

# What is community severance and why is it important?

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On behalf of the Street Mobility and Network Accessibility project team

[www.ucl.ac.uk/street-mobility](http://www.ucl.ac.uk/street-mobility)

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We thank our funders:





# WHAT IS COMMUNITY SEVERANCE?

# WWF



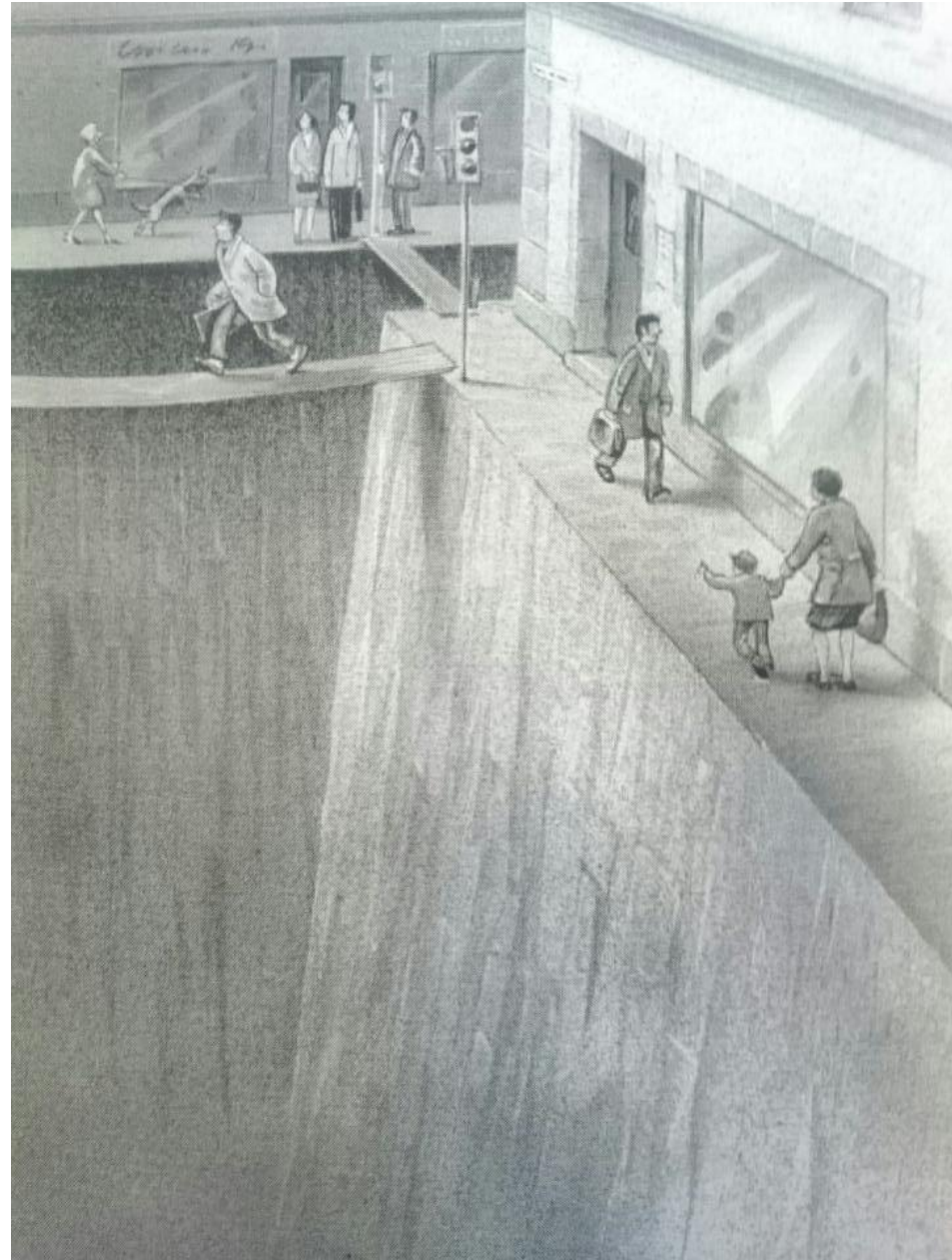
- According to the WWF, the Giant panda population in China is growing. However, it is divided into 33 groups, many of which are very small: 24 groups are at high risk of becoming extinct. Climate change is likely to reduce the area of suitable bamboo habitat.
- At the same time, new roads and other infrastructure could fragment the bears' habitat, restricting pandas' ability to move around to breed and feed.
- National Highway 108 in the Qinling mountains created an impassable boundary between two large populations. In 2007, the road was rerouted through a tunnel and the habitat replanted with bamboo.



## Our definition of community severance

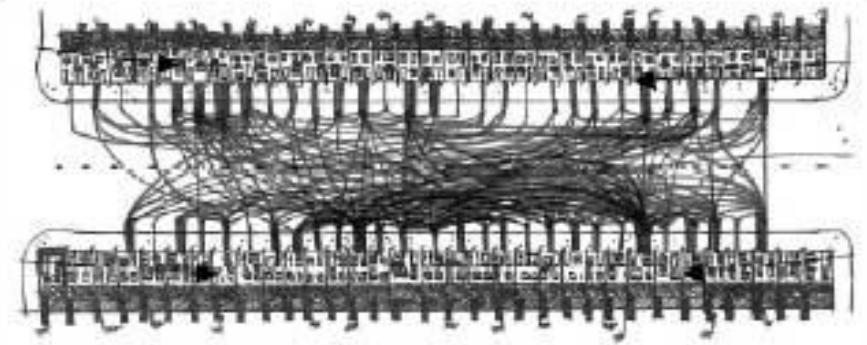
*Transport-related community severance is the variable and cumulative negative impact of the presence of transport infrastructure or motorised traffic on the perceptions, behaviour, and wellbeing of people who use the surrounding areas or need to make trips along or across that infrastructure or traffic.*

# WHAT ARE THE POTENTIAL IMPACTS OF BUSY ROADS ON HEALTH & WELLBEING?

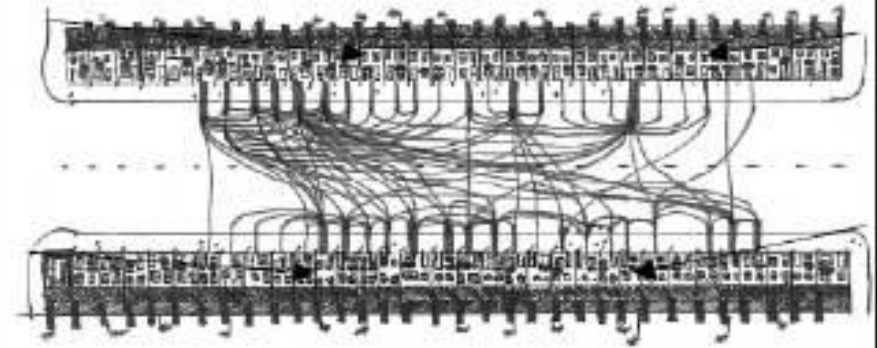


# Community severance

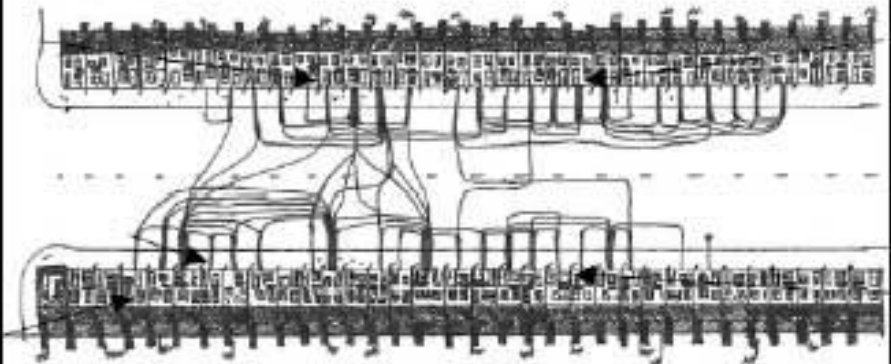
Appleyard D & Lintell M (1972).  
The environmental quality of city streets: the residents' viewpoint. *Journal of the American Institute of Planners*, 38(2), 84-101.



LIGHT TRAFFIC: 140 VEHICLES PER DAY  
5.35 friends per person/ 6.1 acquaintances



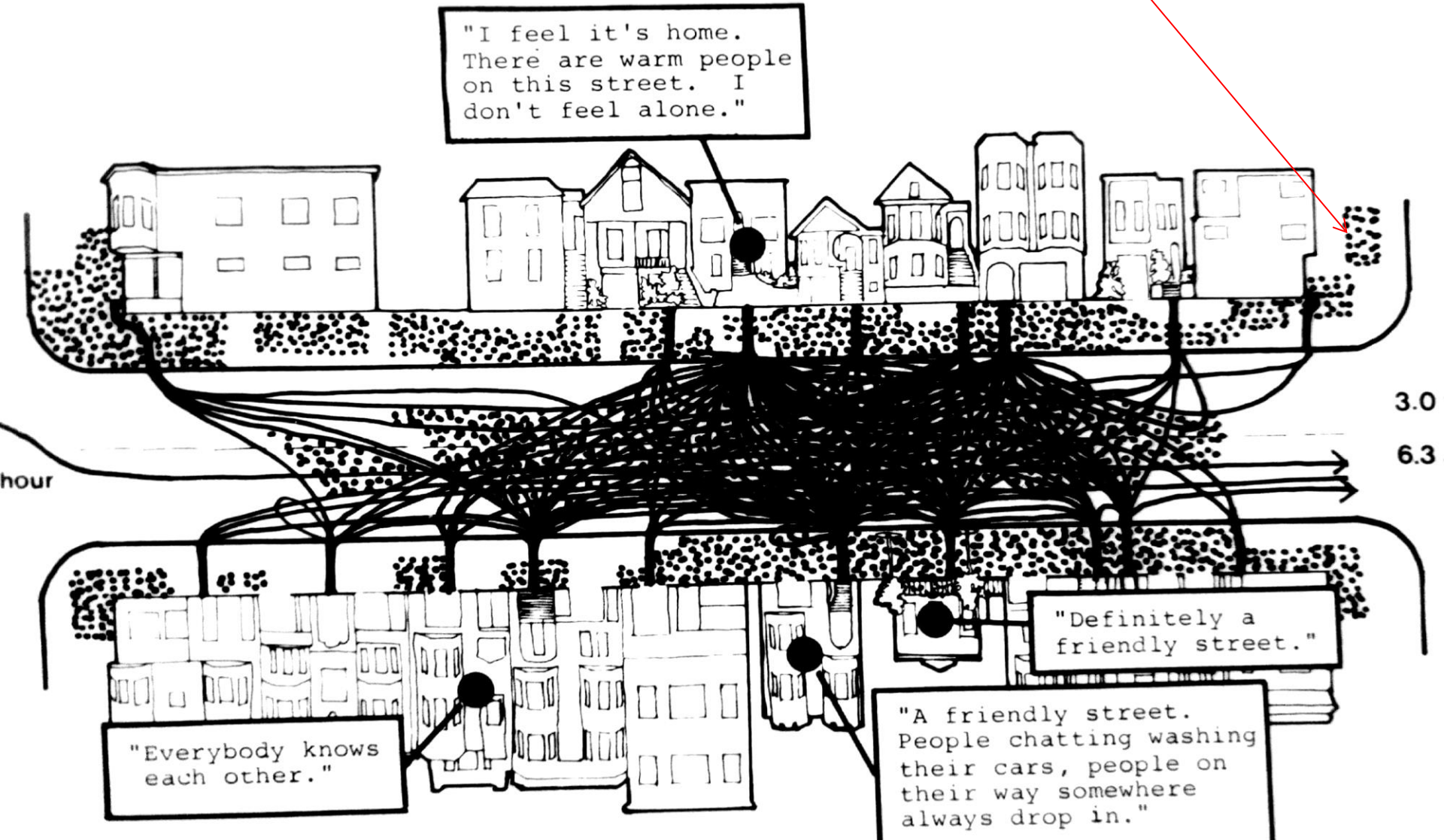
MEDIUM TRAFFIC: 8,420 VEHICLES PER DAY  
2.45 friends per person/ 3.65 acquaintances



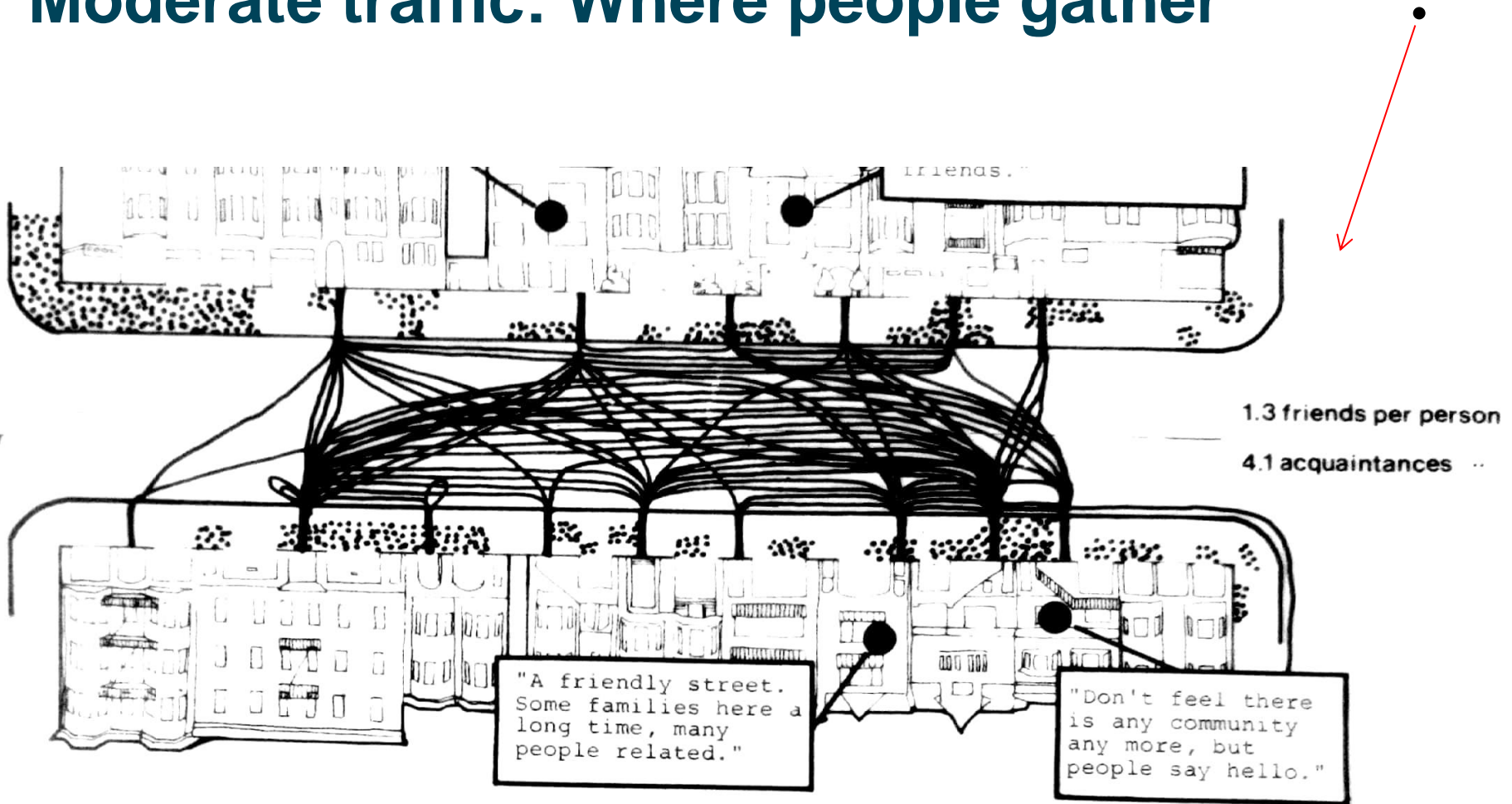
HEAVY TRAFFIC: 21,130 VEHICLES PER DAY  
1.15 friends per person/ 2.8 acquaintances

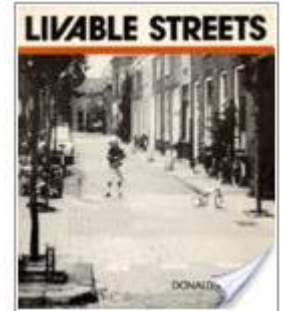


# Light traffic: Where people gather



# Moderate traffic: Where people gather

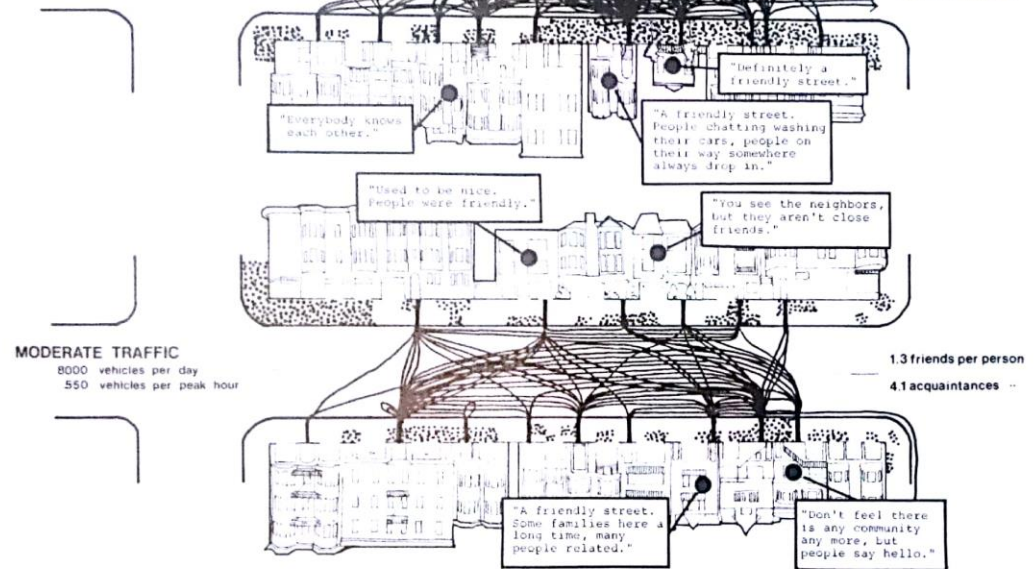




2000/d  
Peak 200/hr



8000/d  
Peak 550/hr



16.000/d  
Peak 1900/hr

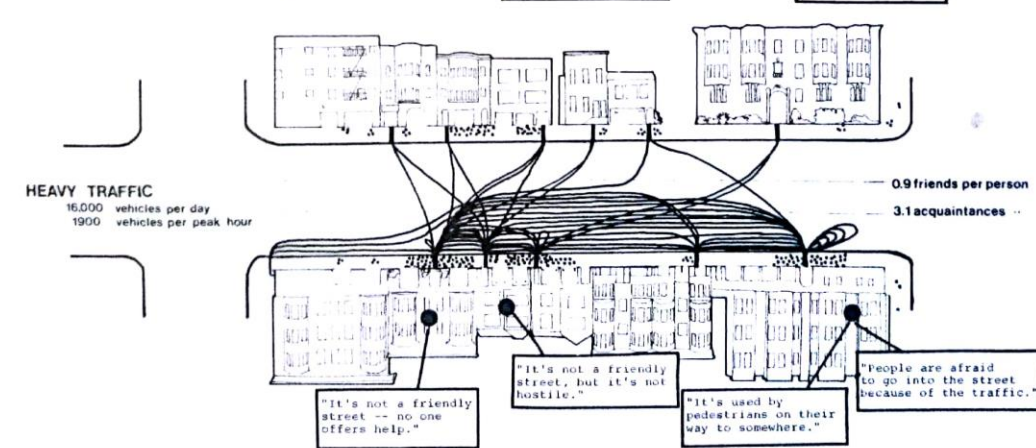


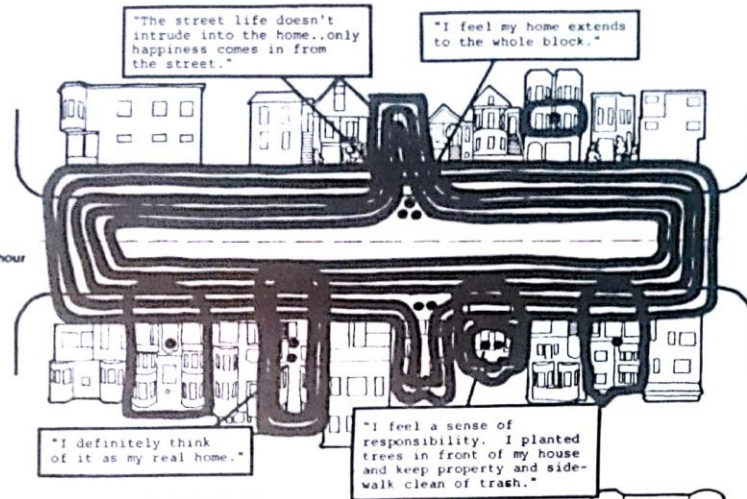
FIGURE 3.



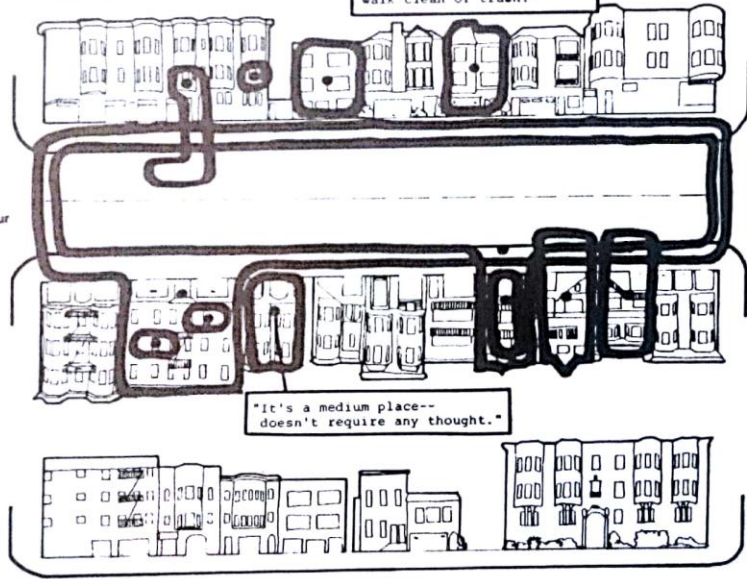
# Home territory



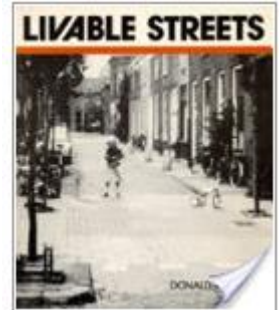
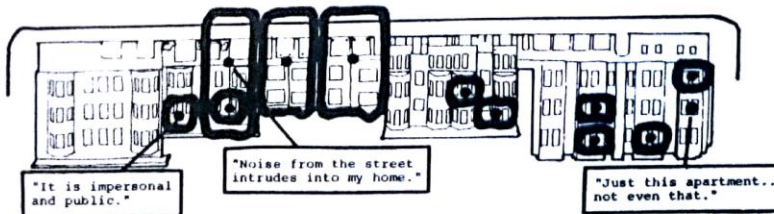
**LIGHT TRAFFIC**  
2000 vehicles per day  
200 vehicles per peak hour



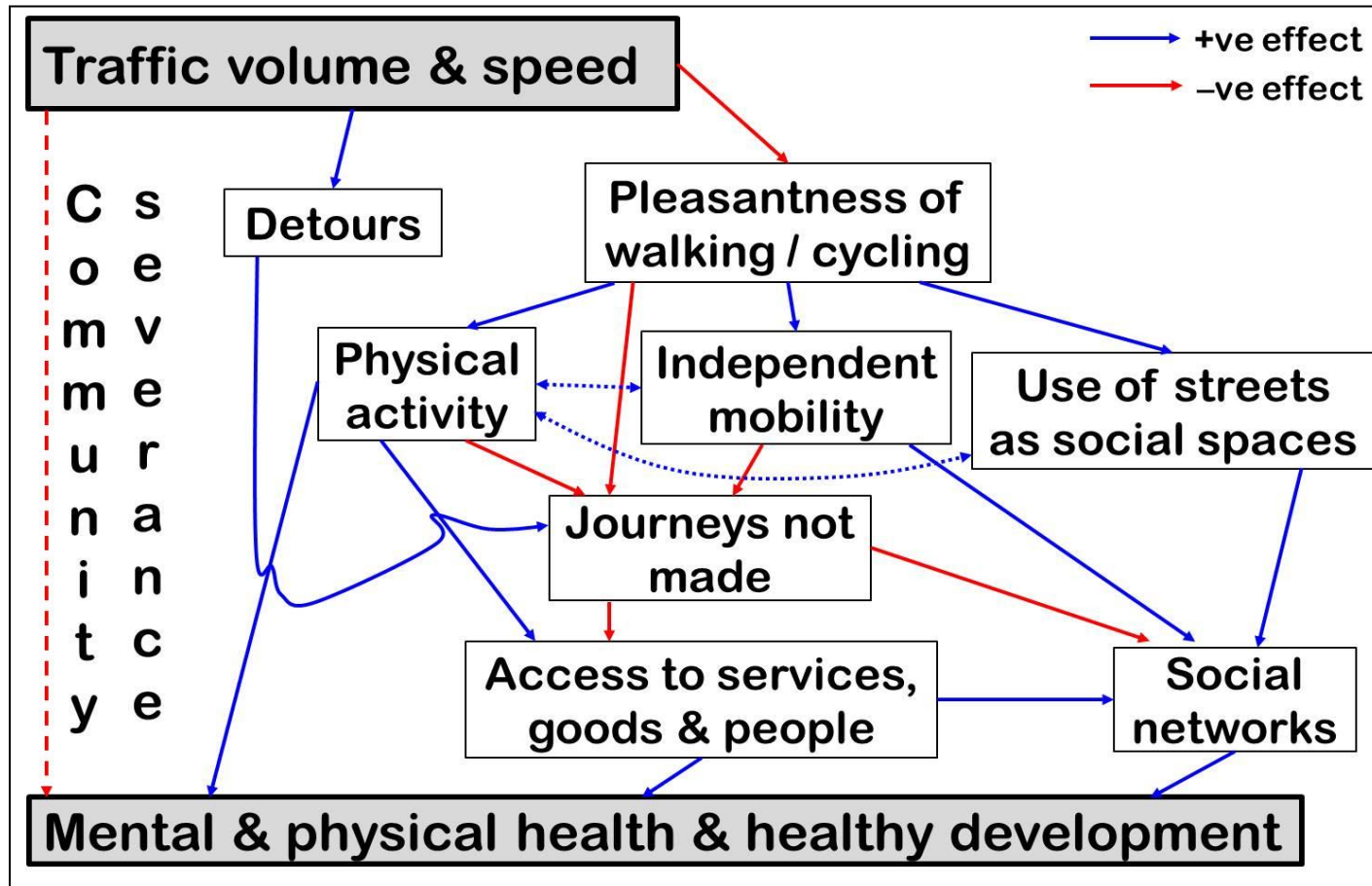
**MODERATE TRAFFIC**  
8000 vehicles per day  
550 vehicles per peak hour



**HEAVY TRAFFIC**  
16,000 vehicles per day  
1900 vehicles per peak hour



# Community severance and health



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



**WHAT ARE THE POTENTIAL  
IMPACTS OF BUSY ROADS ON  
HEALTH INEQUALITIES?**

## Health inequalities from busy roads:

### Benefits of transport – mobility and access

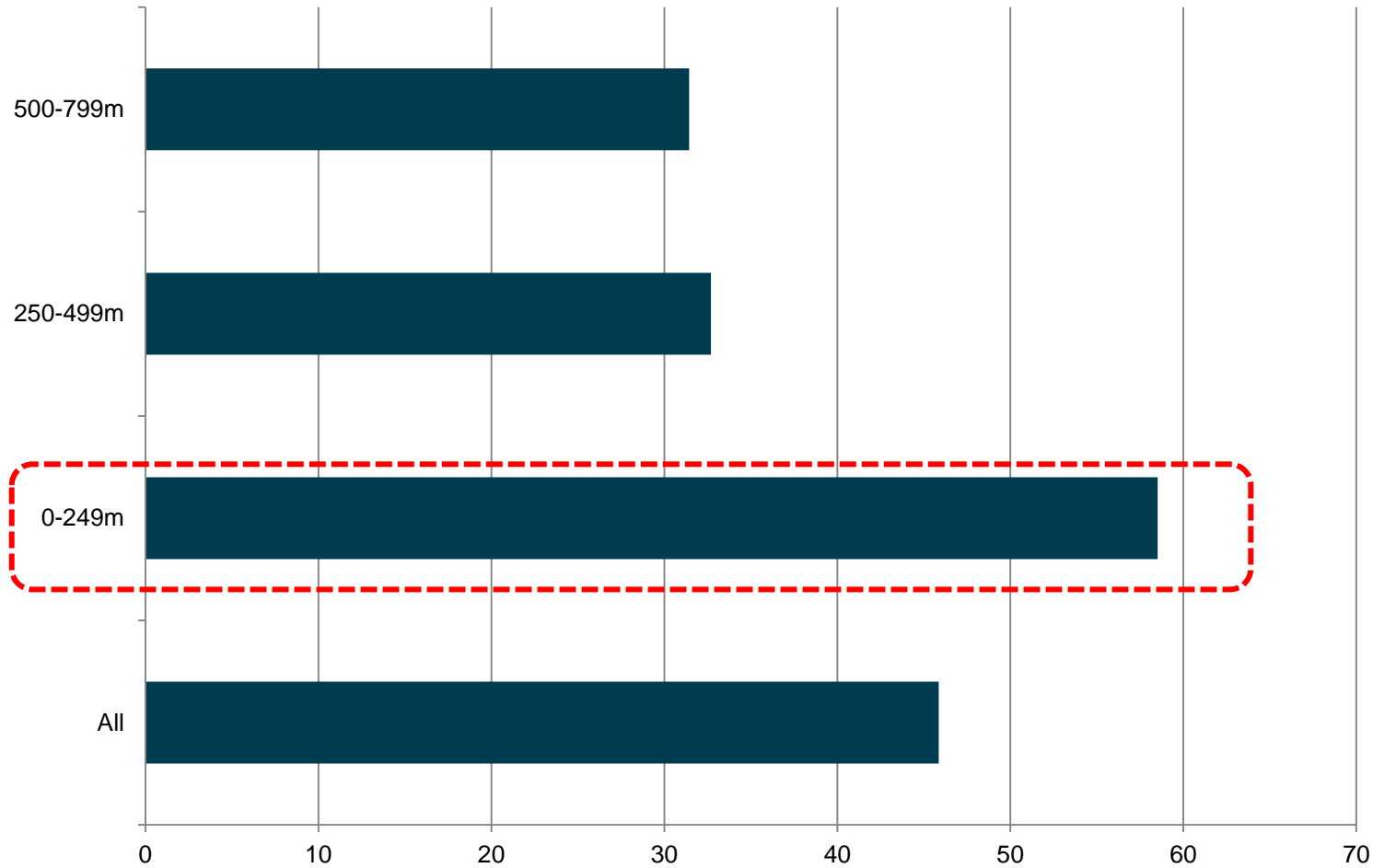
*“A developed country is not where the poor drive cars, it is where the rich use public transportation.”*

Enrique Peñalosa, Mayor, Bogotá



## Mobility and destinations

**% at least occasionally affected by volume of traffic (own road):**  
**P=0.002**



# Health inequalities from busy roads

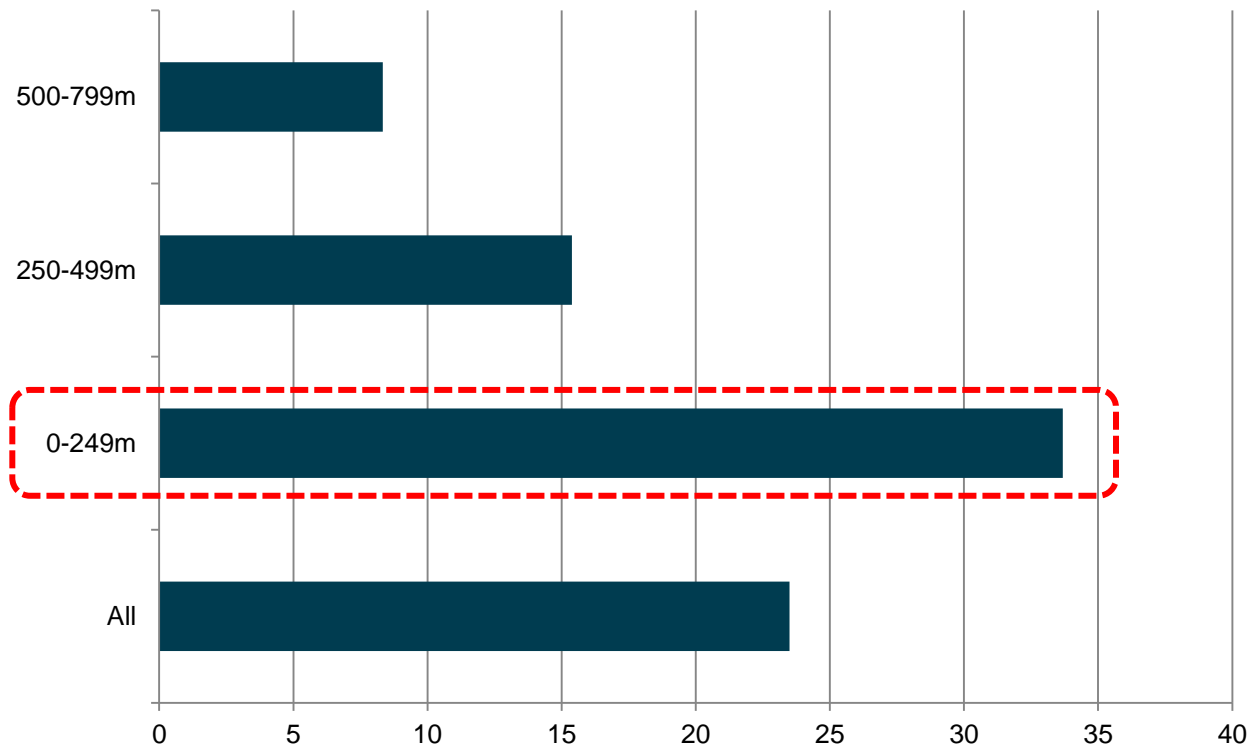
## Air pollution

- Poorer people:
  - More exposed to air pollution from motor traffic
  - More susceptible to health impacts of pollution



**Noise / air pollution  
(% problem on road): P=0.002**

1.



# Health inequalities from busy roads

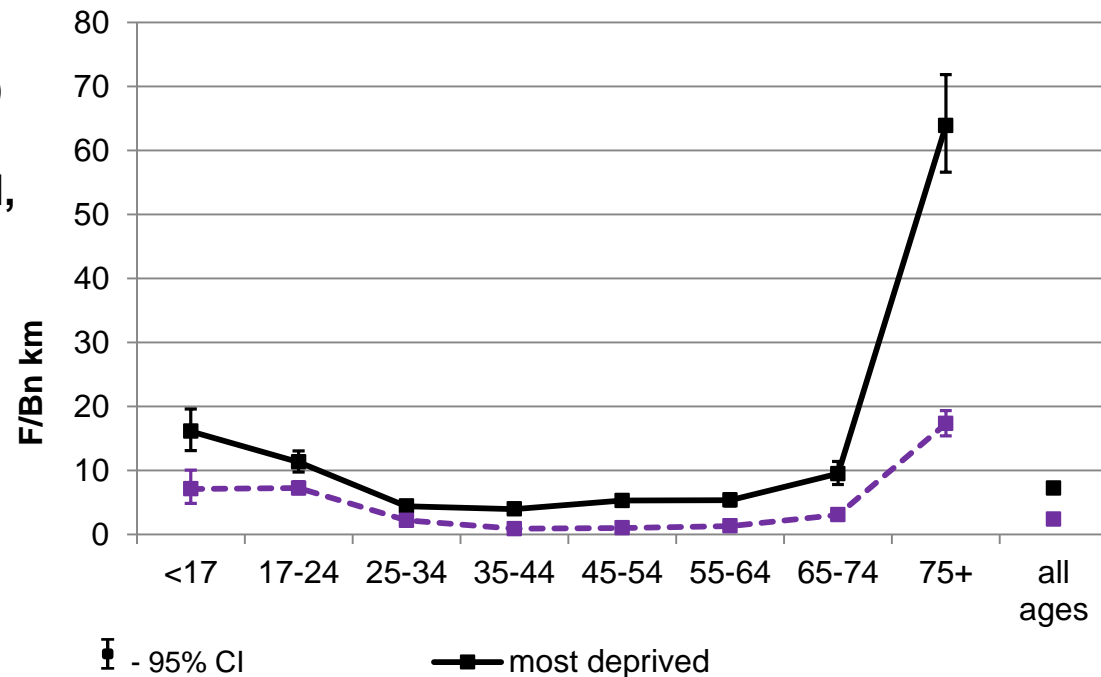
## Noise pollution

- Raised blood pressure
- Interference with concentration and with sleep
- Disruption of education
  - which affects adult health

# Health inequalities from busy roads

## Injuries

Rate of fatality (all modes)  
per billion km by IMD  
quintile, persons, England,  
2007-12




- Injury rates higher in more deprived areas
- More deprived people more likely to be killed in road traffic crash

# Health inequalities from busy roads

## Social isolation

- Poor - worse health –less able to walk or cycle
- Frail, elderly, disabled: less able to cross the road (bus stops)
- Fewer other options for safe spaces to meet and socialise (old, young)

# Street Mobility project



## 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



Survey to quantify the impacts of busy roads on local residents

708 participants in 4 areas: 2 in London, 1 in Birmingham, 1 in Southend

# Wellbeing of residents affected by road vs. others

(Warwick-Edinburgh Mental Well-Being Scale (Stewart-Brown 2009))

Scale from 7 (min) to 35 (max)

	Average Score
All 708 respondents in the 4 case studies	26.2
73 respondents in case study areas who:  [ Perceive traffic volume on main road as heavy <b>AND</b> Perceive traffic volume on main road as fast <b>AND</b> Perceive traffic as a barrier to walking <b>AND</b> Avoids main road because of traffic <b>AND</b>	23.4  (significantly lower than sample average, $p < 0.01$ )
National Average (from other studies)	26.1



# Explaining wellbeing

	Coefficient	Significance
Age:18-34	+	
<b>Age:65-75</b>	+	**
<b>University degree</b>	+	**
Employed	+	
<b>Full time work</b>	+	*
<b>Neighbourhood social capital</b>	+	**
<b>Female</b>	-	*
<b>Lives alone</b>	-	*
<b>Health: bad</b>	-	**
<b>Health: very bad</b>	-	**
<b>Perceive traffic volume on main road as heavy AND            Perceive traffic volume on main road as fast AND            Perceive traffic as a barrier to walking AND            Avoids busy road because of traffic AND</b>	-	**

\*\*1%, \* 5%

## A vision of the future?

*“Old men and women shall again dwell in the streets ... ; every person with their staff in their hand because of great age. And the streets of the city shall be full of boys and girls playing in its streets.”*

Zechariah 8:4-5

# What is community severance?

Vos & Chardon, 1998

“For *[older people]*, isolation can be regarded as a combination of distance to other *[places]* and the resistance of the landscape between *[them]*. The road network will probably contribute considerably to the resistance between *[them]* ... higher traffic density ... increased mortality as well as increasing isolation. The negative effects of roads are often underestimated.”

“For **ground dwelling species**, isolation can be regarded as a combination of distance to other **habitat patches** and the resistance of the landscape between **patches**. The road network will probably contribute considerably to the resistance between **habitat patches**. .... **Mortality on roads can have a considerable impact on amphibian populations and eventually can lead to extinction....**”

Effects of Habitat Fragmentation and Road  
Density on the Distribution Pattern of the  
Moor Frog *Rana arvalis*

C. C. Vos and J. P. Chardon

*Journal of Applied Ecology*

Vol. 35, No. 1 (Feb., 1998), pp. 44-56