Construction Disruption: Boost Jobsite Productivity with IoT

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Housekeeping

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Key Challenges Today

Safety

Visibility

Productivity
Global labor productivity growth in construction averages only 1% annually compared to 3.6% for manufacturing and 2.8% for the total economy.

IoT-enabled data collection and analysis is critical to improving safety and productivity by providing access to previously unobtainable information.
Today, information is collected and available from anywhere, at any point in time via an expanded network of Internet-connected devices.

Construction’s Internet of Things
Making the Connected Jobsite a Reality: Triax’s Spot-r system
COMPONENTS

NETWORK

HARDWARE

Spot-r Clip
Spot-r EquipTag
Spot-r EvacTag

DASHBOARD
Triax installs
Captures real-time data from sensors worn on workers and tagged on equipment
Doesn’t require WiFi or external power
Cuts through tough building materials, specifically steel and concrete
DATA INSIGHTS

Total Workers: 248
Total Hours: 73,593.8
Total Events where Event Type is Alert: 29

Total Events where Event Type is Manual: 3
Total Events where Event Type is Fall and Event Height is Above 4 feet: 6

Historical Workers: (bar chart showing worker counts by month)
Taking a Closer Look at the Data Upon Project Completion
Unlocking Safety Efficiencies
Automatic fall notifications and worker self-alerts notify supervisors to issue on site.

Real-time, floor- and zone-based worker location enables targeted, improved response.

**Spot-r-Enabled Response:** Safety Responder can go straight towards the injured individual.

**Manual Response:** Bystander sees injured individual, goes to jobsite trailer to report issue, returns with help.

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*Gilbane Building Company*

*Fairfield University Residential Dorm Project*
Jobsite Evacuations

Upgrade existing evacuation procedures with an 80-dB alarm emitted by each Clip and 100dB, flashing EvacTags

Monitor real-time worker headcounts and locations until at the muster point

Jobsite evacuations were nearly 4x faster with Spot-r

• More efficient and effective training drills means improved response during real-world scenario safety in live events

• Streamlined evacuations means less production time (and man hours) devoted to air horn drills
  • 226 production hours or $11,000 in wages per drill (500 workers, $50/hour, 25 floors)
Eliminating Waste and Boosting Productivity
Lean Construction

Typical project: 61% behind schedule, 49% completed over budget

Enhances value on projects and uncovers wasted resources:
- Wasted time
- Wasted movement
- Wasted human potential

**Spot-r**: From “monitoring results” to “making things happen”
- Site-specific sources of waste for daily management & decision-making
- Aggregate data enables larger, enterprise-wide insights
Goal: Use worker movements on site to identify sources of waste/lost production time

Identify Efficiency Leaks:

- **Tool Time/Scheduled “Area of Work (AOW)”**
  - Client-entered
  - Schedule-integrated

- **Non-Tool Time at “Points of Interest (POI)”**
  - Non-scheduled floors or zones
  - Beacon-labeled POI (material cache, lift waiting area, jobsite trailer, etc.)

Track worker location and paths via Spot-r Clip and Beacon interaction
Methodology
Late stage 12-story high-rise, new construction

• Worker movement framework identified significant “non-tool time” on site
• In this example, most worker time was spent on 12th and 1st floors
• Workers are losing valuable time in transit & at non-scheduled areas
Late stage 12-story high-rise, new construction

- Diving deeper, the 1st floor represents the most common non-scheduled destination for 12th floor workers.
- Next step: Deploy beacons at Point of Interest (POI) to provide context – What destinations are pulling workers away from their scheduled work?
The Findings

Insights prompted GC to:

- Improve alignment of material stockpiling with scheduled work locations
- Dedicated receiving & distribution staffing

Site Plan and First Floor Points of Interest

- Loading dock: 43.2%
- GC office: 14.6%
- Insulation storage: 10.6%
- Lift 1st: 10.2%
- Drywall storage: 7.4%
- Hollow metal door storage: 5.08%
- Gate/guest book: 3.78%
- Painting storage: 3.78%
- Other: 10.4%
Final Thoughts

- Industry faces a unique mix of challenges and opportunities right now with a skilled labor shortage and increased construction activity.
- It's essential that the industry (contractors, solutions providers, project partners) work together - today - to adopt technology and turn data into knowledge.

Identify a key business problem

Work with providers to deploy and develop platform solutions

Put processes in place to act upon the data and work with industry partners to continually create value to drive further adoption.
QUESTIONS?

Visit Triax at Booth #108 throughout the Lean Construction Institute Congress

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