UCT The Underground Utilities Event
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Excavator Alert System for Avoiding Utility Damage

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UTILALERT

Transforming Safe Pipeline Excavation Operations

HYDROMAX USA

Advanced Water, Wastewater and Gas Data Collection

WHAT IS UTILALERT?

Transforming Safe Pipeline Excavation Operations

- ✓ Discern digging activity from other activities through on-board multi-axis inertial measurement units
- ✓ Capture the GPS location of the excavator in real-time
- ✓ Compare the location to utility boundaries using GIS databases
- ✓ Using GTI/OTD capabilities developed with California Energy Comm. & 26 gas utilities

WHAT IS UTILALERT?

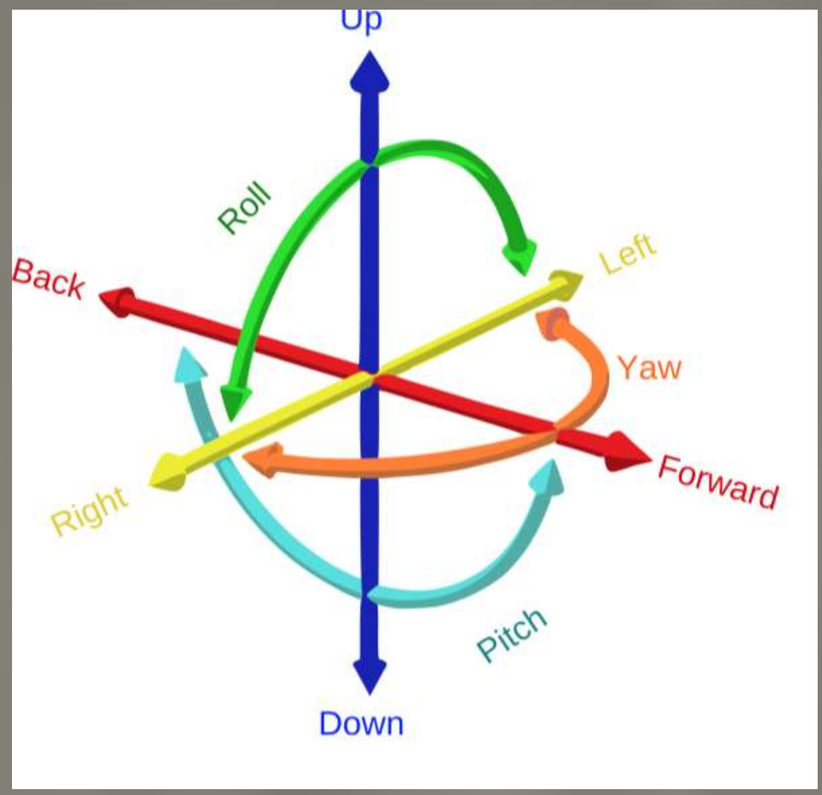
Transforming Safe Pipeline Excavation Operations

- ✓ Alert the excavator operator and management when digging in an area that does not have a valid dig ticket or in proximity to a high consequence utility (requires local 811 center and utility participation)
- ✓ Transmit the information through the cellular network to a dashboard and stores it in a database
- ✓ Track last known position of excavator for more productive equipment management and theft recovery

DIGGING DEEPER

Alerts & Geo-Fencing

- ✓ **Key to damage prevention is UtilAlert's onboard multi-axis Inertial Measurement Unit (IMU) and patent-pending software that enables real-time alerts and geo-fencing. The operator is alerted from the on-board unit.**
- ✓ **Management alerts are flexible and customer defined through an online interface. Alert systems can be through email or text messaging as selected.**
- ✓ **Live cloud based maps are updated at 5 second intervals**



DIGGING DEEPER

Alerts & Digging Near Mapped Utility

- ✓ **The operator notification system includes a loud buzzer, flashing lights and a message screen.**
- ✓ **Includes notification via text or email to the contractor supervisors & safety manager**
- ✓ **Alert participating utility when digging actions are near high consequence utility assets**

DIGGING DEEPER

Alerts & Geo-Fencing

- ✓ **Equipment position is compared to utility asset location geofence boundary**
- ✓ **Equipment fleet map location can be zoomed to appropriate detail**
- ✓ **State of equipment can be determined from specific icon**
- ✓ **Equipment detail available by clicking icon**

DIGGING DEEPER

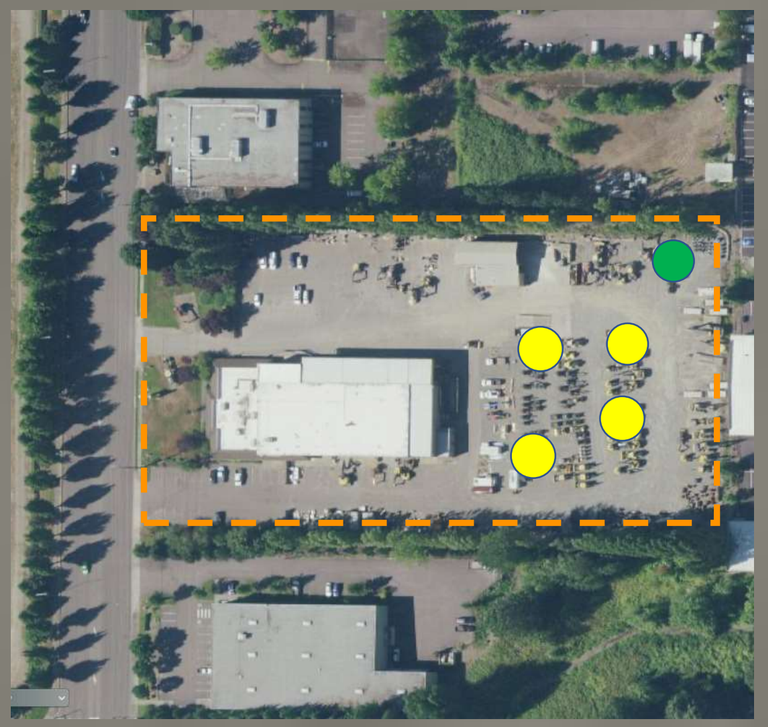
Fleet Location

- ✓ **The GPS tracking also provides real time access to last known position on mobile and desktop applications- improving fleet management and recovery of missing equipment.**
- ✓ **Status of equipment is shown**
- ✓ **Equipment detailed is attached to icon**

DIGGING DEEPER

Managing with Geo-Fencing

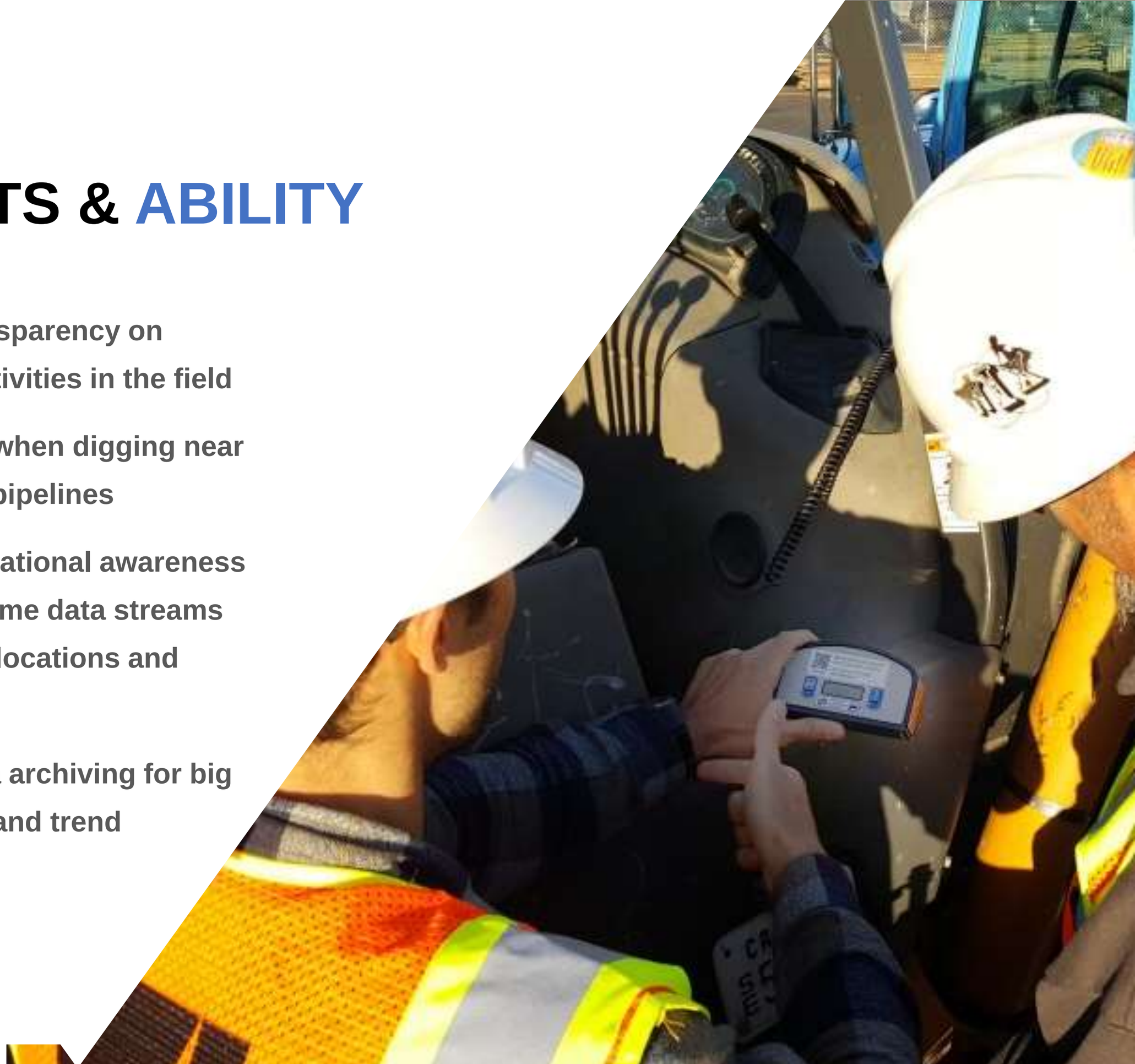
- ✓ **Fleet management is enhanced with live visualization at 5 second intervals**
- ✓ **When unit is shut off, last active position is shown**
- ✓ **User created custom geo-fencing can track time & alert managers when equipment leaves or enters bases or work sites**
- ✓ **Verify time logs**



BENEFITS & ABILITY

Key Benefits

- ✓ **Improved transparency on excavation activities in the field**
- ✓ **Reduced risk when digging near underground pipelines**
- ✓ **Enhanced situational awareness through real-time data streams of excavation locations and movements**
- ✓ **Historical data archiving for big data analysis and trend identification**



BENEFITS & ABILITY

Key Benefits

- ✓ **Potential insurance benefits from continual safe construction job site**
- ✓ **Tracks digging activities outside of authorized boundaries**
- ✓ **Improves fleet management capabilities overall**
- ✓ **Improves employee compliance with good safety practice with timely supervisor reinforcement**

BENEFITS & ABILITY

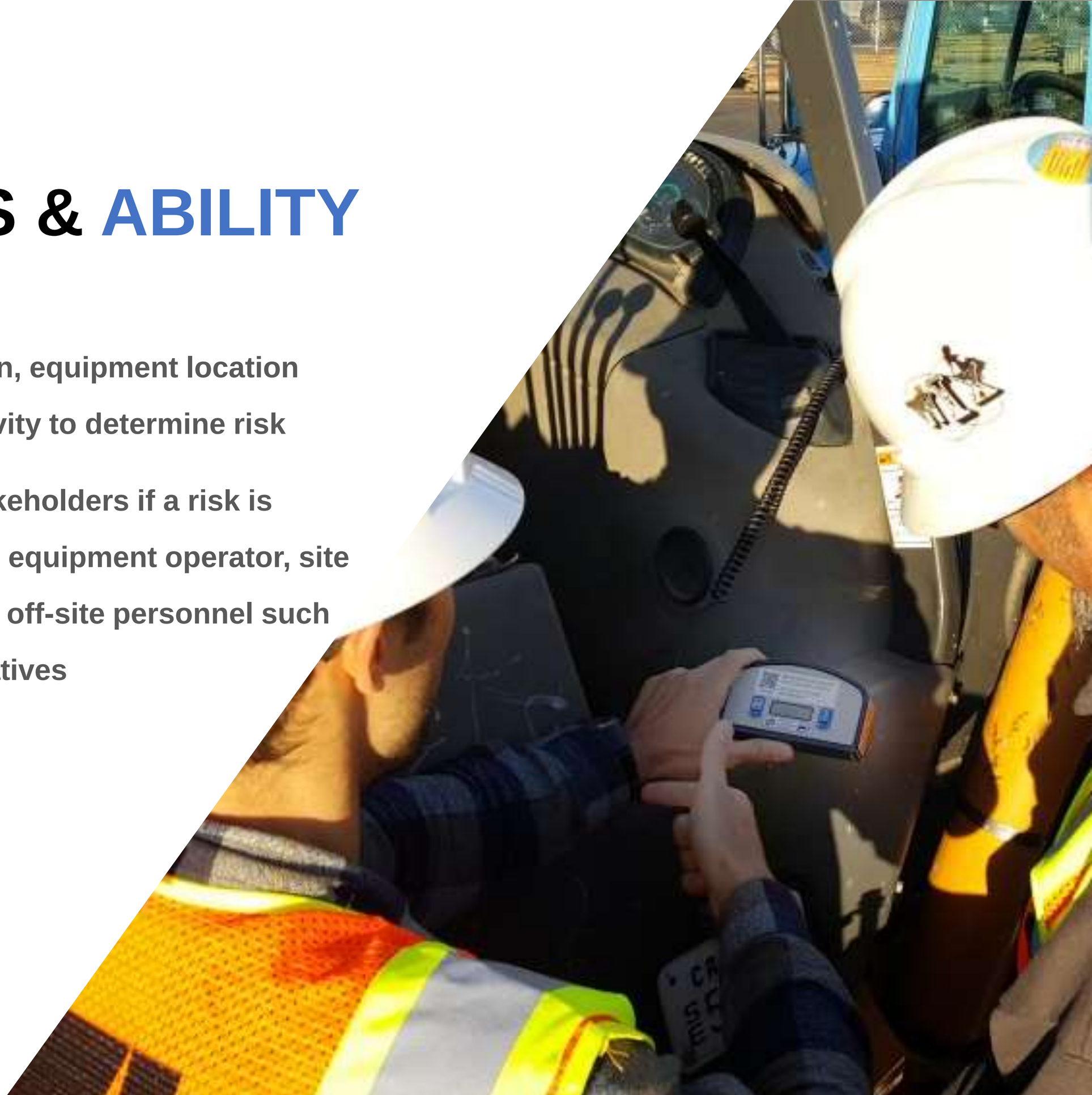
Rapid Data at Visibility - Mobile or Office

- ✓ **Communicate with the infrastructure locator database**
- ✓ **Locate the excavator and other equipment in motion in relation to underground infrastructure**
- ✓ **Determine the current equipment activity being performed**

BENEFITS & ABILITY

Ability

- ✓ **Analyze line location, equipment location and equipment activity to determine risk**
- ✓ **Effectively alert stakeholders if a risk is imminent, including equipment operator, site safety manager and off-site personnel such as utility representatives**



EASE OF USE & DURABILITY

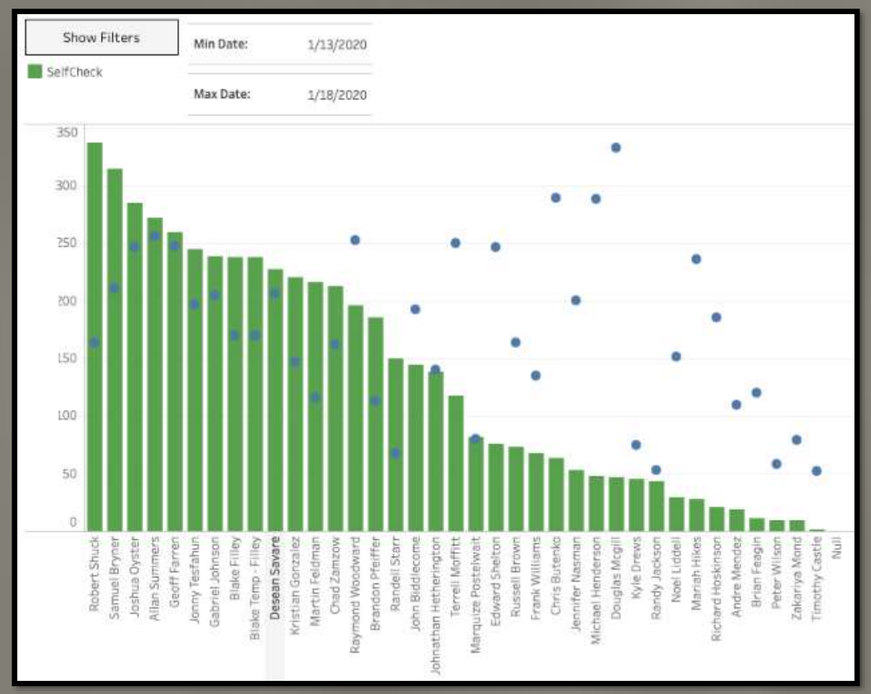
Digital vs. Cost & Environmental Impact of Printed Reports

- ✓ **“Feedback” Alert Mechanisms - Optimizing Situational Awareness and Operational Safety**
- ✓ **Auditory alerts- beeps loud enough to cut through ambient construction noise and ear protection**
- ✓ **Visual alerts - a series of bright LED lights in levels of urgency appropriate to the level of risk determined**

EASE OF USE & ACCESSIBILITY

Digital vs. Cost & Environmental Impact of Printing

- ✓ **Detailed operations desktop and mobile compatible dashboards are provided to supervisory personnel in the field, in remote offices and other environments.**
- ✓ **Dashboards include real-time and historical data for all pieces of equipment on a given site, and can be readily accessed by users.**



WHAT IS THE SYSTEM?

Alerts & Geo-Fencing

✓**Communications – cellular mobile phone modem and data plan - built in**

✓**GPS receiver – built in**

✓**IMU – built in, tuned to sense digging actions**

✓**GIS mapping comparison of location of unit - performed at the Cloud server**

✓**Alerts – customized by user**

✓**Alert Methods – text, email & mapping**

✓**Alert Devices – mobile and desktop**

✓**12 volt or 24 volt – excavator system connected**

✓**Fast Self Installation – no need to schedule, fit it in when convenient**

LIMITATIONS

Of UtilAlert, GPS and Utility Mapping

UtilAlert device is intended to augment practices for safe excavation and shall not be considered a single solution to damage prevention.

Boundaries of utilities and dig tickets have variability in accuracy and are intended to be set to provide greater tolerance to accommodate these inaccuracies and expected reach of excavators.

GPS signals can be inconsistent or deflected due to buildings and terrain which will affect the effectiveness and accuracy of the UtilAlert system.

Mobile cellular connections may be weak or interrupted which would prevent data transmission, analysis and alerts.

Inertial algorithms determined from field data from many types of excavators and transmission at each interval may not detect digging activity. With deference to higher levels of safety, it is normal to expect some false positives from the system (if determined as false, the audio alarm can be silenced).

UCT 25YEARS **The Underground Utilities Event**

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THANK**YOU!**

Any Questions?

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