance.

Integrated Field Reports

Field crews log completed tasks, material usage, and issues from mobile devices. That data feeds directly into the forecast engine, eliminating lag and ensuring accuracy.



Dynamic Budget Thresholds

Budgets aren't static. AI platforms enable smart thresholds that adjust to project phase, geography, weather, and vendor variability – alerting users when financial risk exceeds forecast tolerances.



Executive Dashboards & Alerts

Finance and leadership teams receive visual dashboards highlighting forecasted vs. actual costs, risk exposure, and milestone performance. Alerts flag deviations so teams can act decisively.

"With Vitruvi Software we now have real-time, reliable information. We can see exactly what work is planned for each day, the completions we expect, and what we can hand over to the sales team to generate revenue."

Colin Lodl, Director of Fiber to the Home & New Market Development Great Plains Communications

The result is clarity. Instead of surprises, teams get signals. Instead of manual updates, they get automatic insights.



Real-Time Data, Real-Time Decisions

Forecasting without real-time data is like flying blind. Most cost overruns occur not because teams fail to plan — but because they fail to adjust when on-the-ground conditions change. That's why modern forecasting platforms integrate field data directly into project models.

From Field to Forecast

Crews can log completed tasks, equipment usage, material pull, and exceptions from their mobile devices. This information flows instantly into forecasting models to update costs, progress percentages, and risk levels. No more lag from weekly reports or manual reconciliations.

Eliminate Delays Between Action and Awareness

When AI-powered platforms are connected to real-time data, project managers can respond faster to early warnings — like slowing crew performance or unexpected material consumption. Forecasts evolve continuously, not quarterly. This helps:

- Reduce rework
- Avoid idle labor
- Improve drawdown accuracy
- Shorten response time on change orders

Fail-Safe Reporting:

Even when reports are incomplete, intelligent agents save what data is available as a draft or temporary submission for review. This ensures that progress is continuously captured and reflected in the forecasting system, preserving forecasting continuity and minimizing data loss that could skew projections.

Voice and Messaging-Based Reporting:

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"Having information available in real time from Vitruvi shows us where the cable was put in the ground and how inventory was consumed, which gives us the ability to understand what we are building and report on status."

Rick Fitchhorn, Senior GIS/Mapping Manager, Great Plains Communications

Predictability as a Competitive Advantage

AI-powered forecasting delivers more than operational efficiency — it creates strategic clarity. Infrastructure companies that can forecast with confidence gain distinct advantages:



Build Investor Confidence

With data-driven forecasting, teams can defend budgets, justify investments, and prove project health in real time. This transparency improves access to capital and strengthens lender and board trust.



Optimize Resourcing and Bidding

By modeling best- and worst-case scenarios, teams can optimize contract structures, allocate labor more effectively, and submit more competitive bids without increasing exposure.



Improve Regulatory Standing

With traceable digital records and progress metrics, companies are better prepared for audits and regulatory reviews — reducing compliance risk and speeding up approval processes.

"Ultimately, better insight translates into tighter control over costs and greater confidence in delivering a fast, high-quality service to our paying customers."

Neil Grose, Chief Delivery Officer, Lit Fibre

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Industry Deep Dive: Forecasting in Action



Fiber

A broadband operator used AI forecasting to anticipate material spikes during a multi-city rollout. The system flagged potential supplier bottlenecks weeks ahead of schedule, enabling them to bulk order early and save \$200K.

Oil & Gas

A pipeline project flagged equipment idling across two remote segments. Forecasting software showed the knock-on effects of waiting on specialized crews. With new insights, the project team staggered asset deployment and saved over \$1M.

Renewables

A solar EPC modeled how permitting delays would ripple through an installation schedule. Forecasting helped optimize labor sequencing across three utility-scale sites, reducing cost-per-MW by 18%.

Utilities

A municipal utility used AI models to simulate trenching schedules across five neighborhoods. When regulatory timelines shifted, scenario planning helped reroute crews and protect the capital delivery plan — keeping the project on time and under budget.

Getting Started with AI Tools to Assist Forecasting

Modern AI tools are designed to work with the systems your teams already use. Whether you're managing five projects or 500, these platforms scale and integrate to match your workflows.

AI Features Enhancing Forecasting Accuracy

Companies such as Vitruvi have developed the following features that are enhancing the accuracy of Forecasting:

- **Classifiers for Image Validation:**

AI models trained on just a few hundred images can analyze photos from field teams to verify that required materials — like installed enclosures or gas detection devices — are visibly present in production report photos. Validated data directly supports forecast accuracy by confirming real-world progress.

- **Tag and Label Recognition:**

Computer vision models extract information from images, such as cable IDs or serial numbers, eliminating manual entry and improving data quality. Better data reduces the margin of error in forecasting calculations.



- **Zero-Tap Scheduling Agent:**

Teams can generate and modify project schedules conversationally through an AI assistant instead of navigating a complex UI. Input constraints like start dates, available crews, or blocked periods are used to generate forecast-aligned schedules that update in real time.

- **Work-First Flexibility:**

Teams can begin reporting from day one — even before full system configuration — thanks to platforms that create work items, contracts, and hierarchies on the fly. The early capture of field data supports early forecasting and enhances long-term visibility.

What to Expect:

- Cloud-native setup and rapid deployment
- Integration with ERPs, GIS platforms, permitting tools
- Custom dashboards by role or region
- Mobile data collection, voice agents, and AI-assisted reporting — all feeding forecasting engines with real-time inputs
- Expert implementation and onboarding

Forecasting is no longer a back-office process — it's a real-time strategic function. Bringing AI into your infrastructure toolkit improves performance from planning through completion.



Conclusion: You Can't Afford the \$1M Mistake

A minor delay today can become a \$1M cost overrun tomorrow—every misstep compounds, especially in fast-moving or capital-intensive projects.

AI-powered forecasting doesn't eliminate uncertainty but makes it visible, manageable, and actionable. By integrating real-time data and predictive models into the core of your operations, you can deliver infrastructure with greater confidence, accountability, and profitability.

Ready to make forecasting your competitive edge?

