

Connected Workflows:

How to Use Technology to
Improve Jobsite Safety

The construction industry remains one of the most dangerous businesses in the world. According to OSHA, 21.1% (or 1 in 5) of all worker fatalities in the United States in 2016 occurred in the construction industry.

In addition to the size and complexity of most projects, other factors make a construction site hazardous, thus increasing the chance of injury. These factors include:

- The presence of large materials and heavy equipment.
- Workers not using personal protective equipment (PPE), such as hard hats and gloves.
- The changing nature of the site and its features that hinder visibility of personnel.
- Communication difficulties due to multiple trades being on site and/or the language barriers of workers.

While contractors understand that safety is one of the core competencies of any construction project, the day-to-day reality of enforcement is much more difficult. Workers get distracted and take unnecessary risks that go undetected, and the labor shortage continues to be a real problem — which also includes a shortage of certified construction safety professionals.

Thankfully, the answer, in part, lies with technology and the safety enhancements being created.



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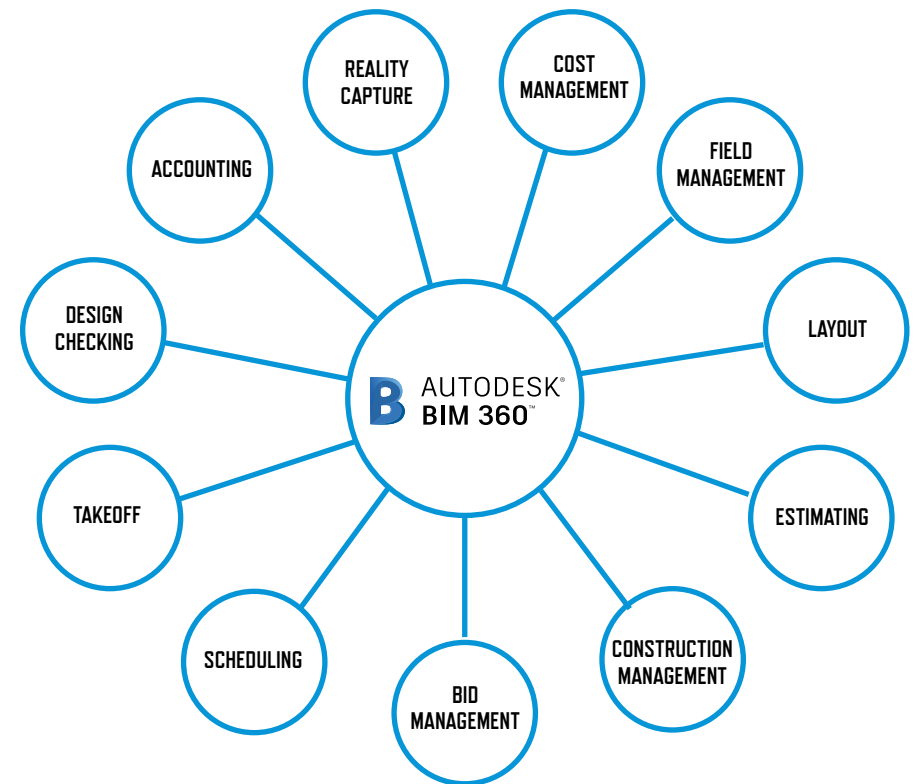
CONNECTED TECHNOLOGY WORKFLOWS IN CONSTRUCTION

As contractors continue to pursue viable ways to reduce costs and increase efficiencies, many are turning to automated, connected technology options to better construction site operations. Integrated technologies save time and money and improve project efficiency and safety by allowing the project team to easily collaborate and share information, whether they are in the office or out in the the field.

CONNECTED WORKFLOWS: HOW THEY WORK

Visualize a spoke on a wheel, and your cloud-based construction management platform, such as Autodesk BIM 360, as the hub of all the different connected applications. Like a wheel, you need the hub ('hub' and wheel analogy don't work since they are showing more of a bike wheel. Instead of saying 'hub' they should say 'spoke') to connect to all other applications because without it, these apps cannot work with each other.

"Integrated technologies can automatically pass information into BIM 360 which becomes the repository for all data," explains Josh Cheney, Industry Manager of Construction Technology at Autodesk. "From there, other technologies can retrieve that same data to use in their own applications. The data is then pushed back into the hub automatically, and people are notified."





BENEFITS OF CONNECTED WORKFLOWS IN CONSTRUCTION SAFETY

Safety is a huge concern in construction, and while safety is everyone's responsibility, it's the safety manager's job to oversee it all. A single safety manager might be responsible for upwards of 30 projects or more at a time. This includes managing, maintaining and reviewing multiple safety incidents; having one single person – or even a team of safety personnel – trying to go through and identify areas of risk across hundreds of photos that are being captured on the jobsite is next to impossible.

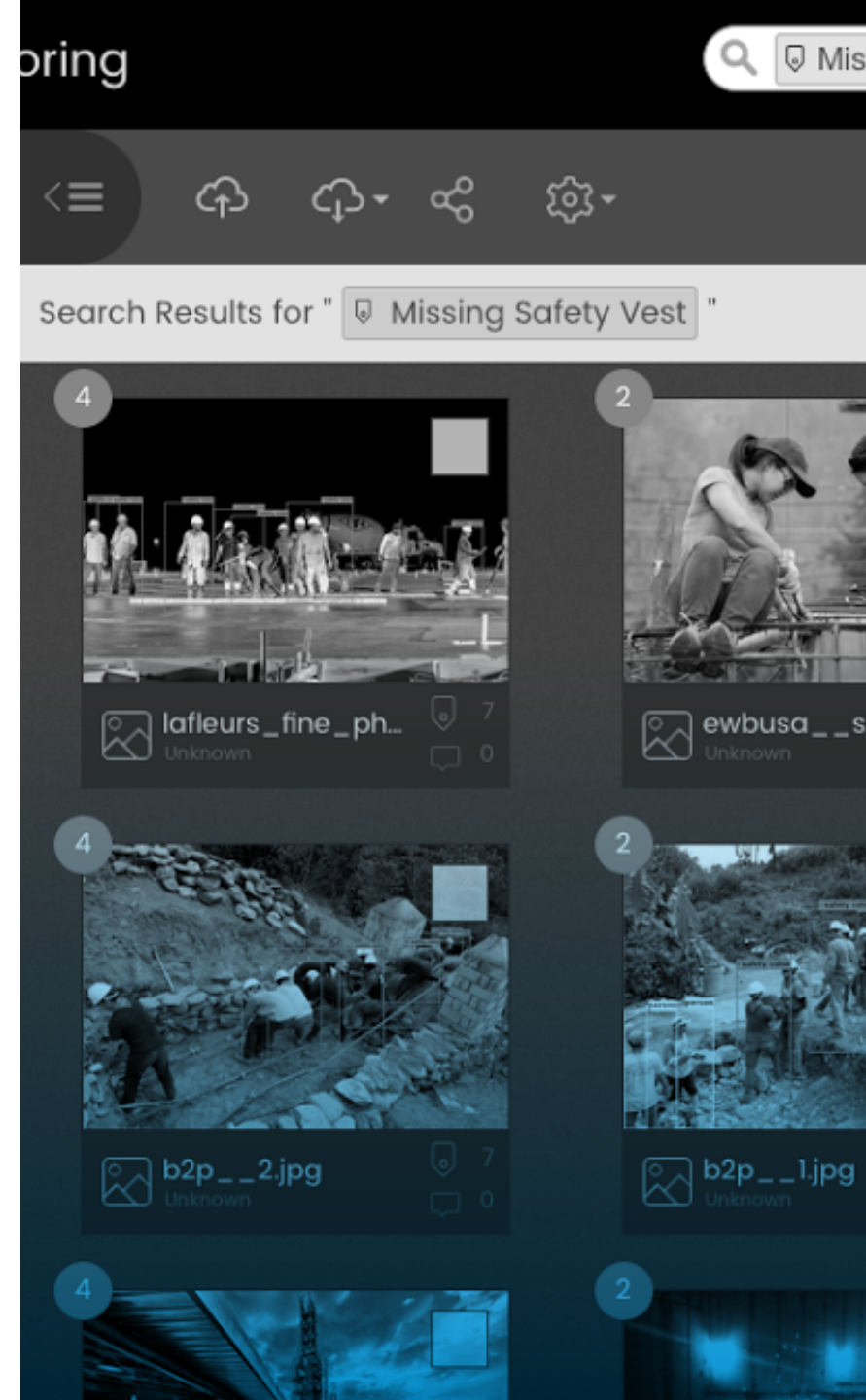
“Connected workflows give you a faster way to identify risk because you have tools, such as Smartvid.io, doing the work for you,” says Cheney. “Certainly, there is some fine-tuning involved, but it takes the task of reviewing say, 50,000 photos that are gathered in a month and turns it into a much more manageable process.”

CONSTRUCTION TECHNOLOGY & CONNECTED WORKFLOWS: ENHANCING SAFETY EFFORTS

In January 2007, Steve Jobs revealed the iPhone at the Macworld convention. While at the time, it was nearly impossible to fathom the impact of smartphones, mobile devices have infiltrated our everyday lives – including the jobsite. This has also created a demand for integration of technologies to enhance construction safety efforts.

DETECTING SAFETY RISKS IN A FRACTION OF THE TIME: SKANKA'S SMARTVID.IO SMARTTAGS

Smartvid.io is an industrial photo and video analytics platform that helps manage the plethora of data generated on jobsites on a daily basis. It analyzes all incoming visual data and automatically labels it, making for easy search and sort. Additionally, using a proprietary machine learning platform, Smartvid.io SmartTags can detect common safety risks, like missing hard hats or gloves, giving teams an extra pair of eyes to help drive a positive safety culture on the project.



As noted in a recent [case study](#), with the introduction of SmartTags, Skanska's innovation and safety teams began to explore how they could apply the technology to further their safety program. As Jason Timmerman, Skanska Environmental, Health & Safety Director explained:

Skanska uses BIM 360 for document management, quality control and other field activities. The integration between Smartvid.io and BIM 360 automatically syncs all photo and video information between the two applications, giving Smartvid.io access to visual and audio information uploaded into BIM 360, and categorizing it for search. Smartvid.io's SmartTag engine then automatically tags potential safety hazards and compiles compliance statistics across safety categories that can be used to reinforce a positive safety culture. See how it works with BIM 360 in the explainer video below.

“By having an ‘**extra pair of eyes that doesn’t sleep**’ looking at our photo data, we could better identify both positive examples and areas for improvement that we might otherwise miss and grow our safety library.”



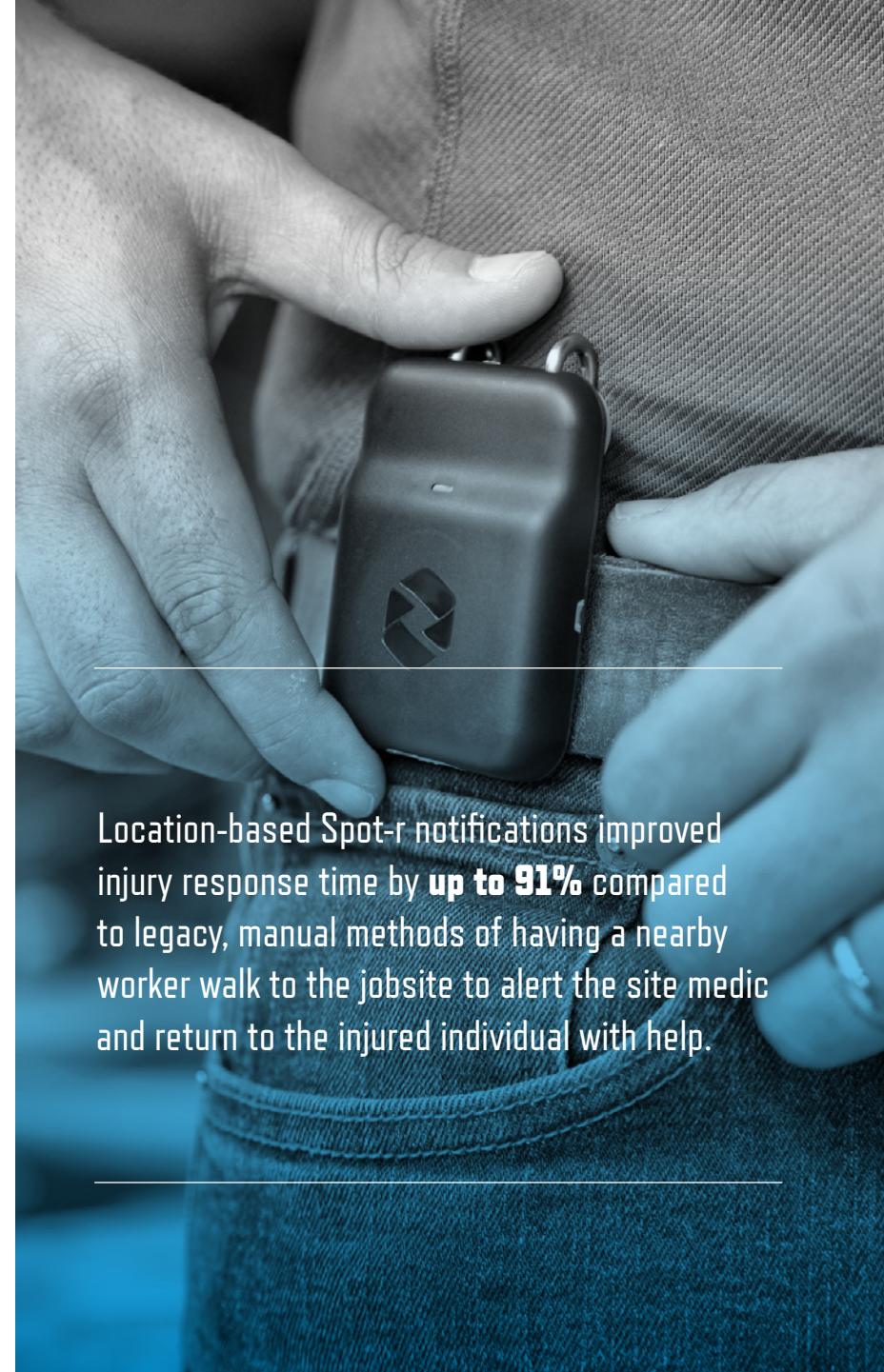
SOLVING A VISIBILITY PROBLEM: SPOT-R BY TRIAX TECHNOLOGIES

Triax developed Spot-r to tackle one of construction's most unique challenges: visibility of the workforce. Spot-r's wearable clip continuously communicates to a site-specific wireless network — providing visibility into the zone-based location of every worker on the site as well as any safety incidents that occur.

One of the technology's primary functions is to detect when a worker experiences a fall incident, and it sends a real-time notification to the Cloud dashboard as well as a text message to the designated recipient, usually a supervisor or project manager, who can immediately see where the worker is and send help.

Spot-r's wearable technology greatly improves response time and ensures that incidents are reported immediately and every time, not only when there is a severe injury. Additionally, the Spot-r device has a self-alert button that workers can press in the event that they experience an injury, such as cuts or particles in the eye, or if they see a hazard on the job site. This provides them with a direct line of communication with a safety supervisor or project manager, and helps the company address hazards proactively.

On Gilbane project sites, location-based Spot-r notifications improved injury response time by up to 91% compared to legacy, manual methods of having a nearby worker walk the jobsite to alert the site medic and return to the injured individual with help.



Location-based Spot-r notifications improved injury response time by **up to 91%** compared to legacy, manual methods of having a nearby worker walk to the jobsite to alert the site medic and return to the injured individual with help.

“The Spot-r Clip technology helps improve safety on our project sites by identifying unsafe behaviors and allows us to be proactive in correcting those behaviors before an incident occurs. It aligns well with our Gilbane Cares culture of returning construction workers home safely at the end of each work day. Our goal is to be the largest user of Spot-r technology in our industry,” says Rebecca Severson, vice president - corporate safety director at Gilbane Building Company.

Spot-r integrates with BIM 360, allowing project managers to view the current locations of workers on both their 2D drawings and 3D models pulled from BIM 360 construction management platform, including where they are relative to 2D and 3D drawings of the site. This removes the friction and data loss caused by switching between apps, and further improves overall visibility.

“When it comes to site evacuation, every second counts,” said Dan Naber, senior vice president, director of risk management for Gilbane Building Company. “We are excited about the Spot-r EvacTag because it significantly reduces the amount

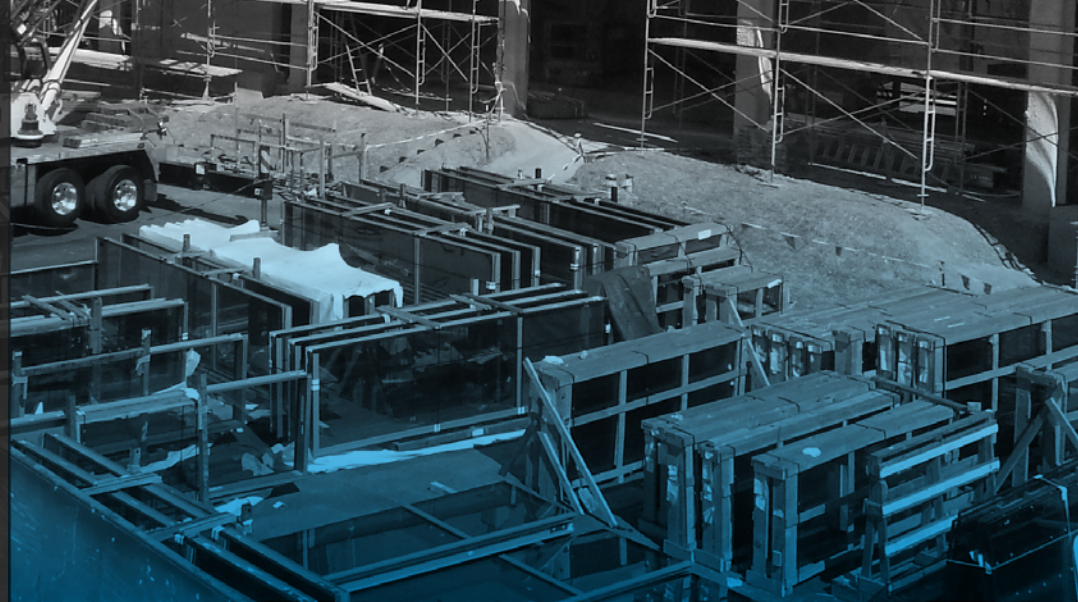
of time it takes to evacuate workers. Also, because Spot-r lets us track worker headcounts and locations in real-time, we can be sure everyone is accounted for. The safety benefits it offers are critical.”

The benefits of using Spot-r were evident on a 12-story New York City housing project. During the first month, Spot-r recorded 13 potential safety incidents. Several days of recorded fall data from a particular zone revealed that several workers were jumping into a three-foot pit, instead of using the ladder that was a few feet away. This information prompted a much-needed conversation about the company’s commitment to safety and best-practices.

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SPOTTING SAFETY ISSUES IN REAL TIME: SENSERA

Cameras have been on the jobsite for a while, but Sensera Systems takes this to the next level by providing remote site surveillance, perimeter security and progress monitoring in real time. Sensera's family of solar powered wireless cameras connect through 4G to their SiteCloud software that manages those cameras, collects videos and images in real time, archives it or forwards it on.

"A big aspect of construction safety is ensuring that rules and processes are being followed," explains David Gaw, CEO of Sensera Systems. "Having relevant images presented in real time allows them to spot issues and potential hazards and take action right away."

Another way Sensera can assist with safety is from a historical perspective. Cameras take snapshots every minute, and by integrating with Smartvid.io's SmartTag, the images can be automatically analyzed to detect issues, such as people not wearing PPE.

Data is pushed from the SiteCloud into BIM 360, and Smartvid.io's software automatically tags the photos, and pushes them back into the hub. Gaw notes, "It's a little more forward-thinking, but when the images coming from Sensera can be automatically analyzed for safety issues, it saves time and prompts quicker action."

Sensera's SiteWatch-PRO models include built-in video analytics and thermal imager to detect unauthorized intrusions to the site after hours. The system will record the event and send notifications to the security staff. Avoiding unauthorized intrusions is another way to manage project liabilities. The SiteWatch-PRO monitoring can also be used during working hours to detect and notify the safety team when workers enter restricted site areas.

COMMUNICATION WITH VIRTUAL JOB WALKS: HOLOBUILDER

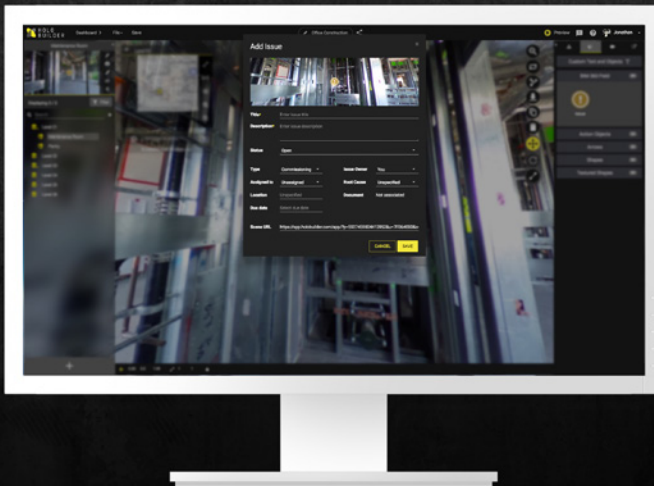
HoloBuilder creates immersive progress views of construction sites using 360° photos.

According to Mo Akbari, CEO and Founder, HoloBuilder aids in construction safety on two fronts. First, it creates a safer environment because of a change in awareness. “As good as technology is, people still need to change behavior. What we have seen from HoloBuilder users is they want to present an orderly jobsite before they capture the 360° images. They look around, see something and fix it. This changed behavior is a big component of establishing a safer jobsite.”

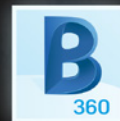
Secondly, HoloBuilder’s virtual job walks have been instrumental in creating safer work environments. Construction companies record the job environment

in 360°, upload it to HoloBuilder.com, or BIM 360, and provide access to others, such as trade contractors. The virtual job walk images can be enriched with text or icons to warn of problematic or dangerous areas. These safety walks, as categorized within the HoloBuilder system, have their own URL within BIM 360, which workers can easily view from any mobile device.

Virtual job walks are quite beneficial, particularly on an international level. Akbari explains that on a construction project in Dubai, for example, there are various laborers coming in speaking different languages. “You can show subs the jobsite in advance – which makes them more prepared when they arrive on-site,” he notes. “This has made a big difference for companies because it’s easy to make this a part of the job orientation process.”



HoloBuilder + Autodesk BIM 360



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Mo Akbari, CEO and Founder, HoloBuilder



THE FUTURE OF CONNECTED WORKFLOWS IN CONSTRUCTION SAFETY

There is no question that technology is helping close the construction productivity gap, but with various companies involved on the project — all using different technologies — these technologies could be viewed as another obstacle. Something as simple as one contractor using an Android while another is using iOS once hindered communication and the project.

These days, however, an innovative application, such as BIM 360, sitting at the center of workflows, gives companies one place to view everything happening on their jobsites.

Cheney concludes, “As safety technologies continue to evolve, a central hub that connects them is going to be a critical component of any construction project — a place where a project management team can view how safety is being managed and maintained.”

CONNECTED WORKFLOWS ARE THE SOLUTION.





READY TO ENHANCE YOUR CONSTRUCTION SAFETY PROGRAM WITH CONNECTED WORKFLOWS?

Make better decisions and improve construction safety efforts with BIM 360, the next generation construction management platform.

[Learn More](#)

