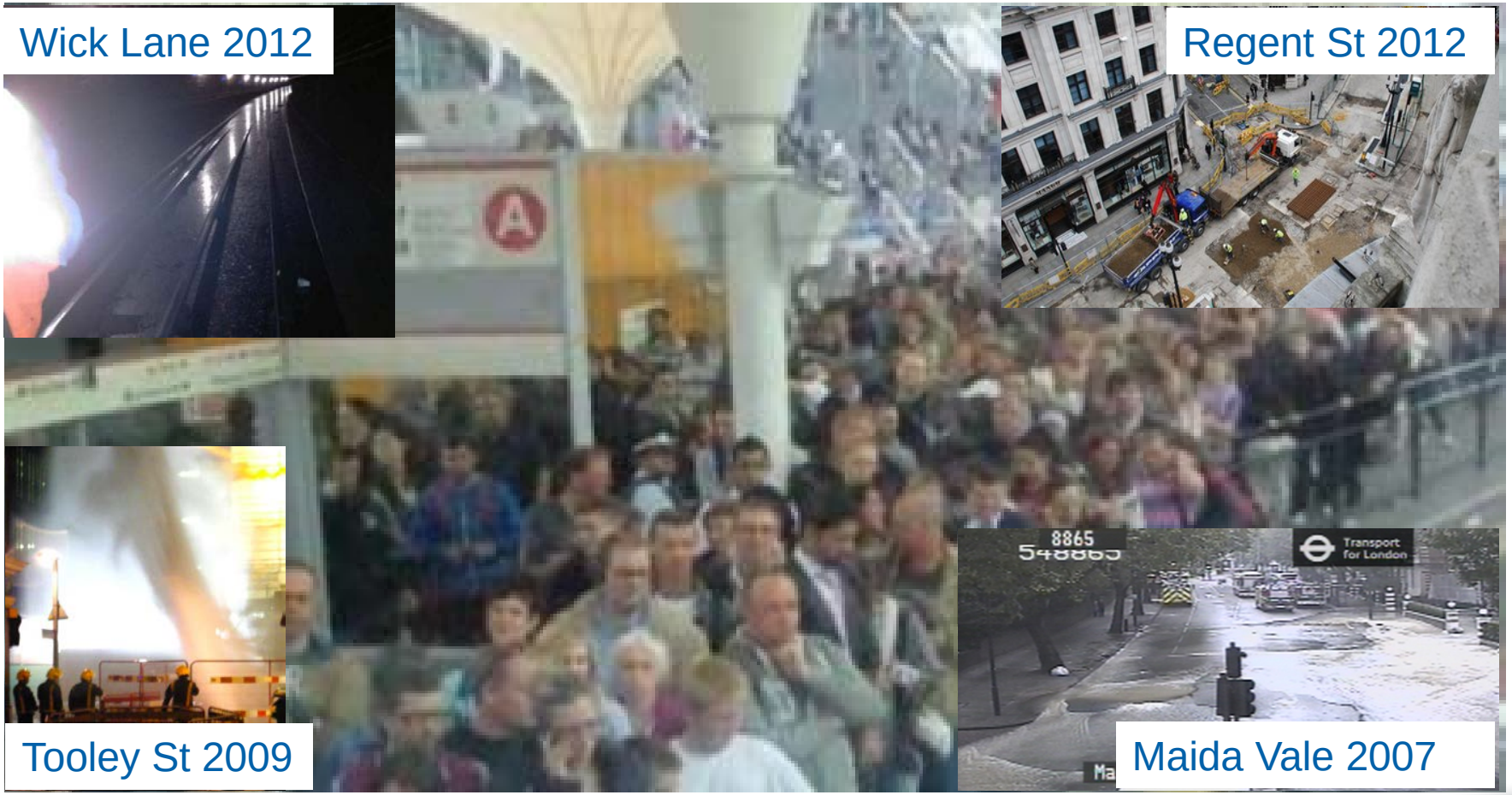
Clean Water Trunk Mains

Greater London Authority

February 2015

Trunk mains: Consequence of failure



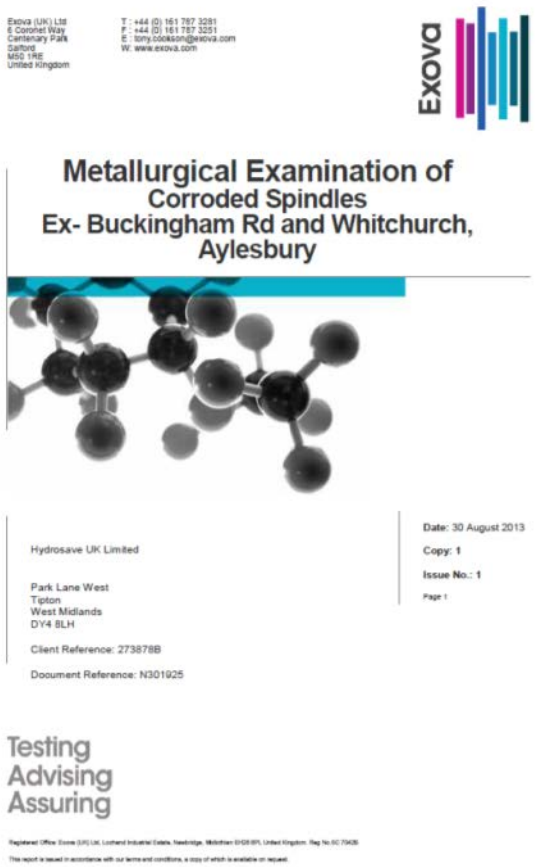
Trunk Mains can cause unacceptable disruption to our customers

Addressing trunk main failures

- Root cause analysis
- Trunk main testing
- Trunk mains replacement, relining or duplication
- Monitoring for preventative or rapid response
- Risk analysis and impact assessment
- Innovation investment
- Further research with University of Surrey on probability and corrosion modelling

Root cause analysis

- When a major failure occurs, a root cause analysis is undertaken to:
  - Review all data
  - Perform detailed operational review
  - Forensic analysis of any pipe cutout
  - Non destructive testing of remaining main
  - Assessment of any external factors
- The aim is to determine the best long-term solution for the main and to learn lessons (to update procedures and standards if needed).



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Testing
Advising
Assuring

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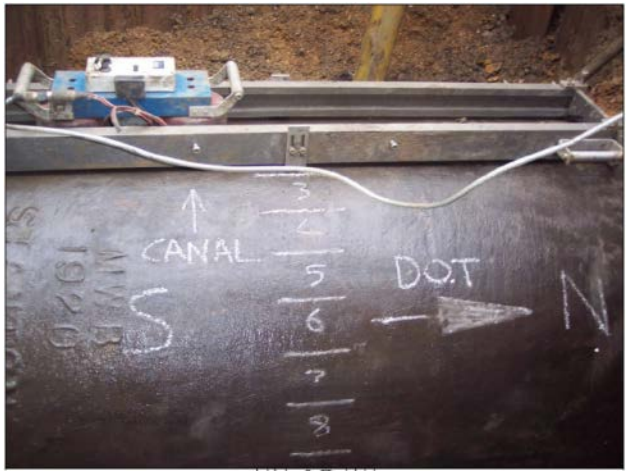
Thames Water

Trunk main testing

Site survey/questionnaire and soil testing



Non-destructive testing (NDT)

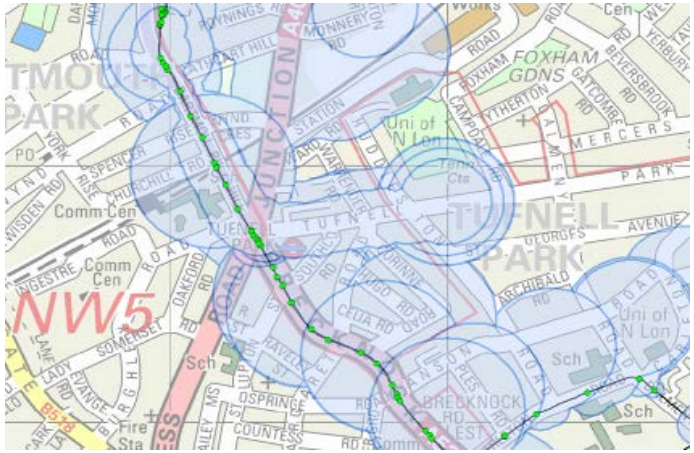
Laboratory testing of soils

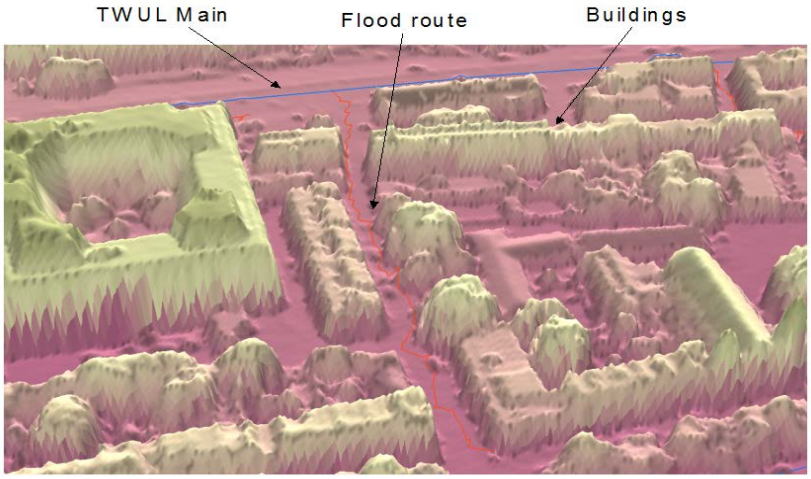
Laboratory testing of pipe material

Thames Water

Trunk main monitoring

Risk analysis



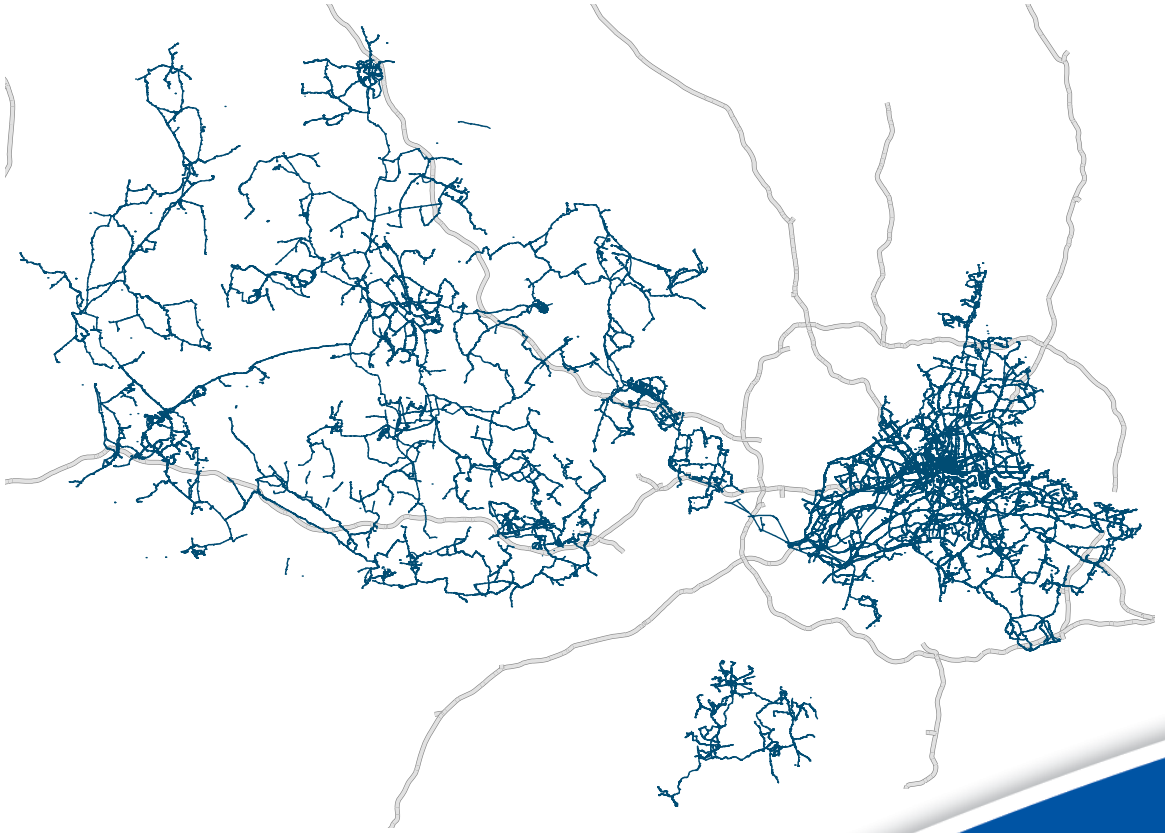


Impact assessment

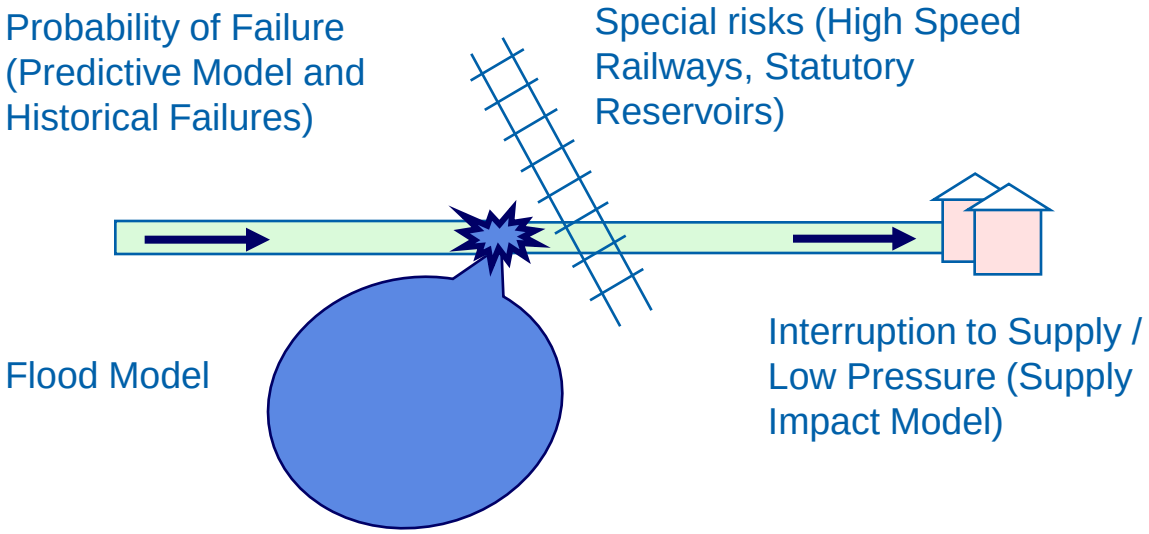
Installation of monitoring allows preventative or rapid response

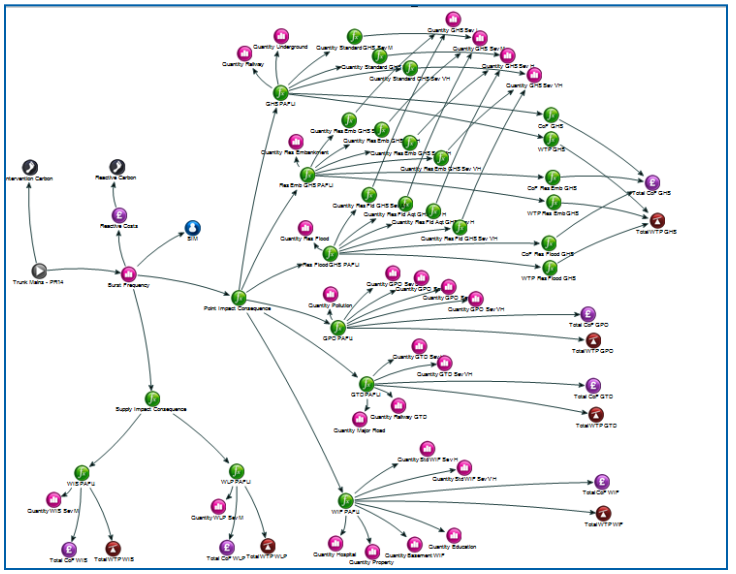
Trunk main risk model

- 4,700km of Trunk Main
- 157,000 simulated burst points spread evenly across this network (at least every 100m).
- Probability of Failure and Consequence of Failure calculated at every one of these simulated burst points.



Calculating risk of failure





"Asset Investment Manager" Risk Map

- Trunk Main Risk Model calculates risk using the corporate risk framework (Cost of Failure) for the following measures:
  - Health & Safety
  - Internal Flooding
  - Pollution
  - Interruption to Supply
  - Low Pressure

Leakage & burst detection: Syrinix TrunkMinder

Trunk main monitoring tool for leakage and bursts

We'll be installing approximately another 300 trunk main monitoring units to protect high consequence locations over the next five years.

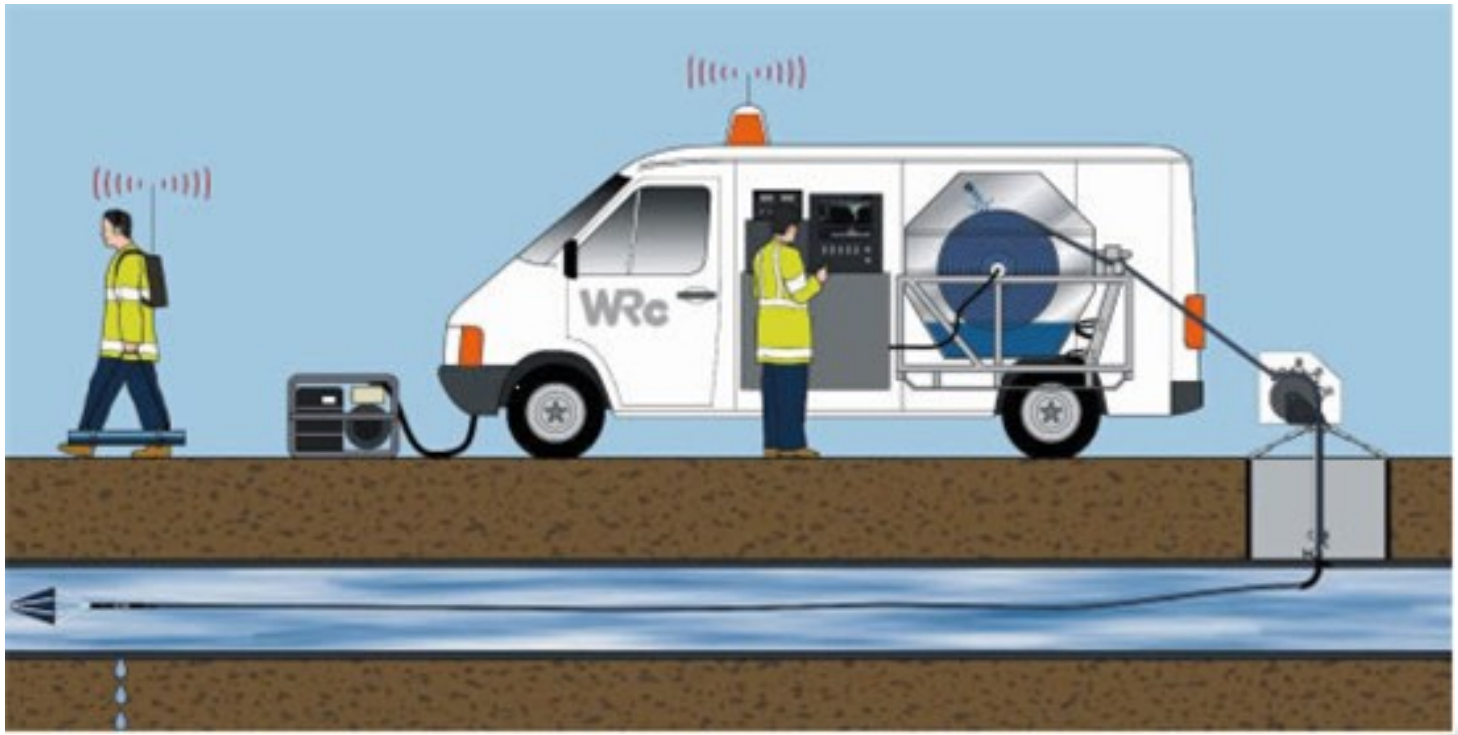
Burst detection: Hydroguard

Trunk main monitoring tool for early burst detection

We've already installed circa 350 across London and Thames Valley at the highest consequence locations

Leakage detection: Sahara

- Highly accurate trunk main mobile leakage detection tool
- Used to find 24Ml/d of leakage per year
- Significant investment over next 5 years to install more survey chambers



Trunk Mains Strategy: Looking Ahead

Long Term: Reducing risk, development to meet predicted changes in failure