City of Dublin

City of Paris

City of Rome

Corporation of London

Eureau

Gaz de France

FEHRL

GERG

ISTT

Italgas

Telecom Italia

Thames Water

UKWIR

Transport for London

TRL

ESWRAC

European Street Works Research Advisory Council

"Research is needed to develop efficient, sustainable methods and techniques for the maintenance, renewal and construction of infrastructure such as road and utility networks and to improve current practice"

"Identifier et développer des opportunités pour réduire l'impact social et environnemental des travaux urbains"

"Erkennen und Entwickeln von Möglichkeiten zur Reduzierung der gesellschaftlichen und umweltrelevanten Auswirkungen von Bauarbeiten an Straßen"

"Individuare e implementare tecnologie finalizzate alla riduzione dell'impatto socio-ambientale dei lavori stradali"

"Para identificar y desarrollar oportunidades para reducir el impacto social y medioambiental del trabajo urbano."

"To identify and develop opportunities for reducing the societal and environmental impact of streetworks"

ESWRAC verdict on *Towards a Thematic Strategy on the Urban Environment* (com (2004) 60 final)

communicated to EC in May 2004

- modern cities can't survive without utility services
- most utility services are buried, unseen and trouble free
- some utility services will (continue to) need maintenance and renewal
- streetworks practitioners need better tools to detect assets and minimise third party damage
- new techniques and improved practice will minimise disruption to traffic and to citizens and will safeguard the environment
- new technologies will ensure that future generations can locate assets easily
- this is an international problem, which should be addressed at a European level, if only to ensure that the scale is sufficient to encourage investment and adoption of best practice

€80,000,000,000
annual cost of traffic congestion in (EU15) by 2010

1,370,000 km
gas mains in (EU15) countries

720,000 km
water mains and sewers in Germany

730,000 km
communication cables in the Netherlands

65,000 km
buried pipes and cables in Rome

3,777,960 km
road network in (EU15) countries

500,000
holes dug by utilities in London last year

€700,000
cost of repairing a single optic fibre cable

€45,000,000,000
cost of repairing Germany's sewer network in the medium term

€3,000,000,000
indirect cost of retrenching and reinstatement last year in UK

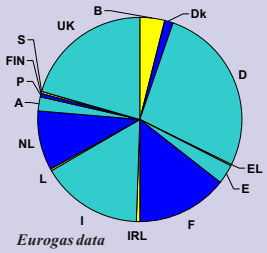
170,000 km
gas distribution system in France

52,500,000
cars on German streets by 2020

Buried utility assets in Europe

There are a total of 1,396,600 km of gas transmission and distribution pipe-lines in (EU15) excluding the huge number of service connections

Pipelines and cable in (EU15)

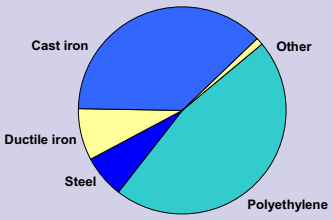


Eurogas data

Each utility uses a variety of materials for their buried assets

Each material sets different problems for the variety of pipe location methods

Materials used in UK gas system



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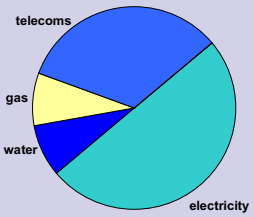
Distribution systems in Rome

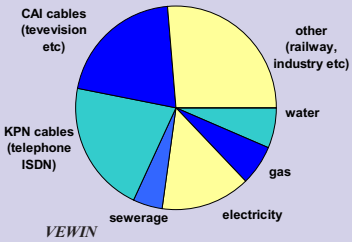


City of Rome

Rome has a population of 3 million and an area of 1,290 km^2

It has a road network of 5,000 km with a total of 60,000 km of buried pipes and cables

Cables and pipes in the Netherlands



VEWIN

There are estimated to be 1.75 million km of pipes and cables in the Nether-lands

A typical tangle of pipes and cables under our city streets that can result in expensive third party damage

We need investment in i

- enable utilities to locate and identify b
- develop better robotic technologies to
- enable utilities to make more use of de assets and highway drainage

It's only by minimising, or even elim need to work in the street that w and improveme

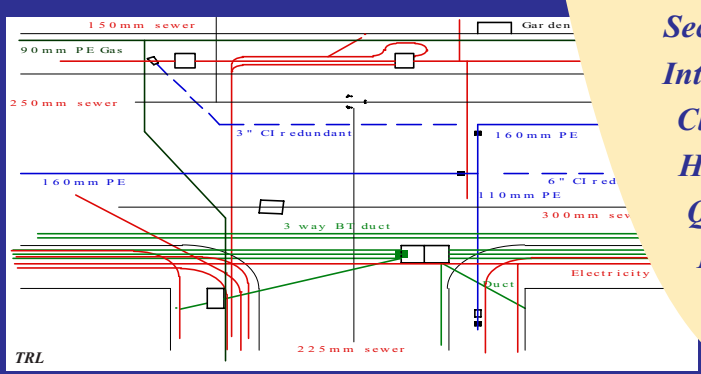
Building on current research

Research on Ground Penetrating Radar (GPR) and on Trenchless Technology is helping to reduce traffic disruption and congestion, but is unable to provide comprehensive information in all situations

Current technology only identified half the buried assets in the picture below, each location method is good for some materials and not for others.

Research is required to combine and improve current technology

TRACTO-TECHNIK



TRL

The proposed addresses pr in par

Improving the Ur
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Increased EU
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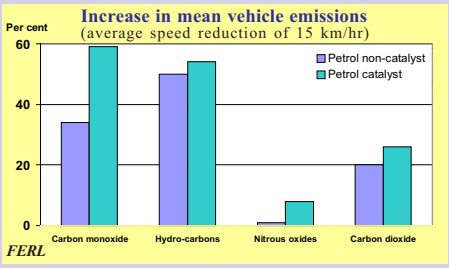
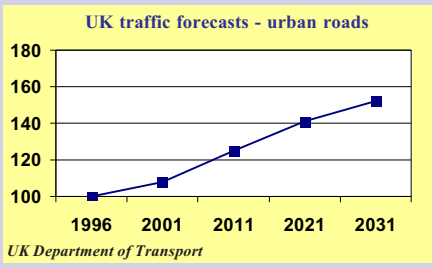
Security
Intelliger
Climate
Health
Quality
Enviro

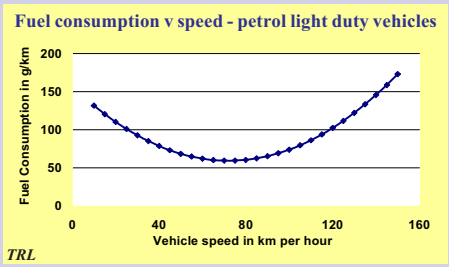
Impacts on the environment, health and safety and what it is costing



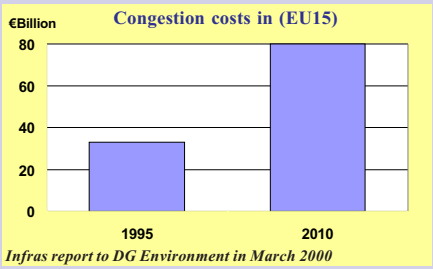
Traffic calming increases vehicle exhaust



Traffic is expected to increase in the UK



Fuel use increases as city traffic speed falls



Congestion costs are expected to rise

nnovative technologies to:

uried infrastructure

repair buried assets and connect services

dicated corridors for utility underground

inating, the length of time that utilities
e will see reductions in congestion
ents in traffic flow

Resulting traffic jams are irritating, environmentally damaging and expensive for society

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Views on what we need to do

"Between 1995 and 2030 the number of kilometers travelled in urban areas is predicted to increase by 40%" and "Rising congestion levels are hampering mobility with increasing costs for the economy rising from 0.5% of GDP to 1% GDP by 2010" - **EU Thematic Strategy on the Urban Environment**

"For European distributors, reducing construction and maintenance costs remains a major issue. Developing alternative solutions for streetworks, and maintaining the safety, can represent a great opportunity whereas environment and underground constraints might shortly significantly increase the costs of streetworks using traditional techniques" - **Gaz de France**

"A primary need for gas-distribution companies working in large metropolitan areas is a reliable and economical technique to renovate/rehabilitate old gas mains" - **Italgas**

"What's needed is an entirely new approach. A change in technology culture" and "we are determined to do more to prevent the endless disruption caused by roadworks in towns and cities" - **Alasdair Darling, UK Secretary of State for Transport**

ESWRAC proposed programme themes and projects

Theme 1 – Making the best of what we have currently

User need requirements and a risk management approach to categorisation of the utility environment
Methodology and standards for utility asset location data collection and exchange
Complete digital map of the underground apparatus
Best Practice for existing technologies
Changing the culture of utility work to improve working methods
Real costs of utility buried asset infrastructure to the industry and society
Towards a better regulatory framework for buried infrastructure management

Theme 2 – Improved future surface-based survey techniques

Development of a multi-sensor location system
Improving GPR and other existing technologies
New technologies for underground asset location

Theme 3 – Below-ground survey techniques

In-pipe mapping and visualisation technologies Part 1. Mapping pig for asset location
In-pipe mapping and visualisation technologies Part 2. Through-wall, in-pipe asset visualisation
Keyhole access infrastructure visualisation
Asset avoidance for directional drilling

Theme 4 – Future developments and possibilities

Smart Pipe Technology
Asset Tagging
Novel approaches to traditional underground infrastructure

Theme 5 – Better construction methods

Recycling backfill material and reducing use of imported fill
Reduction of excavation size
Extending the functionality of trenchless technology
No-dig laterals

Theme 6 – Better asset management

Integrated Infrastructure management
Asset performance measurement
Funding models
Risk management and allocation
Durability of repairs
Prediction of future pipe service life & affect of changing external factors
Extending asset life

Selected recent research

GIGA	Ground Penetrating Radar (Fifth RTD Framework Programme), www.giga-radar.info
TRL	Mitigating the Disruption Caused by Utility Street Works (PR516)
	Long-term Performance of Reinstatements and their Adjacent Pavement: Part 2 Long-term Performance of Reinstatements in the Highway (PR573)
UKWIR	Mains Location Equipment. A State of the Art Review and Future Needs (01/WM/06/1)
	Report on Asset Location and Condition Assessment (02/WM/12/1)

ESWRAC

Please contact the following for more information about ESWRAC

FEHRL	**Steve Phillips**	General Secretary, Forum of European Highway Research Laboratories, Blvd. De la Woluwe 42, 1200 Brussels, Belgique, tel: +32 (0)2 775 8238, fax: +32 (0)2 775 8254, email: stevep@fehrl.org, www.fehrl.org
Gaz de France	**Jean-Pierre Capdevielle**	Chairman: GERG PC Distribution, Chef du Programme Distribution, Centre de Recherche de Gaz de France, 361, Avenue du Président Wilson, 93211 La Plaine Saint-Denis Cedex, France, tél: +33 (0)1 49 22 45 02, fax: +33 (0)1 49 22 56 53, email: Jean-Pierre.Capdevielle@gazdefrance.com, www.gazdefrance.com
GERG	**Dave Pinchbeck**	General Secretary, The European Gas Research Group, Avenue Palmerston 4, 1000 Brussels, Belgique tel: +32 (0)2 230 8017, fax: +32 (0)2 230 6788, email: gerg@arcadis.be, www.gerg.info
UKWIR	**Dr Mike Farrimond**	Director, UKWIR, 1 Queen Anne's Gate, London SW1H 9BT, UK tel: +44(0)207 344 1868, fax: +44 (0)207 344 1852, email: mfarrimond@ukwir.org.uk, www.ukwir.org