



UCL portfolio

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DfT and BIS

Civil, Environmental and Geomatic Engineering

- Infrastructure interdependencies
- Structural design and mechanics in high risk areas (e.g. earthquakes, tsunami etc.)
- Accessible public transport systems
- High capacity transport systems
- Life-scale simulation of person-environment interactions
- Soil-structure interactions

CEGE 2

- Water systems, distribution, treatment
- Waste remediation
- Coastal, river engineering
- Wave energy systems
- Adaptive infrastructures
- Low carbon city development (this includes China and South America)
- Disaster relief and impact reduction
- Systems Engineering

Other UCL engineering depts

- Computer Science
- Electronics and Electrical Engineering
- Chemical
- Mechanical
- Security and Crime Science

UCL Engineering Centres (extract)

- UCL Advances
- Chorley Institute (virtual environments)
- Centre for Computational Statistics and Machine Learning
- Energy Institute
- Environment Institute
- Centre for Health Informatics and Multiprofessional Education (CHIME)
- UCL Interaction Centre (UCLIC)
- Centre for Materials Research
- London Centre for Nanotechnology
- Centre for Security and Crime Science
- Centre for Systems Engineering
- Centre for Transport Studies
- Urban Laboratory

Bartlett – faculty of the built environment

- Mega infrastructure planning
- Urban planning
- Pedestrian movement analysis (macro)
- Urban design
- Energy demand
- Heritage
- Environment

UCL Centre of Engineering Policy

- Only existed for 8 weeks – I head it
- Mission to research and postgrad teach multi disciplinary engineering and policy interaction
 - International
 - National
 - Local
- Government and Industry
- International collaboration

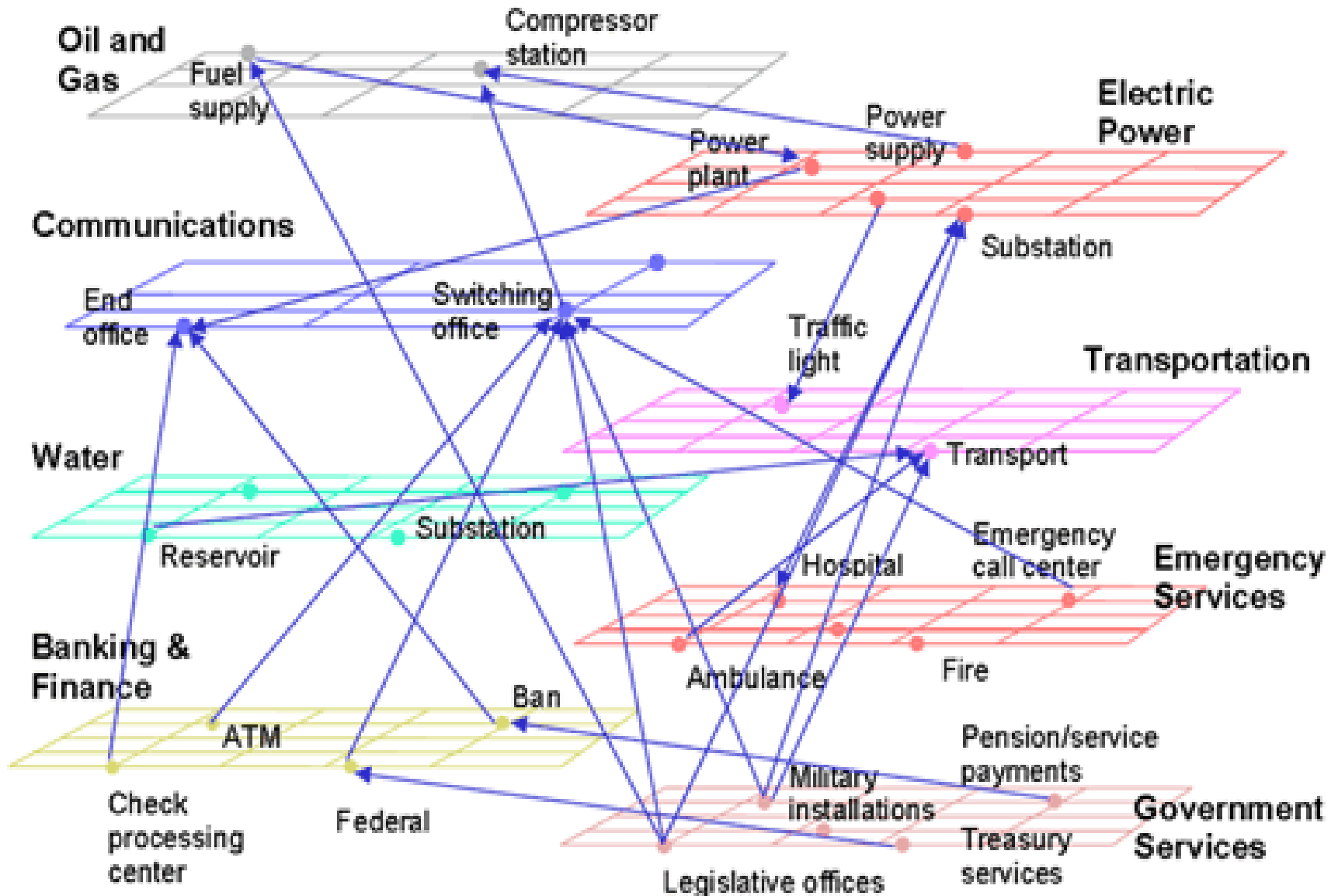
Infrastructure UK Engineering and Interdependency Expert Group

- Studying interdependency economics and governance, resilience and design
- Establishing a UK national infrastructure engineering roadmap for the next 40 years
- Highlighting gaps in research for EPSRC to consider
- Identifying skill gaps for BIS
- I chair it – need coordinated academic input

Interdependency matrix

	Telecoms				Water						Energy							
	landline		wireless		drinking		sewage		surface		rivers		electricity		gas			oil
	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P
Roads	H	M	L	L	L	L	M	M	H	H	H	H	M	M	L	M	L	M
Pedestrian routes	L	L	L	L	L	L	H	L	H	M	L	L	L	L	L	L	L	L
Cycling paths	L	L	L	L	L	L	H	L	H	M	L	L	L	L	L	L	L	L
Surface rail	L	L	L	L	L	L	L	L	H	M	H	M	H	H	L	M	L	M
U/G rail	H	M	M	L	L	L	M	L	M	M	M	M	H	H	L	M	L	M
Airport	H	M	H	M	M	M	H	L	M	M	H	M	H	H	L	M	H	H
Air ways	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	H	H
Terminals	M	M	M	M	H	M	H	L	M	M	M	M	H	M	L	M	L	M
Coastal infrastructure	H	M	H	M	M	M	M	M	M	L	L	L	L	L	L	L	L	L
Seaports	L	L	L	M	H	L	H	M	M	M	H	M	M	M	L	M	L	M
Inland waterways	L	L	L	M	L	L	L	L	H	M	H	M	L	M	L	M	L	M
Embankments	L	L	L	L	L	L	M	M	H	M	H	M	L	L	L	L	L	L
Tunnels	L	L	L	M	L	L	L	L	M	M	H	M	H	M	L	M	L	M
Bridges	L	L	L	L	L	L	L	L	L	L	H	M	L	M	L	M	L	M
Pipelines	H	L	H	L	L	L	L	L	M	M	L	M	H	M	L	M	L	M
Control systems	H	M	H	M	L	L	L	L	M	M	M	M	H	M	H	H	L	M
SatNav	M	M	H	H	L	L	L	L	L	L	L	L	H	L	L	L	L	L
Oil Distribution	M	M	H	L	L	L	L	L	H	M	L	L	H	M	L	L	L	L
Gas Distribution	M	M	H	L	L	L	L	L	H	M	L	L	H	M	L	L	L	L
Electric car recharge network	H	H	H	H	L	L	L	L	M	M	L	L	H	M	L	L	L	L
CO2 transport	M	M	M	M	L	L	L	L	H	M	L	L	H	M	L	L	L	L
Notes	<ul style="list-style-type: none"> If oil distribution networks are damaged transport is severely impacted but the infrastructure remains intact There are interdependencies within interdependencies e.g. loss of gas supplies leads to a high impact on the electricity infrastructure Surface transport will be more electricity dependent and so more vulnerable in future years than now 																	

A simplified view of interdependence



Research opportunities

- Problem characterisation – when is it wicked and when is it not
- Holistic activity design – where is the evidence – what works and why – what doesn't and why
- Is ICT in any way 'special', or is ICT now so embedded in everything that all development is 'special' or 'partly wicked' – investigate
- Do different legal systems have different ecosystem properties – investigate
- Can the journey to success be accounted for differently



Thank you



AGING
INFRASTRUCTURE

Thank you

*English cartoonist / 2009
NATIONAL COURANT.*