2026 STRATEGIC TECHNOLOGY TRENDS

for the Infrastructure Industry

WGI®

Each year, WGI examines the technologies shaping the future of infrastructure and the Architecture, Engineering, and Construction (AEC) industry. These trends are not abstract ideas or distant forecasts. They reflect real shifts already influencing how projects are planned, designed, delivered, and operated across the United States.

Across the AEC market, digital transformation has accelerated from experimentation to execution. Industry research consistently shows that a majority of architecture and engineering firms are actively investing in digital tools, with artificial intelligence, advanced modeling, and data analytics increasingly embedded in everyday workflows. What was once viewed as innovation is quickly becoming baseline capability.

The 2026 strategic technology trends reflect an industry reaching a new level of digital maturity. Data is no longer scarce, models are no longer static, and automation is no longer confined to isolated tasks. Instead, infrastructure organizations are learning how to connect systems, intelligence, and workflows across the full project and asset lifecycle.

> *“Technology is only as valuable as the problems it solves for our partners. As we scan the trajectory of our industry, we aren’t just watching for faster software; we are tracking the trends that fundamentally change the economics of the built environment. This brief explores the emerging reality where digital maturity is becoming a baseline requirement, and how that shift is opening new doors for construction, fabrication, and long-term asset management.”*
>
> ***- Marc Remmert, PE***
> ***VP, Buildings Division Leader***

As expectations rise for transparency, resilience, and performance, technology adoption is shifting from novelty to necessity. Understanding which tools are fundamentally reshaping how value is created in the built environment is now essential for owners, agencies, and practitioners alike.

MODEL CONTEXT PROTOCOL (MCP) AND CUSTOMIZATION

Artificial intelligence adoption in the AEC industry is entering a more disciplined phase. After several years of experimentation with public large language models, many organizations are confronting their limitations, particularly around data governance, security, and alignment with established professional workflows. As a result, the focus in 2026 is shifting toward enterprise AI systems designed to operate within controlled, organization-specific environments.

Firms are prioritizing AI that can securely interact with internal systems and structured data to support multi-step workflows. Rather than replacing professional judgment, these systems assist teams by organizing information, surfacing relevant standards, identifying inconsistencies for additional review, and accelerating access to reference materials. In complex engineering environments, AI is increasingly positioned as a decision-support tool that enhances efficiency and consistency while maintaining human oversight and professional responsibility.

Instead of asking engineers to adapt to generic tools, organizations are designing AI capabilities that align with existing digital ecosystems and internal standards. These systems are intended to augment technical staff, helping firms manage growing project complexity and increasing demand without compromising quality or governance.

A major catalyst for this shift is the evolution of Retrieval Augmented Generation into what many teams describe as RAG 2.0. Early implementations primarily functioned as document search layers. Today's approaches draw from multiple internal systems, respect permission boundaries, and provide traceability so users understand where information originates. In AEC environments, RAG 2.0 improves transparency and confidence by clearly identifying source documentation, enabling engineers to validate and apply information appropriately.

Underpinning much of this progress is the Model Context Protocol, introduced in late 2024. MCP enables AI systems to securely connect with enterprise tools, APIs, and data environments through governed interfaces. This allows organizations to build modular AI capabilities that integrate with design software, project management platforms, and structured engineering data without bypassing established review processes. MCP-compatible architectures support scalable AI deployment while preserving accountability, documentation integrity, and professional standards.

AEC AI ADOPTION SNAPSHOT

Approximately 74% of AEC firms are using AI in one or more phases of project delivery.

Most common applications include proposals, analytics, and workflow automation.

Customized and governed AI deployments are emerging as a competitive differentiator.

DIGITAL TWINS

Digital twins are becoming a powerful framework for managing infrastructure across its full lifecycle. Adoption is expanding beyond pilot projects as owners and agencies seek improved visibility into asset performance, long-term risk, and return on investment.

Modern digital twins integrate design data, operational systems, sensors, and analytics into continuously updated representations of physical assets. Rather than relying on periodic inspections or historical assumptions, owners can use live and forecasted data to test scenarios, anticipate maintenance needs, optimize operations, and prioritize capital investments.

Increasingly, the broader industry is recognizing that the long-term value of a physical asset is enhanced by the quality of its digital counterpart. As capital markets, public agencies, and private operators demand greater transparency into performance, resilience, and lifecycle costs, digital twins are beginning to influence how assets are evaluated, managed, and monetized. In time, maintaining a comprehensive and current digital representation may become not just an operational advantage, but a market expectation for realizing full asset value.

> *"We are moving from a world where we build and hope, to a world where we simulate and know. The digital twin is the difference between reacting to decay and engineering for resilience."*
>
> ***- Joelle McCormack, PE, Innovation Engineer***

WHY DIGITAL TWINS MATTER

- Support proactive, data-driven asset management
- Digital Twins can reduce operational and maintenance costs by up to 35%
- Enable scenario testing and long-term performance optimization

As platforms mature, digital twins increasingly serve as connective tissue across planning, design, construction, and operations. Their value extends beyond visualization, enabling owners to demonstrate performance, support funding strategies, and protect long-term asset viability.

3D PRINTING

3D printing in construction continues to move from experimentation toward practical application, driven by labor constraints, cost pressures, and growing demand for housing and repeatable building types across the United States. While discussed for more than a decade, recent advancements in robotics, automation, and materials science are strengthening its position as a viable supplemental construction method heading into 2026.

Since the mid-2010s, construction teams have successfully 3D printed concrete homes and light commercial structures to reduce time, labor intensity, and material waste. Early gantry-style systems demonstrated feasibility but introduced operational limitations, including height constraints, footprint rigidity, and significant setup complexity. These challenges helped define the technical and logistical hurdles that the next generation of systems is now addressing.

Robotic-arm construction printers are expanding design flexibility and operational efficiency. Unlike fixed-rail systems, these platforms can print in multiple directions, support more complex geometries, and adapt more readily to site constraints. This evolution is gradually shifting the financial and logistical equation from demonstration projects toward scalable deployment in appropriate building types.

Material innovation is advancing in parallel. Research into alternative deposition methods and improved concrete formulations aims to address structural performance, surface finish, and reinforcement integration. These improvements suggest that additive construction may increasingly complement conventional building methods, particularly in applications where speed, repeatability, and labor efficiency are critical.

"3D printing technology has long promised to change the construction industry, and its goals may be closer to reality with recent advances in robotics and automation. The new printer styles appear poised to alleviate several pain points and improve the major factors that make a building project successful: quality, cost, and schedule."

- Matthew Feaga, RA
Virtual Design & Construction Leader

3D PRINTING IN U.S. CONSTRUCTION

- Labor shortages continue to drive interest in **automated construction methods**
- Most active U.S. applications focus on **housing and repeatable building types**
- Robotic printing systems are improving **scalability and feasibility**

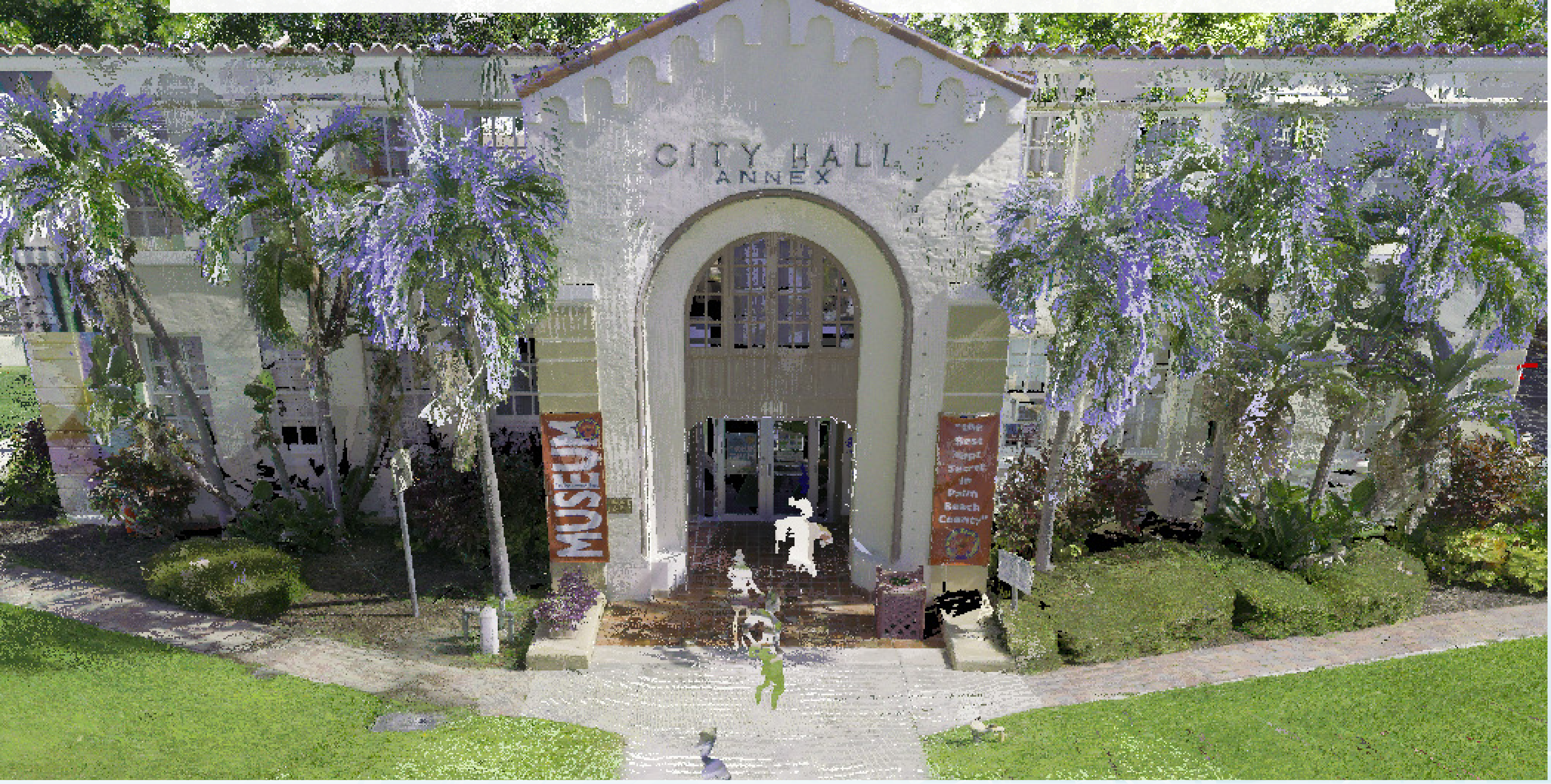
As robotics and digital fabrication mature, 3D printing is best understood not as a replacement for traditional construction, but as part of a broader transformation in how buildings are delivered. Its long-term impact will depend on thoughtful integration with engineering standards, workforce development, and project delivery models.

LIDAR

Lidar plays a fundamentally different role in the infrastructure technology ecosystem than many of the trends discussed in this paper. While tools like AI, visualization, and digital twins interpret and communicate information, lidar's value lies in creating the data foundation of any infrastructure project.

In the next year we expect to see a shift to using lidar data to document or predict change detection. By integrating high-density 3D point clouds with 360-degree imagery, agencies can automate asset collection and inventory features such as guardrails, signage, utility poles, curb lines, pavement markings, drainage structures, and roadside appurtenances with sub-centimeter accuracy. When these datasets are compared across multiple collection cycles, the analysis extends into the time dimension, enabling objective asset condition indexing based on measurable change. For example, guardrail segments can be evaluated, signage can be assessed, and pavement assets can be analyzed. AI-supported workflows quantify these changes against historical baselines to calculate deterioration rates and estimate remaining service life.

As infrastructure projects grow in scale and complexity, lidar is increasingly viewed as an essential digital infrastructure. With the added layer of predictive change detection, lidar enables better decisions for the design and maintenance of the physical world.



VISUALIZATION

While data capture and analytics generate intelligence, visualization translates it.

Its primary mission is no longer simply to display information, but to render complex datasets actionable for diverse audiences. In infrastructure, visualization has matured into a baseline expectation across the project lifecycle. From planning through operations, stakeholders increasingly assume that 3D modeling, real-time rendering, and coordinated visual environments will be part of how projects are communicated and evaluated.

Through interactive models and immersive experiences, agency leaders, technical teams, and community stakeholders can validate a project's function and impact long before construction begins. This clarity accelerates approvals, reduces late-stage changes, and strengthens alignment between design intent and stakeholder expectations.

Crucially, visualization transforms abstract engineering data into intuitive narratives, making it indispensable for evaluating tradeoffs and supporting public engagement. Its value is no longer experimental. It is operational.

> *"This convergence of technologies is driving the industry towards more efficient, sustainable, and resilient operations, positioning it for a future where innovation and technology are at the forefront."*
>
> ***- Nicola Ianeselli, Innovation and Virtual Design & Construction Leader***

VISUALIZATION IN INFRASTRUCTURE PROJECTS

- Widely used by U.S. AEC firms to support **design reviews and stakeholder communication**
- Helps reduce late-stage design changes by **improving understanding earlier**
- Increasingly relied on to support **agency approvals and public engagement**

As visualization tools integrate more tightly with BIM, GIS, and digital twin platforms, they are becoming the interface between complex data systems and decision-makers, translating technical information into clear, actionable insight.

While immersive and extended reality technologies continue to evolve, widespread XR adoption remains several years away. In the near term, visualization's impact is defined less by breakthrough innovation and more by ubiquity. It has become foundational to infrastructure decision-making, not an optional enhancement.

AUTONOMOUS VEHICLES

Autonomous and connected mobility technologies continue to evolve, but their long-term success depends on infrastructure readiness. As vehicle systems advance, public agencies and private operators are increasingly recognizing that infrastructure must evolve in parallel to safely and effectively support new forms of mobility.

The spectrum of emerging mobility solutions is expanding rapidly. Self-driving passenger vehicles, freight automation, advanced rail systems, underground transport concepts, eVTOL aircraft, drone logistics networks, and campus-scale people movers are all progressing at different speeds. Each introduces new requirements for digital mapping, communications networks, geospatial precision, airspace coordination, safety redundancy, and real-time data integration.

Vertiports and other advanced mobility hubs illustrate how infrastructure planning is adapting. These facilities are designed not only to support aircraft operations, but to integrate with ground transportation networks, digital traffic management systems, and real-time environmental monitoring platforms. Similar evolution is occurring across roadway corridors, freight yards, transit systems, and logistics hubs.

> *"As communities and modes of transportation continue to evolve, WGI is positioning to play a critical role in public-private collaboration regarding the use of Beyond Visual Line of Sight (BVLOS) autonomous aerial vehicles, advocacy of modern transportation exploration and detailed analysis and development of the necessary infrastructure and regulation."*
>
> ***- Mark Topping***
> ***Geospatial Client Solutions Manager***

AUTONOMOUS & CONNECTED VEHICLES IN THE U.S.

- U.S. DOT and state agencies continue to invest in **controlled autonomous vehicle testing environments**
- Early autonomous deployments are focused on **freight, transit, campuses, and controlled-access facilities**
- Infrastructure readiness is a key factor shaping the pace of adoption

The industry is prioritizing flexible infrastructure that can support evolving mobility technologies, from autonomous vehicles to drone networks. Ultimately, autonomy is not just a vehicle issue but an infrastructure systems challenge dependent on alignment across digital, physical, and regulatory environments.

INFRASTRUCTURE DEVELOPMENT

Infrastructure development in 2026 is increasingly shaped by the rapid growth of data centers and the critical role they play in the broader technology ecosystem. Far more than utility-intensive facilities, data centers are foundational infrastructure supporting cloud computing, artificial intelligence, digital twins, and data-driven asset management across nearly every sector.

For the AEC industry, data centers represent a convergence of physical and digital complexity. Their design and delivery demand coordination across civil, structural, MEP, power, and site systems under aggressive schedules and strict performance requirements. Reliability, redundancy, security, and scalability are no longer differentiators. They are baseline expectations.

At the same time, the accelerating demand for AI and advanced computing is fundamentally reshaping the technical requirements of these facilities. Power density is increasing. Cooling strategies are evolving rapidly. Water usage, grid interconnection, and land constraints are becoming central design challenges. The scale of computational demand is pushing infrastructure systems to their limits.

Meeting these demands will require many of the technologies discussed throughout this paper. High-fidelity modeling is essential for optimizing power distribution and thermal performance. Digital twins can simulate load scenarios and long-term operational resilience. Operational intelligence platforms enable real-time monitoring and adaptive energy management. Advanced visualization supports planning and permitting in increasingly constrained environments. AI itself is being applied to optimize cooling efficiency, workload distribution, and energy consumption.

In this way, data centers are not just enabling digital transformation. They are also dependent on it. The very technologies driving growth in AI and processing capacity are required to design, deliver, and operate the facilities that make that growth possible.

As investment in data centers accelerates across the United States, their influence extends beyond their sites. They are shaping energy planning, grid modernization, sustainability strategies, and long-term asset management. Understanding this feedback loop is increasingly central to how technology-enabled infrastructure is planned, designed, and sustained.

Data center design has matured alongside these technical capabilities, shifting from generalized models toward integrated, high-performance solutions. Rather than simplifying complex variables to fit traditional workflows, engineers now rely on coordinated digital systems to optimize for efficiency, reliability, and lifecycle resilience at unprecedented scales.

OPERATIONAL INTELLIGENCE

Operational intelligence is emerging as a critical technology trend in the AEC industry, reflecting a shift from static analysis toward continuously operating decision-support systems. Traditional planning and compliance tools remain essential, but they are increasingly supplemented by platforms designed to support real-world operations as conditions evolve.

Advances in cloud computing, data integration, and artificial intelligence now allow infrastructure systems to ingest live and forecast data, maintain current system models, and deliver actionable insight when it matters most. Rather than describing generalized risk, operational intelligence helps answer practical questions about where impacts are expected to occur and how assets will be affected.

For infrastructure owners and practitioners, this shift extends the value of engineering models beyond design, into ongoing operations, resilience planning, and emergency management. As infrastructure systems grow more complex and risk exposure increases, operational intelligence is becoming an essential component of modern, performance-driven infrastructure management.

Operational Intelligence in Action: Real-Time Flood Forecasting

Streamline Technologies' FloodWise™ real-time flood forecasting system transforms traditional hydraulic and hydrologic (H&H) modeling from a static, compliance-centric exercise into a continuously operating decision-support system designed for real-world emergency management, delivering forward-looking, operational intelligence that enables communities to shift from reactive response to proactive, asset-level protection.

Operating as a secure 24/7/365 SaaS platform, FloodWise™ maintains a constantly updated, "living" model of watershed conditions by automatically ingesting real-time and forecasted rainfall along with NOAA climatological and coastal ocean forecasts. This continuous operation enables precise forecasts several days in advance and supports compound flooding analysis, where heavy rainfall and coastal surge interact. By integrating with existing modeling frameworks such as StormWise™, SWMM, and HEC-RAS, FloodWise™ preserves prior engineering investments while extending their value into an always-on forecasting environment.

At the core of FloodWise™ is asset-based intelligence delivered through Flood Risk Points™. Using artificial intelligence and deep learning, Streamline Technologies extracts building footprints from high-resolution imagery and incorporates them directly into the model network, with ongoing advancements to identify roads, bridges, and utility infrastructure from LiDAR and aerial data. These Flood Risk Points™ replace generalized flood zones with precise, actionable insights that identify which streets, structures, and critical facilities are expected to be impacted, including forecasted depth and duration.

This level of granularity empowers emergency managers, municipalities, and flood management teams to allocate resources with precision, protect critical infrastructure, and initiate response and recovery efforts earlier. By answering the operational question of where flooding will occur – before it happens – FloodWise™ enables communities to reduce risk, limit damage, and save lives through informed, proactive decision-making.

“*The transition to forward-looking, operational intelligence, as provided by FloodWise™, reflects a fundamental shift in how communities manage flood risk, from static maps to dynamic, asset-based intelligence.*

By harnessing real-time and forecasted flood modeling, we can answer the critical operational question several days in advance: will this specific street, facility, or infrastructure be impacted? That level of insight fundamentally changes how communities prepare, respond, and protect lives and property, before water ever arrives.”

- F. Warren McKinnie, PE, CRM, GISP, Director of Water Resources, Streamline Technologies Inc.

OPERATIONAL INTELLIGENCE IN INFRASTRUCTURE

- U.S. agencies are shifting from **static planning to forward-looking intelligence**
- Common applications include **flood risk, transportation operations, and asset management**
- Enables earlier, more targeted decision-making before impacts occur

DRONES AND PHYSICAL AI

Physical AI, intelligent systems embedded in machines and robotics, is beginning to move from industrial environments into broader infrastructure applications. Unlike software-only automation, physical AI interacts directly with the built environment.

Potential use cases range from automated inspection and maintenance to construction support and hazardous-environment operations. As sensing, mobility, and decision-making capabilities improve, these systems may augment human labor in tasks that are repetitive, dangerous, or difficult to staff.

While widespread deployment remains emerging, physical AI represents an important step toward more adaptive and resilient infrastructure operations.

CLOSING THOUGHTS

The strategic technology trends shaping 2026 reflect an infrastructure industry that has reached an important inflection point. Digital tools are no longer being evaluated in isolation or adopted as experiments. Across the U.S. AEC industry, they are increasingly treated as foundational capabilities that influence how projects are conceived, delivered, and sustained.

> *"As leaders, we must avoid the temptation to focus on traditional paradigms and processes. We must lead from the front, not only supporting, but being the drivers of change. We are approaching a "light switch moment" where we will awake one day to find the AEC world we once knew has been digitally transformed. Our decisions today will dictate if that moment is a competitive advantage for us or a realization that our business model has become obsolete."*
>
> ***- Gregory Sauter, PE, President***

Taken together, these trends illustrate a clear progression. Accurate data capture establishes a reliable understanding of existing conditions. Intelligent platforms transform that data into insight. Visualization translates complexity into shared understanding. Automation and operational intelligence extend those capabilities across the full lifecycle of infrastructure assets. Each layer builds upon the last, reinforcing the idea that digital maturity is achieved through integration, not individual tools.

As expectations grow for transparency, resilience, and performance, infrastructure owners and practitioners are being asked to think differently about value. Success is no longer defined solely by delivering a project, but by how well that project performs over time, adapts to change, and supports the communities it serves.

The opportunity ahead lies in applying these technologies deliberately and pragmatically, focused on solving real problems rather than pursuing novelty. When aligned with sound engineering judgment and clear objectives, today's technology trends have the potential to improve decision-making, reduce risk, and unlock long-term value across the built environment.

This is not a departure from the fundamentals of infrastructure planning and design, but an evolution of them. As digital maturity becomes a baseline expectation, organizations that understand how these trends connect and reinforce one another will be best positioned to deliver infrastructure that is smarter, more resilient, and built to perform well beyond completion.

LET'S TALK.

For more information about this paper or to have a conversation with one of our experts, please contact:

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