

The Guide to

Sustainability and Productivity in Civil Infrastructure



sensat

CEO forward

The coming decades will be transformative as we push towards net zero globally. With great enthusiasm, I share my thoughts on the intersection of sustainability and productivity that defines the future of civil infrastructure and the importance of software adoption to support this journey.

The global call to achieve net zero by 2050 has propelled sustainability beyond a mere trend—it has become a multigenerational, multisector mission. Simultaneously, the industry's productivity underscores the urgency to innovate and do more with less. In the coming years we all need to turn to innovation to support this journey.

This guide delves into the nexus of productivity and sustainability, exploring the insights of industry leaders who navigate these issues daily. Their perspectives illuminate the path forward, showcasing how teams across sectors integrate innovation into their workstreams.

We unravel what lies ahead for infrastructure, focusing on how successful software adoption will help drive some of the world's most significant projects. Many of these projects are not just monumental in scale; they also pioneer sustainable upgrades—a testament to net zero commitment.

As we navigate the challenges and opportunities 2024 presents, this report serves as a compass, guiding teams towards a future where our actions today contribute to a sustainable and productive tomorrow.

Best regards,



James Dean

CEO and Co-Founder at Sensat

Contents

3	Chapter 1: The forces pushing innovation: productivity and sustainability
—	The global push for sustainability and productivity.
—	Innovation from necessity
—	Recommended readings
<hr/>	
7	Chapter 2: State of innovation today
<hr/>	
11	Chapter 3: How to support innovation adoption within infrastructure
—	Find your champions
—	Understanding the white glove approach
—	Measuring impact
—	So what now?

Chapter 1

The forces pushing innovation: productivity and sustainability



The global push for sustainability and productivity

Every industry is experiencing an increased momentum towards sustainability. For infrastructure, this means integrating environmentally responsible practices into nearly every facet of the project lifecycle.

At the same time, the civil infrastructure's productivity is under immense strain to achieve more with fewer resources. This simultaneous squeeze fosters the conditions ripe for innovation. The industry is at the precipice of productivity and sustainability gains but will only be truly successful if teams lean into the new technologies coming to market.

The challenges in sustainability targets

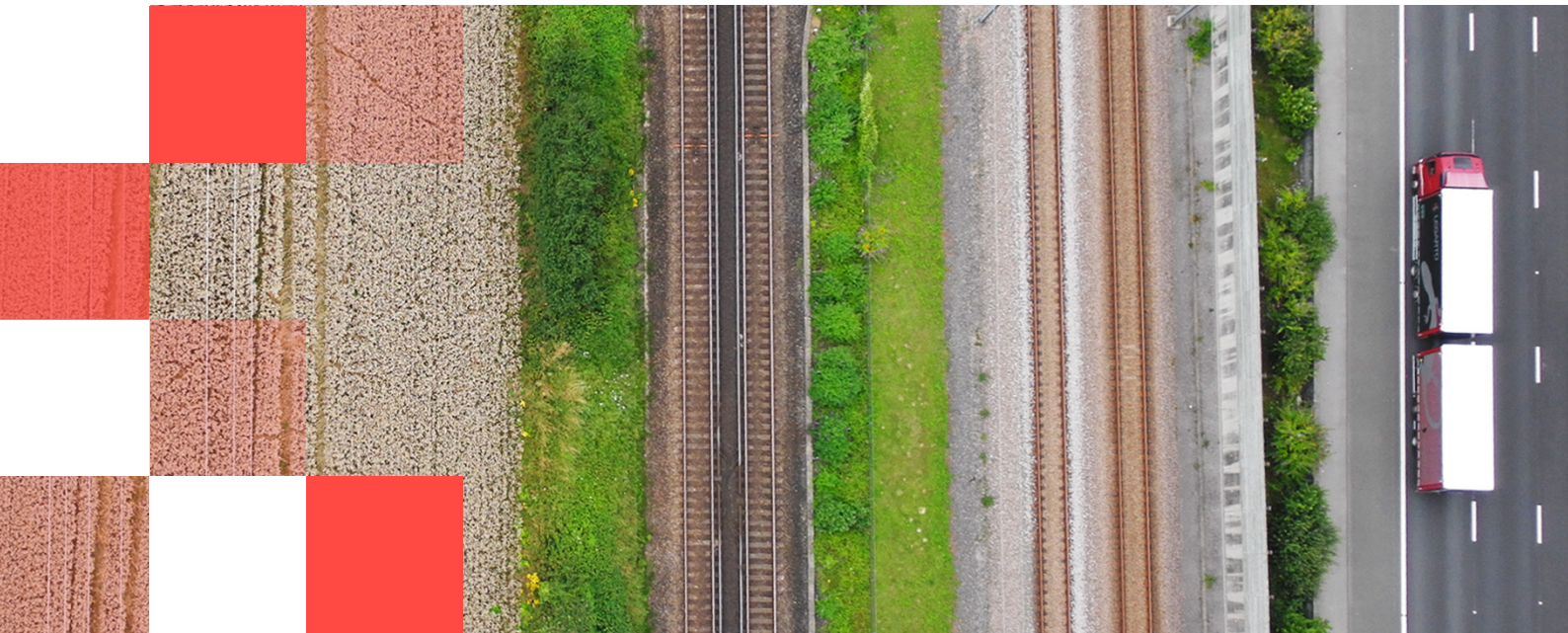
70% of carbon emissions worldwide are linked to infrastructure, according to a [2022 ICE report](#). As a result, we are seeing increasing environmental legislation that confronts planning right through to managing any project.

Sustainability has evolved from a mere checkbox exercise to a key factor in securing project bids. Planning teams must express their commitment to sustainability and demonstrate tangible efforts to compete in an environmentally conscious market.



Productivity means civil engineers maximising the effectiveness and efficiency of what they do at every stage of the infrastructure lifecycle so that we can make the most of our finite resources and deliver more services with a lower environmental impact.

Ed McCann
[ICE President](#)





Productivity and sustainability have to be compatible, so it shouldn't feel like there's a trade-off between the two. We're ultimately talking about changing how we work. When that changes, it can naturally feel challenging and sometimes slow you down. But once you learn the new way, you can make excellent inroads.



John Twomey
Director of Customer Connections,
National Grid



WBalancing environmental challenges and productivity imperatives in infrastructure

While environmental challenges are pressing teams, the civil infrastructure industry is simultaneously facing a need for productivity gains—achieving more with fewer resources. Over the next ten years globally, there will be

thousands of critical infrastructure projects to deliver as more industries shift towards net zero, and the clock is ticking.

Take the energy industry, for example; a [2023 IEC report](#) identifies that reaching national energy goals means adding or refurbishing over 80 million kilometres of grids by 2040, the equivalent of the entire existing global grid. Delivering such projects on time will be the difference between meeting net zero and missing it.

Infrastructure projects require optimising processes, technology, and people to ensure they are executed efficiently and cost-effectively.

75% of firms reported difficulties in sourcing skilled operatives

To compound [this challenge, the shortage of skilled personnel](#) within the industry is a problem expected to worsen if not addressed proactively. The [Civil Engineering Contractors Association \(CECA\) Workload Trends Survey for 2022](#) highlights that 75% of firms reported difficulties in sourcing skilled operatives despite eight consecutive quarters of workload growth.

Innovation from necessity

The need for innovation and productivity paints a worrisome picture. However, due to these growing pressures, companies of all sizes have sped up the search for ways to enhance their existing practices.

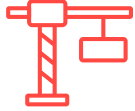
The civil infrastructure industry finds itself at a critical juncture where innovation is no longer optional but critical.

Searching for new technologies is a challenge; navigating the landscape of software implementation requires strategic planning and dedicated efforts. This

comprehensive guide explores three crucial elements for a successful rollout: identifying champions, evaluating vendor support, and measuring impact. Explore each aspect to ensure a seamless journey from the initial search for innovative solutions to the realisation of tangible benefits.

Recommended readings

Here are some of the top resources you can be using to keep up to date with the latest developments in innovation.



GENERAL

Future of Work in Construction.

“Construction must change. It is a key driver of value creation in economies around the world, but it is inefficient, suffers from low productivity and is often mired in disputes. Coronavirus acts a key catalyst for this change in terms of technological investment, social distancing and productivity challenges.”— Alan Muse, Global Director of Built Environment, RICS

[Read more](#)



ENERGY

‘Tracking Clean Energy Technology Innovation’, IEA

Innovation in clean energy technologies needs to accelerate to get on track with the Net Zero Emissions (NZE) by 2050 Scenario. While most of the CO2 emission reductions needed by 2030 can be achieved with technologies available on the market, the path to 2050 relies on technologies that are not yet ready for widespread uptake but must become available this decade, particularly in sectors that are hard to decarbonise such as heavy industry and long-distance transport.

[Read more](#)



RAIL

Innovating safety and productivity in Rail: Shifting culture on and off site, Sensat

When putting boots on ballast, the unanimous philosophy of ‘safety above all’ goes without saying. Today the industry is calling for the cultural shift needed to embrace innovation to make working practices safer both on and off-site.

[Read more](#)



WATER

Ofwat innovation fund Annual report, Ofwat

Innovation is a vital component of economic growth, and investment in innovative ideas and technologies has the potential to transform entire industries. Innovation is essential to address the major challenges the water sector faces; from climate change, to growing customer expectations, to concerns about affordability.

[Read more](#)

Chapter 2

State of innovation today



The state of innovation today

Senior industry leaders call for innovation adoption, a culture shift towards technology, and highlight the importance of change management.

During Sensat's knowledge share discussion surrounding innovation in civil infrastructure, a panel of specialists from across the industry discussed the challenges of technology adoption, the importance of vendor support, and the potential for AI and visualisation platforms to revolutionise the industry in the future.

Some interesting themes from the panellists included emphasis on the impact of technology on human futures and planetary success, discussion of the challenges and opportunities in adopting new technology, and insights on the importance of change management and finding champions within organisations.

Productivity and sustainability fuelling innovation adoption



John Twomey
Director of Customer
Connections, National Grid



Net Zero is a once-in-a-generation ambition we have huge amounts of work that need to be done. There's a climate challenge right here today that needs to be met, so balancing those two things [productivity and sustainability] is sometimes challenging but it's got to be about both, it can't just be about one.



Managing a culture shift



Matthew Higham
Chief Technology Officer,
PA Consulting



Culture in the industry has got to fundamentally change, and by that I mean the mindset and the way that you approach everything—from procurement to risk... You're seeing a huge amount of risk... being democratised but the value is being privatised — and that's not something that can continue.



The importance of change management



Anders Killander
Owner, SwedeConsultants AB



It's [implementing new technology] 90% change management, technology is just a tool. You just have to prepare and help the organisation to embrace a change... there's a lot of planning and good knowledge about how to make change happen, regardless of which brand of tool you select at the end of the day.



Overall, the session provided valuable insights into the future of software and technology in the civil infrastructure industry, highlighting the potential for AI and visualisation platforms to drive innovation and change in the coming years.

What the industry is saying

I have adopted a new software technology in the last 12 months



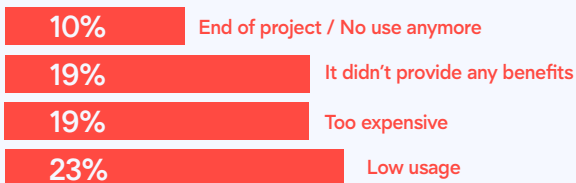
100%

of companies adopted a new software technology in the last 12 months

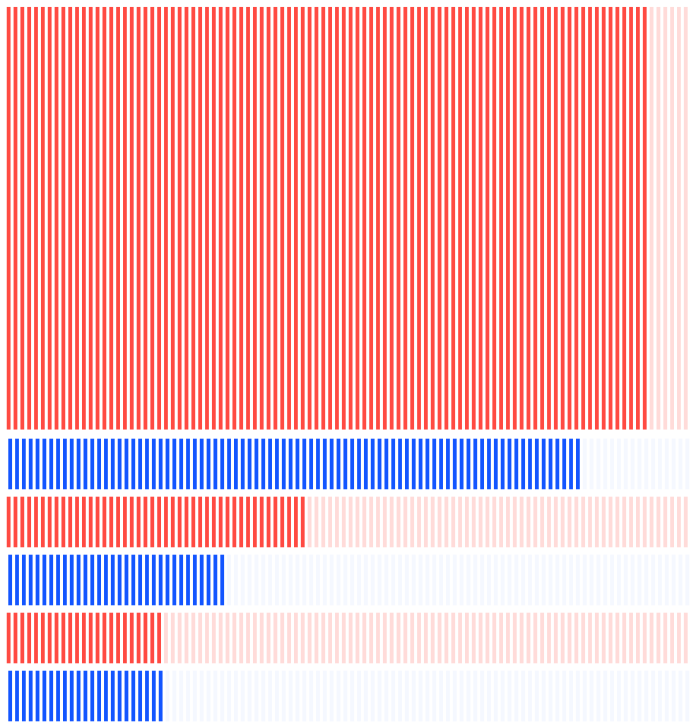
Has your company cancelled a software license in the last year?

58% Yes

Reasons why:



Technologies that will make the most impact on your projects in 2024:

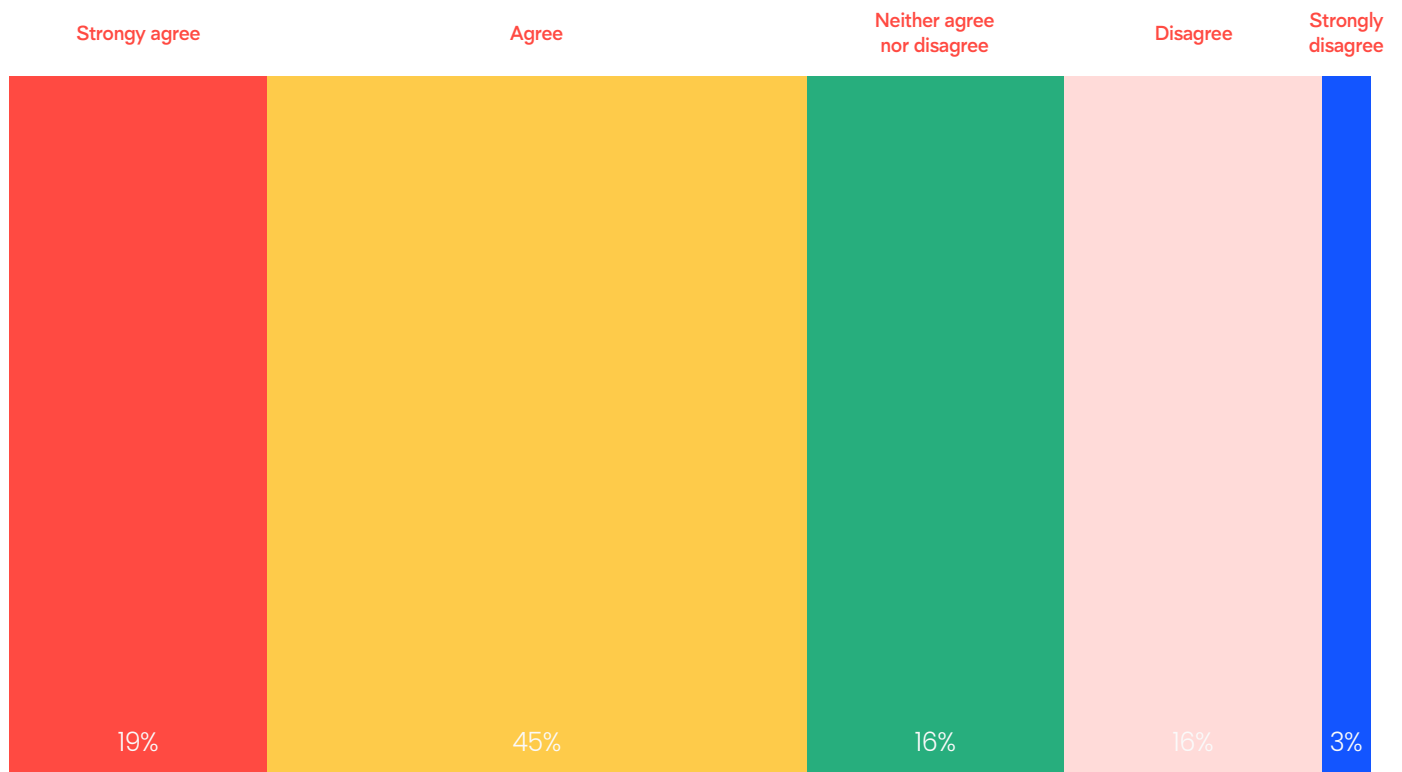


94%

Visualisation platforms (including VR & AR)

- 84% 3D Data (LiDAR photogrammetry, etc.)
- 45% Artificial intelligence / Machine learning based analytics
- 32% 5G site connectivity
- 23% Internet of things
- 23% Other

When new technology is introduced in my company/project, I always understand why I need to use it.



Chapter 3

How to support innovation adoption within infrastructure



The days of labelling the civil infrastructure industry as traditional and slow-adopting innovation are over. More companies are investing in digital transformation and innovation to support strategic needs than ever before. Here are three principles to help you ensure new software is successfully adopted.

1. Find your champion(s)

Defining the champion: the key driver of engagement and transformation

According to [Microsoft](#), "Champions drive engagement and business transformation. They combine technical acumen with people skills to drive meaningful change." They are the ones who see the opportunity for change and also see the value in a product that can help alleviate pain.

A champion's role in software implementation is essential. They will work as the middle person between the software vendor and their organisation to pinpoint exactly how the software could benefit their team.

This person does not need to be the one who has the budget and signoff powers (although helpful) but does need to be able to relay the potential of the software to the people who need to hear it. A champion is often in a position with some level of authority who has the channels to relay the benefits to upper management stakeholders.



Champions share your vision and can see how the software can benefit their day-to-day activities, professionally get them noticed, and enhance a whole team's processes. You do not need to have lots of them; you can just have one person who will make the change and have a ripple effect on their project.



Harry Atkinson
Chief Data Officer at Sensat



The champion's role in software implementation: bridging the gap between vendor and organisation.

Champions are invaluable. During the early software negotiations, they help lead the conversations, highlight the benefits to the company, and bring the right people to the table. The champion often works closely with the software vendor to find initial use cases and is instrumental in building enthusiasm and support for the change.

During this early period, effective communication is critical. Although champions might see the benefit, others may need more time to research the software. A strong champion can help to break down the benefits and translate how the software can enhance existing processes and systems.



Our tip:

Ask the vendor for materials to support conversations. They have likely supported other discussions like the ones you are having and have resources to help you and your team decide on the right path for the project.

Questions that should be answered:

- Does it comply with your software security measures?
- How does it integrate with existing software?
- How many seats does the software have?
- Do they offer proof of concept deals?
- Who in the team would be responsible for managing the software?
- What implantation support do they provide?

Introducing teams to new technology: the champion's support in adoption and implementation

Once the deal is signed, the champion supports a successful introduction of new software by helping with the early adoption and implementation of new software. A champion will help understand the lay of the land and will best know how to introduce the new software.

They often work with the software vendor to create a training plan, identify who needs onboarding, and open up appropriate discussion channels so their team can get the most out of the software.

Why become a champion? Recognising the personal and professional rewards

Champions investing time and effort to introduce new software face both advantages and disadvantages. On the downside, it requires a willingness to invest significant time and effort, and results may not be immediate. However, on the upside, champions serve as the eyes and ears of both the vendor and their company, yielding substantial benefits.

1 – Internal perception: champions are the internal go-to for new software. Although this can be time-consuming, people get internally recognised for achieving operational excellence and sometimes even gain promotions.

2 – Impact on development: Champions have an opportunity to shape the future of software when they provide feedback on usage, improvements, and what is working well in their teams.

3 – External perception: Industry awards and recognition for innovation are increasingly popular. Champions often get space to promote their work and impact on events, awards and other channels, gaining thought-leader status.

2. Assessing vendor support

When investing in innovative software, the level of service should be a key factor investigated. New software requires training and support for it to be a success. At the highest level, looking for a white-glove approach is a sure way to ensure teams adopt and implement the software successfully.

Understanding the white glove approach: elevating service standards for software success

According to [McKinsey](#), a white glove approach is characterised by ‘attention to detail, convenience, speed, [...] and services tailored to each customer’s specific and unique needs.’

For multi-million-pound infrastructure projects, this is the best way forward. White-glove customer success means a dedicated customer success team member who works directly with your organisation is available. As opposed to



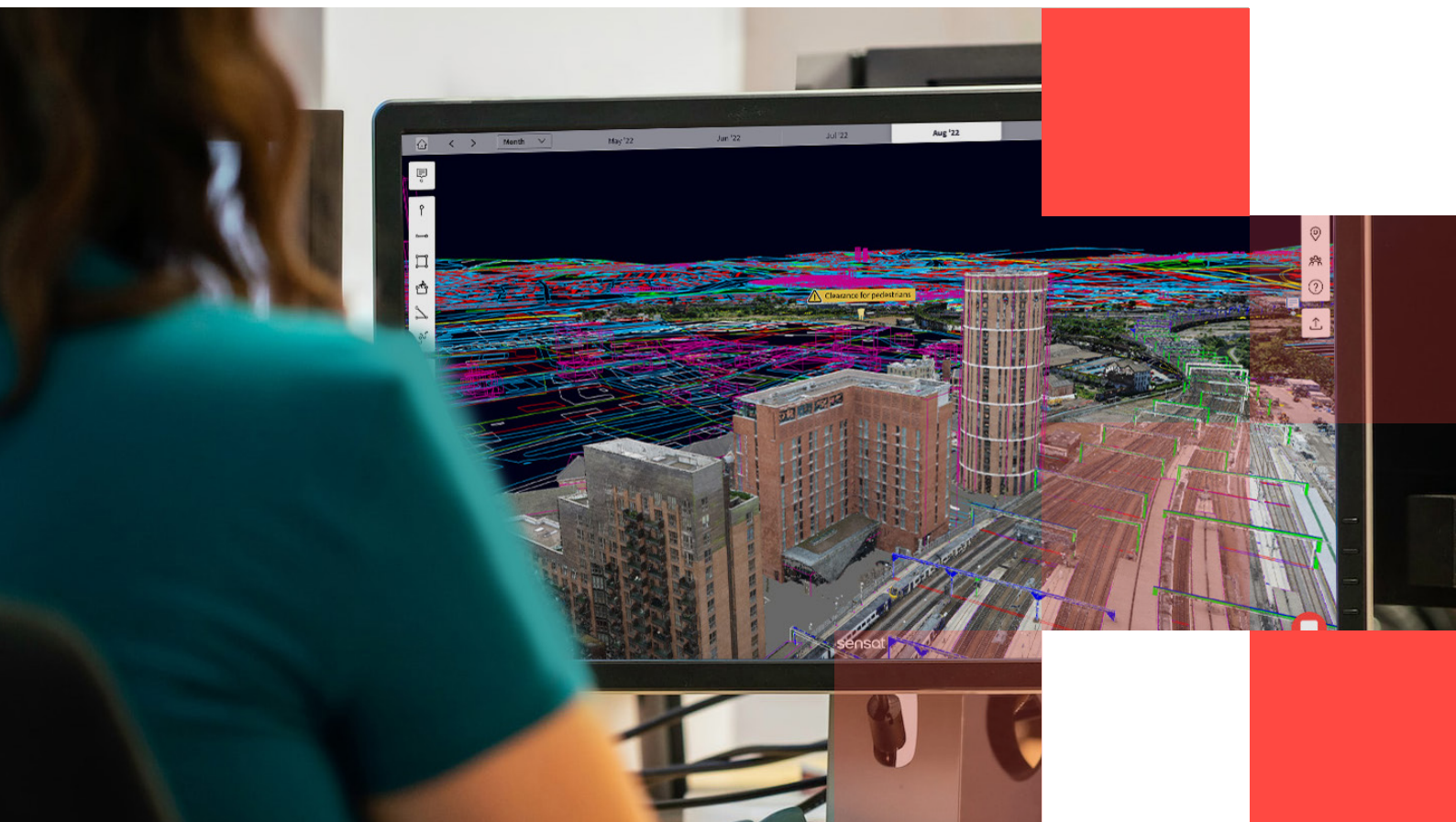
A white glove approach to relationships with customers is key to success. Infrastructure projects are inherently complex and intricate use cases which requires bespoke partnerships, relationships and support.



Katherine Lockley
Customer Success Lead at Sensat



being given a collection of generic videos to watch, this level of service will work to find specific use cases for the software, train teams, and support teams along the way of their software use. This enables teams to get the most out of their investment.



First impressions last: Implementing a successful rollout plan.

Implementing a rollout plan will be the first touch point for many individuals within the organisation. Your software vendor should support you in this and might have suggestions on how to roll out programs. Workshops, targeted use cases and drop-in sessions are all advised for success. Unsurprisingly, lengthy presentations with 50+ people on a Teams call are far from effective.

Although projects are unique, the software vendor should have ideas on the best applications for the software. White glove onboarding allows for a high degree of customisation across teams and tailored use cases so that teams can find near-immediate value in the software. This means that although the same software tools might be used, the vendor can show how tools can be used to suit different needs.



Our tip:

Ask the vendor for the outline of support from the get-go.

- **Explore how a vendor communicates progress:** Communication is key for you as the software purchaser or champion. You may well have to present updates to your upper management, if so make the software vendor team aware. They should be able to deliver regular reports within your timeline.
- **Defining what the first month's post-purchase will look like:** Learn how you and your team can hit the ground running. Expectations should be clearly defined by both the vendor and the organisation to ensure a smooth start to the relationship.
- **What does customer satisfaction look like?:** Work to define key milestones with the software vendor. Explain exactly what you want to achieve and they may be able to set out plans to help get your teams there.

Demonstrating progress and impact

It can take some time before the results come in of introducing innovative technology. Therefore, the champion should regularly be provided with updates on the roll-out performance, where more opportunities and potential issues can arise. The above-and-beyond approach does not

only include progress updates in the form of a call, meeting or email but also supports the champion in communication and showcasing the progress at events, meetings and or other moments.

3. Measuring Impact

Software purchases typically involve significant financial investment. Demonstrating return on investment will help you justify the software's cost to your organisation and

senior management. However, collating numbers is often more complex. There are different ways of measuring the impact of a new software:

Measuring the return on investment (ROI)

Pro ✓ Connecting a cost/time saving to introducing new software is hard evidence of impact.

Con → No project is alike. Making comparisons on cost savings is a complex exercise. Data availability and quality issues complicate assigning precise numerical values and accurate ROI assessments.

Capturing anecdotal feedback

Pro ✓ Having direct feedback from your team and peers on the use cases that software provides high-quality input on measuring impact.

Con → People do not always want to endorse software because they don't like the risk or the limelight.

Capturing satisfaction scores

Pro ✓ You can gauge the usefulness of the software by how satisfied your team is with the new software.

Con → When introducing software, the amount of users using it can be sparse. On top of that, only some users will fill in satisfaction surveys, which can make satisfaction scores inaccurate.

The abovementioned cons have an underlying cause: gaining insights takes methodical time and effort. We turn our eye to the initial business case written up to ease this process. When the champion and the software company collaboratively distil the business case into a clear set of use cases, setting a systematic approach to meeting the expectation is easier.

Regardless of the business case, to prove the use case, more than not, a combination of all three solidifies success. After all, numbers are just numbers, but when people actively endorse a product, it gains trust, which is essential for a successful rollout.



Our tip:

Here are some tips for collating software adoption and usage feedback:

- **The compounding effect:** presenting small monetary gains may not be the impactful result you seek. Therefore, capture all small time savings and translate that into person-hours and cost.
- **Capture the 'eureka' moment:** Capturing time savings can be challenging; how can you prove that preventing something equals time-saving? When introducing new software, new users will experience their own 'a-ha' moment. In the early days, schedule short catch-ups with new users to sense their experiences and note any small 'eureka' moments they experience. Effectively, 'I can now do x' translates into: this is something I couldn't be before, meaning I had to go to x or do y'
- **Collaborate with the software vendor team:** software companies track usage statistics. Liaise with their team to understand what 'good usage' looks like for a project/company like yours.

So what now?

Successful software implementation is paramount for improving processes, productivity, and sustainability in an era of continuous technological advancements.

By focusing on the presence of a champion, evaluating vendor support, and collaboratively distilling a clear business case, organisations can confidently navigate the complexities of

introducing new software. Use this guide as your roadmap to success in the ever-evolving landscape of software adoption.

About the research

Sensat brings together two new sources of primary research: (1) A survey of 30+ senior infrastructure executives and (2) an in-depth panel discussion with three field experts.

The survey was completed in December-2023 by senior executives from across civil infrastructure (primarily UK based).



Watch the panel discussion.

Hear from senior industry leaders in a panel discussion on productivity, sustainability and innovation in infrastructure.

[Watch now](#)

