Institute for Transport Studies  
FACULTY OF ENVIRONMENT

Designing Walkable Environments:  
The impact of urban form on pedestrian perception  
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Background

• Carfree UK’s contribution to the Eco-towns programme
• Importance of walking in urban areas
  – for local trips
  – Access to public transport
  – Public health (NICE, 2008)
Designing Walkable Environments

• Need to understand walking in cities to promote modal shift

• Many attempts made to design residential areas to promote walking
• How do we design urban environments that make walking the natural means of movement?
  – Which characteristics of the urban environment impact most significantly on pedestrians?
  – Relationship to Space Syntax
  – Relationship to New Urbanist ideas
Background

• Links between urban form & walking
  – land use and walking (Boarnet et al., 2008)
  – qualitative or index measures of the urban environment (Alfonzo et al., 2008)
  – Video “walks” through different streets (Ewing et al., 2009)

• …but arguably little of practical use to an urban designer
Making the Link

- Walking-Urban Form link investigated since the start of mass motorisation.
- Radburn, 1920s – separate walking and vehicle routes (Gosling, 2002; Radburn Association, 2006).
- Approach used in British New Towns (Gibberd, 1980; CNT, nd) and beyond (Buchanan, 1963).
• Separate networks as problematic (Jacobs, 1961; DfT et al., 2007) – personal safety issues

• Problems of US low density suburbs & car dependence

• ‘New Urbanism’ solution to ‘walkability’ (Erenhalt, 2008; Katz, 1994; Kelbaugh, 2008) – now being applied in UK, not entirely successfully (Melia, 2008; Hall, 2008)
What do we (think we) know?

- How people perceive urban space
- How perception works
  - Gibson (1958)
- What people think is good or bad about their environment
  - Cao et al. (2006) and others
We live in a perceptual bubble – How do we see the world?

Previous approaches do not focus on the interface between people and the urban environment.
Experiencing Space

a model of the fuzzy darkness of the brain & how it interacts with the world around it

butchered from Gibson (1958) and Ajzen (1991)
• **Urban Morphology** – define distinct, homogenous blocks of development – ‘Urban Landscape Units’ (Kropf, 1993; Osmond, 2010; Whitehand, 2009)

• **Space Syntax** (Hillier, 2004) – approach to identify how connected streets are to the whole network (‘integration’), correlative with pedestrian activity
Design Feedback

Post-Occupancy Evaluation (Malin, 2007)

[review]

plan

[review]

design

Masterplan sustainability evaluation tools (Clements-Croome, 2010)

occupy

build
Method

• Challenge
  – Use this information to produce a study method
  – Make the method valid & the results useful
  – Bridge existing work across disciplines with the needs of planners, designers and users
Street Level Approach

• Other studies

  – Video based survey
    (Ewing et al., 2009)
  
  – Space Syntax (eg Hiller, 2004; Rafailaki, 2006)
  
  – Physiological impacts
    (Nold, 2008)
  
  – Quality ratings & contingent valuation (Tight et al., 2004)
  
  – Walk-along interviews
    (Carpiano, 2009)
Study Design

• Ideas tested & rejected
  – Folksonomic tagging of photos of streetscapes (we can do this post-hoc)
  – Being led by respondent (life history, less control over where we go)
  – Simulated environment (difficult & time consuming to create – easy to miss important aspects)
Method

• Urban Form Analysis
  – Morphological Analysis, determination of Urban Landscape Units
  – Selection of representative ULU types
  – Space Syntax analysis to find route

• Walk along interview
  – Relate perceptual to cartesian space
  – Geocode responses and relate to urban form characteristics
Overlay perceptions of the urban environment
...on that urban environment

- pedestrian
- urban form
- base layer

- Base Mapping
- Building Heights
- Street Network

- Split into Urban Landscape Units

- Space Syntax

- Determine Walking Routes

- Walking Interviews

- Geocoded Perceptual Responses

- Compare Between People & ULUs

- responses to the environment pinned to the points in space where they occurred
Current Status

• Urban Form Analysis
  – GIS development
  – Identification of Urban Landscape Units

• Walk along interviews
  – Initial piloting
  – Design of final experiment
Outcomes

• Link between people’s feelings about a space and its spatial characteristics

• Comparisons between areas based on morphologically based typology

• Ideas for developing design guidance, for example in the Eco-towns
References


• Hillier, B. (2004). *Space is the machine*. Space Syntax.


