MATRAK

The State of Materials in Construction

Why materials matter most

Material Tracking Systems Industry Report

Contents

Foreword by Leigh Jasper

Leigh Jasper
CEO, Saniel Ventures
Co-Founder, Aconex

Materials are the basis of every construction project, yet most construction teams have few insights into their data or the power of tracking their materials.

A majority of the time, workers aren’t even sure where their materials are. Up until recently, only limited solutions existed beyond excel sheets and email communication. These are difficult to coordinate and run the risk of being out of date as soon as they’re sent.

We're now seeing a shift in our industry's maturity, with industry leaders discovering the value in risk reduction. Furthermore, the positive impact it has on their bottom line from real time material tracking through the supply chain and building process.

We believe this report demonstrates the significant benefits to project managers and construction supply chains generated from data driven insights through the materials tracking process.

Industry wide challenges are best solved through collaboration, and we hope this report provides the basis to prompt discussion on how we can bring our industry together around its most fundamental component — materials.

A message from our CEO

Shane Hodgkins
Co-Founder, Matrak

On large-scale construction projects, hundreds of companies come together as one team, to deliver something new for the community. Few outside the industry understand what an incredible and mammoth undertaking this is.

Teamwork is paramount in construction. For a company to execute their role in the project, the company prior needs to have completed their work and provided the necessary materials so the project can progress. Each company is reliant on one another.

What's ironic is that these hundreds of companies often never meet in person. They can be based all around the world. Though it's the norm, it's resulted in avoidable delays and financial penalties, plus enormous frustration and stress from the workers involved.

My brother Brett and I both became passionate about creating a transparent materials supply chain network after working with our dad's facade installation company, Masterlite.

We realised that there were huge benefits for all players when they could see and track the materials and tasks being completed.

Brett and I have validated firsthand, through data-backed insights, that collaboration over siloed working is what enables the whole industry to thrive.

We also wanted to make the solution accessible and practical to anyone. Current construction best practice involves having dedicated staff collating run-rates and statistics in Excel and trying to gain insights themselves — something which the vast majority of players simply can't afford to do.

This is why we've created this inaugural 'State of Materials' in the construction report. We believe that by bringing the industry together through the common denominator of materials and sharing our insights, we can build not just better individual projects for Matrak customers, but a better construction industry for everyone in it.

Overview

Construction supply chains are more global than ever before. As a result, digital solutions have emerged to ensure everyone involved in a project has access to the most recent information and updates.

The past few years have seen digital tools take the construction industry by storm, improving efficiency and communication throughout every stage of the supply chain. Thanks to this, construction software has enabled more **successful projects, faster turnover times and reduced risks.**

We decided to use our data to provide valuable insights into the exciting trends surrounding material supply chain tracking.

Calculated from **206 projects** and **436,473 materials tracked** in Matrak from January 2019 to June 2021, the data highlights how powerful a transparent supply chain can be to create a connected construction industry for all.

How Matrak created this report

The State of Materials in Construction is a report that unlocks the statistics and power of materials in a connected supply chain.

Matrak tracks **millions** of updates and tasks across the entire construction supply chain. Doing this provides us with incredible insights and data.

From January 2019 to June 2021, we've extracted data inputted from Matrak users to benchmark industry averages.

We then supplemented the results with secondary research, in-depth interviews, and surveys with experts.

The data provided in this report comes from the following:

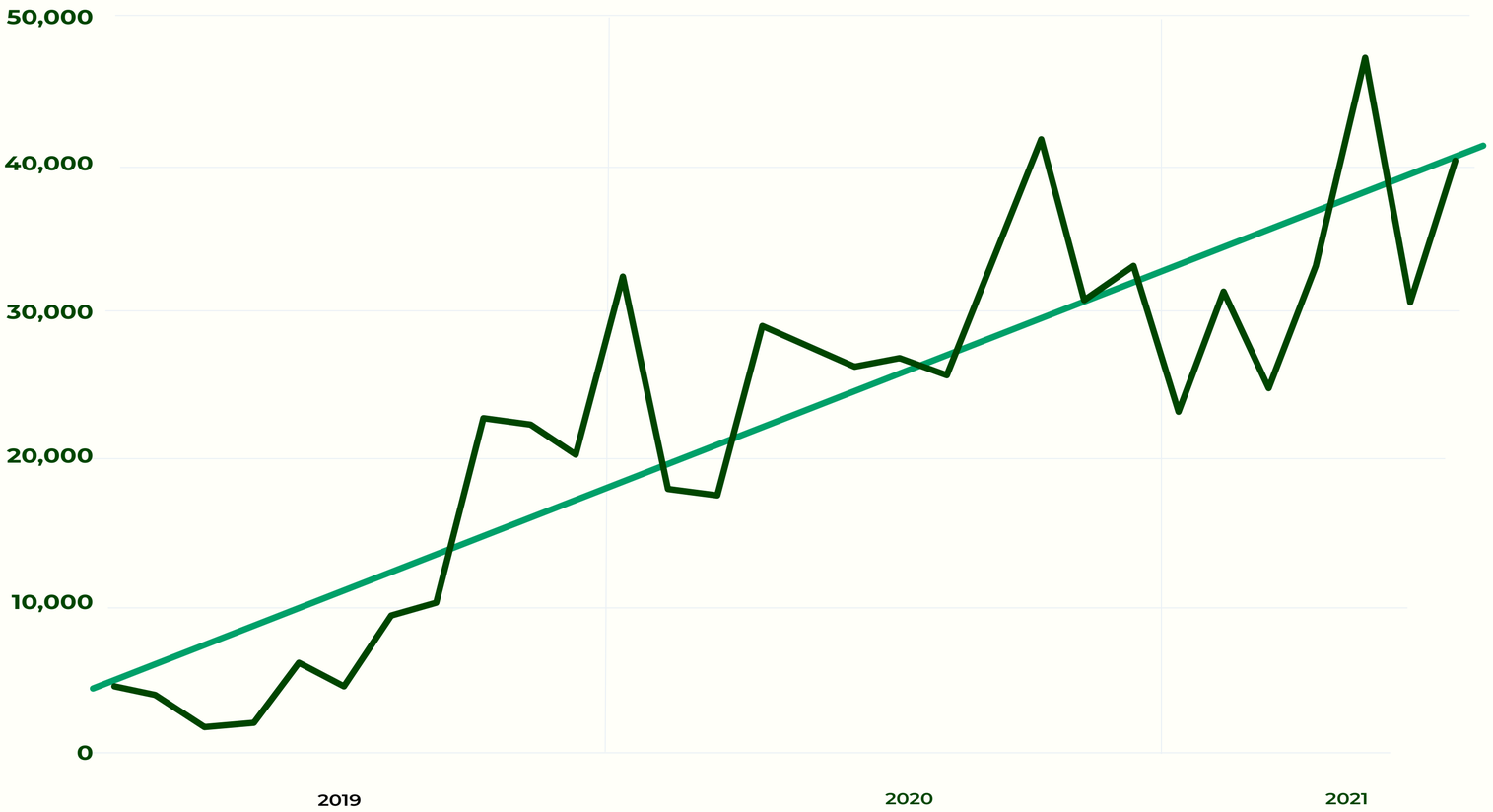
206
Projects

681,228
Movements through the supply chain

10,300,796
Total updates

681,228 movements through the supply chain*

Materials Processed through Supply Chain per Month

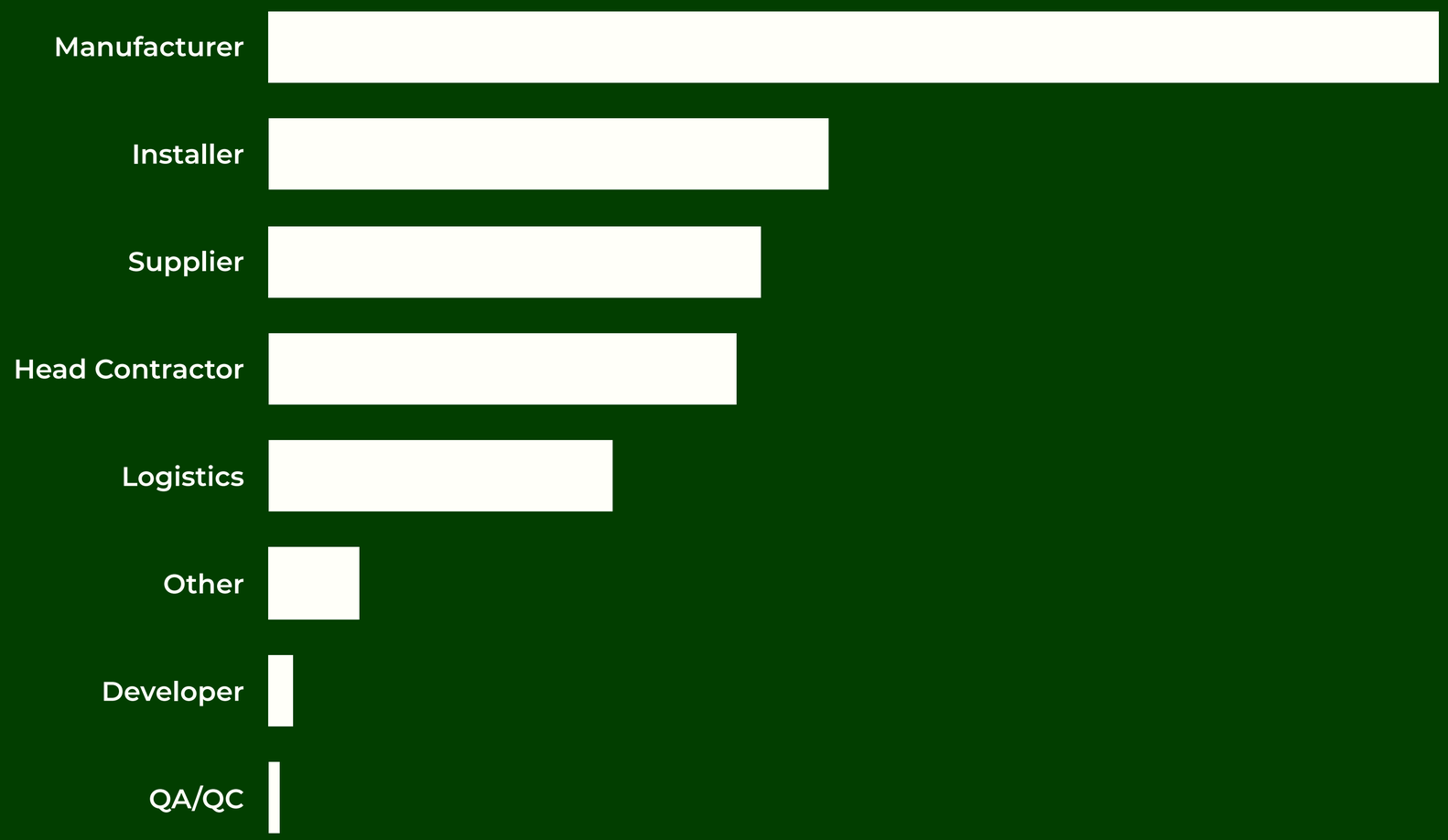


* Movements through the supply chain is when a material has moved through the stages of its supply chain journey, such as manufactured, in transit, arrived on site or even reordered

110 companies across the globe

* Size corresponds to materials updates made in Matrak during January 2019 - June 2021

Spanning across 8 different company types



* % of material updates made by different stakeholders during January 2019 - June 2021

Material Tracking Trends: Why Materials Matter

Why do materials matter?

Think of materials as the glue that holds the entire construction supply chain together.

Why is it the glue? Because materials pass many hands. Additionally, they are the one common denominator across different stages of the supply chain on a project.

Numerous stakeholders are involved as materials get requested, manufactured, inspected, transported, installed, and maintained.

With that in mind, you can easily see the importance of staying on top of their journey throughout the supply chain.

Research has shown us that materials account for approximately

50-60% of a construction project's cost.

With a total of **$161,159,600,000** worth of construction projects approved in FY21 in Australia alone, it means an estimated **$80,579,800,000** will be spent on the materials themselves.[1]

This makes successfully managing materials all the more important, as they play a huge role in overall profits and project success.

1. Material Management Practices in the Construction Industry, July 2014

Average defect rates per project is 1.54% for projects running on Matrak

Implementing a material tracking system has the power to improve your construction productivity in various ways.

With excel sheets and manual defect tracking, benchmarking the defect rates per project has always been a grey area.

A 1.54% defect rate means $1.2 billion dollars are spent annually on defects in Australia alone. For Matrak users, we've seen a reduction of their defect rates by 2% over the last 18 month period.

But here's another way to look at it:

For every defect on a project, a material tracking system saves

3

Calls per defect

With a project averaging 121 defects per trade, a material tracking system can give

363

Calls per trade, per project

Project efficiencies with a material tracking system

With reorders averaging 5 minutes each, any single issue or lost item needing to be reordered can cost suppliers up to $10,000+.

Using a material tracking system not only helps businesses save time and money, but it also reduces friction between overseas manufacturers and local suppliers.

In fact, our data showed 196,020 issues were identified and resolved by manufacturers overseas, avoiding costly re-orders.

Average per project

Average per project

Ben Williams
Construction Director
Probuild

> To ensure a successful project, visibility of the supply chain is paramount.
>
> The industry is at the cusp of self-managed, responsive supply-chains, using technology to supercharge the processes companies like Probuild have developed over the past decade.
>
> This will empower teams to predict, analyse and resolve issues quickly based on early warning signs, ultimately delivering better end results for all stakeholders.

Understanding where your materials are and where they need to go streamlines project progress.

Construction projects have a limited number of loading bays and crane availability.

Allowing site teams to coordinate with logistics partners to request specific materials to site, only when they’re needed, can have a huge impact on site productivity.

This also reduces the need for numerous meetings and phone calls to communicate and coordinate on material movements.

Transparency of material status has been shown to give back hours in your work week, by removing site meetings between builders and suppliers.

41

Hours a week saved in project call ups*

*Call ups are typically used in construction to help plan and manage when materials are needed (or 'called up') to site.
Average time saved per project using a material tracking system

> **Material tracking has the power to reduce waste by 20%**

- Andrew Czompo, Principal Consultant
Inginium

Defects:

Knowing when materials are arriving at the site allows for preparation of the work area, and in turn, helps reduce the potential for defects occurring via damage or mishandling.

Overproduction:

If you can’t trace the material and it’s location, you risk doubling up on orders of the same item by accident.
This leads to you spending more money and possibly exceeding budgets.

The waiting game:

Delays can happen in any project. Without the right foresight, your team may be forced into unimportant tasks to pass unexpected downtime.

Not utilising talent:

When materials aren’t ready, but those handling delivery and installations are, employees are left sidelined until they are required.

Getting correct materials with the right quality and right quantity is paramount for any construction project.

Moreover, having it arrive on time at the right place, to the right people, has the power to save wastage in several ways.

Transport:

If a handoff is planned but hasn't been communicated to the correct team members, there's a risk employees are unavailable to action said handoff when needed. More delays then occur.

Hide & Seek games:

If you don't know the material's location, you and your team may just have to find it yourselves. This distracts you from other important tasks that would have been more beneficial to the project.

Inventory:

Lack of visibility on item quantities can result in excessive inventory, leading to extra storage requests and transport requirements.

Excessive processing:

Many, if not all of those listed, take extra process steps which wouldn't occur had there been a simple way to track material status and location for complete transparency.

196,020 prevented overseas reorders

If manufacturers had the ability to find and resolve issues before items left their factories - assuming it was 1 issue per item - they could save up to 7539 shipping containers.

Based on a further analysis of 28,989 containers tracked during that period, we estimate projects could save between 6 and 37 shipping containers worth of materials per project.

The environmental costs of material shipping containers

Plus, ships are responsible for roughly **3% of global CO2 and GHG** (greenhouse gas emissions), emitting approximately **1 billion tonnes of CO2 and GHGs per year,** on average.

One container, for instance from China to Europe, accounts for approximately **1.913 kg of carbon dioxide.**[3]

Reducing containers and the need for ships on the water due to mishandled materials means we can reduce the industry's output of GHG emissions from excess shipping.

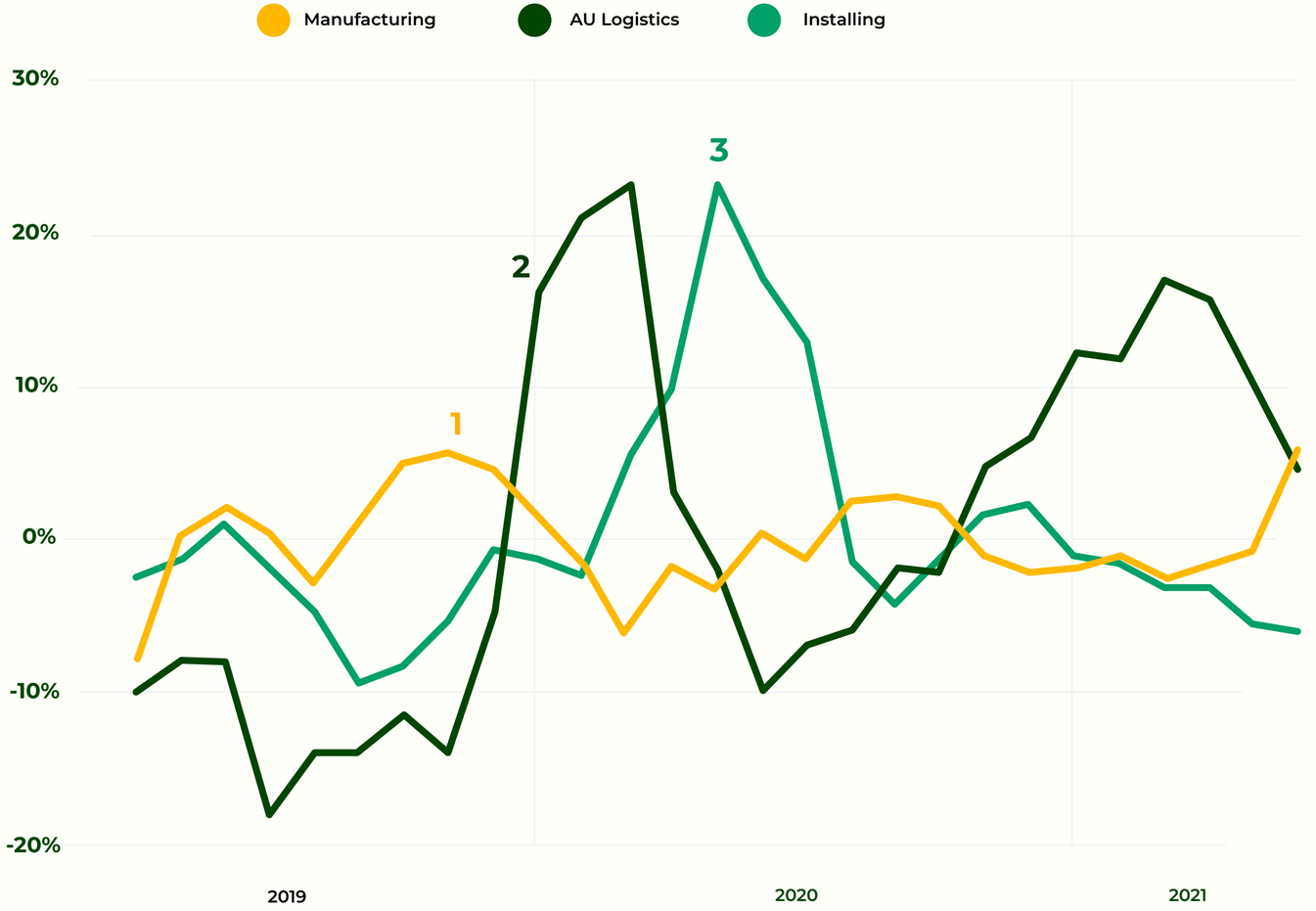
3. Greenhouse gas emissions from global shipping, 2013-2015, October 2017

The Big Picture: Wider Trends and Predictions

Supply chain disruptions

We couldn't write this industry report without a mention of COVID-19. So let's dive in.

COVID-19 affected nearly every industry the last two years, and construction was no exception.



1 We saw COVID-19 really start to impact overseas manufacturing in China around November 2019, leading to a big slump in production until June 2020.

2 In December 2019, a huge corresponding push with shipping and logistics was made to move as much product from China to Australia as possible, in order to alleviate potential extended delays.

3 This resulted in a big jump to commence installation in Australia right before the country was hit by lockdowns and on-site limits around mid-2020.

Installation was the least impacted

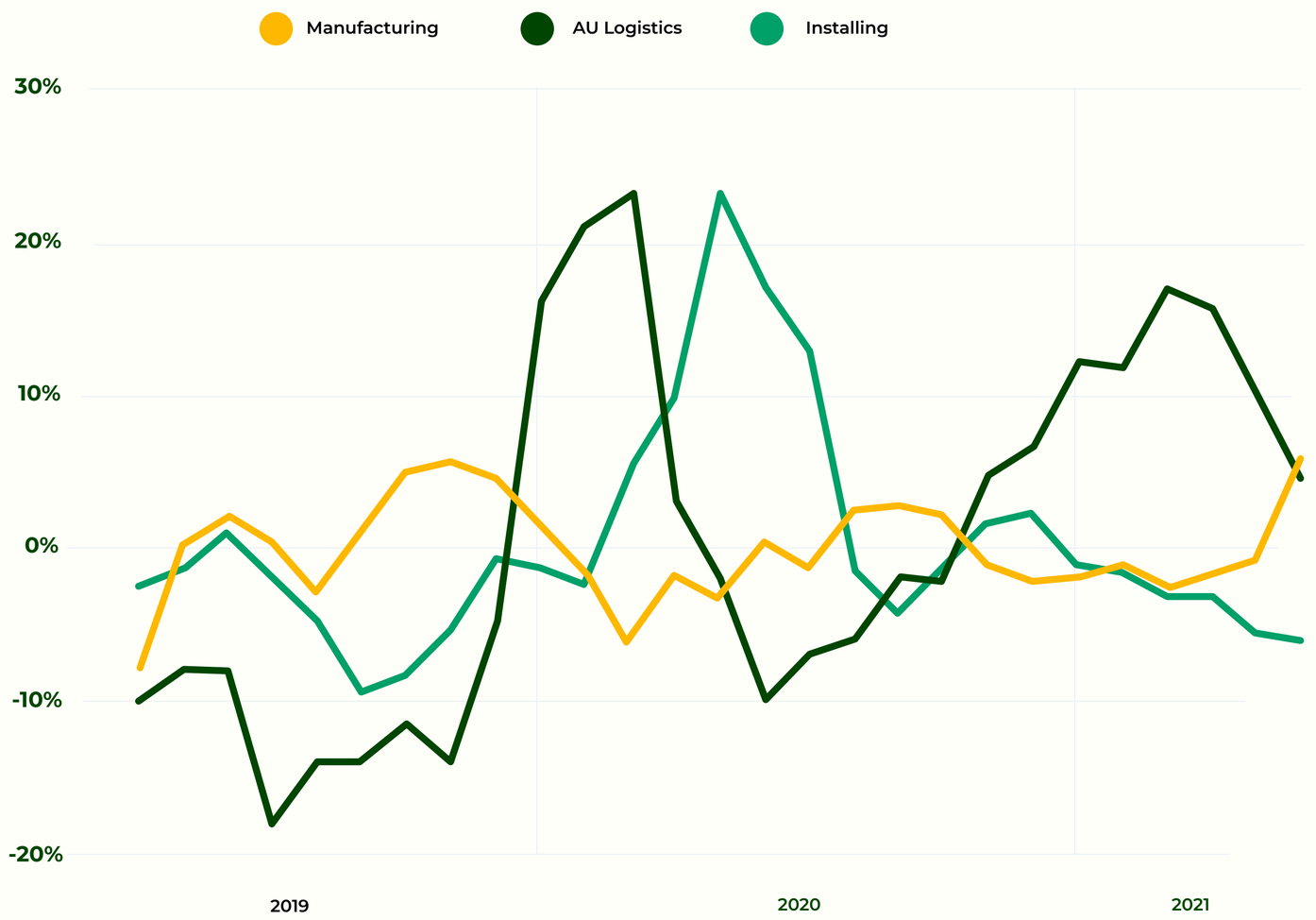
However, despite this huge increase of installations, COVID-19 continued to negatively impact overseas supply. Therefore, the overall installation rate remained consistent between January 2019 and June 2021.

We expect this to change radically for FY22, given the construction site shutdowns in Victoria and New South Wales.

When manufacturing ramped up in China again towards mid-late 2020, shipping and logistics increased as well.

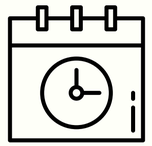
During early 2021, container shortages once again started to impact the industry.

We'll examine this further in our FY2022 report.

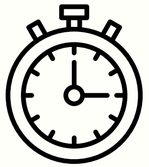


Other ways COVID-19 affected the construction industry

Overseas supply chain disruptions and concerns over security



Delays to client project schedules and concern over supply chain security



Delayed material supplies

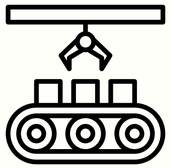
Lockdowns and limited site team/office numbers resulting in reduced productivity

What matters to whom?

We surveyed industry experts and individuals to discover what topics they were most interested in within the construction industry.

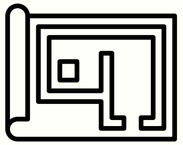
Here's what they told us.

Builders:
Overseas Materials Procurement

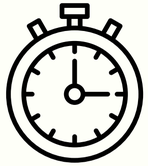


Manufacturers:
Local Materials Procurement

Installers:
Sequence Tracking

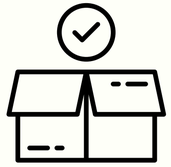


Developers:
Sequence Tracking & Progress Claims



Logistics:
Overseas Materials Procurement

Suppliers:
Sequence Tracking & Local Materials Procurement



Testing:
Local Materials Procurement

Quality issues are trending down — regulations are on the rise

A major reduction in the number of defective materials per project has emerged. This is because of more inspections, improved processes, and a better-connected supply chain.

Quality issues have also steadily been trending down over the last 18 months. This aligns with the industry rolling out further Inspection & Test Plans (ITPs).*

Prediction #1

The rise in new industry standards around ITPs and Quality Checks will be greatly impactful for the safety and longevity of construction buildings.

However, it *can* have the potential to create hours of added labour and work to the industry.

Prediction #2

Innovating will become a necessity to manage the rise in regulations in the construction industry.

This was validated from over

2,144,850 ITPs

and quality checks in Matrak.

*An Inspection and Test Plan, also known as quality inspection plans, are set critical points at various stages within a project for scheduled inspections and verifications. They manage the quality control and assurance of a particular element in a construction project. This helps to ensure the job is progressing as it should be, and that the quality assurance procedure is sound.

ITPs and quality checks are on the rise

Manual labour has increased with the rise of new quality regulations. Historically, ITPs have been a manual paper based process. We've seen projects required to do 80k+ physical signatures for a single project, based on these new standards.

This equates to approximately 94 hours being spent filling out paperwork per trade, which could easily be digitised.

On average, high-rise multi-residential buildings have around 70 trades. As such, the savings can be as great as 6,580 hours/840 working days.

80k+

Signatures per trade per project

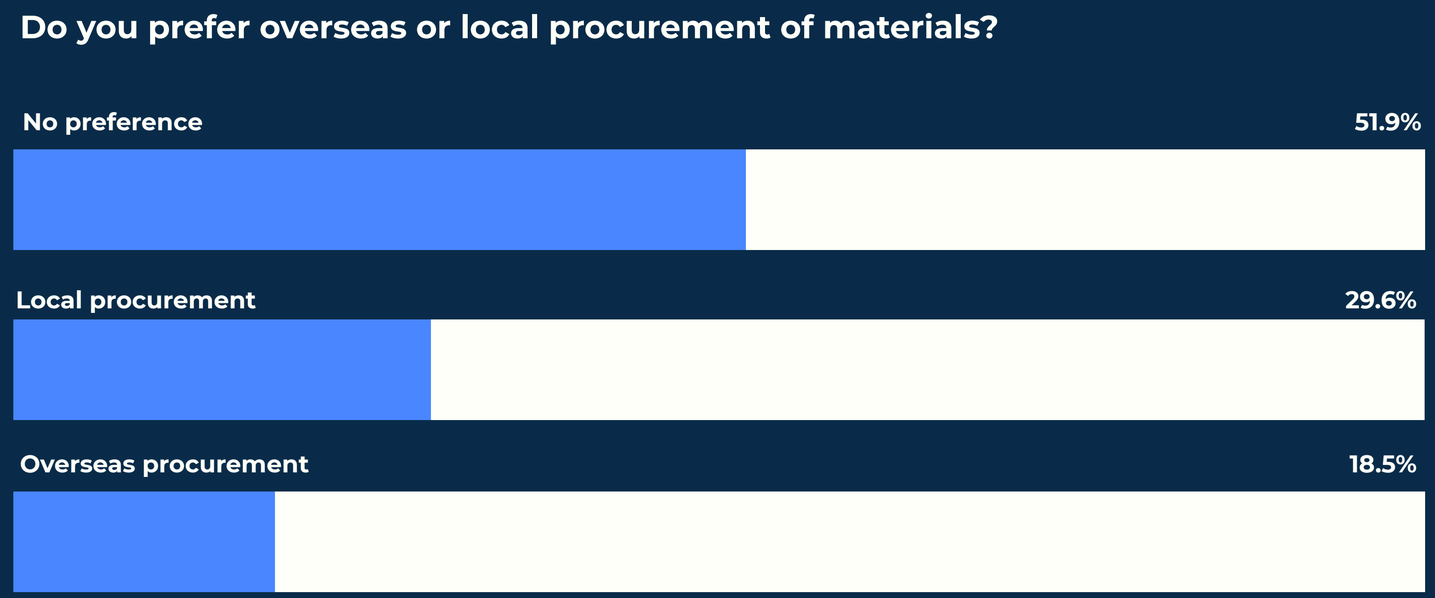
94

Hours per trade per project

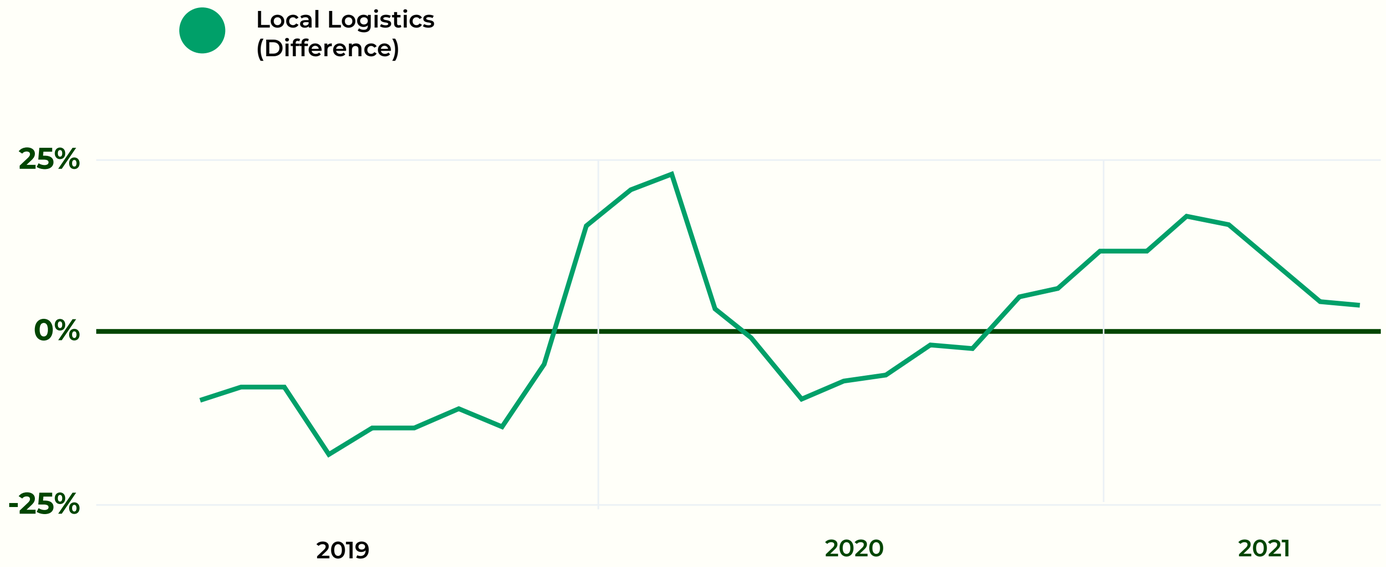
Trends are moving in favour of local procurement versus overseas

We’re seeing a majority of stakeholders preferring local procurement versus overseas.

Prior to COVID-19, travel bans and borders closing, overseas procurement was always in favour.



As overseas manufacturing and shipments have started to pick up again following a slower than usual start to 2021, we're still seeing the majority of stakeholder's interests leaning towards local procurement.



0% baseline shows the monthly average logistics, and where logistics is above/below this average

Prediction #1

We expect this to result in more activity in the Australian construction market over the next few months, which will put money back into the local economy.

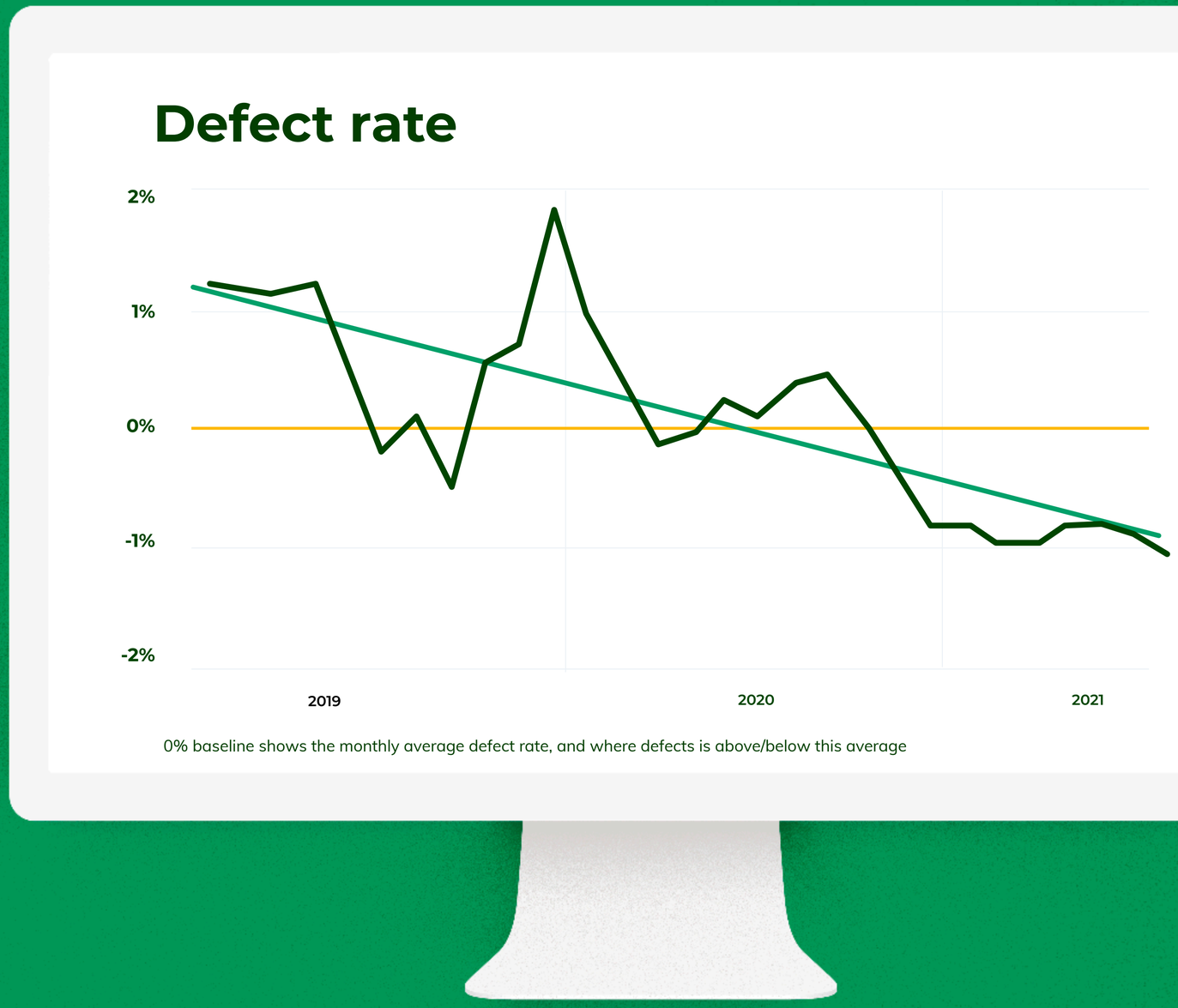
Prediction #2

Overseas manufacturers will need to innovate to stay competitive and offer better services to compete with the local market.

Defects are trending downward for the industry

With material amounts rising and installation rates staying consistent, we still saw a 2% reduction in defect rates over the same period.

This may be due to a combination of increased overseas inspection rates, ramping popularity of onsite testing and ITP/ITR checks, as well as overall quality improvements through using a digital product tracking and management system.

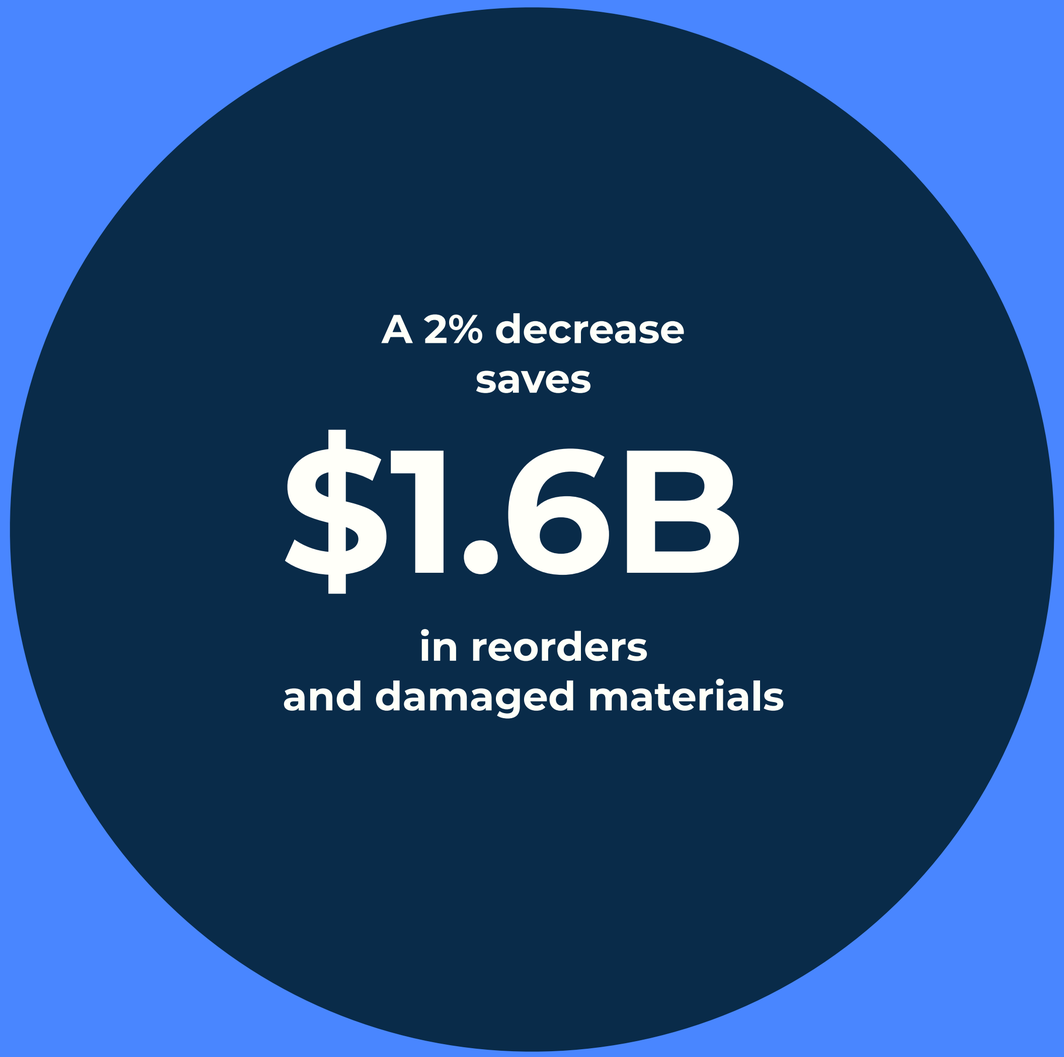


Defects are decreasing by 2%

Reducing your projects defect rate by 2% correlates to huge cost savings.[2]

Costs that originally would be directly cut into the builder's profits, as they have to perform remedial work to fix construction defects.

Continuing this downward trend will help further improve project performance, efficiency, and productivity for the entire industry.



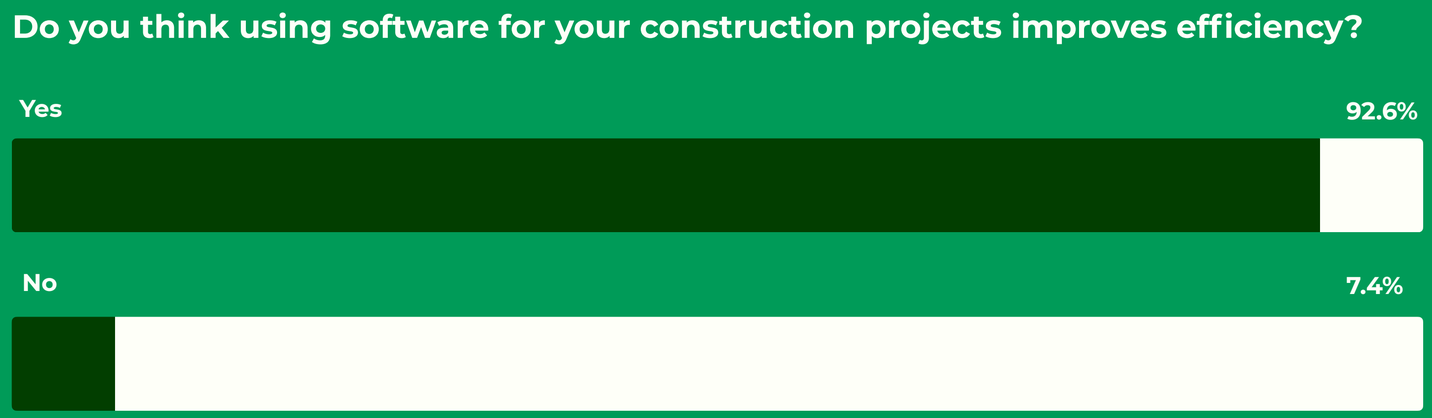
2) ABS Australian Building Approvals, August 2021, ePublication

Conclusion: Where to next?

Digitisation brings profound changes

Today, technology is having a major impact on almost every workplace, bringing a wide range of benefits from increased productivity to lower costs. The construction industry is no exception.

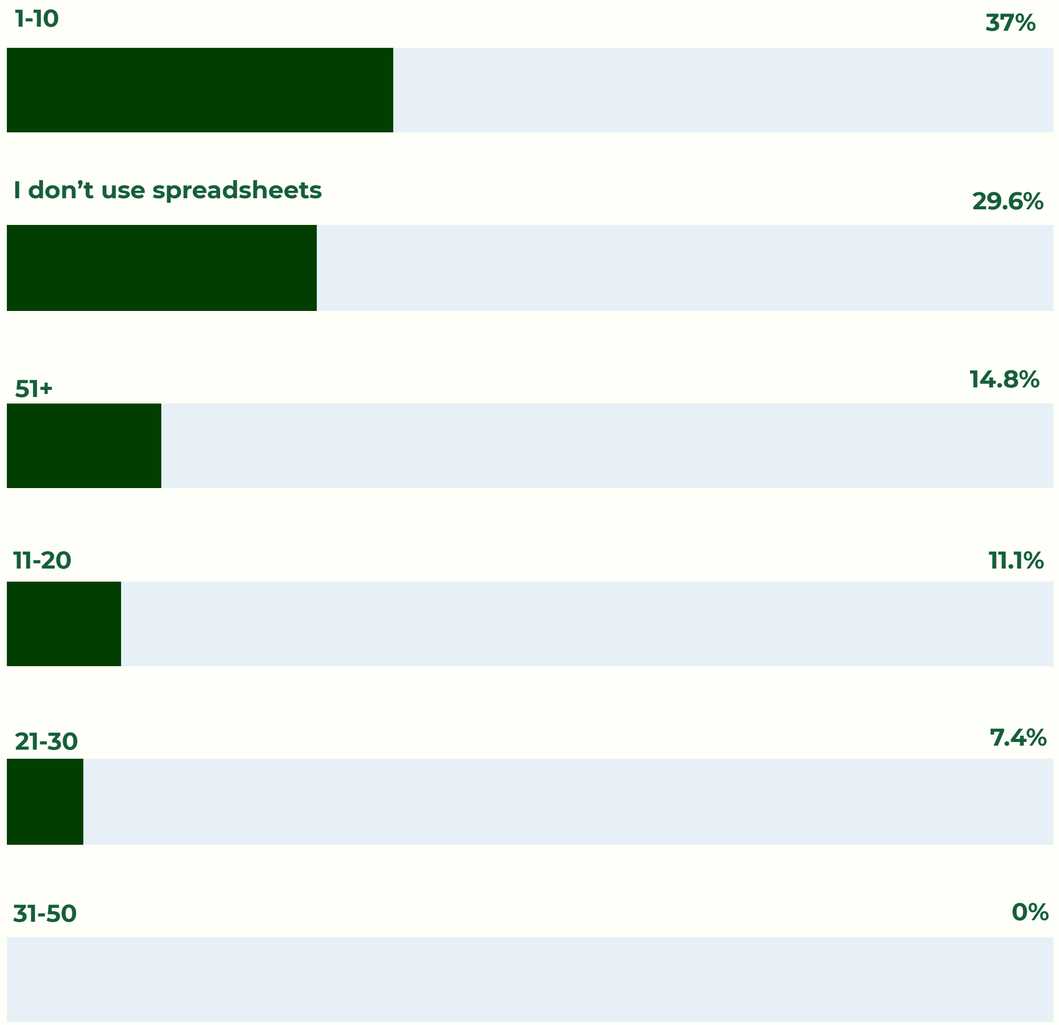
Although a little slow to get on board, and one of the least digitised industries — innovation has already started to begin.



Excel spreadsheets, once heavily relied on by the construction industry, is slowly being phased out of the workspace and job-site

Would you prefer to use software that is better than excel?

How many Excel spreadsheets do you use for a single project?



The success of most construction projects, regardless of their size or type, greatly depends on your team staying connected, following efficient processes, and flagging critical issues as soon as they emerge.

With many digital tools at your disposal that improve processes during planning, construction, finished product and beyond, there's a big opportunity for those who embrace new technology to improve efficiencies and boost their bottom line.

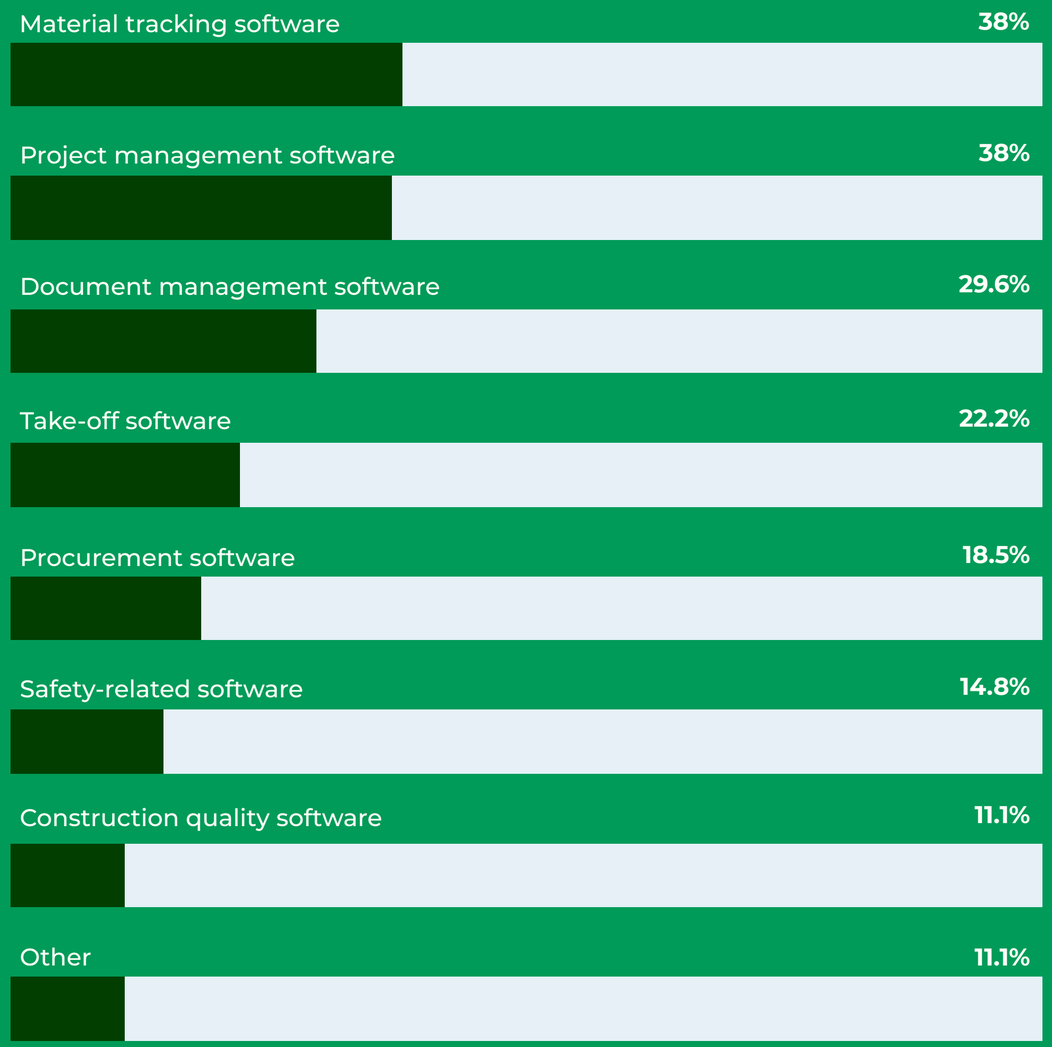
If you're wondering where to start, here are the softwares the industry has voted on as time savers.

It's interesting to note that 'Material tracking software' topped the list, reinforcing the essential role that materials play in any construction project — big or small.

In other words, without the materials, there is no 'glue' to hold the supply chain together.

With numerous new developments and technologies happening now and in the future, it's truly exciting times ahead for the construction sector.

Which software saves you the most amount of time?



Stay ahead of the curve

Material tracking software and the benefits of a fully transparent supply chain can help you stay ahead as the construction industry continues to evolve. They can help improve the way you operate — both on the worksite and behind the scenes.

Everyone who works in the construction industry knows how important the supply chain is to a building project.

When one part of the puzzle is missing, the whole supply chain is left in disarray.

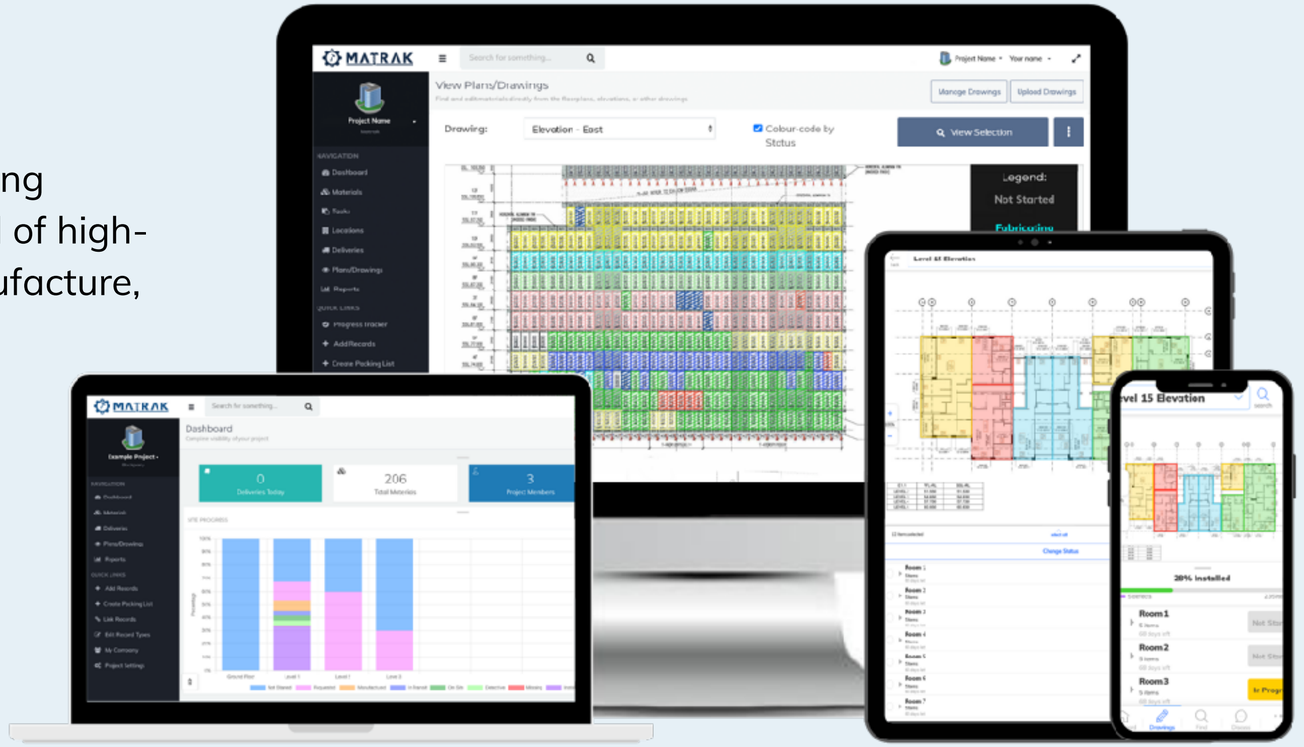
That's why materials are the 'glue' that holds the supply chain together. Without them, the supply chain itself wouldn’t even exist to begin with.

Moreover, as the common denominator across every stage of the supply chain, they are a necessity for teams to work efficiently and complete the project on time.

Hence why materials matter most — they hold the highest stakes in the entire supply chain.

About Matrak

Matrak is a cloud-based material and logistics tracking platform. Our software provides visibility and control of high-risk and high-value construction items through manufacture, logistics and installation.



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Get in touch

Thank you to our customers for contributing to this report

And a special thank you to all our customers who have supported Matrak and its growth.

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“The State of Materials in Construction” data was collected through our Matrak database from January 2019 to June 2021. Our survey ran through July into early October 2021. It was sent out to Matrak’s newsletter subscribers and shared across social media and other construction communities.