From smart buildings to intelligent portfolios

Reimagining the future of places

Executive Summary

The role of the built environment is undergoing fundamental transformation. Organisations must navigate shifting regulations, rapid technological change and rising societal expectations to deliver buildings that support sustainability, efficiency, security and wellbeing, while placing a renewed focus on people and experience.

The global smart building market – encompassing technology solutions and services such as energy, security and integrated workplace management systems – was valued at $103 billion / £76 billion in 2024 and is projected to reach $828 billion / £611 billion by 2034[1]. Such rapid growth signals a new era for the built environment. This paper outlines Mitie's perspective on this evolution – the shift from isolated smart systems to fully integrated, intelligent portfolios.

We define smart buildings as dynamic, data-enabled environments that go beyond system integration to deliver measurable outcomes in sustainability and net zero, resilience and asset performance, and occupant experience and wellbeing. To make the transition to intelligent portfolios, this approach should be embedded throughout the asset lifecycle, from early-stage strategy through to design and construction, and into operations, maintenance and renewal. Selecting a fit-for-purpose, interoperable technology stack is critical to unlocking long-term value. Alignment with leading frameworks – including BREEAM, the WELL Building Standard, and SmartScore – alongside outcome-focused delivery, is also crucial to achieving a transformative improvement.

Benefits of data, analytics and intelligence extend across assets, operations and strategy. Intelligent portfolios, enabled by integrated technologies and data-driven approaches, transform buildings into adaptive assets that learn, optimise and evolve over time. By connecting people, places and technology, they create tangible improvements in sustainability, efficiency, resilience and wellbeing, positioning the built environment as a catalyst for organisational success and societal progress.

By leveraging our cross-sector expertise in projects, technology and facilities services, Mitie enables organisations to unlock the full potential of their buildings and portfolios.

This paper is intended to spark conversations on the transition to intelligent portfolios and inspire a more sustainable, adaptive and future-ready built environment.

[1] Smart Building Market Size & Share | Growth Report, 2025-2034

Redefining the smart building

As organisational priorities evolve, buildings play a central role in helping businesses achieve net zero, strengthen asset resilience and adapt to hybrid, flexible and digitally enabled ways of working. Smart building technologies are central to this evolution, helping organisations enhance performance, strengthen resilience and future-proof their real estate.

While smart buildings have long delivered automation, connectivity and system integration, their benefits now go much further. With performance at the core of their design, they use real-time data, predictive analytics and holistic intelligence from previously siloed systems and assets.
The interaction between these systems creates a feedback loop of insight and optimisation. Live data on occupancy, environment and asset performance informs smarter decisions, enabling buildings to self-adjust, predict maintenance needs and adapt to user demand. The integration of these systems reduces energy consumption, enhances wellbeing and resilience, and supports agile operational strategies aligned with business goals.

This evolving definition reframes the smart building's purpose – from isolated systems delivering automation to intelligent portfolios that advance broader business and societal priorities, such as climate action and human health, wellbeing and resilience, creating lasting value for owners, operators and end users alike.

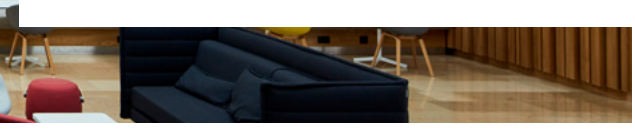
Intelligence = Impact

Smart buildings use real-time data – such as occupancy, temperature, air quality and energy consumption – and automation that adjusts HVAC, lighting and equipment operation to optimise efficiency, comfort and carbon performance. This consolidates their role in the low-carbon economy, enabling them to operate in ways that meet the needs of both people and the planet. Their systems enhance energy efficiency, integrate renewable energy, and advance net zero goals while responding dynamically to market conditions through grid-responsive energy management and portfolio-level decarbonisation.

1. Sustainability and net zero

Smart buildings use real-time data – such as occupancy, temperature, air quality and energy consumption – and automation that adjusts HVAC, lighting and equipment operation to optimise efficiency, comfort and carbon performance. This consolidates their role in the low-carbon economy, enabling them to operate in ways that meet the needs of both people and the planet. Their systems enhance energy efficiency, integrate renewable energy, and advance net zero goals while responding dynamically to market conditions through grid-responsive energy management and portfolio-level decarbonisation.

> "Smart buildings are proving their value – using intelligent systems to reduce energy use, achieve certifications like WELL and BREEAM, and create healthier, more resilient spaces where people can thrive. Intelligence turns data into action and buildings into high-performing places.BREEAM, and place a strong emphasis on sustainability, resilience and occupant wellbeing."
>
> **Alex Avila,** Managing Director, Energy and Sustainability Solutions



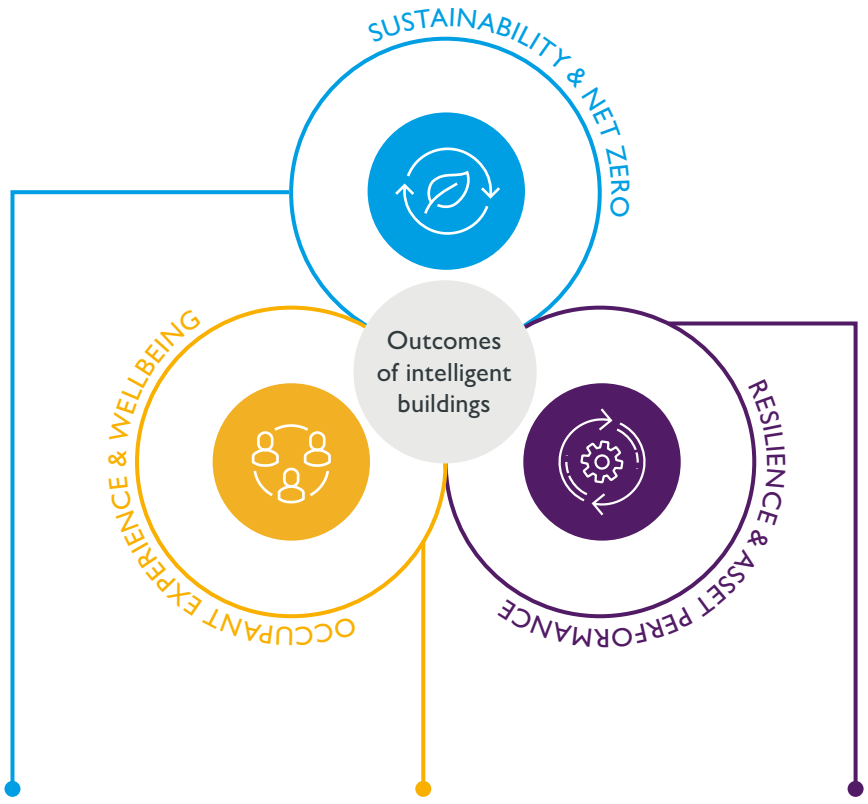
[2]How Smart is Your Smart Building? | Articles | International WELL Building Institute

2. Resilience and asset performance

By applying predictive analytics, fault detection and automated controls, smart buildings support proactive, agile maintenance. Fixing issues before they escalate extends asset life, reduces unplanned downtime and optimises performance. Smart buildings further enhance resilience by mitigating risks from climate, energy and market instability. With growing regulatory demands, these systems help maintain compliance and reduce the likelihood of related legal or operational issues. Enhanced security for people, property and assets is another benefit. Technologies such as smart surveillance, access control and cybersecurity bolster physical and digital resilience, reduce vulnerability and preserve business continuity.

3. Occupant experience and wellbeing

Smart buildings and smart building technologies offer responsive, user-centric and empowering solutions. They streamline access to workspaces and space booking, while responding to personalised comfort settings and real-time feedback. Seamless interaction between systems and data enhances the occupant experience through improved indoor air quality and better visual, acoustic and thermal comfort – supporting health, wellbeing and performance. In addition, enhanced safety features such as intuitive access, smart threat detection and adaptive evacuation systems give people confidence in their environment. The result is an environment that promotes peace of mind, supports productivity and collaboration, and improves overall safety.



Real-time data and automation reduce energy use and emissions while integrating renewables and demand flexibility. Intelligent buildings enable portfolio-level decarbonisation and strengthen ESG performance.

Adaptive systems optimise air, comfort and safety to enhance health and performance. User-centric technologies create responsive environments that foster trust and collaboration.

Predictive analytics and proactive controls extend asset life, minimise downtime and ensure compliance. Integrated physical and digital security protects assets and safeguards continuity.

Figure 1: Intelligent building outcomes framework

The digital backbone of building intelligence

The three key outcomes of smart buildings rely on well-integrated technology. They do not depend on a single innovation but on the convergence of multiple systems that capture, process, visualise, interpret and act on data. This end-to-end flow is enabled by three interconnected elements that collectively form the digital backbone of building intelligence.

1. Data acquisition

Infrastructure connecting physical estate systems to digital platforms is at the core of smart buildings and smart workplace transformation. This includes IoT devices - sensors and actuators - which continuously monitor conditions such as temperature, occupancy, space utilisation, lighting and air quality, as well as operational information such as energy consumption.

This enables real-time data collection and automated responses from a range of sources, including utility meters, environmental monitors, space booking systems and access control systems. Edge computing allows data to be analysed close to where it is generated, enabling more immediate and informed responses, for example, by adjusting temperature in real time as occupancy, utilisation and thermal conditions change.

Data acquisition is key to making sure old and new systems work together. It also supports seamless integration with the Cloud, giving building operators a clear, single view and control of their buildings so they can respond quickly, save energy, optimise space usage and scale operations.

2. Data intelligence

This part of the system brings together the main tools and technologies that turn raw data into actionable information. These include Building Management Systems (BMS), Building Energy Management Systems (BEMS) and Computer-Aided Facilities Management (CAFM). The platforms act as the building's central nervous system, coordinating mechanical, electrical and life safety systems, including HVAC, lighting, fire alarms and security.

When combined with contextual data – occupancy, weather forecasts, and tariff schedules – the platforms generate predictive insights that enhance operations and support informed decisions.

AI and machine learning (ML) are the engines of this intelligence, transforming reactive management into proactive optimisation. ML techniques enhance energy forecasting, predictive maintenance, and automation[3], enabling adaptive control and accurate renewable energy output forecasts based on occupant behaviour and environmental conditions.

Beyond operational optimisation, AI increasingly enables scenario modelling, anomaly detection and autonomous decision-making. It connects asset, environmental and human data to anticipate needs and recommend adaptive responses across the portfolio. Together, these capabilities reduce downtime, improve building performance and deliver intelligent operations across the portfolio.

3. User interface (UI) and experience (UX)

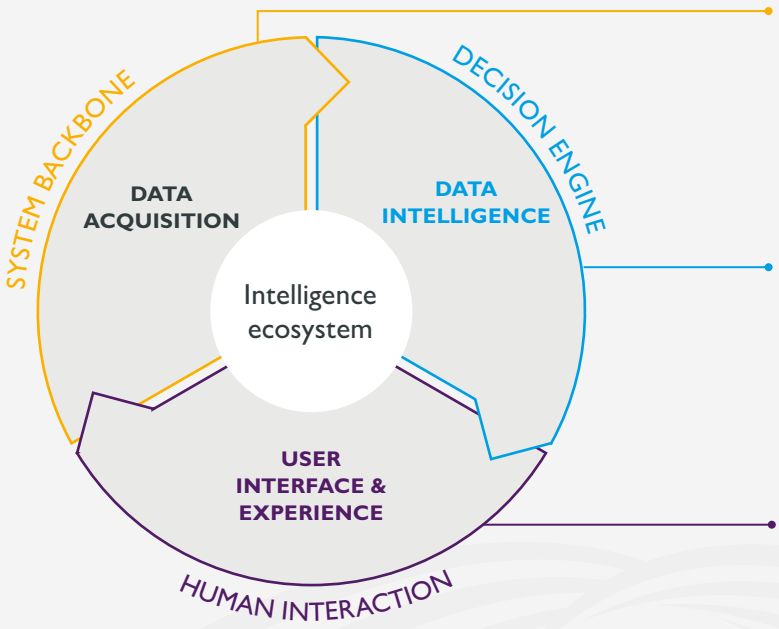
To be easily understood and used, intelligence must be clearly visualised. Real-time insights and performance metrics can be accessed via dashboards, mobile apps, alerts, kiosks and digital signage.

Analytics platforms translate data into insights that can be acted upon for continuous improvement. Users are empowered to enhance their environment with intuitive controls for lighting, climate and space booking. Some spaces offer advanced features such as personalised comfort settings, predictive environmental adjustments and feedback tools for occupants to report issues or share preferences.

By making intelligence accessible and responsive, the UI/UX layer enhances transparency, engagement and satisfaction. User input and feedback, in turn, enrich the intelligence layer, strengthening the continuous learning cycle. In doing so, building data delivers tangible benefits, driving sustainability, resilience and wellbeing.

Together, these layers form a connected data ecosystem – from sensor to strategy. Real-time feedback, predictive analytics and user interaction reinforce one another, enabling buildings to operate as intelligent, responsive systems within a wider portfolio.

[3]Machine Learning in Smart Buildings: A Review of Methods, Challenges, and Future Trends



Dashboards, apps, and signage translate intelligence into insights and user control. Personalised, intuitive interfaces empower occupants, teams, and leaders to shape their environment in real time.

Platforms like BMS, BEMS, and CAFM consolidate and analyse building data, applying AI, automation, and cybersecurity. This layer turns raw data into predictive control, optimisation, and resilience at scale.

Sensors, meters, and IoT devices capture real-time data on conditions, occupancy, and environment. Edge computing enables local responses and ensures integration across legacy and cloud systems.

Figure 2: Intelligence ecosystem

Common building technology challenges

System integration – Complex coordination across multi-vendor systems not designed to interoperate, requiring clear standards, open APIs and rigorous commissioning to achieve seamless, reliable performance.

Retrofitting – Legacy infrastructure makes older buildings difficult and costly to upgrade, requiring careful phasing, non-invasive installation methods and realistic budgets to deliver value without disrupting operations.

Cybersecurity – Greater connectivity expands the attack surface, requiring secure-by-design networks, robust access controls, continuous monitoring and regular testing to protect people, data and systems.

Compliance – Varied regulations and standards add complexity across portfolios; large data volumes can overwhelm teams without clear data ownership, quality controls, retention policies and transparent audit trails.

Human factors – Effective operation depends on trained people, requiring investment in user education, change management and ongoing support so intelligent systems are adopted, maintained and continuously improved across sites.

> "Across the construction and engineering industry, around half of the project data captured goes unused[4] - intelligent systems unlock this untapped value, transforming raw information into strategic insight that drives smarter, faster and more sustainable decisions across the asset lifecycle."

Leagh Cater, Managing Director, Workplace Advisory and Change

[4]Harnessing the Data Advantage in Construction | FMI & Autodesk https://construction.autodesk.com/resources/guides/harnessing-data-advantage-in-construction/

Think smart at every stage

The surest way to address common building technology challenges is a lifecycle delivery model. This embeds open standards, data governance and change management from strategy through to renewal. To unlock its full potential, intelligence must be woven into every stage of the asset lifecycle. There are three key steps for implementation.

DESIGN & CONSTRUCTION

BIM and digital twins enable simulation, collaboration and performance analysis. Future-ready systems, low-carbon materials and commissioning processes build the foundation for sustainable, efficient operations.

OPERATIONS & MAINTENANCE

Predictive maintenance, fault detection and data-driven services optimise performance and reduce costs. Occupant intelligence and real-time insights keep environments efficient, resilient and responsive.

EVOLUTION & END-OF-LIFE

Modular upgrades, circular strategies and carbon tracking support improvement and renewal. Operational data guides deconstruction, retrofits and planning, extending asset value across generations.

Figure 3: Intelligent lifecycle integration

1. Design and construction

Begin with performance-led, integrated design that anticipates future operational needs. Tools such as digital twin models and Building Information Modelling (BIM) enable early-stage simulation, multidisciplinary collaboration and predictive performance analysis. Consider incorporating:

- Future-ready systems and interoperability
- Sustainable and low-carbon design
- Performance assurance
- Commissioning and digital handover

By doing so, you lay the foundation for operational efficiency, digital maturity and sustainability.

Transformative upgrades enable buildings to evolve in line with emerging expectations – integrating new technologies, user expectations and sustainability standards as part of a continuous improvement process. Designing with industry standards and certification requirements in mind also supports future-proofing and compliance, ensuring that buildings can adapt to future technologies, user expectations and regulatory change.

Follow due process to ensure smart technologies perform as intended once operational. Ensure that facilities teams understand how systems work and can resolve any issues early. Thorough testing and verification, supported by digital tools, confirm readiness for use.

2. Operations and maintenance

Once in use, smart buildings enable remote-first, data-informed operations that are responsive, efficient and resilient. Key enablers include:

- Predictive maintenance
- Automated fault detection
- Performance optimisation tools
- Demand-led service orchestration

Service provision is increasingly intelligent. Data and automation are applied to engineering, cleaning, security and other functions that keep estates running smoothly. Occupancy, environmental and operational data enable demand-led services, improving performance and resource efficiency.

In particular, continuous monitoring and optimisation of energy consumption help reduce operational costs and carbon emissions. This turns efficiency into a driver of both financial and environmental performance. Insights from user feedback, behavioural patterns and wellbeing data help shape the environment and guide the improvements prioritised by building users. This results in reduced costs, strengthened compliance and elevated occupant experience.

3. Renewal and repurposing

Flexible systems accommodate continuous improvement of buildings and smart building automation through:

- Adaptable and upgradeable systems
- Circular renewal strategies
- Modular upgrade pathways
- Lifecycle intelligence

By planning to be adaptive and responsive, organisations can extend asset lifespans, minimise waste and maintain performance. Operational data collected over each building's lifecycle supports future retrofits, strategic reinvestment or portfolio planning. This enables continuous improvement beyond a building's current form. In this way, intelligence supports not only day-to-day operations but also sustainability, resilience and strategic asset management – ensuring buildings continue to evolve and deliver value throughout their lifecycle.

End-of-life to new life: circular renewal strategies

Deconstruction planning

Plan the dismantling of buildings so components can be safely recovered, reused or recycled. This minimises waste and environmental impact at end-of-life, and enables efficient refurbishment and resale where appropriate.

Material passports

Maintain a digital record of products and materials used in buildings. This enables future reuse, recycling, safe removal and accurate circularity reporting over time, supporting procurement and compliance decisions.

Embodied carbon tracking

Measure and manage emissions from producing, transporting and installing materials. This will inform low-carbon choices and reduce whole life environmental impact, with transparent data for design, procurement and reporting.

Making building intelligence both credible and visible

Many organisations try to demonstrate leadership in the built environment. Benchmarking performance against recognised frameworks and aligning delivery with advanced industry standards supports continuous improvement. The certification process shapes best practice and sets performance standards, offering credible ways to:

- Measure performance against recognised standards
- Verify progress through independent, third-party assurance
- Communicate outcomes transparently to investors, occupiers and regulators

This is important, as certification connects technical achievement to business credibility. It gives confidence to investors, assurance to regulators and visibility to occupiers and employees, demonstrating that buildings deliver on their environmental and wellbeing commitments.

Certifications bring clarity to complexity. They validate progress, build trust with stakeholders and demonstrate a commitment to excellence. For owners and operators, they reduce risk, enhance asset resilience and protect long-term asset value. For investors, they strengthen ESG transparency and credibility while supporting portfolio performance. For occupiers, they ensure environments that enhance health, experience, and productivity. In doing so, they future-proof assets, support investor confidence and ensure buildings remain responsive to evolving expectations and regulatory requirements.

> Certification isn't just a compliance tick-box – it's a strategic lever to learn, improve, and build trust. By aligning with recognised frameworks developed through years of research and real-world practice, organisations can demonstrate progress, strengthen credibility, and create long-term value for people, planet, and business.
>
> **Sue Hyun,** Director, Workplace Advisory and Change

Energy and environmental sustainability

In the drive towards net zero, energy and sustainability certifications are reshaping how buildings are designed, operated and managed. In the UK, Minimum Energy Efficiency Standards set the legal baseline for lettable properties, while global frameworks such as BREEAM and LEED assess sustainability across the full lifecycle – from design and construction to operation. The UK Net Zero Carbon Buildings Standard provides a consistent methodology for verifying whole-life carbon performance, including both operational energy and embodied emissions. Complementary standards such as ISO 14001 and ISO 50001 embed environmental and energy management practices at scale, ensuring sustainability becomes a structured part of business operations.

Health and wellbeing

As a growing area of focus in human health and wellbeing within the built environment6, standards such as WELL, Fitwel, and RESET assess how buildings support the people who use them. Together, these frameworks translate wellbeing principles into measurable building performance and organisational outcomes. WELL offers a science-based framework for buildings and organisations that spans human comfort, environmental quality and social factors. Fitwel emphasises design and operational strategies that promote healthier lifestyles through movement, inclusion, and social connection. RESET leverages sensor-based monitoring to track building performance and enhance indoor environmental quality, supporting occupant wellbeing. Collectively, these certifications provide tangible measures for understanding how buildings impact people, helping bridge the gap between human experience and building performance.

Smart buildings

In the smart buildings space, SmartScore assesses how advanced technologies are integrated to deliver outcomes such as efficiency, adaptability, and user-centric services. WiredScore focuses on digital connectivity and infrastructure resilience – critical enablers of productivity, business continuity, and occupant satisfaction. Together, these certifications help ensure that smart buildings are not only technologically capable but also ready to scale as part of connected, intelligent portfolios. They form part of a broader ecosystem of building certifications, aligning with frameworks centred on environmental impact, wellbeing and resilience.

These certifications help organisations measure how effectively their workplaces integrate technology and support people – showing that smart buildings are ultimately about improving lives and helping businesses grow. Organisations that understand the crosswalks between leading certification frameworks – such as WELL, LEED, and SmartScore – are increasingly using complementary certification frameworks in parallel to strengthen credibility, performance assurance and market differentiation.

From smart buildings to intelligent portfolios

Building on the foundations laid by smart buildings, the next frontier is already emerging – intelligent portfolios. There is a shift from isolated smart assets to interconnected portfolios spanning campuses, business parks, mixed-use developments and more. Bringing performance, experience, and strategy together at scale delivers benefits greater than the sum of their parts.

New levels of optimisation – linking buildings through portfolio-wide IoT platforms, centralised analytics, and digital twin models unlocks cross-site efficiencies, benchmarks performance, and informs space optimisation and investment decisions.

Improved efficiency and experience – coordinating energy, mobility, maintenance, and workplace operations across portfolios enhances utilisation, reduces costs, and creates seamless, user-centred environments.

Energy intelligence and control – enabling real-time response and portfolio-wide optimisation, improving resilience, energy security, and flexibility while reducing costs through market-aligned energy management and load shifting.

Enhanced governance and value creation – integrating sustainability, financial, and human data to inform strategic decisions, strengthen ESG transparency, and unlock long-term asset and investor value.

Collaboration and social impact – fostering partnerships between landlords, occupiers, service providers, and local authorities, enabling coordinated action on carbon, accessibility, and commpunity outcomes.

This approach supports wider corporate and real estate strategies, from cost reduction and decarbonisation to talent attraction and portfolio right-sizing.

> By shifting from isolated smart buildings to intelligent, portfolio-wide ecosystems, organisations unlock portfolio-level agility - driving carbon reduction, operational efficiency, and experience innovation at scale."
>
> **James Spires,** Director, Energy and Sustainability Solutions

Space optimisation is a core strategic lever. By aggregating and analysing portfolio-wide occupancy, utilisation, and behavioural data, organisations can better align their physical footprint with business needs. Underused sites can be consolidated, repurposed, or reinvested in. High-performing assets provide models for future improvement.

User experience improves too. Intelligent portfolios enable seamless movement and use between buildings while ensuring consistent environmental quality. They typically provide a single digital interface for users. This means everything from space booking and wayfinding to lighting and climate control is hosted on an interactive system that responds to individual preferences and operational requirements. A frictionless experience contributes to high satisfaction, increased productivity and wellbeing.

Smart buildings optimise individual assets; intelligent portfolios multiply value across the sites. Portfolio-wide platforms, such as Distributed Energy Resource Management Systems (DERMS), optimise on-site renewables, battery storage, and load balancing, improving resilience, cutting emissions and lifting financial returns. Forecasting, shifting and trading energy across sites makes strategy more responsive and more valuable. Beyond energy, portfolio-level sustainability extends to transport, waste management, and consistent environmental quality standards across sites.

Intelligent portfolios empower better governance and decision-making. By connecting financial, operational and human data, leaders gain a unified view of performance – integrating sustainability metrics, user feedback, asset condition, and cost data into a single decision-making framework that enables proactive investment planning, predictive risk management, and measurable progress against ESG and business goals. In this way, intelligence moves beyond optimisation to shape long-term value creation and strategic agility.

They also foster collaboration and social value. Shared data platforms enable partnerships between landlords, occupiers, service providers, and local authorities, supporting coordinated action on carbon, accessibility and social impact. By aligning investment and operations through transparent intelligence, portfolios can deliver not only performance gains but also measurable community and societal value.

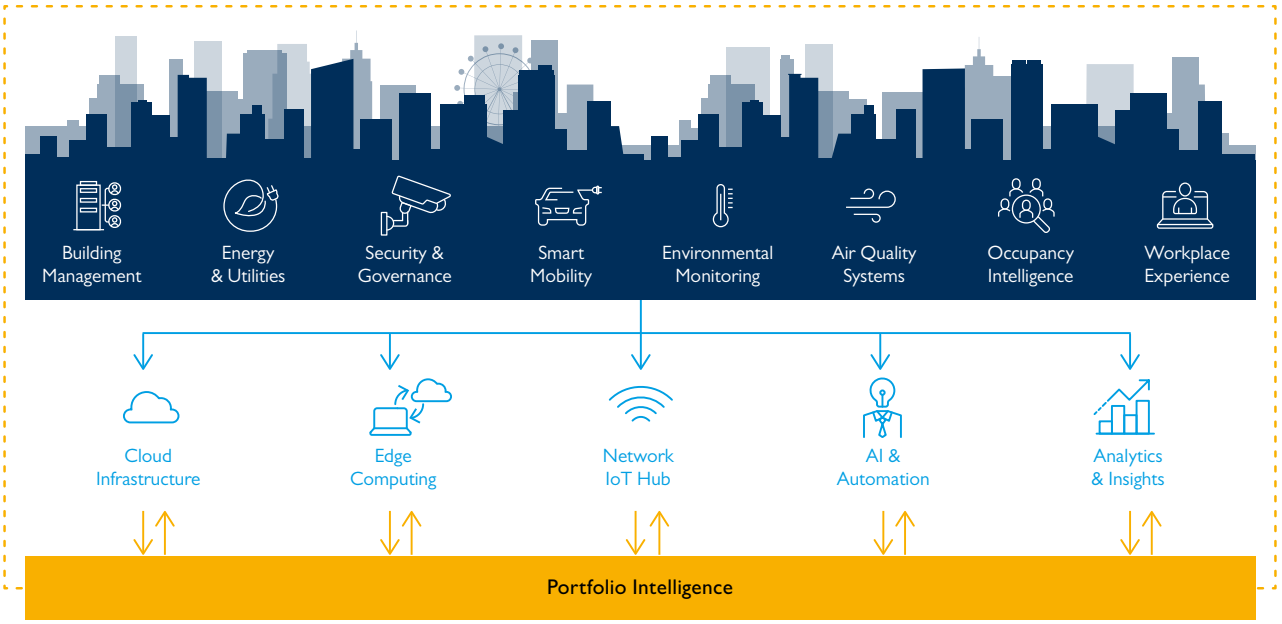


Figure 4: From smart buildings to intelligent estates

Conclusion

Embedding intelligence is a strategic imperative

The conversation around smart buildings is no longer centred on individual technologies or isolated operational upgrades. It is now a defined pillar of a future-ready real estate strategy. Forward-thinking organisations are embedding intelligence to reduce risk, enhance consistency and future-proof operations. They recognise that the built environment must act as a catalyst for long-term success.

> Embed intelligence from the outset – integrating smart thinking into design, investment and governance decisions unlocks long-term value, resilience and competitive advantage across the built environment."

Mark Caskey, Managing Director, Mitie Projects

Act now

Now is the time to integrate intelligence at every level. The following steps will help your organisation stay ahead.

1. **Design with intent**, incorporating intelligence to lay the foundation for operational efficiency, digital maturity and long-term sustainability.
2. **Invest in data-led services** to drive intelligent operations that reduce costs, improve responsiveness and enhance productivity, wellbeing and experience.
3. **Shift the culture** from compliance-led mindsets to continuous improvement, innovation and value creation through the built environment.
4. **Build collaborative partnerships** between landlords, occupiers, service providers and local authorities to enable estate-wide, coordinated insights at scale.

By embedding intelligence, you will lead the way in fostering innovative, sustainable and adaptable estates that drive success and deliver substantial returns now and in the years to come.

Want to know more about intelligent portfolios?

Mitie's experts are ready to unlock performance, resilience and long-term value across your built environment.

We make places perform brilliantly. We bring together smart thinking, practical experience and the right technology to create environments where people thrive and perform at their best. We focus on what matters most to your organisation – today and for the future.

Authors

Alex Avila
Managing Director
Energy and Sustainability Solutions
alex.avila@mitie.com

Leagh Cater
Managing Director
Workplace Advisory and Change
leagh.cater@mitie.com

Adam Mitton
Managing Director
Connected Engineering & Technology
adam.mitton@mitie.com

James Spires
Director
Energy and Sustainability Solutions
james.spires@mitie.com

Sue Hyun
Director
Workplace Advisory and Change
soyoung.hyun@mitie.com

Richard Anderson
Director
Connected Engineering & Technology
richard.anderson2@mitie.com

Level 12 The Shard,
32 London Bridge Street,
London, SE1 9SG

mitie.com