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CAN TRANSPORT RELATED SOCIAL EXCLUSION BE MEASURED?: A REVIEW OF EXISTING GERMAN AND UK PRACTICE

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Abstract: Since the 1980's, the concept of social exclusion has, and continues to attract considerable research interest and policy credence at a European level. The role of transport as a potential determinant in creating social exclusion is also well accepted and documented. However, whilst there appears to be a consensus on the various ways transport provision (or non-provision) can impact on social exclusion in terms of *spatial*, *temporal*, *personal*, *psychological*, *cost* and *information* barriers, as yet, there is no standardized methodology on how these indicators can be operationally measured. This paper begins by providing a brief overview of current understanding as to what social exclusion is and the role that transport plays as a causal factor. A detailed examination of how transport related social exclusion (TRSE) is currently measured in the UK and Germany is then presented, followed by a discussion of the main limitations in these approaches. Finally, we identify a need for a standardized methodology on how TRSE can be accurately measured at a local, national and European level in future surveys which will allow a full examination of the role of TRSE in determining social exclusion, and thus the most appropriate remedial solutions to be identified and implemented in order to reduce exclusion effects.

Keywords: Social exclusion, transport policy, accessibility planning, travel surveys

1. Introduction

The paper begins by providing a brief definition of social exclusion, followed by an overview of the ways that transport provision (or non-provision) can impact on determining individuals or groups that become excluded. A review of how transport-related social exclusion (TRSE) is measured in the UK and Germany is then presented, followed by a discussion of some of the limitations of these approaches. The paper concludes as to how these shortcomings could be addressed that would allow TRSE to be 'more' accurately measured in the future and the most effective remedial measures identified.

2. Social exclusion: definition

The concept of social exclusion (SE) originated in 1980's French social policy debates (e.g. Berghman, 1995; Spickler, 1997; Burchardt *et al*. 1999). The term SE was originally phased in 1974, and first used by the European Commission in 1989, when the Council of Ministers requested the Commission to examine policy options to combat SE (Lucas 2006).

Since its emergence, the concept has attracted growing academic interest and policy credence, specifically in the UK, leading to the creation of the Social Exclusion Unit (SEU) in 1997. More recently other European (e.g. Schonfelder & Axhausen 2003; Uteng 2007) and non-EU countries (e.g. Stanley & Vella-Brodrick 2009) have began researching the topic.

However, despite the long standing acknowledgement of the SE concept, a consensual definition remains elusive. There is a general agreement that SE is a multi-faceted concept, Uteng (2007) for example concluded that there are 3 discernable dimensions of SE: namely it is;

- **Process orientated** (i.e. a dynamic social process that can be changed), for example; *"Social exclusion is a dynamic process of being shut out, fully or partially, from any of the social, economic, political and cultural systems which de-*

termines the social integration of a person n society" (Walker & Walker 1997);

- **Involves participation in decision making**, *e.g. "An individual is socially excluded if (a) he or she is geographically resident in a society and (b) he or she does not participate in the normal activities of citizens in that society"* (Burchardt *et al*. 1999);

- **Involves a spatial element,** e.g. *"A multi-dimensional process, in which various forms of exclusion are combined: participation in decision-making and political processes, access to employment and material resources. When combine, they create acute forms of exclusion that find a spatial manifestation in particular neighbourhoods"* (Madanopour *et al*. 1998)

More recently, attempts have been made to combine the different dimensions into one concise and measurable definition. For the purpose of this paper, the latest UK definition is used, i.e.

"The lack or denial of resources, rights, goods and services, and the inability to participate in the normal relationships and activities, available to the majority of people in society, whether in economic, social, cultural or political arenas. It affects both the quality of life of individuals and the equity and cohesion of society as a whole" (Levitas *et al.* 2007 8).

Whilst, there remains some disagreement to the precise type of 'rights, good and services' that people may be excluded from, most commentators agree, that these include educational, employment, health, social, cultural and transport opportunities (see Hine and Mitchell 2001 for a more detailed discussion).

3. The relationship between transport and SE

The link between 'transport' and SE has long been recognized (e.g. SEU 1998; Church *et al*. 2000; DfT 2004; Kenyon *et al*. 2003; Lucas 2006). The first report of the UK government's Social Exclusion Unit (SEU 1998) for example, indicated that

"many of the problems experienced by traditionally excluded groups and individuals are exacerbated by gaps in the policy and service delivery system at the local level. Among other problems (poor housing, ill-health, high unemployment and low educational attainment), the report noted the problem of ***poor transport*** *and* ***accessibility****"*

Having recognised the relationship between transport and SE, several authors have attempted to define and operationalize the precise ways in which transport impacts on SE, in the form of measurable 'indicators' (e.g. Church *et al*. 2000).

In a review of available evidence, Hine and Mitchell (2001) noted considerable overlap between the previous indicators suggested, and in an attempt to consolidate previous research proposed five broad dimensions of 'transport-related social exclusion' (TRSE). These dimensions are

- **Physical**- where physical barriers are encountered by individuals in their use of public transport (or any form of transport);

- **Economic**- where monetary constraints affect the use of existing transport facilities;

- **Temporal**- where individuals time constraints limit use of transport facilities or where the provision of existing transport facilities is restricted at certain times of the day;

- **Spatial**- access to exiting transport facilities is difficult due to their geographical location/distance;

- **Psychological-** related to individuals perceptions of safety/security and confidence when using different transport modes.

A broadly similar classification of indicators relating to 'transport barriers to accessibility' was suggested by Halden *et al*. (2005), although, a further indicator related to ***information*** was added. This refers to the level and types of transport information provided, and people's ability to use/understand that information. This 6-fold TRSE classification is used throughout the rest of the paper.

4. How TRSE is measured in the UK and Germany?

Having identified a set of operational indicators, this section provides a summary of the methods employed in the UK and Germany, which attempt to measure TRSE. Measurement techniques can be broadly divided into 2 main approaches, namely 'quantitative' and 'qualitative' measurement.

Quantitative measures relate more to objective measurement of aspects such as time and distance to from different facilities. This information is typically (or can be) derived from surveys, from which the data can entered into 'mapping software' to provide a visual overview of different population groups or locations to identify relative exclusion (see Figure 2 later).

In contrast, qualitative measures relate more to individuals' perceptions and attitudes towards different aspects of different modes, including how accessible these modes are. This information is typically collected by National and local travel surveys.

5. The UK approach

Guidance on how to measure TRSE using the UK approach of accessibility planning is contained in a key

UK Department for Transport (DfT) Report (DfT, 2004) which contains quite detailed guidance on a recommended procedure to measure TRSE, through a combination of both quantitative and qualitative methods, that aims to capture the underlying dimensions of SE, and TRSE.

The DfT (2004) recommends a 5 stage process that local transport agencies should adopt in their accessibility planning approach- see Figure 1.

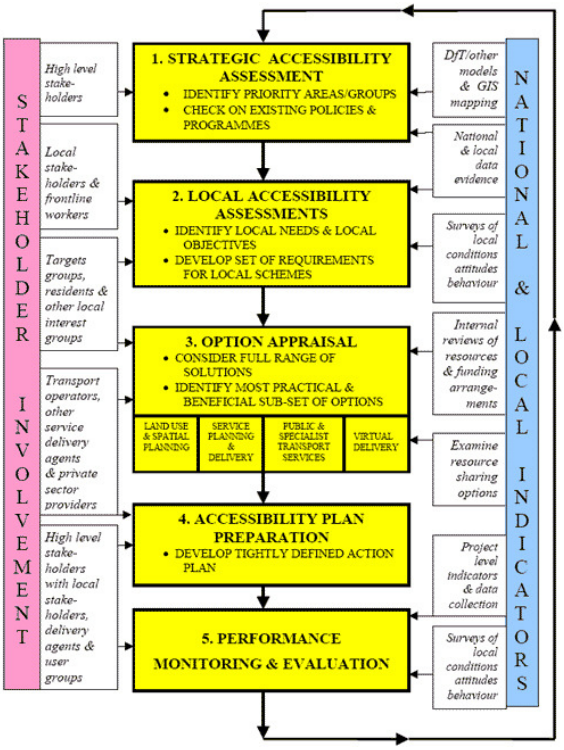

Fig 1. Overview of accessibility planning process

The DfT (2004) provides step by step guidance on how to conduct accessibility audits, and most relevant to this paper are the first two assessment stages, 'strategic' and 'local' accessibility assessments. These stages are briefly described below.

Stage 1: Strategic assessment guidance

- **Step 1: Regional mapping audit:**
  Conduct a mapping audit is to provide a broad picture of accessibility problems and issues that exist within a particular region. The DfT suggest that 'readily available' data should be used, using any combination of CNI's, Census data or other local information to identify socially excluded groups or areas;
- **Step 2: Discussion of results:**
  Discuss the results of the mapping audit with other 'stakeholder' departments and agencies. The aim of this discussion is to highlight to relevant partners where accessibility problems exist and help those partners better define their potential roles in improving accessibility;
- **Step 3: Prioritisation of issues**:
  Prioritize the output of steps 1 and 2 that require further investigation in local assessments. The guidance suggests first targeting areas or groups, where disadvantage is greatest or where accessibility improvements are most likely to address an area's wider objectives.

Stage 2: Local accessibility assessment

- **Step 1: Local evidence:**
  Examine local evidence, which can include local sources of data and qualitative evidence that comes from local knowledge and surveys (An overview of the different forms of local evidence is contained in the Dft report, highlighting their various strengths and weaknesses);
- **Step 2: Detailed local mapping:**
  Produce more detailed mapping audits, tailored specifically to local needs and priorities. These might include for example, mapping for major generators of travel such as employment centres, school transport services, catchments of local health centres by walking, public transport etc, public transport routes and frequencies, and specific population groups;
- **Step 3: New data:**
  Conduct new surveys and research where necessary. This is necessary to fill in any gaps revealed in the mapping audits and to make the validity of the mapping exercises (i.e. to ensure the data matches actual conditions).

The UK approach entails a combination of both quantitative and qualitative measures. The main quantitative element consists of a set of standardized indicators know as Core National Indicators (CNI's) which are based on travel times derived from National travel surveys to various services. The aim is to allow local authorities to compare different population groups, areas or regions on these key indicators to identify specific groups or areas that are experiencing relative exclusion.

The CNI's focus on 9 population groups, namely; 'People of working age'; 'Jobseekers (unemployed)'; 'Children aged 5-10'; 'Children receiving free school meals aged 5-10 (indicating low income)'; 'Children aged 11-15'; 'Children receiving free school meals aged 11-15'; 'Residents aged 16-19'; 'All households', 'Zero-car households'. Seven destination types (services) are used; 'LSOA's (small areas typically consisting of around 1,500 residents) with over 500 jobs', 'primary schools', 'secondary schools'; 'further education colleges'; 'Doctor's'; 'hospitals' and 'foodstores'.

The population groups used comprise of a 'selection' of groups deemed most at risk from exclusion (e.g. unemployed and people on low incomes), and also non-risk groups to allow comparisons. The destinations used focus on 'key services', i.e. access to educational, health, employment and retail outlets. Accessibility to each destination or origin is measured for each service in terms of

the % of each group that could travel to the service within a specific timeframe. The core indicators currently used in the UK are:

- *The % of a) pupils of compulsory school age; b) pupils of compulsory school age in receipt of free school meals within 15 and 30 minutes of a primary school and 20 and 40 minutes of a secondary school by public transport;*
- *The % of 16-19 year olds within 30 and 60 minutes of a further education establishment by public transport;*
- *The % of a) people of working age (16-74); b) people in receipt of Jobseekers' Allowance within 20 and 40 minutes of work by public transport;*
- *The % of a) households b) households without access to a car within 30 and 60 minutes of a hospital by public transport;*
- *The % of a) households b) households without access to a car within 15 and 30 minutes of a medical practitioner by public transport; and % of a) households; b) households without access to a car within 15 and 30 minutes of a major centre by public transport.*

The time band values are derived from responses to the main UK National Travel Survey (NTS) and Scottish equivalent, the Scottish Household Survey (SHS). This information is then typically illustrated via 'mapping software' at either a local, regional or national level. This entails superimposing over a map of the area with different 'coloured' zones, each representing the level of access to specific facilities (e.g. Doctors surgeries, higher education facilities, etc.).This information allows identification of specific areas where accessibility is relatively poor, and can thus help inform remedial actions to improve accessibility in those areas.

In addition to the CNI's, The DfT also advocates the use of Local Indicators (LI's) to assist local authorities in identifying groups at-risk of exclusion at a local level. Similar to how CNI's are derived information can be obtained via National surveys (if required information is available), or via surveys conducted by local authorities. For example, they allow for aspects such as the fear of crime, awareness of the availability of travel information, and individual perceptions about the quality of services and transport to be captured. Depending on the sample size, the results of such surveys may be mapped; with smaller sample sizes being best presented in tabular or graphical format.

The DfT (2004) provide an example of a survey conducted in Middlesborough (in north-east England) which utilized responses of the wider population to a perception of crime question (e.g. very safe to very unsafe responses) to map qualitative responses by region. Based on the survey responses, a shaded map of the Middlesborough area was produced, which allowed those areas where crime was perceived as worst to be identified. This then helped inform how local police force and local authority resources were best targeted and resourced to improve local conditions.

6. The German approach

In contrast to the UK, there appears to be no 'official' National, regional or local policies related to the measurement of TRSE in Germany (see Kemming & Borbach 2003). As such, unlike the UK, there are no standardized quantitative measures (i.e. CNI's) or guidance to local authorities to measure SE or TRSE (a survey of German local authorities is currently been conducted to validate this assumption and to identify how, or if TRSE is currently measured).

As part of this current research project, a review of National German surveys was undertaken, and although, the surveys reviewed were not intended directly to measure SE, or TRSE, the content of some surveys did include SE/TRSE measures. These include the 'Time Budget Survey' (TB), 'Living in Germany' (LIG), 'Mobility Panel Survey' (MPS) and 'Microcensus' (MC).

7. Discussion

This section provides a brief discussion of current understanding of social exclusion (SE) and transport related social exclusion (TRSE), and how definitional issues pose problems for how TRSE can be measured. It then considers the effectiveness and utility of the current UK approach and and selected German surveys to measuring TRSE, highlighting specific problems and limitations in these approaches.

Whilst the remains some disagreement as to the precise definition of social exclusion, this is likely to be due to the multi-faceted nature of the concept, and the complex relationship between the various components that together could (or could not) create a situation whereby specific groups, or individuals become 'socially excluded'.

However, current understanding of social exclusion, (as with earlier definitions) remains problematic and poses problems on how it can be practically measured. It includes aspects such as '*normal*' '*relationships*' and '*activities*', which are ambiguous by nature, and thus subject to interpretation. For example, for one person/some people, it might be normal to attend college every day, whereas for someone else it might be once per week as part of a part time course; or someone may visit a museum/theatre several times per month, whereas others may go once per year, or not at all. This 'participation' in these activities may however, be due to those individuals personal choice, and not because they are 'excluded' from doing so.

Similarly, in terms of lack of resources, if this is interpreted in terms of income, two people on identical incomes may differ in their participation on 'normal' activi-

ties, by choice, not earned income. For example, this could relate to private health services, someone on a low income may have as part of their work benefits access to private health care, whereas someone on relatively higher income does not, or chooses not to pay for a private membership.

Again, reference to the '*majority*' of people in society is open to subjective interpretation. By definition a majority is more than half of a population, but if an 'activity' is available to 51% of people, and not to the other 49%, does it mean the latter are excluded (?).

The role of transport in affecting social exclusion is by definition much clearer, in that inadequate provision of transport services can restrict or prevent people from participating (if they chose to do so) in these '*normal*' activities. The lack of a clear operational definition of SE does pose problems on how TRSE can be measured, and leads to two further key questions: Firstly;

- **What needs to be measured?** In order to fully explore the role of transport as a determinate of social exclusion, the question requires two separate, although, obviously related answers. ***Firstly***, what are the 'activities' that 'normal' people participate in, and thus socially excluded people do not, and ***secondly***, in what ways does transport limit, or restrict this participation?, and secondly;
- **How can all aspects be measured?** Following on from the first question, once the answer is defined conceptually in an operational way, a methodology is required to ensure that all aspects of TRSE are measured by the method.

8. What needs to be measured?

Based on the review of evidence undertaken in this report, there are 6 broad 'activities' (or services) to which access to, or use of can be dependent on transport, and that can be deemed 'normal' activities/services (i.e. that other citizens participate in), that could be affected by the provision or lack of provision of transport services. These activities can be broadly classified into six main classifications or opportunities, namely; 'Educational opportunities'; 'Health opportunities'; 'Employment opportunities'; 'Social opportunities'; 'Cultural opportunities'; and linked to all of the above; 'Transport opportunities'.

In relation to how transport can impact on these activities (i.e. restrict or facilitate access) 6 main aspects were identified, namely Temporal; Spatial; Psychological; Personal; Financial and Information (e.g. Hine & Mitchell, 2003; Halden *et al.* 2005).

9. How can these aspects be measured?

The following subsection now considers how both these identified activities and potential transport barriers are addressed in the UK accessibility planning approach and the selected German surveys reviewed. The section is structured around the 6 main transport barriers identified earlier, and additional relevant SE indicators.

10. Temporal measurement

The UK CNI's provide guidance on two temporal measures (time bands) to a range of lifestyle opportunities (see earlier). For all CNI's two time bands are used; [1] based on the median time value derived from the UK NTS, and [2] a further higher value, that corresponds to the time value that between 80-90% of NTS respondents indicate they currently travel to the respective destinations.

However, it can be argued that these time values are somewhat arbitrary and limited in usefulness. The first time measure (median NTS value) by its nature equates to a time value that 50% of the population take to make trips to the various activities and thus 50% spend more time, than this average value. It is therefore very limited in the type of detail or information that can be provided in identifying individuals or groups that 'may' be excluded from any of the included opportunities..

No specific details are provided for how the second measure is derived, other than it is 'claimed' to represent a time value that 80-90% of NTS respondents take to travel to the various services. This is arguably a more useful measure to use as it is more representative of the time taken to access various services for the vast majority of people in society (80 or 90%), and thus can help identify the minority (10 or 20%) who do not have similar access, and in this sense could arguably be excluded from these services.

However, for some services such as access to medical practitioners where overall journeys times are relatively small (e.g. say less than 20 minutes), if some people (10 or 20%) are required to travel a further few minutes to access services, it does not mean they are excluded from these services, but in reality may have to spend a few more minutes than other people to access them. For this example, again, the ability of CNI's to identify those people who are fully excluded is diminished.

Both UK and German surveys contain a range of temporal measurements, which are discussed briefly below.

In relation the access to key services, in the UK National Travel Survey (NTS) asks people (depending on household composition, i.e. if the household contain children of the relevant age)- *How long (in minutes) would it take (me- the interviewer) would it take to get to the nearest (primary school, secondary school, college) on foot or by public transport, whichever is the quickest.* Similar questions are asked in relation to the nearest chemist and also post office. In the German surveys, similar questions are asked in relation to the various health services (e.g. in the Time Budget (TB) and Living in Germany (LIG) surveys), and in addition to a range of other services/activities not covered in the UK surveys, i.e. shopping facilities, cinemas, libraries, eating/drinking

facilities, parks/open spaces, sports facilities, banks (LIG only), and workplace (Microcensus (MC)).

Similarly, in relation to access to public transport services, in the UK, the NTS and Scottish Household Survey (SHS) both ask people the 'time it would take (the interviewer) to reach the nearest bus stop', and in the NTS also the 'railway station'. This is similar to the approach taken in the German surveys which asks how long it takes to walk to bus stops (MPS), stops for public transport (TB and LIG), and in the Mobility Panel Survey (MPS) also to tram, subway, local and regional rail facilities. However, in the UK surveys survey respondents are asked to indicate 'how long it would take the interviewer to walk to the bus stop', not the interviewee. The time to walk to a bus stop for say a 'healthy able bodied adult' is likely to be considerably less, than say an 'infirm', older, perhaps wheelchair user, who in all examples is likely to take considerably longer to reach the same bus stop. As such, the responses obtained from these questions do not provide an accurate temporal measure of an individual's accessibility to transport services, a thus exclusion indicators.

Further, once individual's time values are recorded, they are typically reclassified into time bands which are then used to compare different groups and/or areas in terms of this proxy spatial measure of accessibility to public transport. For example*, The % of people in Scotland/Edinburgh who live within 6/12/30 minutes of a bus stop.* However, as with the use of median time values used in the CNI's, this arbitrary time measurement is limited in allowing any meaningful insight into transport accessibility.

In the NTS, people are asked 'how frequent are the buses from that stop (nearest bus stop) during the day, requiring categorical responses from 'at least one every ¼ of an hour' to 'less than one per day', and the SHS a similar question, requiring an interval response, i.e. in terms of minutes, hours or days. This is arguably a measure or temporal TRSE as the frequency of services from the nearest bus stop will impact on a person's total journey time. However, the underlying assumption is that this 'nearest bus stop' is the one that respondents actually use, or would use for different journey types, which may or may not be true in all circumstances.

11. Spatial measurement

In contrast to temporal measures, very limited information is collected in both UK and German surveys relating to spatial measurement. The UK SHS collects information of respondents home and workplace (or education place) postcode, which allows the distance between them to be subsequently calculated. Similar measure are collected related to workplace destinations in both the German TB and MC surveys, although, asked in a more direct fashion, i.e. How far to your workplace in km's (TB) and in a categorical fashion, under 10km to 50km + (MC). Additionally, in the MPS, respondents are asked to indicate the distance from their homes to the nearest bus stop (less than 100m to more than 10km).

12. Psychological measurement

In the UK SHS, several measures of psychological indicators are asked, although, focus on safety aspects, and not other psychological aspects such as individuals' confidence when using transport services, or reaching key destinations. These safety aspects include measures relating to using local buses, trains and walking on local neighbourhoods, both during the daytime and evening (after dark).

In addition the SHS contains a series of measures relating to parent perceptions of safety in allowing their children to travel to a range of local 'play' activities (e.g. parks, playgrounds and in neighbourhood streets). The SHS also asks people how convenient (or inconvenient) it would be to access a range of local amenities and services, e.g. shops, post offices, Doctor's surgeries, chemists, hospitals and dentists. Although, not a direct TRSE measure, these questions do allow a measure of 'ease of access' and can be used to compare these perceptions between population groups and areas. No psychological measures are contained in any of the German surveys reviewed.

13. Physical measurement

In relation to personal (health/mobility-impairment) aspects, both the UK NTS and SHS contain several measures related to people's ability to perform various travel related activities. These include difficulties related to walking (NTS and SHS), and in the SHS relating to climbing stairs and standing (both activities along with walking to and accessing public transport facilities), as well as in relation to general transport use (using buses, cars (In NTS also), trains and taxis). No physical TRSE measures are contained in any of the German surveys reviewed.

14. Economic measurement

No direct TRSE financial aspects are measures in either the UK or German surveys reviewed. However, in the SHS indirect measures in the form of asking people to state problems with car use, or reasons for not using local buses, do include options for people to indicate cost as a problem/reason. This does allow potential financial barriers to be identified and also to measure its relative importance to other problems/reasons that are included in these questions (e.g. congestion, time/temporal problems with car use, and frequency, directness, personal abilities etc. with public transport use).

15. Information measurement

Both the UK and 'some' German surveys ask respondents if they have access to internet services, which

in part allows some measurement as to whether people 'could' access (and thus use) travel information. In addition the SHS ask direct questions relating to respondents use of Traffic Scotland (an online resource that provides travel information and route planning).

The SHS also ask people who do not use the internet to indicate the reasons why not, and this include financial and personal health response options that could indicate exclusion.

16. Multidimensional TRSE measures

In addition to the direct TRSE indicators discussed above, several multidimensional TRSE questions are included in the UK surveys**.** The SHS for example, contains a series of questions relating to modal choices/barriers to travel, that contain corresponding TRSE indicator response options. For example, respondents are asked how their children travel to school and then why they choose that method (travel mode). Response options include spatial TRSE reasons (close by/not too far, too far to walk, too far to bus stop), psychological (safest method, children too young to walk on own, PT unsuitable, PT inconvenient), financial (cheapest method). Similar questions are asked relating to reasons for travel to work and educational establishments.

The NTS asks people if they have 'any transport difficulties to any of these types of journeys- travelling to doctors/hospital, visiting friends/relatives at their home, travelling to other social activities, taking the children to school/social activities, travelling to school/ college/ university, travelling for any other reason. Response options are which directly correspond to TRSE indicators are '*too far/long journey'* (spatial); '*cost of using public transport/taxis*'; '*cost of petrol'*; and '*cost of parking'* (financial); '*personal disability'* (personal); '*concerns over personal safety*' (psychological); '*poor information about public transport services*' (information).

Similarly, the SHS also asks people who travel by car to a range of activities (e.g. shopping, evenings put, to see medical practitioners, go to library), how easy or difficult it would be for them to make those journeys by PT. This provides an indirect indication of the ease of access to key services (and other facilities), although, not allow the specific barriers (TRSE indicators) that restrict or facilitate the ease of these trips.

One advantage of multi-dimensional questions as above that it allows the relative importance of each TRSE element to be established (where they are measured), e.g. are spatial (distance), financial (cost), personal factors the most important barriers for these trips.

17. Participation in activities/social networks

Although, not a direct TRSE indicator, participation in '*normal*' activities and social networks is a key component of social exclusion (Walker & Walker 1997). The SHS asks people how often they have used a variety of sports and leisure facilities (e.g. facilities/libraries/museums and galleries/theatres and concert halls/parks and open spaces/community centres) as well as key services such as Doctor's surgeries, post offices, chemists, dentists). Similarly, the LIG survey asks people '*which of the following activities* (cultural *events, do you take part in during your free time?*. Both surveys broadly similar response formats (e.g. once per week/almost every day to never), which allows measures of relative use of to be established, and thus comparison between different population groups/locations etc.; which can be used as measures of exclusion (although, see definition discussion points).

Participation in social networks is also measured by both UK and German surveys, although, the questions asked are slightly different. For example, in the UK SHS people are asked '*how involved are they with people living in their neighbourhood'*, whereas the LIG asks people *'how well they know the people in their neighbourhood'*, *'how close is your contact with your neighbours*', and *'how often they visit their neighbours'*. This would obviously prevent direct comparisons between the two surveys, although, separately, these measures (particular the German questions) can be used to give an indication of peoples participation in social networks, and any relative differences between groups, or areas in this activity.

18. Attitudes towards local services

Again, although, not a direct measure of TRSE (or SE), peoples satisfaction with local transport services, or with local facilities can be used as an indicative TRSE measure. In both the UK SHS and NTS several transport related satisfaction questions are included, e.g. satisfaction with local buses (overall, in terms of reliability, overall cost and frequency), the provision of cycling and walking facilities, and safety from traffic measures.

In addition, people are asked about their satisfaction with their local neighbourhoods in terms of several factors including how accessible it is, how safe it is from traffic, and with a range of local amenities and services, e.g. local shops, libraries, cultural venues, local health services, and schools. No such questions were asked in the German surveys reviewed.

19. Conclusions

In the UK guidance for the measurement of TRSE is comprehensive and relatively advanced compared to Germany, and most other countries. However, the examination undertaken as part of this research has shown the approach to be limited in several aspects that we argue restricts the full measurement of TRSE. Specifically, the use of quantitative measurement (i.e. CNI's) focuses on only one TRSE indicator (temporal) and is thus limited in its explanatory capabilities in indentifying excluded groups or areas to this sole indicator.

The UK national travel surveys do arguably cover all TRSE indicators, although, the extent and depth to which each indicator is measured varies considerably. Most promising in explanatory power are the multidimensional TRSE questions, that as well as identifying the

importance of the individual TRSE indicators, also allow their relative importance (to each other) to be established. Limitations with the current UK accessibility planning approach are in part acknowledged by the UK Department for Transport who suggests as a solution local authorities should use supplementary LI's. However, as no (standardized) guidance on how to measure LI's is provided, it is likely that different local authorities will use different methods, which restricts comparisons between different areas, as well as reliability and validity issues.

The German surveys reviewed in this paper are even more limited that their UK counterparts in measuring TRSE. However, perhaps reflecting the lack of official German National policy, these surveys are not specifically designed to measure TRSE, although, with some modification to survey content could serve that purpose.

Given the increasing importance of identifying and addressing social exclusion at a National and European-wide level, there remains a need for standardized measurement techniques and guidance. As many EU countries have existing National Travel Surveys, the most promising solution would be a set of standardized questions that cover all TRSE aspects.

We recommend that this should be the focus of further research to allow TRSE to be fully measured and understood.

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