Ten Examples of Connected Technologies

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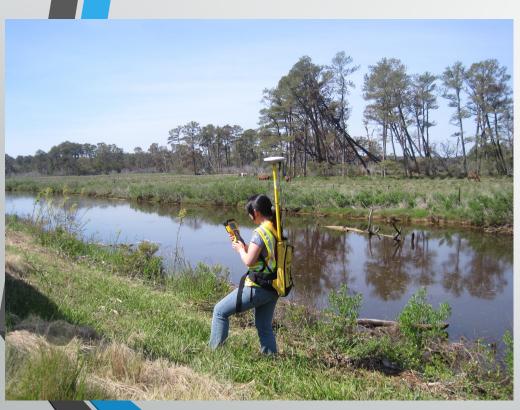
What are connected job sites?

- Construction sites and operations connected by the internet of things (IoT) to save agencies time and money, and improve safety.
- Connected job sites are delivered by connected technologies.

Examples of Connected Technology

The Hardware

Tools to Implement Connected Technology





- Tablets
- Smartphones
- Laptop
- Wearable technology
- Vehicles and equipment

The Software

3D Modeling | Building Information Modeling



Source: Federal Highway Administration, Office of Federal Lands Highway.

- 3D Modeling
 - the use of software to create a virtual three dimensional representation of the surface of an object.
- Building Information Modeling-
 - a process supported with tools and technology to generate functional operations and digital representations of physical facilities and infrastructure.

- Assists designers visualize spatial requirements.
- Improves the accuracy and efficiency of infrastructure design.

Virtual, Augmented and Mixed Reality

- Virtual- simulated experience using headsets or multi-projected environments to generate realistic images and sounds.
- Augmented- interactive experience of a real-world environment enhanced by computergenerated information.
- Mixed- merging of real and virtual worlds to produce new environments and visualizations, a hybrid of reality and virtual reality.

- Ability to experiment within an safe and artificial environment.
- Ability to bring products and concepts to life through visualization.

GPS Machine Control

- Machine control is used to accurately position machinery based on 3D design models and GPS systems
 - Begins with 3D Modeling as a base.

• Benefits:

- Allows an operator to become more efficient and productive.
- Increased safety by reducing the number of workers inspecting accuracy of machines.



Source: Federal Highway Administration, Office of Federal Lands Highway.

Automation of Equipment

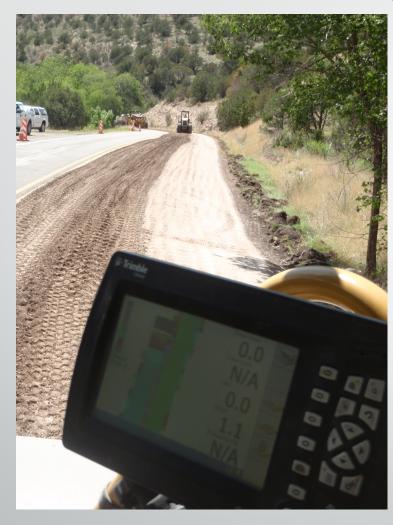


Source: Federal Highway Administration, Office of Federal Lands Highway.

- Systems that show the operator the design difference and systems that directly control the machine hydraulics to maintain a specific position.
- Examples include driverless equipment and robotic equipment.

- Reduction in the number of hours worked by workers and equipment.
- Increased safety by removing the workers from potential unsafe environments.

Intelligent Compaction



Source: Federal Highway Administration, Office of Federal Lands Highway.

 the compaction of road materials using vibratory rollers equipped with an integrated measurement system, an onboard computer reporting system, GPS based mapping, and feedback control.

- Improved densities during compaction.
- Real time feedback of material stiffness values.
- Saves money by making the process more efficient and effective.

Unmanned Aerial Vehicle UAV



Source: Federal Highway Administration, Office of Federal Lands Highway.

 an aircraft without a human pilot on board. UAVs are a component of an unmanned aircraft system (UAS); which include a UAV, a ground-based controller, and a system of communications between the two.

• Examples of Use:

 Crop surveys, aerial photography, search and rescue, inspection of infrastructure, delivery services, land surveying, construction industry, surveillance, security, military operations, etc.

- Ability to provide visual information at lower costs than traditional methods.
- Provides a safer working environment by using UAV's for hazardous work.

Geofence

- a virtual perimeter dynamically generated for a real-world geographic area around a point location, or a predefined set of boundaries.
- The use of a geo-fence is called geo-fencing

- Allows enhanced security equipment.
- Allows better tracking of people and equipment.

Electronic ticketing

- A digital ticket equivalent of a paper ticket. An electronic means of producing individual scale tickets and providing material haul summaries.
- Involves the creation, review, approval, distribution and storage of paperless construction documents.
- Benefits:
 - Allows the process to become more efficient by going "paperless"
 - Allows an inspector to monitor inventory delivery on site or remotely.

Radio Frequency Identification (RFID)

- Use of electromagnetic fields to identify and track tags attached to objects. The tags can be embedded within a material and can contain electronically stored information.
- RFID can be used to track:
 - Equipment and tool management
 - Inventory management
 - Workforce management
- Benefits:
 - Increased asset tracking and monitoring.
 - Increased productivity of employees responsible for management of assets
 - Decreased incidents of theft and loss.

Contact Information

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