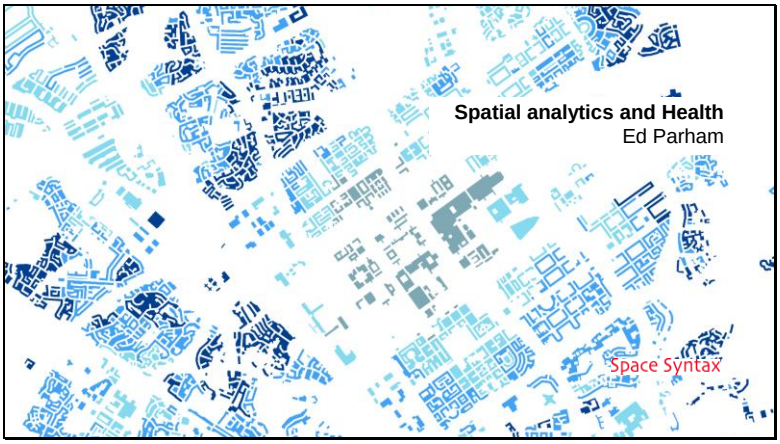
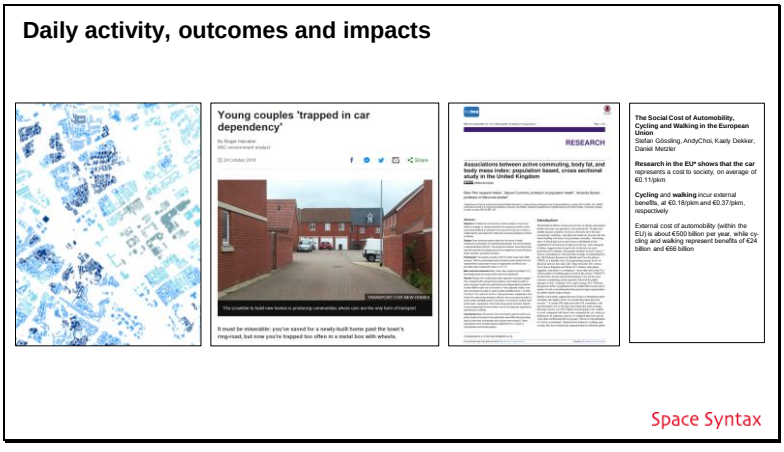
Spatial analytics and health

Space Syntax

Ed Parham

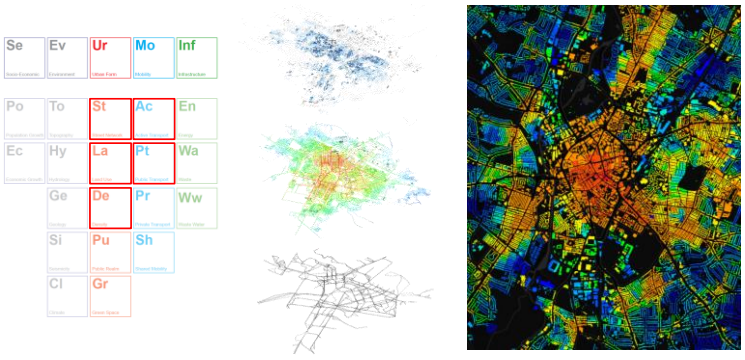


- UCL spin out
- 30 years old
- 25 people
- Emerged from architecture and planning but interested in how people interact with, and are influenced by, the built environment.



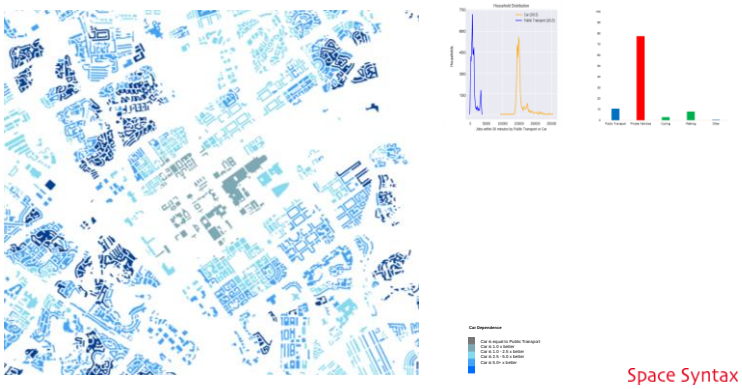
- Built environment affects daily activity – e.g. transport behaviour.
- Transport behaviour impacts health.
- Costs society.
- Built environment can be modelled/analysed before built.

Integrated Urban Models



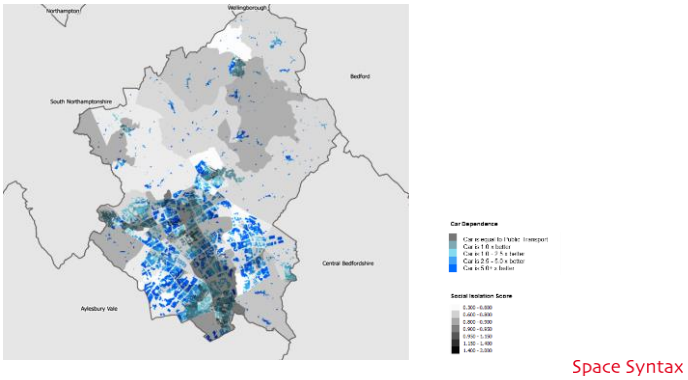
- Models use strategic data available nationally.
- Streets/pedestrian routes, land use, public transport.
- Model analyses how these systems interact from point of individual house and view of person.
- E.g. how walkable is my area?
- Structured so that can be combined with other datasets (e.g. census).

Place risk Car Dependence



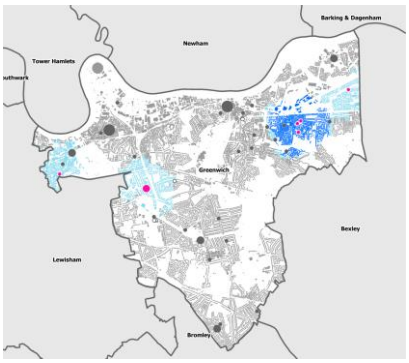
- Measure of car dependence.
- Describe existing condition.
- Understand in relation to current behaviour.
- Scenario test future conditions.

Place and Demographic risk Social isolation in elderly people



- Link to additional datasets.
- Run other models to see vulnerable communities.
- See overlap between “place risk” and “demographic risk”.
- Prioritise areas to look at.
- Understand how built environment systems contribute and think about how to address or mitigate.
- Might be physical change, but might be service delivery, or behaviour change.

Access to health services Capacity and Quality of service



Choice of accessible services, capacity and quality from every house.

Number of GPs per 1,000 registered patients
0.63 – 5
5 – 10
10 – 15

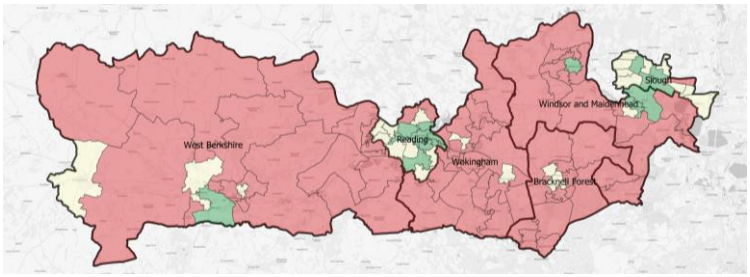
Overall satisfaction percentage
< 75%
≥ 75%

Number of GPs within 15 minutes walk
0
1
2 or more
78%
15%
7%

Space Syntax

- Can link to other open data
- View from point of user, and point of system.
- Not just am in a catchment, but what is the capacity, how happy are patients?

Place and travel behaviour Active Travel (MSOA & LSOA)

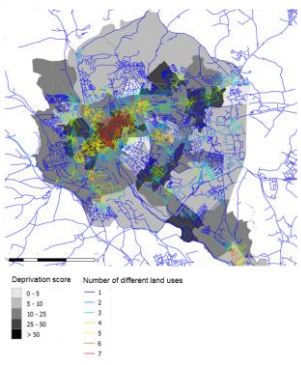


Predict No Car Ownership
Commute by Public Transport
Commute by Active Transport

Space Syntax

- Across Thames Valley produced models that describe transport behaviour.
- Predict No Car Ownership, and commute by Active Transport and Public Transport r2 0.76-0.88.
- Includes built environment and socio economic inputs.
- Stronger correlation to environmental variables than income – shows people in some areas can afford cars but choose not to.
- Was meant to be obesity risk model but couldn't get data.

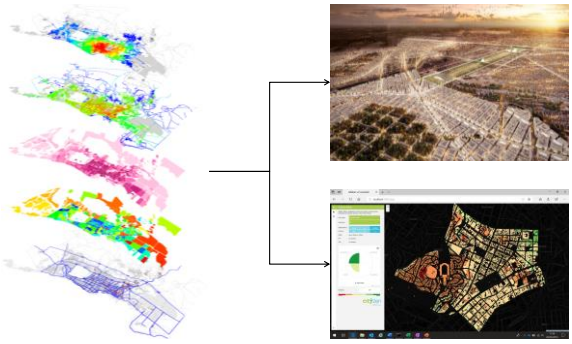
Place and long-term outcomes Obesity



Space Syntax

- NHS healthy new towns experience - Cranbrook/Exeter
- Exeter Public Health identified correlation between walkability index and obesity.
- Causation/correlation – can't guarantee an outcome, but see where environment makes something possible or not.

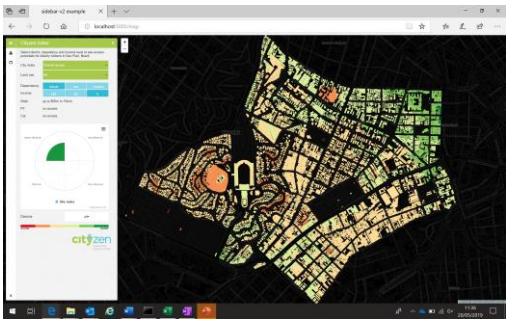
Design better new places and better manage existing places



Space Syntax

- In SSx use models in two ways:
- Design better new places that make behaviours possible;
- Use analysis to manage existing places better.

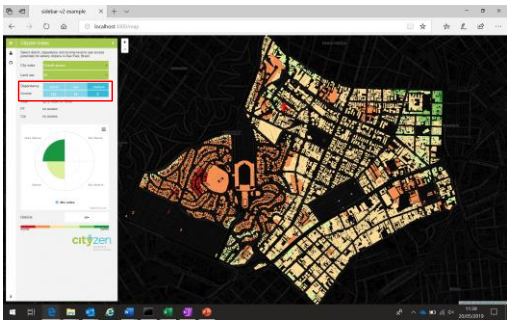
CityZen Explorer



Space Syntax

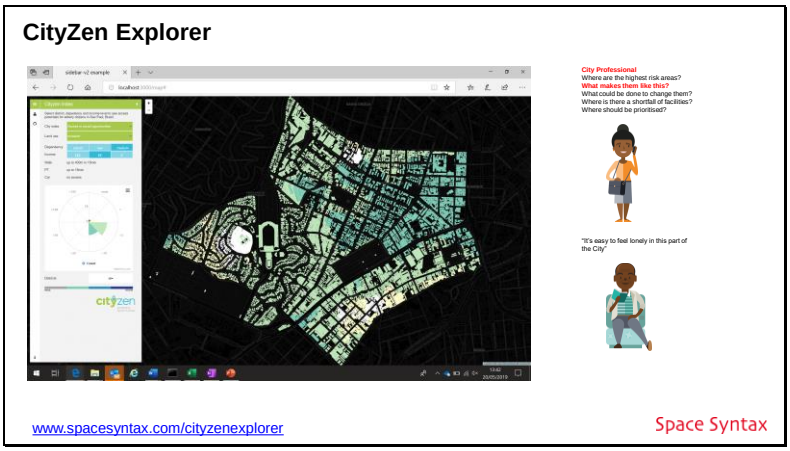
- IUK/Newton Fund project – CityZen – aimed to improve lives of elderly people in cities
- SSx aimed to remove technical barriers so that Sao Paulo city staff can draw insights from model/analysis.
- FCC engaged with city staff and elderly people.
- SSx developed tool to help answer questions of city staff while considering views of elderly.
- Created measures that consider income and physical health.

CityZen Explorer

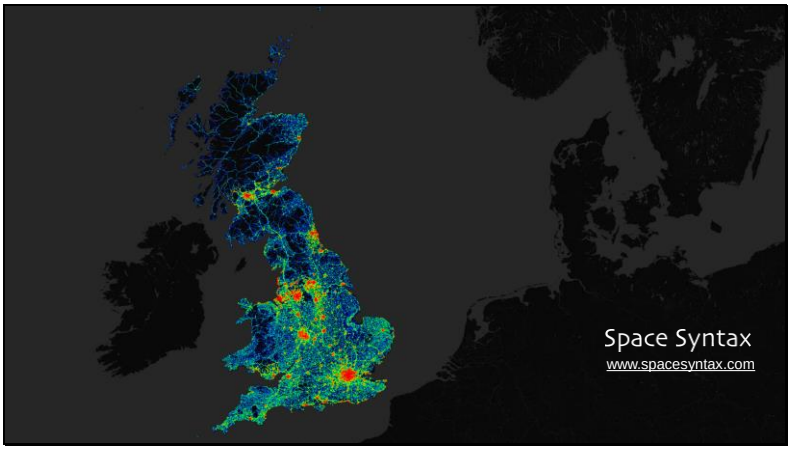


Space Syntax

- Indices on liveability – made up from (planned and unplanned) opportunities for social interaction, physical activity, access to health facilities, and public transport.
- Look at indices and contributors in more detail to see areas of highest risk, then what missing and consider how to respond.



- Tool accessible and online at address on slide.



- IUM pre-processed and available across GB.
- Interested in exploring how we can use it in practice, particularly in relation to health outcomes.