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IGU

Reducing Excavation Damage in the Natural Gas Industry Using Real-Time GIS and Sensors

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How can excavation damage be reduced?

- What is excavation damage?
- Can technology help reduce excavation damage?
- Excavation Encroachment Notification Technology
- Pilot Project & Field Testing
- Results
- Next Steps

What is excavation damage?

- Damage occurring when an excavator **strikes** an underground utility
- Potentially resulting in **fatalities**, serious injury, property damage

- According to the Common Ground Alliance – the leading causes of excavation damage are excavators that don't utilize the one-call center and excavators that dig carelessly near underground pipes

What is excavation damage?

- Over **91,000** damages occurred in 2016
  (Common Ground Alliance - http://commongroundalliance.com/dirt-2016-interactive-report)
- Every **9** minutes an underground utility is damaged because someone didn't call 811
- Excavation damage is estimated to have risen **20%** over the prior year
- Conservatively cost stakeholders **$1.5 billion**

Can technology help reduce excavation damage?

Data Collection

- Dedicated Device
- GPS/GNSS
- Motion Sensors
- Cellular

Analysis

- Data Management
- GIS Processing
- Activity Analysis
- Threat Analysis

Awareness

- Utility Dashboard
- Operator Alerts
- Cell Phone Alerts

GTI's Excavation Encroachment Notification Technology

- Black Box Device
- Esri ArcGIS Server & GeoEvent Server
- Apache Kafka & Apache Spark
  - Machine Learning
  - Characterization Algorithms
- GeoFence Boundaries define areas to trigger alerts

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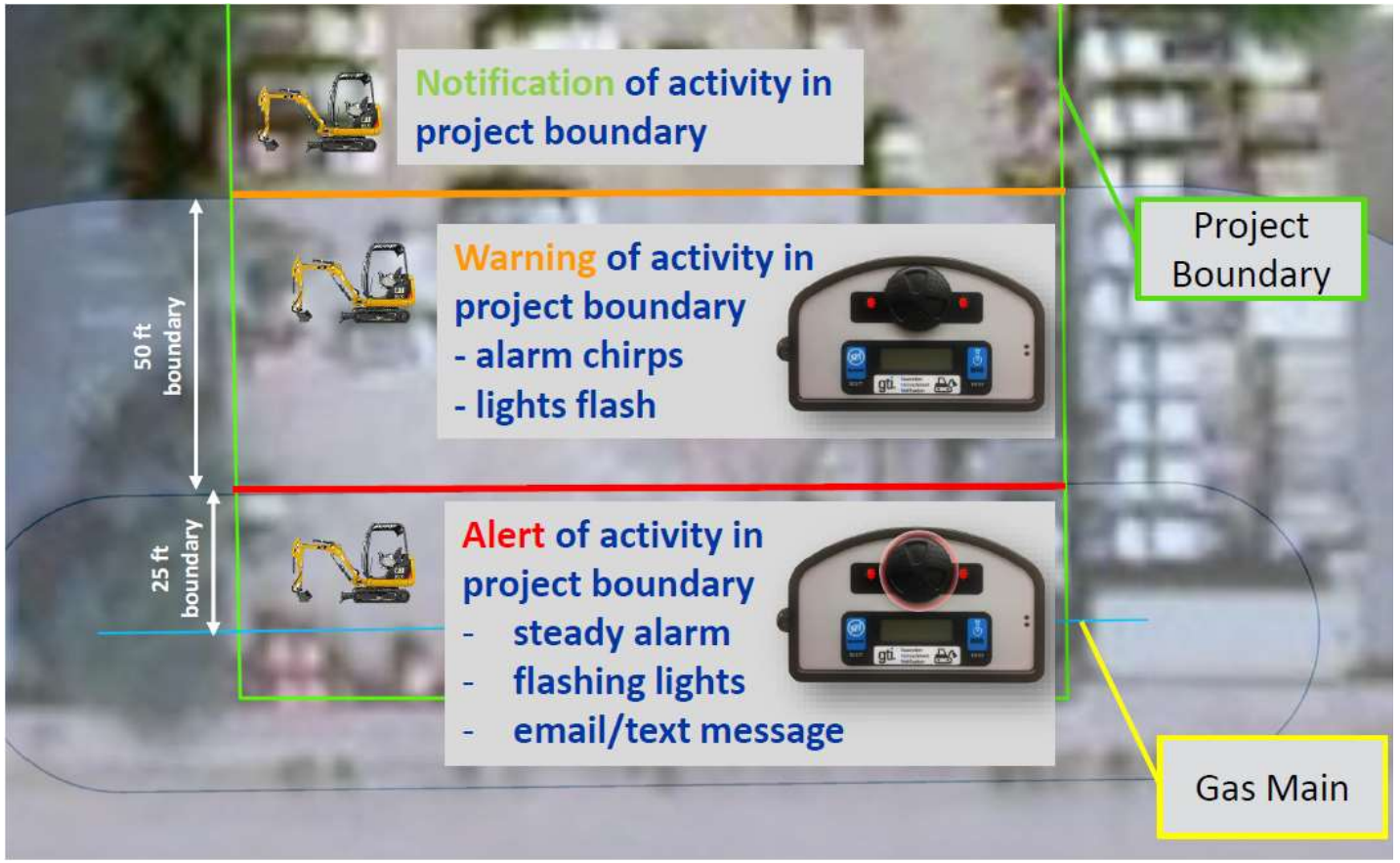
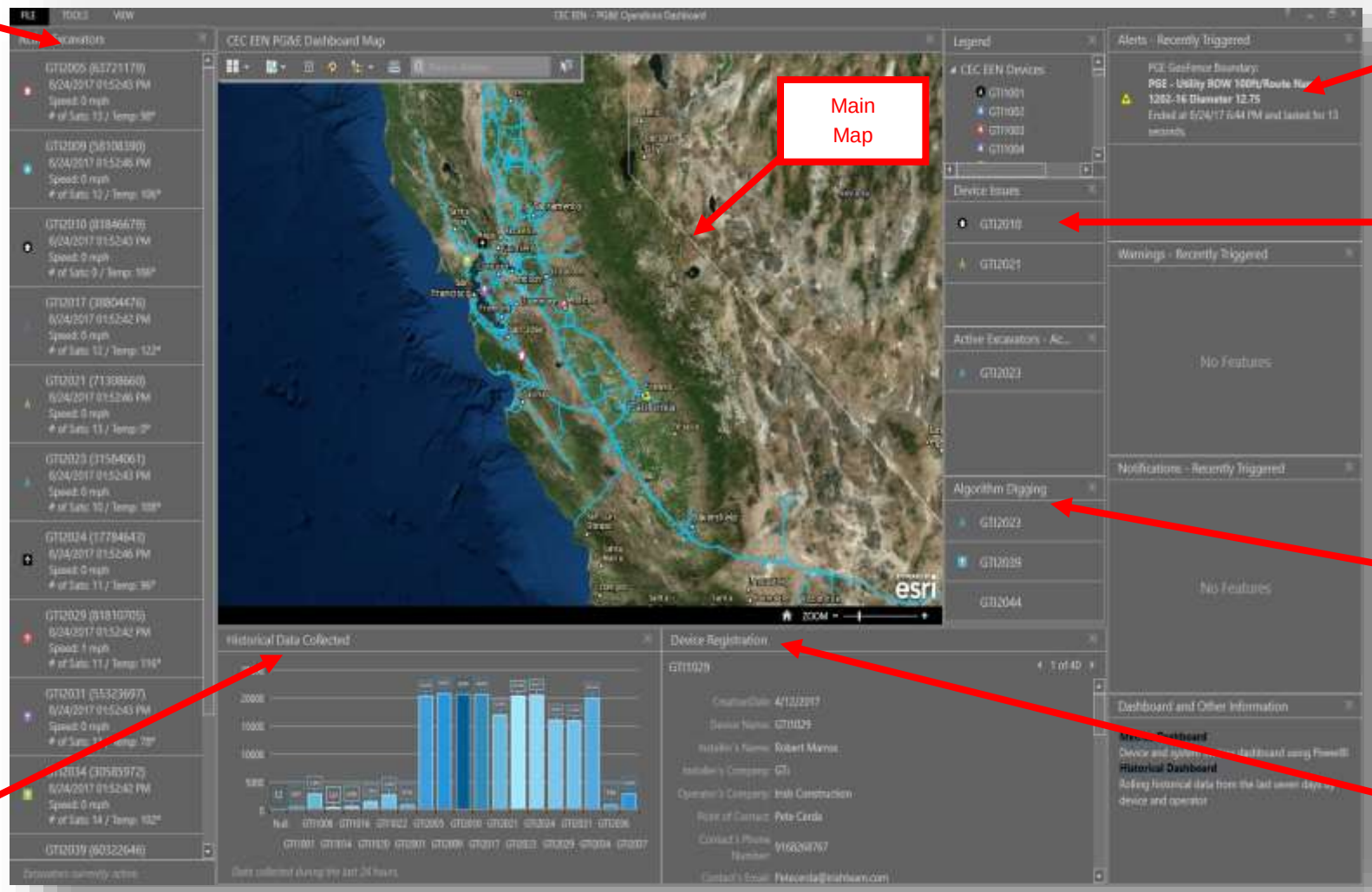
Pilot Projects & Field Testing

- Initial Technology Development
  - Android phones and app
  - Proved concept of streaming data into GIS
- Pacific Gas & Electric/California Energy Commission Grant
  - 150 Dig-In Devices Deployed to Date
  - 13 Total Participants:
    - Five PGE Subcontractors, all Gold Shovel Standard Certified
    - Seven Third party participants (Agriculture, Municipality)
  - 12+ Months of Field Experience
  - 40+ million data points collected (April 2018)

Pilot Projects & Field Testing

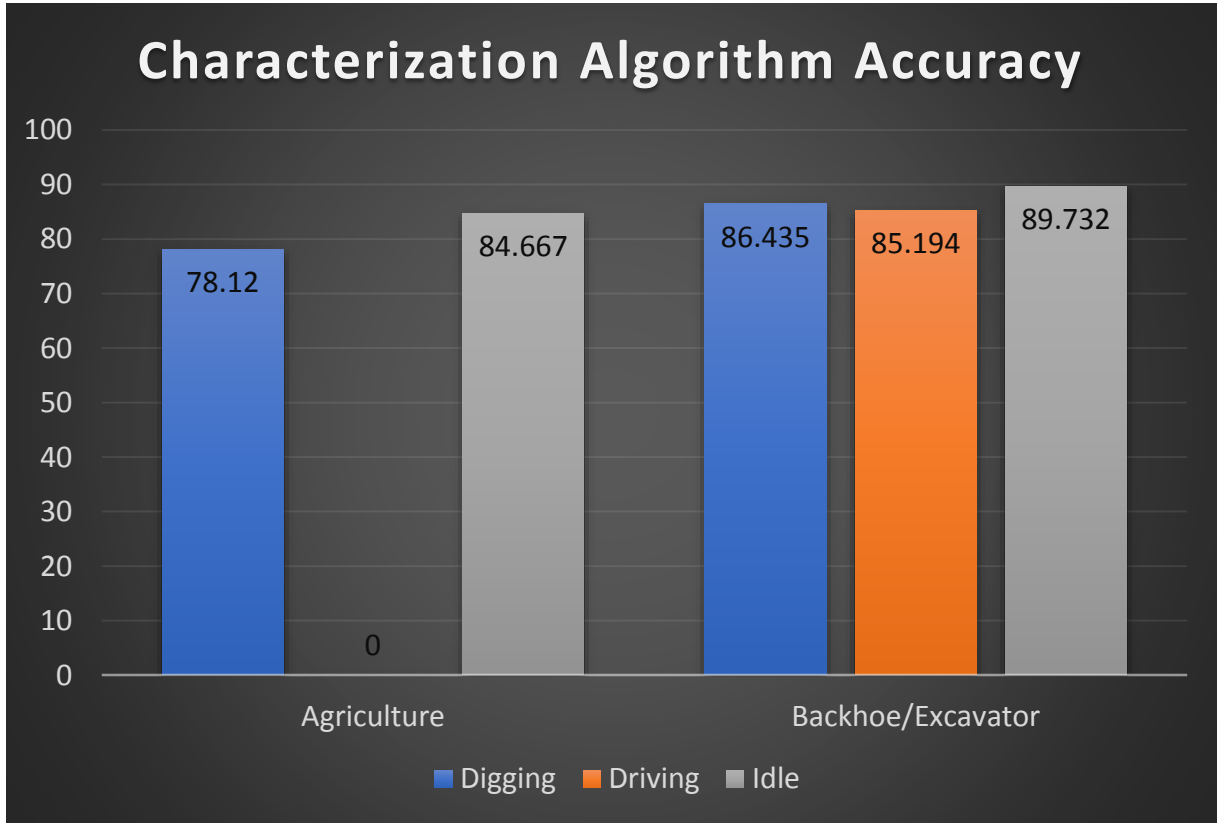


Pilot Projects & Field Testing



Results

- Characterization Accuracy
  - Backhoe/Excavator – 86%
  - Agriculture – 78%
- No known dig-ins while devices utilized
- 40+ Million data points



Next Steps

- Pursue additional pilot project opportunities
- Discuss commercialization with potential partners
- Thank You!

For more information, contact:

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