

Precision over plausibility: AI in infrastructure demands a different standard

Julien Moutte, chief technology officer at Bentley Systems, examines AI and the trust problem in infrastructure

Every time you drive over a bridge, turn on a tap for a glass of water or flip a light switch, you are placing your trust in a complex system of infrastructure. You trust that the engineering was sound, the materials were correct and the analysis was precise. This trust is the silent, foundational contract upon which modern society is built. It is also why the conversation about AI in infrastructure must be fundamentally different from any other domain.

The rise of generative AI has been astonishing, but it introduced the concept of “AI slop” - outputs that are plausible-sounding but imprecise, inconsistent or flat-out wrong. In many fields, this is an acceptable trade-off for speed. A door the wrong shade of blue won't hurt anyone.

The reality of the infrastructure sector, however, is that there is no room for approximation, let alone hallucination. A model that is 90% right is a useful start; a structural analysis that is less than 100% right is a catastrophic liability. Would you drive across a bridge that is “hopefully” designed right?

The gold standard of AI in civil engineering is not to provide a creative starting point but to deliver precise designs for real-world delivery. At Bentley, we are building AI-supported workflows grounded in the strict principles of engineering discipline. This creates a powerful partnership: AI acts as a tireless partner exploring design alternatives a human might not have time to investigate. The engineer, freed from repetitive calculation, focuses on their most valuable assets: judgment, experience, and intuition.

Giving AI an engineering licence

The key to enabling this partnership is the Model Context Protocol (MCP), an open standard governed by the Agentic AI Foundation. MCP works across any AI platform and has quickly become the industry standard for connecting AI agents directly and reliably to external applications.

By building MCP servers for our core products, we give AI programmatic access to the validated engineering and simulation power Bentley has built over 42 years.

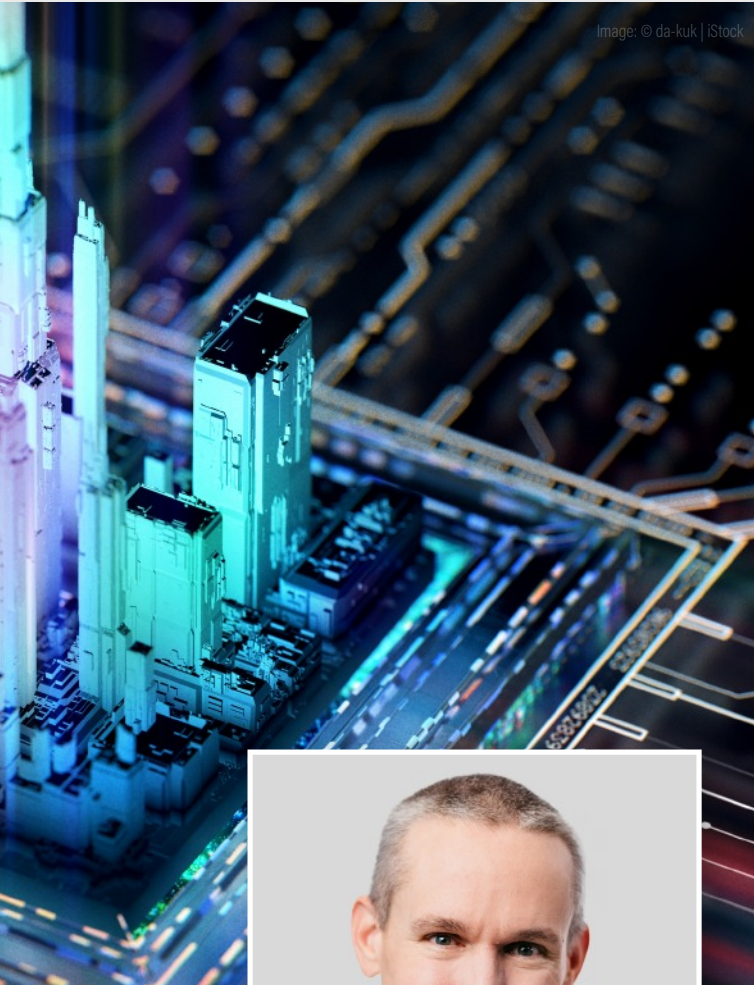


Image: © da-kuk | iStock



Julien Moutte

We are not generating text about engineering; we are executing real, verifiable engineering workflows.

Because structural engineering tolerates no approximation, STAAD - one of the most widely used tools by civil engineers - was a logical place to begin. We published our STAAD MCP server to the MCP Registry, and the results are transforming our vision into reality:

- **AI-driven optimisation:** Using the STAAD.Pro MCP server, an AI agent, performed a structural optimisation on a production model. By varying geometry, section sizes and materials, it achieved a 40% reduction in steel weight - translating directly to project cost reduction.

- **Automating tedium:** We automated slab-wall meshing, a notoriously tedious and error-prone task, entirely through natural language. This frees an expert engineer's time for complex design challenges while ensuring structural continuity.
- **The human-AI feedback loop:** A team with no programming experience used an AI and our STAAD MCP server to perform a complete design-and-analysis workflow in a week. Crucially, output quality improved dramatically when the engineer's expertise - code requirements and rules of thumb - was embedded directly into the prompts. The future is a collaborative loop where human expertise makes AI smarter.

Your data is your IP

This framework rests on one final pillar: data. An AI working from a single model file is working blind. The most powerful insights come when an AI can reference decades of operational data. Bentley's iTwin Platform structures this fragmented lifecycle data into a single, AI-ready schema.

This brings us to a non-negotiable point of trust. Your design and asset data represent your firm's intellectual property. We are the stewards of that data, not the owners. Engineering firms should compete by leveraging their unique IP through AI, not giving it away. At Bentley, your data is never scraped for AI training unless you choose to do so, and the resulting model is yours alone.

The race in infrastructure AI will not be won by the flashiest demo but on trust. By insisting on precision over plausibility, we ensure AI fulfils its promise: helping us build the infrastructure the world relies on more safely, efficiently and sustainably than ever before.

Julien Moutte
Chief technology officer
Bentley Systems

[WEBSITE](#)

