Community severance – the barrier effect of busy roads

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Street Mobility and Network Accessibility project team

www.ucl.ac.uk/street-mobility

@StreetMobility

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E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Arts & Humanities Research Council

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Mapping for Change

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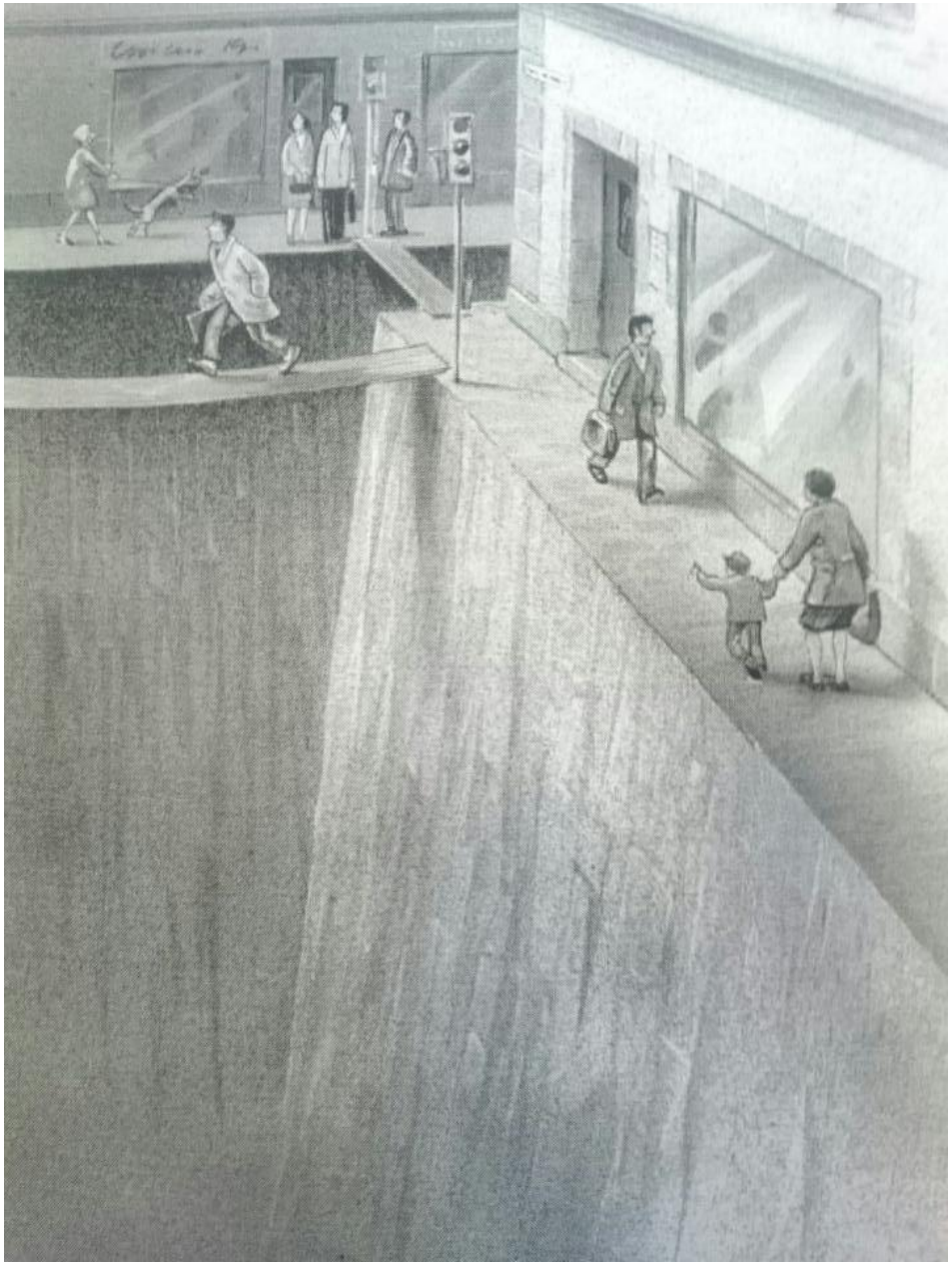
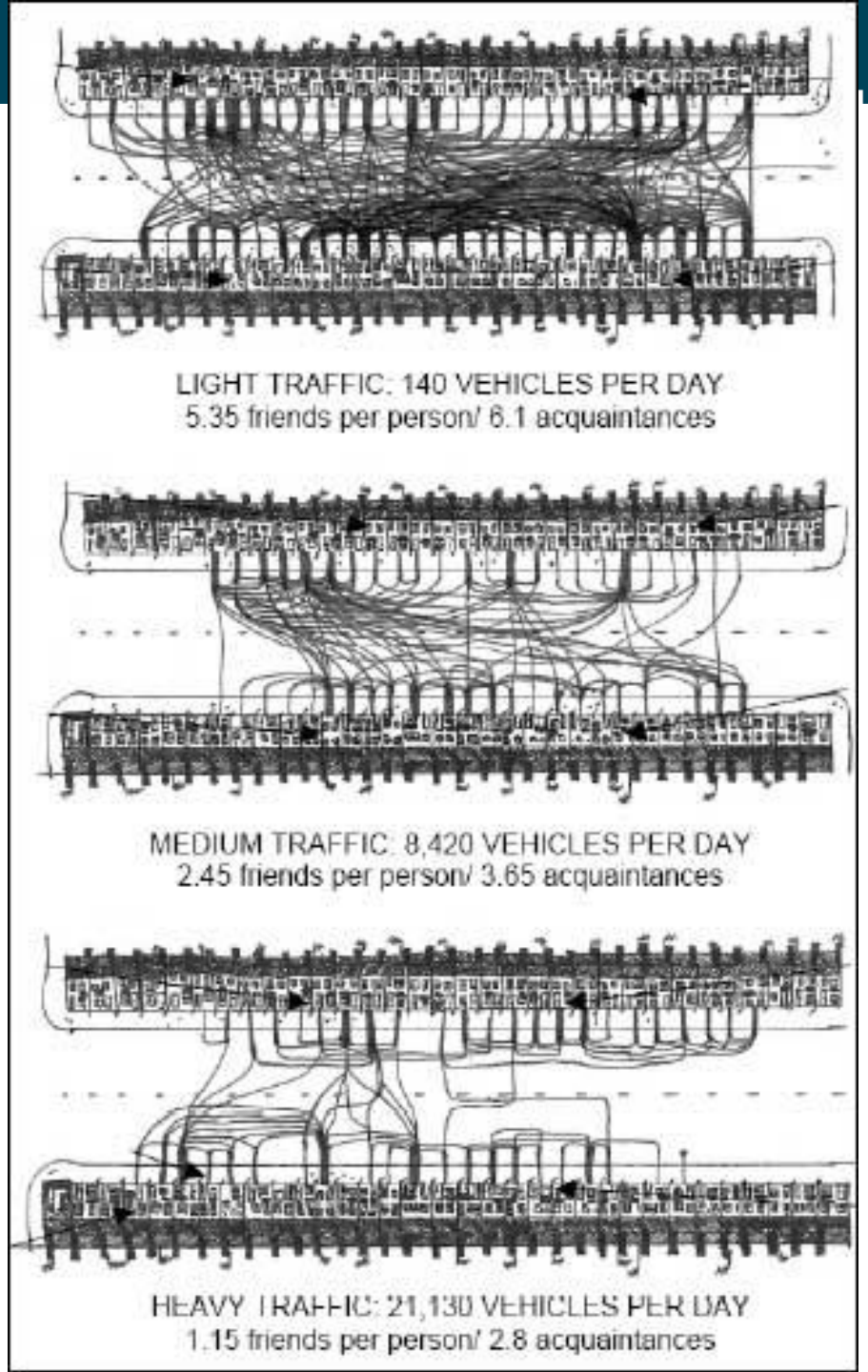
mapping for change

WHAT IS COMMUNITY SEVERANCE?

THE BARRIER EFFECT OF BUSY ROADS

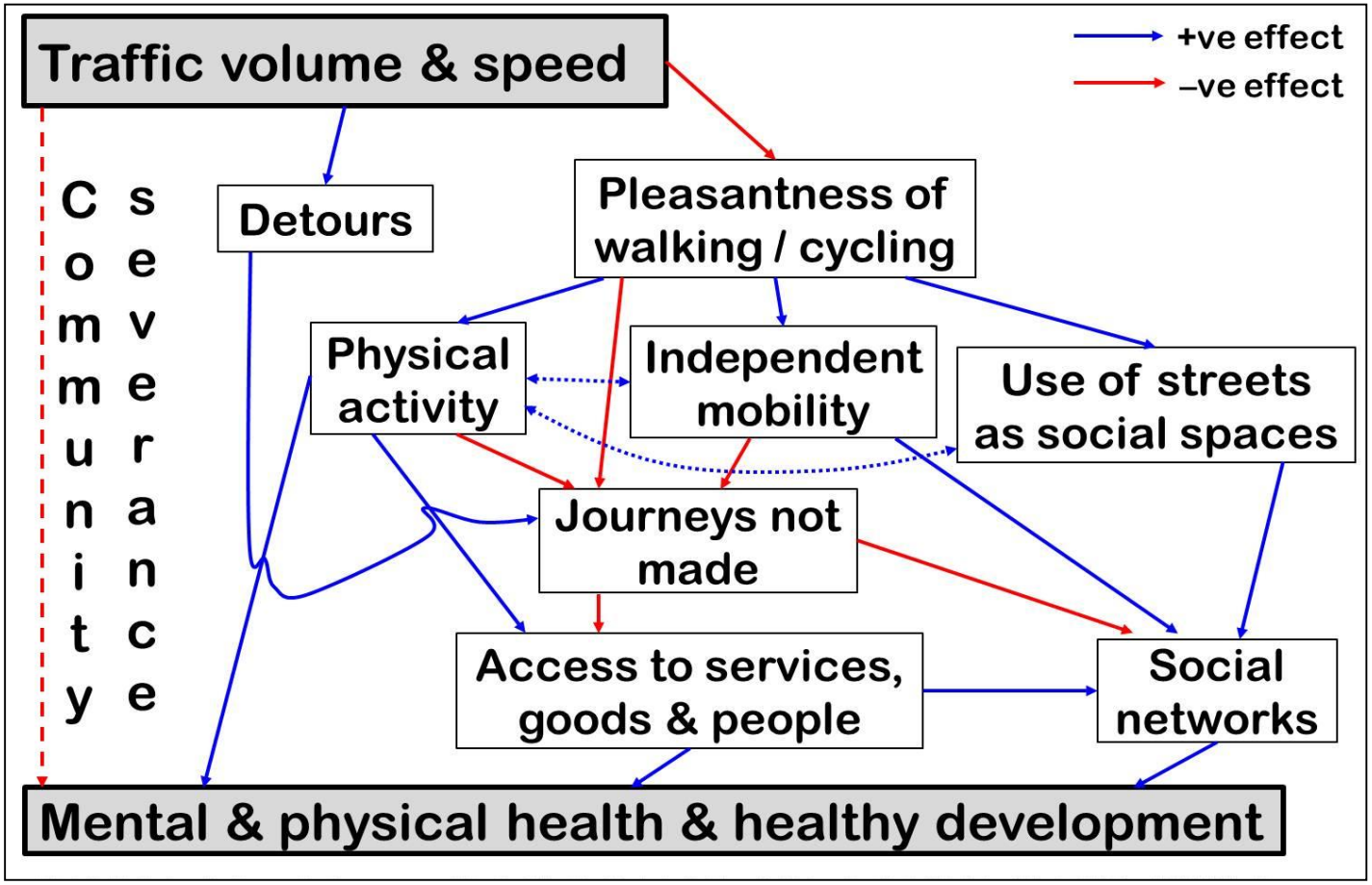


Community severance



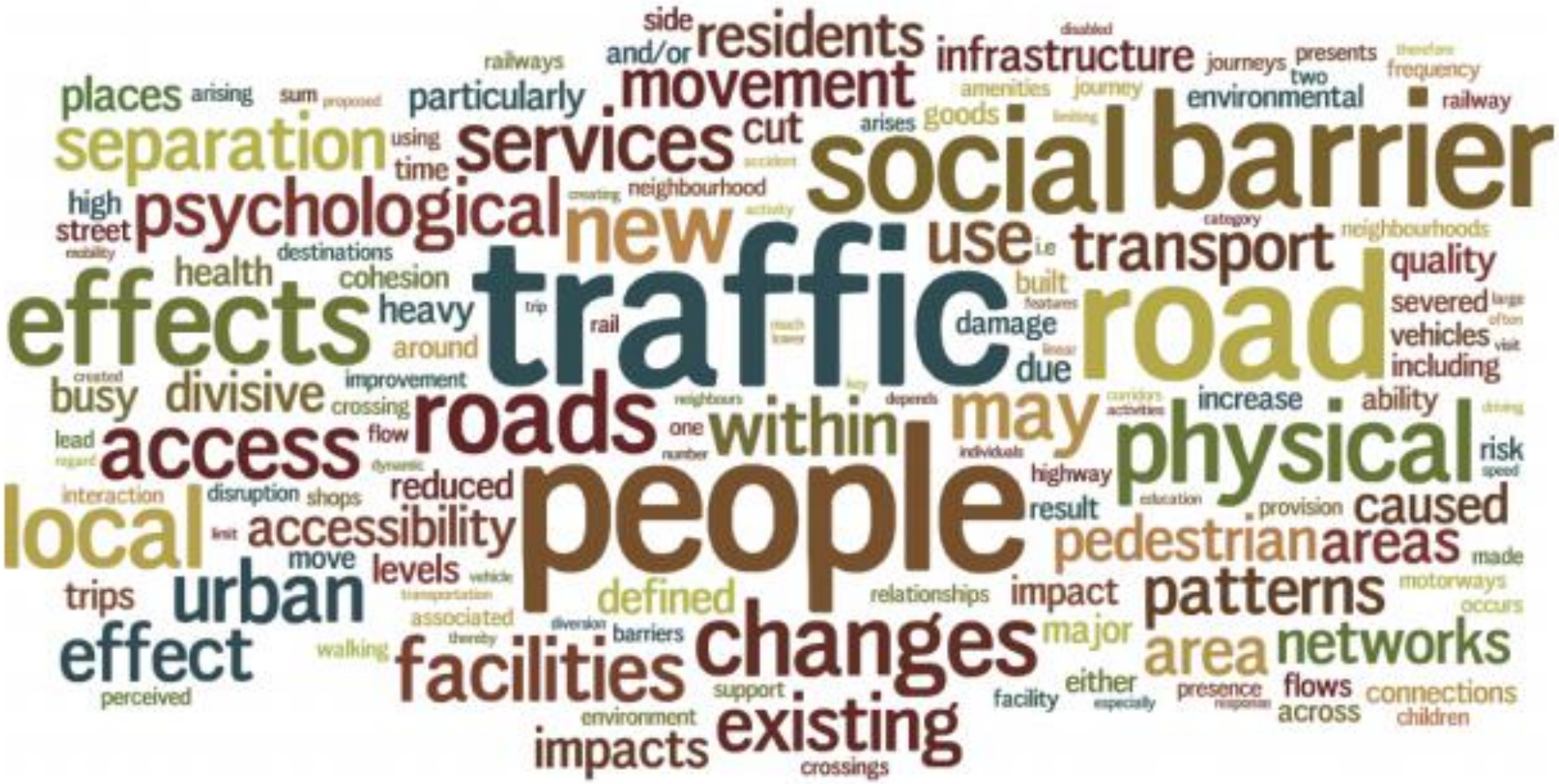
Appleyard D & Lintell M (1972). The environmental quality of city streets: the residents' viewpoint. *Journal of the American Institute of Planners*, *38*(2), 84-101.

Community severance and health



Mindell JS, Karlsen S. Community severance and health: What do we actually know? *J Urban Health.* 2012;**89**:323-46.

Figure 3: Word cloud of definitions of "community severance"



Our definition of community severance

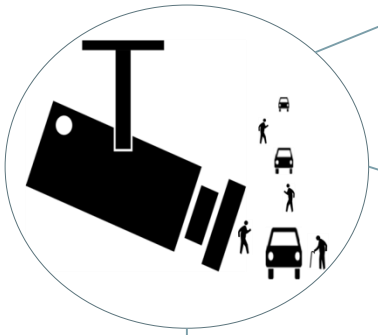
Transport-related community severance is the variable and cumulative negative impacts of the presence of transport infrastructure or motorised traffic on the perceptions, behaviour, and wellbeing of people who use the surrounding areas or need to make trips along or across that infrastructure or traffic.

Quigley & Thornley, 2011
Report to the NZ Transport Authority

- *"Separation of people from facilities, services and social networks they wish to use within their community; changes in comfort and attractiveness of areas; and/or people changing travel patterns due to the physical, traffic flow and/or psychological barriers created by transport corridors and their use."*

The UCL *Street Mobility* project

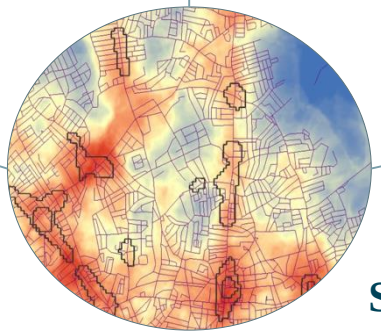
Participatory mapping



Video surveys

Household survey

Street audits



Spatial analysis

Stated preference survey

Seven Sisters Road (London)

Finchley Road (London)

Queensway (Southend-on-Sea)

Stratford Road (Birmingham)

Summary of methods & some findings

Mindell, J S., Anciaes, P R., Dhanani, A., Stockton, J., Jones, P., Haklay, M., Groce, N., Scholes, S., Vaughan, L. (2017)

Using triangulation to assess a suite of tools to measure community severance.

Journal of Transport Geography, 60, 119-129.

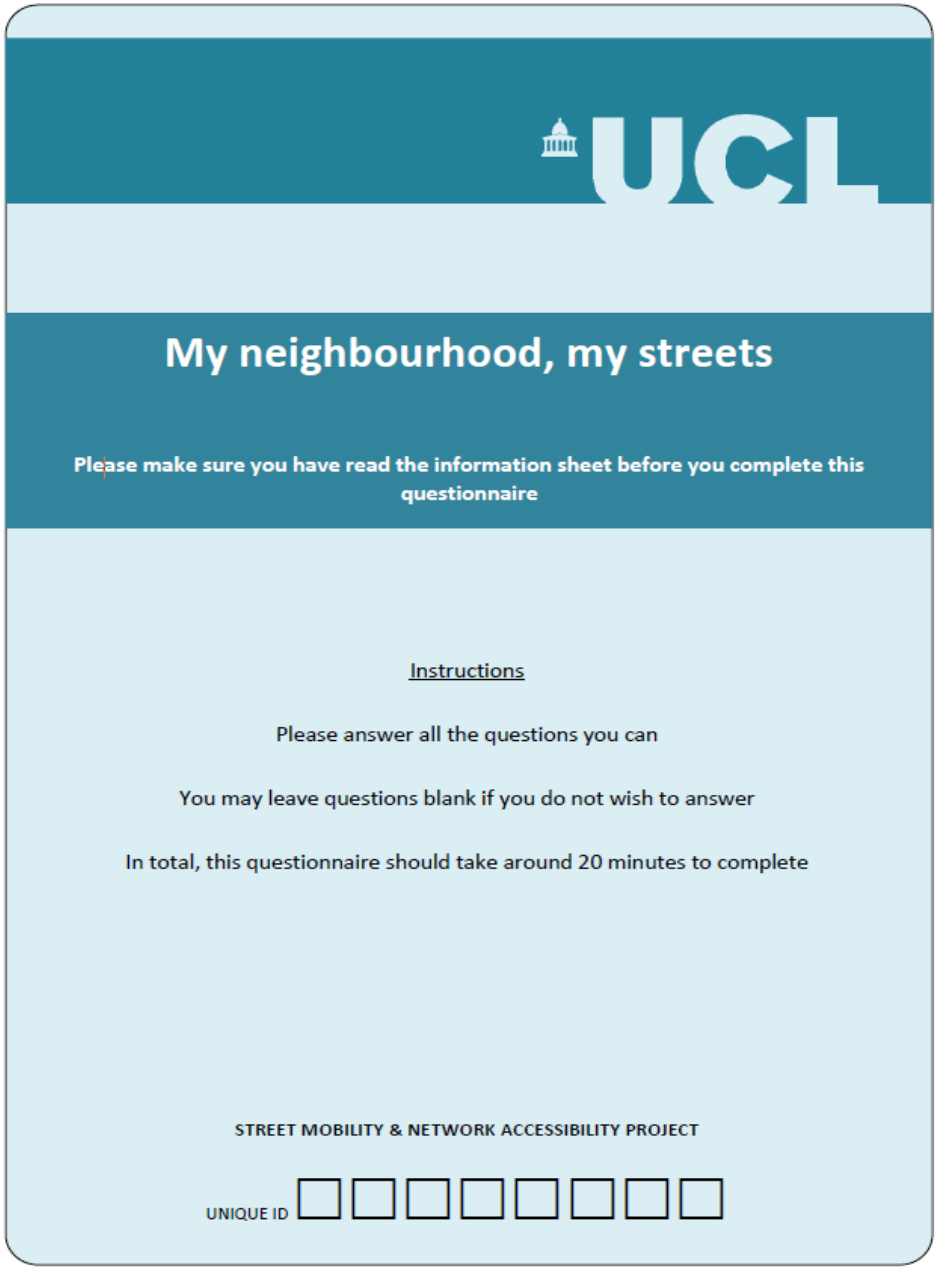
www.ucl.ac.uk/street-mobility/publications

Participatory mapping

- Informal mapping sessions
- Informal street mapping
- In-depth interviews & participatory mapping workshops

Household pen-and-paper survey:

Health and Neighbourhood Mobility Survey



My neighbourhood, my streets

Please make sure you have read the information sheet before you complete this questionnaire

Instructions

Please answer all the questions you can

You may leave questions blank if you do not wish to answer

In total, this questionnaire should take around 20 minutes to complete

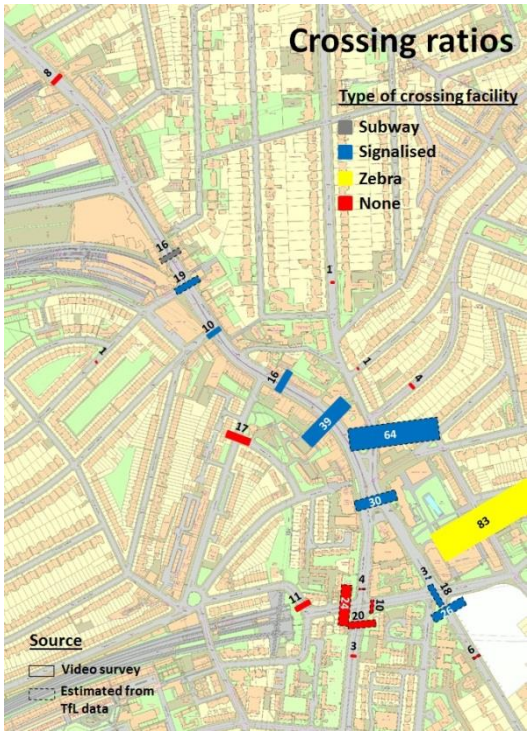
STREET MOBILITY & NETWORK ACCESSIBILITY PROJECT

UNIQUE ID ☐☐☐☐☐☐☐☐

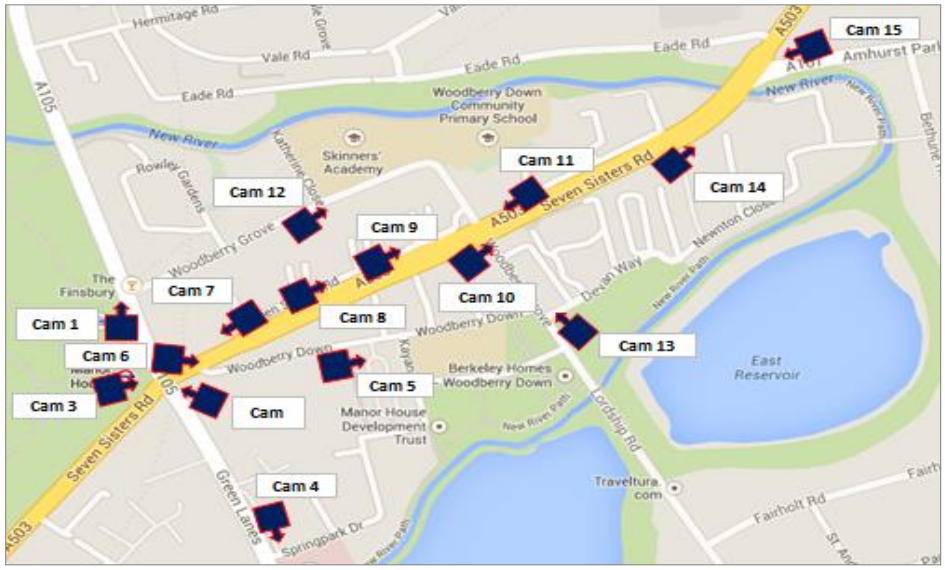
Video surveys

© Gail Seres-Woolfson

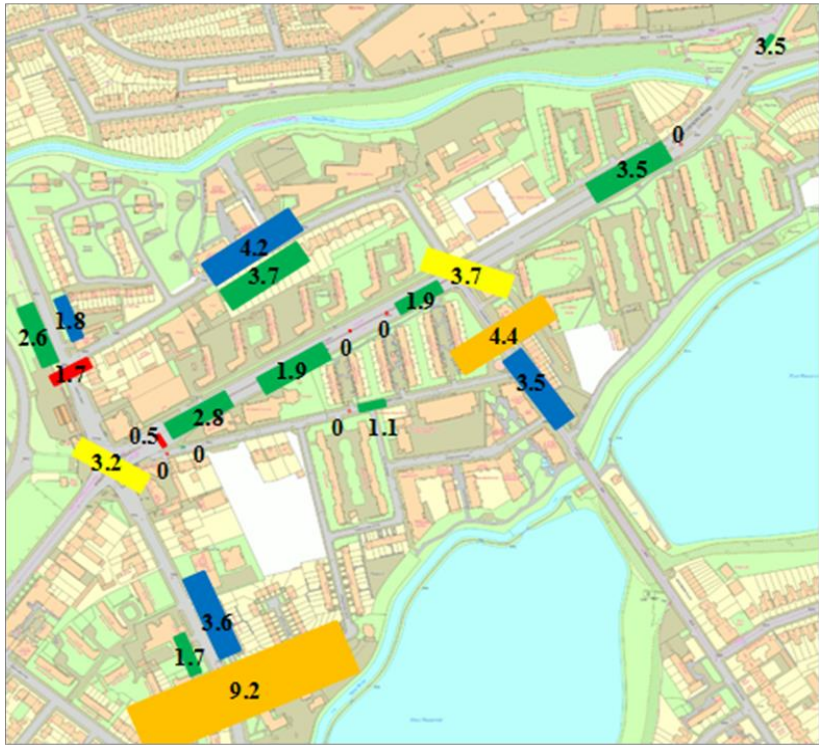
- Placing video cameras to film pedestrian and motor traffic
- Compare actual pedestrian flows with expected (from the walkability model)
- Pedestrian crossing behaviour
  - Formal crossings
  - Informal crossings
  - Waiting times



Video surveys

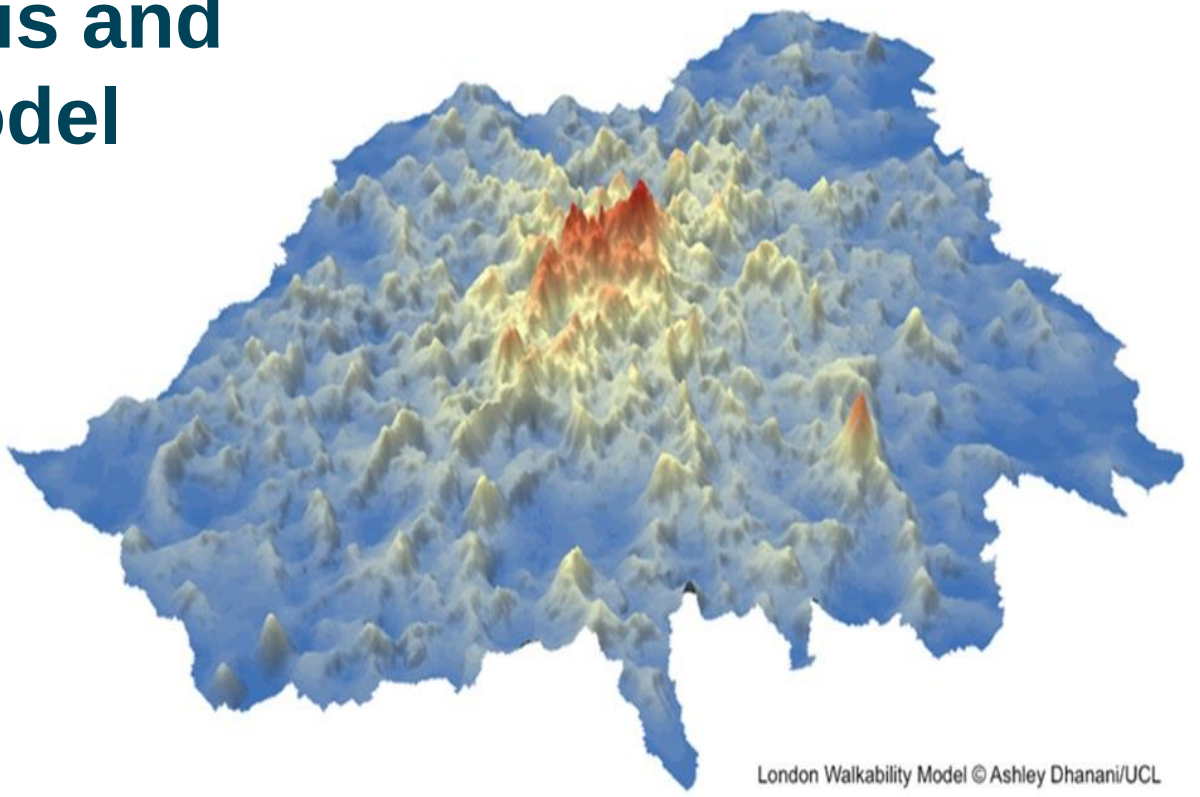


% OF MOBILITY-IMPAIRED



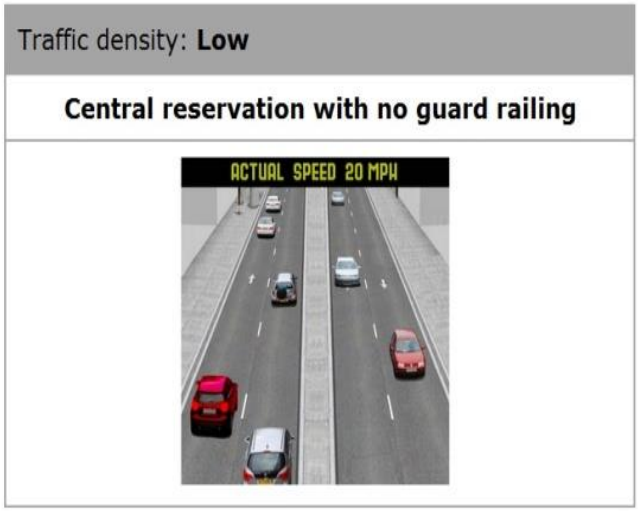
- Walk along pavement
- Walk along pavement, crossing side streets
- Signalized crossing
- Zebra
- Informal crossing

Spatial analysis and walkability model



- **Walkability** – reflects potential for walking
- **Community severance** can occur where high walkability co-exists with high motorised traffic levels

Stated preference survey



Scenario: there is a bus stop on the other side of the road that is in a cheaper travel zone than the bus stop on this side

In this scenario, which of the two options would you choose?

Option A	Option B
Cross at this point Saving 80p off your one-way ticket cost	Do not cross the road and pay the higher ticket cost

Option A Option B

- 423 respondents across 4 areas
- Each respondent answered 8 questions, each one with different road conditions
- National (GB) online panel survey of 3,038 participants

Severance index (examples)

Disutility of crossing the road compared with disutility of not making the trip

0 **69** **83** **100**

Traffic density: **Medium**

Central reservation with no guard railing

ACTUAL SPEED 10MPH

Traffic density: **Medium**

No central reservation

ACTUAL SPEED 20MPH

Traffic density: **High**

No central reservation

ACTUAL SPEED 20MPH

Benefits of interventions

Potential intervention	Benefit per trip
3 → 2 lanes (each direction)	£1.59
2 → 1 lane (each direction)	£1.56
Add central reservation	£0.50
High → medium traffic density	£1.02
Medium → low traffic density	£1.34
Speed below 30mph	£0.18
Footbridge → straight pelican	£0.07
Underpass → straight pelican	£0.34

Tool (under development)

ROAD

Green: cells to be edited

How long is the section of the road? 2000 meters (between 100 to 2000m)

Use the dropdown menus to select the characteristics of the road, or choose one of the built-in options

	CURRENT SCENARIO	FUTURE SCENARIO
Number of lanes (in each direction)	3	3
Central reservation	no	no
Traffic density	high	medium
Traffic speed	20mph	20mph

Built-in options
Click on buttons

Best possible conditions | Worst possible conditions

Best possible conditions | Worst possible conditions | Same as current

Tool (under development)

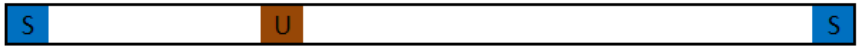
PEDESTRIAN CROSSINGS

The segment below represents the road. Use the dropdown menus in each cell in the segment to choose the approximate locations of the available pedestrian crossings, or choose one of the built-in options

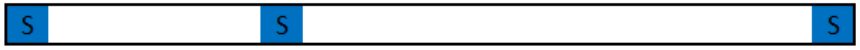
LEGEND

- P Straight pelican crossing
- S Staggered pelican crossing
- F Footbridge
- U Underpass

CURRENT SCENARIO



FUTURE SCENARIO



Built-in options

Click on buttons

No crossings

One in the middle: P S F U

One in each extreme: P S F U

No crossings

One in the middle: P S F U

One in each extreme: P S F U

Same as current scenario

Tool (under development)

OUTPUTS

UTILITY AND TRAVEL BEHAVIOUR

	CURRENT SCENARIO	FUTURE SCENARIO	CHANGE
Severance index (disutility of crossing the road)	100%	74%	-26%
Willingness to walk to avoid crossing the road (mins.)	22.6	15.7	-6.9
Probability of crossing the road (no facilities)	0.2%	1.0%	0.8%
Probability of crossing the road (using facilities)	95.0%	99.0%	4.0%
Probability of not making the trip	5.0%	0.5%	-4.5%

BENEFITS, per person

Benefit of improving crossing conditions, per trip	£0.94

TOTAL NUMBER OF WALKING TRIPS, per year

	CURRENT SCENARIO	FUTURE SCENARIO	CHANGE
Number of trips crossing the road (no facilities)	5,200	26,000	20,800
Number of trips crossing the road (using facilities)	2,470,000	2,574,000	104,000

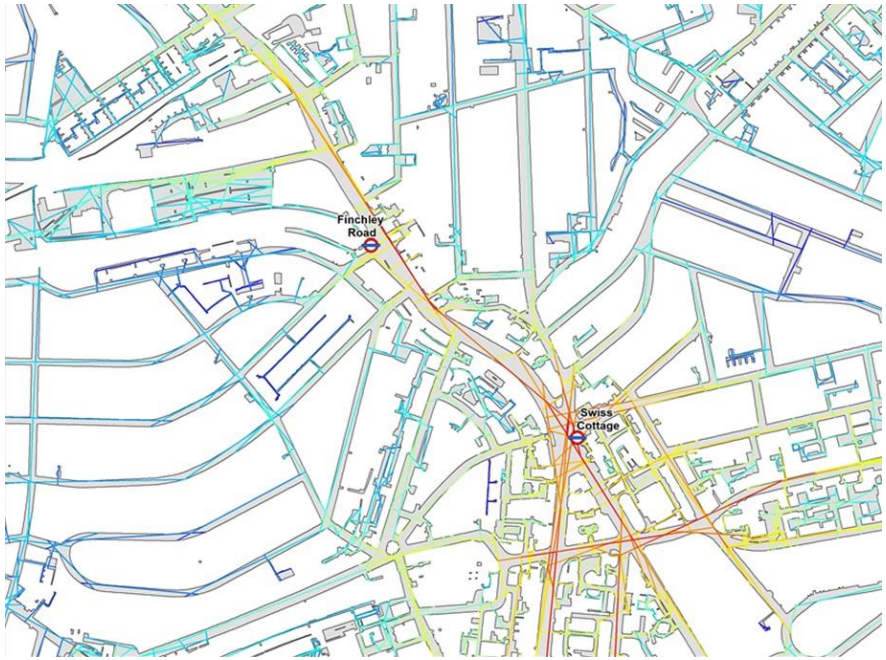
TOTAL BENEFITS, per year

Total benefit of improving crossing conditions	£2,586,189

Disaggregation by age, gender, and trip purpose

Space syntax

- Space syntax network analysis methods measure the centrality of networks based on the geometric simplicity of traversing shortest paths between origins and destinations



Street audit

PERS

Link Assessment Form

Link Name:

Location:

Reviewer: **Time:**

Parameter	Checklist Factors	Checklist +ve	Checklist +/-	Checklist -ve	Overall Score -3 to +3	Design Comments
Effective width	Width for pedestrian flow					
	Wheelchair accessibility					
	All sections acceptable width					
	Separation from traffic					
	Allowance for obstructions					
	Pedestrian congestion					
Dropped kerbs	Located on desire lines					
	Adequate capacity					
	Level dropped/flush					
	Gradient of drop					
	Consistency					
	Frequency of dropped kerbs					
Gradient	Severity					
	Steps/ramps					
	Rest points					
	Undulations					
	Appropriate handrails					
	Presence of crossfalls					
	Presence of obstructions					
	Location/alignment					
	Overhead obstructions					

Street Mobility Toolkit

- Designed to assist local authorities, consultants and local communities to better understand CS and what to do about it
- Provides advice on how to measure CS, and to assess impacts on local communities
- Some tools aimed at local communities, others at transport professionals

Contents of the Toolkit

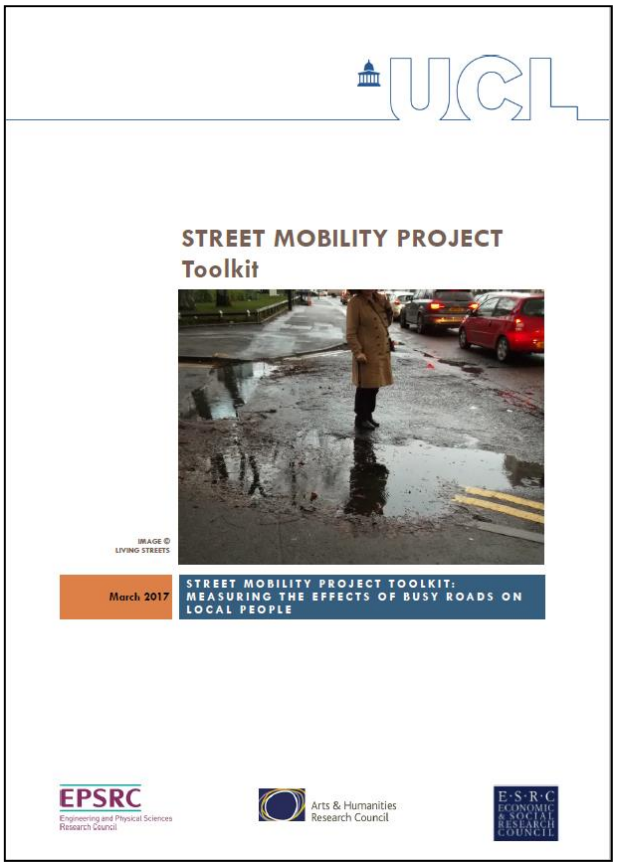
- **Introduction:** overview of the toolkit
- **What we know:** summary of the evidence on the effects of busy roads on local people and key project findings
- **Participatory mapping:** approach and case study
- **Health and Neighbourhood Mobility Survey:** survey instrument and case study
  - **'How to' guides**
- **Video surveys:** what to do and case study
- **Walkability models:** overview and case studies
- **Valuation tool:** summary of the interactive tool
- **Other useful tools:** street audits and space syntax

Introduction
Summary of tools and applicability

Tool	Why use it	What resources are needed?			
		People	Expertise	Money	Time

Community severance measurement toolkit

www.ucl.ac.uk/street-mobility/toolkit



Most of the toolkit is now available to download. The valuation tool will follow in a few months' time.

For more information about the project, see:

www.ucl.ac.uk/street-mobility/project

For more details, see eg

www.ucl.ac.uk/street-mobility/finalconference

www.ucl.ac.uk/street-mobility/publications

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