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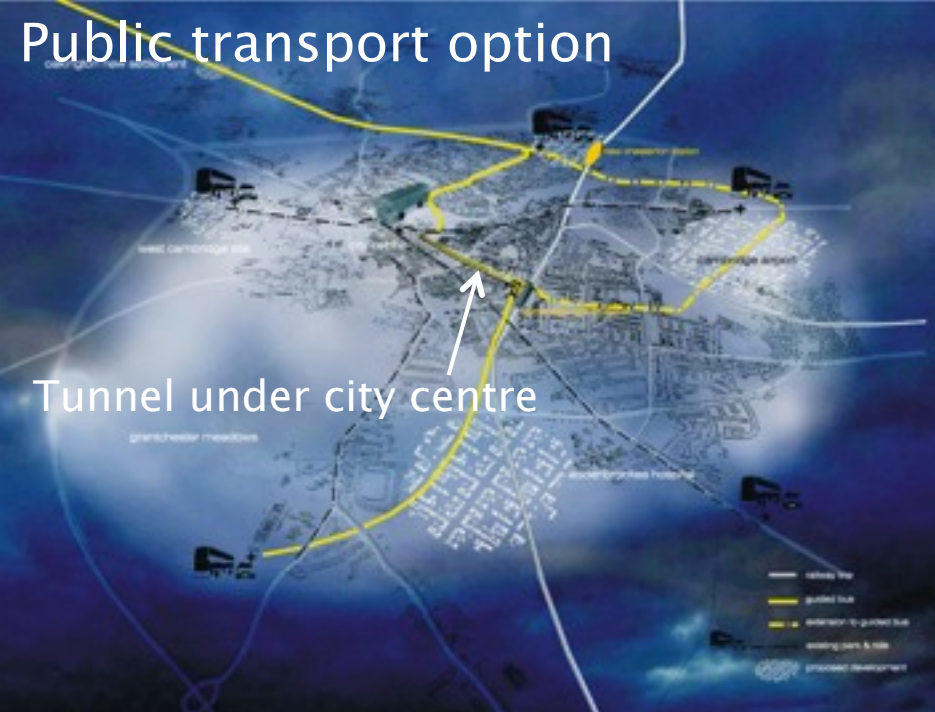
TRANSPORT SOLUTION

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Architecture,
University of Cambridge

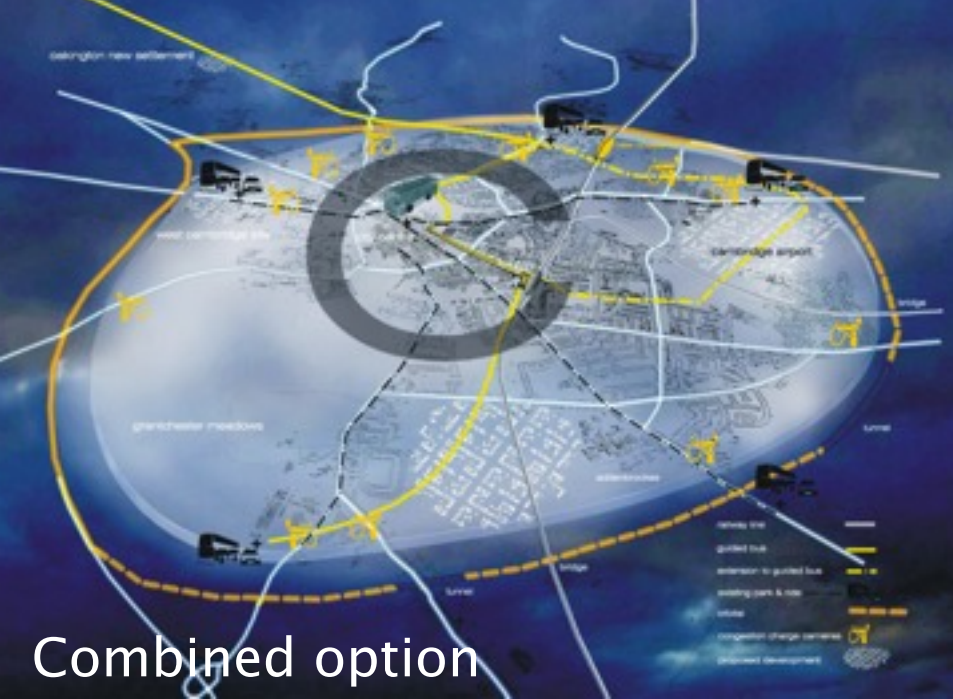
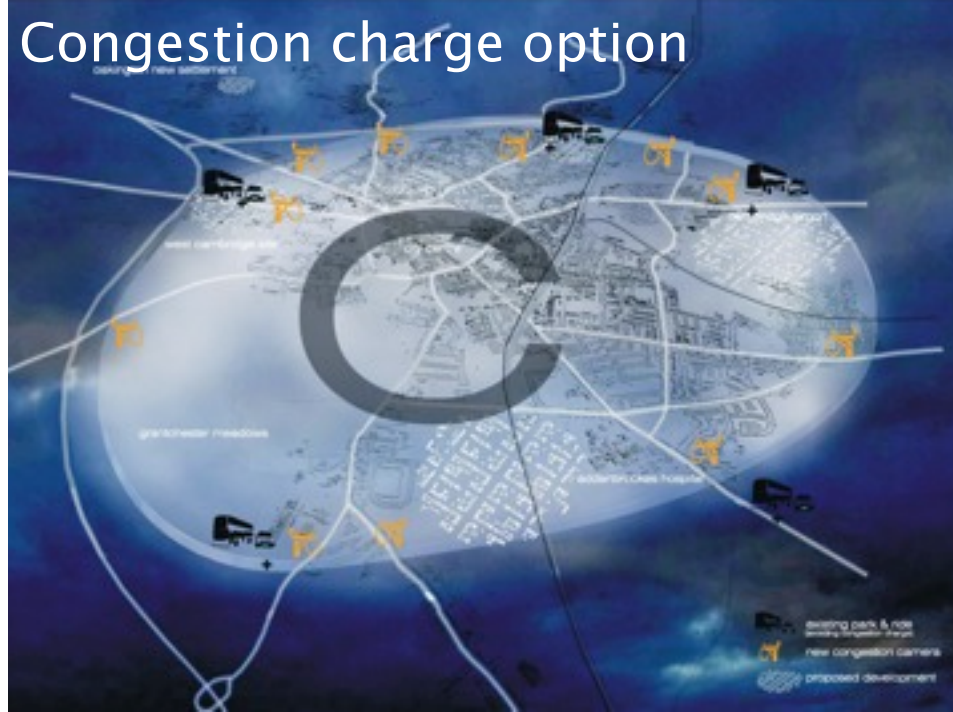
Cambridge Structure Plan – development areas and committed transport schemes



Public transport option



Congestion charge option



Combined option

Comparison of the options

Options	Key Indicators for Cambridge urban area			
	Economic		Environmental	
	Production costs		CO ₂ from traffic	
Rapid Transit system	- 6%	√√√	0%	-
Orbital highway	- 11%	√√√√	+16%	XXXXX
Road pricing	+ 11%	XXXX	-8%	√√√√
Combined option	- 11%	√√√√	0%	-

The Combined option would achieve similar economic benefits to highway expansion but without the increase in CO₂ emissions compared to the

trend
Key:

- √ better than the Reference Case
- x worse than the Reference Case

SOLUTIONS

SUSTAINABILITY OF LAND USE AND TRANSPORT IN OUTER NEIGHBOURHOODS



This research project followed Cambridge Futures – it takes a more scientific and systematic approach by applying a similar but more detailed method to different case study areas

Academic Partners



Prof. Marcial Echenique (Principal Investigator)
The Martin Centre, University of Cambridge



Prof. Hugh Barton (Co-investigator)
Faculty of the Built Environment, University
of the West of England



Dr Gordon Mitchell, Geography &
Institute for Transport Studies, University of Leeds



Dr Stephen Marshall
University College London



Prof. John Nelson, Transport Operations Research Group,
University of Newcastle

Non-academic Partners:

CAMBRIDGE: Cambridgeshire County Council;
Cambridge City Council; Cambridge Futures;
Cambridgeshire Horizons.

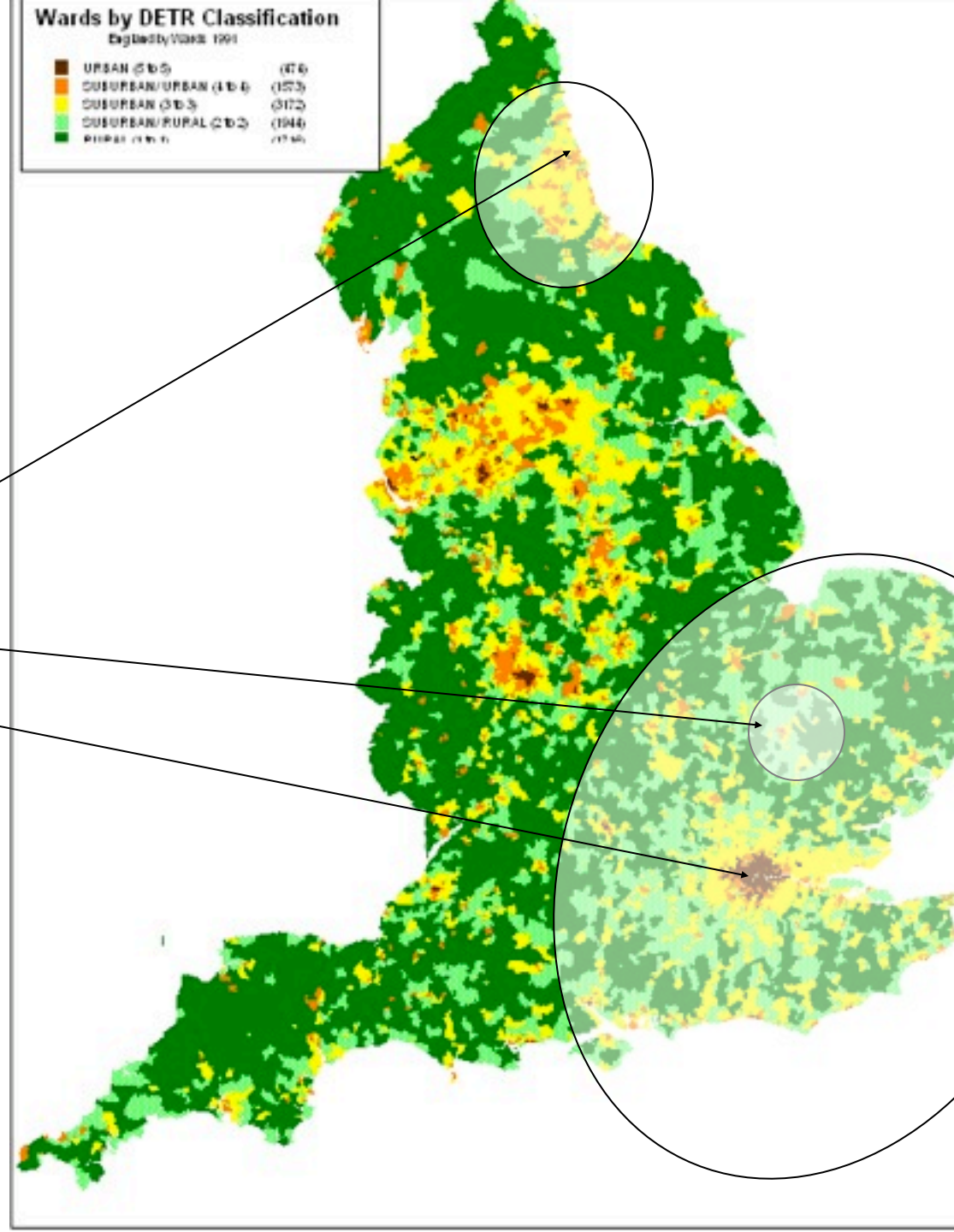
LONDON: Department for Transport; Communities &
Local Government; Transport for London; Thames
Gateway London Partnership.

TYNE & WEAR: North East Assembly

Highways Agency; Bristol City Council; Institution of
Civil Engineers.

INTERNATIONAL COLLABORATORS: 7 academics
representing overseas research institutions.

REFERENCE GROUP: 21 distinguished people with a
breadth of experience across the sectors and
disciplines of the project, acting in an advisory
capacity.

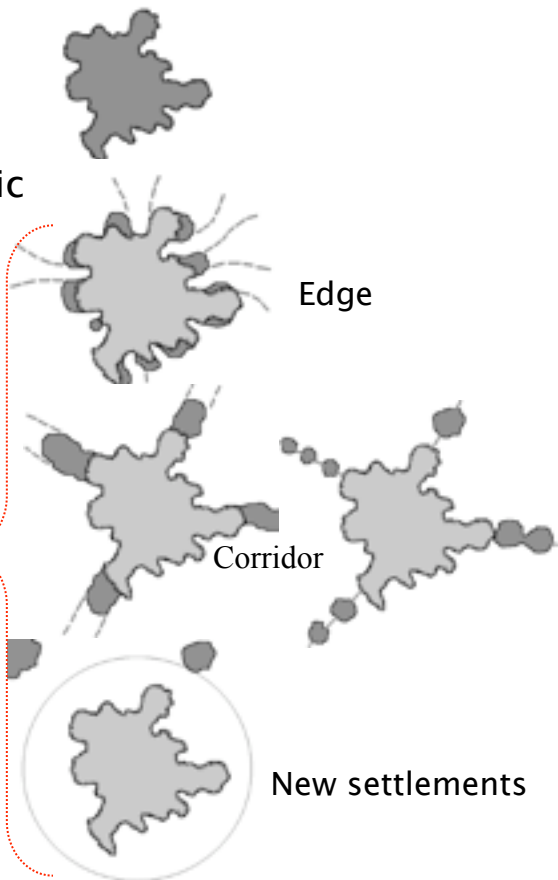


Three case study areas

Tyne and Wear city region
Cambridge sub-region
London & wider south east

Compaction

Investment in public transport



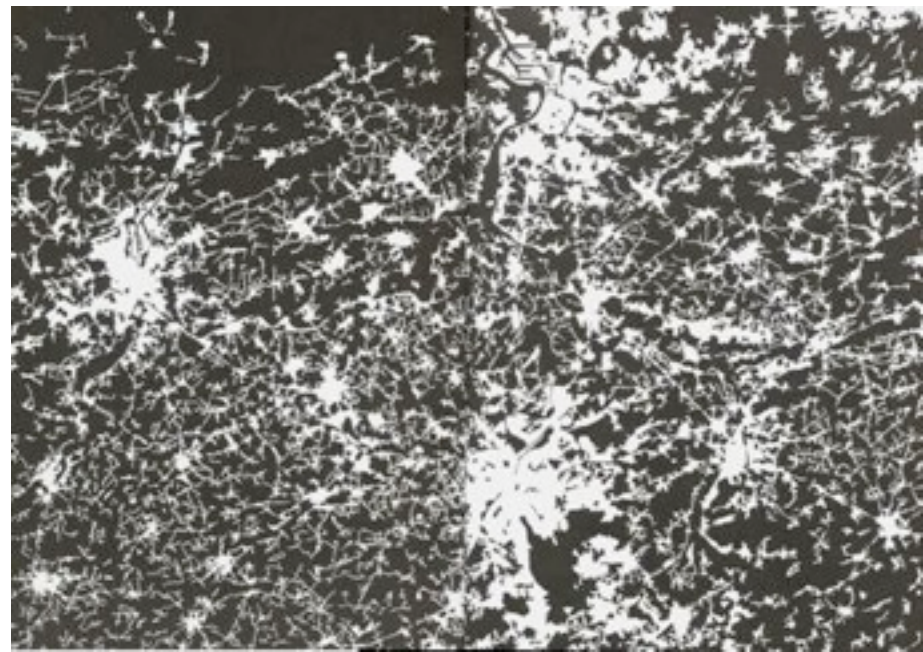
Planned Extensions

Dispersed
Investment in
highways



London Region

Flemish Region (de Geyter 2002)



DESIGN OPTIONS (Strategic)

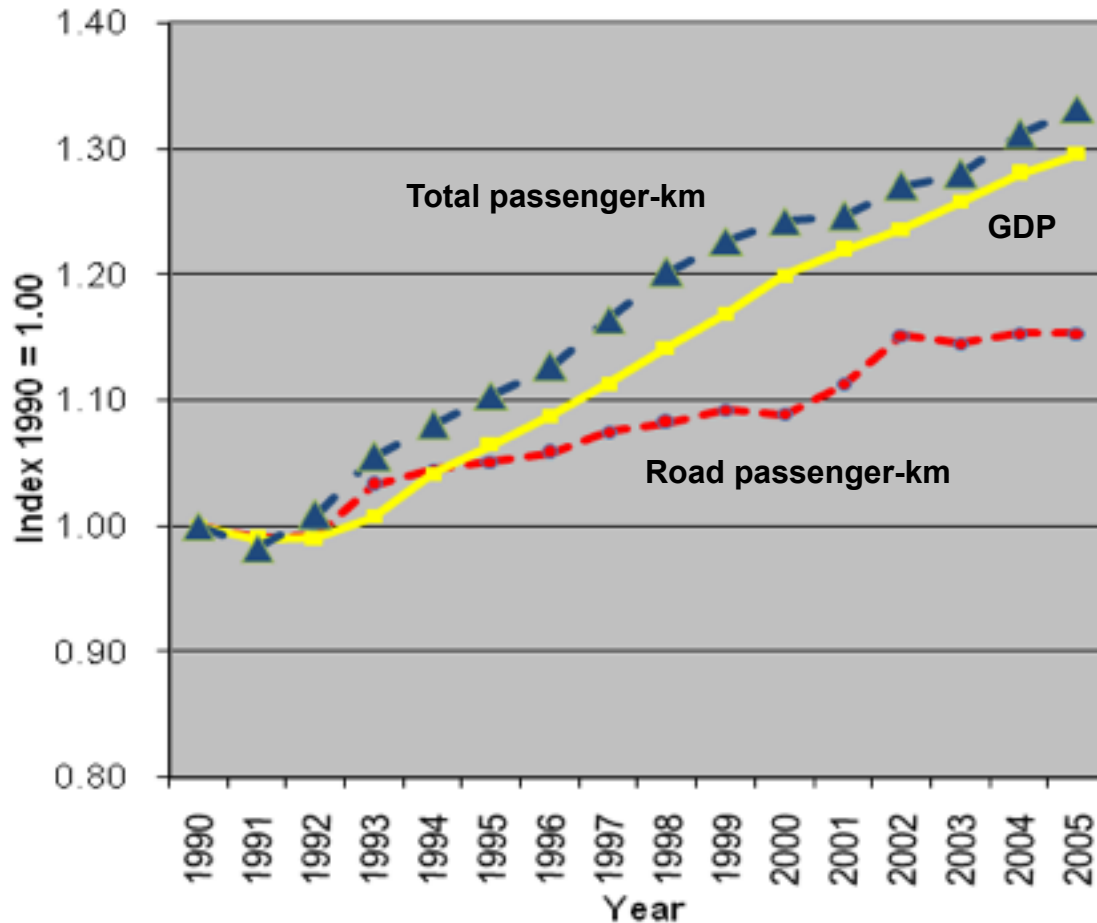
Comparison of results for passenger-km per mode



% change in passenger km compared to trend

- Compaction would reduce car veh.km by no more than 5% – extra crowding and congestion from compaction does not seem justified for such a small reduction in car travel
- Expansion would not increase car veh.km above the Trend, providing the expansion areas have employment and local services, good rail connections and local public transport, and designed to encourage cycling & walking.
- Dispersal would result in a substantial increase in veh.km for the Cambridge Sub region, (a more dispersed sub region would be a big change from the current mono-centric pattern and the differences between the options show up more clearly in this smaller case study area.).
- Results for all of the options depend on assumptions about the redistribution of land use and population.

Growth in total passenger-km (including air travel), Gross Domestic Product (GDP) and road travel



Mobility has social and economic benefits – how to provide mobility without the environmental impacts?

From Echenique, M. (2007). Mobility and Income. In *Environment and Planning A*, 39 (8): 1783-1789.

Source of data: International Civil Aviation Organization (2007), Department for Transport (2008), Office for National Statistics (2009)

ReVISIONS

ReGIONAL VISIONS of INTEGRATED SUSTAINABLE INFRASTRUCTURE OPTIMISED for NEIGHBOURHOODS

Academic Partners:



University of Cambridge



University of Leeds



University of Exeter



University of Surrey



Newcastle University



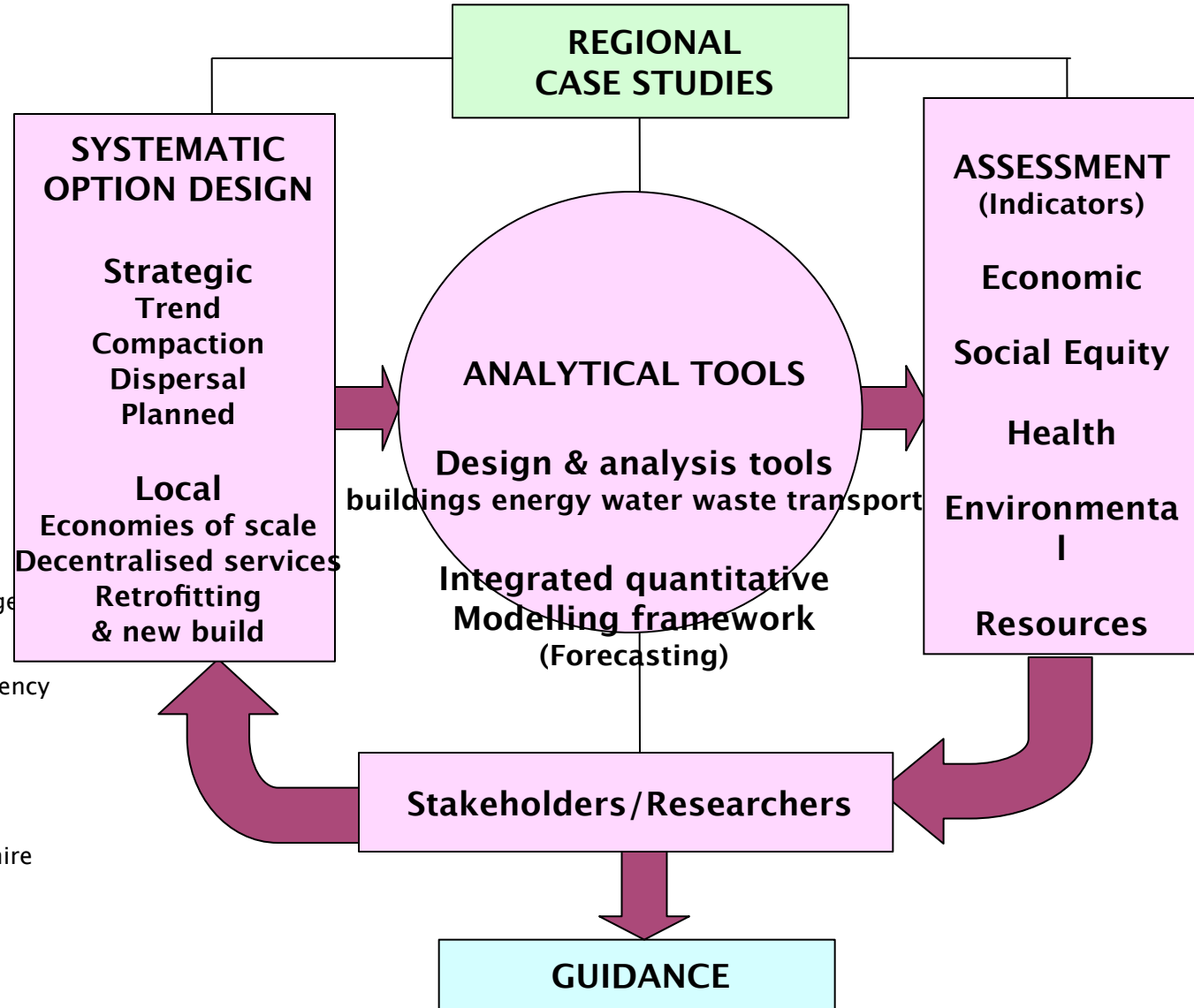
University of Aberystwyth

Non-academic Partners:

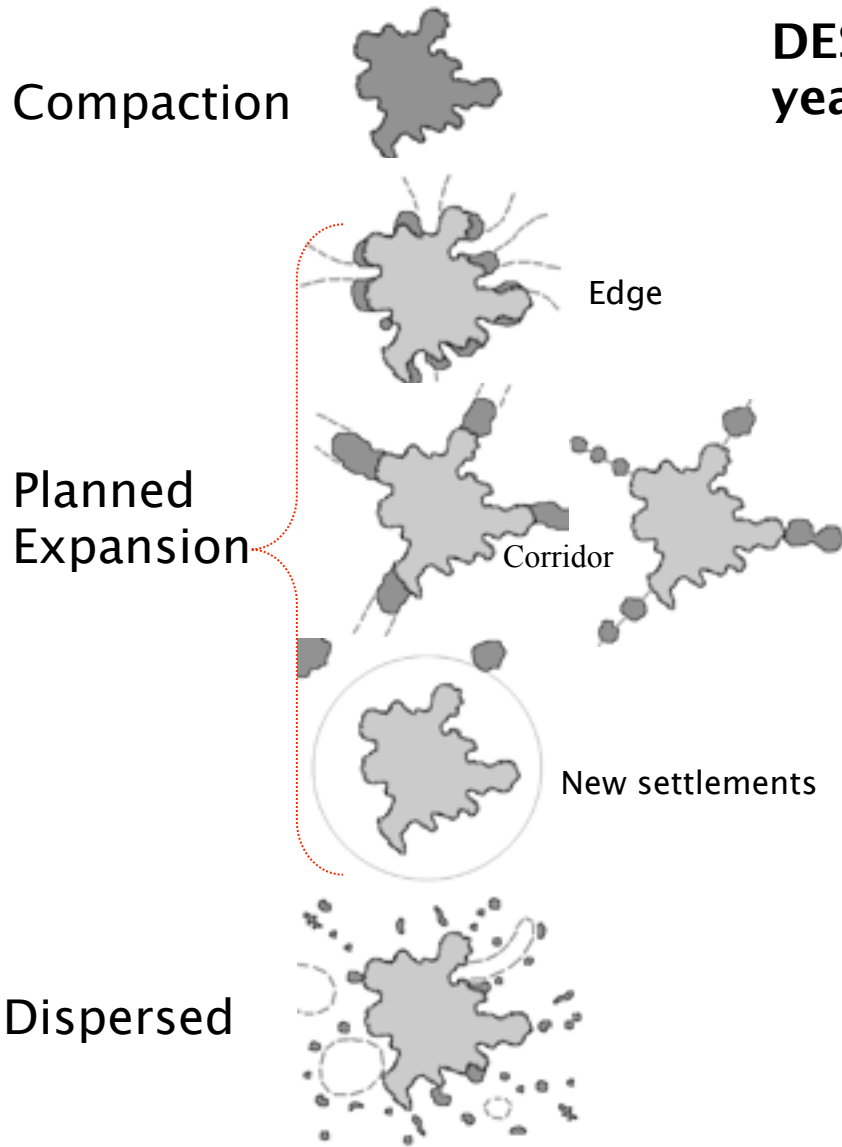
East of England Regional Development Agency
 East of England Regional Assembly
 North East Assembly
 ONE Northeast Regional Development Agency
 South East of England Regional Assembly
 Department for Transport
 Department for Communities and Local Government
 Arup, Biffa Water Services, Environmental Agency, Northumbrian Water Ltd., Yorkshire Water Services Ltd. and others.

International Collaborators:

University of Tsinghua, China
 University of Sao Paulo, Brazil
 University of Southern California, USA



Work in this project is still at an early stage – results expected by 2012



DESIGN OPTIONS to be tested up to year 2051

What infrastructure technologies for Buildings, energy, transport, water and waste?

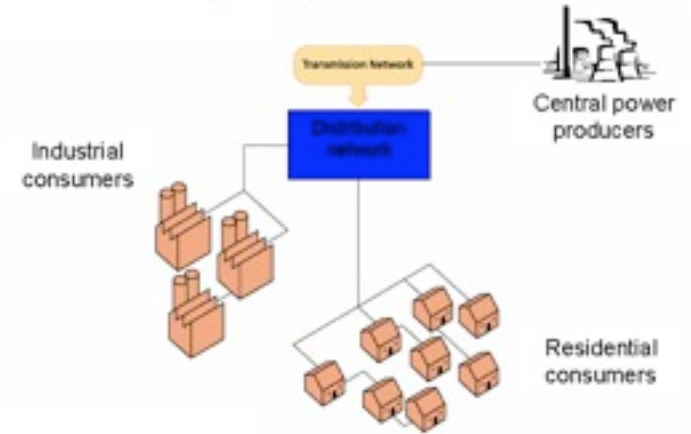
Which urban forms are the most sustainable?

Does urban form facilitate or hinder the introduction of green technologies?



Image by Ink3D

Conventional power system (Source: Ofgem)



**Centralised systems
– economies of scale?**



Image by URS



Eco-village combining agriculture, high tech industry and low energy housing



Designing Cities of the Future



With decentralised energy (Source: Ofgem)



Decentralised systems – more use of renewables?

Eco-town: Northstowe

Energy micro-generation

- Solar
- Wind
- Geo-thermal
- Waste processing

Water

- Harvesting
- Reuse
- Grey water recycling

Waste

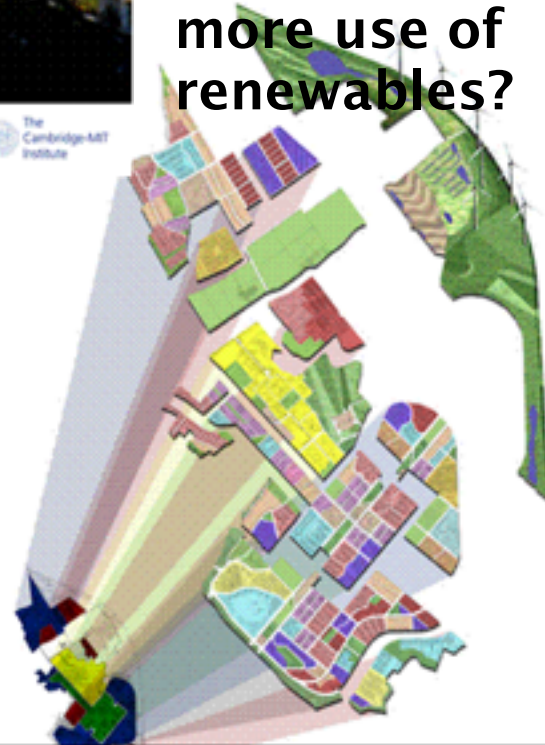
- Processed on site
- Use for energy
- Recycling

Transport

- Local cycling/pedestrian
- Long distance (regional centre by Public transport, elsewhere by car)

Materials

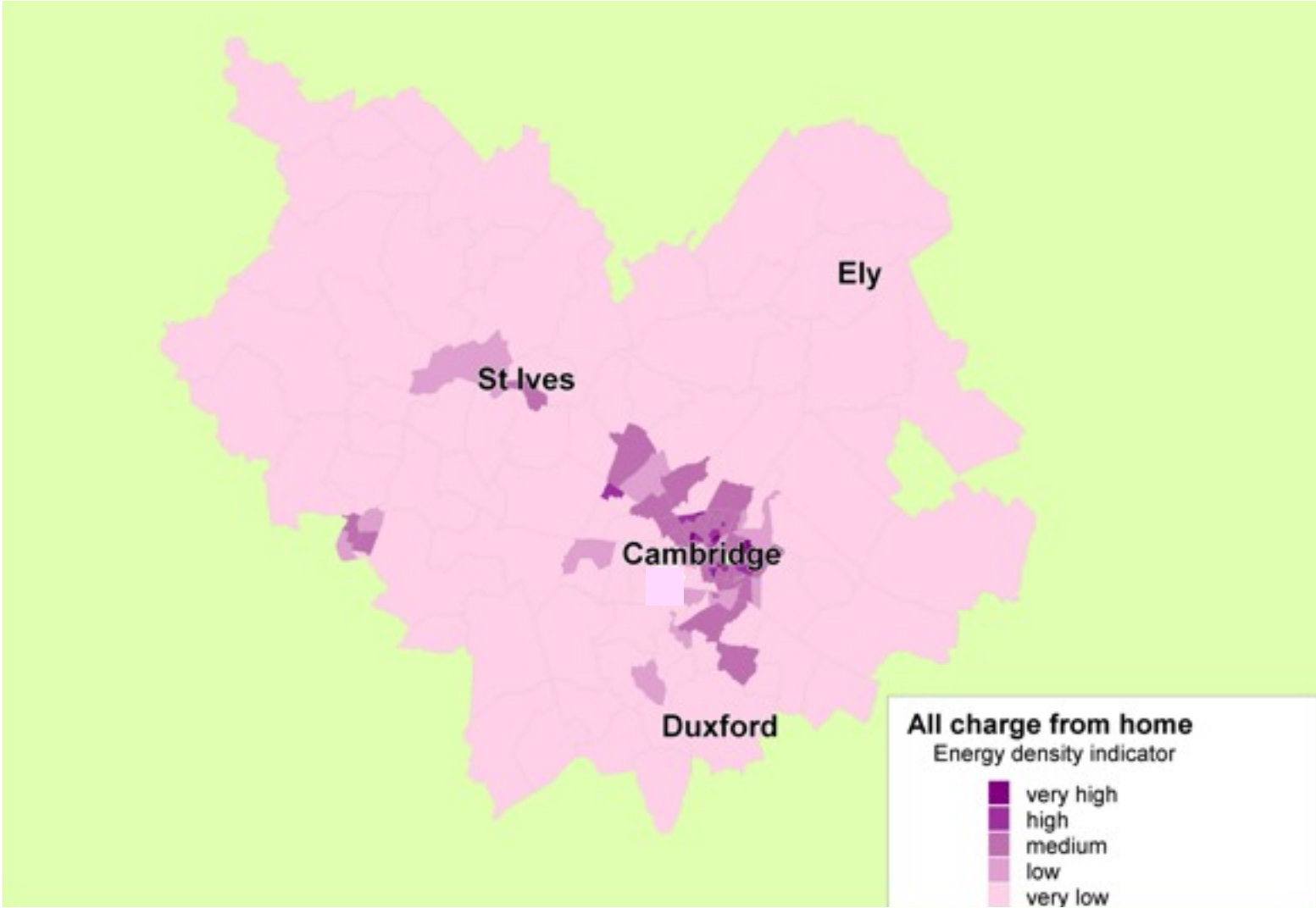
- Renewable (e.g. timber)
- Self built or kit assemblage possibilities



Designing Cities of the Future



Density of energy demand for Cambridge assuming that cars are charged at home



Transport solutions?

- An integrated package of measures is required including demand management
- A compact city policy is not the answer for reducing car use.
- Mobility has social and economic benefits.
- The car will remain the dominant mode of travel for the foreseeable future.
- Need to reduce the environmental impacts of car travel.
- Now researching how spatial planning strategies – such as density, settlement size etc

End, thank you.

ReVISIONS

www.regionalvisions.ac.uk

SOLUTIONS

www.suburbansolutions.ac.uk



www.cambridgefutures.org