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# Pressure Pipe Inspections: Planning and Techniques

*Presented by:*

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**CPM Pipelines**

**UNDERGROUND CONSTRUCTION TECHNOLOGY**

THE UNDERGROUND UTILITIES EVENT | February 7-9, 2023 | Orlando, FL



# Agenda

- Presentation origins
- Where do we start?
- Why do we inspect?
- Inspection planning
- Approaches: Reactive to Predictive
- Inspection technologies



# Presentation Origins

- California solicitation
- Extensive yet elusive RFP package
- RFP response off target - what was the target?
- Zero results / project never awarded

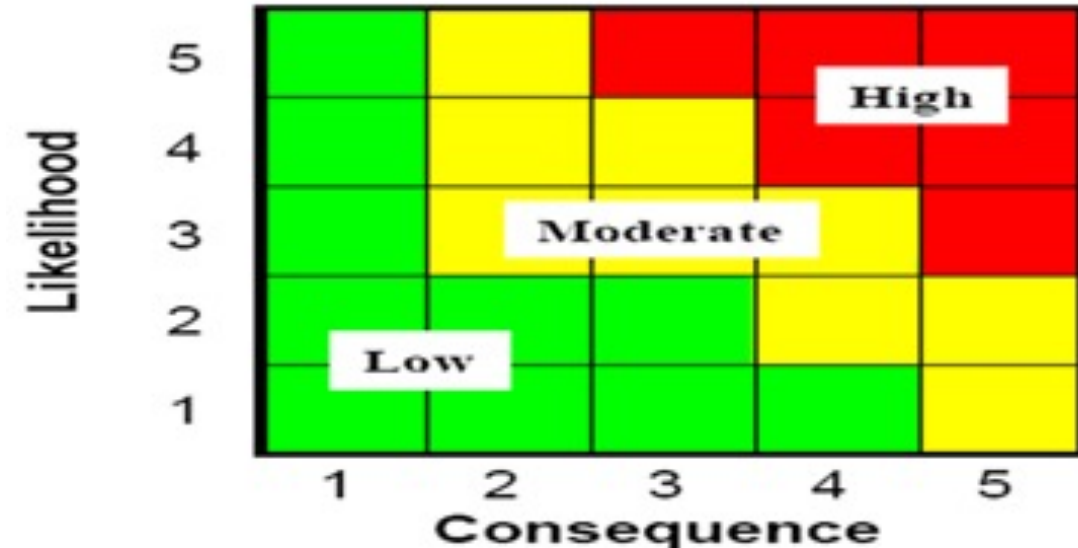
**Information Overload vs. the Right Information**  
(based on goals and objectives)





# Where do we Start?

- Asset Management
  - Organizing information
- Risk Analysis
  - Likelihood of Failure
  - Consequence of Failure
- Prioritization (specialized companies and software)





# Why do we inspect?

- System sustainability
- System reliability
- Financial impacts



**If you can't see the problem, you can't fix the problem.**



# Why do we inspect?

- Public health
- Public safety
- Environmental impacts



# Planning for Inspections: Preliminary

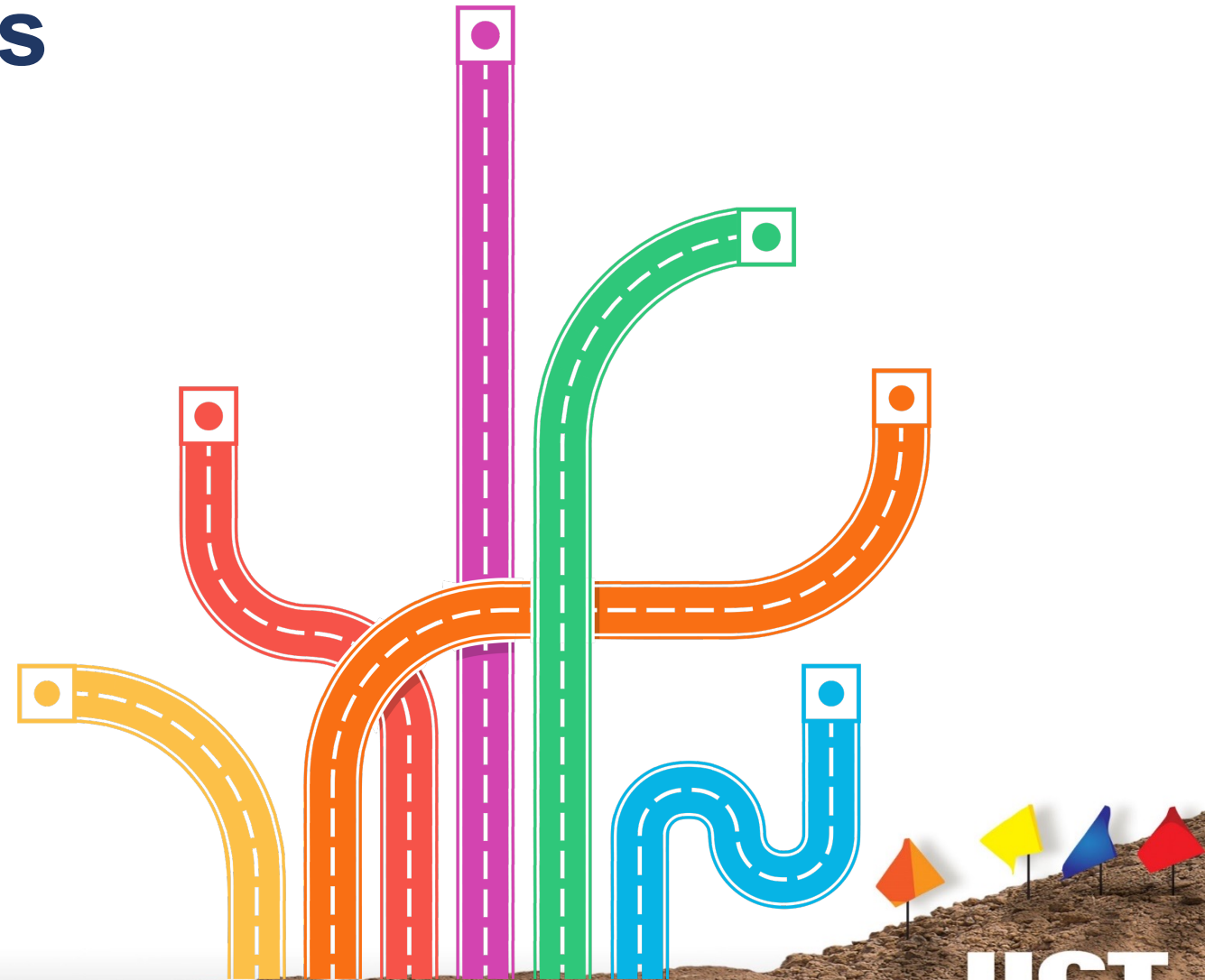
- Client goals
- Available information
- Missing information
- Relevant stakeholders





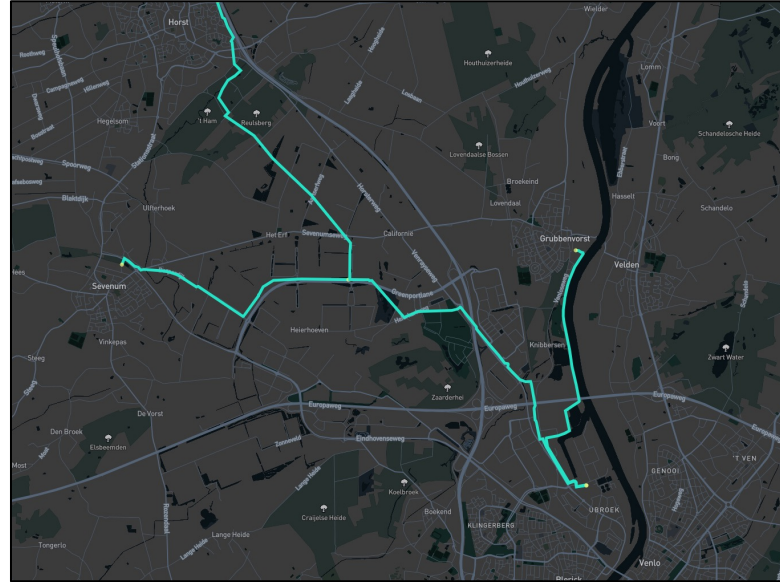
# Planning for Inspections: Multiple Components

- Owner
- Consultant
- Contractor
- Technology provider



# Various Approaches

- Reactive
- Proactive / Preventative
- Predictive





# Reactive Approach



- Identify symptom (leaks and failures)
- Repetitive emergency spot repairs
- Solicit based on symptoms (locate leaks or existing failures)
- Receive proposals that are reactionary and prevent successful, cost effective, asset management plan





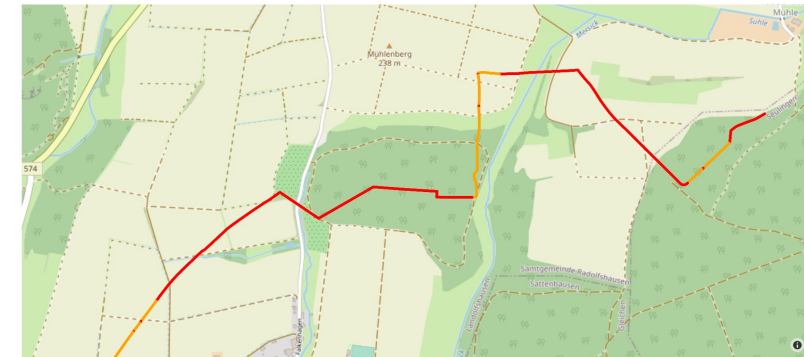
# Proactive Approach

- Determine and create a budget vs repetitive costly emergency repairs (lost revenue, property, pipeline and service interruptions, contamination and clean up, etc)
- Utilize prioritization schedule
- Identify cohorts to inspect annually
- Annual inspection optimization



# Predictive Approach

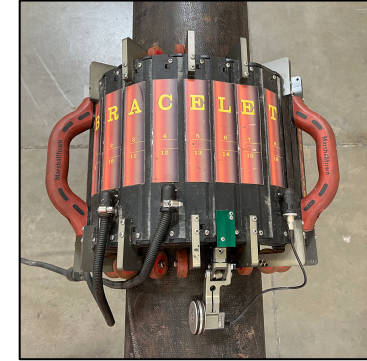
- Perform initial inspections utilizing high resolution tools
- Analysis of the initial inspection data
- Perform periodic follow up inspections
- Utilize data to develop predictive analysis for management of future budgets (CIP)





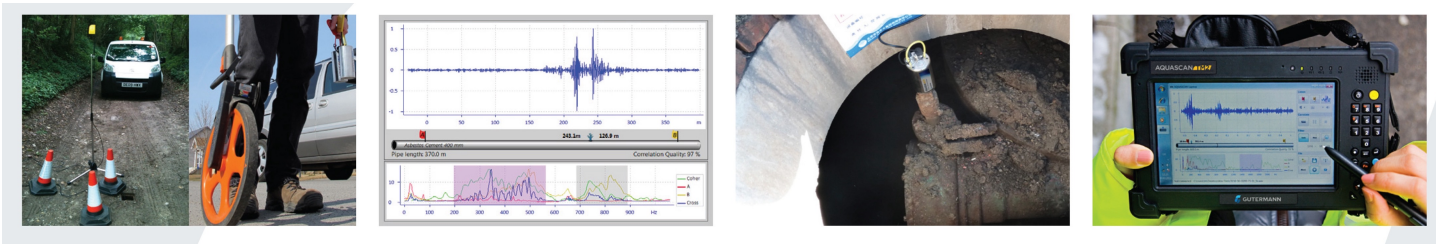
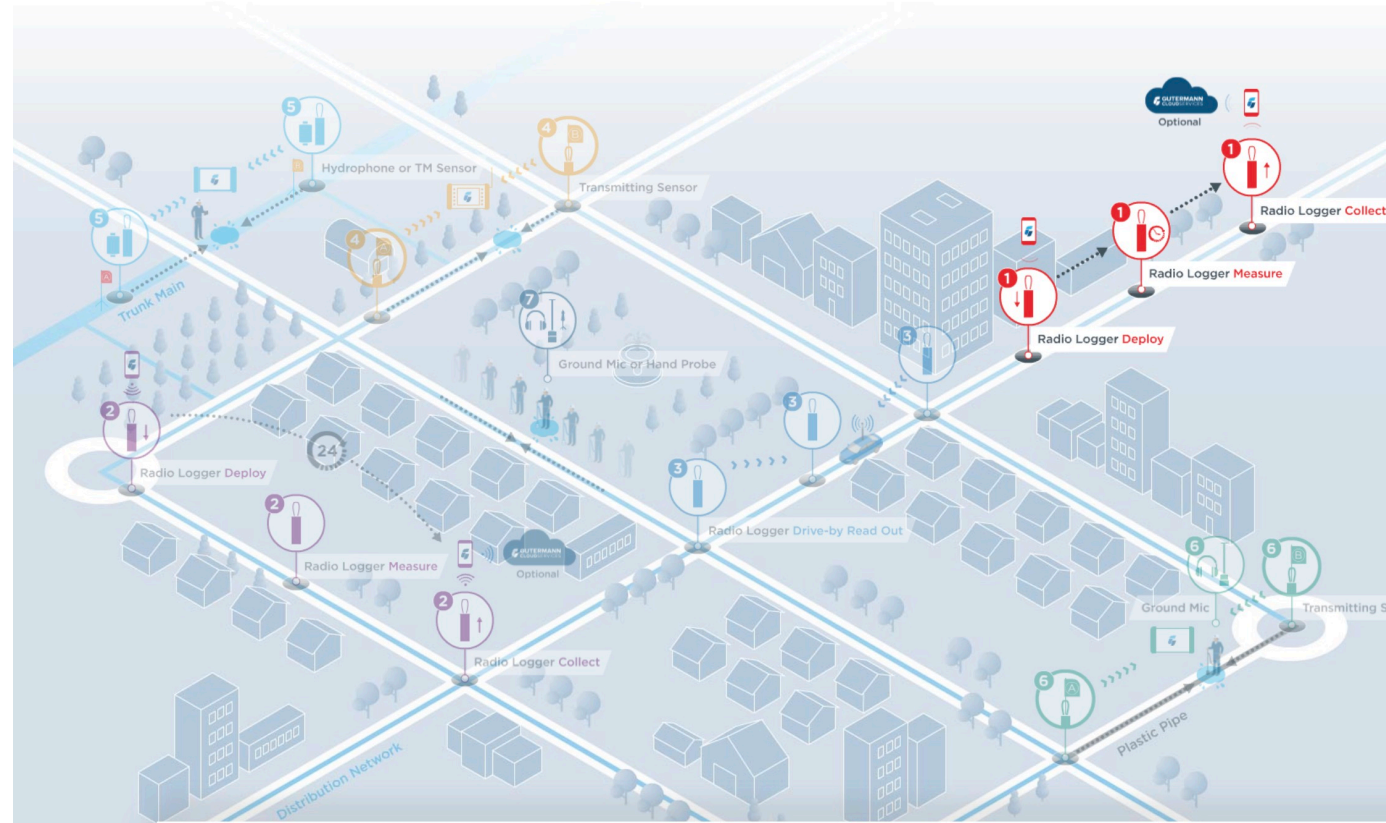
# Inspection Technologies

- External survey and monitoring
- Internal survey
- External validation
- Internal In-line





# External Survey and Monitoring (Acoustic)





# Internal Survey (Free Swimming)

- Leaks, pressure, gas pockets and temperature
- **This will not provide condition of pipes** without further investigation or validations





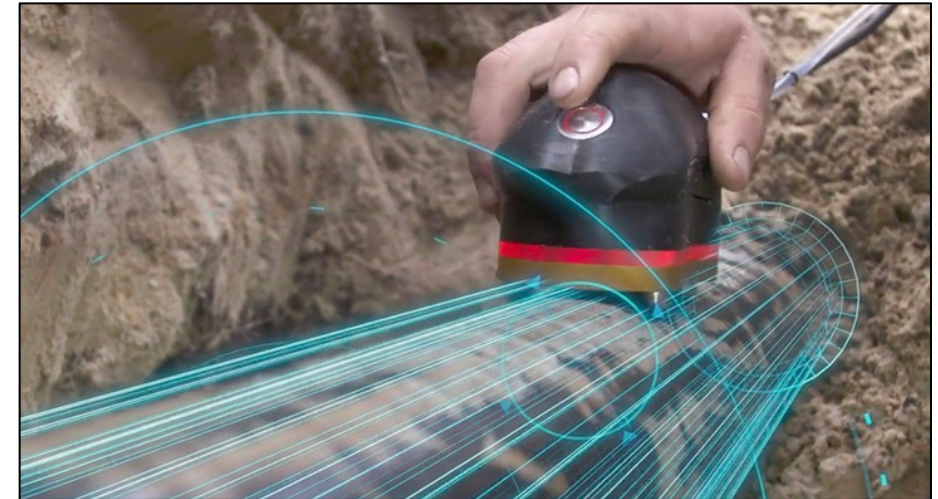
# External Validation (Electromagnetic metallic)

- Requires UT for verification of wall thickness

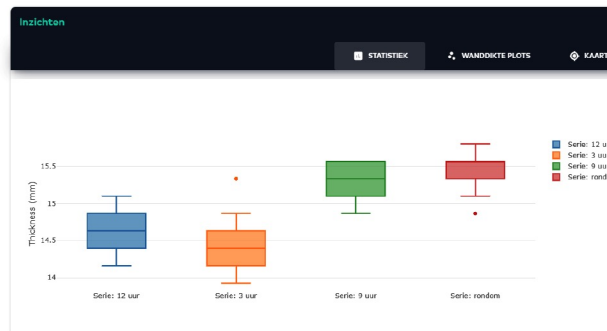




# External Validation (UT all material types)



Info	
Materiaal	AC
Aanleg jaar	1979
Diameter	150
Verwachte wanddikte (mm)	16.04
Verwachte wanddikte validatie (mm)	16.04
Cintrek (mm)	572
RD X	185213.990936093
RD Y	977327.671726501



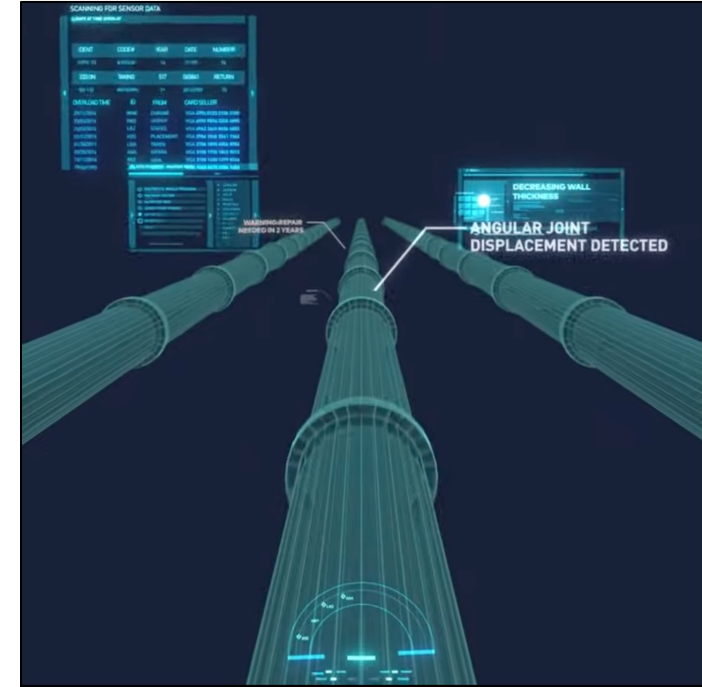
# Internal In-line (UT, EM, and acoustic)

- Free swimming  
vs. tethered





# In-line access





# Deliverables





# Summary

- You can't afford to continue being reactive
- Prioritize all critical pipes
- Begin development of a program
- Project planning based on specific vendor expertise
- Create a proactive or predictive approach based on best-in-class available technology





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