BARTON MALOW

Using 360 photos, reality capture and AI to save time and reduce safety risk

COMPANY OVERVIEW

Barton Malow, ranked as one of Forbes' largest private companies in 2018, is a general contractor and construction management firm that has been in continuous operation for almost a century. With more than 2,000 employees in 10 states, it services diverse markets, from education and sports to healthcare and energy. The company performs a full range of trades, including civil/excavation, concrete, structural steel, rigging/millwright, refractory, boilermakers, and interiors. During the past five years, it has devoted more than 18 million man hours to its widely ranging projects.

SAFETY FIRST

Safety is fundamental to Barton Malow's mission. Testifying to that, the company proudly displays a logo that proclaims this: "Build it Safe—No Exceptions." Both executive leadership and employees are safety advocates on all levels, and Barton Malow believes that in-depth, advanced planning is crucial to eliminating or controlling hazards. With an impressive safety record superior to the industry average, it continues to maintain an ongoing commitment to safety improvement.

INTRODUCING VINNIE

As an important part of that commitment, in January 2019 Barton Malow began deploying Smartvid.io products on six sites as part of a pilot program. Smartvid.io enables Predictive-Based Safety, helping companies identify projects at highest risk for an incident and act on them to prevent incidents from occurring.

Smartvid.io's AI engine, Vinnie, has been trained to recognize construction risks in photos and other project data creating an unbiased, automated risk assessment that enables teams to have better visibility into risk.

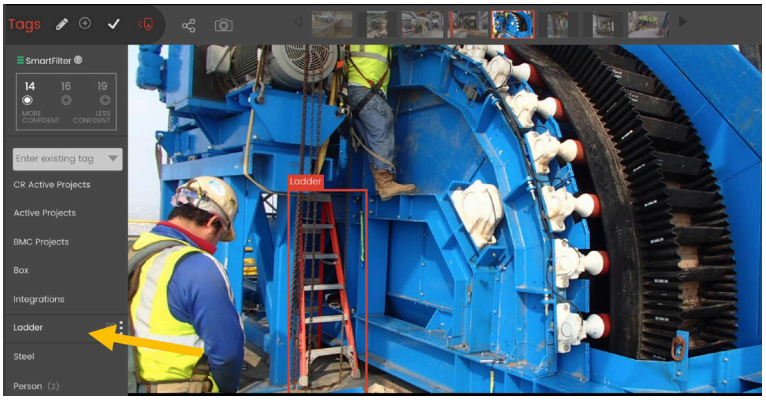

Figure 1. Vinnie identifies ladder use, consistent with elevated risk.

Barton Malow

SMARTVID.IO

"Vinnie helps us understand where risk has occurred in the past so we can take action to mitigate those risks in current and future projects."
– Ted Jennings, Virtual Design and Construction Manager, Barton Malow

The Safety Observations product combines an easy-to-use mobile application with risk scoring and workflow that enables the entire company to engage in gathering safety data. The Predictive Analytics product analyzes both the AI-based Safety Monitoring and Safety Observation data sources, in addition to other project data, to create prioritized project rankings so teams know where to focus attention. By implementing this Predictive-Based Safety approach, customers have seen reductions in incident rates of 30% or more. Getting started is easy with pre-built integrations to Autodesk BIM360, Procore, Oracle, Egnyte, Box, and other data sources such as StructionSite.

Vinnie uses construction-specific AI models trained on thousands of projects to scan photos, including 360 photos from StructionSite, video and other visual project data for indicators of risk such as ladders, which are associated with potentially hazardous work at height (Figure 1). The platform also helps Barton Malow identify personal protective equipment (PPE) compliance, such as wearing hardhats and safety glasses on jobsites. Additionally, it tracks the number and location of construction photo libraries to ensure easy accessibility and consistent use.

Committed to the benefits of advanced technology, Barton Malow's goal is to use Smartvid.io to look at its large volumes of visual data to better understand and trend staff safety behaviors, culture and job-specific hazards in an effort to determine where to focus its training and risk remediation efforts. "Knowing your potential points of failure and whether the number is headed up or down is crucial to directing safety resources appropriately," says Ted Jennings, virtual design and construction manager for the company.

"We particularly liked Vinnie's ability to seamlessly access and analyze our existing photography, including progress and milestone photos and video walkthroughs," he added.

PROJECT	LIFETIME RISK SCORE	TOTAL PHOTOS	PHOTOS PER MONTH	WORK AT HEIGHT PER 100 PHOTOS	LADDERS LAST	HOUSEKEEPING OBSERVATIONS PER 100 PHOTOS	PPE - AVERAGE COMPLIANCE
Project 1	32	3942	164	4.3	7.5	9.5	96.9%
Project 2	41	15198	475	6.3	3.6	7.5	97.7%
Project 3	51	7491	192	3.5	18.3	4.5	99.3%
Project 4	60	9470	279	2.2	5.7	4.4	97.1%
Project 5	69	5792	446	2.9	6.2	4.8	99.2%
Barton Malow Average			*295*	*3.8*	*8.2*	*6.1*	*98.6%*
Smartvid Peer Group			*304*	*19.7*	*8.3*	*4.5*	*95.5%*

Figure 2. The Safety Suite dashboard ranks the highest risk projects and provides metrics on designated parameters.The predictive value of risk scores based on these KPIs has been borne out in retrospective analyses of prior Barton Malow project data. High risk scores (lower numbers) consistently correlated with a high rate of safety incidents, while low risk scores (high numbers) had far fewer (Figure 3).

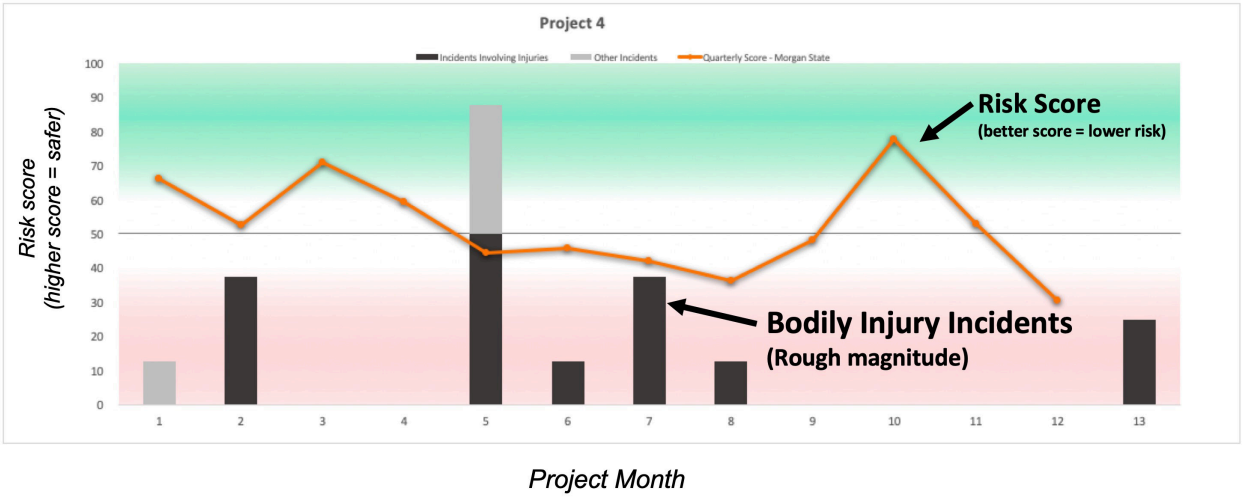

Figure 3. Graph showing correlation of analytics of historical projects with actual incidents.

"Vinnie helps us tap into the full value of the images we already have, with no added resource required. Reviewing the volume of photos collected at our jobs without high tech assistance would be impossible. With Vinnie, we spend less time and get a much better picture of site safety. And all of our materials are organized, located and examined."

Barton Malow makes extensive use of Vinnie's interactive dashboard creating an unbiased, automated risk assessment (Figure 2). This data is combined across all risk indicators into a bundled risk score for each project. Information is compared with prior data to show how performance is trending. Also presented are company and industry peer safety ratings on all parameters to provide additional benchmarking to help set targets for performance improvement. Barton Malow's key performance indicators (KPIs) include ladder use, housekeeping hazards, and PPE compliance.

This underscores Vinnie's success in paving the way towards true predictive-based safety analyses, which uses AI to assess risk, forecast where and when incidents are likely to happen and ultimately produce a list of actions that can be taken to alter behaviors before incidents happen.

SIMPLE INTEGRATION FLOW

Barton Malow's jobsites generate a large number of 360 degree photos, including project walks, which are fed to its StructionSite application and often dropped into site diagrams. StructionSite data flows through BOX in the cloud, where photos are directly aggregated and managed. All data, including StructionSite information, is then transmitted to Vinnie where it is examined by AI and automatically turned into jobsite analytics. These automatically display the actionable insights on a dashboard.

StructionSite → box → SMARTVID.IO

Once set up, the entire integration flow is automatic.

With Vinnie's open data sharing, integrating multiple systems is simple and seamless. The platform integrates with many construction management and image and document storage systems to provide an automated safety risk assessment report that delivers cross-project benchmarking. Once set up, data flow is completely automatic.

THE FUTURE

Currently Smartvid.io is working with Barton Malow to implement predictive-based safety. They are combining AI-derived risk scores with a range of other factors, from weather to project phase, in an effort to modify behaviors before an incident occurs rather than make the same change based on an incident review meeting after the fact.

Barton Malow

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Barton Malow is packed with construction industry innovations, such as new construction delivery methods, use of technology, unique materials/ techniques and sustainable advancements.

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Smartvid.io is a software company headquartered in Cambridge, MA which provides machine learning tools for the management and analysis of industrial media.