Institute for Transport Studies

FACULTY OF ENVIRONMENT

UNIVERSITY OF LEEDS

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

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ITS

- Carfree UK's contribution to the Eco-towns programme

- Importance of walking in urban areas

  - for local trips

  - Access to public transport

  - Community cohesion (cf. Appleyard, 1981; Jacobs, 1961)

  - Public health (NICE, 2008)

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- Need to understand walking in cities to promote modal shift

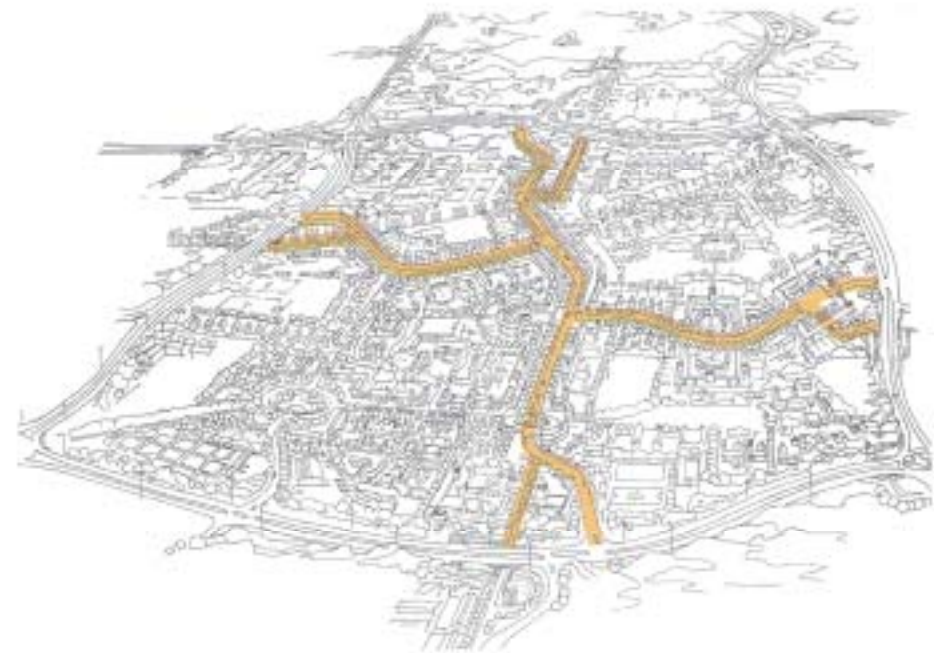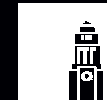- Many attempts made to design residential areas to promote walking

Figure 9 Theoretical Illustration of the Main Local Route System

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- 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

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- 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

- 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)

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- 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)
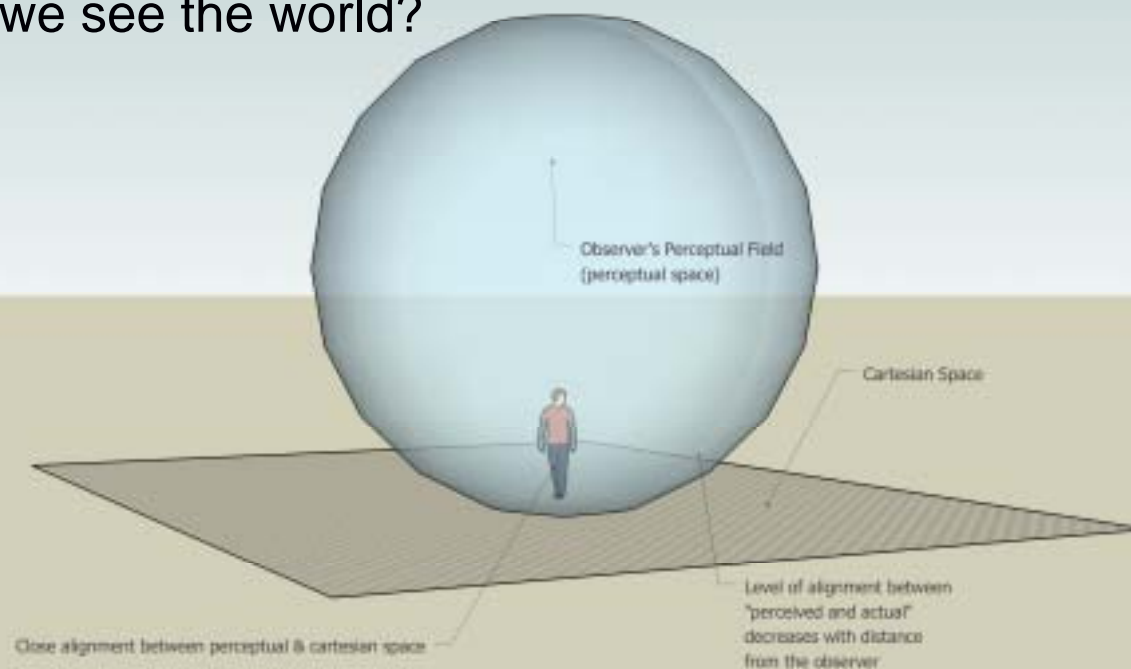

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- How people perceive urban space
  - Lynch (1960), Hillier (2004)
- How perception works
  - Gibson (1958)
- What people think is good or bad about their environment
  - Cao et al. (2006) and others

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We live in a perceptual bubble –
How do we see the world?

Observer's Perceptual Field
(perceptual space)

Cartesian Space

Level of alignment between
"perceived and actual"
decreases with distance
from the observer

Close alignment between perceptual & cartesian space
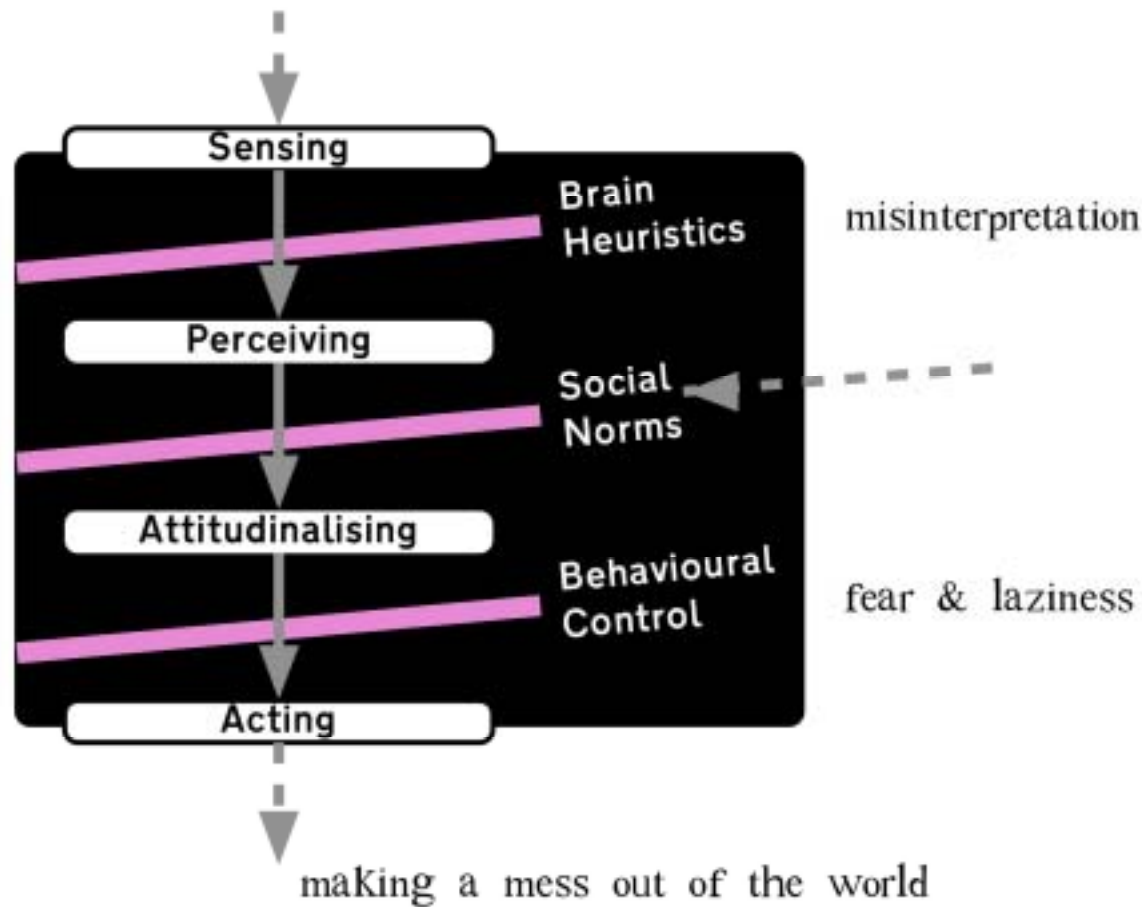
Previous approaches do not focus on the **interface** between people and the urban environment

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

Sensing

Brain Heuristics

misinterpretation

Perceiving

Social Norms

Attitudinalising

Behavioural Control

fear & laziness

Acting

making a mess out of the world

butchered from Gibson (1958) and Ajzen (1991)

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- **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
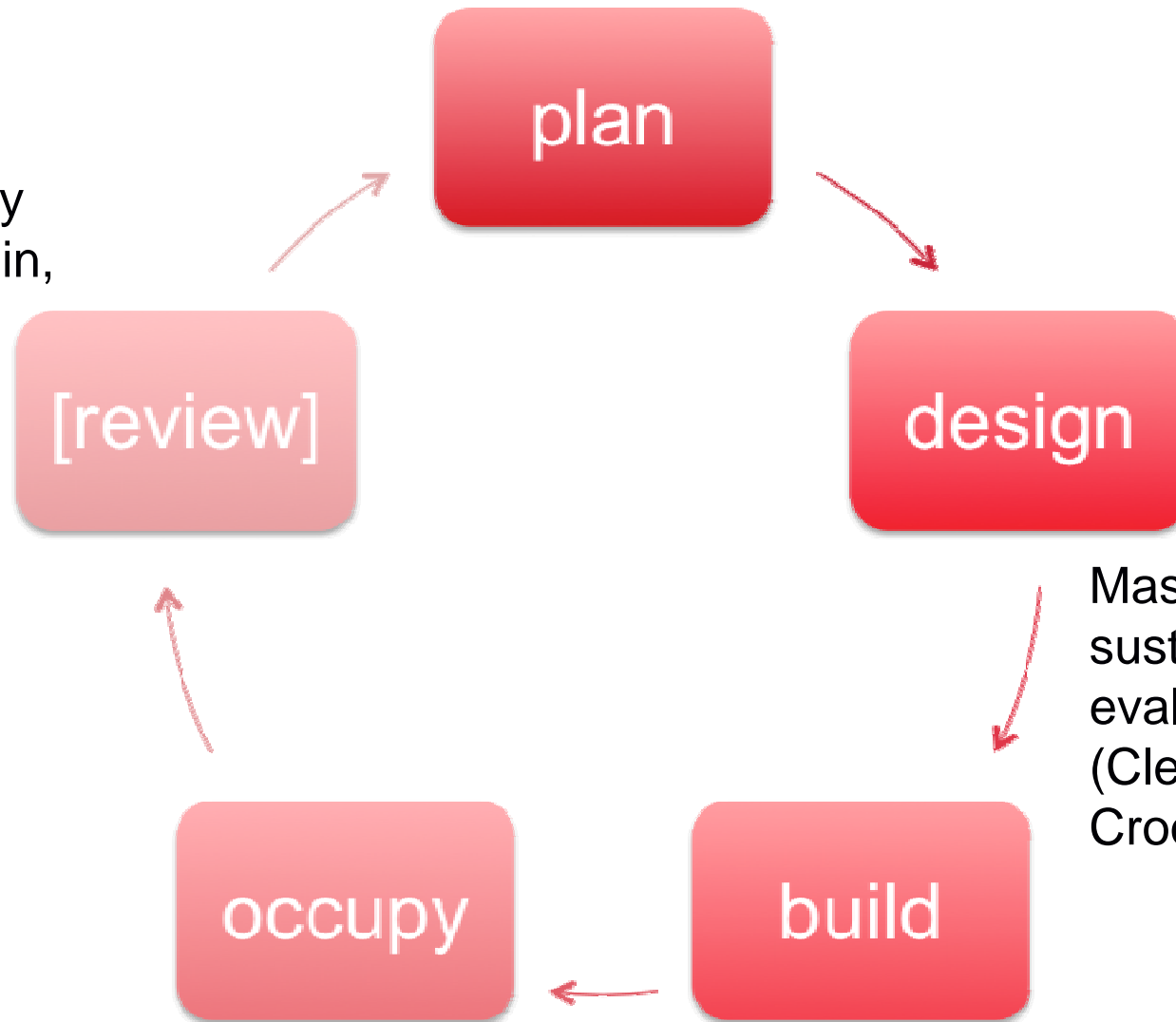

Ruth Conroy Dalton

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Design Feedback

Post-Occupancy
Evaluation (Malin,
2007)

plan

design

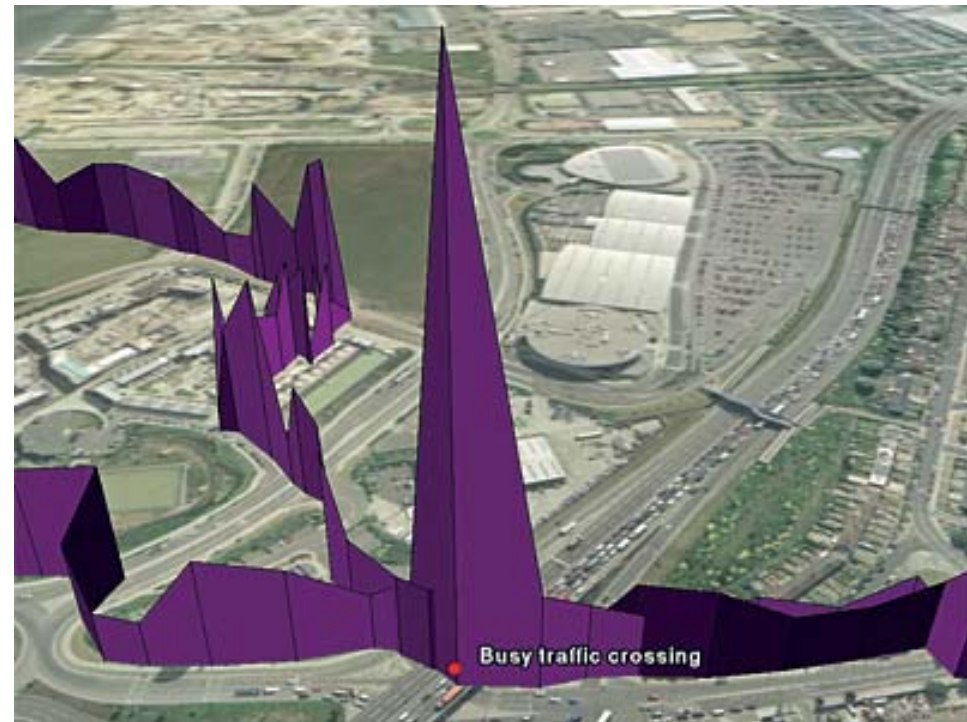[review]

occupy

build

Masterplan
sustainability
evaluation tools
(Clements-
Croombe, 2010)

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- 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

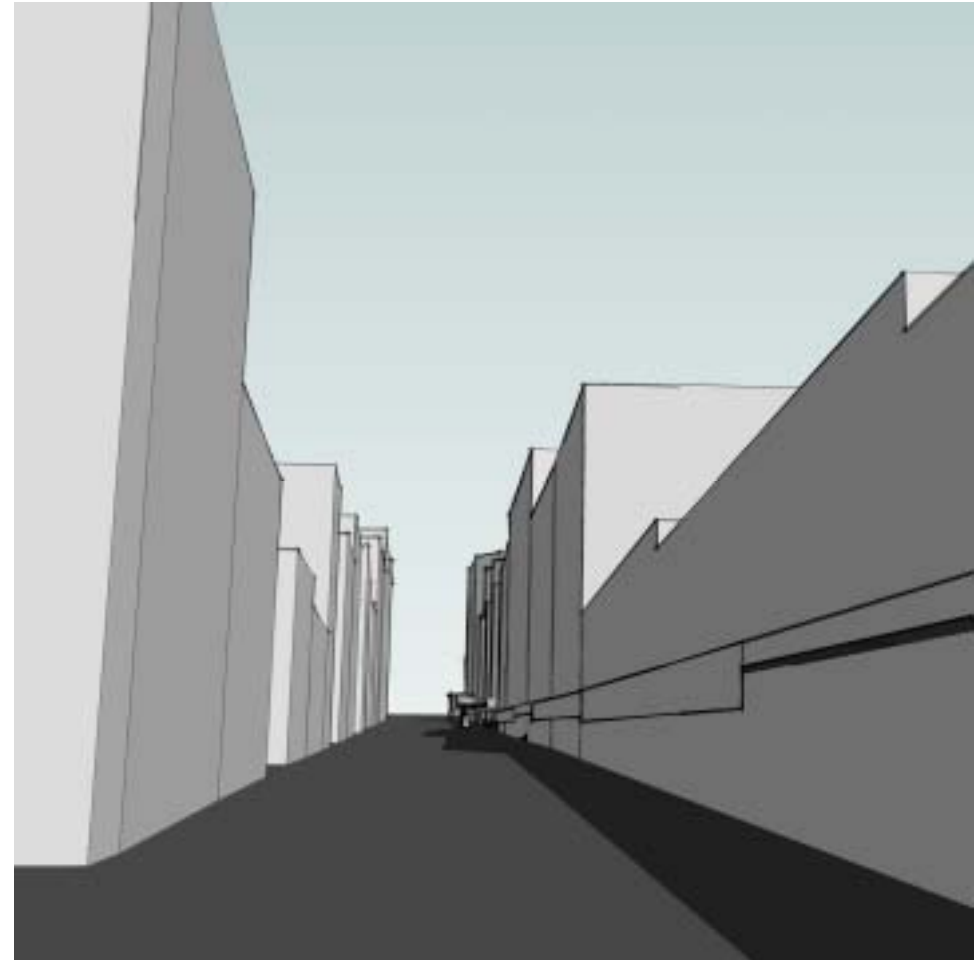

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Street Level Approach

- 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)

Busy traffic crossing
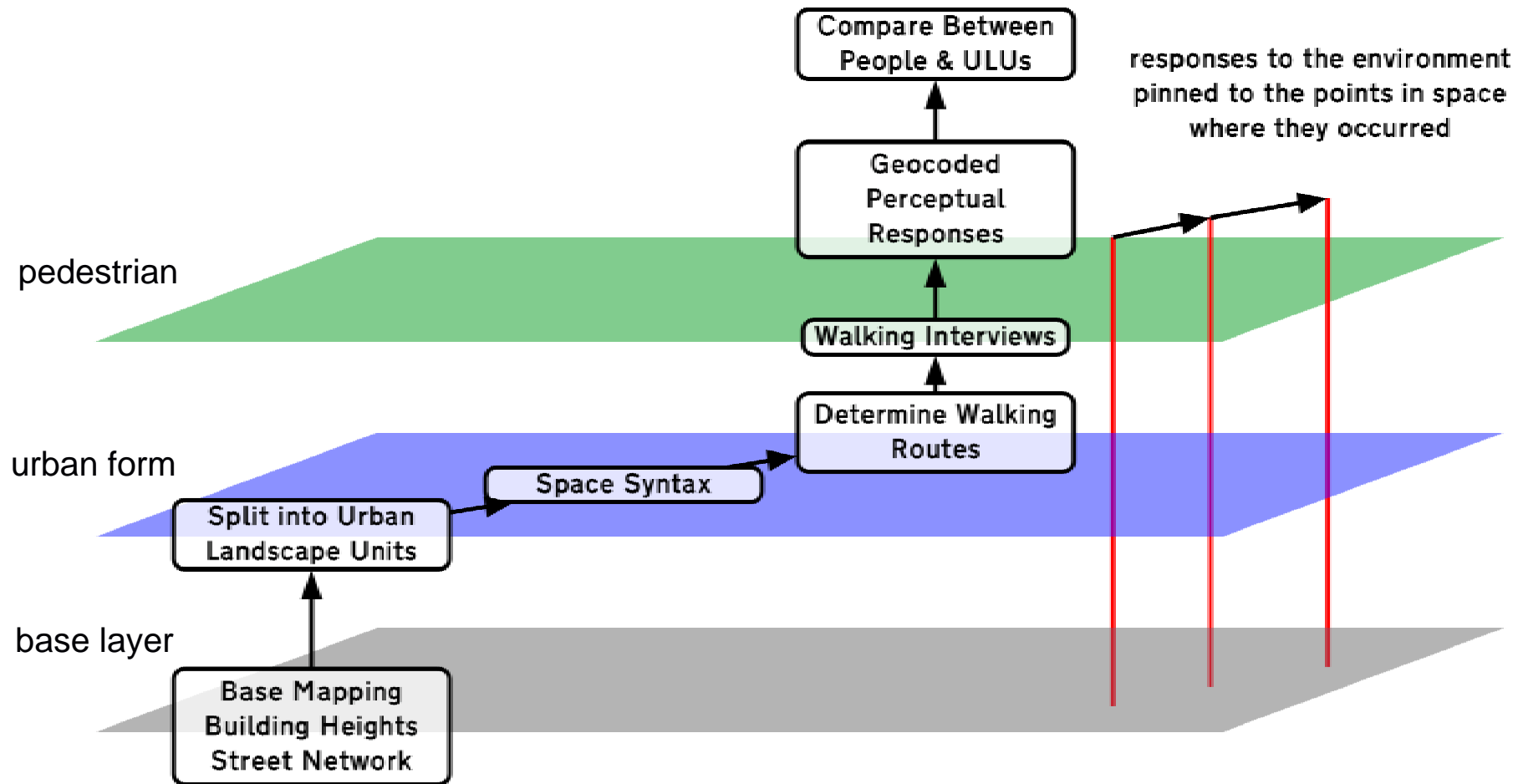
from Nold (2008)

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- 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)

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- 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

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Layers

Overlay perceptions of the urban environment
...on that urban environment

responses to the environment
pinned to the points in space
where they occurred

Compare Between People & ULUs

Geocoded Perceptual Responses

Walking Interviews

Determine Walking Routes

Space Syntax

Split into Urban Landscape Units

Base Mapping Building Heights Street Network

pedestrian

urban form

base layer

ITS

- ## Urban Form Analysis

  - GIS development

  - Identification of Urban Landscape Units

- ## Walk along interviews

  - Initial piloting

  - Design of final experiment

ITS

- 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

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