

Street mobility and network accessibility: towards tools for overcoming barriers to walking amongst older people

Review of non-academic literature and resources relating to Community Severance

STREET MOBILITY AND NETWORK ACCESSIBILITY SERIES

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Abstract

The UCL Street Mobility and Network Accessibility team has conducted reviews of academic literature on aspects of community severance. These reviews, distilled into previous working papers in this series, have led the team to conclude that academic approaches to the assessment and remediation of community severance are rarely applied in practice. Nevertheless, effort is clearly made by practitioners – such as local authorities, and community and pressure groups – to quantify and tackle the impacts of community severance. The UCL team intends to translate its research findings into advice and a toolkit of resources to better equip practitioners in prevention, or identification and solution of, community severance-related problems. This review of non-academic literature and resources concerning community severance provides an insight into current practice, enabling development of pertinent research evidence-based advice and tools for practitioners.

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1. Introduction

The aim of this review is to draw together available non-academic information (in English) concerning issues surrounding community severance to augment the research on this topic by a multi-disciplinary team based at UCL, funded through the Lifelong Health and Wellbeing Cross-Research Council Programme. The UCL team have previously conducted academic literature reviews on specific aspects of community severance, which have been distilled into several working papers, including ‘Quantifying community severance’ and ‘The value of the barrier effect of roads and railways’. One broad conclusion from the research by the UCL team to date is that, while the reviewed literature points to various ways of assessing and addressing community severance, the methods proposed have rarely been applied by practitioners. Moreover, outside academia, it is clear that a number of local authorities and consultancies, together with community and pressure groups have, increasingly during the past two decades, tried to quantify and tackle the impacts of community severance-type issues in a variety of ways, even if they do not couch them in such terms.

The anticipated outputs from the UCL research include advice and a toolkit of resources of use to practitioners in the field seeking to measure and redress community severance-related problems. To this end, it would seem appropriate that the academic literature reviews be supplemented by an appraisal of the existing concepts and tools used by practitioners (which include relevant community and campaign groups in this context) to measure issues relating to community severance.

a) Why is this an important issue to research?

It is worth pausing to reflect, at the outset of this paper, on what an examination of non-academic literature and resources could contribute to the UCL team’s work on community severance, i.e. the rationale for this broader review and what parameters will guide its execution.

From the work done so far by the UCL it is evident that community severance is generally a poorly understood concept among both researchers and practitioners. As a

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result, available material and evidence on what it is, how to measure it, together with the effectiveness of measures utilised to address it, are relatively sparse. It is, therefore, necessary to draw on all available sources of information, including non-academic resources, to gain as full an understanding of this topic as possible. Nevertheless, many people are concerned about the effects of community severance, both single issues and cumulative impacts, even if they do not recognise this term. As this concern, and the response that it prompts, emanates from community / voluntary groups and individuals, as well as professionals, it is necessary to look beyond the academic literature to understand fully how it manifests itself. It could reasonably be argued that insufficient attention has been paid to community severance to date. This may be due to poor understanding of a complex issue and, as a result of this, an absence of standardised techniques to measure community severance. This has resulted in a variety of definitions of community severance emerging, with differing interpretations leading to different issues being measured and addressed via a range of approaches. Again, it is likely that this diversity of interpretation can only fully be understood by looking beyond the academic literature. Incomplete understanding of the concept of community severance will result in failure to acknowledge and address the full range of its negative impacts.

The UCL research team have examined the range of interpretations of community severance, then developed the following definition to apply to their work, which is used to guide this review:

“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 crossing that infrastructure or traffic.” (Anciaes 2015, p4)

Community severance is often used inter-relatedly with other terms, e.g. community cohesion and social connectedness, which are the antithesis. However, these also often require some definition / interpretation to understand the range of issues they cover, which is likely to be more fully informed by an examination of resources beyond academic literature.

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Community severance can result from new roads, road improvements and changes in traffic levels. It can also be time-specific and may affect different user groups in different ways. Existing academic literature does not reveal much about these facets of community severance, again indicating a broad trawl for information is required.

Good transport and land-use planning involves an assessment of both the positive and negative impacts of scheme proposals. Some impacts are simpler to quantify and measure than others, which could lead to a focus of attention and resources on the easier-to-understand issues. The established body of academic literature on community severance does not explicitly acknowledge this issue that can, therefore, only be further explored via a look at practices in the field.

b) Method

This review has involved a study and analysis of non-academic resources (in English) that ‘tell us’ something about community severance. They do not always refer to that term explicitly, but they do relate to the UCL research team’s definition of community severance, referred to above. Examples of the range and types of information that have been drawn on for the review are summarised below:

- Community severance assessment tools: e.g. guidelines on collating evidence to demonstrate that the severance effect of roads is having a negative impact on peoples’ behaviour and lifestyles.
- Case studies: e.g. projects that have set out, either explicitly or implicitly, to address the severance effect of roads on communities and the accessibility of vulnerable road users.
- Websites: e.g. of organisations concerned with the negative impacts of roads on community cohesion and wellbeing.

The review will focus primarily on UK generated resources, as these have the greatest relevance to the issues under scrutiny, as well as the target audience for the toolkit outputs from the study. Nevertheless, owing to the general paucity of intelligence on community severance, material has also been drawn from North America, Australia and

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New Zealand, together with information on practices in northern Europe (which generally has a good reputation for balancing the needs of people and traffic) available in English.

While the review focuses primarily on contemporary sources of information, there is a value in looking briefly at those tools and resources designed to measure and address community severance issues that have fallen into disuse, or never gained traction. Understanding the reasons for their demise will help guide the development of the toolkit of resources, which will comprise the key practical outputs from the UCL research.

c) Presentation of information

At the end of this document there is a compendium of the references and resources examined for this review, listed alphabetically by author / source organisation, including date of latest iteration / update, together with an indication of origin / format (e.g. written report, website, journal article, etc). The main body of this review provides an analysis and interpretation of what this information tells us about how community severance under the following themes:

- What community severance-related issues are covered in the literature?
- Who is concerned about community severance-related issues?
- What methods are available for quantifying and analysing community severance-related issues?
- What role does community engagement play in identifying and addressing community severance-related issues?
- What measures have been utilised to address community severance-related issues?
- How successful, or otherwise, have these initiatives been and the reasons for this?
- What are the key remaining knowledge gaps relating to community severance?

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2. What community severance-related issues are covered in the literature?

“Despite virtually all of the respondents interviewed having no formal requirement to assess or appraise community severance as a part of their day-to-day work, practitioners were aware of and able to identify a broad range of causes of community severance created by new and existing transport infrastructure. They identified that three key types of barriers to movement caused community severance...” (James et al 2005, p54-55)

The aspects of transport infrastructure and motorised traffic often associated with community severance in the literature can be grouped into three types: physical, psychological and social. These are not necessarily mutually exclusive.

a) Physical, sub-divided into two groups:

- Static, e.g. barriers, railings, embankments, fencing, walling, planting, etc. Some transport corridors create physical barriers to movement and widespread community severance in themselves, in that they are virtually impossible to traverse away from dedicated crossing facilities. Waterways, railway lines and motorways all fall into this category. Roads that might otherwise be crossable in numerous locations can create severance if bounded by physical measures (e.g. railings) to prevent or deter indiscriminate crossing behaviour.
- Dynamic, e.g. heavy traffic at certain times. Parked cars might fall into both sub-categories, in that continuous lines of stationary vehicles can create a static physical barrier, but their configuration is constantly changing (dynamic). Several commentators have noted that some arrangements of parked vehicles can contribute to community severance to a greater extent than others. Echelon parking angled at odds from pedestrian desire lines, as well as extensive lines of nose-to-tail kerb-side vehicles with minimum breaks, tend to be the most obstructive.

b) Psychological, roads that are unpleasant to cross, walk / cycle along, or generally be near due to...

- Perceived danger / safety

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- Streetscape quality (planting, arrangement of furniture, etc.)
- Traffic noise
- Air quality
- Vibration
- Signing / legibility
- Visual intrusion
- Fear of crime
- Footway width
- Distance from traffic

c) Social

- Trip detours
- Trip delay
- Walkability / pedestrian connectivity
- Accessibility
- Public transport access
- Local cohesiveness
- Social isolation
- Trip suppression
- Personal choice / freedom (particularly for children)
- Isolation / separation from facilities, services and social networks
- Neighbourhood lifestyle
- Cycle-friendliness

The type of problem can vary depending on the time of day, e.g. traffic congestion and noise during the day, speeding traffic at night.

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3. Who is concerned about community severance-related issues?

a) Central Government

In 2001 the then Prime Minister, Tony Blair, asked the Social Inclusion Unit (SEU) to explore the problems experienced by those faced with social exclusion in reaching employment and key services. The resultant 2003 report, *'Making the Connections'*, included recommendations for the introduction of 'accessibility planning' to be coordinated by local authorities, but likely to involve a range of stakeholders and delivery bodies, including local residents, community groups, NHS Trusts, education and transport providers, etc. While the work of the SEU went well beyond looking at the impact of transport infrastructure and traffic on individual's ability to get about to include, for example, the availability of public transport for those without primary access to a car, it did overtly acknowledge some of the community severance impacts of roads and that the burden of these problems often weighs most heavily on the disadvantaged. *"Deprived communities can often be the hardest hit by the negative impacts of traffic like...large roads cutting through the community."* (Social Inclusion Unit 2003, Forward)

b) Local Government

The literature points to a general appreciation of the problems associated with community severance among relevant local authority officers and members. However, this is accompanied by a lack of clarity as to who should take a lead on coordinating action to address these issues, as they fall into the remit of a range of public sector roles, including those encompassing planning, highway engineering, health promotion, road safety, social inclusion, etc. *"Practitioners were generally able to describe what they thought community severance was and how it was caused even if they had not come across it as something substantively assessed in their everyday work. The vast majority of practitioners identified the various effects of community severance (such as trip delay and diversion) that are highlighted in the existing literature and appraisal guidance. In addition, there was strong recognition of the links between community severance and social inclusion issues."* (James et al 2005, p53) Moreover, there is growing understanding of the inter-connectivity between the user-friendliness of public spaces

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and the economic, social and physical wellbeing of the communities and individuals associated with them, even though existing local authority structures often do not facilitate a cross-departmental approach to problem solving. As the then President of ADEPT, George Batten, put it in his introductory commendation of *Manual for Streets 2*: *“Local authorities are increasingly aware of the fundamental nature of well designed and maintained streets to the economic, social, educational and environmental well-being of local citizens and communities; and the harmful consequences of neglecting the places where we live and work.”* (The Chartered Institution of Highways and Transportation 2010, p3)

c) Consultants

Consultants, particularly those engaged in public realm improvement projects. *“The general trend of increased levels of vehicular traffic in Greater London has led to worsening conditions for pedestrians and cyclists despite improvements in central London as a result of the congestion charge. Furthermore, the streetscape is principally designed for the motor vehicle often to the exclusion of other types of user. For instance guard railing, staggered pedestrian crossings and pavements interrupted by side roads are designed to ease motor traffic movement, but all detract from the street environment and walking experience.”* (Gehl Architects 2004, p9)

d) Professional bodies

Professional bodies, again particularly those concerned with streetscape in some respect, encompassing urban designers, planners and landscape architects, together with a growing number of aesthetically-conscious highway engineers. *“The way our streets are designed and managed is essential to our everyday lives and their quality affects everyone. Streets are not just a way for people to get about but are places in their own right, the centre of the community. Streets that look good can also be safer... I am very pleased that the CIHT (Chartered Institution of Highways and Transportation) is able to support the publication of this up to date advice and to encourage the application of good practice.”* (Davis, 2014)

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e) Public realm pressure groups

Pressure groups established to champion pride in, and care of, the public realm. *“Street Pride is Civic Voice’s national campaign supporting local action to help rid our streets of unnecessary clutter, (particularly) bollards signs, posts (including lampposts and traffic lights) and guard rails... Streets make up nearly 80% of the public space in our urban areas. They often become cluttered by all kinds of objects that are unnecessary, badly designed or poorly located and which lack any co-ordination. The result is streets with physical and visual obstructions that make them feel degraded and uncared for. We all deserve better.”* (Civic Voice 2010)

f) Public health professionals and pressure groups

Those concerned with public health, both professionals and pressure groups. *“We must not (continue to) create obesogenic towns. Two generations ago children played and adults socialised in the streets between their homes. In many continental cities and towns this is still true, but in the UK it has become unconventional, and worthy of disapproval, for parents to let their children play out in the street. We call for a new approach to street design and layout, which puts the needs of residents, especially children, above those of drivers. The car should be a guest in residential, shopping and other populated streets and walking pace should be the normal driving speed.”* (Association of Directors of Public Health et al, in Sustrans et al 2008)

g) Sustainable travel campaign groups

Campaign groups whose raison d'être is to promote sustainable travel. *“We bring communities together to help them redesign their streets to make them safer and more attractive places to live, where people come first... We work with local residents and other partners to create high quality urban environments that promote sustainable travel and are safe and pleasant to live in and visit.”* (Sustrans' Community Street Design web pages)

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h) Academics

The UCL research under which this paper sits, represents a cross-disciplinary collaboration between the departments of Epidemiology & Public Health, Architecture and the Built Environment, plus Civil Engineering (Centre for Transport Studies). It is funded through the Lifelong Health and Wellbeing programme, a cross-research council initiative, coordinated by the Medical Research Council, *“established to meet the challenges and opportunities of an aging population”* (MRC website). Both the source of funding and the structure of the UCL research point to a clear acknowledgement that the issues surrounding community severance are multifaceted in origin and solution. Researchers at other academic institutions have also looked at topics that ought to encompass aspects of community severance. These include current work by the Physical Activity and Public Health group based at the University of Cambridge on understanding the short and long term effects of environmental changes on levels of physical activity, particularly walking and cycling, and the mechanisms by which such changes in behaviour come about.

i) People with specific mobility issues and the organisations that represent them

“In a recent survey conducted by the RNIB, a third of people said they had been injured during a three month period when walking around their local area. Some people even said they were so intimidated by the risks outside they ended up staying at home and becoming isolated. This is simply not good enough.” (RNIB 2015) Many public bodies have, for decades, acknowledged that the adverse impacts of highway infrastructure tend to be felt more keenly by specific groups. *“Community severance effects are not evenly spread amongst the people in the area around the road... aged people, the disabled and children are particularly vulnerable to disruption of their travel patterns.”* (Highways Agency 1993, para 5.4) However, judging by the increase in vociferousness of disadvantaged user group activity relating to accessibility and transport infrastructure in recent years, there is clearly ongoing disparity between acknowledgement of the problem by public sector bodies and their ability and / or willingness to take effective remedial action.

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j) Communities affected by severance

Communities affected by severance, but often voiced only when they are formally consulted. *“Work by the Highways Agency involving case studies with affected communities explored in detail why the barriers associated with severance changed people's behaviour. People were able to identify a range of reasons why behaviour had changed (both in relation to new roads and to roads that had become increasingly busy over time). There was a reduction in the desire or ability to socialise or go for a walk in the affected area. Parents restricted children from playing outside or crossing the road due to road safety fears. People shut themselves off from their surroundings and modified their lifestyles and working patterns to counter the negative effects of congestion; this included changing their shift patterns at work and the use of different areas for shopping and recreation.”* (James et al 2005, p23)

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4. What methods are available for quantifying and analysing severance-related issues?

“There was very little literature on the actual measurement of severance. In fact, we found no studies that had measured community severance but several that had measured a component of the community severance causal pathway.” (Marsh and Watts 2012, p5)

As the concept of community severance is generally not well understood, nor defined, there are currently no tools available that have specifically and unequivocally been developed to measure the totality of community severance and been widely adopted. Nevertheless, if the aspects of transport infrastructure and motorised traffic commonly associated with community severance in the literature, listed earlier, are taken as a starting point, a broader range of assessment tools could be brought into play to measure the extent of individual, or a sub-group of, impacts in specific locations. The ensuing results would then need to be pieced together to present a holistic profile of the range and severity of community severance impacts in an area. Although, there remains little clarity on what the composite elements of what that picture should be (indeed, this is an anticipated output from the UCL research). Below is a summary of those assessment tools that have been most closely linked to quantifying community severance since it became more widely acknowledged as a distinct problem in the latter half of the twentieth century. [NB This section profiles techniques that are utilised by professional practitioners, those where the primary constituent is community engagement are covered in the subsequent section of this report.]

a) Methods that specifically relate / refer to community cohesion and severance

Building on his seminal work in three San Francisco streets in the 1960s, Donald Appleyard (1981) suggested in a book that expanded on work first reported in a US journal in 1971 the following set of criteria for identifying a ‘protected neighbourhood’, defined as a cohesive community in relation to transport and urban design considerations. According to the criteria, streets with the following attributes should not suffer from community severance:

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- Acceptable vehicle speeds and volumes (although ‘acceptable’ is not defined).
- Acceptable noise levels (again, however, ‘acceptable’ is not defined).
- A reduction of pedestrian accidents (from / to what level is not defined), and rights of way for pedestrians.
- Places where people can sit, converse and play.
- Places where communal life is possible and where it can happen if residents want.
- A ‘neighbourly territory’, where residents believe the street belongs to them, for which they have a sense of pride and responsibility. Moreover, the street should be *“a fine place for children to play”*.

A more recent report by New Zealand’s Public Health Advisory Committee (2010) devised a list of features that promote a socially cohesive urban environment, with similarities to Appleyard’s criteria above and include:

- Public spaces that are high quality and accessible for all sections of the population.
- Multi-purpose spaces that accommodate activities for different age groups.
- Good quality public spaces located near more deprived areas.
- Public spaces that are accessible by public transport and a connected network of walking routes.
- Seating, shelter, and shade available in public spaces.
- Facilities that are able to be shared, to ensure a wide range of people can access them.

Work in Sweden during the 1980s resulted in an assessment tool for quantifying the barrier effect of roads derived from the sum of two effects: the disturbance to movements ‘across’ the road, as well as to movement ‘along’ the road by vulnerable road users from passing traffic (Swedish National Road Administration 1986). External commentators have not been able to gain access to the detailed methodology. However,

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it is understood that the “*substantial volume of data required for the complex calculations*” (Quigley and Thornley 2011, p19) resulted in this measure of assessment of community severance not been widely applied.

Research in Denmark during the early 1990s yielded recommendations for a quantitative assessment of severance derived from the value of the barrier and the risk perception effects generated by roads (Danish Road Directorate 1992). A fair volume of data was required for the calculation, including:

- Average daily traffic.
- Average traffic speed.
- Proportion of heavy vehicles.
- Number of pedestrian crossings facilities.
- Length of road.
- Weighting of relative importance of different land uses, e.g. it was deemed four times more important to be able to cross the road to access shops than recreation facilities.

The amount of data required, together with the highly complex mathematical formula used, has meant that this approach has not gained any real traction, particularly outside Denmark. It has also been subject to criticism for under-playing community severance by, for example, setting it at 50% of the value of the noise nuisance effects of roads.

In 2001 Read and Cramphorn were commissioned by Transfund New Zealand to suggest an approach for quantifying the social severance impact of roads. Their ensuing recommendations described an approach that would need to be applied to different elements of road projects, for different categories of road user. The research authors conceded that the development work required to evolve this methodology would be substantial, costly and quite complicated. *“It would involve focus group work to understand how people would react to road and traffic changes; and further surveys about stated preference, again asking communities how they would react to road and traffic changes...Read and Cramphorn go on to suggest that the data collected above could then be used to calculate willingness to pay and willingness to accept data for*

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each project, via complex statistical modelling.” (Quigley and Thornley 2011, p20) The authors, themselves, “...commented on the difficulty and cost surrounding their proposals, and noted that [there was no guarantee they would] add substantially more value than the existing assessment approaches based on qualitative interviews and surveys, basic counts and map-work.” (Ibid, p21-22) Perhaps not surprisingly Read and Cramphorn’s proposals were never taken forward by the New Zealand Government.

Recommendations arising from a more recent study commissioned by the New Zealand Transport Agency (Marsh and Watts 2012), suggested the adoption of the following severance index for vulnerable populations:

- Destinations – define the destinations to which access is typically desired, e.g. health, education, social, leisure, shops and transport facilities, etc.
- Catchment area – define facility catchment areas from which users may be drawn.
- Vulnerable groups – identify vulnerable groups.

Analysis is subsequently undertaken by counting the number of trips made to every destination using origin / destination surveys for each vulnerable group. Then *“the number of people affected from each subgroup and the magnitude of the effect would be calculated (of new severance or relief from severance) based on a rubric developed to categorise the level of severance.” (Ibid, p5) The authors suggest that the index could be fed with data drawn from three sources, which could be triangulated to fully describe the severance effect:*

- Quantitative – e.g. surveys, observation, usage statistics for key destinations (e.g. shops and schools), actual measurements of noise and pollution, traffic volume and speed, use and frequency of public transport.
- Qualitative – e.g. investigation of individual’s perception of severance using focus groups and interviews.
- Desk based research – e.g. changes in the comfort and attractiveness of the local area among vulnerable groups relating to air quality, visual amenity, noise, vibration, etc.

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Following data collation Marsh and Watts suggest that, for agreed groups and destinations, severance could be assessed through a combination of changes in travel time, costs and number of destination choices ‘before’ and ‘after’ the transport infrastructure under scrutiny took effect. Methods for data collection advocated by Marsh and Watts include site visits, audits, streetscape assessments, observation, document analysis, GIS mapping, etc. While well researched and thorough, the resource implications of this proposed methodology are pretty extensive. Consequently, there is little evidence that the recommendations have been widely adopted in New Zealand.

The UK Department of Transport’s Manual for Environmental Appraisal (DOT 1983) sets out a process for undertaking an environmental assessment of the impacts of new transport projects. The list of eleven anticipated impacts to be considered include community severance. The Manual suggests that transport projects may not only create new severance, but can also “*heal some divisions*”, thereby reduce existing severance. However, it goes on to state that these two effects should not be used to offset each other, so an increase in severance in one location is not cancelled out by a decrease elsewhere. The Manual describes a qualitative approach that delivers a four-stage classification of severance – none, slight, moderate, severe. Despite a wide definition of severance, the only data the Manual suggests need be collected is:

- Changes in pedestrian distances to key facilities, and
- Changes in vehicle journey times to key facilities.

In its 1996 report, the Standing Advisory Committee for Trunk Road Assessment (SACTRA) left the basic structure of the Manual for Environmental Appraisal (above) intact, but made two additional recommendations regarding community severance:

- Delays to pedestrians as a symptom of severance should be included within the economic valuation of the scheme.
- Particular attention should be placed on vulnerable groups in society, particularly focusing on access to facilities required by such groups living within defined catchment areas.

However, the methods suggested for translating these additional recommendations into practice were poorly thought through, consequently they have not been widely

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applied. For example, the catchment area for vulnerable groups was described as that within half a mile of the town centre, which one critical reviewer described as “*an arbitrary cut-off that is more likely to relate to the distances central city car drivers would walk after parking their cars, rather than real life catchment of vulnerable groups*”. (Clark et al 1991) Moreover, the work of SACTRA does, of course, only apply to Trunk Roads.

The 1991 TRRL report entitled ‘The Appraisal of Community Severance’ (Clark et al) described three essential components for assessing the potential for community severance:

- Defining the facilities to which access is potentially impaired, e.g. health, education, social, leisure, retail and transport facilities (a detailed list is provided in the TRRL report).
- Defining facility catchment areas from which users may be drawn, with boundaries between different catchment areas positioned half way between the nearest alternatives.
- Estimating the total and vulnerable populations within those areas, the latter to include: groups without full mobility (those aged over 70 years, families with pre-school children, wheelchair users); groups with a need for safety (school children, people with disabilities); groups depending on the locality (ethnic groups, low income households, etc.)

Assessment would then entail:

- Understanding the numbers of people in each vulnerable category.
- A qualitative assessment by field officers of difficulties likely to be encountered.
- Counting the number of trips to be made to each of the specified facilities.

The entire process described above is quite resource intensive and, even then, yields only a theoretical ‘propensity for severance’, rather than a definitive measure of severance in the location under scrutiny. Also, it focuses on resident populations, thereby excluding other users of the area potentially affected by severance.

The 1991 TRRL research (ibid) went on to propose a severance index, utilising the methodology outlined above to gather data that would be multiplied first against traffic density of the road under review, then against the presence and acceptability of

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mitigating factors. This would yield a separate index for each facility and for each vulnerable group, which would be summed to give a total severance score for each scheme. This proposed mix of qualitative and quantitative assessment was both resource-intensive and required a wide skill set. As a result, it has never been developed.

The Design Manual for Roads and Bridges (DMRB) Part II Environmental Assessment, Volume 11, Section 3, Part 8: *Pedestrians, Cyclists, Equestrians and Community Effects* (Highways Agency 1993) includes recommendations for measuring changes in non-motorised user (NMU) behaviour, creating baseline data from which to assess impacts of highway schemes. *“Community severance is defined here as the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows.”* (para 5.2) Despite the guidance stating that the methodology could be applied to existing roads that have experienced an increase in traffic flow, it is not easy to see how this would work well in practice. Unless an increase in traffic levels and consequent intensity of community severance is anticipated, a ‘before’ study to gather baseline data against which NMU behaviour changes can be measured is unlikely to have taken place. So, this methodology is not really applicable to measuring established community severance impacts. Also, DMRB applies only to trunk roads and motorways.

The Design Manual for Roads and Bridges, Volume 5, Section 2, Part 5 Non-Motorised User Audits (Highways Agency 2005), acknowledges that severance-related problems for NMUs can accrue from highway developments. However, it is explicitly intended to be applied to new / proposed schemes relating to trunk roads and motorways. So, again, will not address pre-existing problems, nor is it applied to the majority of roads around which communities cluster. *“Examples of difficulties that may arise for NMUs within scheme design include... lack of continuity of routes... inadequate crossing facilities... speed and volume of motor traffic.”* (pA/1) It does, however, go beyond problem identification to include prompts to help minimise building NMU severance into the design and construction of significant new highway infrastructure. *“How have NMU routes been designed to closely align with desire lines without deviation? [and] How have connections to origins / destinations and NMU facilities been considered throughout the design of the NMU route?”* (pA/5)

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The New Approach to Appraisal (NATA) was introduced by the then Department for Transport, Environment and the Regions (DETR) as part of the 1998 Integrated Transport White Paper, entitled ‘A New Deal for Transport: Better for everyone’. The aim of the White Paper was to create a *“better, more integrated transport system (that contributed to) wider Government objectives for economic prosperity, environmental protection, health and social inclusion”*. (James et al 2005, p9) NATA was developed as a multi-criteria decision framework used to appraise transport projects and proposals in the UK, building on well-established cost-benefit analysis and environmental impact assessment techniques (such as those contained in DMRB). Within NATA, community severance is dealt with as a sub-objective of ‘accessibility’ and is concerned with non-motorised users (NMUs), especially pedestrians. It is classified into four broad levels:

- None – little or no hindrance to NMu movement.
- Slight – all people will be able to move but there will be some hindrance to movement.
- Moderate – some people, particularly children and old people, are likely to be dissuaded from making pedestrian journeys, it will be longer and less attractive for others.
- Severe – people are likely to be deterred from making pedestrian journeys to an extent that they re-organise their activities. Those making journeys on foot will experience considerable hindrance.

The extent of community severance is measured against criteria set out in DMRB:

- Neutral or slight beneficial – where new severance or relief from existing severance is slight, or the total number affected is <200 people.
- Large beneficial or adverse – new severance or relief from severance is severe / substantial and affects a moderate to high number of people (>1,000).
- Moderate beneficial or adverse – all other cases.

While the coalition Government dropped the term NATA in 2011, it remains in the Department for Transport’s WebTAG guidance on transport scheme analysis.

In their 2007 seminal work entitled Link and Place, Jones, Boujenko and Marshall set out to develop a new approach to urban street planning that took much greater account

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of their non-traffic functions and, by implication, community severance-related issues. *“Since the start of the rapid growth of motorisation in the UK and other European countries around fifty years ago, the planning and design of urban streets has concentrated primarily on meeting the needs of motor vehicles, using a roads-based street classification. This has led to vehicle-dominated designs that have generally neglected the other functions of streets, as places of economic and social activity, and as important parts of the urban public realm. The Link and Place approach acknowledges that streets serve both Link and Place functions, to varying degrees, and that Link and Place aspects are given equal consideration – there is no automatic presumption of traffic priority.”* (Jones et al 2007, p6-7) In brief, the authors proposed a Link / Place classification matrix, against which all the streets in an urban area would be classified according to their status as a Link and a Place. This would then guide investment decisions to those streets that are under-performing most significantly as Links and / or Places. Importantly, the approach advocates a much stronger role for non-traffic street users in identifying issues and priorities, so that Link and Place user needs are considered at the same time. *“This leads to a more balanced street provision outcome, where Place needs are not just an afterthought.”* (Ibid, p10) However, the shift from the current approach to street design and management advocated by Link and Place would, the authors concede, be quite significant. *“The implications of fully taking on board the philosophy that underlies the thinking in this guide are very substantial. They require transport professionals and urban planning and design professionals to work together, in a single integrated process... and may therefore have major administrative implications for some local authorities...”* (Ibid, p242) As a result, there is little clear evidence that this well thought-through methodology has yet been widely adopted.

The US Department of Transportation’s Federal Highway Administration has utilised Community Impact Assessments (CIAs), as *“...an iterative process to evaluate the effects of a transportation action on a community and its quality of life.”* (From the Federal Highway Administration website, under ‘Livability – CIA’) A ‘quick reference’ guide for professional to applying CIAs to transport schemes was developed in 1996 to counter the trend that: *“In the past, the consequences of transportation investments on*

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communities have often been ignored or introduced near the end of the planning process, reducing them to reactive considerations at best. The goals of this [resource] are to increase awareness of the effects of transportation actions on the human environment and emphasis that community impacts deserve serious attention in project planning and development.” (Ibid) A constraining factor in applying the CIA methodology in a UK context, is that it is predicated on US regulations, statutes, policies and technical advice, etc., that have no foundation in Britain. However, it does offer a logical assessment process for identifying the community impacts of transport schemes, that could be applied more widely, comprising the following steps:

- Define the project and study area – develop various project alternatives that satisfy the project purpose and need, then identify areas of potential impact.
- Develop a community profile – determine the characteristics of the affected area, such as neighbourhood boundaries, location of residences and businesses, demographic information, economic data, social history of communities, land use plans, etc.
- Analyse impacts – examine the potential impacts of the proposed transport scheme (plus alternatives) versus no action. Of particular relevance to community severance the ‘questions to help identify community impacts’ under this section of the guide include: *“How will the project affect interaction among individuals and groups?”* as well as *“Is a wall or barrier effect created?”* and *“How does the project affect non-motorist access to businesses, public services, schools and other facilities?”* (Ibid, section 5)
- Identify solutions – identify and recommend potential solutions to address adverse impacts, considering avoidance, minimization, mitigation and enhancement.
- Use public involvement – utilise public participation throughout the process, e.g. to research the community profile, to develop project alternatives, to test the acceptability of mitigation measures.

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- Document findings – present the findings of the CIA through presentations, as well as in written form to disseminate to interested parties and inform subsequent decision-making.
- Review as an iterative process – as communities are dynamic and constantly changing, allow for re-evaluation and adjustment of findings and recommendations, particularly if there are significant time lapses in project development.

A couple of case studies were examined of where CIAs have been applied to transport projects in the US, to assess the relevance of this tool for the UCL research. These were the Big Lake Community Impact Assessment (Matanuska-Susitna Borough 2014) and Community Impact Assessment for Monroe Connector / Bypass (North Carolina Turnpike Authority 2009). In brief, both studies relate to very significant, high cost, new transport infrastructure proposals. The resultant CIA reports covered a wide range of potential impacts (e.g. the effects on bus routes, increases in noise and vibration, as well as access and community cohesion, etc.) of a number of alternative schemes (e.g. comparing road and rail options). The ensuing commentary and recommendations relating to community severance were very broad-brush and unspecific. For example, the sole recommendation in the Monroe Bypass CIA relating to facilitating non-motorised access was: *“Since municipalities are generally encouraging and / or have adopted master plans that address interest and need for pedestrian and bicycle provisions, the NCTA [North Carolina Turnpike Authority] should coordinate with local jurisdictions to discuss accommodations for sidewalks, where appropriate and feasible”*. (North Carolina Turnpike Authority 2009, p79) Meanwhile, the near 500-page Big Lake Community CIA merely concluded that certain scheme options were likely to have a more significant negative impact on community cohesion than others, without going into any detail about the specific severance effects of the proposals or how they could be mitigated. So, option 2 would have the *“...least impacts on community cohesion as it does not split established neighbourhoods”*, while option 3 would result in *“...substantial changes to the centre of Big Lake, including physically dividing the town centre into an east and west side which would have a substantial impact on community cohesion”*. (Matanuska-Susitna Borough 2014, p55-6]

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The New Zealand Transport Agency's 'Pedestrian planning and design guide' (2009) acknowledges severance as an issue, defining it, in an initial glossary as: *"Separation of people from facilities and services they wish to use within their community due to obstacles to access such as busy roads"*. This comprehensive and people-focused guide to accommodating and facilitating pedestrian movement subsequently refers to severance in a number of contexts, particularly in relation to *"measuring walkability"* of places (Ibid, p11-1) Here it includes a methodology to assess connectivity of a neighbourhood that, in summary, measures how quickly key destinations can be reached from different origins, taking account of obstacles to progress (e.g. detours, time spent waiting to cross roads, etc.). Walkability decreases (while evidence of severance increases) where relatively short walking distances become unacceptably long (in terms of the time taken to cover them) as a result of hindrances to progress.

b) Methods that, while not specifically designed to measure the community severance-related impacts of transport infrastructure, could be / could have been applied to this purpose

Quality Audits were first introduced as a concept in Manual for Streets (DfT 2007). However, as this guidance is primarily associated with new residential developments, it was not until the emergence of a follow-on document (Manual for Streets 2, CIHT 2010), advocating wider application of the principles to high streets and existing roads, etc., that this technique became more readily associated with addressing / preventing community severance and creating streetscapes conducive to human interaction. *"Quality Audit is recommended as integral to the design process, from initial conceptual designs when a vision for a scheme is developed and including criteria for success, e.g. not just reducing collisions or congestion but also increasing footfall and use of places..."* (CIHT 2010, p34) Nevertheless, Quality Audits are generally only applied to proposed works (new or improved schemes), so are not easily applicable to assessing established problems of community severance where no remedial measures have yet been developed.

Road Safety Audits (RSAs) are intended to ensure that schemes have adequately considered and addressed all safety issues in order to minimise the number and severity of situations in which road users are killed or injured while using the public highway. The

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task is (only) undertaken by qualified and experienced practitioners who examine new schemes and highway improvements during the design and construction stages. Despite its laudable intentions, which ought to safeguard the interests of all those impacted by roads, the RSA process has been criticised for creating ‘solutions’ to road safety problems that actually compound community severance and result in a behavioural response that undermines road safety. *“There can be a tendency for auditors to encourage designs that achieve safety by segregating vulnerable road users from road traffic. Such designs can perform poorly in terms of streetscape quality, pedestrian amenity and security and, in some circumstances, can actually reduce safety levels.”* (CIHT 2010, p37)

The Campaign for Better Transport, concerned with promoting use of sustainable travel options, particularly surface public transport, worked with Abellio (a Dutch rail company that operates a number of franchises in the UK) to produce a report entitled ‘Fixing the Link’ in 2013. This uses the results of case studies in three English urban areas, Colchester, Ely and Ipswich, to present a *“...methodology that assesses the route between a station and town centre on the basis of four criteria:*

- *Liveliness – a lively scene is one with people on the street, attracted by a variety of uses and places to sit down and watch.*
- *Human scale – a physical setting that matches human scale and walking speed.*
- *Legibility – the ease with which people can orientate themselves and see the route into town.*
- *Safety & comfort – pedestrians must have priority and the route should feel safe, protected from traffic, well maintained and overseen.”* (Campaign for Better Transport and Abellio 2013, p11)

While there are clear overlaps with community severance, the fact that this guidance relates to a single issue (links between stations and town centre) and is based on Dutch good practice, may well mean that it is not seen as widely applicable in the UK context. Moreover, the Dutch work on which the English case studies were developed involved Abellio’s parent company working in *“partnership with local authorities (to) identify route enhancements that will have the strongest beneficial impact on the comfort and security of passengers from the moment they leave the train through to the local high street”*.

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(Ibid, p3) By contrast, UK rail operating companies currently simply do not see themselves as having a responsibility for ‘passenger experiences’ beyond the confines of the rail network / stations.

The pressure group Living Streets has collated a range of information and resources, much of it freely available from its website (www.livingstreets.org.uk), to enable and encourage the collation of evidence to support remedial action concerning problems on local streets. This includes advice for professionals *“to support them in creating better streets”*. Under ‘street design and management’ there is guidance on assessing a number of topics that might impact on community severance, including de-cluttering, prioritising vulnerable road users, and creating people-focused streets. The information is supported by examples of good practice / inspiring case studies, a rationale for why action is needed, where to look for technical advice on assessing / addressing problems, plus policy arguments and legal support for enacting change.

Space Syntax was developed in the late 1970s / early 1980s, by The Bartlett School of Architecture at UCL, as a tool to help urban planners simulate the likely effects of their designs. In relation to the street network, Space Syntax has been used to quantify and describe how easily navigable an area is, and to predict the correlation between spatial layouts and traffic flow. Despite these functions, some commentators have observed that this tool appears to overlook a number of key community severance-type issues. *“The principles of Space Syntax seem to us to be highly appropriate for the evaluation of sustainable local pedestrian or cycle networks. (However), at the moment Space Syntax has nothing to say on breaks in pedestrian networks like major roads...”* (Henson and Essex 2003, p13 / 231).

Advice by professional institutions to the practitioners they represent in various fields relating to health, transport and land-use planning, has increasingly come to embrace considerations relating to community severance in recent years. In 2012, for example, the Town and Country Planning Association issued guidance (‘Reuniting Health with Planning’) on how planning and public health practitioners can work together to implement health and planning reforms in England, which seeks to address questions including: *“How does your plan promote patterns of development, street layouts,*

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permeability, connectivity and urban design quality that support active travel, physical activity and mental wellbeing?” (TCPA 2012, p29).

As noted earlier in this paper, the concept of Accessibility Planning emerged from work by the UK’s Social Exclusion Unit into transport disadvantage, which culminated in the 2003 report ‘Making the Connections’. Their research concluded that the external dis-benefits of transport infrastructure and travel patterns often fall most heavily on the more vulnerable sections of society. *“Busy roads can divide and damage local communities and restrict walking – especially amongst children and elderly people. Heavy traffic can cut people off from facilities because of fear of accidents. Some older people and disabled people can feel particularly intimidated by traffic. Studies have suggested a clear relationship between traffic volume and quality of life, including the amount of social interaction with neighbours. 75 per cent of parents say that they let their children play outside less than they used to; and 43 per cent are concerned about busy roads.”* (SEU 2003, p20) The report identifies a range of contributory causes of transport poverty, including rising car ownership and use, the evolution of a land-use planning system and practices that exacerbated this, and a consequent undermining of public transport viability and provision. Such problems have been compounded by a lack of clear responsibility for accessibility among central and local government departments. The ensuing SEU recommendations for Accessibility Planning aimed to ensure that:

- *“There is a clear process and responsibility for identifying groups or areas with accessibility problems.”*
- *“In developing and delivering their Local Transport Plans, authorities have improved information on barriers to accessibility and the areas where accessibility is poorest.”*
- *“Local authorities work with other agencies to consider a wider range of solutions to accessibility problems including changes to the location and delivery of services.”* (Ibid, p61-2)

While ‘Making the Connections’ appeared to represent a significant stride in the right direction towards increasing understanding of, and developing means to address, community severance-related issues, it has faltered in this regard on several counts. Easily quantifiable measures of transport disadvantage, such as lack of car ownership

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and infrequent buses, have come to dominate the assessment process over less well understood community severance-type issues, like community cohesion and trip suppression. The Accessibility Planning concept has come to be viewed as an expendable luxury for local authorities during the significant curbs on public sector spending in recent years. Moreover, the term ‘Accessibility Planning’ has been adopted in recent years to describe site-specific plans to ensure public buildings are accessible to those with physical disabilities. As a consequence it has largely lost its original broader meaning, as conceived by the SEU.

When they were a statutory requirement of public bodies, Equality Impact Assessments could well have yielded useful information about the community severance impact of roads, particularly on more vulnerable and disadvantaged groups in society. *“An EqIA is an information gathering tool designed to enable decision makers to give ‘due regard’ to their equality duty in the decisions they take. It guides decision makers to:*

- *Consider the effect of existing policy / practice or proposed future policy / practice on people who share a ‘protected characteristic’ (e.g. age, disability)*
- *Identify opportunities to improve equality of opportunity and / or foster good relations and / or eliminate discrimination.”* (Highways Agency 2011, p4).

Equality Impact Assessments were not, however, confined to highway schemes and transport projects, but applied to the relevant responsibilities of any public body. *“An EqIA should be considered for any policy or practice that affects people where there is either evidence of, or an indication that... there are barriers to access for some groups.”* (Ibid, p6) The requirement for local authorities and other public bodies to undertake Equality Impact Assessments was withdrawn in 2012, under David Cameron’s war on ‘red tape’.

The North American Pedestrian and Bicycle Information Centre website (www.pedbikeinfo.org) provides a range of advice on undertaking NMU audits. A number of the resources identified by this website include reference to problems associated with community severance. For example, the Federal Highway Administration's Pedestrian Road Safety Audit Guidelines encompass a detailed checklist of considerations relating to street crossings, including: does pedestrian network connectivity continue through crossings; do wide curb radii lengthen pedestrian crossing distances and encourage high-

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speed right turns; and does a skewed intersection direct drivers' attention away from crossing pedestrians?

The Active Neighbourhood Checklist, devised by US-based Active Living Research (<http://activelivingresearch.org/active-neighborhood-checklist>), is an observational tool designed to assess key street-level features of the neighbourhood environment that are thought to be related to physical activity behaviour. Project case studies featured on the website include the negative health impacts of major roads on the communities through which they pass. These impacts encompass noise and air pollution, road safety issues, as well as discouragement to active travel as a result of the paucity of dedicated facilities for walking and cycling along and across busy roads.

The US-based International Physical Activity and Environment Network has developed guidelines for a methodology to assess strengths of association between the neighbourhood built environment, leisure physical activity, walking and cycling for transport, together with the BMI of participants (www.ipenproject.org/methods.html). This highly complex methodology is, however, unlikely to be widely utilised in the UK as it is so resource intensive. It goes well beyond an examination of community severance issues as it is concerned with assessing the full extent to which a neighbourhood encourages or discourages physical activity. So, for example, it also looks at the impact of crime levels, physical activity at home and in the workplace (e.g. digging, lifting), mental outlook on life, etc.

c) Methods specifically related to measuring how pedestrian activity could be affected by community severance

Measuring Pedestrian Activity was commissioned by Transport for London (TfL) in 2007 from consultants Colin Buchanan. It aimed to provide a distillation of best practice advice on assessing pedestrian movement, which would be accessible to the broad church of practitioners that have become involved in enhancing provision for those on foot. It was a response to an emerging need for techniques that could more easily be administered and understood by all those involved. Topics covered include counting pedestrians, observational studies, as well as attitudinal surveys. Regarding the latter, the document provides some useful advice about avoiding terms that are poorly understood by the

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majority, e.g. permeability and legibility. While the guidance does not specifically mention community severance, several of the techniques it outlines could be applied to assessing manifestations of this problem, e.g. ‘tracing’ pedestrian crossing desire lines utilising CCTV.

Pedestrian Environment Review System (PERS) was released by TRL in 2003 as: *“A low-cost tool for assessing the quality of provision for pedestrians... This framework aims to introduce qualitative factors and perceptions of the pedestrian environment, and reduces the amount of information that is often required by other audit tools.”* (Moreland 2004) PERS stresses the importance of qualitative factors in assessing conditions for pedestrians, e.g. street ambience, noise, fear of crime, etc., which affect other modes (with the possible exception of cycling) less. While the heterogeneity of people means there is no typical user, PERS views the environment from a ‘vulnerable pedestrian’ perspective, which should mean that resultant recommendations are suitable for the vast majority. While TRL designed the tool to enable the results to be presented and understood by a non-technical audience, completion of a PERS audit is quite resource intensive and time consuming, as well as requiring some relevant professional knowledge drawn from a variety of contexts. *“If the individual can fully understand the criteria for each parameter described in this handbook and is acquainted with the scoring review procedure, they will meet the minimum requirements for conducting a Pedestrian Review in the field. However, it is preferable, and will provide more accurate results, if the reviewer has background knowledge in the workings of the pedestrian environment. Experience of a wide range of pedestrian environments would also be of benefit in being able to score with a comparative knowledge.”* (Transport Research Laboratory 2006, p198) The crossings review stage of PERS, one of the most relevant to community severance, identifies the undesirability of deviation from pedestrian desire lines, physical barriers (e.g. railings), inadequate crossing time allowances and excessive waiting times. The handbook on how to conduct a PERS audit includes prompt sheets and scoring cards to be taken into the field. Scores for the various attributes are awarded on 7-point scale, -3 to +3, with -3 being unacceptable to +3 exemplary.

Local Transport Note 1/11 Shared Space includes some thoughts on pedestrian data collection that could relate to community severance, in that it warns of the potential for

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suppressed demand in the way streets are used. *“Changing the way a street operates to bring about an increase in the level of sharing requires an understanding of how people currently use the space. It is, therefore, useful to collect a certain amount of baseline data to inform the design while recognising that planned patterns and levels of use might be quite different from those being recorded.”* (DfT 2011a, p27)

d) Summary of key issues regarding assessment methods:

A small number of early efforts to develop comprehensive community severance assessment tools, during the 1980s and 90s in a number of countries, resulted in highly complex and resource-intensive methodologies that have not evolved nor been widely adopted.

The assessment tools most commonly used in the UK by practitioners to specifically assess community severance, based on Central Government guidance, measure only a very narrow range of impacts, typically increases in pedestrian journey times and distances.

It would be useful to have greater clarity on the distinction and relationship between measures of the causes and effects of community severance. Causes will typically include traffic volumes and speeds, together with road widths and physical barriers. Effects will encompass detours for non-motorised road users and additional travel time due to delays encountered in crossing the road. Some assessment methods address only causes or effects, some both, but none clearly sets out to establish the correlation between all relevant variables.

Many of the methods currently available for measuring a broader range of community severance impacts, cover assessment of a wide range of issues relating to the user-friendliness / fitness for purpose / environmental condition of streets and roads, so are not confined to severance alone.

The ‘yardsticks’ for quantifying some of these other issues are often easier to understand and apply than measures of community severance, e.g. signage clutter, volume of litter, condition of footways, etc. There is a consequent risk that the easier-to-comprehend issues will tend to dominate the process, drawing attention away from more esoteric severance-related problems.

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Application of assessment tools tends to be quite trip-specific, e.g. a look at how difficult it is to walk from public transport stops to key service destinations; or a look at how difficult it is to walk or cycle to a school or work-place. An assessment of community severance should not be confined to problems surrounding existing travel patterns, but also encompass trips that are not made, as current conditions make them impractical or unattractive for certain users. It should also measure the impact of roads on the behaviour and psychological well-being of its neighbours when they are not making journeys at all.

A majority of the methods, particularly those utilised by professionals, are applied during the development of new schemes, or improvements to existing ones. There is very little guidance, and few resources, available for the assessment of pre-established problems.

Some methodologies have been developed to apply only to certain types of roads. The most widely established and accepted method for assessing community severance in England among highway practitioners is that recommended in the Design Manual for Roads and Bridges (DMRB). Currently, however, this is only applied to trunk roads and motorways that, for the majority of their length, do not pass through residential communities. Notwithstanding this point, there may well be elements of the DMRB methodology that could be applied to other types of road, but this has not yet been explored or established by practitioners.

The vast majority of assessment methods focus on the public realm, few probe the impacts on private spaces, e.g. the extent to which busy roads might lead to an evacuation, or under-utilisation, of fronting domestic rooms and gardens that are adversely affected by traffic noise and vibration.

There is a lack of clarity in existing assessment methods on the catchment area regarding the community severance effects of transport infrastructure. At what distance from a transport corridor can its severance effects still be felt? How does this vary with different types of infrastructure and affected groups?

Very few tools involve quantification of the financial implications of community severance, nor the monetary value of addressing them. In order to justify investment in

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remedial measures, it is vital to establish an economic case for (i.e. what the pay-back will be from) doing so.

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5. What role does community engagement play in identifying and addressing these issues?

“Streets and public spaces are most successful when residents and other users have the opportunity to influence decisions about them.” (Living Streets website)

Below is a summary of the most significant opportunities that have evolved in recent years for local communities, both resident and transient members, to get involved in how the streets that impact on their daily lives look and function. The key issues that are emerging from this community engagement activity in relation to community severance follow on from this.

Campaign group Living Streets coordinate Community Street Audits, which involve working with groups of stakeholders, including local residents and businesses, to identify improvements that will create a safe and attractive environment for all users. The organisation charges a fee (typically between £5K and £10K) for the service, that they generally look to the ‘host’ local authority to cover. As Community Street Audits are delivered as a bespoke paid-for service, depending on local needs and budget, there is limited information publicly available about what they entail. However, Living Streets make awards to neighbourhoods, groups and individuals that have undertaken successful initiatives to create safe and vibrant streets and public spaces, most of which have been facilitated by Community Street Audits. In many cases the outputs of the audit were used to demonstrate evidence of a problem or need, for which funding for some remedial measures was secured. Nevertheless, anecdotal evidence from Community Street Audits suggest participants are often quite unimaginative about the extent, nature and causes of less tangible street-level problems, often those relating to community severance. Consequently, they frequently need to be prompted about these issues by the trained audit leader.

In addition, the Living Streets’ website contains a range of resources to enable local communities to assemble an evidence base and marshal their arguments to press for improvements in their streets, including those that relate to community severance. This includes advice on using social media, preparing a press release, letter writing, doing a local radio interview, organising a meeting, running an awareness-raising event, etc.

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There are hints on problems to investigate, e.g. waiting and crossing times, together with advice on how to assess and measure them. This is accompanied by dedicated resources to mobilise activity, including case studies of similar successful campaigns. In addition, there are useful explanations of how local authority decision-making works, plus definitions of relevant terms, such as ‘desire lines’ and ‘trip suppression’.

The sustainable transport charity Sustrans have developed a similar process, Community Street Design, for engaging residents in efforts to make their neighbourhoods more conducive to walking, cycling and human interaction. *“Working in individual streets or neighbourhoods, we deliver a comprehensive community engagement and design service focused on meeting local aspirations for improving streets. Typically this involves addressing traffic speed and / or volume, rat-running, problem parking, as well as delivering activities to encourage sustainable travel behaviour and more social use of streets as public spaces...”* (from Sustrans’ website) There is limited information available in the public arena about the focus and impact of the Community Street Design process, although one of the case studies profiled on the Sustrans website refers to assisting a community in Haringey address *“high traffic speeds and rat running, which led to concerns over safety for pedestrians and cyclists”*. What is evident, however, is that this approach throws up a wide range of problems associated with public use and perception of streets, including anti-social behaviour, fly-tipping, dog fouling, etc., in addition to those more obviously linked with community severance.

Placecheck was developed in 1998 by the Urban Design Alliance, a federation representing the interests of the built environment professional bodies. A dedicated website includes instructions on how to do a Placecheck, which centres around an observational walkabout and review of what people like and dislike about the place. *“It is a method of taking the first steps in deciding how to improve an area. Placechecks are often able to kick-start change in a way that might not otherwise be possible. They can lead to anything from litter clear-up days to neighbourhood planning.”* (from the website). The process generally turns up all sorts of issues, only some of which might relate to community severance, such as difficulty crossing roads. Moreover, the process requires a strong community lead, so is less likely to take place in more deprived areas (often those worst affected by severance). All the examples of Placechecks in action profiled on the

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website were initiated by a local Civic Trust, i.e. an established and organised group with a keen interest in the aesthetics of the area. The process tends to be prompted by a development proposal (either controversial, or with the potential to achieve some planning gain), or in response to a tangible aesthetic problem, such as loss of historic character.

Historic England (formerly English Heritage) has taken an increasingly keen interest in how highway infrastructure impacts on the function and aesthetics of locations ‘with history’. Many of the improvements it would like to see in degraded areas, e.g. the removal of guard-railing, reduction of street clutter, restoration and enhancement of communal public spaces, would also help address community severance. Its Streets for All guidance includes the following advice on the value of street audits. *“A street audit can be a time consuming task to organise and undertake, but can be very worthwhile, especially if the public or local stakeholders, particularly disabled people, are involved. It is important to make sufficient time and financial allowances available to ensure it is done thoroughly. An audit is a rewarding exercise and should be enjoyable for all concerned. Make sure participants get feedback and that opportunities for change identified are given due attention and followed up.”* (English Heritage 2008a, p2)

In addition to the initiatives developed by UK interest / pressure groups outlined above, a number of those representing professional practitioners are also coming to appreciate the benefits of local community involvement in decision making regarding public realm improvements and to facilitate this through the resources they generate. *“Street Design for All...is designed to be used by a wide range of people. It reminds professionals of the new opportunities in the design and management of streets and is also intended to help local community groups understand how they can take part in the development and adaptation of their own streets and talk with knowledge to decision makers.”* (Davis 2014, p2).

Local Transport Note 1/11 Shared Space (DfT 2011a) *“...places particular emphasis on stakeholder engagement and inclusive design, where the needs of a diverse range of people are properly considered at all stages of the development process.”* (p5)

Local Transport Note 3/08 Mixed Priority Routes: Practitioners’ Guide (DfT 2008b). Chapter 6 is headed ‘Consultation, engagement and stakeholder participation’ and offers

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advice on the benefits of community consultation and how to do it effectively, supported by a number of illustrations drawn from case studies. *“Desire lines were used to dictate the location of pedestrian crossings throughout the... scheme. Consultation also made it clear that crossings made in one movement were far preferable to two-stage staggered crossings with a central refuge area, the result being that many of the signalised crossings were wider than would normally be specified.”* (p49)

Overseas examples of efforts to facilitate community involvement in understanding and addressing problems relating to severance impact of highways, include Community Walking Audits coordinated by the Feet First advocacy group based in Seattle, Washington (www.feetfirst.org). Their most recent work in this area has been largely linked to Safe Routes to Schools initiatives, involving pupils in the process through various curriculum activities and funded by the relevant local highway authorities. This could suggest it is easier to secure funding to work on projects with a clear target beneficiary group. Also, it is almost certainly easier to work with a defined and captive audience, with obvious pathways (e.g. school curriculum activities) for engaging them in the consultative process.

The Australian Victoria Walks advocacy group has developed a suite of web-based resources aimed at local stakeholders, enabling them to undertake DIY walking audits (www.victoriawalks.org.au/Walking_audit/). These include prompts to investigate issues relating to severance, e.g. *“Are there crossings in logical places?”* and *“Are there the right sort of crossings for the size of road?”* plus illustrations of good and bad practice. Again, however, the entire toolkit deals with much more than just community severance-related concerns, such as the condition of footpaths, pavement parking, signage, street furniture, aesthetics, road safety and personal security. The parent website includes a rationale for promoting walking that refers to the community cohesion benefits: *“Walking cultivates community. The more we walk, the more we know about where we live, the people we meet and share our neighbourhood with. This is why walkable communities are vibrant communities. Conversations and friendships develop when we are out and about walking on our own two feet. More people walking leads to friendlier and livelier streets, reduces social isolation and creates safer neighbourhoods.”*

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The North American Pedestrian and Bicycle Information Centre has collated a suite of information about undertaking NMU audits, available via its website (www.pedbikeinfo.org). While it acknowledges that professional input into the audit process is important to ensure the outcomes are acted upon, it recognises the value that local user knowledge can bring to the procedure, often drawing attention to issues that may not be immediately obvious to outside practitioners. *“Informal audits can be performed by any individual or community group. More formal audits (i.e. those that follow a standardised set of audit procedures) can also be conducted; these are usually performed by a multidisciplinary team of trained professionals, including engineers, planners, transportation researchers, pedestrian and bicycle specialists, and others. A multi-disciplinary team will often allow a fresh look at traffic conditions at a location or along a corridor.”*

The North American Feet First advocacy group, based in Seattle, Washington has evolved Community Walking Audits to engage communities in measures to improve their local environments for making journeys on foot. The audits are coordinated by the advocacy group at a cost of around \$3,000, generally funded by the parent highway authority, and involve relevant stakeholders, e.g. residents and local authority representatives. Completed audits have picked up on a variety of problems and issues, some of which relate to severance, while others concern the quality of the public realm, litter, lighting, way-finding, etc. Recommendations invariably include, as a priority, the need to improve road-crossing facilities for pedestrians and cyclists, suggesting that this severance related issue is a pervasive and perennial one. Of note, information available on the Feet First website (www.feetfirst.org/what-we-do/walking-audits) implies a move, in recent years, away from generic community-based audits to a focus on those centred on trip generators that attract a relatively high proportion of non-motorised users, e.g. schools. The audit methodology involves getting participants involved in surveying and developing solutions, which would certainly be easier to achieve via school curriculum work with a ‘captive’ audience, compared with a disparate resident community.

The Active Living Research initiative, hosted by the University of California, is concerned with promoting activity-friendly communities. The resources it has developed to this end include an Active Neighbourhood Checklist

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(<http://activelivingresearch.org/active-neighborhood-checklist>), designed to build knowledge and capacity among communities regarding local problems and their possible solutions, some of which will relate to the severance effect of roads. *“The data collected could be used to raise community awareness about the role of the environment in supporting or discouraging physical activity and, subsequently, to mobilise community groups to advocate for positive change. Its simple format, lay terminology, item specificity, and relatively short length were intended to make the tool user-friendly for multiple community stakeholders”.*

The American Planning Association’s Great Places in America Programme (<https://www.planning.org/greatplaces/>) is an award programme designed to celebrate and showcase *“... places of exemplary character, quality, and planning.”* While the programme is not a vehicle for fostering community involvement in efforts to overcome road severance (among other issues) in itself, it does provide a platform to demonstrate that attractive and successful neighbourhoods are synonymous with community engagement and are not dominated by motor vehicles. *“Places are selected annually and represent the gold standard in terms of having a true sense of place, cultural and historical interest, community involvement, and a vision for tomorrow... America's truly great streets, neighborhoods and public spaces are defined by many criteria, including architectural features, accessibility, functionality, and community involvement... Characteristics of a Great Street include: it encourages human contact and social activities... (While a Great Neighborhood should) foster social interaction and create a sense of community and neighborliness.”*

a) Summary of key issues regarding community engagement

Community engagement regarding highway planning, development and management was quite unusual until relatively recently. There was a general feeling that this was the preserve of professionals who ‘knew best’.

Engagement with user / community groups regarding highway impacts started to gain more significant ground during the 1980s and 90s, when grassroots environmental and non-motorised user pressure groups began to retaliate in earnest against the negative impacts of an inexorable post-war rise in car ownership and use.

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Professionals responded by starting to consult with user groups, particularly those of which they had limited understanding or appreciation of their needs, e.g. cyclists, people living with different disabilities.

Several commentators have suggested a more proactive approach to gathering evidence from community members regarding the impacts of road severance should be taken, to counteract under-representation among certain social groups and / or poor understanding of their needs. *“User groups can contribute significant information, particularly in cases where use of a mode, or the needs of people with certain disabilities, are not within the direct experience of those undertaking the design. It is recommended that such groups are consulted at every appropriate stage of the design process in order that the design team is aware of their views as designs are progressed. Local representatives should be contacted where possible.”* (Highways Agency 2005, p3/4)

However, those likely to be most adversely affected by community severance are also likely to be among those most difficult to engage, e.g. the elderly, children, people living with disabilities, the economically disadvantaged. As a result, extra efforts may need to be made to ensure their views are heard. *“Consultation should aim to be representative of all the social groups affected and in practice this means using a ‘purposive sampling’ technique that will actively sample different types of people from communities. Using this technique also avoids consultation that only feeds back the views of those in the community who are most vocal. Some groups such as parents of young children and those with restricted mobility may find it difficult to make journeys to consultation meetings or presentations and so specifically sampling and recruiting these groups ensures that their needs are fully taken into consideration.”* (James et al 2005, p7)

A number of organisations have developed community engagement processes techniques for which they charge to deliver, e.g. Living Streets’ Community Street Audits, Sustrans’ Community Street Design.

There has also been an emergence of DIY street assessment toolkits aimed at local communities, e.g. Placecheck. However, these invariably require a committed and resourceful local champion to lead on them, so are unlikely to be widely used in more deprived areas (often those most adversely affected by community severance).

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Organisations representing the interests of vulnerable road users have, through their work with local communities in recent years, been instrumental in increasing awareness about the severance impacts of roads, together with the physical and psychological barriers that contribute to it. *“We concern ourselves with creating an attractive street environment for walking and cycling, and overcoming the barriers to this in all their forms... It might be a busy main road that's hard to cross due to the speed of traffic... They can equally be more intangible or societal. Modern living means we often live away from our friends and family in a sort of urban solitude, if you feel disconnected from where you live are you likely to want to spend time in it? The greater the tendency to be disconnected from the world around us and the more we distrust strangers, the more we opt to hermetically seal ourselves away in our homes, cars and automobiles. And the more we need to build bigger and bigger roads to accommodate all this fresh metal, thus creating ever bigger physical barriers.”* (Blog on the Sustrans website titled ‘Community street design: a solution to our urban solitude’.)

Different interest groups will be affected by community severance in different ways and their preferred solutions may, therefore, also differ. *“Different individuals will also have different requirements; for example, an adult pedestrian’s desire for a direct route might suggest an at-grade crossing, whereas the need for a safe crossing for child pedestrians in the same location may suggest the need for a grade-separated crossing. Moreover, in contrast with designing for motorised users, the designer cannot assume any given level of competence, recognition of signs or familiarity with traffic law and conventions on the part of the NMU. While pedestrians, cyclists and equestrians share a number of characteristics, the optimum solutions for meeting their needs may vary significantly. For example, a cyclist’s desire for speed may be in conflict with an equestrian’s desire for a calm environment to keep horses under control. Therefore, in addition to variation between individuals, the designer must also consider variation between the types of user.”* (Highways Agency 2005, p1/2)

Communities tend to engage in consultation where there is a problem, local authorities where there is an infrastructure proposal.

Appleyard and Lintel voiced some interesting thoughts regarding the interpretation of information gained from communities about the effects of severance. They concluded

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that communities / people adapt to streets with high traffic levels over time, e.g. those adverse to living on heavily trafficked streets move away, while those who value other attributes offered by the location may be prepared to put up with it. However, people with limited resources may become locked into undesirable environments, become resigned to them and think they are powerless to do anything about them. Also, some respondents may provide defensive answers about their level of contentment with their location, e.g. to protect their property value, hide the fact they have limited resources to alter the situation, or made an error of judgment in moving there. The lack of a clear public target (someone to blame) can also mute complainants.

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6. What measures have been utilised to address community severance-related issues?

“Practitioners felt they were ‘revenue short and capital rich’; that is, funds were often available for new schemes, but funding for the modification or maintenance of existing schemes was lacking... They also observed that identifying existing community severance is not a high priority for local transport authorities.” (James et al 2005, p8)

Available literature and evidence suggests that the issues commonly associated with community severance are most often alleviated not by schemes specifically designed to address severance, but by measures implemented in response to more tangible and easily understood problems, usually linked to road safety and streetscape enhancements. Moreover, as noted earlier in this paper, while the issues relating to community severance can be classified as physical, psychological, or social, solutions are invariably physical in nature. However, these physical responses can also help to alleviate the psychological and social problems. So, for example, the physical removal of guard-railing and introduction of at-grade crossings, should reduce perceived danger among vulnerable road users and improve the streetscape (both psychological aspects of community severance), as well as enhance accessibility and reduce trip detours for those on foot (social aspects).

Below is a list of measures associated with the alleviation of problems linked to community severance (although their introduction may well not have been prompted by a desire to address severance – and in some situations can add their own problems).

- Grade separated crossings (over-bridges, subways).
- At-grade crossings (zebras, pelicans, toucans, central refuges, kerb build-outs, courtesy crossings).
- Junction design (tight radii, ambiguous priorities).
- Traffic calming (physical features that typically alter the vertical and horizontal alignment of the carriageway).
- Minimal road markings (e.g. removal of centre lines dividing narrower two-way roads).

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- Surface treatments (e.g. the introduction of block-work, setts, or colour changes to delineate where vulnerable road users may be expected in the carriageway).
- Signage (including informal / arty / variable messages).
- Carriageway narrowing (utilising median strips, planting, kerb build-outs, etc.).
- Guardrail removal.
- Speed limits (e.g. 20mph zones).
- Traffic reduction (e.g. ‘filtered permeability’, where traffic regulations and highway layout restrict access and / or give priority to vulnerable road users in specific streets).
- Parking management / reorganisation (e.g. creating frequent breaks in lines of parked vehicles to facilitate pedestrian road crossing movements).
- Shared space (although not generally used for heavily trafficked areas or ‘fast’ roads).
- School safety zones.
- Home Zones.
- Streetscape / public realm enhancements: *“It is often in the spaces between buildings where human activity and social interaction take place. These spaces should be designed or adapted to respect or enhance a street’s sense of place.”* (Davis 2014, p3)

There is now, particularly as a result of growing interest in the aesthetic aspects of streetscapes in recent years, a fair body of advice on utilising the measures outlined above. What follows is a brief résumé of what the more widely used and / or most recent sources of guidance have to say that is associated with community severance. [It is worth noting that much of this advice does not specifically mention the term ‘community severance’, nevertheless the recommendations put forward would help alleviate severance-related problems.]

Manual for Streets (DfT 2007a). *“There is a need to transform the quality of residential streets, and this requires a new approach to their provision. The Manual is aimed at any organisation or discipline with an interest in residential streets, ranging from access officers to the emergency services. The importance of joint working among practitioners*

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is a key feature of the Manual. Its scope is limited to residential and other lightly trafficked streets, although some of its principles may be applied to other road types where appropriate... Streets should not be designed just to accommodate the movement of motor vehicles – a prime consideration is that they meet the needs of pedestrians and cyclists... The Manual introduces a user hierarchy in which pedestrians are considered first in the design process to ensure that all the user groups are properly considered at an early stage... Of particular importance to pedestrians is the ease with which they can cross a street, and route continuity. Designers should aim to keep pedestrian paths as straight as possible to minimise diversion from desire lines. Low traffic speeds, together with wide and unobstructed routes whose alignments minimise the need to change level, also serve to enhance the environment for pedestrians.” (DfT, 2007b, p2-4) Note, however, that Manual for Streets was primarily intended to guide infrastructure design for new residential development. Also, there is no mention of the word ‘severance’ in the document, although it does draw attention to the role of highway infrastructure in shaping ‘community’ cohesion. “Streets are the arteries of our communities – a community’s success can depend on how well it is connected to local services and the wider world. However, it is all too easy to forget that streets are not just there to get people from A to B. In reality, streets have many other functions. They form vital components of residential areas and greatly affect the overall quality of life for local people... we need to do more to recognise the role that streets play in the life of a community, particularly the positive opportunities that they can bring for social interaction.” (DfT 2007a, p6) There is also mention of ‘social interaction’: “Streets that are good quality places achieve a number of positive outcomes, creating a virtuous circle... people meeting one another on a casual basis strengthens communities and encourages a sense of pride in local environments... The public realm should be designed to encourage the activities intended to take place within it. Streets should be designed to accommodate a range of users, create visual interest and amenity, and encourage social interaction. The place function of streets may equal or outweigh the movement function.” (Ibid, p16)

Manual for Streets 2: Wider Application of the Principles (CIHT 2010). “MfS2 builds on the guidance contained in MfS1, exploring in greater detail how and where its key

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principles can be applied to busier streets and non-trunk roads, thus helping to fill the perceived gap in design guidance between MfS1 and the Design Manual for Roads and Bridges (DMRB)... (A series of progressive steps is suggested), moving from simple measures through to the complete transformation of streets, and more than one can be done at the same time. Steps One to Four can be undertaken in the course of routine maintenance, or small-scale improvements. These can be inexpensive to implement from an engineering point of view and can be carried out quickly... 1 Tidy up... 2 Declutter... 3 Relocate / merge functions... 4 Rethink traffic management options... 5 Recreate the street.” (p4, 32-33) MfS2 provides numerous examples of how to make streets look attractive and be fit for purpose for a variety of uses and users, in addition to the movement of traffic. This includes some fairly unconventional case studies that are working well in practice, to encourage practitioners to think outside the box, e.g. the diagonal pedestrian crossings at significant crossroads in Balham and Oxford Circus (p63). Both MfS1 and 2 are underpinned by the results of research that was undertaken as part of their preparation, which supports those recommendations that might otherwise have proved controversial. For example, the documents include evidence that tight kerb radii, that reduce vehicle speeds and pedestrian crossing distances, can still allow large vehicles to make necessary turns. It also provides data on how vehicle-stopping distances have reduced as a result of improved braking systems, so sightlines at junctions can be reduced enabling more pedestrian-friendly designs. Both Manuals are also at pains to point out some obvious considerations that are frequently overlooked, at a cost to vulnerable road users, e.g. “Placing crossings on pedestrian desire lines will avoid the need for guard-railing”. (CIHT 2010, p66) MfS2 offers some thoughts on the severance-related impacts, both positive and negative, of on-street parking. On the positive, it adds activity to the street and can be organised to create build-outs to facilitate pedestrian crossing. Conversely, “..if there are few places for pedestrians to cross with adequate visibility it can introduce a road safety problem, particularly if traffic speeds are above 20mph”. (p81) Also, “Echelon parking may be more difficult for pedestrians to pass through than longitudinal and right angled parking, depending on the spacing of parked vehicles, and can provide a greater barrier to crossing the street”. (p82)

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Local Transport Note 1/08 Traffic Management and Streetscape (DfT 2008a). Although no mention of community severance specifically, there is strong emphasis on the myriad small-scale street level improvements that could be made, which would not only enhance aesthetics, but also improve pedestrian accessibility, particularly for those with mobility impairments. “This LTN is relevant to all schemes, of all types and scale, in urban and rural settings, but focuses particularly on the smaller, everyday schemes such as junction entry treatments... The improvements that can be made to the smaller routine schemes may be subtle in design and impact (good practice in itself), but the benefits of these improvements will be substantial if widespread in application. Not only will the street look much better, but the reduced clutter and the clearer signing will benefit people with limited mobility and those who are blind or partially sighted.” (p7) The disadvantages of guard-railing, supported by numerous illustrations, are a recurring theme in this document and the supporting case studies.

Local Transport Note 3/08 Mixed Priority Routes: Practitioners’ Guide (DfT 2008b). This presents the findings and recommended good practice arising from ten Government-funded demonstration projects, across a variety of local authority settings, during the last decade. These sought to find solutions to the inherent conflict between the competing needs of different road users on busy town centre high streets. The broad conclusions were that, while access for motorised vehicles, including deliveries, buses, taxis and (if necessary) through traffic needed to be maintain in many circumstances, much more could and should be done to facilitate access for non-motorised users, by making it much easier and safer to move along and across the street, while reducing the dominance of vehicles. *“High streets with mixed traffic and diverse use present a unique combination of road safety problems and are among the least safe of urban roads. Within town centres and other areas with a mixture of land uses, pedestrianisation and limited vehicle access schemes have been successful in reducing casualties. However, many high streets and shopping streets are not suitable for such measures, and so other ways are needed to give greater safety to pedestrians, cyclists and public transport, by the reallocation of road space and traffic calming...”* (p5-6)

Local Transport Note 1/11 Shared Space (DfT 2011a). *“Shared space is a design approach that seeks to change the way streets operate by reducing the dominance of*

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motor vehicles, primarily through lower speeds and encouraging drivers to behave more accommodatingly towards pedestrians... This Local Transport Note (LTN) is mainly concerned with the use of shared space on links. While it focuses on High Street environments, many of its principles will apply to other types of shared space. It is intended to assist those designing and preparing street improvement and management schemes.” (p5) The document contains one specific mention of community severance: “Poorly designed streets can be indifferent or unwelcoming, contributing to community severance, reducing social cohesion as well as suppressing levels of walking and cycling. They can also have a negative impact on local economic performance.” (p10)

Traffic Advisory Leaflet 5/11 Quality Audit (DfT 2011b). This provided a succinct summary of how the recommendations in Manual for Streets’ 1 and 2, for a more integrated approach to highway design and management (via Quality Audits), could be translated into practice. *“Quality Audit is a defined process, independent of, but involving, the design team that, through planning, design, construction and management stages of a project, provides a check that high quality places are delivered and maintained by all relevant parties, for the benefit of all end users. The starting point is to establish the vision and / or objectives for the scheme, which could be expected to address (various issues including) the following:*

- *Seeking an appropriate balance between Place and Movement.*
- *Enabling accessibility for all user groups.*
- *Meeting community needs.*
- *Road safety and personal security.” (p1)*

Quality Audits are, however, unlikely to be effective in identifying and investigating existing problems as they will be invoked only when a highway scheme proposal is on the table. *“QA is appropriate for both large and small schemes and for changes to existing streets that are proposed by the highway and / or planning authority”.* (p3) Moreover, as QA involves a wide mix of user and design reviews and audits (e.g. cycle audit, walking audit, safety audit, community street audit, equality impact assessment, Placecheck, etc.), it is likely to be quite resource intensive. As a result, it would be difficult to justify its application to unproven and nebulous pre-existing issues, like community severance.

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'Designing Streets for People: how highways and transportation professionals can help make better places' (CABE 2006). A summary of the inputs to and outputs from a series of 25 'Streets for People' training days that were held in various towns and cities throughout England from 2004 to 2006. These urban design workshops for highways and transportation professionals were sponsored by CABE and English Heritage, and managed by the Institution of Highways and Transportation (IHT). *"Highway dominance has a major, and in many cases negative, impact on the quality of neighbourhoods across England. This often happens when highways issues are negotiated in isolation from urban design principles. The result is that quality is unwittingly sacrificed to meet individual highway requirements. Good urban design is not only, or even mainly, about how places look. It is about creating great places and spaces that work for the whole community. Great places and spaces spell success. They attract investment, deliver regeneration and new jobs, encourage communities and mobility, they help reduce crime."* The initiative was pitched at IHT members, many of whom had received no formal training in urban design. Although community severance issues are somewhat buried among information primarily concerned with streetscape design, this resource does draw attention to the wider human impacts of highway engineering to practitioners in that field. *"Ease of movement is not solely a matter of balancing the needs of all modes, however. It also encompasses the importance of designing the fabric of towns and cities to promote good connections, and of deploying land uses to make the most of transport assets... Smaller urban blocks, radial highway patterns, good interchanges, the careful location of car parks, relating development to public transport accessibility, are all key tools in making it easier to move around urban areas."* (Ibid p13)

'Streets for All' (English Heritage, now Historic England, 2006). This comprises a series of regional streetscape manuals that set out principles of good practice for street management, showing how to reduce clutter, co-ordinate design and reinforce local historic character. As stated elsewhere in this paper, attractive, people-focused streetscape design is invariably synonymous with locations that do not suffer from community severance.

'Streets for All: 3 Guardrails and crossings' (English Heritage, now Historic England, 2008b). One of the generic factsheets to emerge from the Streets for All initiative,

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covering a topic of particular relevance to community severance. *“It is widely recognised that improving pedestrian accessibility and the public realm environment is essential to help maintain the vitality and viability of town and city centres. It has been found that the reduction of vehicle speeds and the redesign of street space to be more friendly to pedestrians, which has led to a transformation and revitalisation of the street scene. Part of this process depends on the use of traffic calming techniques such as road narrowing, realignment, tight corner radii, raised tables, wider crossing areas and 20mph zones to reduce the speed of vehicles and raise the status and dominance of pedestrians. The removal of guardrails may lead to more random crossing movements by pedestrians away from any formal crossing points, but the lower speed produced by the re-design of the roads should allow the driver time to make allowance.”* (p2)

‘Streets for All: A guide to the management of London’s streets’ (English Heritage, now Historic England, 2000). This comprehensive guide includes acknowledgement of the severance impacts of some highway infrastructure, in addition to their contribution to a degradation of the historic and aesthetic attributes of many public spaces. *“Superfluous guard-railing attracts other clutter to create a major impediment for pedestrians. Wherever possible, it should be removed... Clutter can be dramatically reduced by redesigning pedestrian crossings to allow people to cross both lanes at one time. This reinforces pedestrian priority and eliminates the ‘cattle pens’ that encourage motorists to drive faster in the certainty that pedestrian needs are effectively subordinated to those of traffic.”* (p19)

The Public Realm Information and Advice Network (PRIAN) has generated a number of resources to help raise awareness, particularly among highway engineers, about the merits of aesthetically pleasing highway design and maintenance. The publication ‘Street Design for All’ (Davis 2014), together with the PRIAN website (<http://publicrealm.info>), provide succinct and accessible advice, supported by good practice case studies and numerous illustrations, on what contributes to good and poor highway design from a public realm perspective. Various recommendations would also help alleviate community severance, including the removal of guard-railing and the provision of pedestrian-friendly crossings.

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Sustrans, the UK charity concerned with promoting active and sustainable travel, provides a good deal of information and advice on what works to encourage walking and cycling on its website. This includes profiles of ‘Inspiring Infrastructure’ improvements that have significantly benefited vulnerable road users, including cost, how they were progressed and what they are achieving (www.sustrans.org.uk/search-results?key=Inspiring+Infrastructure+). The impact of examples of Inspiring Infrastructure that have helped address community severance issues are included in the subsequent section of this paper.

During its existence, the Commission for Architecture and the Built Environment (CABE) championed well-designed buildings, spaces and places, ran public campaigns and provided expert, practical advice, working directly with architects, planners, designers and clients. Although it was merged into the Design Council in 2011, a good deal of the information collated by CABE is still accessible on-line in the National Archives. This includes profiles of case studies that showcase exemplars of urban design in the UK, a number of which address community severance issues (<http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/case-studies>). Some examples of the impact of CABE case studies that help address the severance effects of transport infrastructure are included in the following section of this paper.

The ‘Slow Street Sourcebook’ (Urban Design London 2015) “...illustrates a range of traffic calming measures which reduce vehicle speeds and improve the quality of a place... Good streetscape design can help improve the overall feel of an area, encourage more people to walk and cycle and use streets responsibly. This helps make a safer and more pleasant environment for everyone. Walking and cycling trips are often the main form of physical activity for many Londoners. As more people feel more confident in walking and cycling around London, this will also offer a range of health benefits.” (p5)

‘Connectivity and Permeability’ (Healthy Spaces & Places 2009). One of the outputs of a project funded by the Australian Government Department of Health and Ageing, this design guidance provides evidence on the link between connected neighbourhoods (with minimal severance from transport infrastructure) and peoples’ predisposition to walk, with knock-on impacts for physical and mental wellbeing, particularly for older citizens.

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“On average people are willing to walk one kilometre to reach a functional destination. This is dependent on many factors including topography, weather and the walking environment including directness of the route. By providing path connections around every 100 metres a suburb will be highly permeable and more likely to encourage pedestrian trips. Where major barriers (such as creeks and railway lines) make connections expensive to provide, the network should confluence around fewer crossing points spaced around 500 metres apart.” (p5)

Filtered v unfiltered permeability (Melia 2012). This short academic paper summarises for a UK audience the practice, common in many northern European countries, of positively discriminating in favour of vulnerable road users in terms of accessibility in urban areas. The author argues that only by building time and convenience advantages into getting around by foot and bicycle will these modes be able to compete with motorised travel. This can only be achieved by designing out any severance effects of transport infrastructure on NMUs. *“Unfiltered permeability refers to road layouts which provide equal permeability for all modes... If increasing permeability and reducing journey lengths for pedestrians tends to increase walking, a priori we would expect a street grid, which reduces distances by all modes, to encourage driving as well... Although the terminology varies, in continental European cities such as Freiburg, Münster and Groningen the principle of filtered permeability is a key element of their transport planning strategies, which have been relatively successful in restraining car use and promoting alternatives. Through traffic is channelled onto a limited network of main roads. Suburban developments are often designed as area-wide culs-de-sac for general traffic, while a range of short cuts such as bridges, tunnels, cycle paths and bus gates provide a more permeable network for the sustainable modes... Observations across several European cities suggest that the time and convenience advantage compared with travelling by car is one reason for the relatively high levels of cycling in the cities which follow this approach.” (p3-4)*

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7. How successful, or otherwise, have these initiatives been and the reasons for this?

“Practitioners are often unable to assess the effectiveness of the identification and mitigation of community severance in their work due to the lack of funds for post-opening evaluation of schemes. They requested more case study information about lessons learnt from other scheme implementation in order to be more informed about 'what works' when designing new schemes and their mitigation.” (James et al 2005, p8)

“As things stand, contemporary UK examples of good urban design in transport schemes aren't that easy to find. Indeed, one of the reasons that the improvements to the High Street in Kensington, London have received wide publicity is that there are few similar schemes jostling for public attention, and fewer still where useful information has been made so readily available. It is, for example, extremely helpful to know that a project involving the removal of over 90% of the original pedestrian guard-railing led to an average reduction of 64% in the number of pedestrian injuries in each of the first two years after its completion. It is still more encouraging when you know that reducing casualties wasn't the scheme's primary purpose.” (CABE 2006, p26)

As little work has been done exclusively, or primarily, on the remedial impact of initiatives on community severance, evidence for this review has been drawn from highway improvement schemes that have addressed a variety of issues, including severance.

a) Schemes in high-profile locations

Kensington High Street received attention and funding because *“...it lies at the heart of the Royal Borough of Kensington and Chelsea and is not only a major east-west radial route to the centre of London, but also an important commercial / retail street flanked by highly desirable residential areas... Rearrangement and simplification of pedestrian crossings and the extension of the central reserve (now) allows the road to be crossed easily and safely. The removal of barriers to movement, especially guardrails at staggered crossings, provides a sense of liberation to the pedestrian, trusting both pedestrians and drivers to use the street responsibly. Clear lines of sight allow drivers*

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and pedestrians to visually engage each other and feedback from wheelchair users has been particularly appreciative of the removal of guardrails, which now ensure they can both see and be seen when crossing the road.” (From the archived CABE case studies <http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/case-studies/kensington-high-street>)

Maid Marian Way, which skirts the east of Nottingham city centre, “...the Friar Lane junction has been transformed, influencing how the whole of Maid Marian Way impacts on the surrounding built environment and on pedestrian movement (despite the fact that the) street continues to carry broadly the same traffic volume as before... The remarkable transformation of Maid Marian Way highlights the effort required to overcome the worst legacies of segregation as a highway design philosophy... A street identified as one of the least loved in the country has been transformed into a legible and functional space. In comparison with its previous layout, its barrier effect is largely overcome... A survey of pedestrian movements between April 2003 and April 2005 suggested that the Friar Lane route across Maid Marian Way has attracted considerably more people: a 56% increase in weekday pedestrians and a 29% increase among Saturday shoppers. It feels comfortable to cross the busy road, a pedestrian journey across Maid Marian Way is no longer the hostile experience it once was... Maid Marian Way remains perhaps the best UK example of a ring road that has been transformed despite retaining its strategic traffic function. Maid Marian Way shows how – with a strong, shared commitment to change – soulless traffic conduits can be made into lively city streets.” The entire scheme cost £2.9 million. (From the archived CABE case studies <http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/case-studies/maid-marian-way>)

Just west of Sheffield rail station “...the regeneration of Sheaf Square and Howard Street has delivered seamless and legible connections between key points in the city centre. The reflection of history, culture and enterprise in their layout, form and aesthetic give them meaning and purpose... Successful partnerships; inspired and committed leadership; design excellence; the prioritisation of pedestrian movement over vehicular movement where appropriate; and a clear ongoing maintenance and management regime. All of these have been essential to the success of Sheaf Square and Howard

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Street in achieving genuine benefits for the users of the spaces and Sheffield as a whole." The entire scheme, which also achieved significant streetscape enhancements, slower traffic speeds and reduced accidents, cost £24 million. (From the archived CABA case studies

<http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/case-studies/sheaf-square-howard-street>)

In the London Borough of Southwark *"Walworth Road now has the character and appearance of a bustling high street. Anecdotal evidence indicates: a noticeable increase in footfall and in the number of pedestrians crossing; a decrease in shop vacancies; and growth in the amount of time people spend in the street... Specific improvements include: better provision for pedestrians to cross according to their desire lines; better provision for bus passengers in terms of the positioning, layout and prominence of bus stop 'pairs'; and easier pedestrian movement and a more visually pleasing street scene due to the removal of unnecessary street clutter and the creation of raised side street crossings."* The entire scheme cost £4.2 million. (From the archived CABA case studies <http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/case-studies/walworth-road>)

North-east of Southampton Central station *"The London Road improvement scheme has had a marked impact on the way people use and appreciate the street. It has transformed a once failing space into a worthy gateway to the city... Angled bays can be awkward for crossing pedestrians to negotiate. However, the consolidation of parking, and the loss of some spaces overall has opened up new areas for pedestrian crossings with unobstructed sight lines. Together, the horizontal deflection and new parking arrangements help to interrupt traffic flow and limit speeds. In turn, this helps create gaps in the flow so pedestrians can cross without formal signal control... Despite the economic climate, pedestrian footfall on London Road has increased. Early results suggest that both traffic speeds and the number of collisions have been reduced."* The entire scheme cost £1.3 million. (From the archived CABA case studies <http://webarchive.nationalarchives.gov.uk/20110118095356> / www.cabe.org.uk/case-studies/london-road)

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“Norwich City Council implemented the Norwich Mixed Priority Routes Scheme along Prince of Wales Road, which provides a successful example of removing guardrails at crossings... the scheme implemented the following measures (among others) to create pedestrian bias... Removal of the central island and carriageway narrowing... Widening of pavements and crossing points... Designing without guardrail... Monitoring of the scheme continued for 3 years after completion to establish how successful it has been. Before implementation 69 accidents were recorded over a 3 year period from 1998-2001, of these 44 involved pedestrians. From completion of the work in July 2004 up to January 2007, there were just 18 accidents, of these 7 involved pedestrians.” (England Heritage 2008, p4)

“In Birmingham the Inner Ring Road was long seen as a constraint to extending the City’s inner retail core and was a major barrier to pedestrians. This has now been broken with at-grade crossings provided for pedestrians who previously had to contend with detours via unpleasant subways. Elsewhere in Birmingham the Inner Ring Road has been lowered with a ground level pedestrian route provided in place of subways between the City Centre and Broad Street, helping to regenerate this area of the City.” (CIHT 2010, p16)

“Sky Blue Way is a major urban relief road, constructed in the 1980s, which relieved traffic from Far Gosford Street, a medieval street on the edge of the city centre [in Coventry]. The road carved a broad swathe through the urban fabric, revealing the rear of buildings. There are few buildings overlooking the new route and it is a hostile environment for pedestrians and cyclists. A scheme has now been developed by the City Council, working with developer partners, to heal the damage done by the road scheme. It introduces new buildings to front onto Sky Blue Way, making best use of the awkward plots of land. Changes to one of the terminal junctions are also proposed, simplifying the layout and removing extensive lengths of guard-railing.” (CIHT 2010, p20)

“(The) success (of the Mixed Priority Route Demonstration projects) has been demonstrated not only in terms of the road safety benefits, but also through wider peripheral benefits. These range from increased economic vitality associated with additional visitors to local shops and services and increased investment in regeneration, to improvements in facilities and the environment. Common to all schemes are the more

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tangible human and community benefits derived from drastically improved streetscapes, wider footways, reduced dominance of vehicles and better crossing facilities. (Among other findings), improvement in accessibility for all users was an important aspect of these schemes and was evaluated in terms of the reduced severance experienced particularly by pedestrians. Improved crossing facilities and the control of traffic speeds were key aspects of the schemes...” (DfT 2008b, p9). However, “MPR schemes are very difficult to implement on annualised budgets and funding availability over 3+ years should be considered where possible.” (Ibid, p15) All the Mixed Priority Route demonstration projects were relatively costly, ranging from £1.3 million to £4.5 million, so similar initiatives are only likely to be introduced in high profile locations where investment of this magnitude in the public realm can be justified.

b) Schemes in lower-profile location

Living Street, Bradford is “...an exemplar project next to social housing flats, reflecting priorities identified through a regeneration program. Here, the front entrances of the flats were turned round so the natural access is onto the traffic free route and car parking is demoted to the rear. Connect2 funding enabled local residents and Bradford Council to create the ‘Living Street’, a 4.5m wide corridor distinguishable by its high quality feel created by brickwork verges, providing a north / south route through the area with links to key destinations; a route where pedestrians and cyclists would take precedence over motorists, including at road crossings. The scheme wasn’t without its challenges of course. Linking areas of land in a variety of ownerships and working to implement planning conditions agreed in better financial times meant a need for ongoing commitment over several years from the local authority, a real commitment to partnership working, some compromise and strong political leadership both within the council and from the various other stakeholders. The steering group required as part of the Connect2 program, the buy-in of the then leader of Bradford Council and a strong project manager were vital in overcoming obstacles which did arise... The impact: 260,000 estimated trips per year; 73% of (local residents) use the route to get to work, shops and school; over 70% of people say the route has helped them increase their

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levels of physical activity.” (From the Inspiring Infrastructure profiles on Sustrans’ website www.sustrans.org.uk/node/7221)

“Nearly 44 years after the works started on a footbridge over the M8 in Glasgow the structure was finally completed as part of a Connect2 project. The bridge forms the jewel in the crown of a scheme whose ambition was to link the communities in the west of central Glasgow to the city centre itself. It closes a gap in the cycling and walking network from the Forth and Clyde Canal in the north of the city with the River Clyde which runs through the centre of Glasgow... The route services three schools, a local station and numerous businesses, and provides a safe, direct route that can be linked into by surrounding quiet, residential streets. Prior to the completion of the bridge the journey to the city centre was circuitous and unpleasant as it passed under the motorway. Using this route it is now quicker to traverse across the city by bike than by any other form of transport.” (From the Inspiring Infrastructure profiles on Sustrans’ website www.sustrans.org.uk/article/inspiring-infrastructure-the-bridge-to-everywhere-glasgow)

“Park Lane and Fountain Place jointly form the commercial and social centre of Poynton, a village situated on the southern fringe of the Greater Manchester. These roads also have an important movement function, for both vehicles and pedestrians. Long-standing proposals for a Poynton bypass would not be progressed in the foreseeable future, so the streetscape enhancements proposed needed to accommodate existing traffic patterns. The resultant Village Improvement Scheme... involved the creation of a sequence of informal crossings highlighting pedestrian desire lines, a central reservation to assist pedestrians to cross, narrow traffic lanes to keep vehicular speeds low, and repaved footways, including the re-paving of the private shop forecourts to enhance the pedestrian environment.” The total cost of the scheme was £3 million, coming from a number of funding sources including a contribution from the DfT’s Links to Communities programme. (www.sustrans.org.uk/our-services/what-we-do/route-design-and-construction/shared-space-busy-intersection-poynton From the Inspiring Infrastructure profiles on Sustrans’ website)

Sustrans’ community-led street design project in Haringey *“...focused on a neighbourhood of around 1,000 households and evidenced 23% increase in all traffic*

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travelling 20mph or less and 34% increase in the number of residents who felt the street is a place to socialise... Residents felt so empowered that, following the initiative, they created a campaign group to continue making improvements to the area.”
(www.sustrans.org.uk/policy-evidence/the-impact-of-our-work/community-led-street-design-turnpike-lane-haringey)

Many of the case studies featured on the Living Streets website are focused on addressing highway and traffic-related problems experienced by more deprived communities. However, the practical remedial measures that have ensued as a result of community engagement and activity coordinated by Living Streets have tended to tinker around the edges of significant problems. Tangible achievements have mainly been of the quick-win, easier-to-implement, not too resource intensive, uncontroversial, off-carriageway environmental improvement variety. Typical examples include dealing with problems of litter, graffiti, dog excrement, overgrown vegetation, etc. Very few of their featured case studies have dealt effectively with community severance issues, e.g. there is no evidence that any have resulted in significant crossing improvements of busy roads. (www.livingstreets.org.uk/professionals/case-studies)

c) Measures of the potential financial impact of initiatives

In 2007 CABE published a report, entitled ‘Paved with Gold’, which summarised the findings of its work on the financial value that good street design contributes, over average or poor design. Utilising PERS to assess the design quality of various case studies, the research found that “...for each single point increase in the PERS street quality scale, a corresponding increase of £13,600 in residential prices could be calculated... For each single point increase on the PERS street quality scale, a corresponding increase of £25 per square metre in rent per year could be calculated... Alongside these direct measures of value the research also included another assessment method – stated preference surveys... The survey showed that, on average, pedestrians were willing to pay more for better streets. Local residents were willing to pay more council tax, public transport users would accept higher fares and people living in rented homes were happy to pay increased rents to improve the quality of their high streets.” (CABE 2007, p6) However, all the case study locations were in Greater London

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where land values are high, which makes replication of these figures unlikely in many other locations.

To embellish its report on the potential of London's public realm in 2004 – a study entitled 'Towards a fine city for people: public space public life study in London', for Central London Partnership and TfL – Gehl Architects drew on best practice examples from continental cities to illustrate what is possible, with the appropriate combination of political will and investment, and the potential financial rewards that can subsequently accrue. *"Copenhagen has changed gradually through the last 30 to 40 years, from a city dominated by cars to a city centre for daily life for people on foot... (As a result) Copenhagen inner city has gained the reputation of being a fine place for urban recreation...with increased quality for people on bicycles and on foot. These qualities of life are part of the reason that a growing number of people want to live in the centre of the city... The public money invested... has been paid back through an increased number of taxpayers in the city and an increased turnover for city-based businesses."* (Gehl Architects 2004, p116)

d) Summary of key issues regarding the impact of initiatives to address community severance

Addressing community severance issues in the UK has become closely entwined with improving the streetscape, i.e. creating opportunities for people to interact and spaces that they want to spend time in. Streetscape improvements will not necessarily address the full range of community severance-related problems, as they are driven primarily by design and access considerations, rather than (poorly understood) community severance issues.

Notwithstanding the above, probably the most likely and effective means of addressing (at least some) aspects of community severance is currently via streetscape improvement schemes. Streetscape improvement schemes tend to be focused on high-profile locations that can demonstrate a strong economic justification for the sizeable investment and disruption the physical works are likely to entail, e.g. town and city retail and commercial centres.

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Initiatives prompted primarily or solely by road safety concerns often result in isolated ‘point’ improvements, e.g. a new or improved NMU crossing in a specific location, rather than area-wide remedial measures.

Alleviation of severance has, to date, generally been associated with the introduction of quite a narrow field of physical remedial measures, typically bridges, underpasses and pedestrian crossings. A number of commentators consider this a fairly shallow response that fails to acknowledge the wider impacts of community severance beyond the highway environment. *“Consideration of mitigation measures (such as pedestrian crossings) has previously focused upon the provision of physical solutions such as bridges or underpasses. While physical measures are part of the solution, it is suggested that other measures such as the provision of information, signposting, surface treatments, drainage, vegetation management and lighting may also have a role to play. Considering a total ‘mitigation strategy’ rather than individual mitigation measures may be an effective way of dealing with the various aspects of severance and the different communities that may need to be considered.”* (James et al 2005, p7)

The introduction of physical remedial measures does not necessarily guarantee alleviation of community severance for all users. Poor design of bridges, underpasses and at-grade crossings can actually reinforce severance for some social groups. For example, wheelchair users and cyclists can be physically prevented from using facilities only accessible by steps or steep ramps (although this is now less likely with the Disability Discrimination Act). Women and the elderly may be deterred from utilising isolated underpasses.

There is little evidence of the evaluation of initiatives to alleviate community severance post implementation. Transport schemes have generally been assessed in terms of their contribution to a reduction in more tangible impacts, such as reduction in road casualties, reduced vehicle journey times, improved air quality, etc.

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8. What are the key remaining knowledge gaps relating to community severance?

A generally poor appreciation of what community severance is, the nature and extent of the issues it encompasses, leads to a rather muddled approach to trying to measure and address its impacts. Outputs from the UCL research that include, upfront, a clear definition of what community severance refers to, together with the issues that it encompasses, would be of significant value.

A number of different techniques for trying to assess the severance impacts of transport infrastructure have evolved and been tried in the past, e.g. increases in trip distance and time, evidence of trip suppression, informal desire lines not accommodated with existing infrastructure, etc. However, lack of an agreed set of issues to assess, and ‘yardsticks’ against which to measure them, means that comparability of results between different locations / schemes is difficult. Again, it would be advantageous if the UCL research were able to propose a definitive set of community severance-related problems, as well as measures of their significance.

It is understood that community severance affects some population groups more than others and in different ways. *“Severance is disproportionately experienced by some groups, children, older people, people with disabilities, people without easy access to a car and people on low incomes.”* (Marsh and Watts, 2012, p4) It would be useful to clearly determine what all these groups and differences are through the UCL research, together with whether they subsequently require different responses to address their particular severance-related issues.

Community severance does not only affect different road users in variety of ways, but different users of the affected area even when they are not seeking access. It pervades private spaces and activity in addition to movement in the public realm. *“Transport projects can also change the experience of living in a particular community or neighbourhood, for example actual or perceived noise, pollution, safety and aesthetics. This can result in severance even when, arguably, access is not severed.”* (Marsh and Watts, 2012, p5).

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Efforts to measure the severance effects of transport infrastructure have, to date, largely been focused on the immediate surrounding residential community. A stronger case for remedial action could be proven by assessing the impacts on a wider severance catchment area, and by including users of the affected area who are not residents, but share some other common characteristic that draws them to the location. *“Within the definition of severance the term ‘people’ also requires thought. People are part of communities and communities are far broader than those defined by geographical locations – they are formed around activities they take part in.”* (Marsh and Watts, 2012, p4) The definition of transport-related community severance adopted by the UCL team to guide this research does offer scope to encompass a broader geographical area, as well as non-residents, and these should be clearly defined within the outputs. The resultant assessment tools will, however, need to ensure they are proportionate in terms of the resources likely to be required for application.

The majority of guidance on practitioner-lead assessment of community severance is intended to be applied prior to scheme development and delivery. Little attention has been paid, among professionals, to established severance problems caused by infrastructure in situ. How can an effective case be made for investment in investigating and addressing existing issues, particularly during times of public sector spending restraint. *“For all the benefits they may have brought for some, and for all that they might have seemed a good idea at the time, the majority of the urban relief and ring roads built in the 1960s and 70s (and some much more recently) were constructed with little thought for how the town or city might change in the future. Many of those places are continuing to pay the price: in terms of severance, social exclusion, depressed land values, a hostile built environment and poor image. They do so because it has (at least to date) proved too costly or too difficult to modify these highways so as to reduce or remove this blight. Urban flyovers and underpasses, for example, can be only what they are: they are simply not adaptable.”* (CABE 2006, p16) It would be useful if the UCL recommendations include acknowledgement of the importance of investigating established schemes that create community severance, together with advice on how best to approach this.

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Emerging qualitative measures of community severance will likely involve a degree of self-reporting on issues for which comparison of results could be problematic, owing to personal variation in the calibration of responses among individuals. For example, in reply to the question: ‘Do you get enough contact with family and friends who don’t live with you?’, respondents with ostensibly the same amount of contact time may give very different answers, ranging from ‘yes’ from the socially self-sufficient to ‘no’ from the gregarious.

It is likely that, in the UK for the foreseeable future, the most efficient use of resources will be achieved by undertaking a number of measures to improve streetscapes, only some of which will directly address community severance. Attempting to make a separate economic case for investment in community severance issues in isolation will be less effective than trying to tackle a number of inter-related issues, e.g. realising aesthetic, environmental, road safety and social improvements at the same time. It is anticipated that the UCL research will provide guidance on how a new community severance assessment tool could slot most comfortably into this scenario. Including how to avoid the more esoteric severance-related problems being overshadowed (as is commonly the case at present) by issues that are easier to understand and measure, and thus tend to attract the lion’s share of attention and resources.

There appears to be a tendency for urban planners and traffic engineers to perceive community severance as a product of transport infrastructure, focusing on physical manifestations and solutions. By contrast, health professionals tend to concentrate on the social and psychological impacts. It would be good to draw these together in some way, with recommendations from the UCL team on how this could be effectively achieved. Allied to the previous bullet, looking at the full range of problems and possible solutions surrounding community severance holistically, will create a much stronger case for remedial action than compartmentalising them into subject-specific issues. This should also lead to coordination of an appropriate package of responses across a range of relevant delivery agencies, rather than less effective isolated activity.

To support the previously mentioned recommendations, there is a need for greater clarity in understanding, as well as accessible tool for measuring, the economic value of issues surrounding community severance. These would include *positive* impacts, such as

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the internal and external societal benefits of encouraging more active travel (walking and cycling) for local journeying. They would also encompass *negative* impacts, such as the cost of social isolation (e.g. owing to trips not made), stress (e.g. from traffic noise and vibration infiltrating private domestic space). Putting a value on such variables will support the case for investment in measures to promote the positive and tackle the negative.

Any recommendations and tools to arise from the UCL research need to have an eye on the reality that, while non-professionals can and should be involved in helping to quantify transport-related community severance issues and suggest possible remedial action, it will be down to qualified professionals to take forward ensuing recommendations. As a result, it is likely that some degree of awareness-raising and training will also be required among practitioners to ensure they are sufficiently equipped with the appropriate skills. *“Streets and junctions designed as public spaces (rather than just traffic facilities) are likely to be more attractive to, and convenient for, all users. Most highways and transport professionals, while agreeing with this statement, find it extremely difficult actually to implement such designs. This is generally for two reasons. First, the training, experience, custom and practice of most of those who have a role in the design of streets and junctions has focused on providing for vehicles before other users. Second, successfully accommodating the varied and often conflicting requirements of different users of the public highway in any given location is a highly complex task.”* (CABE 2006, p10)

Community severance does not merely affect a particular road user group, although it is often most closely associated with pedestrians. It impacts on a variety of different groups in different ways: walkers, cyclists, public transport passengers, children, the elderly, people living with disabilities, residents, occupiers of / visitors to other land uses in the vicinity, etc. Such an all-encompassing spectrum of considerations will require a significant leap in understanding among practitioners and interest groups hitherto concerned with the needs of a specific sub-set. *“With good reason, highways and transportation professionals have been accused in the past of considering ease of movement by private motor vehicles far above all other modes, leaving buses, pedestrians and cyclists to make do with what’s left over. But the answer is not simply to*

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focus on a different single mode. Better places cannot be achieved by designing for whichever user group is currently in vogue or happens to be within your particular professional remit." (CABE 2006 p12) The UCL outputs should offer tools that would involve disparate interest groups, drawing together their specific expertise to create a rich and broad knowledge pool.

More generally, there are likely to be numerous different parties concerned about community severance and involved in addressing it. The UCL research will, it is hoped, offer guidance on how best to coordinate their efforts, priorities, action and investment.

It would be useful to determine, through the UCL research, the extent to which community severance develops insidiously, possibly imperceptibly, over time as traffic conditions intensify. If so, what are the implications of this for remedial action, e.g. what would the trigger point for interventions be?

There is some evidence that community severance effects diminish as time passes, once people start to adapt to the situation. *"Over time, the neighbourhoods (affected by severance) enlarged on either side of the road and people reorganised their patterns of travel so that they did not have to cross the road as often... the original neighbourhood appeared to split and evolve to accommodate the road."* (James et al 2005, p23) Again, it is hoped that the UCL research will be able to shed some light on this issue, offering evidence that it is phenomenon, as well as advice on how to assess community severance diminution effects over time, together with some comment on the implications of this.

Anecdotal evidence of the impact of streetscape improvements completed in recent years to facilitate pedestrian movement, often reveal significant visual deterioration and neglect, as well as creeping reversion to how things were before. Typical examples include the re-introduction of blacktop in areas that had received surface treatment, or the erosion of textured / coloured surfaces; the installation of formal pedestrian crossing facilities in locations where courtesy crossings were being trialled. Certainly this applies to schemes undertaken in less high profile locations featuring 'cheap-and-cheerful' solutions, e.g. Clifton village, Cumbria; Julian Road, Bath; and Fountain Place, Poynton. It will be helpful if the UCL research outputs include recommendations to help ensure schemes are future-proofed, ensuring their intended benefits to address community severance (among other things) are locked-in for the long term.

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