Infrastructures, technologies and practices: implications for energy demand

Anna Carlsson Hyslop
John Connaughton
James Faulconbridge
Allison Hui
Lenneke Kuijer
Nicola Spurling
Frank Trentmann
In discussion with Matt Watson

Elizabeth Shove
Lancaster University

DEMAND
DYNAMICS OF ENERGY, MOBILITY AND DEMAND

Research Councils UK
Energy
For a Low Carbon Future

DeMand

Has three core propositions

1. Energy is used not for its own sake, but in the course of accomplishing social practices.
2. Social practices and energy Demand are shaped by infrastructures and institutions.
3. These systems reproduce interpretations of need and entitlement, and of normal and acceptable ways of life.

What people do obviously matters for energy demand

Technologies and infrastructures obviously matter for energy demand, and for what people do

- Buildings
- Road networks
- Cycle ways
- Air conditioning systems
- Computers
- Clothing
- And much more..

If we are interested in DeMand we need some ideas about how technologies, infrastructures and practices interact.

Technologies are important for energy demand not (only) because they are more or less efficient but because they enable and sustain specific practices and hence patterns of consumption.

Building demand for electricity

Required new practices and new technologies (Hughes, Forty).

Technologies and infrastructures continue to build the capacity to consume.

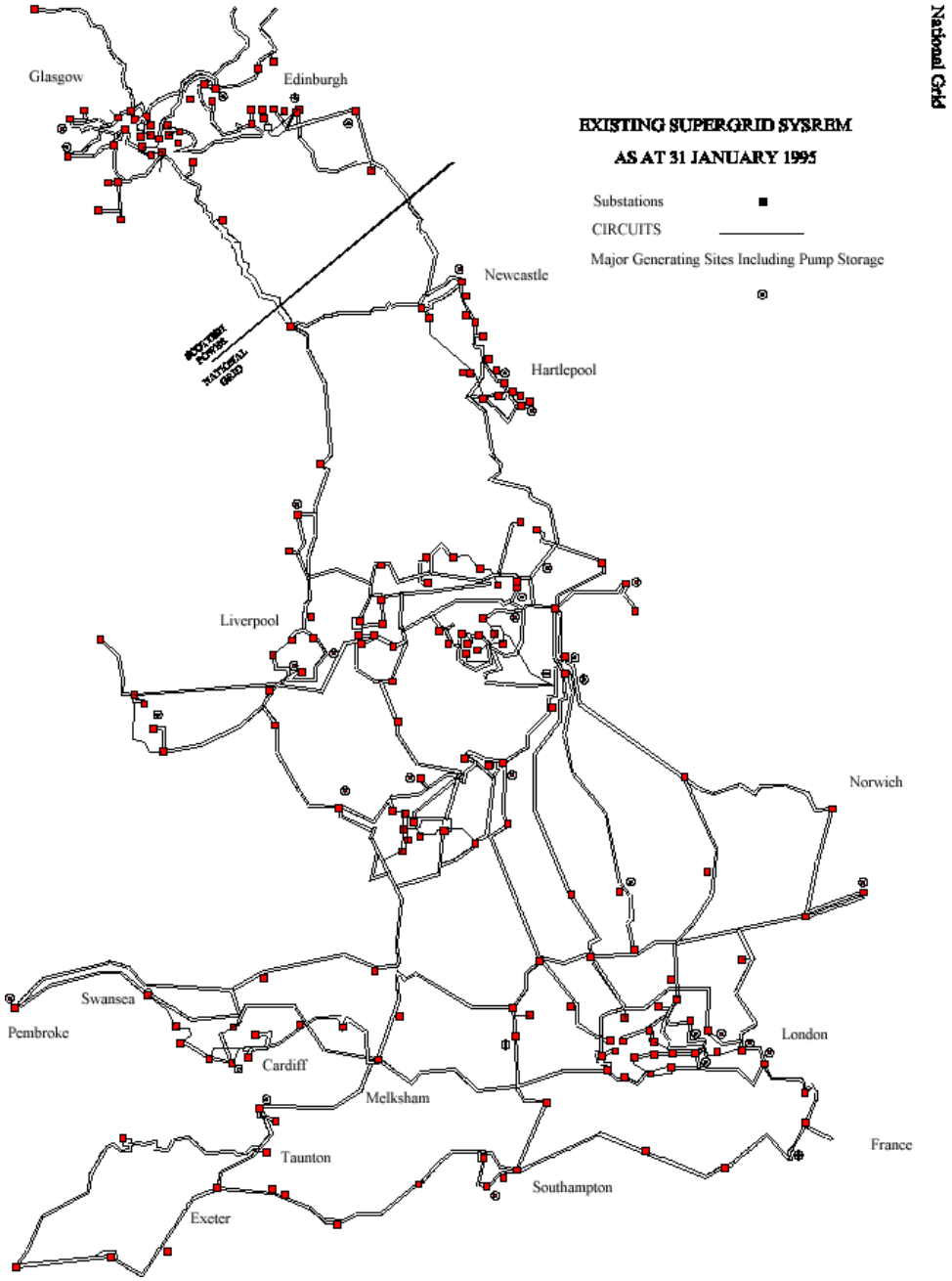
DEMAND response

Modifying practices to suit the system

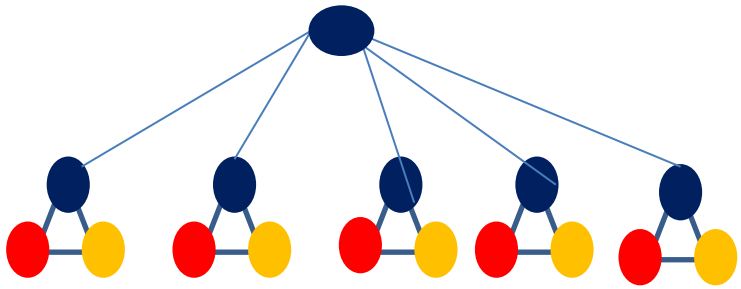
Predict and provide

Sizing supply

Modelling demand

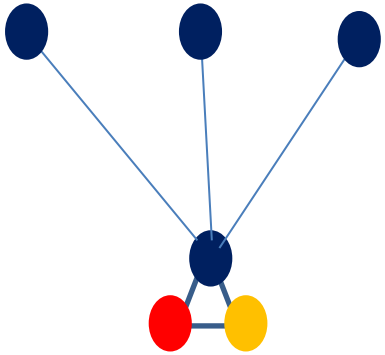


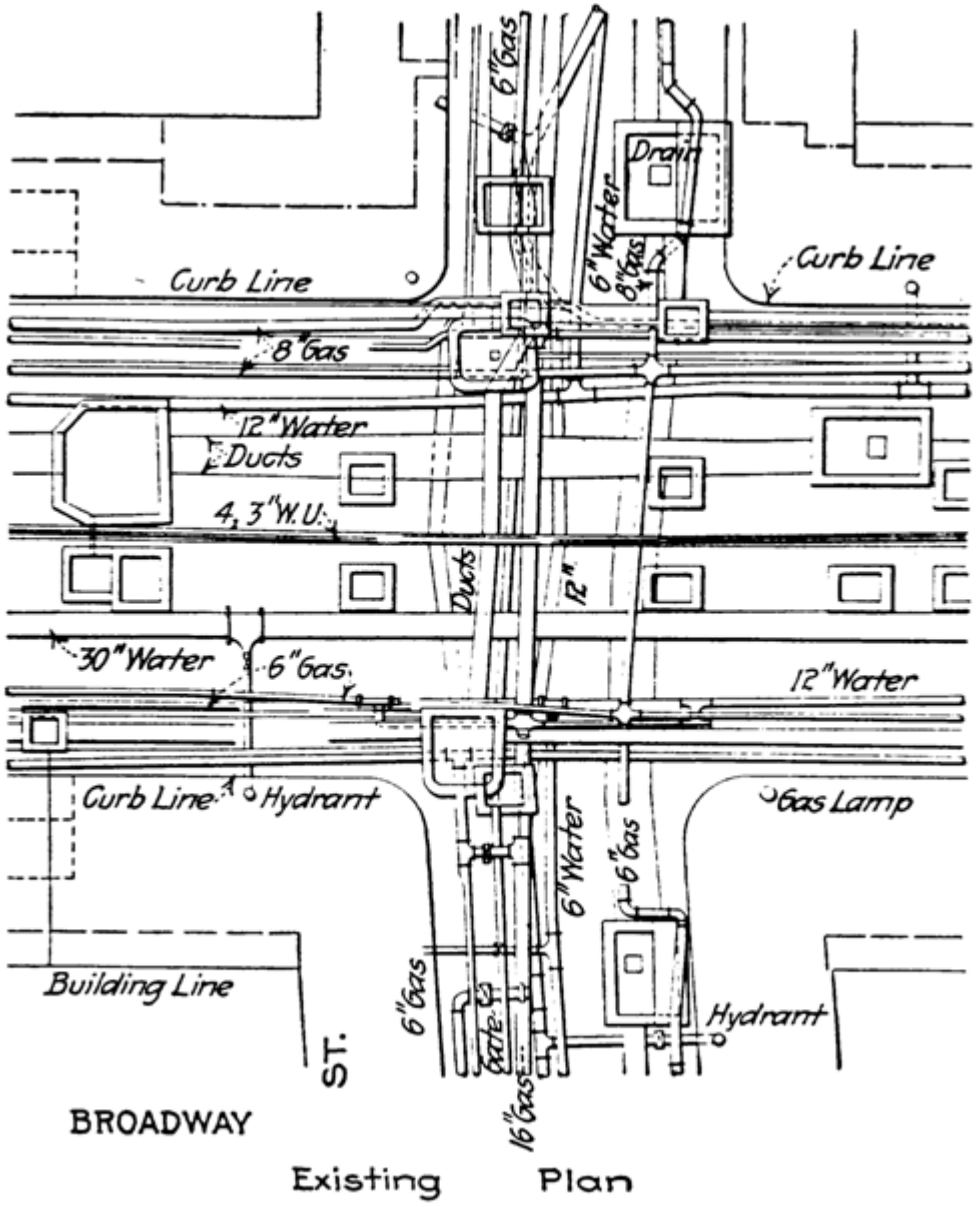
Unlike specific devices/technologies, infrastructures permit and are also part of the dynamics of many practices at once.



http://www0.cs.ucl.ac.uk/staff/W.Langdon/gif/grid_figure1.gif

Many practices depend on several co-existing infrastructures.





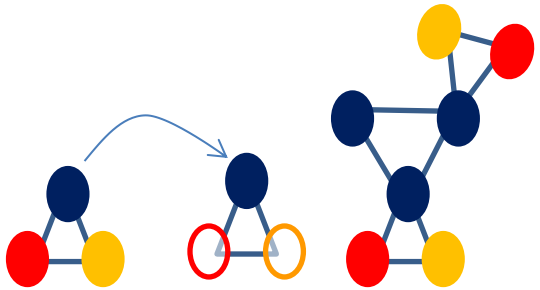
Existing Plan

http://www.nycsubway.org/wiki/Chapter_06._Sewers,_Pipes,_and_Conduits

Contemporary co-existence is combined with uneven historical development.

Gas, water, electricity, telephone, broadband.

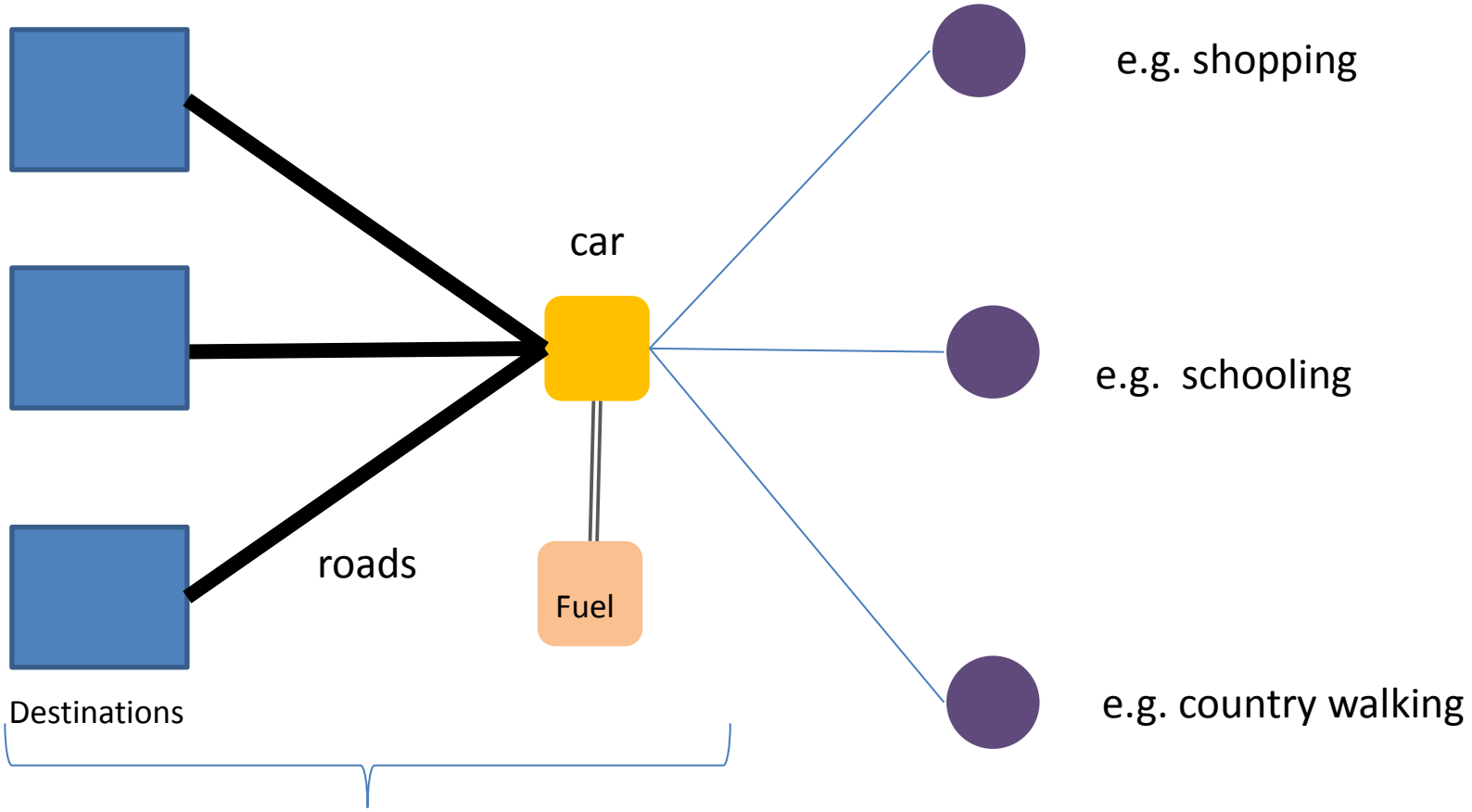
Patterns of accumulation, path dependence, competition



Infrastructures persist
Infrastructures interact

Practices change

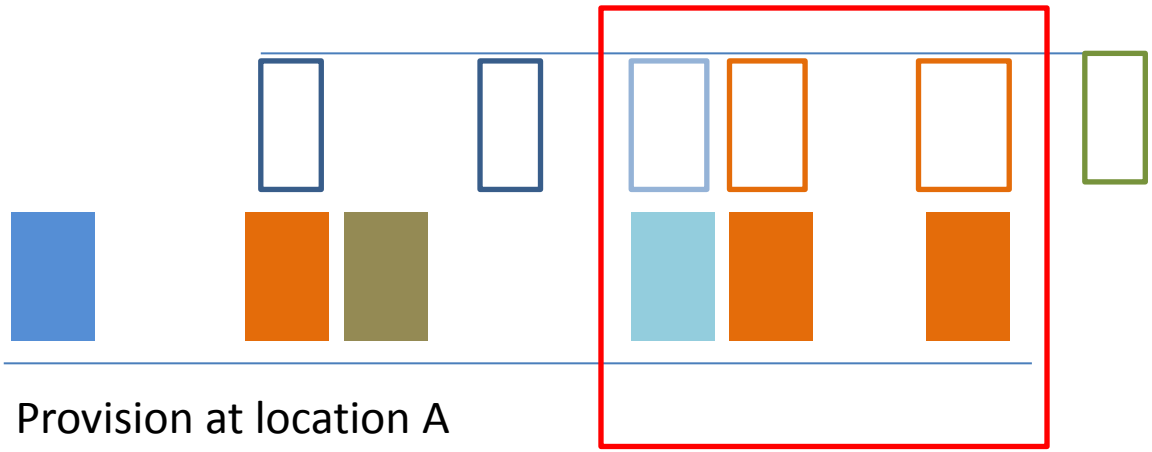
Conceptualising transport infrastructures and mobility (as part of) practices



Motorcentric infrastructures and car dependent practices*

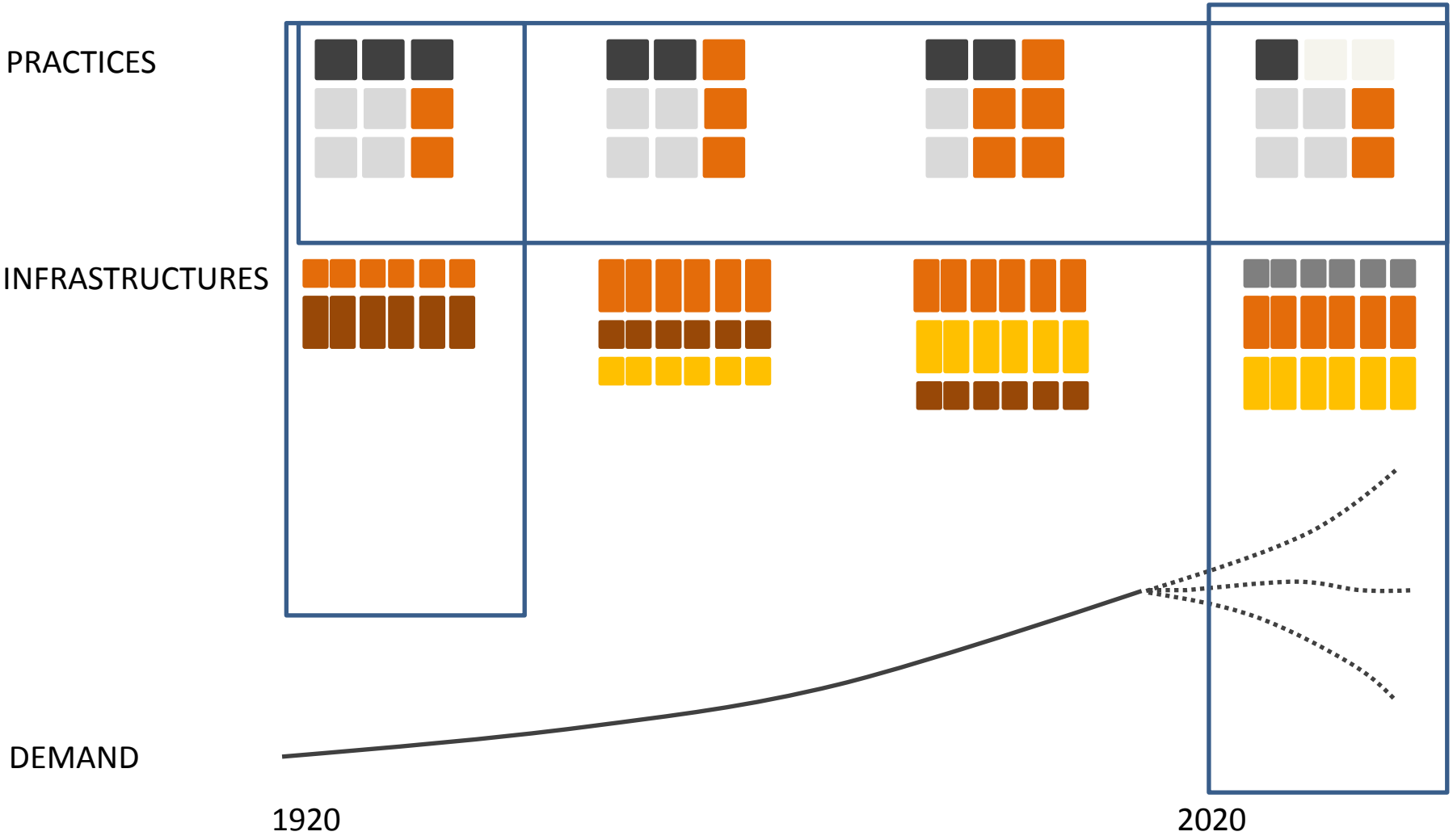
*Rather than car dependent individuals or car dependent locations (Giulio Mattioli)

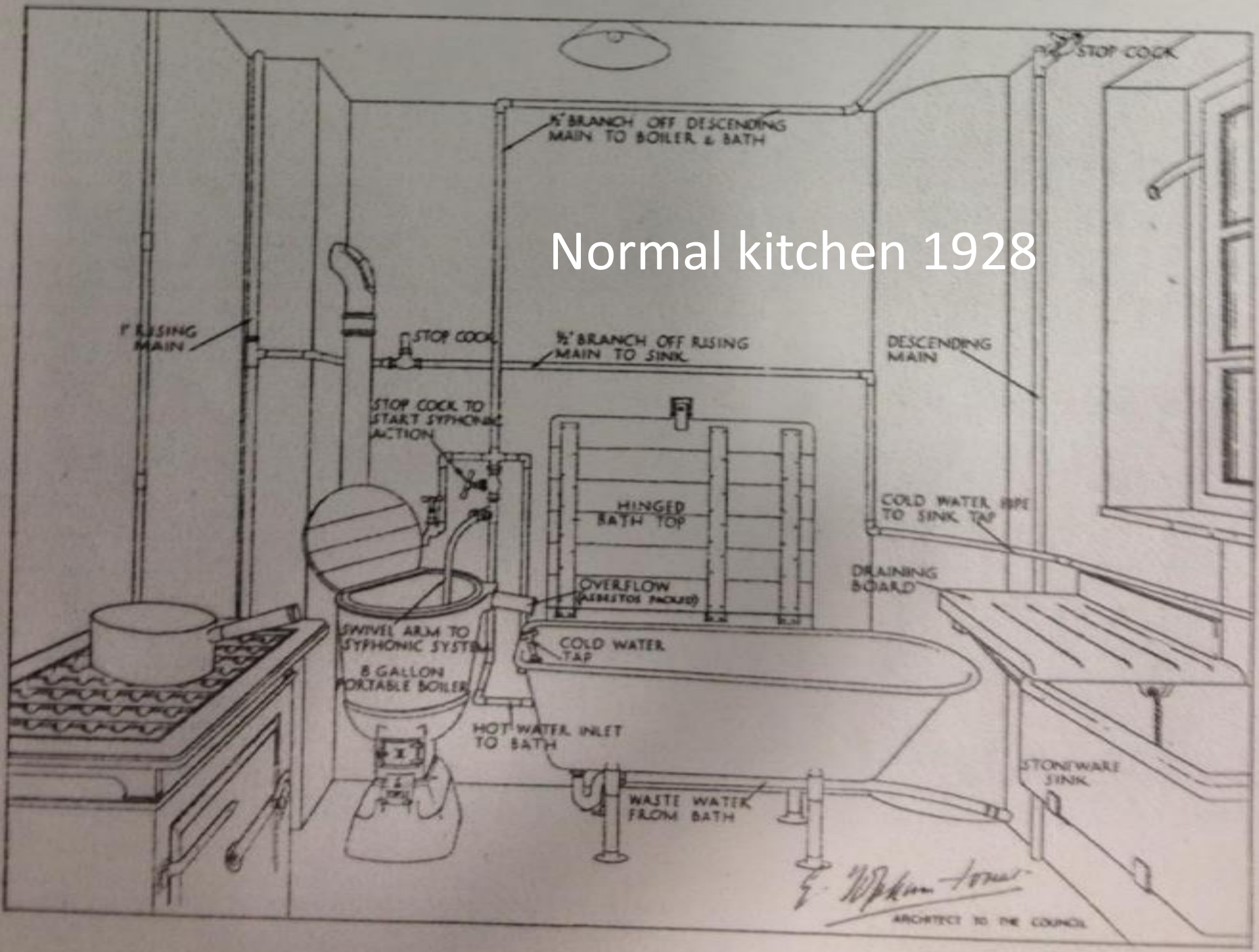
Spatial aspect to consider



Some orange and blue features of practice A are available at location A. But not all. And at location A. other bits of infrastructure are also to be found.

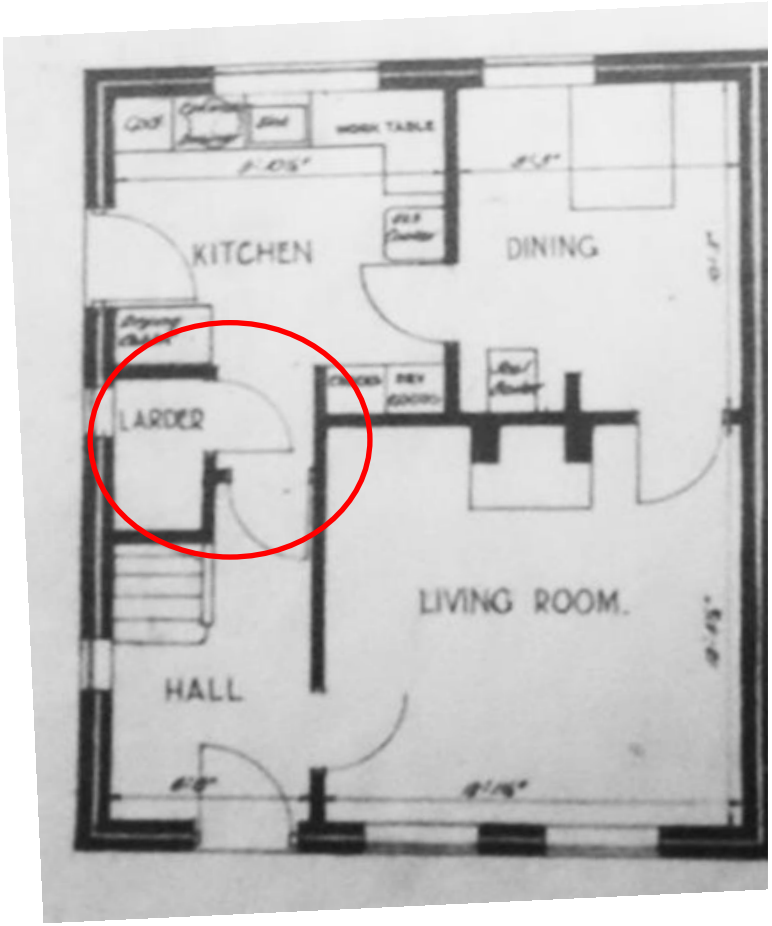
How do different configurations of infrastructure, at different times and locales, relate to patterns of practice and hence energy demand?

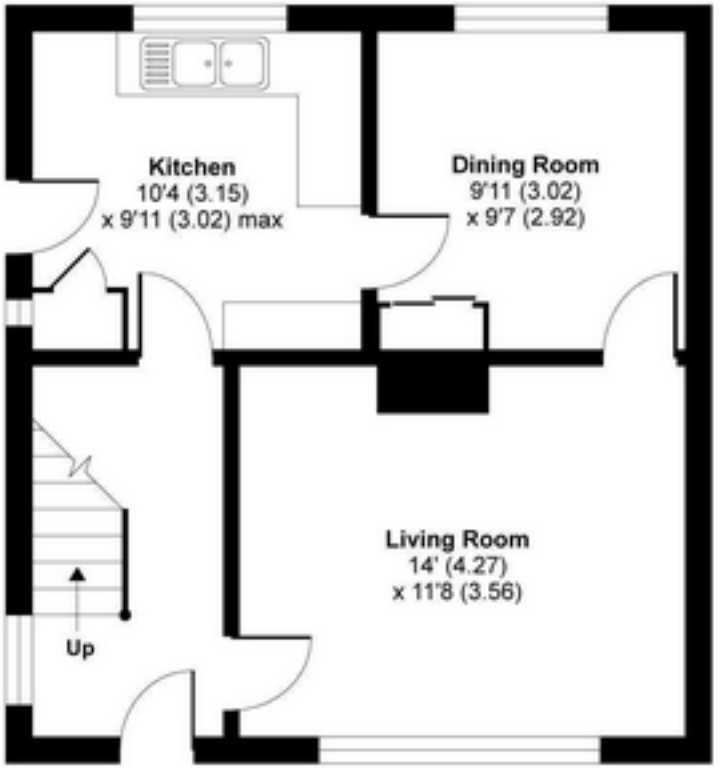



STOP COCK
½" BRANCH OFF DESCENDING MAIN TO BOILER & BATH
Normal kitchen 1928
½" RISING MAIN
STOP COCK
½" BRANCH OFF RISING MAIN TO SINK
DESCENDING MAIN
STOP COCK TO START SYPHONIC ACTION
HINGED BATH TOP
COLD WATER PIPE TO SINK TAP
DRAINING BOARD
OVERFLOW (ASBESTOS PACKED)
SWIVEL ARM TO SYPHONIC SYSTEM
COLD WATER TAP
8 GALLON PORTABLE BOILER
HOT WATER INLET TO BATH
WASTE WATER FROM BATH
STONEWARE SINK
ARCHITECT TO THE COUNCIL

From built in larder to electric fridge: 1928 plans and from estate agents: 2014

Spink hall lane
Issues of responsibility
Ownership, normal provision





APPROX. GROSS INTERNAL FLOOR A

What is an office? infrastructures and systems of provision

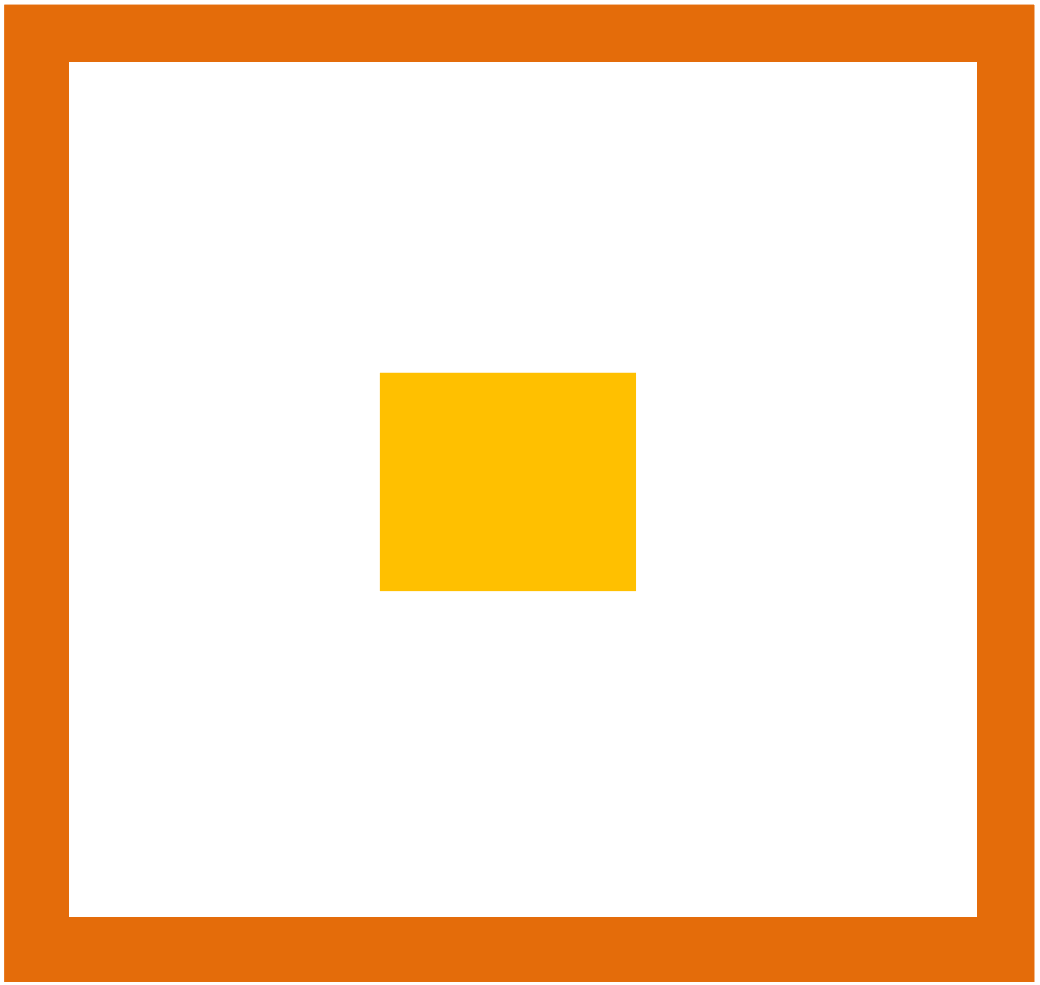
Shell and core will comprise the structure, its cladding, its base plant, completed common areas and external works. More specifically it will generally include:

High and low voltage switchgear.
Transformers.
Lift systems.
A standby generator.
Boilers.
Chillers.
Cooling towers.
Water and fuel tanks.
Sprinkler plant.
Building control systems.
Air conditioning chambers and fans.
Water and fuel pumps.
Dry risers.
Fire detection, alarm and hose reel systems

- Design to meet all needs.
- Everything else is taken out again when the tenant leaves

http://www.designingbuildings.co.uk/wiki/Shell_and_core#Normal_shell_and_core_provision_for_a_high-spec_city_office

http://www.propertyfinder.ae/en/commercial/office-space-for-rent-dubai-downtown-dubai-1902253.html?img/0



Basic provision
Fitting out

6 year lease
99 year lease

Fixity
Flexibility

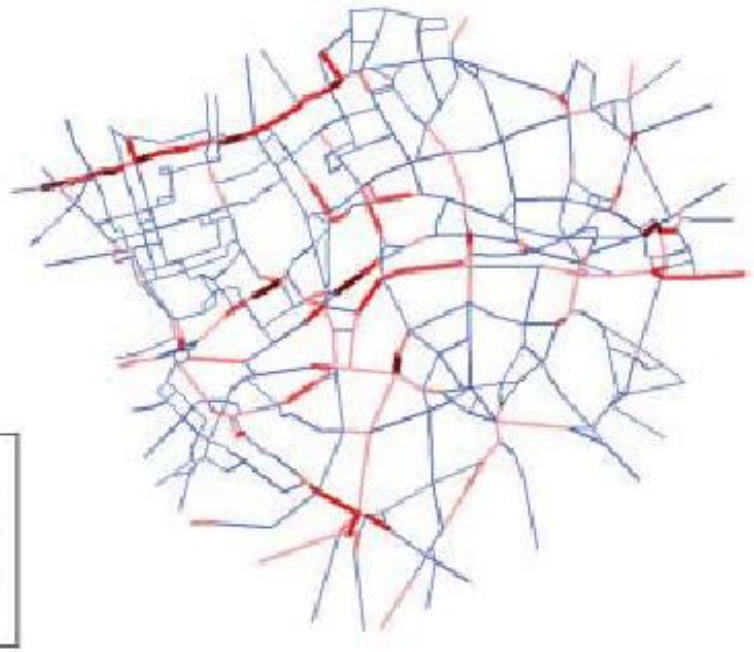
Responsibility
‘over sizing’
Escalation

Standards and
specifications

Cars, roads, destinations and car-dependent practices

Infrastructures and flow (peaks)

Space, time and practice
'features' of the infrastructure-in-use



http://commons.wikimedia.org/wiki/File:UK_Roundabout_8_Cars.gif?uselang=en-gb

Relations between coexisting infrastructures

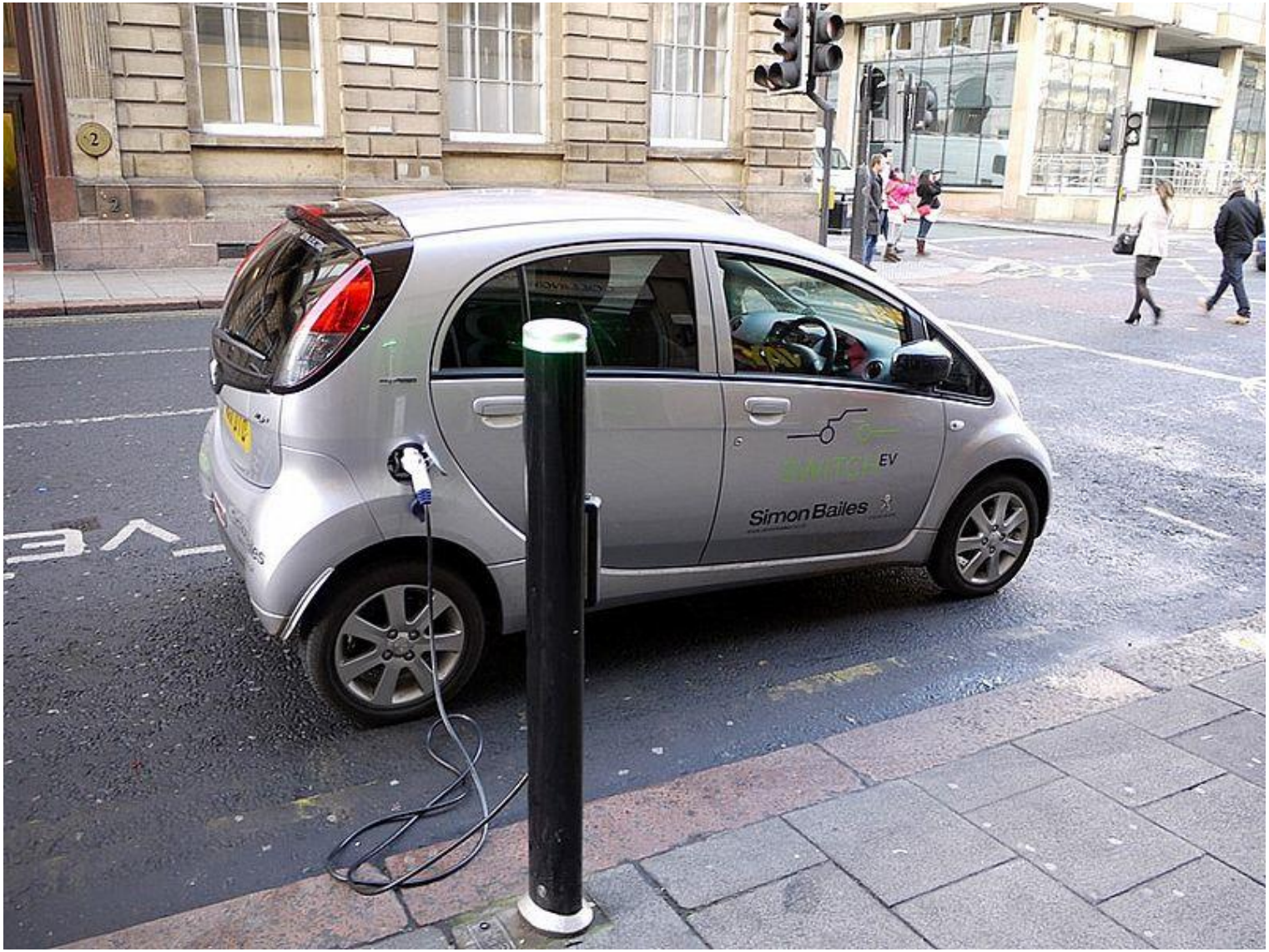
Stevenage built with 26 miles of cycle way: not much used
Infrastructures alone: not the whole story

Layering – new material arrangements and practices on top of old ones

Existing and new

Augmenting

Driving and EV driving



http://commons.wikimedia.org/wiki/File:Electric_car_refuelling,_Collingwood_Street_%28geograph_2726139%29.jpg?uselang=en-gb#file

infrastructures are part of many practices at once.

Sharing infrastructure

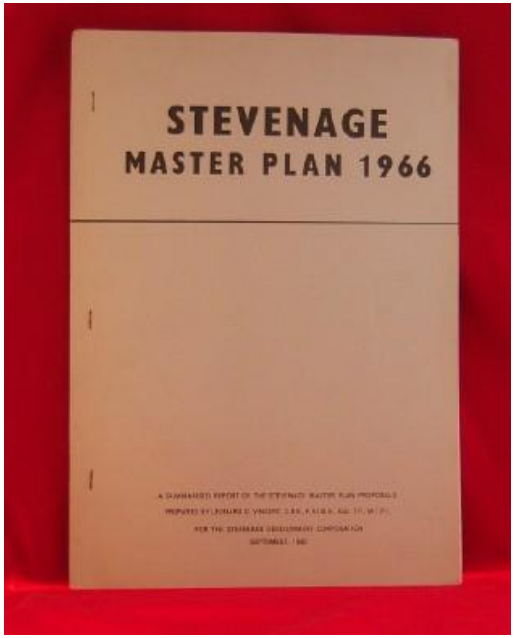
Sites of competition between practices

Planned and unplanned

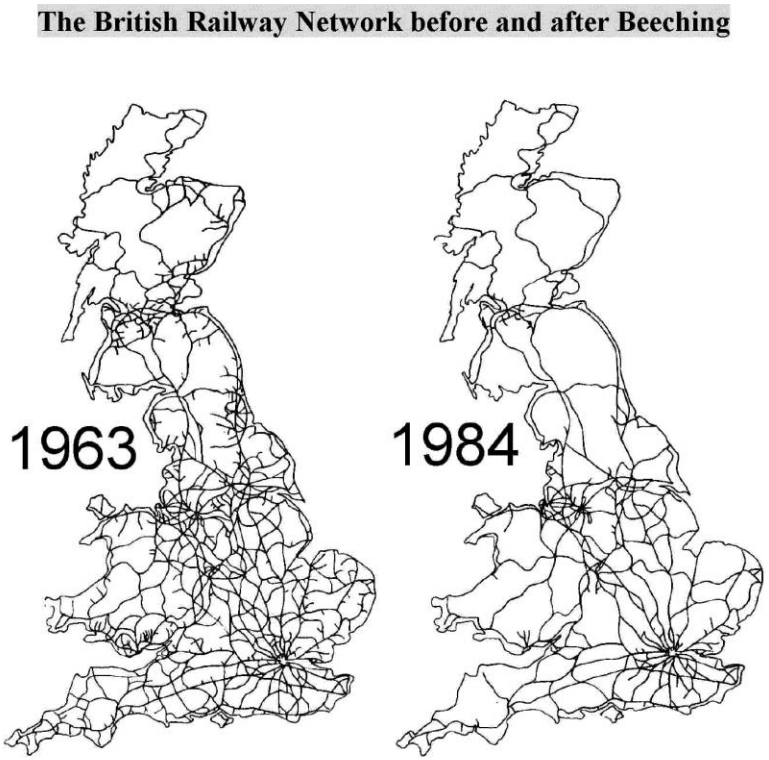
http://www.cyclestreets.net/location/46659/cyclestreets46659-size640.jpg

Planning and un planning

Policy, Professions, Scale



Doing infrastructure



Undoing infrastructure

http://www.bilderberg.org/railways.htm

Re-doing infrastructure

Different ways of thinking about technologies, infrastructures and practices – and how they change

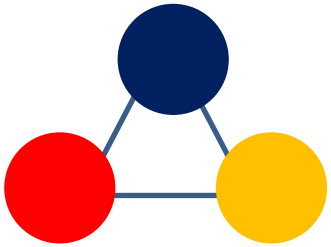
Technology and Behaviour

Bounded technology, individual users
Proper and improper use
Non-technical barriers
Purchasing decisions
User behaviour

Sociotechnical Systems

Scripting
Configurations that work
Co-construction of technologies and users
Relation between human and non-human actors

Technology as part of Practice



Practice as the central unit of enquiry
Integration of elements, material/technology, meaning, competence.

Material elements
Material arrangements

A Reminder

Changing practices **enable and call for infrastructural** support **and generate energy demand**.

Infrastructure-practice relations are critical for what constitutes a normal office, home, shopping trip, etc.

A Question

Which **dynamics of social practices** matter for energy demand?

- automation (cooling – refrigeration; air conditioning)
- delegation to appliances (laundering, full central heating)
- convenience and speed (multiple appliances)
- shopping, bulk provisioning, locations and destinations

A Challenge

Understanding the 'users' , STS, adoption, investment, LTS, appropriation of sociotechnical systems, ANT, innovation studies, diffusion, impact, and social practice studies (narrowly defined), don't capture these processes. **New ideas are needed.**