Road Safety Research Report No. 123

Road User Safety and Disadvantage

Clare Lowe,[1] Grahame Whitfield,[2] Liz Sutton[2] and Jeremy Hardin[1]
1 AECOM
2 CRSP

February 2011

CONTENTS

EXECUTIVE SUMMARY

Background and method

It has been shown that, for some road users, there is a relationship between socio-economic disadvantage and the risk of being killed or injured on the road. In particular, children and young people from disadvantaged areas are at greater risk when walking compared with those from relatively affluent areas. In 2008, the Department for Transport commissioned research to explore the reasons why this might be the case. The aim of the research was to provide a practical overview of road safety issues in disadvantaged areas involving an exploration of:

- the populations, environment, behaviour, attitudes and perceptions of risk in disadvantaged communities;

- attitudes to road safety issues, and behavioural responses in the context of other issues and priorities that people living in disadvantaged areas may hold;

- road safety service provision in disadvantaged areas across different sectors, and the nature and extent of partnership working in this provision; and

- the extent of community involvement in road safety delivery.

The project aimed to provide lessons for improving road safety service provision in disadvantaged areas and to provide suggestions for public policy responses, including improved linkages with other areas of public policy and initiatives. While the primary focus of this research was the situation in disadvantaged areas, many issues raised in this research are clearly applicable to other areas with high levels of road traffic incidents.

This study builds on existing evidence by providing a rich source of detail about the inter-relationships between environmental, attitudinal and behavioural factors in respect of risk of road injury and death among children and young people in disadvantaged areas. It also sets out a detailed picture of local road safety provision and of the nature and extent of community involvement in addressing road safety risk. The research incorporated:

- a project development phase involving analysis of injury and spatial deprivation data, a review of existing evidence on the issue, interviews with (road) safety experts and government representatives from other policy areas – this stage identified key issues for exploration; who the research should focus on and suitable study areas for the following core phase of the study;

- a core phase consisting of five case studies in wards in Wigan, Bradford, Newham, Sunderland and Wolverhampton, which involved a review of local data and policy; interviews with representatives of local agencies to establish services and interventions in place and how these operate; research within communities

using focus groups and observation approach to explore attitudes and behaviour, including lifestyles and culture, travel needs and behaviour and the street context; and

- a follow-up phase designed to fill information gaps arising from the previous stages of the study – this involved desk research, interviews and social network analysis (SNA) to provide insights on partnership working; and a repeat of the community research in a relatively affluent area with a high casualty rate for comparative examination of the risks and their association with disadvantage.

Factors associated with high levels of risk

The main issues identified in the community research generally supported the findings in the existing literature in that the factors relating to the likelihood of people from disadvantaged areas being involved in road traffic incidents were related to them:

- **living in more hazardous environments**, such as older style developments, with dense housing and proximity to high volumes of fast moving traffic and high levels of on street parking;

- **having lifestyles with higher levels of exposure to road traffic risk**, such as them being more likely to walk and being less likely to be able to afford access to a car; and

- **not having access to safe spaces and supervised facilities for children and young people**, meaning there are less alternatives to streets/roads as places to socialise and play outside the home.

However, the research did not find that people in disadvantaged areas have low levels of understanding about risks or were unwilling to take up local provision. Indeed, it found that people had detailed knowledge of road safety risks, but that this often had to compete with concerns over issues about personal safety, given that their local area had neglected and/or vandalised buildings and high rates of criminality and anti-social behaviour. It also found that facilities in the local area (such as parks, sports and community centres) are often considered inaccessible, inappropriate for local people's needs or unaffordable.

In addition to environmental factors, the research found that high levels of hazardous and illegal driving behaviour (both by drivers from within the area and by drivers passing through) pose a particular risk to people living in disadvantaged areas. This included:

- ad hoc and dangerous parking (including on pavements near schools, for example);

- speeding and aggressive driving;

- low levels of seat-belt wearing (particularly in the rear of cars); and

- a lack of use of child restraints or booster seats.

Another important aspect highlighted in the research was the impact of a lack of consistent visible enforcement of the 'rules of the road' and the negative impact of this on driver behaviours. For example, where there were seen to be no consequences for drivers who parked their cars on pavements or near junctions, who did not stop at crossings and who drove while using mobile phones, there was a sense among local people that little was being done to improve safety in the area.

Although there were some specific issues that warrant additional and/or more specific focus in disadvantaged areas, this research found that some environmental issues identified in the disadvantaged areas with high casualty rates, such as major arterial roads, heavy traffic and parking problems, were also applicable to more affluent areas. Many behavioural issues were also similar across areas, especially poor driving. However, the research found that people living in disadvantaged areas had to also contend with unsafe and run-down environments on a daily basis, while local children had fewer safe places to play than children living in more affluent areas.

Road safety provision and practice

The risk factors identified by local road safety professionals were generally very similar to those identified in the community research. They were clearly reflected in the comprehensive range of initiatives that were in place, which included:

- children's road safety education and training to promote safe behaviour and crossing;

- publicity and communication activities to raise awareness and promote safe behaviours;

- road safety design and engineering;

- enforcement activity to tackle motoring offences;

- diversionary activities for young people; and

- measures to address crime and antisocial behaviour.

Children's road safety education and training interventions were generally made available to all rather than being focused on disadvantaged communities. Other interventions, such as engineering measures and enforcement activity, were typically targeted at 'hot spots' with known histories of collisions or offences. Alternatively, measures were aimed at specific target groups, particularly children and young people, through interventions such as car-seat provision and diversionary activities for young people. **Community Champions**, a Government-supported community

development initiative in Wigan, was the only example of an intervention specifically focused on disadvantaged wards.

Some examples of the types of interventions in place in disadvantaged areas that focus on the key environmental risks were:

- road safety engineering schemes in all areas at sites where collisions have previously occurred as well as route actions, area-wide traffic calming measures and local engineering treatments in response to local concerns, although the latter were relatively rare;

- improvements to parks and open spaces involving refurbishment and new play facilities to provide safe places to play;

- street improvements, including the provision of street furniture, lighting and landscaping to enhance the environment and improve pedestrian safety; and

- a social housing provider with a policy to provide two parking spaces per dwelling in new build developments to avoid the need for on-street parking where there is a risk to children.

Other examples of interventions representing a relevant and appropriate response to some of the identified risky behaviours were:

- enforcement operations by the police, sometimes in partnership with others, targeted at specific areas and motoring offences, including speeding and non-seat-belt wearing;

- child car-seat provision, including car seat hire, subsidy and car seats for maternity ward taxis; and

- the provision of relevant and accessible local information to the public, such as information on local casualty levels to raise awareness and targeted leaflets in minority ethnic languages.

The monitoring and evaluation of road safety interventions was often limited, or absent, due to limited resources and a lack of knowledge and skills. In addition, it is difficult to identify significant changes in casualty levels at a very local level and causality is often difficult to establish. The mixed picture in respect of monitoring and evaluation made it difficult for local professionals to determine the effectiveness of interventions and initiatives, and for the wider road safety community (including the Department for Transport) to identify and share good practice.[1]

---

1   The Neighbourhood Road Safety Initiative (NRSI) is a notable exception which has been subject to full evaluation and sharing of information on good practice (Department for Transport, 2010).

There are many different types of partnerships working to improve road safety, including local authority level road safety forums and strategic road safety partnerships. As such, local partnerships varied in how they operated as each have a slightly different focus. At a minimum, they operated as a forum for a lead partner to provide local organisations and community groups with information about initiatives and interventions and to be questioned about implementation and progress. At another level they provided a forum for a much more inclusive multi-directional exchange of information, knowledge and expertise. The success of partnerships was often a result of the extent to which a local 'champion' took interest in the road safety issues and promoted them at a strategic planning level and brought other organisations onside. The research identified some key elements for effective partnership working on road safety issues, which included:

- building road safety into strategic level planning;

- sharing data to guide planning;

- ensuring partnerships have real clarity of purpose;

- leadership and championing across organisational boundaries;

- effectively identifying and utilising partner roles and skills;

- making sustained provision for joint-funded posts; and

- developing good relationships between local partners (including professionals and local people).

The research adds to the view that the clear value of road safety provision could be augmented by it becoming a more mainstreamed and joined-up area of policy making and local service planning and delivery.

The research found little evidence of community initiatives that directly involved local people in developing and delivering road safety interventions in the case study areas. Initiatives that were in place tended to be top down, and delivered **for** local people, rather than engaging the community in any ongoing and meaningful way in their delivery. Community involvement was sometimes mentioned with reference to, for example, school travel plans or personalised travel planning. However, the primary focus was often sustainability and health issues with a limited target audience rather than the wider community. As such, many community initiatives are not grounded in the experience and perceptions of people living in the local community. A bottom-up approach involving the local community would be more effective in delivering interventions that recognise the problems that local people face and meeting their needs, including, for example, local traffic management and engineering schemes.

Lessons for road safety

The overarching finding from this research is that environmental and planning issues and community involvement need to be at the heart of a comprehensive cross-government road safety strategy if the numbers of road injuries involving children and young people in disadvantaged areas are to be significantly reduced from the current levels. Residents in all the case study areas lived in hazardous traffic environments, and addressing the physical management of roads and traffic is central to lessening the differential risk of road injury for children and young people in disadvantaged areas compared with those from more affluent neighbourhoods.

While educational, training and awareness-raising initiatives have an impact on the level of road traffic injuries and ought to be continued, this research strongly suggests that they are unlikely **in and of themselves** to ensure that the reductions in the level of incidents in recent years are maintained in the future. Indeed, the (potential) benefit of these initiatives would often appear to be reduced in the context of the environmental factors which affect how people live their lives, with the effect of raised awareness and education consequently being undermined. Further, the lack of involvement in decisions about development or traffic management in their area can also result in initiatives and interventions being introduced that do not address local concerns or needs.

This research provides some clear suggestions as to how road injuries might be reduced, as follows:

- **Developing and managing the physical environment** – this broad area of activity is concerned with managing the high demands on densely populated urban areas; dealing with the legacy of older urban environments not originally designed for cars; and giving a higher priority to pedestrians in managing the conflict between pedestrians and vehicles. Appropriate activities would include, for example:
    - planning measures to avoid further intensification of housing;
    - planning measures to avoid major developments without provision for public transport access or on-site parking by users;
    - traffic engineering and signalling measures that give greater priority to the needs of pedestrians including, for example, 20 mph zones and parking restrictions, particularly around schools and pedestrian crossings;
    - environmental and engineering improvements that lessen the dominance of vehicles to create safer and more pleasant streets; and
    - the provision of safe access to safe open spaces.

    In each case, engagement with the community would be likely to elicit a scheme that addresses recognised problems and is more likely to be supported.

- **Managing traffic and effective enforcement activity** – the research suggests that there is a need for more effective and visible traffic management and

enforcement activities to reduce the volume and speed of traffic in disadvantaged areas, and so reduce the risks for child pedestrians. Appropriate measures in this regard would include, for example, parking enforcement to reduce dangerous parking and the enforcement of speeding restrictions as well as other driving laws, such as seat-belt wearing. Clearly, this kind of activity would have resource implications. As such, it stresses the importance of working with the local community to identify areas of particular risk and determining an appropriate response.

- **Changing behaviours and attitudes** – the research suggests that future road safety communication activities need to be designed to ensure they use language, imagery and media that make the content relevant to people in disadvantaged areas and, in some cases, their ethnicity/culture as well as age. The application of marketing tools, such as MOSAIC, can be appropriate for identifying and engaging key groups.

- **Integrating road safety into other policy agendas** – the research has indicated that there would be considerable value in ensuring that road safety issues are incorporated at a high level within a wide range of organisations so that it becomes entrenched in strategic-level planning and policy by organisations and departments outside of those explicitly focused on local authority road safety. It strongly suggests that the development of policies and interventions that address multiple levels (educational, engineering and enforcement strategies) – such that road safety is seen as relevant to a broad range of aspects of policy making and service delivery – will address the situation that no one agency or area on its own has the expertise and ability to deal with all aspects of policy making and service delivery, and also the situation where different agencies assume that another organisation has both the expertise and the responsibility to deal with all these aspects. This is particularly pertinent given the Government's ethos of the 'Big Society' in which local authorities need to engage and involve the wider community on a broader range of issues through their sustainable community strategies. Where road casualty reduction targets, for example, are recognised in the policies and priorities of a number of organisations, it would seem likely that it would become easier for them to commit to activities and interventions that contribute to this strategy, and to work together with others towards a common goal. It is well understood that road safety is a cross-cutting issue that may feature in, for example, health, policing, other emergency services, children's services, community development and community safety. It is therefore important that road safety, and road casualty reduction, are recognised within the policy agendas of organisations that have responsibilities in each of these areas.

- **Increasing the level of co-ordinated partnership working at an operational level** – it is evident that road injury prevention is a broad issue covering a wide range of sectors and disciplines beyond local authority road safety departments. While there are examples of effective co-ordinated working, it would appear that there is scope for more joined-up working at an operational level, including

linkages with the police, fire and rescue and other emergency services, community safety, community development, health, children's services, regeneration, housing and neighbourhood management, recreation management and planning. Some of these partners will have a role in the development and management of the physical environment – a central theme. For all partners it is important that they understand their role and how it directly or indirectly can contribute to reducing road casualty levels and injury inequalities.

1   INTRODUCTION

1.1   Background and objectives

Despite an overall decline in the number of road traffic related deaths and injuries in recent years, it remains the case that people from disadvantaged areas remain at higher risk than those from more affluent areas (Road Safety Analysis, 2010). It has been shown that there is a relationship between socio-economic disadvantage and the risks of being involved in a road traffic accident for some road users. However, although there is a general consensus that the 'socio-economic gradient' is real, the reasons for this relationship remained unclear.

In 2008, the Department for Transport commissioned a wide-ranging, exploratory research project to provide a practical overview of road safety issues in disadvantaged areas. The research aimed to explore the relationship between socio-economic disadvantage and road injury in detail in order to assist the Department for Transport in its thinking about how it might develop and implement future strategies to reduce road casualties – in particular, in disadvantaged areas.

The research involved a detailed exploration of the populations, environment, behaviour, attitudes and perceptions of risk in disadvantaged communities, looking for key areas of commonality. These attitudes to road safety issues and, behavioural responses, were explored in the context of other issues and priorities that people living in disadvantaged areas may hold. Additionally, the study aimed to explore the extent of community involvement in road safety delivery in disadvantaged areas.

The project also aimed to provide evidence of road safety provision in disadvantaged areas. This required exploration of the type of road safety interventions being delivered, how they are delivered, how they are prioritised and whether disadvantage is a determining factor in road safety provision.

The project aimed to provide lessons for improving road safety service provision (in disadvantaged areas in particular) and to provide suggestions for other public policy responses, including improved linkages with other areas of public policy and initiatives in disadvantaged areas. In this context, the role that partnership working may have to play in road safety service delivery formed an integral part of the research.

1.2   Methodology

The initial developmental stage of the research involved the following:

- **Analysis of police road casualty data (STATS19) and spatial deprivation data** to document the relationship between injuries experienced by different road users and the relative deprivation of the area as categorised by the Index of

Multiple Deprivation (IMD). This indicated that the differences between deprived and more affluent areas are most apparent for children and young people as pedestrians and cyclists, as well as young people as car passengers. The analysis also identified five case study areas in Newham, Sunderland, Wigan, Wolverhampton and Bradford, characterised by relatively high levels of deprivation as well as relatively high levels of child road injury.

- **A review of existing evidence** on the known relationships and explanations for the heightened risks faced by different groups of people living in disadvantaged areas.

- **A series of interviews** with road safety officers, representatives of charitable organisations and pressure groups concerned with accident prevention and promoting safety, and representatives from government departments and other agencies with specific functions and responsibilities in disadvantaged areas.

This stage identified key issues for exploration: who the research should focus on and suitable study areas for the core phase of the research. The following tasks were undertaken in the core second phase of the study:

- **A review of local data and policy** in the case study areas – compilation and analysis of demographic and socio-economic data for the case study wards to provide a profile of the local area.[2] In addition, the local policy context for each area was explored through desktop research of local agency policy documents and data that may impact on road safety, transport and the community.

- **Interviews with representatives of local agencies** to provide a 'top down' perspective of road safety risks in disadvantaged areas, and to establish services and interventions in place and how these operate in practice 'on the ground'. Interviews were undertaken, where possible, with officials from road safety engineering; road safety education, training and publicity; school travel; police services; fire and rescue services; children's services, health agencies; regeneration agencies; leisure services; and housing and youth offending teams.

- **Research within communities** using a semi-ethnographic approach to explore attitudes and behaviour, including lifestyles and culture, travel needs and behaviour, and the street context – this involved group discussions with key actors and local residents, including young people and children, as well as on-street observations of children, drivers and traffic in each case study area.

The final (third) phase of the research was developed to fill information gaps arising from the previous stages of the study. This highlighted the need to explore further whether and how partnership working influences road safety in disadvantaged communities and areas. It also demonstrated the need for an affluent area case study for comparative purposes to test the emerging hypothesis that the environment was

---

2   All data sourced from the Office for National Statistics.

the central factor in contributing to differential injury risk. The methodology for this stage of the research involved:

- partnership analysis incorporating a review of the governance and organisational aspects of two case study area partnerships; content analysis of partnership meetings and agendas; discussions with key partnership members; interviews with corporate policy staff and Social Network Analysis (SNA) to investigate the relationships, contacts and meetings between members; and

- a repeat of the community research identified above in a relatively affluent area that has a similarly high casualty rate involving a key actor group, group discussions with parents, children and young people and on-street observation – a ward in Maidstone was identified for this element of the study.

1.3　The report

This report presents a summary of the key findings from the programme of research:

- **Section 2** presents conclusions regarding the contributory factors associated with greater risk of road injury for people from areas of relative disadvantage;

- **Section 3** provides a summary of road safety provision in disadvantaged communities and identifies the extent to which disadvantage is a factor in service planning and evaluation – this section also explores patterns of partnership working and community engagement; and

- **Section 4** draws together the implications from the research and presents lessons for policy and practice to reduce road casualties in disadvantaged areas.

The full evidence from the programme of research is available on the internet in separate appendices to this report:

- Appendix 1 – Methodology;

- Appendix 2 – Literature review;

- Appendix 3 – Case study report; and

- Appendix 4 – Partnership working report.

2 FACTORS ASSOCIATED WITH GREATER ROAD INJURY RISK

2.1 Introduction

One of the key aims of the research was to identify the factors associated with greater risk of road injury for people, particularly children and young people, from areas of relative disadvantage. This section presents the main findings from the case studies on this issue and sets them in the context of the existing evidence base. In so doing, it builds on the existing evidence by providing a rich source of detail about the inter-relationships between environmental, attitudinal and behavioural factors in respect of risk of injury and death among children and young people in disadvantaged areas.

2.2 The case study areas

The second phase of the research involved in-depth investigation in five case study areas. These were identified as areas in the lowest decile Super Output Areas (SOA) as measured by the Index of Multiple Deprivation (IMD) scores and as areas with high rates of pedestrian casualties among children and young people. On this basis, the following wards were selected:

- Stratford and New Town (Newham);

- Thornholme and Central (Sunderland);

- Swinley and Ince (Wigan);

- St Peter's (Wolverhampton); and

- University (Bradford).

At the end of Phase 2, the findings suggested that, while attitudes, behaviour and lifestyle were contributory factors to the level of risk that people faced, the local environment played a key role in increasing the likelihood of road accidents for pedestrians in these areas. To test this emerging hypothesis, a more affluent case study area with a similar level of road traffic incidents was selected in order to compare and contrast the environment, lifestyles and behaviour with those in disadvantaged areas. The ward selected was Bridge Ward in Maidstone (see Appendix 3 for more detail). While this does not provide a systematic comparison, it does provide an indication as to whether the issues identified in the deprived case study areas are similar or different from those in more affluent areas.

A detailed analysis of the characteristics of each case study area is set out in Appendix 3. Some of the key indicators are set out in Table 2.1 and show that there was a high level of consistency across the 'deprived' case study areas in terms of

socio-demographic indicators of deprivation and of broader characteristics such as access to transport and land use. From Table 2.1 it can be seen that the figures for the 'affluent' case study area (Maidstone) are in stark contrast to those in the deprived areas:

Table 2.1: Profile of case study areas key indicators							
Characteristics	**Ward**						**England**
	Affluent	**Deprived**					
	Bridge, Maidstone	**Stratford and New Town, Newham**	**Thorn-holme and Central Sunderland**	**Swinley and Ince, Wigan**	**St Peter's, Wolver-hampton**	**University, Bradford**	
	%	%	%	%	%	%	%
No qualifications	19	29	30	35	35	40	29
Economically inactive or unemployed	2	7	5	4	8	6	3
Claiming Housing Benefit	8	20	16	7	n/a	12	9
Lone-parent families with dependent children	3	11	7	7	11	5	6
White	95	45	91	98	50	26	90
No car/van in household	19	59	49	36	49	48	27
Walk to work	12	8	21	17	1	23	10
Estimated average household income per week	£710	£470	£330	£435	£340	£320	
Roads Ward District	10 2	13 16	22 10	12 7	14 13	23 6	
Domestic gardens Ward District	35 6	6 17	13 13	18 13	11 32	9 10	
Green space Ward District	26 87	20 24	21 60	41 67	35 29	21 74	
Source: Office for National Statistics, 2008.							

- incomes were lower in all deprived areas than their regional average or the average in England;

- all deprived areas had more people classified in socio-economic group E than the national average, this representing people who were unemployed or employed in the lowest grade occupations – further, the proportion of people in each area with no qualifications was either at, or below, the national average;

- all deprived areas (except Wigan) had higher levels of Housing Benefit claimants compared with England as a whole;

- all deprived areas (except Bradford) had higher levels of lone parent families with dependent children in their population compared with the national average;

- three of the areas had relatively large ethnic minority populations – the case study areas in Bradford, Wolverhampton and Newham had significant Pakistani, Indian and African Caribbean populations respectively; and

- there were significantly higher proportions of households with no car in all deprived areas compared with the national average, and in all areas (except Newham) many more people walked to work.

An examination of the land use in each of the areas provides a general indication of the dense urban nature of the environments in which people lived. While it may be the case that there were parks or open spaces near to the case study area, this analysis provides an indication of residents' access to open spaces and places for children to play in the area in which they go about their day-to-day lives. Overall, when compared with their district or borough, all deprived areas, except Newham, had more land taken up by roads. In all deprived areas (except Wolverhampton), there was less green space in the ward when compared with the district or borough as a whole. Further, as a consequence of the nature of the housing in the deprived areas, Wolverhampton and Newham also had notably less domestic garden space. On the latter aspect, however, it ought to be noted that the levels of access to domestic gardens and open green spaces was also relatively low in the wider districts in which the case study wards were located. The contrast with Maidstone on these latter indicators is particularly striking.

Table 2.2 gives an overview of the number and rates per 100,000 of children and young people (aged 1–17) killed or seriously injured in each of the case study areas. More details on the selection of the wards for inclusion in the research and on how these statistics compare with other areas (both deprived and affluent) are set out in Appendix 1.

The main findings of this research strongly support much of the evidence in the existing literature (see Appendix 2 for a review). They also concur with the main factors that officials in road agency organisations interviewed in this research

Table 2.2: Profile of child pedestrian casualties by ward (2002 06)			
Ward name	**Local authority**	**Number of pedestrian casualties (aged 1–17 years)**	**Rate of pedestrian casualties (aged 1–17 years) per 100,000 population**
Disadvantaged areas			
Central	Sunderland	9	28,125
Thornholme	Sunderland	13	9,182
University	Bradford	22	21,670
St. Peter's	Wolverhampton	11	16,429
Swinley	Wigan	17	15,873
Ince	Wigan	12	6,962
Stratford and New Town	Newham	8	9,734
Affluent area			
Bridge	Maidstone	20	2481
Source: Road Accident Data - England 2002–06, from STATS19			

identified as contributing to an increased risk of injury and death among (in particular, young) people in disadvantaged areas.

The following sections set out the main findings in respect of: the environmental and lifestyle factors; and those factors relating to behaviours and attitudes. In each section, the findings from the disadvantaged case study areas are presented first. The findings from the affluent case study are then presented to provide a comparison.

2.3   Environmental and lifestyle factors

2.3.1 Deprived case study areas

Overall, the key findings from this research are that increased risk relates to people in disadvantaged areas:

- **living in more hazardous environments** such as older style developments, with dense housing and proximity to high volumes of fast moving traffic and high levels of on-street parking (Christie *et al.*, 2010);

- **having lifestyles with higher levels of exposure to road traffic risk**, such as them being more likely to walk and being less likely to be able to afford access to a car (Christie, 1995);[3] and

- **not having access to safe spaces and supervised facilities for children and young people**, meaning there are fewer alternatives to streets/roads as places to socialise and play outside the home (Towner *et al.*, 2005).

---

3   Although there is evidence that car ownership is rising in these areas, the relative ownership rates (in comparison with more affluent areas) currently remains lower.

All the disadvantaged case study areas had an already high density of housing. In some of the older areas, in particular, there was evidence of an ongoing intensification of housing, as some older properties had been (and continued to be) converted into multi-occupancy dwellings and new developments involved a larger number of smaller housing units on small sites. There was also evidence of an increasing number of families with older children still living at home who also had cars. Despite relatively low car-ownership levels in these areas, the combined impact of this and the often very limited (and decreasing) provision for off-road parking (including in respect of conversions and new developments) was that there was considerable (and increasing) pressure on the space available for people with cars to park.

In addition, a significant proportion of the traffic that came into the areas was 'passing through' to or from the city/town centre or was heading towards venues such as football stadia, hospitals, retail areas and further/higher education sites within and around the area. Indeed, in addition to the impact of housing development, there was also evidence that these 'venues' and other local facilities (such as mosques, 'take-away' outlets and car showrooms) generated further increases in traffic and demand for parking in the local area – some of which obstructed pavements and crossings for pedestrians, and some of which had an impact on other motorists. The impact of this was often exacerbated by these venues not having sufficient capacity to accommodate all the vehicles that came into the area to use them and drivers not using the parking provided because there was a charge for it. This traffic often included heavy lorries and public buses using what were relatively narrow and congested roads, and which also had several retail and 'take-away' outlets that required people to park to use them. In combination, this resulted in local roads (both the main roads and side streets) not only having to accommodate large volumes of traffic, in some cases this clearly above their capacity, but also to deal with (at times considerable) additional demand for places to park in areas in which there was already a lack of available space or provision.

The combination of congestion, the nature of local roads and the lack of available space for parking increased the risk of incidents to both residents and motorists. A significant factor in this risk was motorists commonly parking on narrow pavements (to leave space on the road for traffic), on street corners at junctions, in restricted areas near schools, and in yellow lined and zigzagged areas. It was also common for double parking to take place outside schools, shops, 'take-away' outlets and other venues. This ad hoc and often dangerous parking – by cars, vans and lorries – made it more difficult for pedestrians to navigate the local area safely, as they often had to step into the road to pass parked vehicles or to see if it was safe to cross. The parking at junctions or near crossings, in particular, had an impact on all pedestrians, but particularly on parents' and wheelchair users' ability to use the drop kerb provision safely. This kind of parking also obscured the vision of other drivers, who could not always see other cars, pedestrians or cyclists clearly, and which often resulted in them making manoeuvres without being fully aware of what lay ahead.

Although many of the streets in the older case study areas had clearly not been designed to deal with the number of cars that used them (not to mention the seemingly ever-increasing number doing so), there was evidence that newer road layouts in these areas had been planned primarily around the needs of drivers and traffic management, rather than around the needs or preferences of pedestrians or cyclists. In many cases, pedestrians had to contend with what local people considered as a lack of, or poorly placed, road crossings, or with priority being given to ensuring traffic flow over the ability of people to use pedestrian crossings within reasonable amounts of time. In many cases, crossings were placed in locations which local people felt were not 'natural' crossing places, or they were placed in locations which local people considered to be dangerous and they were therefore not routinely used. In other cases, provisions such as pelican crossings or traffic calming were considered dangerous as drivers often did not stop at them or sped up between road humps. Some examples of this include the following:

- In Wolverhampton, a pelican crossing is not located directly in front of a further education college (which is situated on a busy dual-carriageway). A safe pedestrian crossing was situated further along the road at traffic lights. This was observed to be in order to keep the traffic moving, which was coming from a three-lane roundabout. The consequence of this was that young people reported not generally using the crossing as it was not deemed convenient.

- In Newham, traffic-light sequencing was considered as operating in favour of cars, this was especially the case with 'multi-stop' crossings which required people to wait for several minutes at each 'island' before allowing them to cross. The consequence of this was that people very often crossed the road when it was not safe to do so, especially if they were trying to catch a bus or train.

- In Sunderland, local pedestrians felt that keeping the flow of traffic moving along a dual-carriageway was the priority, leaving people waiting for extended periods to cross the road. The consequence of this was that young people were crossing the road in front of moving traffic.

- In several areas, cyclists felt unsafe owing to narrow cycle lanes (which were often blocked by parked cars) and their proximity to buses.

Many homes and facilities for children and young people in these areas (including nurseries, primary/secondary schools, further/higher educational centres and community centres) were in close proximity to busy roads which intersected the area. As noted above, many people accessing these facilities drove into the area and attempted to park nearby (in many cases, as close as possible, even if the area was restricted or there was no space available). Given that most people in these areas walked to work, walked their children to school and walked to local facilities, navigating their local environment in the context of the level of traffic, the nature of parking and the provision for pedestrians was often very challenging, in particular for parents with young children and young people moving around independently. This was particularly noticeable in the pre- and post-school period, when the traffic

in the local area increased considerably and many drivers' frustration at being unable to drop or pick-up their children at school (due to the lack of space) often seemed to override their concern for other people attempting to move around the area safely.

This research strongly supports the findings of earlier research, which noted the importance of open space for children in disadvantaged areas (Sutton, 2008) and highlighted the way in which children play on local roads ('street play') as a consequence of there being a lack of safe, accessible and affordable alternative space or activities (Christie *et al.*, 2009; Sutton, 2008). Across all the areas in this study, there was a lack of suitable or safe play space for children, and the facilities that were available were generally considered unsuitable in terms of accessibility (getting there was difficult), inappropriate (due to vandalism, criminality, anti-social behaviour, etc.) or too costly. In the context that most households did not have sufficient enclosed garden space and that some households accommodated large families, it was common for children and young people to play on or near local roads, and for this to generally be unsupervised. Given the nature of these local roads and that they were filled with parked cars, this placed children at particular risk of incident. This risk is potentially exacerbated in that, given the nature of children's play, they can often get distracted by peers and their games may deliberately involve an element of risk taking. Of course, this became potentially more dangerous when children and young people played near the busier roads in their local area.

2.3.2 Affluent case study area

The environment in this area was very similar in many respects to that of the more disadvantaged case study areas. The main difference was that the area contained many larger houses with enclosed garden space which were set in a greener landscape in which fewer children played out in the local streets. This said, it was striking how much similarity there was in respect of the environmental factors which had an impact on road safety.

It too was a predominantly urban area and densely populated. There was also considerable ongoing development of new housing, both conversion of existing properties into smaller housing units and high-density new build on sites of demolished large houses. The area was bisected by a very busy main road (A20) bringing large volumes of traffic into and through the area towards/from the town centre (which marked one of the ward's boundaries). It had a number of schools, a further education college, part of a university campus and a recently developed retail area, which all contributed to increased (and increasing) traffic movement in the area and to additional demand for parking. A particular issue raised in respect of traffic flow was the way in which traffic came into the area on the main A20 and then used smaller local roads to by-pass the town centre's one-way system to access

local facilities (such as the new retail area), resulting in residential roads being used by large numbers of traffic which often drove through at speed.

In contrast to the disadvantaged areas, significant parts of the local area had 'resident only' parking which reduced the extent and nature of problematic parking in comparison with that in the disadvantaged areas. However, although the main routes did not allow parking, parking on residential streets was still reported and observed to raise issues in respect of road safety. This was particularly the case in the pre- and post-school periods and was most notable in respect of one residential cul-de-sac (a no-through route, although there was potentially provision for this) on which there was a grammar school, a comprehensive school and the rear access to a primary school.

The close proximity of all three schools and their accompanying traffic presented a range of risks for young people walking to school, for local residents and other road users, as space for traffic was limited but the road was still heavily used. This was particularly the case in respect of parents of children attending the schools who drove from out of the local area and local parents who did not feel it was safe (or sometimes convenient) for their children to walk to school. In this case, it was common for parents to double park, drop their children off using resident's parking spaces and to turn-around in the road (often mounting the pavement while doing so) to exit the road against the flow of other drivers seeking to do the same. At a junction near to this road – referred to locally as 'the cross' – previous 'lollipop' provision had been withdrawn due to lack of funding and this was felt to have resulted in the area being particularly dangerous area due to poor visibility, heavy traffic and the numbers of children crossing the road. In the context that the schools in question were expanding, had recently added additional sports provision and one had removed the facility for cars to turn around on site, the pressure on the local infrastructure had clear potential to further increase the risk to children and young people in the future.

As with the disadvantaged areas, there was concern about a lack of poorly placed road crossings and the response of pedestrians (particularly children and young people) to this. For example, many parents commented that a footbridge designed to take pedestrians over the main A20 (this is a route taken by large numbers of children and young people who travelled into the area by train and then walked to a large campus consisting of further education/higher education institutions, a school and a conference centre) tended not to be used by young people as it was not located on the most direct route they took. Further, although there was ample parking on site, the traffic accessing it used small side streets to access and park on. It was also commented that there was inadequate provision at the main exits that students used (opposite shops) to enable them to cross safely. Another aspect of street design that was highlighted was that bus stops used by children did not seem to have been built to accommodate the numbers of people who would use them. It was commented that, particularly after school, pedestrians had to contend with narrow pavements

being crowded by school children waiting for buses. While less of an explicit risk than the crossing of roads, this highlights another aspect of the local environment which did not seem to have taken into account how facilities would be used in real-life situations.

In combination, the implications of these issues were that pedestrians commonly crossed very busy roads in places that were unsafe, and cars used narrow side streets, which were also pedestrian routes to the site as a 'cut through', as overspill parking.

In addition to this, many people felt that the way in which the local main routes were managed (in particular the A20 and the roads bordering the area to the town centre) resulted in increased levels of risk being taken by pedestrians – in particular, children and young people. Traffic-light sequencing, in particular, was thought (and observed) to operate in favour of maintaining the flow of traffic to such an extent that pedestrians using the town centre often became frustrated or impatient when the 'green man' failed to appear, despite traffic being stationary, or the period they had to wait to cross was lengthy. While there was alternative underpass provision in the town centre, many people commented that they did not think this was safe (especially young women, who noted they would not use it at night). Similarly, there was a lack of dedicated crossing places on the main road – despite there being traffic lights – which resulted in many people crossing despite the moving traffic.

2.4   Attitudes and behaviours

2.4.1 Deprived case study areas

Of course, while highlighting the importance of environmental factors, there are also a range of factors that increase the risk of being involved in an incident that relate to people's behaviours and attitudes. While this research supports much of the existing evidence in respect of environmental factors, it is less supportive of some of the assertions in the existing evidence – in particular, that people in disadvantaged areas **have low levels of understanding about risks,** this meaning that the current provision of advice in local areas may not be appropriately targeted or the messages are not reaching those most at risk or that they are not being acted upon.

This research found that many people living in the case study areas had relatively high levels of understanding of the risks that people in their areas faced and how these could be avoided or reduced, that people (including children) had obtained or been exposed to a range of information from a variety of sources about issues relating to road safety in their area and were also aware of the facilities and services available in their area. This level of knowledge and awareness was high across people in all age groups, including children and young people.

However, the impact of this knowledge and awareness on their day-to-day lives was often reduced, given that road safety risks were often subsumed by other issues, such as: criminality, anti-social behaviour and neglected/derelict buildings and facilities. This often resulted in road safety being lower down many peoples' day-to-day priorities in the context that, for many, personal safety was of greater concern. This said, when prompted, it was clear that people were aware of the issues around road safety and were concerned about the risks that people (in particular children and young people) living in their area faced. As such, it does not appear to be the case that the current range of education, training and publicity initiatives are unsuccessful in reaching people and having an impact on how people think about issues around road safety. It is more that these messages are in competition with the more immediate and pressing challenges that people face living in disadvantaged areas.

This research does, however, support the argument that people in disadvantaged areas **live in areas with high levels of hazardous and illegal driving behaviour**, such as driving while impaired, without seat belts or child restraints, and driving without entitlement or insurance. Some of the main issues that arose within the disadvantaged areas around this issue were those around the following:

- **Driving behaviours and attitudes** – this was reported as being particularly of concern in respect of young men and was associated with 'macho' driving culture and risk taking. Young people in some areas reported that they had not received driving instruction from a qualified instructor and reported driving recklessly due to being uninsured or not having passed a driving test.

- **Ad hoc and dangerous parking** was highlighted as an environmental factor. However, it remains the case that some parking in these areas was simply dangerous and without consideration for pedestrians and other road users.

- **Speeding** was reported to be of concern in all the disadvantaged areas. Wider roads were reported by people in these areas as commonly used by people who drove aggressively, while narrower streets were used as 'rat runs' to avoid congestion. In some cases, young people driving stolen cars was also reported to be an issue which caused people to be concerned about their own, and their children's, safety.

- **Lower levels of seat-belt wearing (particularly in the rear of cars)** – many people were inconsistent seat-belt wearers (depending on seating arrangements and car occupancy) and many young people succumbed to peer pressure that using a seat belt was simply not 'cool'. There was also widespread misunderstanding/disregarding of the law among some groups in respect of the requirement for all passengers to use seat belts (including when in the rear seats or when larger families are travelling by car).

- **Lack of use of child restraints or booster seats** – there were mixed reports about the use of safety equipment for children. Some people reported not using

them due to the expense or due to the impracticalities of using them in their cars (this was sometimes due to the size of the car and sometimes due to cars carrying too many children).

A common complaint in the case study areas was that existing sanctions were not a sufficient deterrent to alter seat-belt wearing behaviour, prevent poor driving and parking behaviour. This was particularly the case in respect of their inability to alter perceptions towards driving cars that were not fit for the road and not having car insurance, especially among young people. In addition, there was also a widely expressed view (in some cases strongly held) that a lack of enforcement of parking restrictions and 'rules of the road' was a significant contributory factor to the development of a general atmosphere in which an 'anything goes' attitude overcame drivers' sense of caution and consideration for others. In some cases, this lack of enforcement was felt to have led to an open flouting of the regulations among some road users in the 'knowledge' that they are a low priority for law enforcement in these local areas.

2.4.2 Affluent case study area

Unlike some of the disadvantaged case study areas, road safety was a clear and explicit concern to residents in Maidstone (of course, this level of focused concern is in the context that there were not the same wider pressures on the local environment that existed in the disadvantaged areas). Indeed, the Maidstone Community Strategy highlighted that transport, traffic congestion and parking were the most commonly discussed areas for improvement in the area (Ipsos MORI, 2009).

Parents expressed concern over the tension they felt between the need to keep their children safe on the one hand (and to protect them from the known risks in the area) and to allow them some independence on the other (this was especially an issue for children about to go to secondary school). Indeed, parents in this area voiced such strong concerns about their children being safe from traffic that they were aware that they inadvertently contributed to the problem by driving their children around the area and to school. This said, there was a difference in attitude to the issue of encouraging children towards travelling independently to school, this reflecting (in many ways) the fact that this was a safer area than the other case study areas and, in particular, that parents in disadvantaged areas were often concerned about personal safety more generally.

In terms of wider attitudinal and behavioural facts, the concerns held by people in this area were very similar to those in the other case study areas; the main ones being concern about the volume of traffic, poor driving behaviour (including speeding and parking) and a lack of enforcement. There was also evidence that young people living in this area took similar risks as those in disadvantaged areas with their safety, including behaviour such as:

- trying to 'dodge' cars when crossing the road;

- listening to music and using mobile phones while walking and crossing the road;

- not always wearing seat belts when in cars, particularly for shorter journeys or when rear-seat passengers;

- not wearing cycle helmets, mainly because they are not 'cool' once they reach a certain age; and

- being car passengers with drivers who engage in risky behaviour (e.g. speeding, being drunk, using mobile phones, carrying too many passengers, not having the necessary documents).

2.5   Ethnicity

The relationship between ethnicity and road safety is a complex issue, not least because many Black and Minority Ethnic (BME) groups tend to live in more disadvantaged areas. It is for this reason that previous research focused on understanding the factors which influence incident rates among people in the BME population has been unable to disentangle this issue with any degree of certainty.

This research involved discussions in a few case study areas with Pakistani, Bangladeshi, Indian and Black residents, as well as some young people from Chechnya and Somalia in one case study area in particular.

In one area, there was a particularly 'macho' driving culture among some of the Pakistani and Bangladeshi young men, where fast driving, the playing of loud music while driving and non-compliant seat-belt use was common. However, this behaviour was not confined to young men from these ethnic backgrounds, as young White men also engaged in similar driving behaviour in other areas, and driving without a licence or without seat belts occurred among some young Black people in other case study areas. As such, these particular road safety issues may be associated with youth rather than ethnicity and it is not possible to draw this out further on the basis of this research.

Among older people from Pakistani and Bangladeshi backgrounds, there was some evidence of different perceptions of risk in relation to seat-belt wearing and car-seat use as compared with people in other ethnic groups. However, it was notable that many such families were often large and 'extended', and thus not all could be properly seated or restrained in the vehicles they used. Further, in two of the case study areas, it was reported that newly arrived immigrants from different countries were not fully conversant with UK driving and in-car safety laws, and were also not familiar with UK parking regulations and customs. In one area, in particular, there was a widely held perception that the UK driving test was much more difficult to pass than in their own country. One implication of this, and something which would be worthy of further consideration in thinking about interventions, may be that

newly arrived immigrants may find it hard to adapt to the range of driving and in-car safety requirements, and they may need specific support to take these on board.

As such, this research was also unable to determine whether explanatory factors for road safety risks related to cultural differences, environmental factors or socio-economic factors. This said, it remains the case that those people living in disadvantaged areas (irrespective of ethnicity) are more likely to be involved in road traffic incidents and specific action may be needed to raise issues with people in these populations.

3 ROAD SAFETY PROVISION FOR DISADVANTAGED COMMUNITIES

The research included an investigation into the services and interventions in place in disadvantaged communities and how these operate in practice 'on the ground'. This section summarises the types of intervention that were planned, or in place, in the case study areas, and the agencies involved in their provision.

3.1 Activities and interventions

The research broadly identified principles underlying how interventions were planned and monitored, and the extent to which disadvantage is a factor in road safety service planning.

3.1.1 Types of intervention

The research found an understanding and recognition by professionals of many of the specific issues that appear to cause a poorer road safety record in the case study areas. A range of interventions were in place which, in summary, included the following:

- **Children's road safety education and training to promote safe behaviour and crossing** – all areas provided school road safety education and training interventions through council road safety departments. These varied in scale and the level of resourcing, with some, such as Wigan and Bradford, providing a comprehensive road safety programme to all school year groups, while others, such as Sunderland, were more limited. In two of the case study areas, fire and rescue and other emergency services were involved in school road education delivery, but this was not the case elsewhere. The police generally only had a limited involvement in schools' road safety education.

- **Publicity and communication activities to raise awareness and promote safe behaviours** – the research produced a snapshot of campaigns and events recently implemented, or ongoing, in the case study areas. There was a particular focus in some areas on raising awareness and promoting behaviour change around seat-belt wearing and car-seat use through interventions such as seat-belt checking days, car-seat voucher schemes, local and minority language literature, police spot checks and outreach work by health visitors. Fire and rescue and police services were often involved in these public engagement activities, alongside council road safety departments, with health promotion agencies playing a contributory role in some areas. Local Safeguarding Children Boards (LSCBs) were typically focused on non-accidental injury to children and the priority given to child neglect and abuse was heightened by a high-profile child abuse case during the course of the research. Just one area included a post-holder

from the LSCB with a remit for accidental injury prevention among children, including road injury.

- **Road safety design and engineering** – all case study areas had examples of road safety engineering schemes. They were implemented primarily at 'hot spot' locations with a history of casualties and they were intended to reduce the number of people killed and injured. Schemes typically involved detailed analysis of the casualty data to identify collision types and causes, and to prioritise and guide the engineering solution. Treatments included, for example, central refuges on main roads, lighting improvements, redesignated road space, new pedestrian crossings, new signage, anti-skid measures, improving visibility and alterations to road markings. There was widespread implementation of traffic-calming schemes in residential parts of the case study areas using speed humps, speed tables and chicanes. Areas may be prioritised for traffic-calming schemes based on factors including collisions, casualties, housing density, socio-economic factors, pedestrian activity and vehicle speeds.

  There were examples of traffic management measures, such as 20 mph zones and parking restrictions, in the study areas to control vehicle speeds, volumes and parking behaviour. These tended to be technical solutions that were subject to consultation, but not full engagement with the local community.

  Engineering measures were usually evaluated in broad terms through post-scheme monitoring of collision patterns. Road safety engineering activity in the study areas tended to be largely technically led for both prioritising where measures should go and for identifying solutions. Local people may be consulted on proposals once developed, but they were not usually involved in identifying needs or in determining what should go where. Treatments in response to local demand, at locations without a history of casualties, were often just a minor element of road safety engineering programmes, or did not occur at all, and may be in response to more vocal and organised community demands in more affluent communities.

- **Enforcement activity to tackle motoring offences** – the police played a key role in enforcement activity through community and traffic policing. Several areas implemented operations aimed at driving offences such as speeding, illegal parking, mobile phone use and non-seat-belt wearing. These were often regional, multi-force police operations, where activity in disadvantaged areas would be occasional and intermittent as part of a wider operation. There were examples of intelligence-led operations using, for example, Automatic Number Plate Recognition (ANPR) to target uninsured or unlicensed vehicles. Other examples of enforcement-related activities in the study areas included Community Speedwatch schemes and school-gate parking operations by the police. One area carried out joint fire and rescue service/police road stop/awareness raising activity in casualty hot spots, with traffic offenders given the option of a fine or on-site talk and information provision on the casualty impacts of speeding.

Communities were often concerned about illegal driving and felt that enforcement activity in their area was limited.

- **Diversionary activities for young people** – there were examples of diversionary activities being provided for young people, such as football weeks and other children's activities run by the police and fire and rescue services. Leisure departments played a key role in the provision of play and recreation facilities and activities which may contribute to reducing exposure to risky road environments among children and young people.

- **Measures to address crime and antisocial behaviour** – youth offending teams had a general role in engaging with young offenders, and those at risk of offending, to avoid repeat criminal or anti-social behaviours. In the case study areas some of this was concerned with car crime, such as promoting seat-belt wearing and discouraging off-road biking, and youth offending teams provided a means for the transfer of road safety messages to disaffected young people. In all areas there were strong links between fire and rescue and youth offending services with the delivery of diversionary and other activities for young offenders, or those at risk of offending. Police and community priorities typically focused on dealing with antisocial behaviour.

3.1.2 Activity planning

Many of the road safety initiatives provided by professionals were universally available and were not aimed specifically at reducing inequalities in injury risk between different areas or communities. Road safety education was typically seen as a programme available to **all** children across an administrative area and it would generally be seen as inappropriate, as well as politically unacceptable, to positively discriminate in favour of relatively disadvantaged areas in providing children with these basic life skills. However, it was evident that road safety teams may make greater efforts to encourage participation by schools in areas of relative disadvantage, where need is felt to be greater, although, ultimately, the choice to take up services rests with the school.

Communication activities are typically issue led, implemented on an authority wide basis and sometimes targeted at vulnerable or target groups rather than being specifically focused on disadvantaged localities. The exception to this was the Community Champions initiative in Wigan, grant funded by the Department for Transport, which focused on the most deprived wards in the borough.

In all of the case study areas, the planning of road safety engineering measures was based primarily on casualty reduction targets, with the implementation remedial engineering solutions closely linked to where collisions have occurred. There was no deliberate focus on disadvantaged areas, but in authorities where there is a link between road casualties and deprivation, engineering measures have been put in place in key accident hot spots in these disadvantaged areas. Similarly, police

enforcement activity, such as spot checks on speeding, were generally targeted at problem areas that may or may not coincide with areas of disadvantage.

Leisure planning in the case study areas generally aimed to provide well-distributed and accessible services and facilities for all in the local authority area. Some pricing policies were targeted at relatively deprived segments of the communities.

All of the case study areas had regeneration strategies and activities in place. These often aim to engage with the local community and there is a focus on improving the area as a safe and improved place to live through environmental improvements and employment initiatives.

The study has shown that disadvantage by itself is not generally a guiding factor in planning road safety interventions or other allied activities. Disadvantaged areas are often not prioritised at all and, if they are, this will have been guided by factors such as casualty and traffic offence rates in the area rather than the area's relative socio-economic profile.

3.2   Monitoring and evaluation

In examining the range of activities and interventions in place, the research also explored the extent to which initiatives were monitored or evaluated and how this information was used. It was found that some interventions were subject to relatively straightforward monitoring, for example, the numbers of children trained or customer opinion. Other interventions, such as Junior Road Safety Officers, had been developed elsewhere and been subject to broader outcome evaluation. In many other cases no assessment was undertaken, or there was no knowledge of this happening. This absence of assessment makes it difficult to establish the effectiveness of interventions and whether they should be continued in the same way or with some adjustment.

It is recognised that there are genuine barriers to putting evaluation processes into place, including, for example:

- resource limitations – there is a cost associated with the collection and analysis of relevant data;

- lack of knowledge and skills – often those associated with developing and delivering interventions will not be equipped with the necessary evaluation skills; and

- validity –it will often be difficult to ensure that outcomes are attributable to the intervention being evaluated, particularly in the short term, and where the measures are relatively small scale or part of a wider programme of activity.

At the same time, the benefits of monitoring and evaluation should be realised, particularly with regard to the framing of objectives, not necessarily directly concerned with casualty reduction, against which outcomes can be measured.

3.3 Appropriate provision for disadvantaged communities

There tended to be a limited number of activities concerned with understanding the specific needs of disadvantaged communities, and promoting behavioural changes in response to these needs. However, where this did happen, there is a strong impression that they address specifically identified problems, provide worthwhile support to disadvantaged communities and potentially contribute to reducing the differential risk of road accident injury. A leaflet on seat-belt wearing, as part of a wider programme of information and support, written in the specific languages where non-seat-belt wearing was known to be prevalent in that ethnic community is one example of such practice.

Another example was the production of a resource containing casualty information specific to the local area to raise awareness of the high level of child pedestrian casualties there. The subsidy of child car seats (originally a Neighbourhood Road Safety Initiative (NRSI)), car seats for taxis from maternity wards and car seat inspections were also examples of interventions demonstrating a recognition of the needs of the target audience and focusing on relevant issues for promoting behaviour change (i.e. seat-belt wearing and installing good child car seats). Road Safety Champions (a volunteer scheme), and other area-based community development activities, are further examples of interventions that aimed to understand communities and develop activities that were wanted by, and relevant to, the people in the local area.

3.4 Delivering in partnership

Given the cross-cutting agenda of the issue of injury inequalities, this research was concerned to examine the importance of joint working between different agencies. The aim was to examine:

- how different partnership arrangements may influence road safety in disadvantaged communities and areas;

- how effective different arrangements are in utilising members' skills and developing strategies and interventions; and

- to identify good practice in joint working for delivering road safety improvements.

In addition, the partnership investigation aimed to understand the potential effects of incorporating road safety issues and targets into wider partnership policy agenda, and to explore what difference this may make to service delivery.

The study incorporated discussions with different agencies on their experience of partnership working, discussions with policy officials on the role and function of corporate and partnership strategy, as well as a detailed investigation of two partnerships and how they function in practice. The latter incorporated a social network analysis of participating members.

This research showed that partnerships varied in how they operate. They represented, at a minimum, a forum for the lead partner to inform and be questioned about activities and progress. At another level, the partnership provided a forum for a multi-directional exchange of information and knowledge. The partnerships also varied in their 'buy in' and alignment to strategic-level planning from no specific identification of road safety issues at a corporate level by different partners through to a clear focus on road safety targets and performance. Allied to this, there were differences in the extent to which road safety and casualty reduction was championed by individuals and promoted at a strategic planning level.

A relatively effective partnership had clear objectives, monitoring and accountability to a higher level group. Membership was reasonably wide and sound relationships between most, but not all, partners had been developed over some period of time. This partnership made use of the different skills and resources of some members. The following conclusions emerged from this aspect of the research:

- **Build into strategic level planning** – the analysis of the two contrasting partnership arrangements indicated that there is merit in ensuring that the functions and objectives of local road safety partnership arrangements are recognised by, and aligned with, higher strategic level functions. There is a need for high-level organisational priority and commitment which will tend to give subsidiary partnerships greater credibility and support from a wider range of partner authorities. This supports the findings of the Audit Commission in their investigation into the prevention of unintentional injury to children (Audit Commission, 2007).

- **Data sharing to guide planning** – the partnership work showed that there is an emphasis on evidence-based planning at a strategic level and the use of statistical data to guide and monitor strategy. Police road casualty data (STATS19) were widely used for monitoring purposes, not least for monitoring performance against the National Indicators. Police road casualty data, as well as hospital injury records (health episode statistics), provided a good source of information for recognising geographic and health inequalities and for guiding strategies accordingly. It is important to share, and regularly review, this information and analysis with partners for joint evidence-based planning.

- **Clarity of purpose** – the partnership analysis has indicated that it is important to have a clear understanding of the terms of reference of the group and the objectives. Where the purpose was clear, and participants had a common agenda,

it was apparent that progress is more likely to be made. This also illustrates the importance of establishing monitoring systems for measuring performance in relation to the stated objectives.

- **Leadership and championing** – the investigation of partnership practice has indicated that the recognition of road casualty reduction as a partnership activity required individuals who take a lead in championing the issue and promoting its inclusion in different settings. This would involve, for example, using casualty data to highlight problems in specific areas or among specific groups and lobbying for recognition.

- **Utilising partner roles and skills** – it was apparent that who is involved in the partnership is important and it is also important for each to have a good understanding of others' roles. In this way the different skills and resources of partners can be recognised and used. This is something that may be more challenging where it is outside more traditional joint-working arrangements and encompasses services involved with addressing health and social inequalities or developing safe and liveable streets, particularly for children.

- **Developing good relationships** – the analysis illustrated the importance of developing good relationships in partnership. It was recognised that this can take time and it is important that there is trust and respect between partners and the ability to work together.

- **Joint-funded posts** – the investigation indicated that the presence of joint-funded posts is likely to have a positive impact on partnership working. This mechanism creates buy-in from the participating agencies and helps in their alignment and working together.

3.5   Community engagement

We found little evidence of community initiatives that directly involved local people in developing and delivering road safety interventions in the case study areas. Initiatives that were in place tended to be top down, and delivered **for** local people, rather than engaging the community in any ongoing and meaningful way in their delivery.

During the community research, different groups of residents, particularly in Bradford, Sunderland and Wigan, all wanted to be engaged in identifying and planning road safety with their local authorities. However, their reported experiences suggested that they had not always been consulted about issues that had a direct impact on their daily lives, such as the impact of local road closures within areas, or the positioning of new bus or cycle lanes. The more this appeared to happen, the more disengaged they became from wanting to take part in the consultation.

In Wigan, residents had been consulted via questionnaires and some of those delivering them had reservations about this method – seeing it as a 'tick box' exercise, produced in order to fulfil the requirements of the local authority rather than the needs of the community. In addition, these methods are not the most appropriate ways of engaging those who have language or literacy issues. As such, local authorities were often viewed as merely engaging in a bureaucratic exercise.

Local authorities need to take into consideration **which** groups are being involved and which may be overlooked when consulting in the community. In one case study area, for example, Pakistani and Bangladeshi women did not usually attend organised public committee meetings. This means that local authorities may be missing the views of those who: (a) tend to walk to most places locally; and (b) have the most day-to-day responsibility for child care. Their views and experiences may, therefore, be overlooked. The community research in that area worked with local women and a childcare centre, which helped access, explain and translate the women's views and experiences. In Wigan, young people living on an estate in the Ince ward argued strongly that there was a real need for traffic calming in their housing estate to stop the risks posed to younger children from joy riding. It was only by engaging young people in the issues face to face that these views came to light.

Local authorities then need to make sure that they target a range of people appropriately. Our experience in the Sunderland case study may shed more light on how best to involve the local community in road safety and planning issues. We found it beneficial to have a highly motivated local councillor who knew the area and the residents well, and who could mobilise them to attend a discussion. Providing a large map of the area enabled the local people to identify major traffic 'hot spots' or other problem areas and to discuss what could be done about them in the presence of the councillor. Residents in Sunderland would have also welcomed the opportunity to have representatives from the relevant local authority departments present. However, their solitary experience of discussing road issues was a local authority representative informing them of what was about to happen. The research team's experience in the local community suggests that in-depth work with communities helps local people to feel listened to. However, if it is to work, meetings and discussions need to occur on a regular basis. In this way, rapport and trust is gained, as the development and delivery of initiatives is a process to be undertaken over time. In this way proper feedback is given on issues and any progress that is made. Of course, there are potential resource implications of undertaking this approach. However, these need to be considered as part of the wider budget allocated to both road safety and community engagement work. This said, this research indicates that the inclusion of local people in discussions about forthcoming potential changes could ensure that changes made meet local needs and develop responses that might not otherwise be considered by professionals.

It appears to be currently the case that community initiatives are not grounded in the experience and perceptions of people living in the local community. As such, there is a compelling need for the ongoing and meaningful involvement of people within the local community. It is clear that this involvement will not be effective if it is along traditional question and answer 'consultative' lines. Local/national agencies should move towards a model whereby local people are considered to be the experts on the area in which they live and therefore able to provide grounded and informed advice on programme development and implementation, as well as invaluable insight into how plans may or may not work in practice. There is also a real need to integrate road safety more effectively into residential and business planning within local communities, as well as with their wider local transport plans. Problems with parking, for example, cannot be left to schools to resolve in isolation, or for professionals to deal with who are removed from the community. Road safety planning has to involve all those who use the streets and roads of their community in order to make it safer.

4 LESSONS FOR POLICY AND PRACTICE

4.1 Introduction

This section brings together the findings from the programme of research and highlights some possible policy and operational responses which may make a contribution to the reduction of road injuries in disadvantaged areas and among children and young people. Given their often more general relevance, it would seem likely that the impact of these responses may also be beneficial in other areas and for other groups of people.

The overarching finding from this research is that environmental and planning issues need to be given considerably more emphasis as part of a comprehensive road safety strategy if the numbers of road injuries in disadvantaged areas are to be significantly reduced from the current levels. Critically, it suggests that the knowledge, insight and expertise of people from within local communities ought to be at the heart of such a strategy.

This is not to say other interventions do not have an important role to play as, despite the evidence often being mixed or partial, it is clear that educational, training and awareness raising initiatives do have an impact on the level of road traffic injuries. However, on the basis of the existing evidence, it would seem that they are unlikely in themselves to succeed in reducing the level of incidents to any great extent. Indeed, this research found that the (potential) benefit of these initiatives is often reduced in the context of the environmental factors which affect how people live their lives and their lack of involvement in decisions about development or traffic management in their area.

The remainder of this section looks at how road safety may be improved by: developing and managing the physical environment; managing traffic and effective enforcement activity; changing behaviours and attitudes; integrating road safety into other policy agendas; and increasing the level of co-ordinated partnership working at an operational level.

4.2 Developing and managing the physical environment

Overall, the research shows that addressing key environmental issues should be a primary goal for road safety policy.

A strong impression from the research is that the nature of local environments themselves place local people (particularly children and young people) at risk in terms of road safety. In part, this ties in with the legacy of the way in which local areas have developed over many years, something which can often be difficult to address. Another important contribution to the background levels of risk that people

in these areas face in their day-to-day lives is the way in which local areas are currently planned and managed. In respect of this latter point, this research suggests that it does not appear realistic to expect some areas to continue to cope with ever-increasing demands on the local infrastructure.

It is often argued that, in some respects, environmental issues are more difficult to address than attitudes and behaviour, primarily on the grounds of cost. For example, that it would be difficult to create more room within and outside homes in densely populated urban areas, or to make roads wider within them. However, if casualty reductions are to be achieved, redevelopment and redesigning communities should not automatically be ruled out. As such, the research suggests that local planning agencies need to more robustly assess the potential impact of further intensification of housing use (both conversion and new build) and other development (retail, hospitals, universities, schools, etc.) on people living in the local area, particularly on demand for parking in the area and on traffic flows into and through the area. While there is already a requirement for larger developments to be subject to a Transport Assessment, there perhaps remains a risk that the cumulative impact of numerous smaller developments is not consistently taken into account.

In contrast, this research suggests that some environmental and planning issues may actually be easier to address and that doing so may be more effective, in particular for young people. Indeed, it suggests that improving local transport and road infrastructure, including signage and crossings, could make a considerable contribution to the reduction in road traffic injuries.

For example, it would seem likely that expecting children and young people to use a road crossing which has been installed (say) 250 metres from the 'natural' route that they would take to school or college would be less effective than putting in place provision that meets their needs and preferences. Similarly, introducing traffic calming or developing better local play areas would appear likely to be more effective in an area where heavy and poor parking resulted in reduced visibility for pedestrians, drivers and playing children, than seeking to change behaviour through further awareness-raising activities. This latter point supports the need for free places for play, safe routes to safe parks and open spaces, and provision for children playing outside as set out in the previous government's *Play Strategy* (DCFS, 2008).

There are further examples elsewhere of other environmental initiatives that have aimed to address some of the issues highlighted in this research. This includes, for example, the Liveable Neighbourhoods (Sustrans, 2010) and the DIY Streets Pilots, developed by Sustrans (2010b). The latter involved working with local communities to identify the issues of concern, such as 'rat-running' and commuter parking, and developing affordable Home Zone type interventions to make streets safer and more attractive. This included, for example, informal pedestrian crossings using coloured strips and street gateways designed by local residents and street planters – all designed to claim ownership and discourage traffic and speeding. These types of

interventions fit well with the conclusions reached here and are illustrative of the type of approach that could contribute to safer streets for local residents in disadvantaged communities.

Further, road safety engineering activity targeted at casualty 'hot spots' (both **actual** in terms of the statistical evidence and **apparent** in terms of what local people feel is the case) would appear to be an entirely appropriate response to the conclusion that an unsafe traffic environment is a key contributory factor to the greater risk of injury in disadvantaged areas. In addition, provision that can help improve the traffic environment for pedestrians – for example, increased time available for crossing at timed traffic lights and safe pavements near bus stops – may contribute to a reduction in differential injury risk between disadvantaged and more affluent areas. In particular, specific provision being made at and around schools to restrict/limit the movement of traffic (either completely, for example by the introduction of 'yellow boxes', or at specific times, by means of restricted entry or staffed crossings), increase visibility and give priority to pedestrians would be a response which – while possibly not popular with parents who wish to drop their children at the school gate or drive past schools – would make the immediate environment (and routes to it) considerably less hazardous.

Similarly, area-wide measures, such as 20 mph zones/limits and parking restrictions, can have positive benefits for improving the traffic environment for pedestrians, and in particular children, in disadvantaged areas. If such adaptations are made in collaboration with local people (as opposed to the local community only being 'consulted' on plans), it would seem very likely that they could go some way to addressing the conflict between different road users in favour of pedestrians and away from drivers, and making the traffic environment in disadvantaged areas less dangerous.

4.3   Managing traffic and enforcement activity

The research demonstrates the importance of reducing the volume and speed of traffic – or at least to control the continued increase – in densely populated urban areas. It also highlights the importance of ensuring that, in the management of traffic that comes into such areas, priority is given to the needs of the people who live and work in each area, i.e. these people should be a key element in the decision making of those who manage traffic flows and not a secondary concern behind the perceived needs of motorists.

Some of the provisions that could be made to address this issue are environmental (as discussed above) – i.e. by making certain traffic signage clearer, road crossings more convenient for pedestrians and introducing some hard landscaping or raised bollards, it would prevent traffic from, for example, turning into residential streets or parking dangerously in and around roads near schools. However, some provisions would be to ensure that local 'venues' or large organisations (such as hospitals or

universities) that attract traffic into the area either have sufficient parking available that people will use or that they make alternative provision which does not result in the local area becoming an 'overspill' car parking area.

In addition, there is a real need to consider alternative transport options to encourage people coming into an area to leave their cars elsewhere and for drivers going through an area to use alternative routes or modes of transport. Some possible solutions would be to increase the incentives for public transport use, promote car sharing, and provide free and convenient 'park and ride' facilities. While these forms of provision are in place in some places, it would seem likely that organisations in an area, and schools in particular, may benefit from the co-ordination of innovative (and necessarily locally developed) takes on the 'park and ride' model, for example: 'park and stride' to schools (arrangements being made for parents to use local retail car parks pre- and post-school); specific school-based provision of using 'park and ride' buses in areas where children come to schools from out of the area (as was the case in Maidstone); and the promotion of 'lift share for schools'. At a much more local level, the encouragement of 'walking bus' provisions/arrangements as part of the development and implementation of school travel plans and 'safe routes' may also help to reduce the use of cars among parents who live in the area and drop their children at school on their way to work. They may also help develop better links between initiatives to develop sustainable and healthy travel with those concerned with road safety.

A more immediately addressable feature of local traffic conditions is the real need for more effective enforcement to deter motorists from flouting regulations and driving/parking dangerously, especially during the pre- and post-school period. Although this has clear resource implications, it is unquestionably the case that more regular and/or visible enforcement of parking regulations, of uninsured and unlicensed driving, and of motoring offences would make disadvantaged areas considerably safer. At present, the lack of enforcement results in many people feeling that traffic restrictions are pointless, that motorists are free to 'do as they will', and that pedestrians (including parents with children and parents of young people) know that they simply have to continue to navigate often extremely dangerous environments which they know to be risky.

4.4   Changing behaviours and attitudes

The research clearly highlights that the way in which education interventions and awareness-raising activities are currently implemented are unlikely, in themselves, to be able to bring about significant changes in attitude or behaviour.

Overall, it appears that the provision of advice, support and information aimed at improving safe driving behaviour among young people (in particular) may have an impact on their driving behaviour. However, this is clearly not the case among all drivers in disadvantaged areas. The research identified that irresponsible and

dangerous driving was commonplace and that, while young people were aware of the 'rules of the road', they did not always adhere to them or think them important. For example, even though young drivers (in particular) were aware of the messages regarding seat-belt wearing and were aware of the law, they remained inconsistent and reluctant users due to issues about self-image and peer pressure.

It also identified that recent immigrants were not always fully aware of UK legal requirements or were appreciative of the risks of driving in the UK. For example, there was a lack of awareness as to when seat belts must be worn and a lack of appreciation of the need for children's booster seats (particularly in the case of large families).

To respond to this, the research suggests that future road safety communication activities need to be designed to ensure they use language, imagery and media that make the content relevant to people in disadvantaged areas, and, in some cases, their ethnicity/culture, as well as age.

Reflecting that people were generally aware of the law and of the risks they took, it does not seem likely that only focusing on the legal requirements (of wearing a seat belt, for example) and the risks (of speeding, for example) will necessarily have the desired impact. This research suggests that such initiatives are much more in tune with the concerns that young people (and other drivers) might have around driving, such as the potential implications of uninsured driving, unqualified driving and unqualified driving tuition as well as of seat-belt wearing, the use of mobile telephones or listening to loud music while driving.

In addition, the research suggests that targeted initiatives and messages will be needed to address different groups of people, particularly people who are recent immigrants and who may not access 'mainstream' UK media. It will also need to reflect the fact that, particularly among people in minority ethnic populations, communication activities may need to reach out to men and women separately.

Finally, there are two points that ought to be highlighted when thinking about future communication activities. First, care must be taken to avoid any stigmatising, as there is not widespread acceptance of the term 'disadvantaged' among people in what we have classified as disadvantaged areas. The use of anything approaching this term would be likely to result in people not accepting that the messages applied to them. Second, such activities ought not to assume that road safety is as high a priority for people living in disadvantaged areas as the statistics might suggest it should be. As highlighted earlier, in many cases people were more concerned about their personal safety at a more general level.

4.5   Integrating road safety into other policy agendas

The research indicates that the situation where responsibility for road safety is perceived as 'belonging' to the local authority road safety team is a barrier to making progress on the reduction of road safety injuries. Given that the incidence of road injuries has such a broad range of contributory factors, it is clear that a much more mainstreamed approach is needed; this covering a range of policy areas, if the number of injuries is to be reduced.

The research has indicated that there would be considerable value in ensuring that road safety issues are incorporated at a high level within a wide range of organisations so that it becomes entrenched in strategic-level planning and policy by organisations and departments outside of those explicitly focused on local authority road safety. It strongly supports the intention of the Department for Transport guidance to local authorities (Department for Transport, 2009) that the development of policies and interventions should address multiple levels (educational, engineering and enforcement strategies) – such that road safety is seen as relevant to a broad range of aspects of policy making and service delivery – and that this will address the situation that no one agency or area has the expertise and ability to address all aspects themselves, and address the situation where different agencies assume another organisation has both the expertise and responsibility.

This supports the conclusions of a recent cross-cutting Government review into accident prevention among children and young people in highlighting that joint working in injury prevention across different areas of policy was a strategy that ought to be pursued in order to address the disproportionate injury rates in the home, from fire and water as well as road injury, experienced by children and young people in disadvantaged areas (DCFS *et al.*, 2009). It also supports the conclusion of the Parliamentary Advisory Council for Transport Safety's 10-year review of the Government's road safety strategy for the need for road safety to become an area of policy in which there is much more joined-up working between local highway authorities and their casualty reduction partners, and that it is confirmed within the public health agenda in particular. It also supports the importance of identifying ways in which people in local communities can be meaningfully involved (Besley, 2010).

Where road casualty reduction targets, for example, are recognised in the policies and priorities of a number of organisations, it would seem likely that it would become easier for them to commit to activities and interventions that contribute to this strategy, and to work together with others towards a common goal. It is well understood that road safety is a cross-cutting issue that may feature in, for example, health, policing, other emergency services, children's' services, community development and community safety. It is therefore important that road safety, and road casualty reduction, are recognised within the policy agendas of organisations that have responsibilities in each of these areas.

4.6   Partnership working

The study has indicated that partnership working has a number of requirements as well as opportunities which can contribute to the better delivery of road safety interventions.

First, partnership arrangements can provide a forum for data sharing to guide the planning and sharing of good practice. Police road casualty data (STATS19) and hospital injury records (health episode statistics) provide a good source of information for recognising geographic and health inequalities, and for guiding strategies accordingly. If they are to have a real impact on the safety of people in their area, it is important for local partnerships to share, and regularly review, this information and analysis with partners for joint evidence-based planning. A failure to do this risks gaps emerging, duplication of effort (and a waste of resources) or missed opportunities at, for example, the planning stage of new developments or traffic management schemes.

It is also important to have clarity of purpose, with a clear understanding of partnership objectives and terms of reference. Where the purpose is clear, and participants have a common agenda, it is apparent that progress is more likely to be made. This also highlighted the importance of establishing monitoring systems for measuring performance in relation to the stated objectives. It also indicated that the importance of leadership and championing should not be underestimated. Where there are individuals who can take a lead in championing road safety issues, and promoting their inclusion in different settings, this should be exploited. Critically, however, there ought to be sustained funding in place for such local 'champions' to undertake their role. Otherwise, the success of this role is too dependent on goodwill and someone 'going above and beyond'; this is potentially risky should an individual change role or move on.

A key requirement and opportunity for partnership arrangements is that they utilise different partners' skills. Who is involved in the partnership is important and it is also important for each partner to have a good understanding of the others' roles. In this way the different skills and resources of partners can be recognised and exploited. This is something that may be more challenging where it is outside more traditional joint-working arrangements and encompasses services involved with addressing health and social inequalities, or developing safe and liveable streets, particularly for children. This emphasises the need for particular attention to be paid to the development of trust and respect between partners, as well as clear areas of responsibility. The research found that the presence of joint-funded posts is likely to have a positive impact on partnership working. This mechanism creates 'buy in' from the participating agencies and helps in their alignment and working together.

5 ACKNOWLEDGEMENTS

6   REFERENCES

Audit Commission (2007) *Better Safe than Sorry: Preventing Unintentional Injury to Children*. London: Audit Commission.

Besley, E. (2010) *Beyond 2010: Taking Stock and Moving Forward*. London: Parliamentary Advisory Council for Transport Safety.

Christie, N. (1995) *The High Risk Child Pedestrian: Socio-economic and Environmental Factors in their Accidents*. TRL Research Report No. PR117. Crowthorne: Transport Research Laboratory.

Christie, N., Ward, H., Kimberlee, R., Lyons, R., Towner, E., Hayes, M., Robertson, S., Rana, S. and Brussoni, M. (2009) *Road Traffic Injury Risk in Disadvantaged Communities: Evaluation of the Neighbourhood Road Safety Initiative*. Road Safety Web Publication No. 19. Department for Transport: London. http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme1/researchreport19/pdf/rswp19.pdf (accessed 16 December 2010).

Department for Children, Schools and Families (DCFS) (2008) *The Play Strategy*. Nottingham: DCFS Publications. http://publications.education.gov.uk/eOrderingDownload/The_Play_Strategy.pdf (accessed 16 November 2008).

Department for Children, Schools and Families (DCFS), Department of Health and Department for Transport (2009) *Accident Prevention Amongst Children and Young People – A Priority Review*. Nottingham: DCFS Publications.

Department for Transport (2009) *Advice about Local Road Safety Strategies*. London: Department for Transport. www.dft.gov.uk/pgr/roadsafety/laguidance/localroadsafetystrategies.pdf (accessed 17 December 2010).

Department for Transport (2010) *Road Injury Risk in Disadvantaged Areas: Evaluation of the Neighbourhood Road Safety Initiative*. London: Department for Transport.

Ipsos MORI (2009) *Maidstone Community Strategy: Summary Report*. London: Ipsos MORI.

Office for National Statistics (2008) Neighbourhood statistics. http://neighbourhood.statistics.gov.uk (accessed 16 November 2008).

Road Safety Analysis (2010) *Child Casualties 2010: A Study into Resident Risk of Children on Roads in Great Britain 2004–08*. London: Road Safety Analysis. www.roadsafetyanalysis.org/wp-content/uploads/2010/08/Child-Casualty-Report-2010.pdf (accessed 16 December 2010).

Sustrans (2010a) Liveable neighbourhoods. www.sustrans.org.uk/what-we-do/liveable-neighbourhoods (accessed 17 December 2010).

Sustrans (2010b) What is DIY streets? http://www.sustrans.org.uk/what-we-do/liveable-neighbourhoods/diy-streets (accessed 17 December 2010).

Sutton, L. (2008) The state of play: disadvantage, play and children's well-being. *Social Policy and Society*, 7(4), 537–549.

Towner, E., Dowswell, T., Errington, G., Burkes, M. and Towner, J. (2005) *Injuries in Children Aged 0–14 Years and Inequalities*. London: Health Development Agency.

APPENDIX 1: Methodology

APPENDIX 2: Literature review

APPENDIX 3: Case study report

APPENDIX 4: Partnership working

These appendices are available at http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme1/roadusersafetyreport/