

AI could help the construction industry work faster—and keep its workforce accident-free



Suffolk has partnered with the startup Smartvid.io on technology that uses image recognition to detect safety risks like workers missing protective equipment. Courtesy of Suffolk and Smartvid.io

By Elizabeth Woyke,

Construction workers are killed on the job five times more often than other laborers. Now a new kind of construction worker—a data scientist—aims to use artificial intelligence to predict the likelihood of injury and intervene.

Suffolk, a Boston-based general contractor with annual sales of \$3 billion, is developing an algorithm that analyzes photos from its job sites, scans them for safety hazards such as workers not wearing protective equipment, and correlates the images with its accident records. The company is still fine-tuning the technology but says it could potentially compute “risk ratings” for projects so safety briefings can be held when an elevated threat is detected.

Suffolk is also writing an algorithm that would parse information from a variety of sources, including 10 years of scheduling data from its archives, and forecast project delays—information that could be communicated to building owners and subcontractors. Suffolk is also exploring ways to utilize data from IoT sensors to increase efficiency. One idea is to track the location of its concrete suppliers’ trucks so that workers are ready to pour the concrete as soon as the trucks arrive.

Such data crunching is rare in construction, which has been slow to adopt advanced analytics—in part because margins are thin and tried-and-true methods have a firm hold. “People know how to build the way they know how to build,” says James Benham, the CEO of JBKnowledge, a software and consulting firm that conducts an annual global survey on construction technology. “And it’s hard to convince most of them to do things any other way.”

But a labor shortage and a desire to boost the industry’s low productivity rates are compelling some firms to invest in data science. Proponents say the budding trend could eventually transform the \$13 trillion sector. Benham estimates that about 20 construction firms in the US have launched some kind of data science initiative in recent years.

Suffolk is one of these pioneers. In 2017, it appointed a McKinsey management consultant named Jit Kee Chin as its first chief data officer. The role, which the company describes as “leveraging big data and advanced analytics to improve the core business,” is a new one in the construction industry. Other companies may have a “director of innovation,” “vice president of construction technology,” or head of R&D

that handles similar tasks, but Chin arguably wields more influence, given her C-suite title and broad remit, which includes working with the company’s innovation and strategy teams on technology initiatives.

Like other construction firms, Suffolk generates a lot of data, from field reports and job-site photos to supplier contracts and inspection records. In the past, the company’s various applications couldn’t share data easily, so the company struggled to do any type of forecasting. Chin hired a group of data scientists and experts in data visualization, IT, and operations, who stitched together the company’s data feeds and designed an online dashboard to present the information. The result is a program that lets Suffolk employees look at a single summary chart of all the company’s projects around the country and view details on each one’s finances, safety record, schedule, and more.

■ Continued on page 6

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California Sub-Bid Request Ads



Requests quotes from qualified and certified DBE Subcontractors, Suppliers, and Service Providers for the following (but not limited to) work:

Signs, Erosion Control, Fencing, Landscape, Trucking, Rip Rap, Guardrail, Traffic Control, Treated Wood Waste, Rebar, Steel Pipe Arch, Corrugated Steel Pipe

FOR CONSTRUCTION ON STATE HIGHWAY IN NEAR LUDLOW FROM 0.3 MILES EAST OF CRUCERO ROAD TO 0.4 MILE WEST OF BADGER WASH

In District 08 On Route 40

Contract No. 08-0R1604 Federal-Aid Project ACHSIM-040-1(084)E DBE Goal 14%

BID DATE July 10, 2018 @ 2:00 p.m.

Sub & Vendor Scopes and Bids Due Prior

Sukut Construction, LLC

4010 W. Chandler Avenue, Santa Ana, CA 92704

Contact: Jerry Pabbruwee

Phone: (714) 540-5351 • Fax: (714) 545-2003 • Email: estimating@sukut.com

Plans/specs are available for viewing at our office by appointment, via Sukut's FTP site, or may be obtained from Owner. Subcontractors must be prepared to furnish 100% performance and payment bonds and possess current insurance and workers' comp coverage. Sukut Construction will assist Qualified Subcontractors in obtaining bonds, insurance, and/or lines of credit. Please contact Sukut for assistance in responding to this solicitation. Subcontractors/Vendors will be required to sign Sukut's Standard Subcontract/Purchase Order. Copies are available for examination.

Sukut Construction's listing of a Subcontractor in its bid to the agency is not to be construed as an acceptance of all of the Subcontractor's conditions or exceptions included with Subcontractor's price quotes. Quotations must be valid for the same duration as specified by Owner for contract award.

**Sukut Construction, LLC
An Equal Opportunity Employer**

Balfour Beatty

9800 S Meridian Blvd Suite 250, Englewood, CO 80112 • Phone: (720) 643-2292

Balfour Beatty Infrastructure, Inc. (BBI) is soliciting proposals from all interested contractors for the following tasks and trades (scopes can be negotiated): Temporary Traffic Control, Utility Work, Concrete and Flatwork, Electrical, Quality Control, Concrete Coring, and other work associated with the **34.5 KV CABLE REPLACEMENT M-LINE MVS SWITCHING STATION AND MTF, MSS, MPS AND MTW SUBSTATIONS** currently advertised by **San Francisco Bay Area Rapid Transit (BART)** in **San Francisco, California**.

Note this project is subject to the Major Projects Project Stabilization Agreement. Please see the contract documents for additional information. Bonds may be required depending on scope, assistance is available if needed.

For this project, a goal for Disadvantaged Business Enterprise (DBE) participation has been established. Subcontractors meeting project goals for DBE criteria may be given preference in order to meet these goals.

If interested in submitting a bid in any of these categories, please email railbids@bbi.us for a link to the specifications and plans or see BART's procurement portal.

All questions or clarifications with respect to the inquiry can be addressed to Dominic Masica by email at dmasica@bbi.us or by phone at 720-643-2292.

Proposals must be submitted no later than **6/25/2018 at 4:00 PM PST** to railbids@bbi.us

Balfour Beatty is an equal opportunity employer.



SWINERTON BUILDERS

Advertisement of Upcoming Cal State LA TOCA Projects

Caltrans Surface Parking Lot: \$3,500,000

Campus Metering Project: \$1,000,000

DVBE, SBE, WBE, MBE, and local subcontractors and suppliers encouraged.

Swinerton Builders is seeking qualified subcontractors and suppliers for all trades to participate in the upcoming Cal State LA TOCA Projects. These Projects are Public Works Projects, and are Prevailing Wage with Certified Payroll required.

Trades

Earthwork, Demolition, Asphalt Paving & Striping, Site Utilities, Concrete, Electrical, & HVAC

All interested bidders must be able to provide a payment and performance bond and/or show proof of bond ability through the Swinerton Prequalification application.

Interested Subcontractors must submit their prequalification application by Friday June 13th 2018.

Interested Subcontractors should contact:
Saed Ali at 213-905-9492, sali@swinerton.com

A link to the project documents are located at:
<http://www.swinerton.com/subcontractors/subcontractor-current-bid-opportunities>

Subcontractors are also encouraged to begin the Swinerton Prequalification process at:
<http://www.swinerton.com/subcontractors/subcontractor-prequal>



Proven Management, Inc.
225 3rd Street, Oakland, CA 94607
Phone: 510-671-0000 • Fax: 510-671-1000

Requests proposals/quotes from all qualified and certified DBE subcontractors, suppliers, and truckers for the following project:

SEISMIC RETROFIT OF 23rd AVENUE OVERHEAD (Bridge #33C-0148)

CITY OF OAKLAND

CITY PROJECT #1001681 &

FEDERAL PROJECT #STPLZ-5012(130)

Bids: June 21, 2018 @ 2pm

GOAL: DBE – 17.23%

SWPPP - TRAFFIC CONTROL –
PAVEMENT MARKING – TRAFFIC STRIPE
- THERMOPLASTIC STRIPES & MARKING –
DEWATERING – STEEL PIPE PILING – MICRO-PILING – CONCRETE STRUCTURES – DRILL & BOND DOWELS – REBAR – CHAINLINK FENCE – METAL BEAM GUARD RAILING – CONC BLOCK BARRIER – MISC METALS – SIGNS & MARKERS – PORTLAND CEMENT CONCRETE

Bonding, insurance, lines of credit and any technical assistance or information related to the plans & specifications & requirements for the work will be made available to interested DBE firms. Assistance with obtaining necessary equipment, supplies, materials, or related assistance or services for this project will also be offered to interested DBE firms.

100% Payment & Performance bonds will be required from a single, Treasury-listed surety company subject to PMI's approval. PMI will pay bond premium up to 1.5%. Subcontractors awarded on any project will be on PMI's standard form for subcontract without any modifications. For questions or assistance required on the above, please call.

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CHASE CENTER

and

Warriors Mixed-Use Office and Retail Development

Please Join Us for the Procurement Package #4 Pre-Proposal Meeting



Image courtesy of MANICA Architecture/ Steelblue LLC

Project Description: Chase Center, a 18,000-seat, multi-purpose event center, will anchor a district of 11 acres of restaurants, cafes, offices and public plazas, along with other amenities. This project is administered by the Office of Community Investment and Infrastructure with a Small Business Enterprise (SBE) goal of 50%.

Interested bidders should visit the link provided and select their trade of interest

[Bid Package #4 - Chase Center and Warriors Mixed Use Office & Retail Development](#)

Procurement Package #4 will include the following scopes of work:

- Line Striping
- Parking Equipment
- Final Clean-Up
- Window Cleaning
- Interior Wayfinding Signage
- Exterior Building and Site Signage

When: Monday, June 18, 2018 at 2:00 pm
Where: 499 Illinois Street
San Francisco, CA 94158
Treasure Island Conference Room

Please RSVP at (628) 221-8943 or at rsvp@mortensonclarkjv.com



California Sub-Bid Request Ads



Is requesting quotes from qualified DBE Subcontractors, Suppliers, and Service Providers for the following (but not limited to) work:

Pavement Grinding, AC Paving, Stripe & Mark, Traffic Control, Aggregate, Pipe PVC, SWPPP, Schedule, Shoring, Bore & Jack, CCTV

Hi-Desert Water District Wastewater Reclamation Project Phase 1 Collection System Bid Package D

Located in Yucca Valley, San Bernardino County, California
Hi-Desert Water District

BID DATE June 19, 2018 @ 2:00 p.m.

Sub & Vendor Scopes and Bids Due Prior

Sukut Construction, LLC

4010 W. Chandler Avenue, Santa Ana, CA 92704
Contact: Robbie Zwick

Phone: (714) 540-5351 • Fax: (714) 545-2003 • Email: estimating@sukut.com

Plans/specs are available for viewing at our office by appointment, by Sukut FTP, or from Owner's website. Subcontractors must be prepared to furnish 100% performance and payment bonds and possess current insurance and workers' comp coverage. Sukut Construction will assist qualified subcontractors in obtaining bonds, insurance, and/or lines of credit. Subcontractors/Vendors will be required to sign Sukut's Standard Subcontract/Purchase Order. Copies are available for examination. Please contact Sukut Construction for assistance in responding to this solicitation.

Sukut Construction's listing of a Subcontractor in its bid to the agency is not to be construed as an acceptance of all of the Subcontractor's conditions or exceptions included with Subcontractor's price quotes. Quotations must be valid for the same duration as specified by Owner for contract award.

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TAFT ELECTRIC COMPANY

1694 EASTMAN AVENUE, VENTURA, CA 93003
Contact: Arnold Tostado • atostado@taftelectric.com
Phone: (805) 642-0121 • Fax: (805) 650-9015

Invites sub-bids from qualified DBE businesses for the following project:

Agency: State of California • Department of Transportation

07A4495 Loop Detector Repair and Replacement

Location: Los Angeles and Ventura Counties

BID DATE: June 14, 2018

Trades Seeking: Fiber Optic, Traffic Control, DLC Cable Supplier, Traffic Signal Model 2070 Controller Units & Type 334 Cabinet Supplier, MVDS Supplier.

We are an Equal Opportunity Employer and intend to seriously negotiate with qualified Disadvantaged Business Enterprise subcontractors and suppliers for project participation.

Payment and performance bonds may be required. Please contact us at the above listed number for further information regarding bidding on this project. To the best of our abilities we will help with bonds/insurance/credit. Plans are available for viewing at our office.

We Are An Equal Opportunity Employer



11555 Dublin Boulevard • P.O. Box 2909
Dublin, CA 94568-2909
(925) 829-9220 / FAX (925) 803-4263
Estimator: **JIM YACKLEY**
Website: www.desilvagates.com
An Equal Opportunity Employer

DeSilva Gates Construction (DGC) is preparing a bid as a Prime Contractor for the project listed below:

**ANNUAL OVERLAY / REHABILITATION
2017-18, Project No. 2018.0050,
Bid No. 17-18.026**

**Local Business Enterprise Goal Assigned
is 25%**

OWNER:

**CITY OF SAN LEANDRO
835 East 14th Street, 2nd Floor,
San Leandro, CA 94577**

BID DATE: JUNE 21, 2018 @ 3:00 P.M.

DGC is soliciting quotations from certified Local Business Enterprises, for the following types of work and supplies/materials including but not limited to:

**ADJUST IRON, CLEARING AND GRUBBING/
DEMOLITION, COLD PLANE, ELECTRICAL,
STRIPING, SURVEY/STAKING, UNDER-
GROUND, TRUCKING, WATER TRUCKS,
STREET SWEEPING, HOT MIX ASPHALT
(TYPE A) MATERIAL, RUBBERIZED HMA
(GAP GRADE) MATERIAL, ASPHALT OIL,
FULL DEPTH RECLAMATION, COLD CENTRAL
PLANT RECYCLED ASPHALT.**

Plans and specifications may be reviewed at our offices located at 11555 Dublin Boulevard, Dublin, CA or 7700 College Town Drive, Sacramento, CA, or at your local Builders Exchange, or reviewed and downloaded from the ftp site at <ftp://ftp%25desilvagates.com:f7pa55wd@pub.desilvagates.com> (if prompted the username is ftp@desilvagates.com and password is f7pa55wd) or from the Owner's site at <http://www.sanleandro.org/depts/finance/purchasing/bids>.

Fax your bid to (925) 803-4263 to the attention of Estimator Jim Yackley. If you have questions for the Estimator, call at (925) 829-9220. When submitting any public works bid please include your DUNS number and DIR number. For questions regarding registration for DIR use the link at: www.dir.ca.gov/Public-Works/PublicWorks.html

If you need LBE support services and assistance in obtaining bonding, lines of credit, insurance, necessary equipment, materials and/or supplies or related assistance or services, for this project call the Estimator at (925) 829-9220, or contact your local Small Business Development Center Network (<http://californiasbdc.org>) or contact the California Southwest Transportation Resource Center (www.transportation.gov/osdbu/SBTRCs). DGC is willing to breakout portions of work to increase the expectation of meeting the LBE goal.

At our discretion, 100% Payment and 100% Performance bonds may be required as a subcontract condition. This will be a PREVAILING WAGE JOB. DGC is an equal opportunity employer.

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CALTRANS 2016 DISPARITY STUDY PUBLIC COMMENT FORUMS



The California Department of Transportation (Caltrans) conducted a Disparity Study (Study) that Caltrans and local governments will use to refine their implementations of the Federal Disadvantaged Business Enterprise (DBE) program in accordance with 49 Code of Federal Regulations Part 26. The Study includes an analysis of whether there is evidence of discrimination or its effects in the transportation contracting industry in California.

Caltrans is hosting a series of Public Comment Forums to obtain comments related to the Study and personal testimony and experiences related to working in the California transportation contracting industry. Information Caltrans is seeking includes, but is not limited to, whether:

- Firms face difficulties or barriers when bidding as prime contractors, subcontractors, or suppliers
- Business owners believe they have been treated fairly or unfairly based on their race, ethnicity, or gender
- Contractors solicit, or fail to solicit, bids or price quotes from DBEs on projects with no DBE goals
- There is a level playing field for firms in accessing to capital, bonding, and insurance

You are invited to participate in public forums that will be held statewide as follows:

DATE	DISTRICT	TIME	LOCATION
Monday June 18, 2018	District 3	3-5 p.m.	Caltrans District 3 Office, Cedar Ridge Room, 703 B Street, Marysville, CA 95901
Monday June 18, 2018	District 10	3-5 p.m.	Lodi Community Library, Community Room, 201 W. Locust Street, Lodi, CA 95240
Tuesday June 19, 2018	District 4	3-5 p.m.	Caltrans District 4 Office, Auditorium, 111 Grand Avenue, Oakland, CA 94612
Tuesday June 19, 2018	District 7	3-5 p.m.	Caltrans District 7 Office, Conference Room 1.037, 100 South Main Street, Los Angeles, CA 90012
Wednesday June 20, 2018	District 8	3-5 p.m.	Caltrans District 8 Office, 805 Conference Room, 464 W. 4 th Street, San Bernardino, CA 92401
Thursday June 21, 2018	District 9	3-5 p.m.	Caltrans District 9 Office, Mt. Tom Room, 500 South Main Street, Bishop, CA 93514
Friday June 22, 2018	<i>Webinar</i>	9-11 a.m.	RSVP to mario.solis@dot.ca.gov if interested in participating.
Monday June 25, 2018	<i>Webinar</i>	3-5 p.m.	RSVP to mario.solis@dot.ca.gov if interested in participating.
Tuesday June 26, 2018	District 5	3-5 p.m.	Caltrans District 5 Office, Sycamore Room, 50 Higuera Street, San Luis Obispo, CA 93401
Wednesday June 27, 2018	District 1	3-5 p.m.	Caltrans District 1 Office, Room 59, 1656 Union Street, Eureka, CA 95501
Wednesday June 27, 2018	District 6	3-5 p.m.	Caltrans District 6-Manchester Office, Yosemite Room #145, 2015 E. Shields Avenue, Suite 100, Fresno, CA 93276
Thursday June 28, 2018	District 2	3-5 p.m.	Caltrans District 2-West Venture Building, Lassen Training Room, 1031 Butte Street, Redding, CA 96001
Friday June 29, 2018	District 11	3-5 p.m.	Caltrans District 11 Office, Gallegos Room, 4050 Taylor Street, San Diego, CA 92110
Friday June 29, 2018	District 12	3-5 p.m.	Caltrans District 12 Office, Room 104, 1750 East 4 th Street, Suite 100, Santa Ana, CA 92705

You may also submit testimony electronically, **no later than 5:00 pm, Friday, June 29, 2018, to Mario.solis@dot.ca.gov**, or by U. S. mail to Caltrans Office of Business & Economic Opportunity, Attention: Mario Solis, 1823 14th Street, Sacramento, CA 95811; or by fax at (916) 324-1949. If you have any questions about the Caltrans Disparity Study, contact Mario Solis, Branch Manager, at (916) 324-1812 or Mario.solis@dot.ca.gov.



California Sub-Bid Request Ads

Pacific Structures is seeking qualified and certified
MBE/WBE/SBE/LBEs

Subcontractors, Suppliers, for the project below:

160 Folsom- 40 Story Condominium

Location: 160 Folsom, San Francisco, CA 94105

Bid Due Date: September 1, 2018

Description of work:

Pumping/ Placing/ Finishing for Pads,
Curbs, and Built-up Slabs

Pacific Structures

3004 16th Street • San Francisco, CA 94103

Phone: (415) 606-3572

Contact: Natalie Besser

Email: Natalie.Besser@pacific-structures.com

An Equal Opportunity Employer

DESILVA GATES CONSTRUCTION

11555 Dublin Boulevard • P.O. Box 2909
Dublin, CA 94568-2909

(925) 829-9220 / FAX (925) 803-4263

Estimator: **JACK SHEWMAKER**

Website: www.desilvagates.com

An Equal Opportunity Employer

DeSilva Gates Construction (DGC)
is preparing a bid as a Prime Contractor
for the project listed below:

**ANNUAL STREET OVERLAY / REHABILITATION
2016-17 PHASE 2**

PROJECT NO. 2017.0050 BID NO. 17-18.043

Local Business Enterprise Goal Assigned is 25%

OWNER:

CITY OF SAN LEANDRO

**835 East 14th Street, 2nd Floor,
San Leandro, CA 94577**

BID DATE: JUNE 19TH, 2018 @ 3:00 P.M.

DGC is soliciting quotations from certified Local Business Enterprises, for the following types of work and supplies/ materials including but not limited to:

ADJUST IRON, FDR TREATMENT, MINOR CONCRETE, ROADSIDE SIGNS, STRIPING, SURVEY/ STAKING, UNDERGROUND, TRUCKING, WATER TRUCKS, STREET SWEEPING, CLASS 2 AGGREGATE BASE MATERIAL, HOT MIX ASPHALT (TYPE A) MATERIAL.

Plans and specifications may be reviewed at our offices located at 11555 Dublin Boulevard, Dublin, CA or 7700 College Town Drive, Sacramento, CA, or at your local Builders Exchange, or reviewed and downloaded from the ftp site at <ftp://ftp%25desilvagates.com:f7pa55wd@pub.desilvagates.com> (if prompted the username is [ftp@desilvagates.com](ftp://ftp%25desilvagates.com) and password is [f7pa55wd](ftp://ftp%25desilvagates.com)) or from the Owner's site at <http://www.sanleandro.org/depts/finance/purchasing/bids>.

Fax your bid to (925) 803-4263 to the attention of Estimator Jack Shewmaker. If you have questions for the Estimator, call at (925) 829-9220. When submitting any public works bid please include your DUNS number and DIR number. For questions regarding registration for DIR use the link at: www.dir.ca.gov/Public-Works/PublicWorks.html

If you need LBE support services and assistance in obtaining bonding, lines of credit, insurance, necessary equipment, materials and/or supplies or related assistance or services, for this project call the Estimator at (925) 829-9220, or contact your local Small Business Development Center Network (<http://californiasbdc.org>) or contact the California Southwest Transportation Resource Center (www.transportation.gov/osdbu/SBTRCs). DGC is willing to breakout portions of work to increase the expectation of meeting the LBE goal.

At our discretion, 100% Payment and 100% Performance bonds may be required as a subcontract condition. This will be a PREVAILING WAGE JOB. DGC is an equal opportunity employer.



Barnard Bessac Joint Venture - DBE Opportunities

Barnard Bessac Joint Venture, an Equal Opportunity Employer, is seeking quotes from interested and qualified Disadvantaged Business Enterprises (DBE's) and other subcontractors and suppliers for the following:

PROJECT: Gravity Pipeline Progressive Design Build Project

OWNER: Silicon Valley Clean Water

Initial Publish Date: February 22, 2018

Firms that are certified by one of the following programs are qualified: Entities owned and/or controlled by socially and economically disadvantaged individuals, MBE, WBE, SBE, SBRA, LSAF and HUB.

OPPORTUNITIES INCLUDE

(Feb. 2018 through June 2022):

Shaft - Slurry wall; Shaft - Secant pile; Jet Grout; Earth Pressure Balance Tunnel Boring Machine fabrication & delivery; Concrete foundations (flat work); Concrete demolition & off-haul (shallow structures); Site clearing & grading; Site fencing; Trucking (spoils off-haul & disposal); Temporary modular office trailer supply & installation; Office Janitorial services; Office Supplies; Security; Quality control testing and other laboratory testing services; Trucking of materials & equipment; Equipment rental (Loaders, Skidsteers, Excavators, Manlifts, Forklifts); Raw material supply (iron/steel, consumables, fluids); Fabrication; Jobsite supplies (PPE, tools, etc...); Printing services (plotting / signs / banners); Traffic control supply and/or services; Utility relocation; Trench excavation and shoring; Sheet pile installation; Potholing; Geotechnical investigation (Borings, CPT's); Instrumentation & Monitoring; Pre-condition surveys (buildings, roadways, utilities); Tunnel precast segmental lining manufacturing; Supply of moulds for precast segmental lining; Rebar supply and/or installation; Ready-Mix concrete supply; Street sweeping / cleaning; Utility inspections; Water treatment systems; Concrete pumping and placing; Dimensional lumber supply; and Paving subcontractors.

Please contact either of the following names to get you name on the bidders list:

Shannon Cozino: shannon.cozino@barnard-inc.com (site office)

Brittany McNamee: brittany.mcnamee@barnard-inc.com (HQ office)

AI could help the construction industry work faster

Continued from page 1

Chin's group uses this information to create predictive algorithms designed to manage construction risks. It built its worker-safety predictor by taking more than 700,000 images from 360 projects over the past 10 years, uploading them to a cloud-based platform developed by the startup Smartvid.io, and running an image recognition algorithm to identify whether workers were wearing hard hats, gloves, and safety vests and goggles. The team then plugged the tagged photo information, along with weather and other project-related data, into a second machine-learning model. The group is now deciding whether to tweak the algorithm to detect ladders and scaffolding, which could cause falls, and dangerous clutter at a job site.

Writing its own algorithms should also help Suffolk integrate new types of data into its forecasts.

The company frequently experiments with emerging technology and is currently testing wearable gadgets that can be programmed to recognize hazardous zones in a job site and record whether workers are present there, according to chief innovation officer Chris Mayer.

Chin estimates that these new digital tools could help Suffolk increase productivity by 14 to 20 percent in a few years. A 2017 McKinsey report says construction firms could boost productivity by as much as 50 percent through real-time analysis of data. "The industry desperately needs this type of capability," says Benham of JBKnowledge. "It can help people make better decisions and shave weeks to months off their project schedules."

SOURCE: www.technologyreview.com