



STREET MOBILITY PROJECT

What We Know



THE DOMINANCE OF
CARS IN MANY
TOWNS SUCH AS
ROTHERHAM CAN
MAKE TRAVEL FOR
OTHER ROAD USERS
UNPLEASANT

IMAGE ©
LIVING STREETS

March 2017

**STREET MOBILITY PROJECT TOOLKIT:
MEASURING THE EFFECTS OF BUSY ROADS ON
LOCAL PEOPLE**

This document contains evidence and our research to help local government and local communities understand more about community severance in their area.

SUMMARY OF THE EVIDENCE

First we summarise what was already known about the ‘barrier effect’ of busy roads, sometimes called ‘community severance’. On the following pages, we describe what we found in our study. References for some key studies are not open access but where possible we have used references that are widely available: we have provided URLs for these.



FIGURE 1: THE 'BARRIER EFFECT' OF TRAFFIC AND TRANSPORT INFRASTRUCTURE

IMAGE © UCL STREET MOBILITY PROJECT

What was already known

In 1972 Donald Appleyard and Mark Lintell published a study of residents on three streets in San Francisco.¹ They had found that people living on a street with little traffic knew most of their neighbours and had many friends on the street. However, similar people living on an otherwise comparable street, but with heavy traffic, knew few people and had very few friends on the street.

More detailed work was published in a book a decade later.² This showed that the amount of traffic in the street outside their home also affected people's living space – both the parts of their own home they could use comfortably, and the area of the street outside they considered to be ‘theirs’. Both these sets of findings were also seen in a similar, more recent study in Bristol.³ Other studies showed that children on busier streets were less likely to be allowed to play in the streets, which was bad for both their mental and physical development.⁴

Motor traffic has many effects on health. This includes injuries, the effects of pollution, and its role in discouraging people from being physically active in their everyday life. Recently, evidence

¹ Appleyard D, Lintell M. The environmental quality of city streets: The residents' viewpoint. *American Institute of Planners Journal*. 1972; 38:84-101.

² Appleyard D, Gerson MS, Lintel M. *Livable streets*. Berkeley: University of California Press, 1981. (recently reissued in a 2nd edition: 2012, Editor B. Appleyard)

³ Hart J, Parkhurst G. Driven to excess. Impacts of motor vehicles on the quality of life of residents of three streets in Bristol UK. *World Transport Policy & Practice*. 2011; 17(2): 12-30. Available at: <http://eprints.uwe.ac.uk/15513>

⁴ Mindell JS, Karlsen S. A review of the evidence on community severance and its impacts on health. *Journal of Urban Health*. 2012; 89:232-246. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3324603/>

from around the world has also shown that although car users may spend more in a single visit, people travelling by bus, bicycle or on foot make more frequent purchases. Overall, car users spend less money in local shops than other people: improving pedestrian access makes economic sense for retailers too.^{5,6}

Compared with other local effects of transport, the ‘barrier effect’ of major roads and other transport infrastructure on local communities (also known as ‘community severance’) has not been studied enough.⁷ Moreover, most of the information available is in technical reports that can be difficult to access. We have therefore published a review of what is known about measurement of community severance.⁸

The barrier effect can make it difficult for pedestrians to cross the road (Figure 1). This particularly affects older people, children, and people with disabilities. It can deter people from walking for several reasons, such as the detours needed to reach a crossing point; the delays waiting for signals or gaps in the traffic; or extra inconvenience if a subway or footbridge is needed to get across. People may respond by using cars instead of walking or cycling, or even by staying at home if they have no alternative. Roads with a lot of traffic are also likely to have higher levels of air and noise pollution; problems with glare of lights or reduced visibility because of vehicles; and fear of injury. These can all make walking along them unpleasant.⁸

Walking and cycling (often referred to as active travel) have a range of benefits for physical and mental health and wellbeing, particularly through increasing physical activity.⁹ Many studies across western Europe have shown that the benefits from this physical activity greatly outweigh any increase in exposure to air pollution or injury. If substantial proportions of the population move from car journeys to travelling by walking, cycling or public transport, this could also reduce air pollutant emissions and the risk of traffic injury.¹⁰

⁵ Transport for London (2002). *The benefits of town centre pedestrian and public realm schemes*. London: Transport for London.

⁶ Lawlor E. *The pedestrian pound: The business case for better streets and places*. London: Living Streets, 2015. Available at: https://www.livingstreets.org.uk/media/1391/pedestrianpound_fullreport_web.pdf

⁷ Anciaes PR, Boniface S, Dhanani A, et al. Urban transport and community severance: Linking research and policy to link people and places. *Journal of Transport and Health*. 2016;3(3):268-277.

Available at: www.sciencedirect.com/science/article/pii/S2214140516302171

⁸ Anciaes PR, Jones P, Mindell JS. Community severance: where is it found and at what cost? *Transport Reviews*. 2016;36(3):293-317. Available at: www.tandfonline.com/doi/full/10.1080/01441647.2015.1077286.

⁹ Davis A, Cavill N, Wardlaw M, et al. ‘Physical activity, trends in walking and cycling and the obesity epidemic.’ Section II, Chapter 2 in Mindell JS, Cohen JM, Watkins SJ (Eds) *Health on the Move 2. Policy for health-promoting transport*. Stockport: Transport and Health Study Group. 2011. Available at: www.transportandhealth.org.uk/?page_id=32

¹⁰ Bearman N, Singleton AD. Modelling the potential impact on CO₂ emissions of an increased uptake of active travel for the home to school commute using individual level data. *Journal of Transport and Health*. 2014;1(4):295-304. Available at: www.sciencedirect.com/science/article/pii/S2214140514000772

What our study found

We found that community severance affects people in the whole area around a busy road, not just those who live beside it. We have therefore created a new community severance definition:¹¹

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 flow.

We have confirmed in our case studies that large volumes of motor traffic make roads unpleasant for pedestrians, due not just to the vehicles themselves but also to the associated air and noise pollution. Pedestrian crossing facilities are generally inadequate: there are not enough of them, they are poorly designed, or they do not allow people enough time to cross the road safely. These problems can reduce the overall walking quality, mobility and accessibility for local residents (Figure 2). Each of the measurement tools we have developed, presented in this toolkit, confirmed these findings. They also revealed connections between the factors which contribute to community severance, showing that the suite of tools is reliable when used together.

Surprisingly, our research showed that the volume of motor traffic was more important than its speed in affecting local residents' mobility in their neighbourhood. Nationally, 15% of people (17% in urban areas) found the volume of traffic often or always affected their ability to walk round their area. In our four case studies it was 40% (figures adjusted for age). Not surprisingly, the nearer people lived to the busy road, the more they were affected.



FIGURE 2: MOTOR VEHICLES HAVE A RANGE OF NEGATIVE EFFECTS ON PEDESTRIANS

IMAGE © UCL STREET MOBILITY PROJECT

We also found that most people would prefer to walk further to a crossing with pedestrian lights, rather than use a subway or a footbridge.¹² In addition, many people choose not to cross, even if there is a cheaper shop or a bus stop in a cheaper travel zone on the other side of the road.¹³

¹¹ Ancaes PR. *What do we mean by "community severance"?* Street Mobility and Network Accessibility Series. Working paper 04, August 2015. Available at: <http://discovery.ucl.ac.uk/1527807>

¹² Ancaes PR, Jones P. *Pedestrians' preferences regarding signalised crossings, footbridges, and underpasses.* Street Mobility and Network Accessibility Series. Working paper 09, June 2016. Available at: <http://discovery.ucl.ac.uk/1505651>

¹³ Ancaes PR, Jones P. *How do pedestrians balance safety, walking time, and the utility of crossing the road? A stated preference study.* Street Mobility and Network Accessibility Series. Working paper 08, June 2016. Available at: <http://discovery.ucl.ac.uk/1505652>

As part of our research we developed ‘walkability’ models for Birmingham and for London. These show which streets have the best access to public transport and are close to people and a good mix of shops, leisure and work places. The model for London was very good at predicting how many people actually walk in different areas.¹⁴ Community severance seems to occur particularly around roads that have both high walkability and also high motor traffic levels.

‘Walkability’ does not measure how easy or pleasant it is to walk round the area, so we assessed the quality of the pedestrian environment using a formal, objective tool. However, we found that when we made a separate assessment of the experience of walking down each street in an area, the findings did not always match local residents’ own opinion about their area, for example on issues such as pavement quality.

Using video surveys, we found that pedestrian flows along busy streets are lower than we would expect, despite the presence of places pedestrians are likely to want to go to, such as bus stops.¹⁵ In addition, high volumes of motor traffic also lead to more risky behaviour crossing the road, such as crossing outside designated facilities or too close to moving vehicles (Figure 3).¹⁶



FIGURE 3: RISKY BEHAVIOUR BY PEDESTRIANS WHEN CROSSING THE ROAD

IMAGE © UCL STREET MOBILITY PROJECT

We also found that minor changes to road design could make walking trips much shorter and quicker, reduce the amount pedestrians are exposed to traffic, and could improve the quality of the street environment.¹⁷

¹⁴ Dhanani AN, Vaughan L. Towards a walkability model for strategic evaluation of policy action and urban active transport interventions. 48th Meeting of the Universities’ Transport Study Group (UTSG), 2016;48. Available at: <https://iris.ucl.ac.uk/iris/publication/1188700/1>

¹⁵ Ancaes PR, Jones P. *The influence of motorised traffic on pedestrian flows – new insights using bus stop data*. Association for European Transport Papers Repository. 2015. Available at: <https://abstracts.aetransport.org/paper/index/id/4702/confid>.

¹⁶ Ancaes PR, Jones P. *Irregular pedestrian crossing behaviour on a busy road in London: where, who, when, and how*. Paper presented at the 49th Annual UTSG Conference, January 2017. Available at: <http://discovery.ucl.ac.uk/1538001>

¹⁷ Ancaes PR, Jones P. The effectiveness of changes in street layout and design for reducing barriers to walking. *Transportation Research Record* 2016; 2586: 39-47.