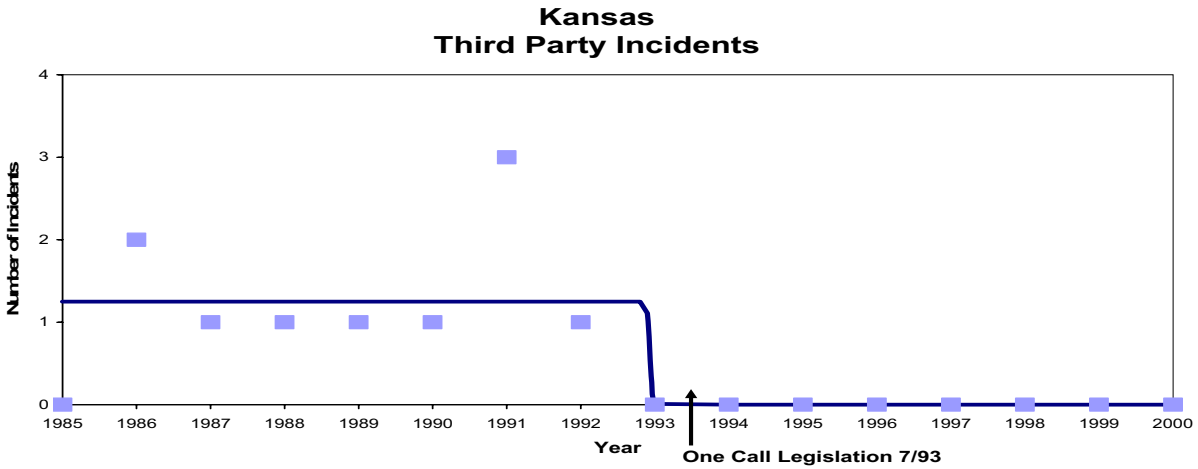
Prevention Panel

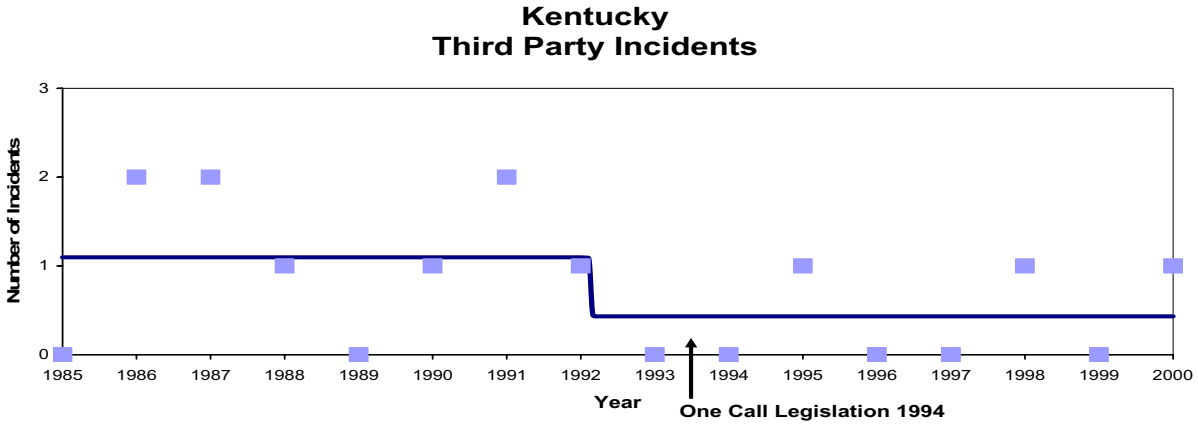
Technology Research

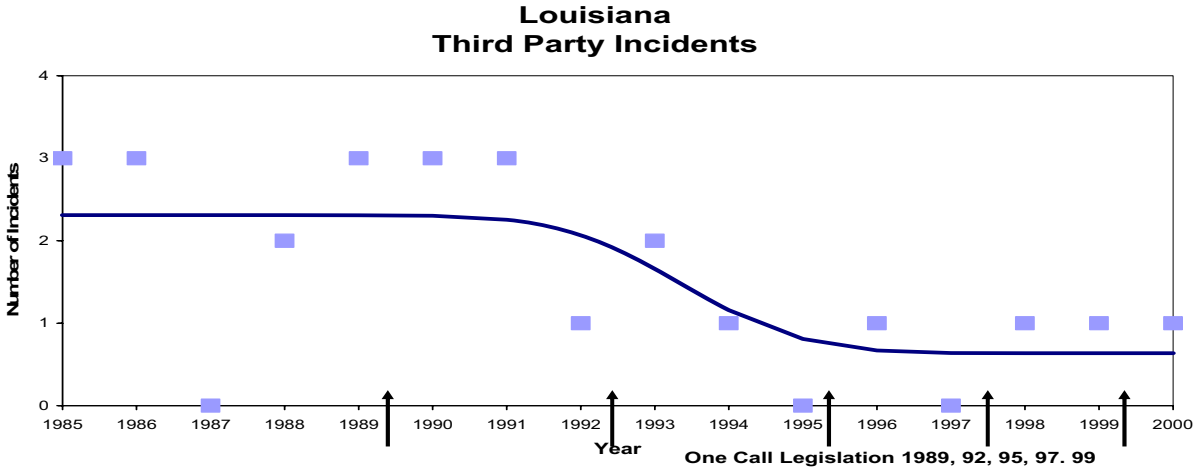
Harvey Haines
PRCI

PRCI Mechanical Damage Research

- **Damage Prevention**
  - One Call
  - Encroachment Monitoring
  - Contact Monitoring
- **Damage Detection**
  - Detection
  - Characterization
  - Remediation







States Where One-Call was Implemented Between 1985 & 2000

One call has lowered Third party damage incidents. What can be done to keep incidents low or lower them more?

From PRCI Analysis of DOT Gas Incidents 1985-2000 by Kiefner & Assoc.

Damage Prevention – R&D Categories

- Technologies
- Practices
- Human Factors

PRCI Past & Present Research

- **2006 Program**
  - DP-1-1 — Operator Practices for Damage Prevention
  - DP-1-4 — Incorporation GPS Device into One-Call
  - ROW-1 — Technologies for RoW Monitoring

- **Previous PRCI/GRI Research**
  - Satellite/Airborne monitoring
  - Real Time Acoustic monitoring

DP-1-1

- **Survey & Interpret Current Good Operator Practice for Damage Prevention**
  - Survey PRCI members on good practices and proceedures
  - Define and clarify deployment of practices
    - **Markers, surveys, one call**
    - **Encouragement/enforcement of one-call procedures**
  - Review of other descriptive practices that benefit prevention
  - Interpretation of practices that work well

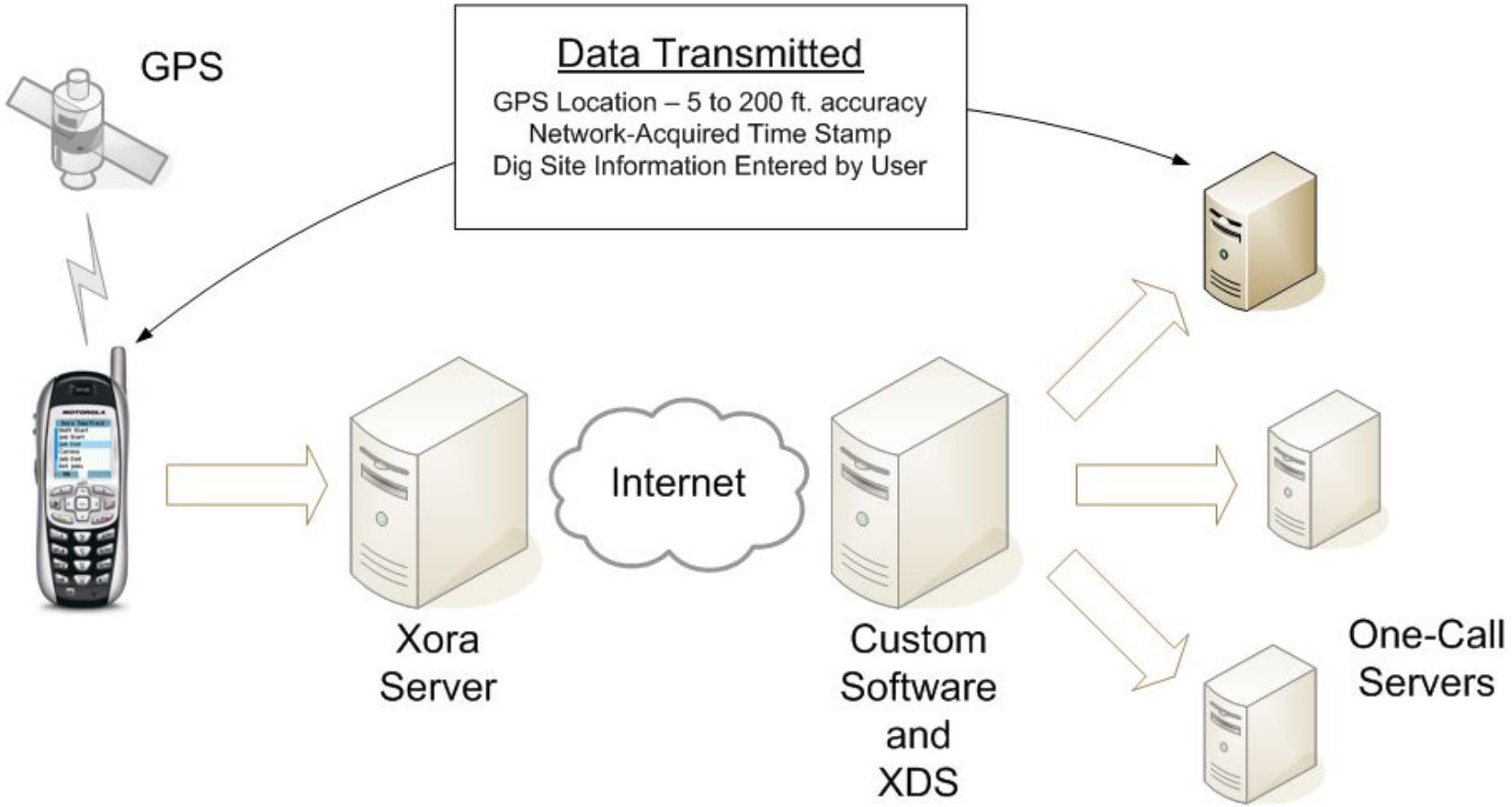
DP-1-4

- **Utilization of Ground Positioning Satellite Device in Conjunction with One Call Systems**
  - A step for One-Call in the shift from addresses locations to GPS coordinates
  - Greater accuracy of location
  - Reduced number of unnecessary locates
  - Allows utilities to focus more of their time on prevention where actual digs take place
  - Next Step - Coordination with One-Call database owners to receive and process data

User Interface

- **User enters information pertinent to site:**
  - Job #
  - Comments
  - Landmark
  - Dig Depth
  - Etc.

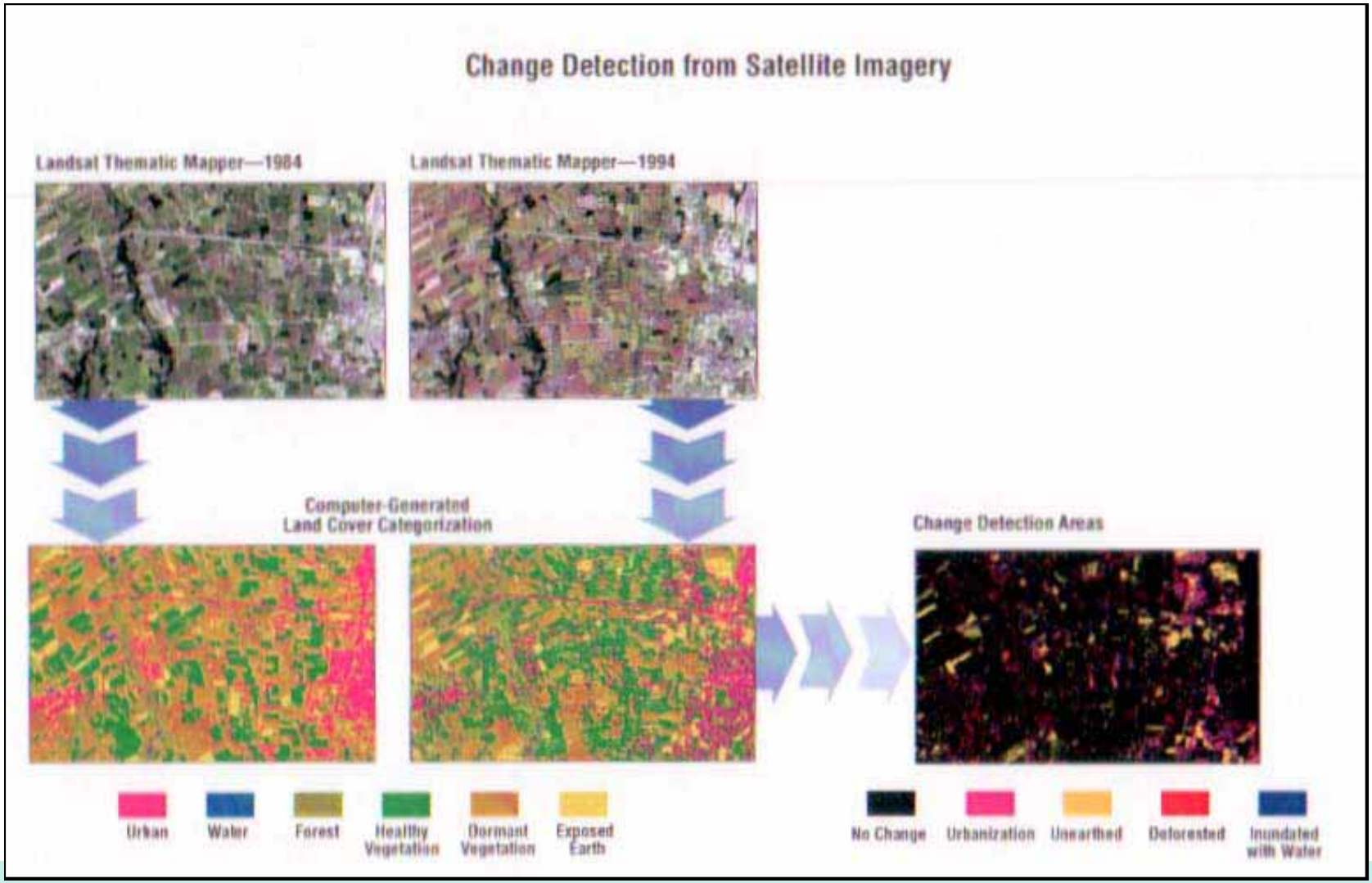
Network Diagram

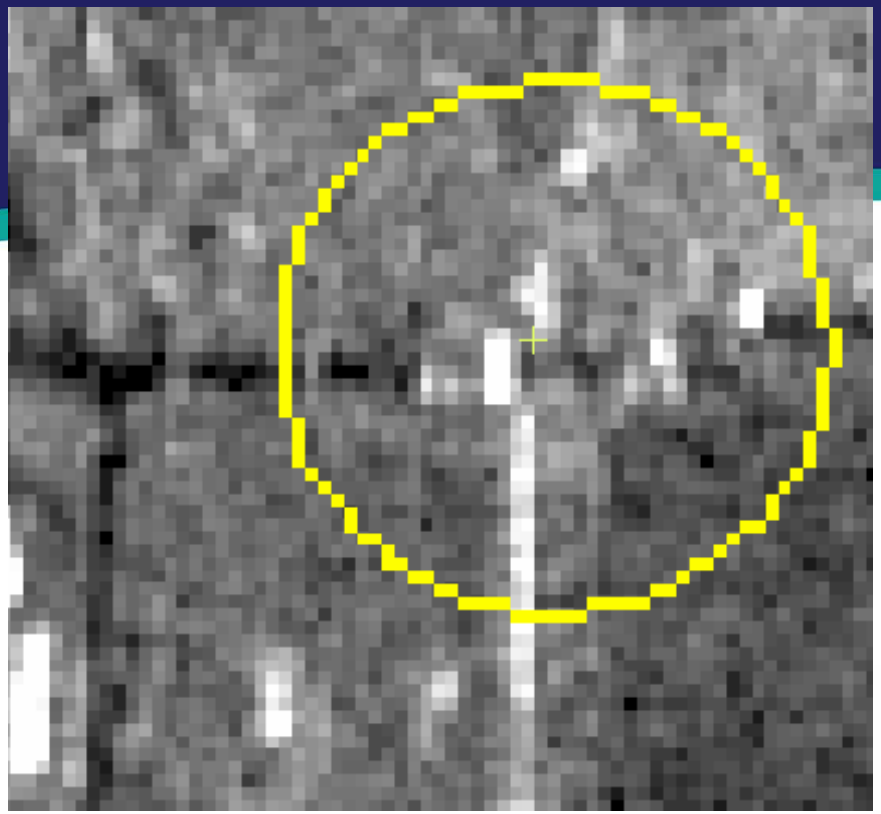


ROW-1

- **Technologies to Accurately & Cost-Effectively Detect Unauthorized Activity Near Pipelines**
  - Review of emerging technologies for monitoring RoW activities, (extending the information obtained from GRI 8747)
  - Identification of technologies in other industrial sectors
  - Definition of cost & performance targets for a cost-effective RoW monitoring system.
  - Identification of new front-running technologies warranting financial support
  - Proof-of-concept trials for promising technologies

Multi-Spectral Satellite



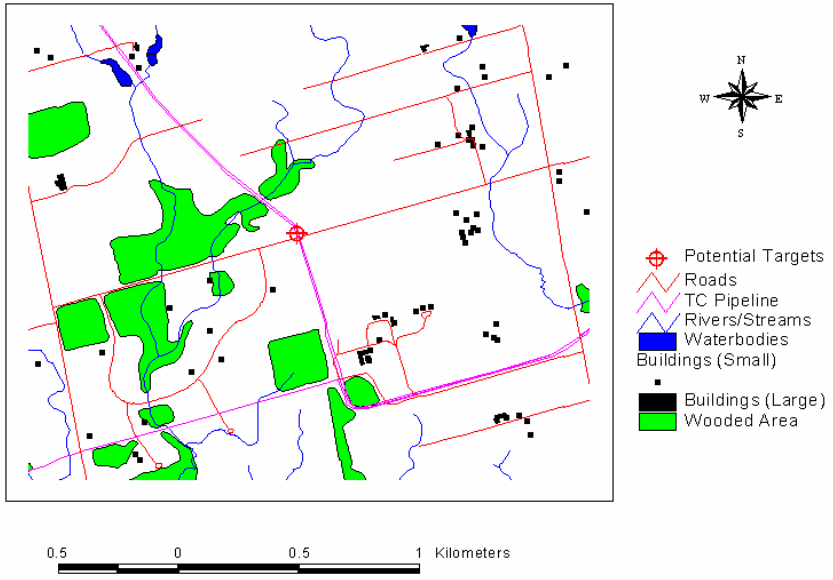


Company A

Encroachment Monitoring Service

Alarm Five Vehicles in RoW

GPS: 613914 m.E. 4859428 m.N.



Real Time Monitoring Project History

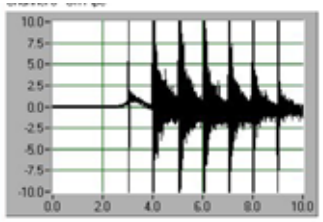
- **Real-Time Contact Monitoring Project**

  Phase I 95/96 — Evaluation of Japanese technology

  Phase II 97 — Examined signal to noise ratio – such as flow noise & partially closed valves

  Phase III 98 — Realistic contact signals from actual backhoe scrapes and hits

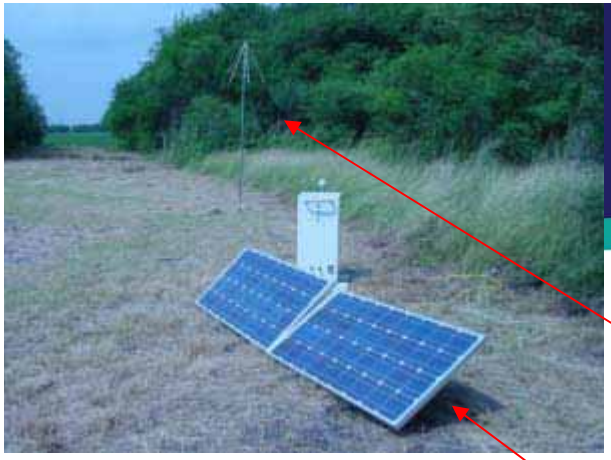
  Phase IV 99 — Short-term field demo on operating pipeline

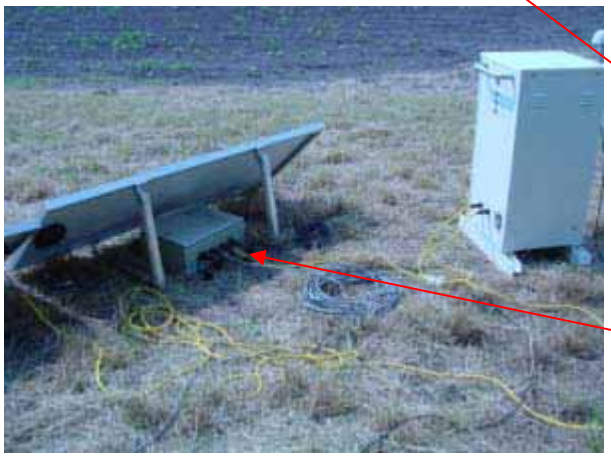


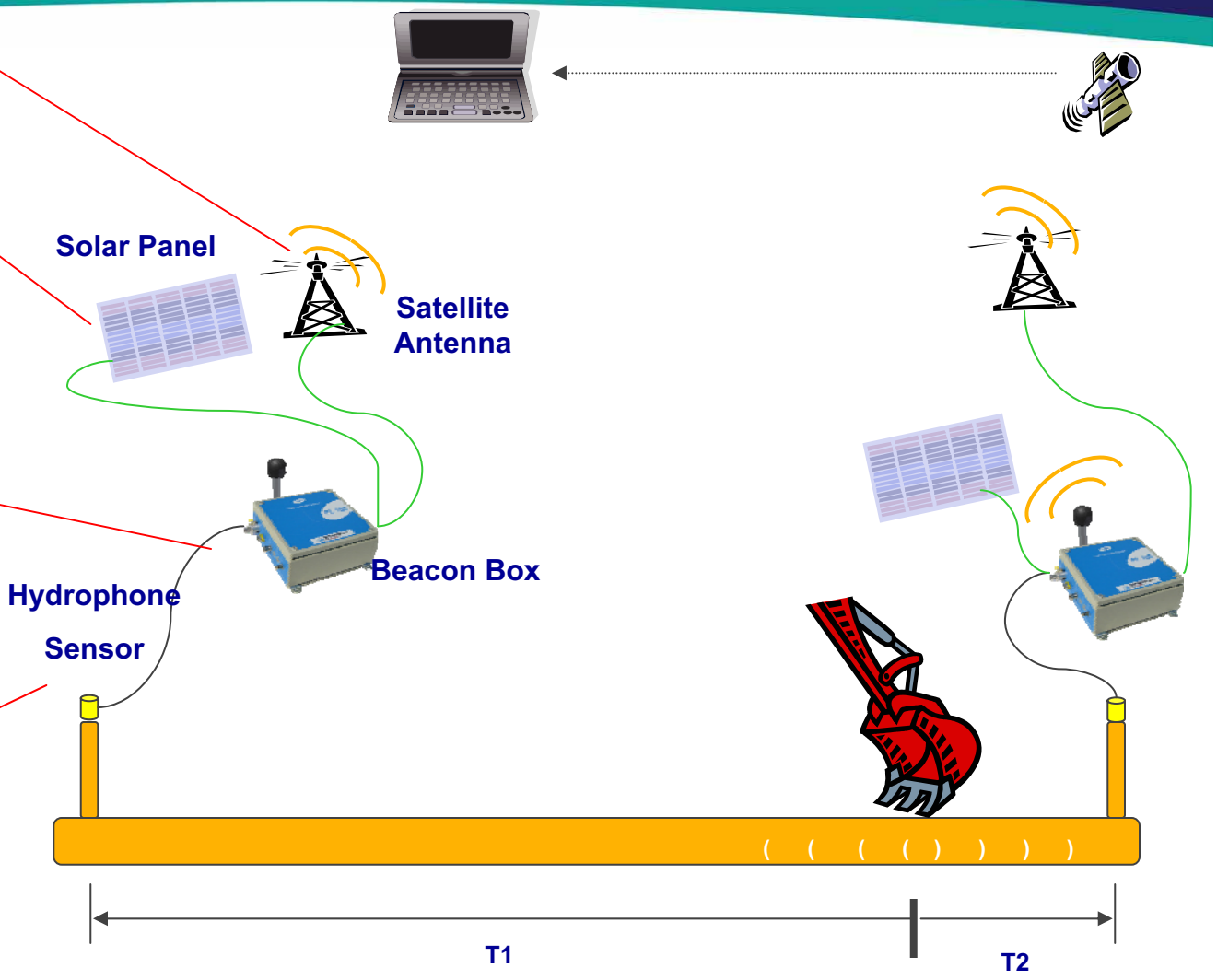
  Phase V 99/00 — Initiate 2 year field evaluation at two sites

  Phase VI 02/05 — Initiated pre-commercialization development with GTI/Battelle & 5 partners.

GE Acoustic Real Time Monitoring Demonstration







Summary of PRCI 2006 Projects

- **ROW-1**
  Identify Technologies for Monitoring the RoW
- **DP-1-1**
  Identify Good Operator Practices for Damage Prevention
- **DP-1-4**
  Develop a GPS Device for Incorporation into One-Call

Next Generation Capabilities

- **Data Capture**
  - Defense & Aerospace Industries
  - GPS
  - Tracking systems
- **Data Interpretation & Visualization**
  - Medical Imaging
  - Gaming Industries
- **Response**
  - Threat Assessment & Reaction
  - Battlefield Logistics
- **Communications**
  - Cell phones
  - Satellites