



# IoT Technology's Impact on Productivity and Efficiency During a Labor Shortage Market

Steve Baret  
Eyrus Head of Strategy & Partnerships  
August 2022



**Steve Baret**

**Eyrus Head of Strategy & Partnerships**

**It's very  
nice to  
meet you.**



**Steve Baret**

**Eyrus Head of Strategy & Partnerships**

Feel free to reach out:

[Steve@eyrus.com](mailto:Steve@eyrus.com)



## Learning Objectives

- › Learn how to evaluate and prioritize current construction technologies available.
- › Gain understanding of the value IoT brings to the Construction Industry.
- › Learn how IoT can automate data collection to provide meaningful insights on projects.
- › Gain insights of how the data collected through IoT can drive workforce productivity in a tough labor market.



# Agenda

1. Overview of Trending Technologies in Construction
2. Why Prioritize IoT-based Innovations?
3. Types of IoT Technologies in Construction
  - Material/Equipment Tracking
  - Machine Learning/Auto sensing Technologies
  - Labor Monitoring
4. How IoT Technology Addresses the Labor Productivity?
5. Implementation Considerations and Return on Investment
6. Case Studies/Examples

# Trending Technologies

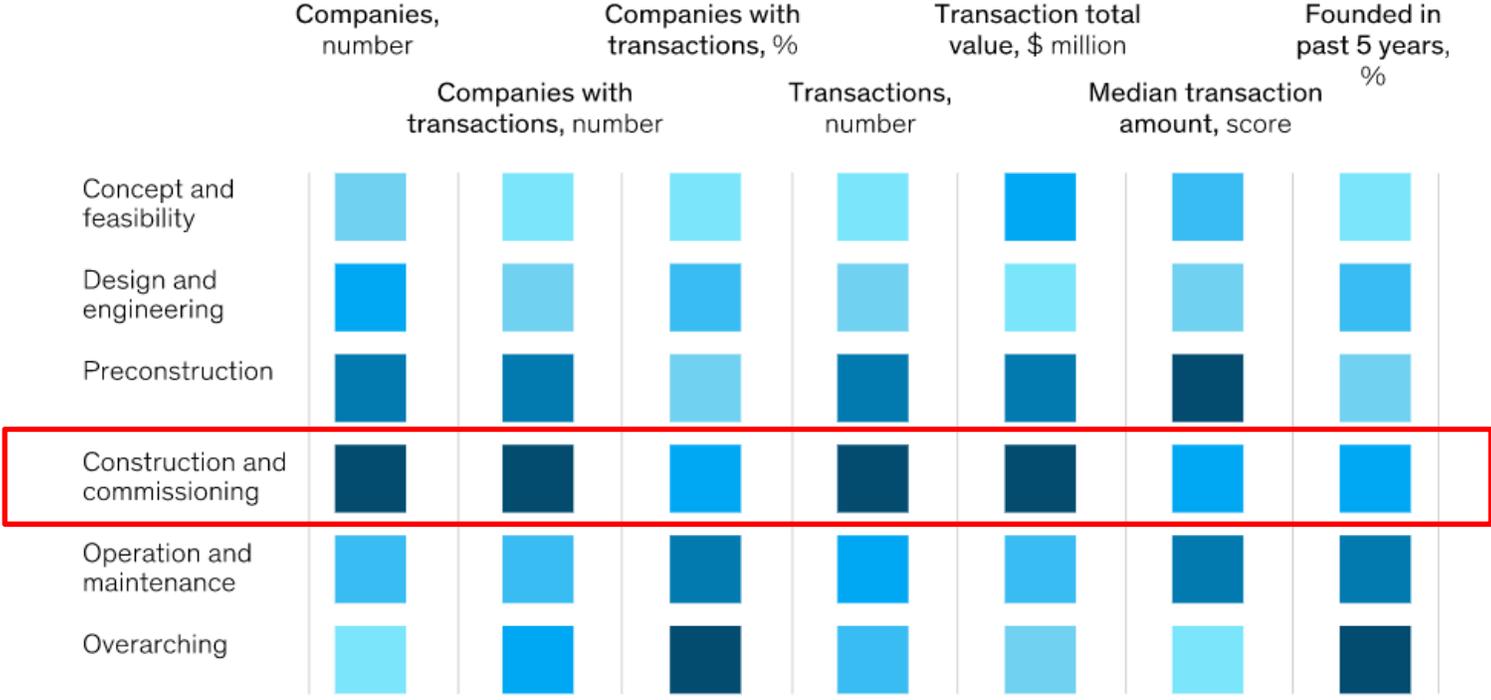


# What do Investors think?

The construction and commissioning phase has twice the investment activity and more active players.

Use-case investment momentum by category

Highest Lowest



Highest Investment Activity

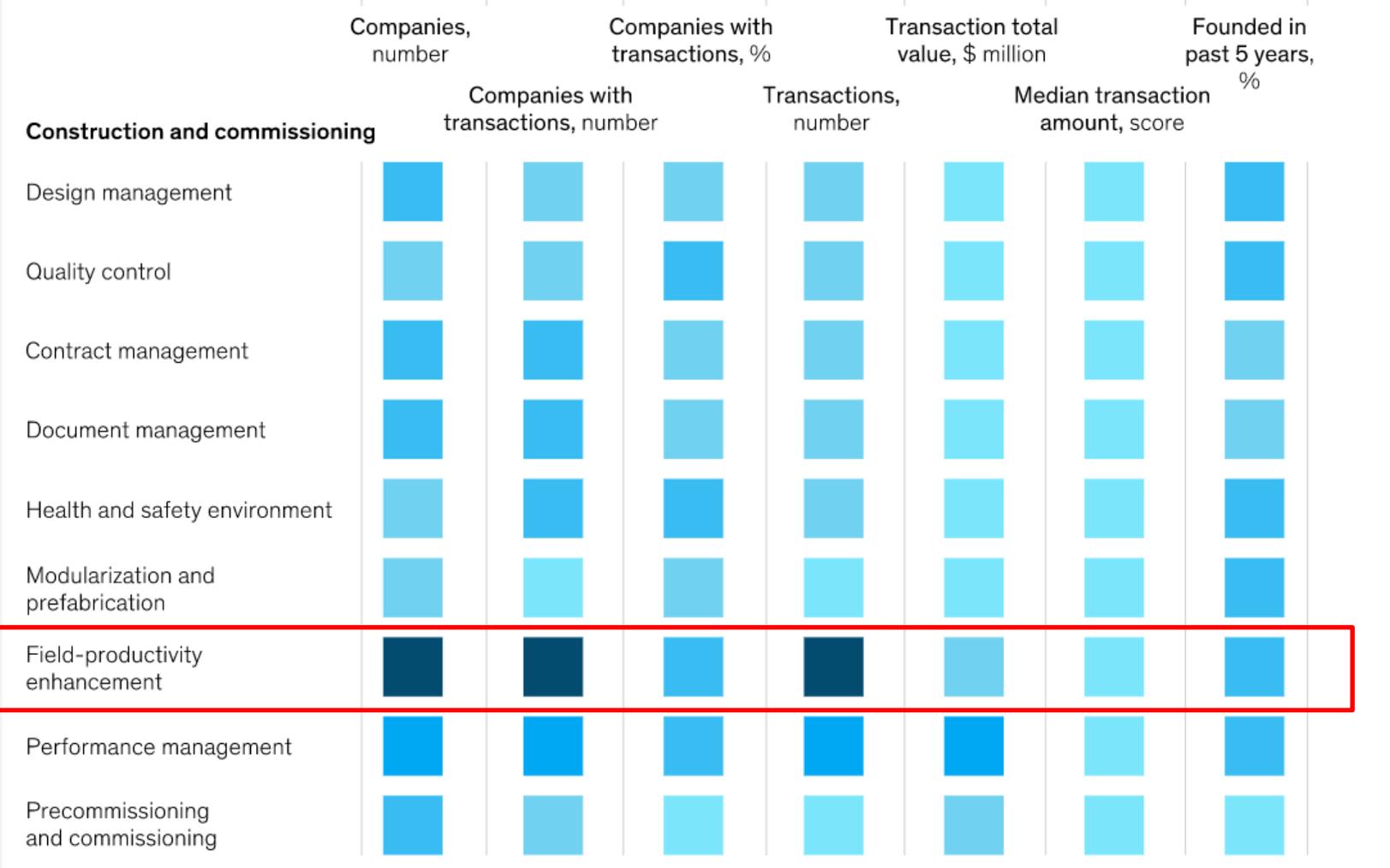


Source: McKinsey analysis

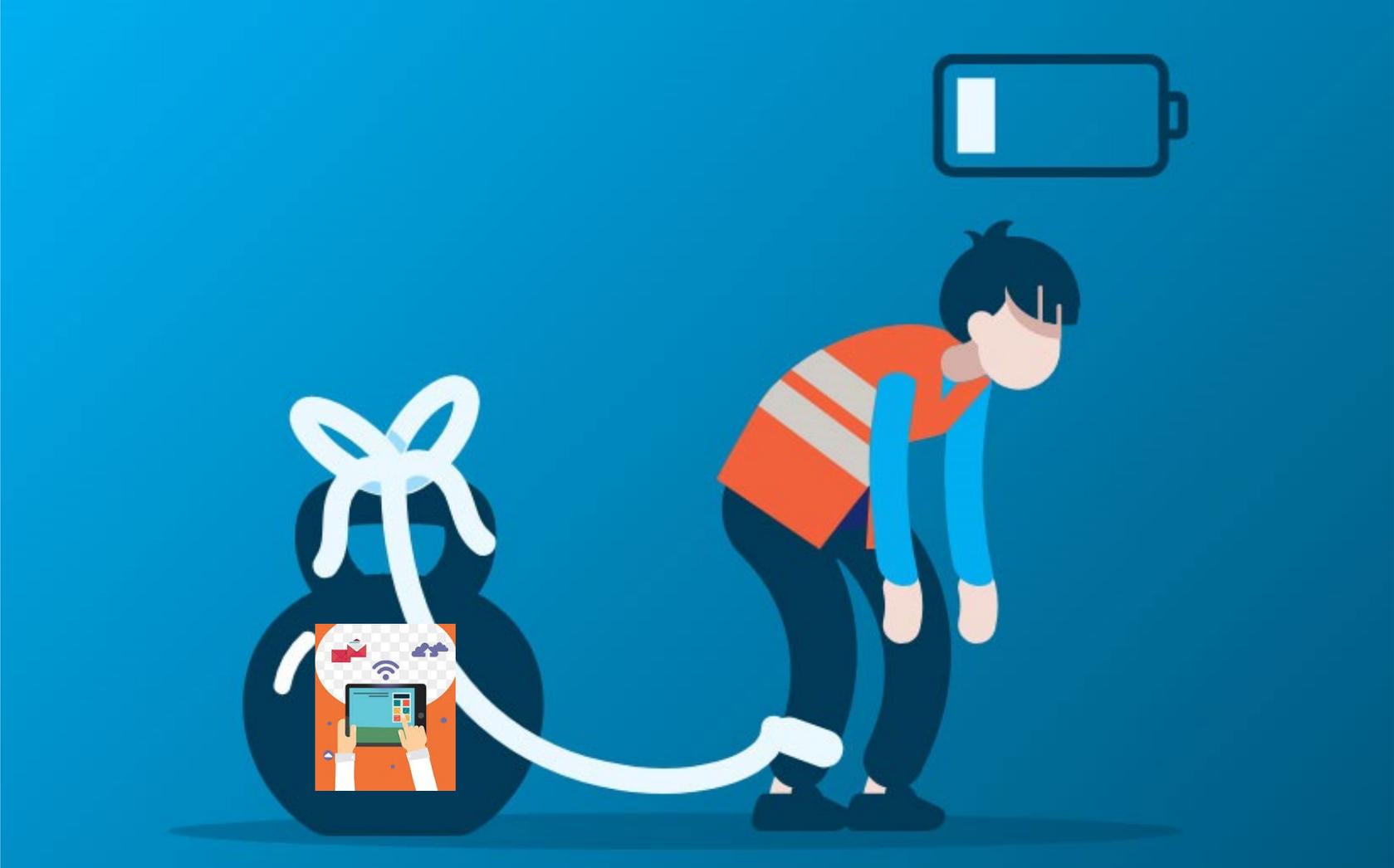


# What do Investors think?

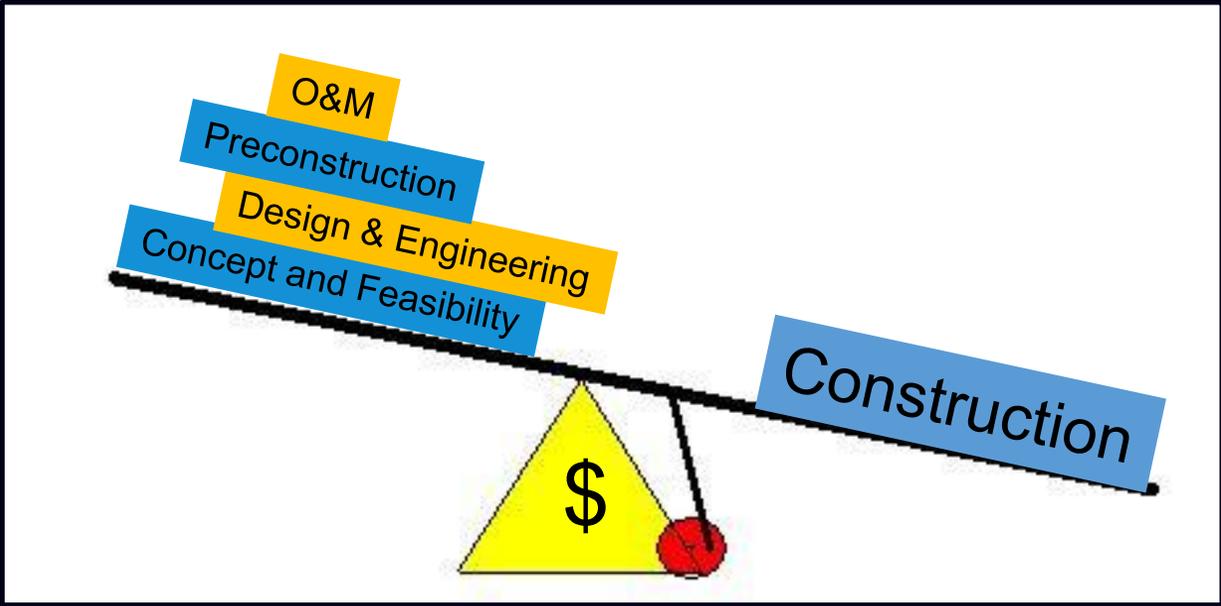
Highest Investment Activity



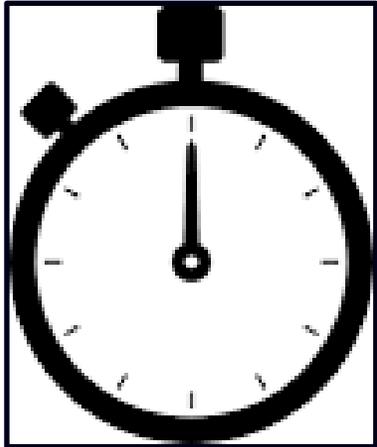
# What does the Field Worker think?



# What do Innovation Managers think?



Objective Vs Subjective



# What is IoT?

## **The Internet of Things (IoT)**

is a technology that allows us to add a device to an inert object that can measure environmental parameters, generate associated data and transmit them through a communications network.



# Why prioritize IoT?

- IoT supports the “construction” phase
- Works in the background to collect data and is non-intrusive to the workforce
- Provides an “objective truth”
- Provides remote visibility for all stakeholders
- Easy to implement (hours vs weeks, months or years)
- Cost effective and a quick win for project teams

**Investors**



**Workers**



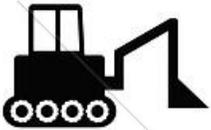
**Management**



# IoT use cases in construction



- Labor Monitoring – Identify who is on site, validate credentials, automated progressing, safety management, etc.



- Equipment Tracking – Track equipment utilization and control access to equipment based on certifications.



- Material Tracking – Use IoT to track location of materials in supply chain, from supplier/fabricator to installation.



- Monitor Site Conditions – Use IoT sensors to track moisture levels, concrete curing, etc.

# Why focus on labor monitoring?

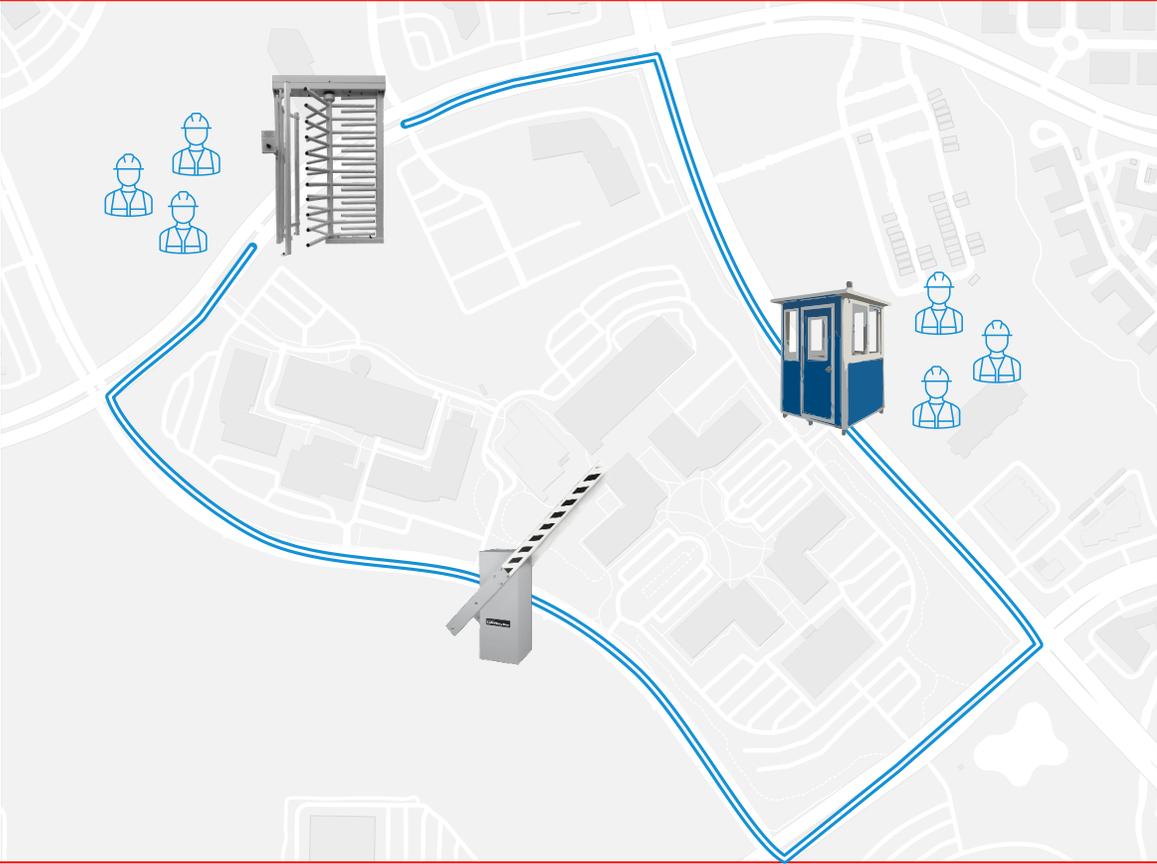
- › According to [The Construction Labor Market Analyzer](#), **construction labor cost percentage should be anywhere from 20 to 40% of total costs.**
- › Average hourly earnings for production and nonsupervisory employees in construction rose to \$32.19 in May 2022, [according to the Bureau of Labor Statistics](#), **a 6.3% increase from a year ago and the highest gain in 40 years.**



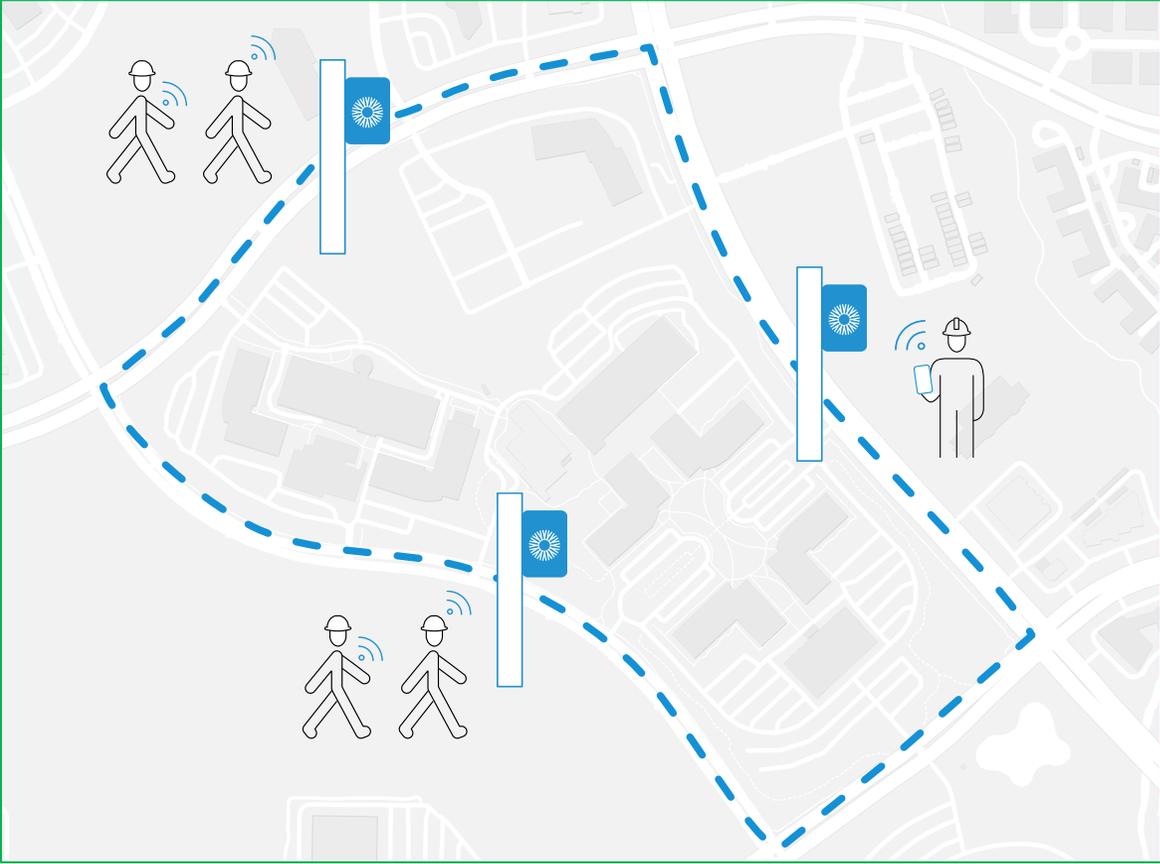
# How to implement labor monitoring?

Starts with determining site access requirements.

## RESTRICTED ACCESS

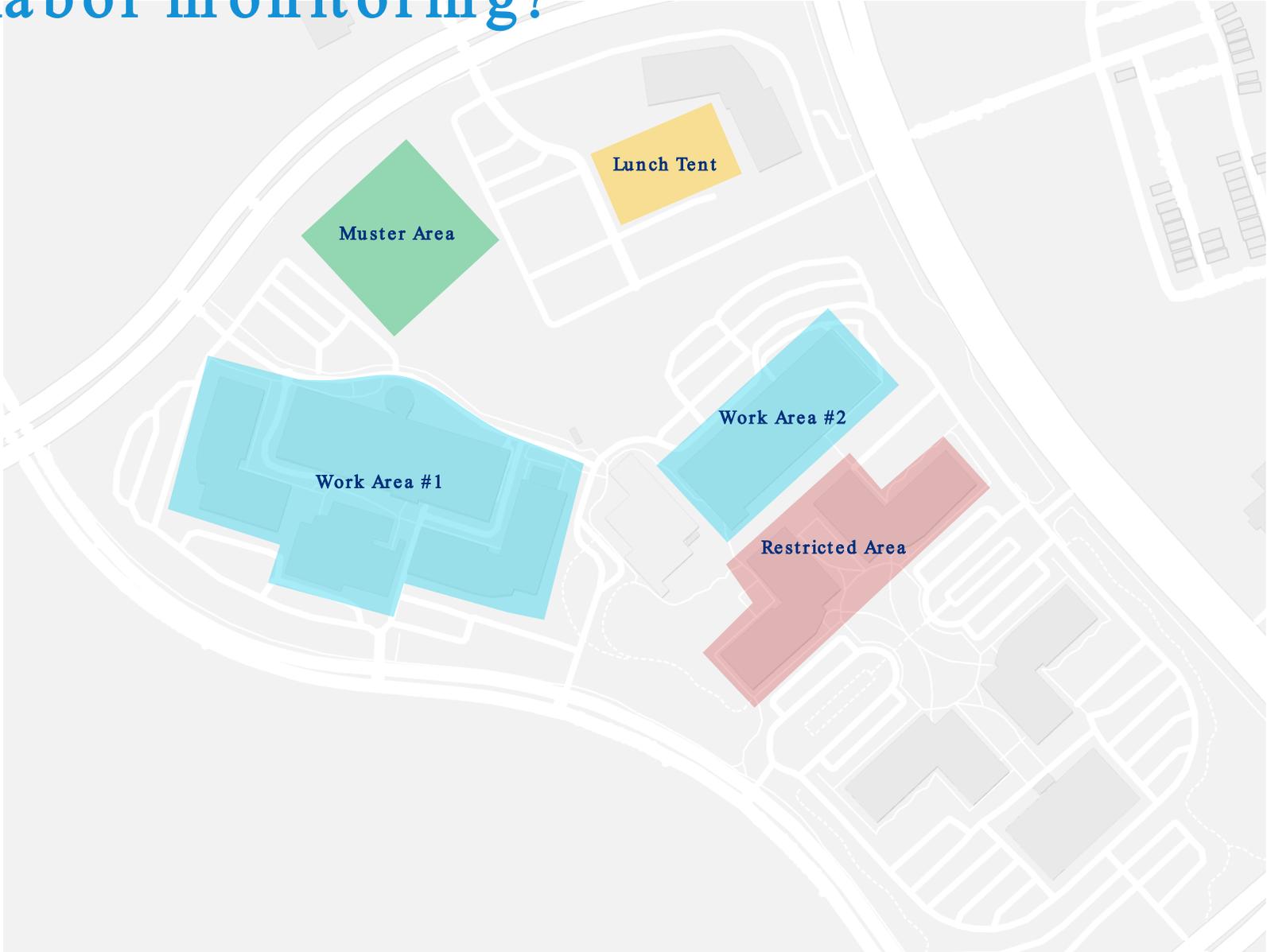


## PASSIVE ACCESS



# How to implement labor monitoring?

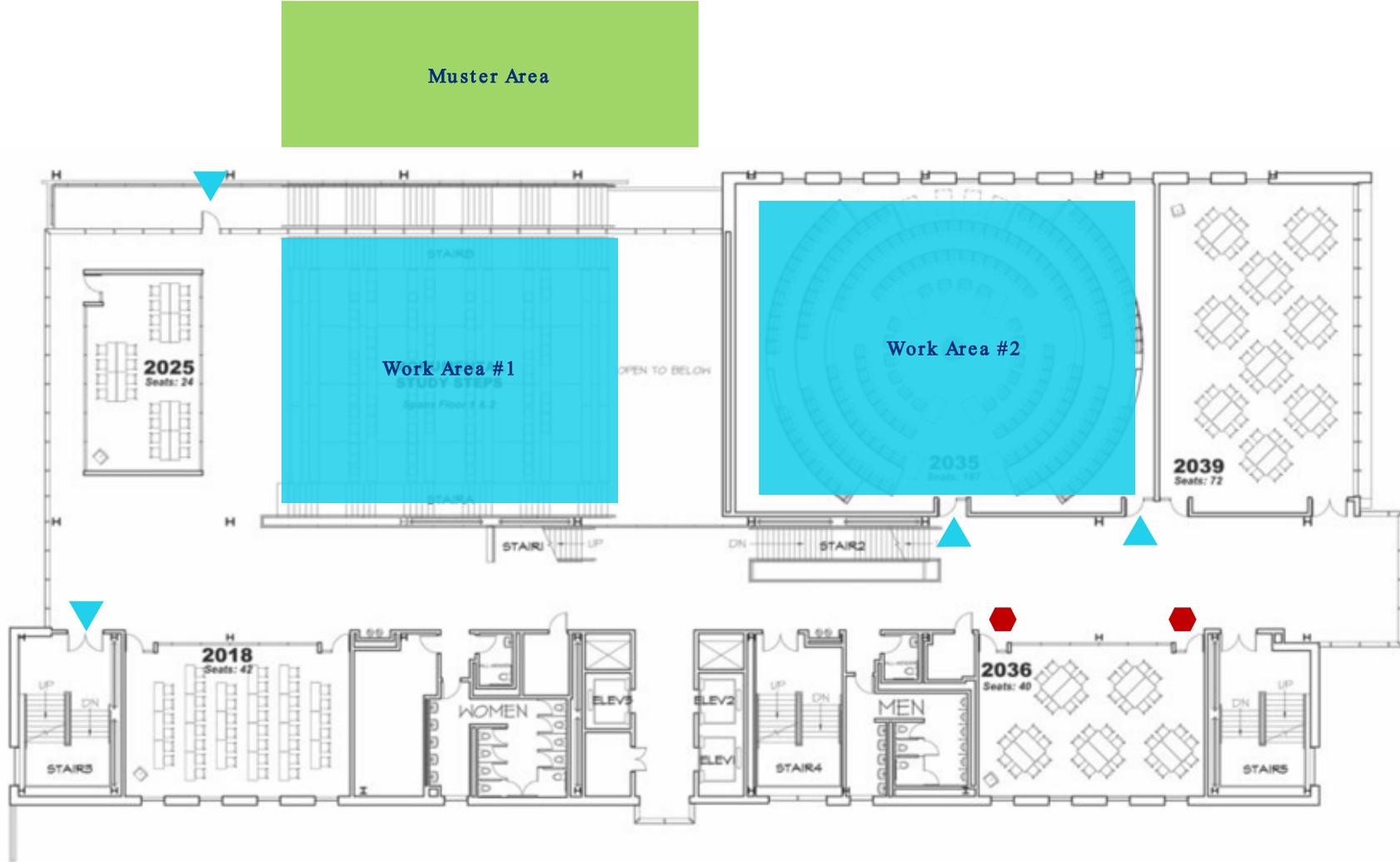
Determine important project zones/areas to collect data.



# How to implement labor monitoring?

Apply the same principles indoors.

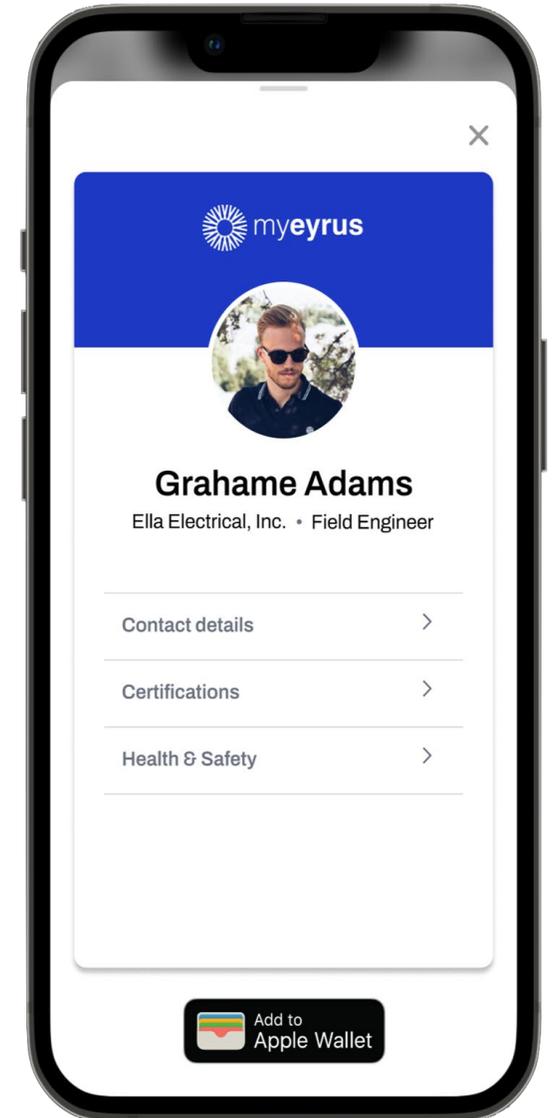
- ▼ Standard Access
- ◆ Restricted Access



# How to implement labor monitoring?

Site workers register via an app before arriving on site and create their “digital badge”.

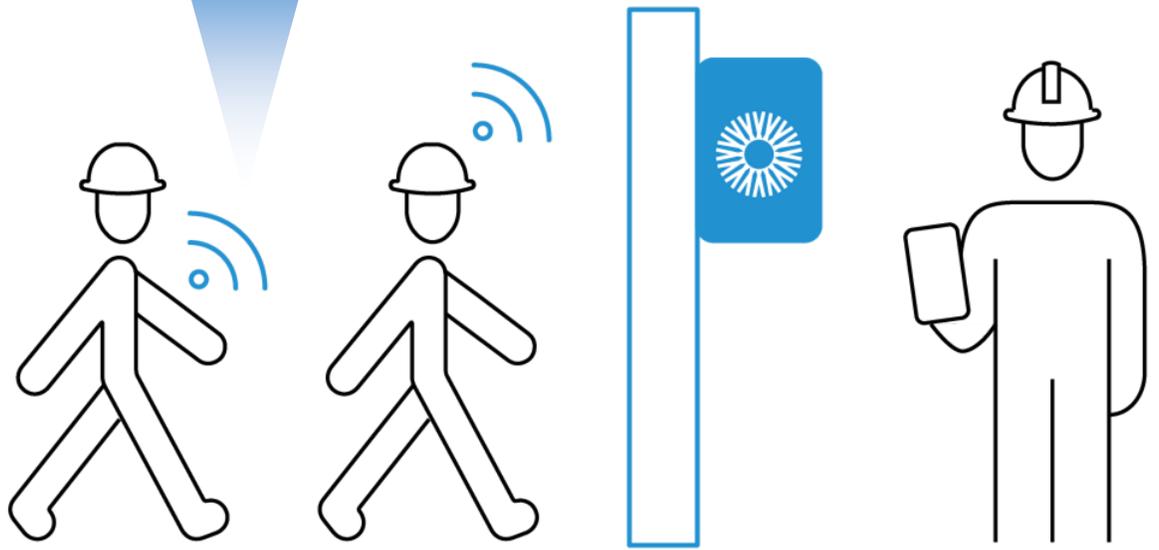
- Receive a text message or scan a QR code.
- Complete training and registration activities via a mobile app.
- Enter project specific credentials (certifications, demographics, etc).
- Registrations can be approved in a workflow by the project administrator.
- Upon approval, worker phone can be used as a “digital” badge.



# How to implement labor monitoring?

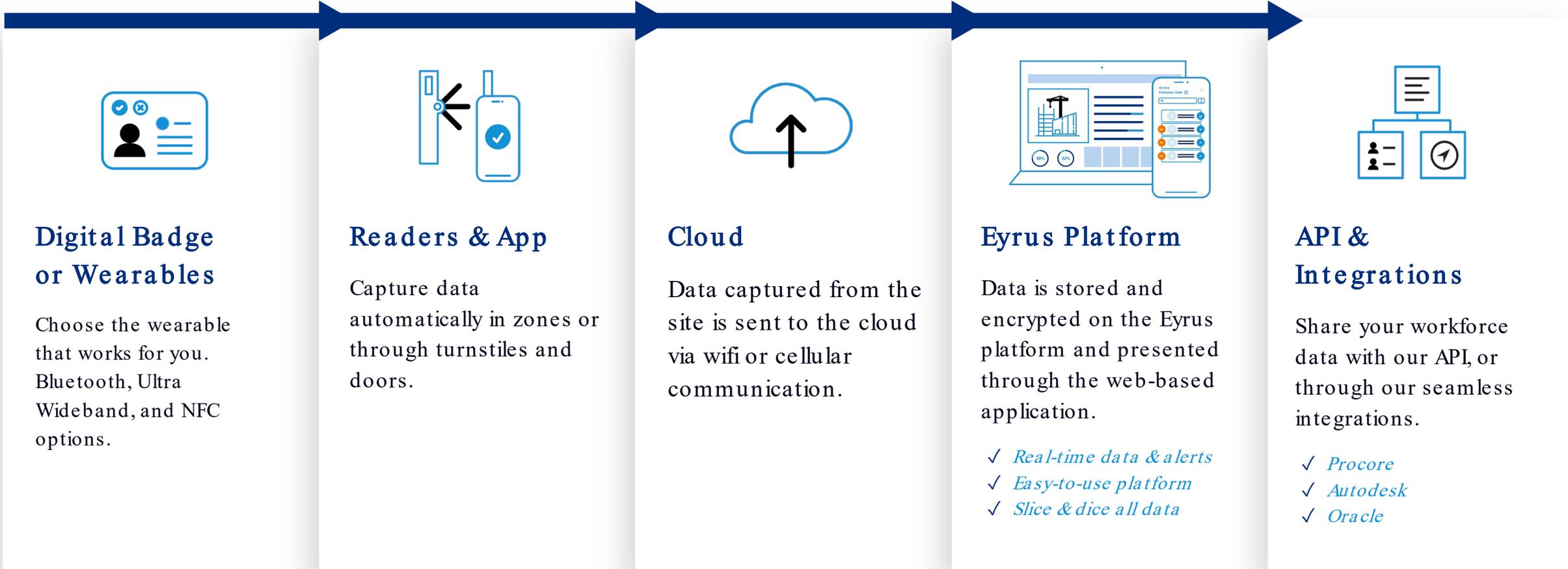
Option to leverage other badges or wearables based on project needs.

- > BLE hard hat beacons | 2-year battery life
- > BLE ID badges | 4-year battery life
- > NFC Cards for turnstiles, doors, or app



# How to implement labor monitoring?

Simple, automated, behind the scenes data collection.



# How do I use the labor data collected?

The objective, IoT-based data collected helps to answer important questions about your project.



## Safety

Can I quickly account for all site workers during an emergency?



## Productivity

Do I have the right number of workers on site to meet my productivity/schedule goals?



## Compliance

Does the site workforce meet the requirements for the municipality/area I am working in?



## Certification

Is my workforce properly certified to be on site?



## Objective Verification

Can I confidently verify my own payroll or the time reported by sub-contractors?



# How do I use the labor data collected?

## Automate the daily report process.

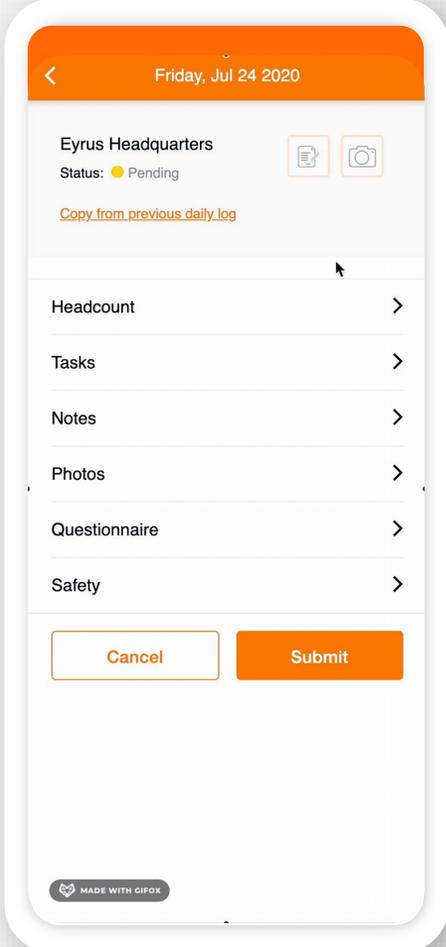
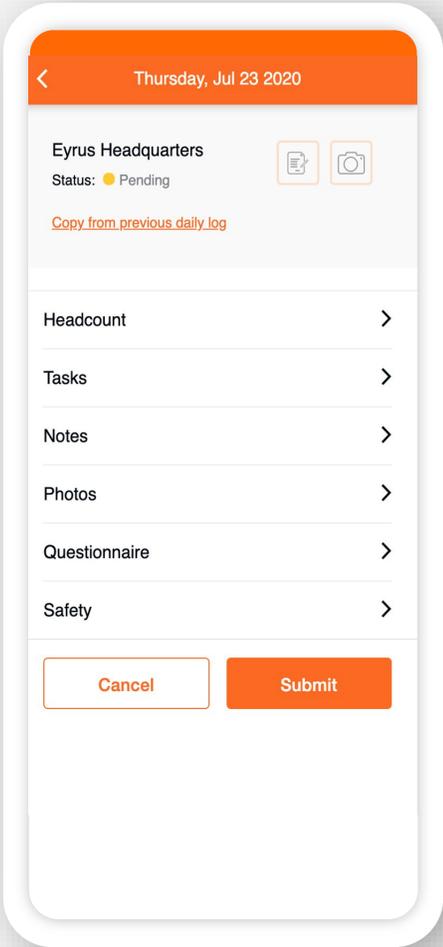
Subs and Self-Performers submit it daily information including:

- > Task progress and % complete
- > Safety question answers
- > Upload notes and photos

Project Managers and Superintendents access as reviewers to:

- > View all submitted daily logs
- > Submit Walkthroughs
- > Compare automatic vs reported headcounts

Downloadable PDF available upon completing the day.

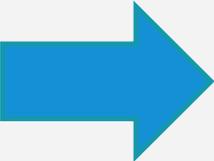


# How do I use the labor data collected?

## Automate the timesheet process

Eyrus Headquarters Apex 

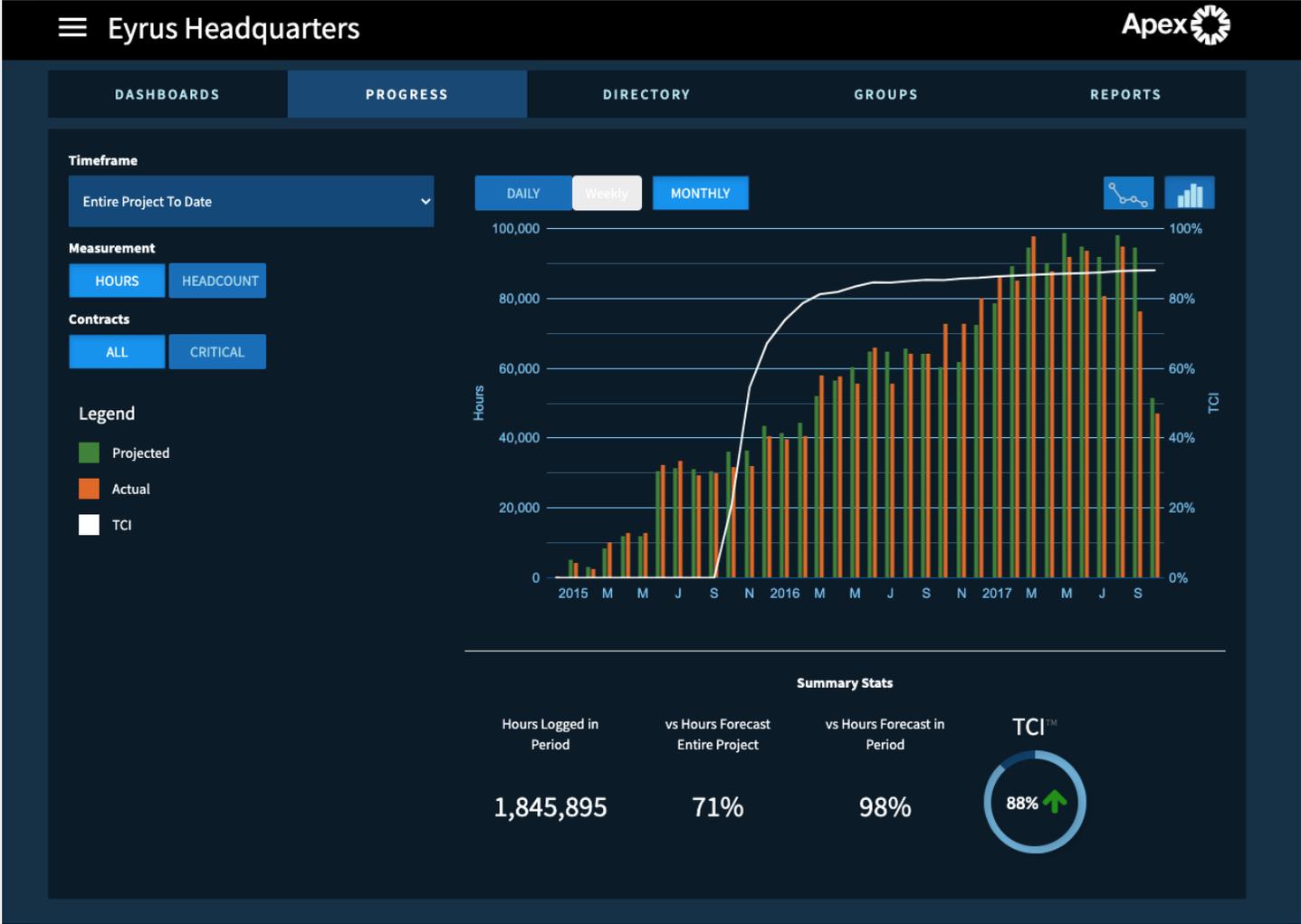
DASHBOARDS	PROGRESS	DIRECTORY	GROUPS	REPORTS
Sub Contract: ACE-Mona (9 timesheets, 0.29% of total)		78.06 hours 8.67 hours / day		
<a href="#">Kevin McDowell</a>	10/14/2017	6.22	7:13 AM	1:27 PM
<a href="#">Kevin McDowell</a>	10/17/2017	8.85	9:50 AM	6:41 PM
<a href="#">Kevin McDowell</a>	10/18/2017	12.53	7:26 AM	7:58 PM
<a href="#">Kevin McDowell</a>	10/11/2017	10.02	6:55 AM	4:56 PM
<a href="#">Kevin McDowell</a>	10/12/2017	8.19	6:43 AM	2:54 PM
<a href="#">Kevin McDowell</a>	10/13/2017	7.6	7:09 AM	2:45 PM
<a href="#">Kevin Green</a>	10/11/2017	7.92	6:42 AM	2:37 PM
<a href="#">Kevin Green</a>	10/17/2017	8.96	8:41 AM	5:38 PM
<a href="#">Kevin Green</a>	10/18/2017	7.77	6:52 AM	2:38 PM
Sub Contract: Alex&Hussein Project Management (2 timesheets, 0.0...)		13.68 hours 6.84 hours / day		
<a href="#">Brian Carroll</a>	10/12/2017	7.49	9:27 AM	4:56 PM
<a href="#">Bryan Oliva</a>	10/12/2017	6.19	7:19 AM	1:30 PM



# How do I use the labor data collected?

## Gain objective visibility into project schedule adherence

- › Rely on Real-Time Alerts for Schedule Deviation  
Stakeholders alerted when thresholds are triggered
- › Track Manpower Deficit Sooner  
Understand deviations to manpower onsite vs scheduled
- › Forecast vs. Actual  
Grasp changes in what is happening in real-time



# How do I use the labor data collected?

## Automate Safety and Security functions.

### > Virtual Units

Understand Site Density, Muster Point, Areas of Interest set up by virtual perimeters, real time attendance

### > Real-Time Communication Tools

Evacuation Reporting, and Mass Text Messaging

### > Fatigue Tracking & Alerts

Track hours on site and understand worker tendency for safety incidents

### > Muster Point Attendance

Real-time Verification of Workforce Muster Attendance

**Eyrus Headquarters** Apex

DASHBOARDS    PROGRESS    DIRECTORY    GROUPS    **REPORTS**

Daily Report   Weekly Report   Evacuation Report   Alerts Report   Workforce Report   Timesheets Report   Undetected Devices Report

3 / 77 workers verified [View audit log](#)   **ADD WORKER**   **END EVACUATION SESSION**

Filter by Contract: --- All Contracts ---   Filter by Status: --- All Statuses ---   Filter by Foreman: --- All Foremans ---   Filter by Location: --- All Locations ---

CONTRACT ^	NAME AND CONTACT	FOREMANS NAME	LOCATION	STATUS	NOTES
Connor Concrete	<a href="#">Alex Rodas</a> Phone: (240) 405-3818	<a href="#">Edit Foreman</a>	Muster Zone	<input checked="" type="checkbox"/> Verified	<a href="#">Add Note</a>
Connor Concrete	<a href="#">Ana Dolores Ochoa De Gomez</a> Phone: (571) 420-6029	<a href="#">Edit Foreman</a>	Building 1	<input checked="" type="checkbox"/> Verified	<a href="#">Add Note</a>
Connor Concrete	<a href="#">Ana Tobar Rivera</a> Phone: (301) 717-7148	<a href="#">Edit Foreman</a>	Building 1	<input checked="" type="checkbox"/> Verified	<a href="#">Add Note</a>
Connor Concrete	<a href="#">Austin Boddicker</a> Phone: (571) 243-1120	<a href="#">Edit Foreman</a>	Site	<input type="checkbox"/> Outstanding	<a href="#">Add Note</a>
Connor Concrete	<a href="#">Baltazar Garcia</a> Phone: (202) 706-0309	<a href="#">Edit Foreman</a>	Building 1	<input type="checkbox"/> Outstanding	<a href="#">Add Note</a>
Connor Concrete	<a href="#">Brian Smith</a> Phone: (442) 200-4030	<a href="#">Edit Foreman</a>	Building 1	<input type="checkbox"/> Outstanding	<a href="#">Add Note</a>



# How do I use the labor data collected?

## Automate labor certification and compliance reporting

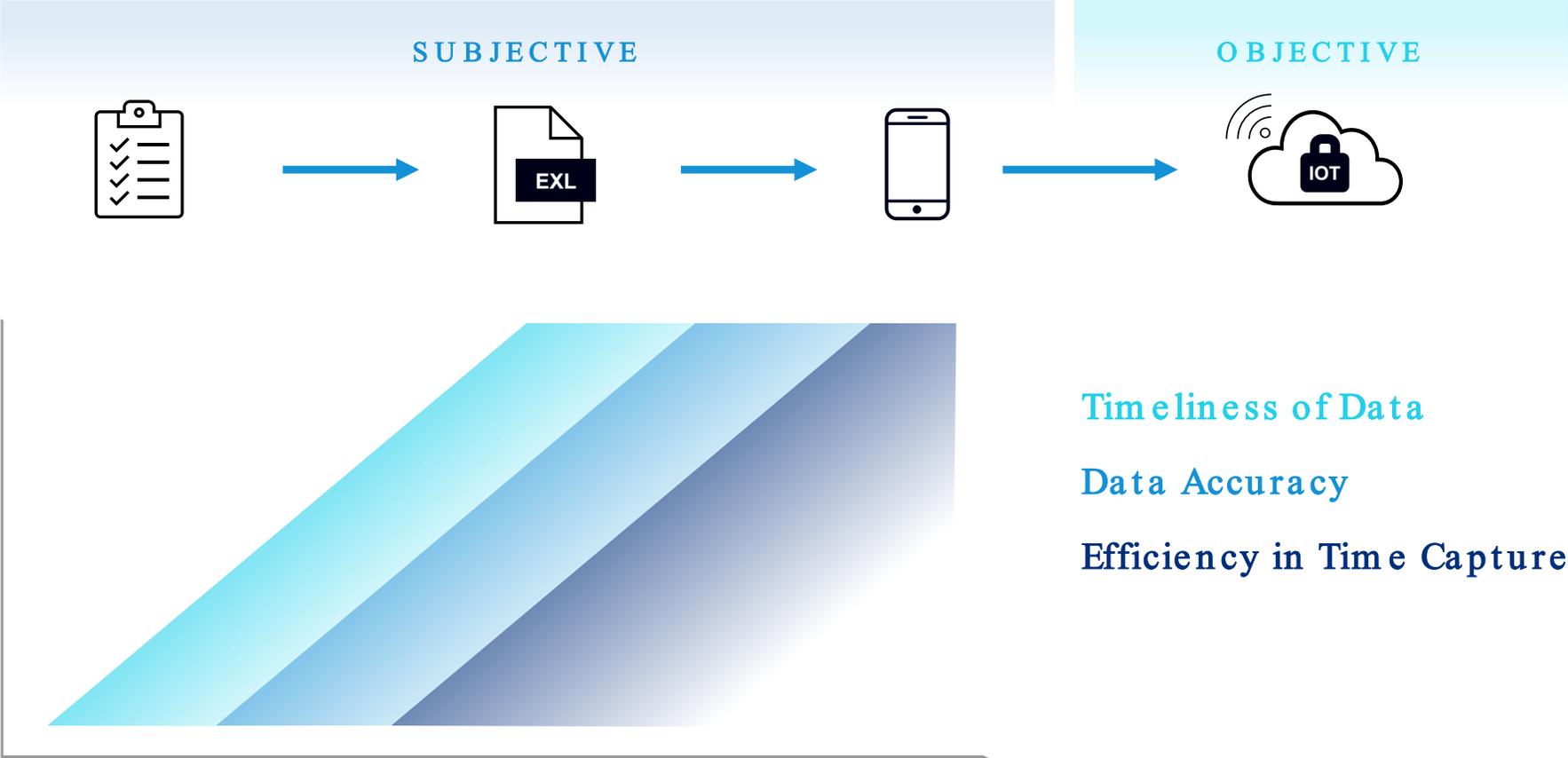
- › Leverage Attributes collected during registration process
- › Create compliance reports for attributes such as OSHA 10 or 30
- › Automate certification process for programs such as CCIP and OCIP
- › Report on site worker demographics to meet local requirements

The screenshot shows the Eyrus Headquarters interface with a navigation menu on the left and the Apex logo on the right. The main content area displays a table of workers under the 'DIRECTORY' tab. The table has columns for company name, worker name, OSHA 30 Issue Date, OSHA 10 Issue Date, work days, and hours. A 'Column Chooser' dialog box is open over the table, allowing users to select which columns to display. The dialog includes a search bar and checkboxes for 'Training', 'OSHA 10 Issue Date', 'OSHA 30 Issue Date', 'First Aid / CPR Issue Date', and 'Wage Rate'. The 'OSHA 10 Issue Date' and 'OSHA 30 Issue Date' options are currently checked.

DASHBOARDS		PROGRESS		DIRECTORY		GROUPS		REPORTS			
24 workers								4,848.66 hours			
OSHA 30 Issue Date: (24 workers, 100% of total)								360 work days		4848.66 hours	
Cholkamy Constructio...	<a href="#">Derek Curtis</a>	2/5/2016	5/11/2017		33				434.7		
Ella's Electric	<a href="#">Alice Padilla</a>	4/27/2016	10/12/2017		8				69.86		
Cholkamy Constructio...	<a href="#">Dominick Reeves</a>	5/31/2016	10/12/2017		6				48.15		
Connor Concrete	<a href="#">Clyde Townsend</a>	3/15/2016	4/18/2016		15				131.58		
Connor Concrete	<a href="#">Dave Beck</a>	4/5/2016	6/17/2016		47						
Connor Concrete	<a href="#">Stephanie Sims</a>	2/25/2016	2/29/2016		2						
Eli's Rebar	<a href="#">Delbert Bradley</a>	2/25/2016	2/29/2016		2						
Eli's Rebar	<a href="#">Gustavo Gordon</a>	9/14/2015	4/21/2017		4						
Ella's Electric	<a href="#">Lena Hopkins</a>	1/29/2016	2/26/2016		4						
Ella's Electric	<a href="#">Christie Spencer</a>	1/29/2016	2/17/2016		8						
Ella's Electric	<a href="#">Leland Hale</a>	1/29/2016	4/19/2016		27						
Ella's Electric	<a href="#">Erik Roberson</a>	8/28/2015	8/30/2017		24				938.79		
Cholkamy Constructio...	<a href="#">Elmer Richards</a>	2/5/2016	5/11/2017		33				434.7		

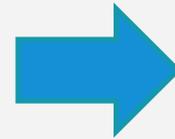


# What is the impact to the project team?



# How does IoT labor monitoring help with the current labor shortage?

- › IoT automates many of the labor-related project processes (worker onboarding and project timekeeping, etc)
- › IoT automates much of the project reporting (schedule progression updates, certification reports, etc)
- › Provides “objective truth” to get “real answers” to keep project on schedule/budget
- › Provides additional insights that were previously too costly to collect



Project Workers can focus on value-added vs administrative tasks

Project Management can make better decisions and utilize labor more efficiently

# Who is leveraging IoT today?



## Risk Mitigation, Safety and Compliance Data Reporting

Scope	Challenge
<ul style="list-style-type: none"><li>› Confidential Data Center</li><li>› Des Moines, Iowa</li><li>› Over 1k Member Workforce</li><li>› 600K+ Total Project Hours</li></ul>	<ul style="list-style-type: none"><li>› Accurate real-time attendance for natural disaster threats was not readily available</li><li>› Key workforce management data was needed for the project's cost and productivity information</li></ul>

### Solution

- › Eyrus used for real-time workforce data, reporting and photo ID badging
- › Fell within the project budget capability
- › Accuracies created and additional value for ROI on other project areas

### Results

- › Successful site evacuations for 3 tornados during the project using real-time attendance
- › Data for reporting on safety compliance was captured easier
- › Customizable alerts created for people on-site for critical walk-throughs

### Success Metrics

- › **150% ROI in time spent on daily administration**
- › **18% productivity increase on superintendents time**
- › Knowing who is on-site during emergencies easier to make a safer work environment
- › Minimized fraud & abuse, and improved safety conditions



# Who is leveraging IoT today?

“

*Eyrus has a window to workforce productivity on our projects unlike any real time technology available in the marketplace.”*



**Sean Cahill**  
Senior Vice President PGP  
Development

“

*The normalization of data across the entire program allows us to accurately and in real-time enhance safety, security on-site and workforce visibility. The integrated platform across the program allows us to compare performance and manage our risks on-site.”*



**Ian Mincey**  
Project Exec Director of Preconstruction  
TURNER CONSTRUCTION



# Who is leveraging IoT today?

“ I use Eyrus on my projects for the efficiency and insights on construction progress. Time is saved on documentation, and reporting is easier & concise with data being continuously collected onsite.”

**Billy Frye**

Senior Project Manager | Verity Commercial

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“ Setting up was very simple, very easy. Once we learned how to navigate the software, it was simple for us to use. I would absolutely recommend Eyrus.”

**Max Nellis** Superintendent | HIT Contracting

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“ The features and capabilities of Eyrus have allowed us to capture real time data analytics to understand what is happening on our project in the moment. The user interface is very intuitive and easy for us to navigate. Also, the Eyrus team has been very open to expanding the capabilities of the software to capture and track customized data for our project. I would recommend it for any project with labor hour analytic needs.”

**Bryan Higgins** Project Manager | Whiting-Turner



Questions?



**IT CONFERENCE**  
FOR CONSTRUCTION PROFESSIONALS



**Steve Baret**

Eyrus Head of Strategy & Partnerships

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