



U.S. Department of Transportation  
Pipeline and Hazardous Materials  
Safety Administration



# PHMSA Pipeline Safety Research



**Track Session on Threat Prevention  
June 24-25, 2009**



# Threat Prevention Strategy

To develop technology, standards or best practice type solutions for reducing the number of incidents and accidents resulting from excavation damage.



# Project Types Underway

- PHMSA's R&D program has sought Damage Prevention topics in nearly all general research solicitations since 2002
- However, only 9 directly relevant projects have been awarded to date with some projects relevant to multiple objectives

	#	DOT	Industry	Total
<b>Strengthening Standards</b>	1	\$0.07M	\$0.08M	\$0.15M
<b>Technology Development</b>	6	\$1.9M	\$2M	\$3.9M
<b>Knowledge Documents</b>	3	\$0.22M	\$0.51M	\$0.73M
<b>Relevance Totals:</b>		<b>\$2.19M</b>	<b>\$2.59M</b>	<b>\$4.78M</b>

- PHMSA has projects more relevant to leak detection that also address prevention. Those are being presented in Track 2.



# Project Types Underway

- **Technology development continues:**
  - On a sensor system that is buried on the right-of-way and capable of detecting equipment encroachment.
  - On look-ahead drill bit sensors that will avoid striking all pipeline types.
  - Adding encroachment detection to airborne systems currently addressing leak detection.



# Project Impacts To Date

- **Technology Impacts:**

- "Digital Mapping of Buried Pipelines with a Dual Array System"
- Commercialized with Witten Technologies, Inc.
- Was the first commercial system capable of producing highly accurate, three-dimensional maps and images of underground utilities efficiently and noninvasively (without digging) as much as ten feet underground. The system uses both ground penetrating radar and induction transmitters and receivers.



# Project Impacts To Date

- **Consensus Standard Impacts:**
  - “Effectiveness of Prevention Methods for Excavation Damage”
  - Relevant to:
    - API RP 1166, "Excavation Monitoring and Observation"
    - ASME B31.8S, "Managing System Integrity of Gas Pipelines"
  - Both API & ASME have forwarded project results to committee officers for use in revising standard.
  - Impact will be registered during the next round of measurement with PHMSA.

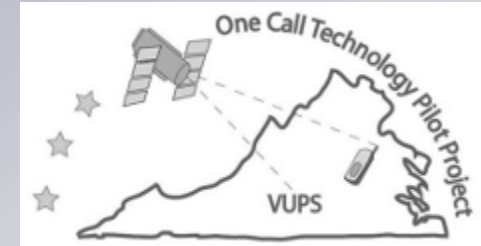


# Remaining Challenges

- Effective damage prevention requires solutions that comprehensively include people, processes, and technology.
- Affordable/reliable technology remains challenging to bring to the market
  - In the ground
  - On the right-of-way
  - In the air
  - From orbit/space
- More best practices are needed that synergize technology and people to prevent/minimize damage.



## Other Issues



- **Virginia Pilot**

- Ideas for project were conceived at a previous R&D Forum
- Three-Phase project to use GPS to enhance communications in the one-call and excavation processes
  - Phase I: GPS & whitelining & locate ticket generation
  - Phase II: GPS & creating electronic locate manifests
  - Phase III: GPS & excavation (GTI)
- Status: Phase I complete (and expanding); Phase II underway with significant progress and success; Phase III is another topic on today's agenda.





## Other Issues

- **PHMSA Damage Prevention Grants**
  - State Damage Prevention (SDP) Grants
    - Grants to states for implementing the nine elements
  - Technical Assistance Grants (TAGs)
    - Grants to communities or non-profits for examining technical pipeline safety issues
  - Technology Development Grants (TDGs)
    - Grants to non-profits (and others) for developing technologies for preventing damage while excavating



## Other Issues

- **Facilitating CGA's Utopiaville**
  - PHMSA partnering with CGA to create a Damage Prevention Technology Matrix
    - Identifying commercial technology
    - Tracking technology research
    - Available to public so awareness of tools is more wide spread to all involved in the shared underground
    - Work begins this summer



## For More Information...

- On the projects addressing threat prevention, please visit: <http://primis.phmsa.dot.gov/rd/splan.htm>
- On the impacts measured on projects addressing threat prevention visit:  
<http://primis.phmsa.dot.gov/rd/performance.htm>
- Or contact:

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