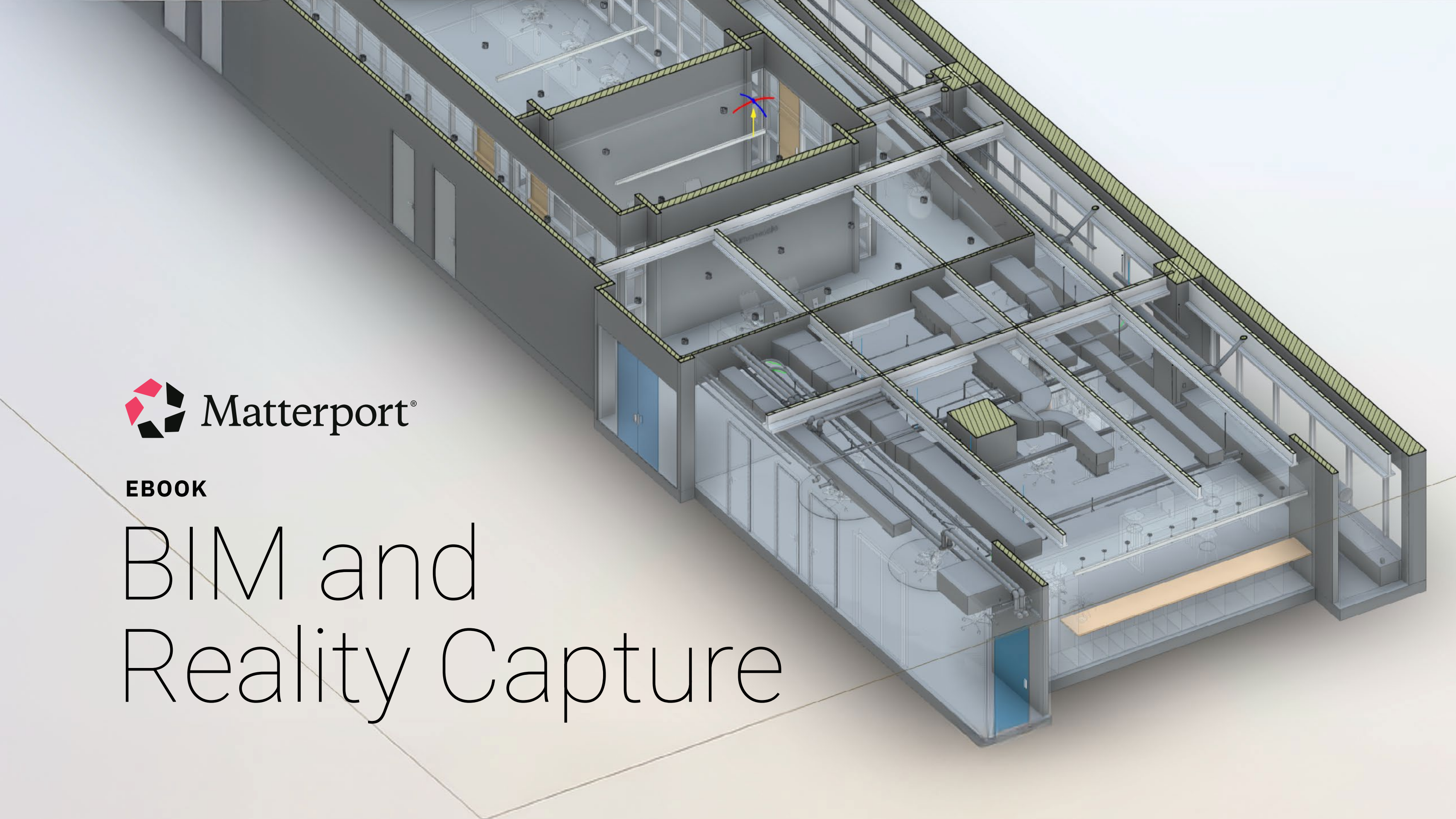




EBOOK

BIM and Reality Capture



BIM and Reality Capture

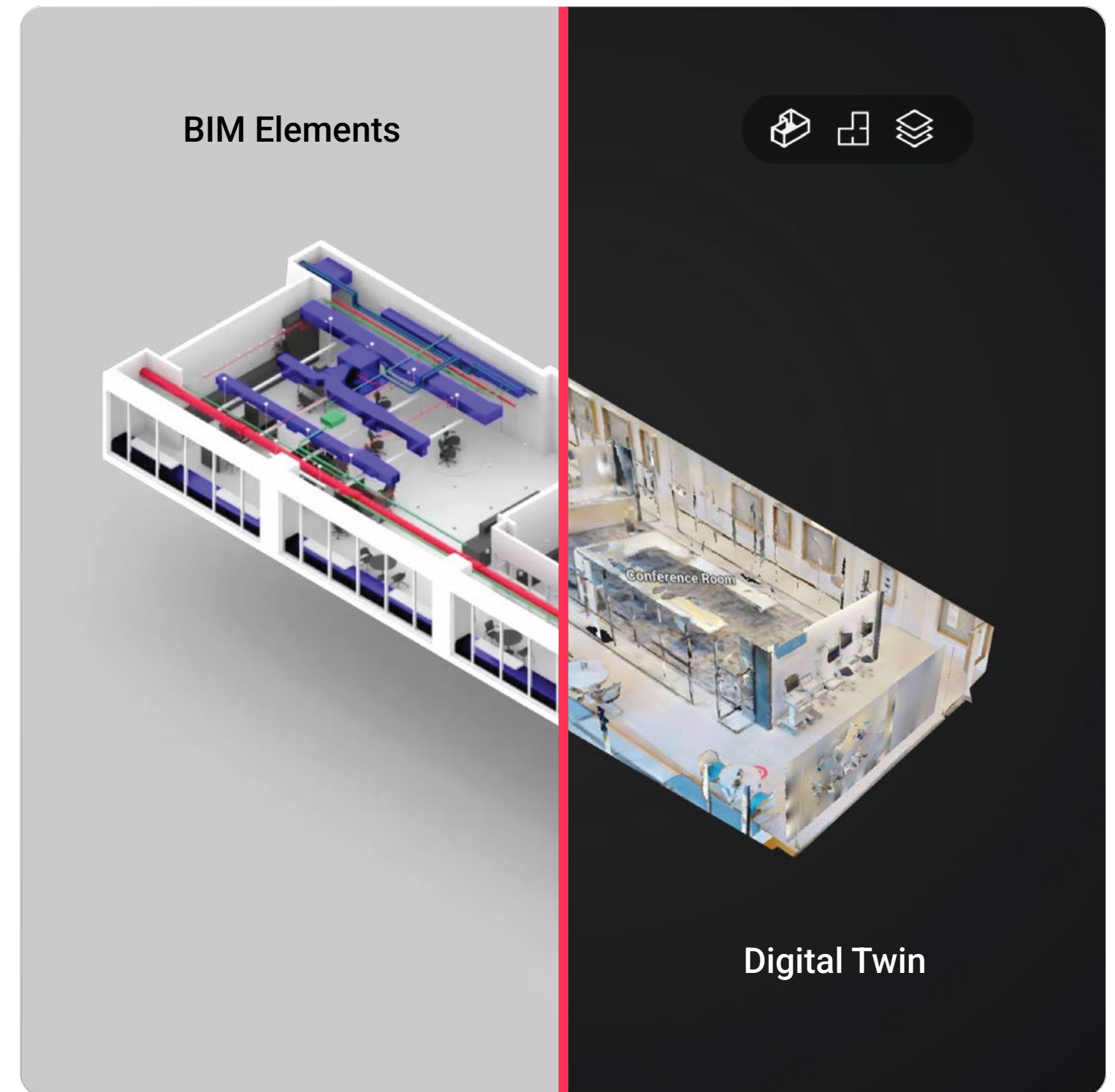
Shaping the Future of the AEC Industry

The architecture, engineering, and construction (AEC) industry is on the brink of a digital transformation, driven by the convergence of two groundbreaking technologies: Building Information Modelling (BIM) and reality capture. Together, these innovations are reshaping how we design, build, and manage the built environment. By merging the physical and digital realms, reality capture technology such as Matterport, and its seamless integration with BIM, are helping AEC professionals unlock new levels of precision, collaboration, and efficiency.

This eBook explores how the convergence of BIM and reality capture empowers stakeholders throughout a project's lifecycle—from planning and design to construction, handover, and facility management. The seamless integration with platforms like Autodesk software, including Autodesk Construction Cloud™ and Revit™, provides AEC professionals with a unified ecosystem to create, visualise, and manage projects with unparalleled efficiency.

Reality Capture is the process of digitally scanning and converting physical spaces into accurate 3D models, enabling visualisation, collaboration, and analysis within Matterport's platform and other design software.

Digital Twin is a precise virtual replica of a physical space, created using reality capture technology, that enables immersive visualisation, analysis, and collaboration within Matterport's platform.



Global Challenges and Opportunities

The world is changing fast, look at these key trends.

68%

By 2050, approximately **68% of the world's population will live in urban areas**, adding about 2.5 billion people to urban centers.

14%

In 2020, **14% of construction rework was attributed to poor data management**, leading to an industry-wide loss of \$1.84 trillion.

49%

49% growth of global construction output is expected by 2030. (\$10.2 trillion in 2020 to \$15.2 trillion by 2030)

1%

Construction productivity **increased only about 1% per year over the past 20 years.**
(Source: McKinsey Global Institute)

39%

Buildings and construction contribute roughly **39% of global carbon emissions.**
(Source: UN Environment Programme)

80%

80% of large **construction projects are over budget** and take 20% **longer to finish.**
(Source: McKinsey Global Institute)

Addressing the AEC Industry's Greatest Challenges



Urbanisation and Rapid Growth

The global population is projected to reach nearly 10 billion by 2050, with 68% living in urban areas. This unprecedented urbanisation drives the demand for smarter, faster, and more sustainable construction solutions.

How Reality Capture and BIM Help

By leveraging reality capture, AEC professionals can create detailed digital twins of urban environments. These models provide the contextual data needed for informed decision-making, ensuring projects are completed efficiently and sustainably.



Data Fragmentation and Inefficiencies

In 2020, poor data management resulted in \$1.84 trillion in rework globally. Siloed workflows and fragmented data exacerbate project delays and increase costs.

How Reality Capture and BIM Help

The integration of high-quality 3D, LiDAR scans with BIM platforms like Autodesk Construction Cloud centralises data, ensuring all stakeholders work from the same source of truth. This reduces miscommunications and streamlines workflows across disciplines.



Sustainability and Lifecycle Management

Sustainability is no longer optional; it's a mandate. AEC firms are under pressure to reduce resource consumption and enhance building performance over time.

How Reality Capture and BIM Help

Digital twins created with reality capture provide the accuracy needed for energy-efficient designs and lifecycle management. By simulating real-world conditions in BIM, teams can optimise resources and achieve long-term sustainability goals.



Streamlining Construction Phases

By integrating Matterport scans into BIM platforms, project managers can maintain up-to-date models that reflect ongoing construction progress. This reduces ambiguity, fosters accountability, and ensures that teams work in alignment.

Key Benefits

Real-time progress tracking

Early identification of discrepancies between design and construction

Efficient coordination among contractors and subcontractors



Supporting Post-Construction and Facility Management

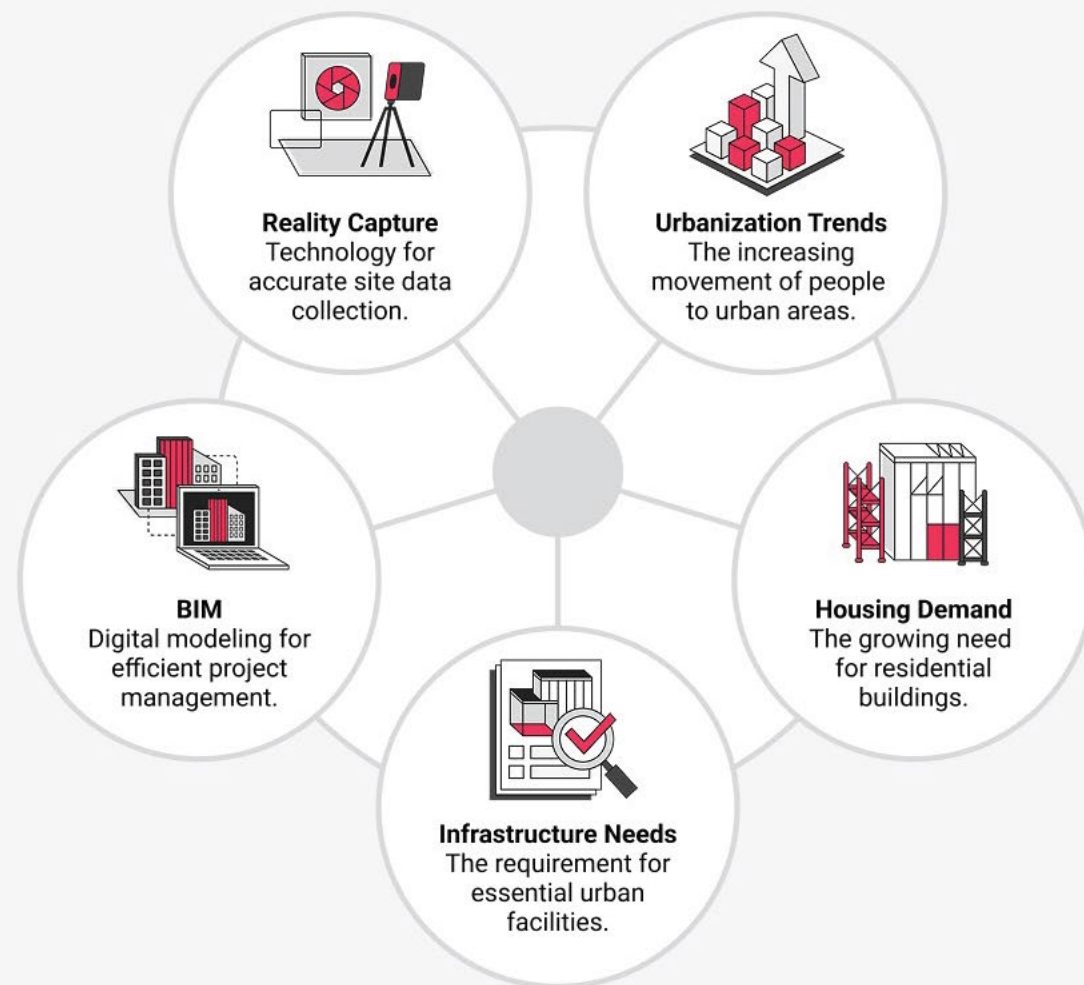
Once construction is complete, Matterport's reality capture supports lifecycle management by providing accurate as-built models. These 3D models allow facility managers to optimise maintenance and renovations, saving time and resources.

Facility managers benefit from Matterport's reality capture throughout a building's lifecycle. 3D models enriched with BIM data enable precise scheduling of maintenance tasks, space optimisation, and energy management for operational efficiency.

The Vision

A Unified Digital Ecosystem for AEC

Integration of BIM and Reality Capture



Reality capture informs BIM. BIM fuels reality capture.

The integration of reality capture technology with BIM has changed the way projects are designed, constructed, and managed. Just as Geographic Information Systems (GIS) provide contextual data for BIM in geographic space, reality capture provides real-world, in-situ conditions with millimetre precision, bringing the physical world into a digital framework.

BIM and Reality Capture represent more than just tools—they are the foundation for a unified digital ecosystem. Matterport’s reality capture technology transforms physical spaces into high-resolution 3D models, providing a precise and immersive understanding of existing conditions. When integrated with BIM, these 3D models become the bedrock of data-driven decision-making throughout a project’s lifecycle.

By enabling real-time collaboration and centralised data management, the convergence of these technologies eliminates silos, reduces inefficiencies, and empowers teams to work smarter. This vision is not just about solving today’s problems; it’s about paving the way for a future where the built environment is designed, constructed, and maintained with unparalleled accuracy and insight.

Reality Capture and BIM

A Synergistic Approach

Reality capture informs BIM with highly detailed, accurate digital twins, creating a robust foundation for project planning, design, and operations.

BIM, in turn, provides the framework and data structure that integrates reality capture data, allowing stakeholders to make informed decisions throughout the project lifecycle.

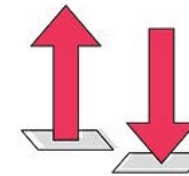
Why This Convergence Matters

Reality capture and BIM together create a cohesive way to quickly understand the most complex of projects. With Matterport's integration into Autodesk Construction Cloud, AEC professionals can now use high-fidelity 3D models in an environment where design, construction, and facility operations come together. This simplified data management, streamlines workflows, and empowers data-driven decision-making.

Integration of BIM and Reality Capture



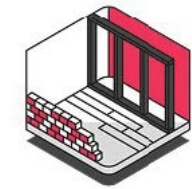
Accuracy and Context
Ensures precise scans are integrated into BIM models for accurate designs



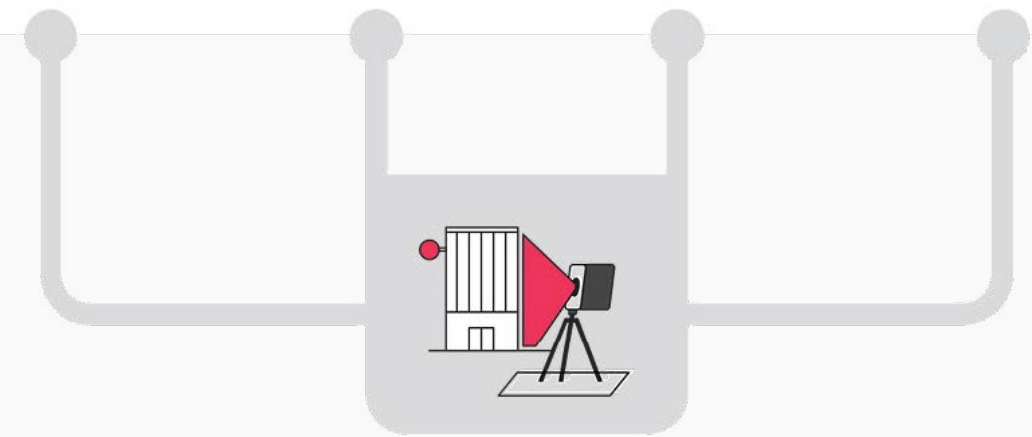
Cost Reduction
Minimises rework and project costs through accurate site data integration



Team Collaboration
Enhances stakeholder collaboration and accountability via cloud platforms



Informed Decision-Making
Facilitates better, faster decisions with visual overlays of existing and proposed designs



Future Vision: The Next Decade of AEC Transformation

As BIM and reality capture continue to evolve, the AEC industry will see:

AI-Powered Insights

Predictive analytics will become integral to every project phase, minimising risks and optimising resources.

Global Collaboration

Cloud-based ecosystems will connect teams worldwide, enabling real-time data sharing and innovation.

Sustainability Leadership

Enhanced modeling will allow firms to achieve ambitious net-zero carbon goals with precision.

Advanced Robotics

Integration with robotics will streamline construction tasks, reducing timelines and human error.

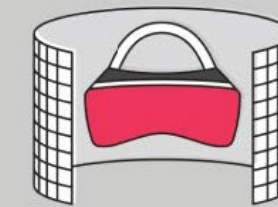
Digital Ownership

The future will see stakeholders owning not only physical assets but fully integrated digital counterparts that provide a lifecycle solution.

Fostering an Industry-Wide Cultural Shift

The widespread adoption of BIM and reality capture also necessitates a cultural shift within organisations. Training programmes, leadership buy-in, and collaboration across disciplines are key to ensuring technology adoption aligns with strategic goals.

Integration of BIM and Reality Capture



AR/VR Experiences

Immersive technologies enhance project visualisation and stakeholder engagement.



Digital Twin Management

Digital twins optimise asset lifecycle management and decision-making



AI and Automation

AI tools streamline BIM processes, enhancing efficiency and accuracy.

The Path Forward

Transforming AEC with Technology



Enhanced Collaboration

The integration of Matterport and BIM creates a shared digital environment where stakeholders—from architects and engineers to contractors and facility managers—can collaborate in real time. By breaking down traditional silos, teams can make faster, more informed decisions, improving project outcomes.



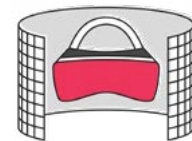
Predictive Insights and Risk Mitigation

With accurate data from Matterport's reality capture, BIM models can simulate potential scenarios, identify clashes, and mitigate risks early in the project lifecycle. This proactive approach saves time, reduces costs, and enhances overall project quality.



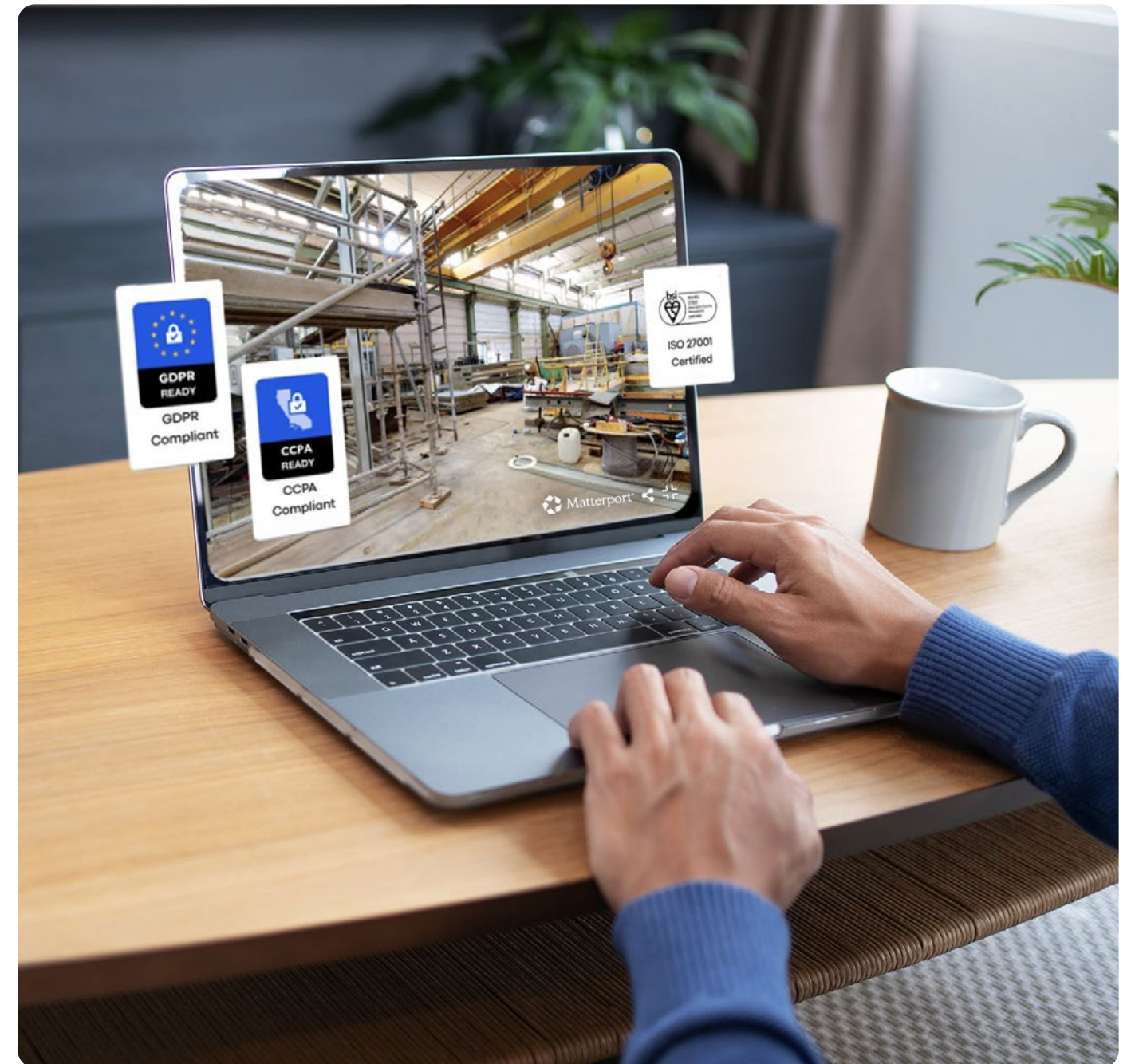
Embracing AI and Automation

Looking ahead, advancements in AI and automation will further enhance the capabilities of BIM and reality capture. Automated model creation, AI-driven clash detection, and predictive analytics will streamline workflows and reduce manual effort.



Unlocking the Potential of AR and VR

Augmented and virtual reality applications offer immersive ways to engage with BIM and reality capture data. Teams can perform virtual walkthroughs of projects, enhancing stakeholder understanding and accelerating approvals.

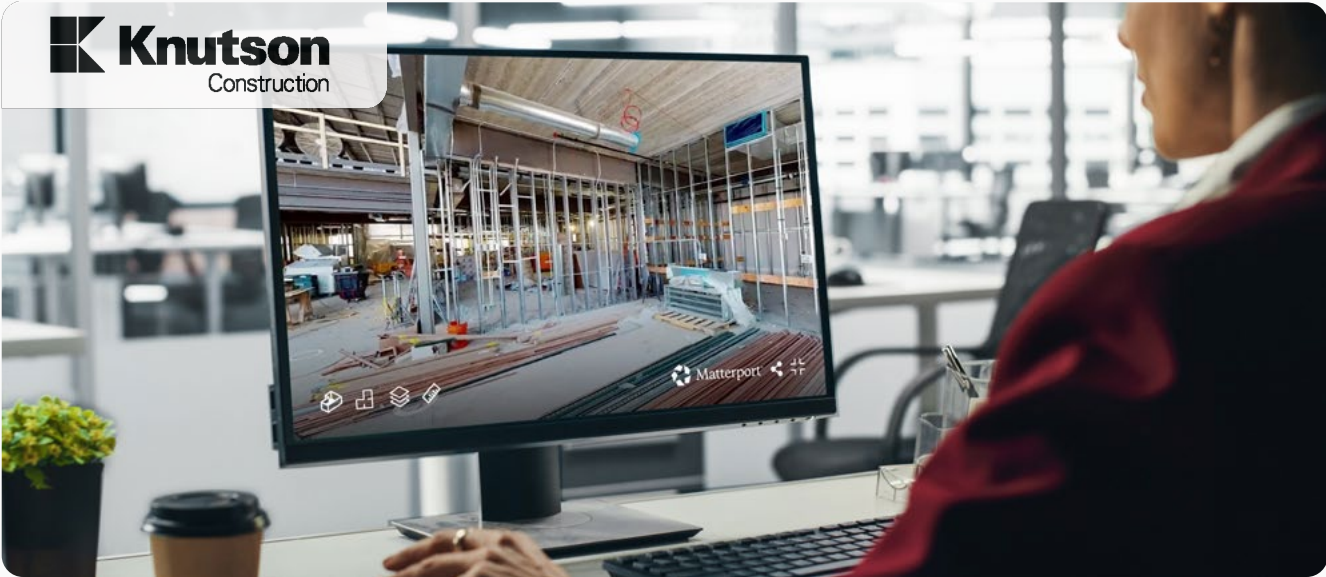


Solving AEC Industry Challenges to Win More Work

KNUTSON CONSTRUCTION Healthcare Facility Efficiencies

Challenge
Frequent design changes and misaligned data impacted project timelines.

Solution
By using Matterport's reality capture integrated with Autodesk Revit, Knutson Construction ensured consistent, accurate data across teams.



Results
Achieved a 75% reduction in site visits and doubled the speed of documentation production.

[Watch Video](#)
[Read Case Study](#)

BURNS & MCDONNELL Eliminating Redundancies

Challenge
Multiple site visits across geographically dispersed locations increased costs and delayed schedules.

Solution
Leveraging Matterport's reality capture, Burns & McDonnell consolidated site data into 3D models accessible to all stakeholders.



Results
Reduced project schedules by 30% and eliminated travel by 80% by avoiding redundant visits and improving decision-making efficiency. documentation production.

[Watch Video](#)
[Read Case Study](#)

ARUP

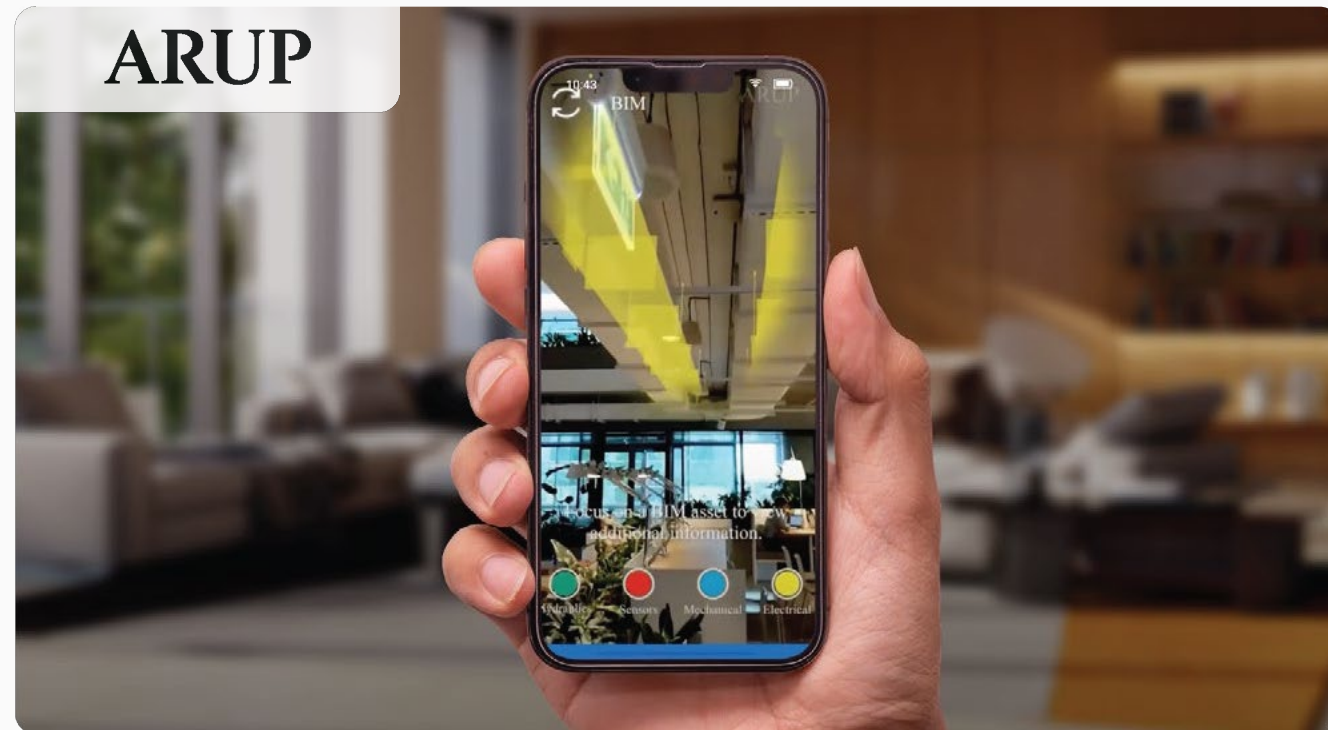
Propel Engineering & Design with BIM Files

Challenge

Arup needed to improve collaboration across global teams managing complex projects.

Solution

Matterport's BIM integration enabled streamlined access to accurate 3D models for all stakeholders.



Results

Enhanced accuracy, reduced site visits, and faster project completion with LOD200 BIM files.

[Watch Video](#)
[Read Case Study](#)

TAKENAKA

How BIM-ready Captures Cut Inspection Costs

Challenge

Frequent site surveys and inspections across multiple locations increased costs and reliance on specialist engineers on-site.

Solution

Takenaka adopted Matterport to remotely document and inspect MEP conditions—generating accurate BIM files that eliminated the need for repeated site visits and expensive laser scanners.



Results

Reduced photography time by 90% and saved thousands of dollars per scan which cut travel and labour costs significantly through remote inspections.

[Read Case Study](#)

SYNC TECHNOLOGIES

Saving 2,800 Workdays On 500+ Projects

Challenge

Coordinating designers, engineers, builders and subcontractors across construction sites led to miscommunication, costly rework and project delays.

Solution

SyncTech used Matterport Pro2 cameras to capture immersive 3D models of construction sites—giving all stakeholders a single, accurate source of truth accessible remotely within 48 hours.



Results

Saved 2,800 workdays across 500+ projects, and reduced costly rework.

[Watch Video](#)
[Read Case Study](#)

BUILD HEALTH INTERNATIONAL (BHI)

Design in Resource-Limited Settings

Challenge

Coordinating multidisciplinary teams for projects in underserved regions.

Solution

Matterport digital twins enabled seamless collaboration across design and construction phases.



Results

Accelerated design approvals by 25% and reduced construction discrepancies by 30%.

[Watch Video](#)
[Read Case Study](#)

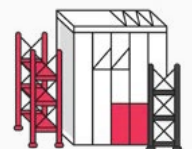
A New Era for the AEC Industry

The convergence of BIM and reality capture is not just transforming individual projects; it is redefining how the AEC industry communicates and operates. Matterport's technology empowers professionals to:



Design with Precision

Create data-rich models that reflect real-world conditions.



Build with Confidence

Leverage accurate, up-to-date information to minimise errors and delays.



Manage with Efficiency

Utilise our 3D models for effective facility management and lifecycle planning.

As the AEC industry continues to evolve, Matterport stands at the forefront of this transformation, providing the tools and insights needed to meet today's challenges and embrace the opportunities of tomorrow. Whether you're designing a skyscraper, constructing a hospital, or managing a campus, the future of AEC begins with BIM and reality capture.

Ready to take your projects to the next level? Reach out to learn how Matterport can help you shape the future of the built environment.

Speak With An Expert