



MSC TRANSPORT PLANNING

DRIVEN TO EXCESS:
IMPACTS OF MOTOR VEHICLE TRAFFIC
ON RESIDENTIAL QUALITY OF LIFE
IN BRISTOL, UK

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DECLARATION

This study was completed for the MSc in Transport Planning at the University of the West of England, Bristol. The work is my own. Where the work of others is used or drawn on it is attributed.

This study contains exactly 20,207 words.

Signed

Joshua Hart
14 April 2008

“People have always lived on streets. They have been the places where children first learned about the world, where neighbors met, the social centers of towns and cities, the rallying points for revolts, the scenes of repression... The street has always been the scene of this conflict, between living and access, between resident and traveler, between street life and the threat of death.”

-Donald Appleyard

ABSTRACT

Quality of life in cities and towns is of increasing concern to the public, and to policymakers. One of the major threats to quality of life is the growing volume of motor vehicle traffic, which has increased more than fifteen-fold in the UK since 1950. This growing car dependence is creating an epidemic of deteriorated mental and physical health associated with air and noise pollution, inactivity, road deaths and injuries, and a growing destabilisation of the global climate. Problems related to car dependence have been particularly acute in greater Bristol, UK, where car ownership, vehicle use, and congestion are among the highest in Britain.

The study investigated the specific impacts of traffic on quality of life within a residential area of Bristol through a replication of Donald Appleyard's research into the effect of traffic on neighbourhood social interaction. (Appleyard, 1969) Primary data was collected through observations and a series of interviews with 60 households on three streets with varying levels of traffic in one neighbourhood in North Bristol.

Results confirm that Appleyard's findings are applicable within the United Kingdom, specifically that the number of friends and acquaintances on a residential street, as well as the extent of individuals' 'home territory' tend to decrease as vehicle traffic increases. Other notable outcomes from the research include the finding that the frequency of stationary, street-based recreational activities is reduced as traffic flow increases, and that individuals' perception of the safety of their neighbourhood may be disproportionately influenced by the amount of traffic on their street of residence, especially affecting the degree of independence granted to children. Finally, policy solutions to the issues raised are presented.

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CHAPTER 1: INTRODUCTION

Motor vehicle traffic is one of those aspects of the modern world that we take for granted- its' universal presence is so banal that most of us have forgotten- or have never known- the unique quality that urban spaces can have when not overwhelmed by cars. Industrialised societies, and increasingly developing ones as well, endure a tremendous burden from the impacts of mass motorisation, in order to allow the 'freedom' to hop in one's car and drive anywhere at any time. This conflict between quality of place and mobility is at the heart of the transport crisis we now face. The current research attempts to lift the veil on some of the more obscure impacts caused by traffic on residential streets, and in so doing add to the continuing dialogue about how to improve livability and quality of life in our cities, towns and neighbourhoods, while retaining levels of accessibility that allow people to carry out the responsibilities of daily life.

This study replicates the work of Donald Appleyard, a UC Berkeley planning professor who investigated the effects of car traffic on residential neighbourhoods from the 1960's to the early 1980's. He is best known for his 1969 study that found that people living on streets with heavy traffic have only one third the number of social connections as people living on light traffic streets. Appleyard was a pioneer and a visionary who drew on psychology, sociology and urban planning to better understand the problems of the modern city, and contribute to a future where human settlements would once again become places oriented toward the needs of people rather than automobiles. In what was a tragic loss to the study of urban planning as well as the quality of city streets everywhere, Professor Appleyard was killed in 1982 by a speeding motorist in Athens, Greece.

Despite many studies that have looked at the specific impacts of varying levels of motorised traffic on human health, and especially since 2004, the effects of the built environment on physical activity, a review of the literature identified no published replications of Appleyard's original traffic study outside of the United States. There were also few studies found that attempted to differentiate among the primary factors influencing social decay on busy streets. This study seeks to fill these gaps, and determine whether the negative effects of traffic on quality of life- especially the suppression of social networks- are limited to large cities within the United States or can be generalized to suburban land uses within the UK.

Bristol, UK was selected for the study as it has some of the highest levels of car ownership, vehicle travel, and congestion of any city in the UK, as well as the associated degradation of environmental quality that is associated with these statistics.

CHAPTER 2: REVIEW OF EXISTING LITERATURE

Donald Appleyard's Livable Streets

In his most influential work, Donald Appleyard led a study in 1969 that looked at residential streets with different levels of traffic, and the effect of that traffic on the quality of life of the people who lived there. (Appleyard, 1969) He and Mark Lintell directed subsequent investigations throughout the 1970's into street design, traffic, and neighbourhood quality of life that culminated with the publication of his seminal work- *Livable Streets* in 1981.

One of Appleyard's most significant, and persistently cited findings is that people living on streets with heavy traffic have fewer friends and acquaintances on average compared with those living on streets with light traffic. This effect was confirmed by follow up interviews and street observations, which indicated that casual conversations, children's play, and other street-based social life (that facilitated the formation of social connections) varied inversely with the amount of traffic on a residential street. Appleyard's findings provide a quantitative case for traffic calming and have been cited over 150 times in the literature. (Google, 2008)

The street diagrams produced as part of Appleyard's 1969 study of three streets in San Francisco, and reprinted in his 1981 book *Livable Streets* are included as Figures 2.1 and 2.2. These diagrams visually represent the erosion of social capital and individual responsibility over a residential street as traffic volumes increase.

Appleyard's Original Social Diagram (1969)

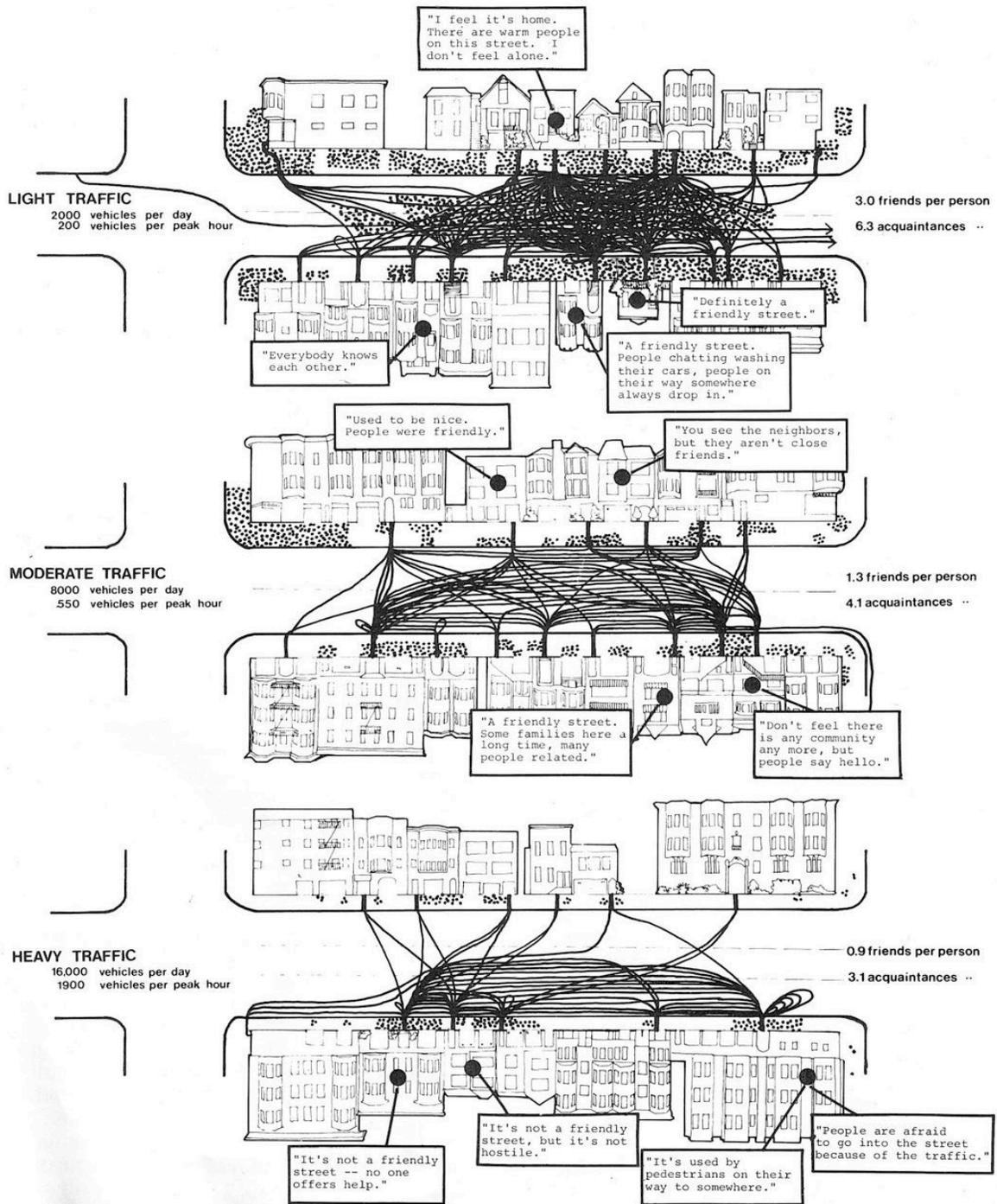


Figure 2.1 Appleyard's original social diagram- lines represent social connections. Dots are where people are said to gather (Appleyard, 1969)

Appleyard's Original Territory Diagram (1969)

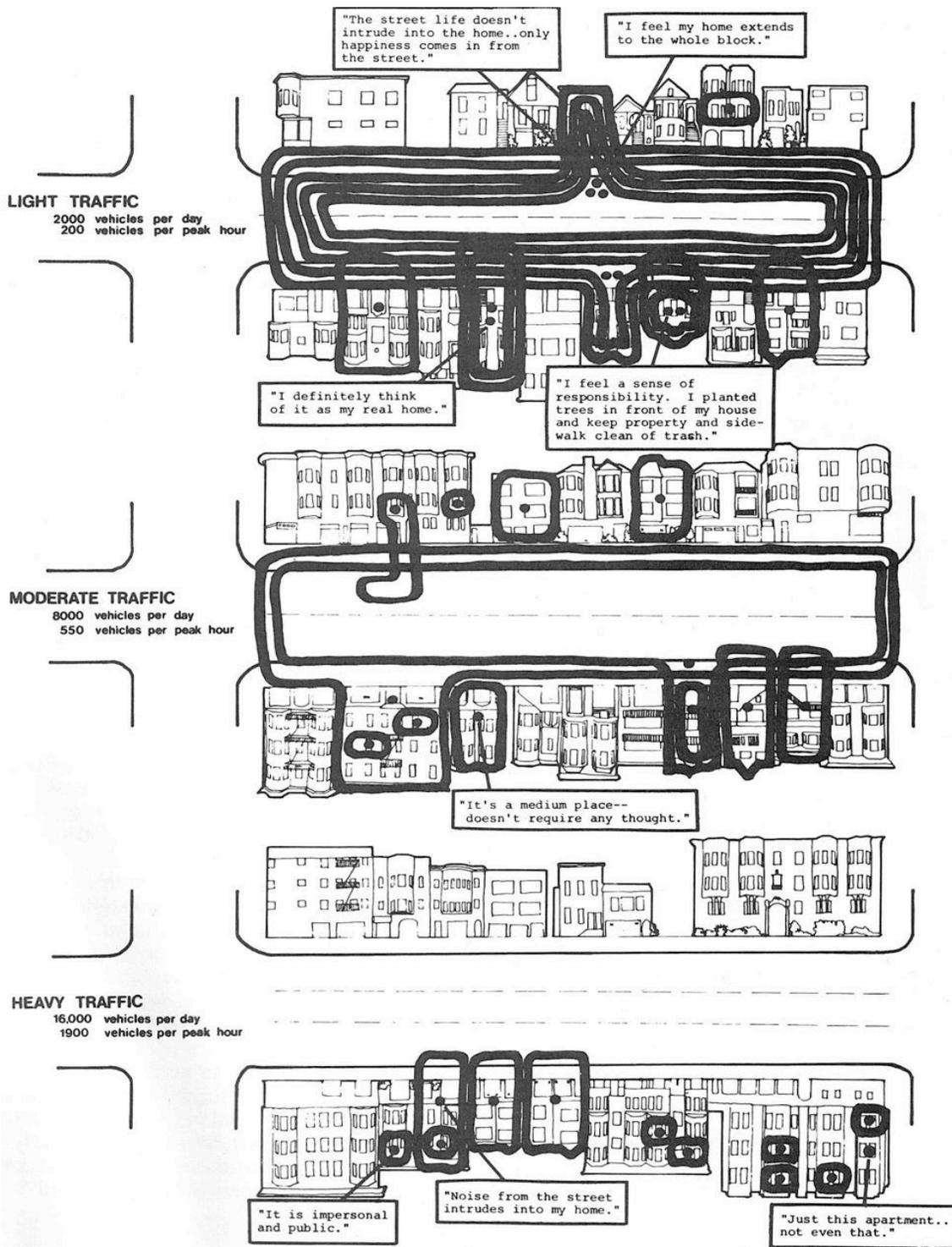


Figure 2.2 Appleyard's original home territory diagram- the boxes represent the area that residents identified as their "home territory" (Appleyard, 1969)

Other Replications of Appleyard's Neighbourhood Interaction Study

A search of the literature search identified three replications of Appleyard's neighbourhood social interaction study that have been undertaken in the United States since the publication of *Livable Streets* in 1981. Following are summaries of these three studies:

Livable Streets, unpublished paper (Patterson et al, 1988): For a research methods class at the University of California at Berkeley, a group of graduate students returned to San Francisco to study the same streets that Appleyard did. They found similar results- that higher traffic streets were associated with degraded social networks and abbreviated areas of personal territory.

Livable Streets Revisited (Bosselmann & MacDonald, 1997): This study sought to determine the difference in quality of life and number of social connections between heavily trafficked roadways of different designs- specifically looking at the traditional urban boulevard design, with central lanes for through traffic and local streets on either side. The results confirmed Appleyard's findings that "heavy traffic is associated with a withdrawal from the physical environment, (whereas) residents of the street with low traffic show an acute, critical, and appreciative awareness and care for the physical environment." The study also found that despite having very heavy levels of traffic (about 45,000 vehicles/ day), the boulevard designed with side streets recorded lower levels of irritation with the negative effects of traffic than the medium traffic street (15,000 vehicles/ day) showing that boulevard design can be an effective mitigation of the worst effects of heavy traffic volumes on residential quality of life.

Traffic's Human Toll (Transportation Alternatives, 2006): This study was undertaken in New York City by the pedestrian, bicycle, and public transport advocacy organisation Transportation Alternatives. The researchers used a corps of volunteers to conduct 600 door-to-door interviews in 4 neighbourhoods over the course of a year. Compared with the initial Appleyard study, they selected streets with significantly lower traffic volumes, with low, medium, and high traffic streets having less than 1,000, 2-3,000, and 5,000 cars per day respectively. Findings echo Appleyard's study that those on heavily trafficked streets hold more negative views of their block, are more often interrupted during sleep, meals, and conversations, and spend significantly less time walking, shopping, and playing with their children.

Transport, Quality of Life and Standard of Living

One of the difficulties when attempting to reach conclusions about the effects of variables such as traffic volume on 'quality of life' (QOL) is the qualitative nature of the term. While measures such as 'standard of living' use quantitative measurements of personal income and consumption levels, 'quality of life' is a rather amorphous term that refers to "an individual's emotional, social, and physical well-being." (Donald, 2001) Although there is no single objective measure available to gauge an individual's happiness or wellbeing, there have been numerous self-report survey instruments developed that can provide indicators to reveal individual, neighbourhood and citywide variations in welfare and happiness. (McMahon, 2002) Among the variables related to QOL are environmental quality, social life, safety, nutritious and accessible foods, physical activity, and physical and mental health.

'Quality of life' and 'standard of living' are often used interchangeably in the mainstream press and popular culture. However, 'standard of living' is simply a measure of the amount of consumption within a given society, without looking at the effects of that consumption on quality of life or livability. The British Social Science Research Council (SSRC) found that as standard of living and consumption levels rose in Britain in the 1970's, life satisfaction and quality of life declined. (Hall, 1976) This finding challenges the widely held belief among government officials, economists and the general public that economic growth has uniformly positive effects on society.

An example of this tendency with direct relevance to this study is the negative effect of increasing dependence on personal motorised travel on the quality and livability of residential neighbourhoods. A large number of studies document a range of negative effects of motor vehicle traffic on human health and the environment. These include noise impacts (Yamazaki et al, 2005), air pollution (Green et al, 2004), increased crash risks (Dumbaugh, 2005), and physical inactivity (Saelens et al, 2003) It should come as no surprise that residents and urban planners consider reducing vehicle related environmental impacts as being a top priority for neighbourhood improvement. (Wilhelm & Ritz, 2003, Watson, 1994, Wardman and Bristow, 2004) The overwhelming impact of motor vehicles on their surroundings is so great that traffic volume is often used as a surrogate for urban environmental conditions. (Weiland et al 1994, Duhme et al 1996, Ciccone et al 1998 as cited by Yamazaki et al, 2005)

While the purchase and use of an automobile would show up as an improvement to one's "standard of living," owning a car is also associated with reductions in basic measures of quality of life, such as physical activity levels. (Besser & Dannenberg, 2005) As the rate of car ownership increases, destinations that were previously accessible without a car may move into fringe areas where public transport and cycle/ pedestrian access is poor, increasing social and geographical pressures toward the "necessity" of owning a car, and reducing active travel. The number of UK adults who considered a car to be a "necessity" increased from 22% in 1983 to 36% in 1999. At the same time, the number who said they don't have a car because they can't afford it decreased from 22% in 1983 to 11% in 1999, despite the rising incidence of poverty. (Gordon et al, 2000) These statistics reveal an increasing automobile dependency within the UK, and this has particular impacts on people of low income. (Litman, 2003)

Car owners will of course experience certain benefits, such as improved accessibility to locations lacking in public transport, and for some, enhanced social standing. Yet the effects on the neighbourhood and others living in the region- the so-called external costs of vehicle use- are wholly negative.

Traffic Impacts on Quality of Life

There has been a good deal of attention paid in the literature over the past two decades to the impacts of increasing motorisation. Especially in the last five years, there has been a growing collaboration between medical and transport planning researchers to understand the roots of the obesity/ inactivity epidemic, and how automobile dependence impacts childhood development. Research into these areas generally falls into 7 inter-related categories: accessibility, noise, air pollution, climate change, traffic danger, physical activity, and social degradation. Research findings from each major area will now be summarised.

Accessibility

The '*freedoms to*' and choice gained by the car user have been at the expense of numerous '*freedoms from*' (e.g. danger, noise, air pollution), with community, locally available goods and services being lost to everyone."

-Juliet Jain and Jo Guiver (2001)

Rising levels of car ownership, expanding road networks and the associated infrastructure have allowed for unprecedented personal mobility. However, expanding

mobility for car owners has led to a diminishing level of *accessibility* for those lacking access to a car. (Litman, 2003)

Increase in Cars and Traffic in the UK 1950-2002

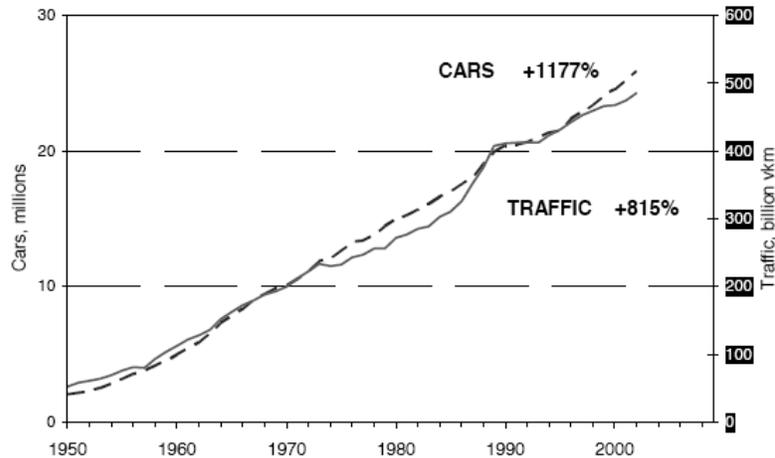


Figure 2.3 Increase in number of vehicles and vehicle km traveled, UK 1950-2002 (Goodwin et al, 2004)

Increases in car use can result in reduced public transport service at higher prices, a more dangerous walking and cycling environment, and further incursions of higher traffic levels into commercial and residential neighbourhoods, with the associated safety, noise and air quality implications. The tendency of increasing driving to discourage the use of other modes of transport and generate additional vehicle use is also well documented. (Pikora et al, 2003)

Noise

“It is characteristic of most modern forms of transport that the passengers are largely unaware of the noise their conveyance is making, even though the din to outsiders may be unbearable”
-Colin Buchanan, *Traffic in Towns*, 1963

Noise pollution is one of the most serious (yet frequently overlooked) effects of motorised traffic on physical and mental health, and general quality and enjoyment of life. Noise pollution is associated with a wide range of human health and quality of life impacts, including annoyance, cognitive performance degradation, sleep disturbance, heart disease, hearing loss, depression and hypertension. (Simpson, 2007) The effects of traffic noise on the population are widespread. Approximately 40% of UK residents report being bothered by noise from traffic, a proportion that almost doubled

in the last 3 decades of the 20th century. (BRE, 2000) Traffic noise is the single greatest cause of indoor disturbance (Williams & McCrae, 1994), and even at low levels causes annoyance and sleep disturbance (Bluhm et al, 2004). It has also been suggested that sleep interruptions from traffic noise can result in inattention during the day, and are linked with increased child pedestrian casualties. (WHO, 2005)

It has been shown in several studies that those whose homes had windows facing busy streets were more often depressed. (Ohrstrom 1991, Stansfeld 1992, Bluhm et al 2004 as cited in Yamazaki et al, 2005) These acoustical effects on mental health, combined with the interference of road traffic noise on street level conversations, are likely to at least partially explain Appleyard's finding that traffic is a major inhibiting factor in the development of neighbourhood-based social networks. In short, neighbours don't spend time chatting outside when the traffic roaring by forces them to shout in order to be heard.

The effects of traffic noise on a busy street often extend into the living quarters as well. In homes sited along the busiest roads, despite mitigation measures such as double glazed windows, noise can penetrate into a home more easily than other traffic impacts such as air pollution and particulate matter. Many residents in Appleyard's original study (as well as residents interviewed in Bristol for this study) would actually retreat into the rear of their flats or houses, in effect surrendering the front rooms as a buffer zone between themselves and the traffic outside. (Appleyard, 1981) The effects of noise also showed up in residents' description of their 'home territory' when on the heaviest trafficked streets, sometimes only the rear of the home was identified as the area over which they took personal responsibility and ownership. These residents appeared to actually cede the front rooms of their own homes to the commotion of the street.

Air Pollution

"Clean air is an essential ingredient of a good quality of life. People have the right to expect that the air that they breathe will not harm them."

-UK Air Quality Strategy, 2000

Despite righteous proclamations by government task forces, it is a reality that many residents of cities in the UK, and around the world, continue to suffer from unhealthy levels of air pollution on a daily basis, conditions that are in no small part attributable to

motorised road transport, which tends to pollute the air close to where people live and breathe. (Duhme et al, 1996) Air pollution is the largest outdoor impact on environmental quality, according to public surveys. (Williams and McCrae 1995) Worldwide, more than 1.5 billion are exposed to unhealthy concentrations of pollutants. (Satterthwaite, 1999) According to the World Health Organization (2002) over 2.4 million deaths annually worldwide can be attributed to polluted air. Some improvement in vehicle emissions control technology has occurred over the past few decades, such as catalytic converters which are now required in most industrialised countries. Catalytic converters reduce the amount of carbon monoxides, hydrocarbons, and nitrogen oxides, yet in the process increase the amount of carbon dioxide and nitrous oxide emitted (Wald, 1998) which don't have direct human health impacts but do have very serious and long-term climate impacts. (IPCC, 2007) Technological advances would be reducing street level vehicle emissions if it were not for the increase in the number of miles being driven, and as a result concentrations of nitrogen oxides and particulate matter often violate EU health standards in many cities. (DETR, 1999)

Unlike the coal smogs of London that peaked in December 1952 when 4,000 people died, and which led to the Clean Air Act of 1956, (Berube et al, 2005) modern air pollution is largely invisible, and therefore 'out of the public eye' despite the significant damage being caused. Another major reason why governments have repeatedly failed to meet air quality standards in urban areas is the "unwillingness of politicians to challenge the public's expectations of personal mobility." (Leksmono 2007) In other words political leaders are more prepared to allow people to get ill and die from unhealthy air than introduce potentially unpopular measures to reduce motor vehicle use.

Air pollutants, as one would expect, have a wide range of human health impacts. These include lung and eye irritation, cancer, and various damage to the circulatory, reproductive, nervous, and kidney systems. (Chatterjee, 2007) These health impacts can be particularly severe on pregnant women, the elderly and young children. (WHO, 1998) In one study in San Diego, it was found that children living near busy roads suffered significantly higher rates of asthma. (English et al, 1999 as cited by Green et al, 2004) Another study found a 10-20% increased risk of low birth weight and preterm birth in infants born to women living close to heavily trafficked roadways. (Wilhelm and Ritz, 2003) From an environmental justice perspective, such impacts are of particular

concern as non-white, economically disadvantaged people predominantly live, work, and are educated near heavy traffic and other sources of air pollution. (Green et al 2004)

Finally, motor vehicle exhaust has aesthetic effects including visual blight, damage to building frontages, soot accumulation, and noxious smells. These impacts further discourage street interaction and social life, compounding the other impacts from vehicle traffic.

Climate Change

“Our freedoms, our comforts, our prosperity are all the products of fossil carbon, whose combustion creates the gas carbon dioxide, which is primarily responsible for global warming.”
-George Monbiot, *Heat*, 2006

Other negative effects of higher traffic levels are not limited to the neighbourhood or the region, but are global in nature. The real threat exists of catastrophic interference in the global climate system if humans continue emitting carbon dioxide and other greenhouse gases under “business-as-usual” future scenarios. (Hansen et al, 2008) Future impacts are likely to include melting ice caps and glaciers, rising sea levels, ocean acidification, spread of drought, malnutrition, disease, and extreme weather events, many which may appear in a manner that is abrupt or irreversible. (IPCC, 2007) The likelihood of these events increases the longer that emissions continue from human activities such as transport. (ibid)

Transport currently emits 19% of the EU’s total greenhouse gases, with the vast majority of this coming from road traffic. (European Commission, 2007) The transport sector, however, is of particular concern as it is the fastest growing source of carbon emissions, having increased 26% between 1990 and 2004, even as other sectors reduced their emissions. (ibid) If policies don’t change significantly, emissions from transport in the UK are expected to nearly double by 2050. (DTI, 2006)

Traffic Danger

“To be safe, to feel safe at all times, to have no serious anxiety that husbands, wives, or children will be involved in a traffic accident, are surely pre-requisites for a civilized life... there are now virtually no urban streets that are completely safe.”
-Colin Buchanan, *Traffic in Towns* 1963

Globally, road crashes kill or seriously injure at least 50 million people every year. (WHO, 2004) The UK's share of this annual human toll is about 30,000. (DfT, 2007a) Road traffic in the UK is the single greatest cause of premature death for boys and second greatest cause for girls age 5-15. (ONS, 2002) Aside from the tremendous physical toll behind this statistic, and the lasting psychological impact on the family and friends of the victims, the fear of being killed or injured by a motor vehicle is one of the primary factors preventing greater use of non-motorised transport (and loss of opportunities for physical activity and independent mobility), especially by children. (Timperio et al, 2004) This (often justified) fear can lead to greater numbers of parents driving their children to school- yet another example of the vicious cycles created by car dependency. However, there are hopeful signs that this situation may not a hopeless downward spiral. Efforts by school communities and local governments to reverse this trend by providing walking and cycling training and motivation to school children, as well as improving physical infrastructure- footpaths, pavements, and cycleways- have been spreading throughout Europe and the US. Such "safe routes to schools" programs have led to 20-200% increases in cycling and walking and up to a 49% decrease in childhood bicycle/ pedestrian collision rates in areas of California. (Orenstein, 2007)

Table 2.1 Risk of pedestrian fatality in a vehicle collision by vehicle speed (IIHS 2000)

Vehicle Speed	Risk of Pedestrian Fatality
20 mph	5%
30 mph	45%
40mph	85%

The threat that traffic poses to pedestrians and cyclists is strongly associated with the number of vehicles on a given roadway. For example, the risk of injury to child pedestrians along busier roads was 14 times greater than roads with lower traffic volumes. (Roberts et al, 1995) In addition, vehicle speed is strongly associated with pedestrian fatality rates in a collision, with a large jump in injuries and fatalities occurring around 20mph. (see table 2.1).

Government responses to this problem have been criticized as inadequate, especially in the United States. According to the policy think-tank, the Surface Transportation Policy Project, between 1998 and 2003 pedestrians made up 11% of traffic fatalities,

yet less than 1% of federal transport funds were spent on pedestrian safety improvements. (Ernst, 2004)

Physical Activity and Childhood Development

“We have built communities so it is difficult, and in many cases dangerous, to walk or bicycle and have thus “engineered” physical activity out of our daily lives”
-James F. Sallis, 2004

The growth of sedentary lifestyles in industrialized countries has led to what experts are calling a major public health crisis. Preventable illnesses associated with inactivity and obesity include stroke, heart attack, certain cancers, diabetes, and depression. (Sallis et al 2004) In the United States, 70% of the population fails to meet minimum recommended physical activity (USDHHS, 2000), a deficiency that leads to over \$77 billion per year in hospital costs. (Pratt et al., 2000)

Over the last ten years, researchers have found increasing evidence that the ‘walkability’ of one’s neighbourhood is strongly correlated with the amount of physical activity undertaken by the individuals living within that neighbourhood. (Sallis et al 2004, Badland & Schofield 2005) It has been observed that in older neighbourhoods, residents tend to engage in active travel more often than those living in newer, car-oriented neighbourhoods. (Berrigan and Troiano, 2002) Characteristics of “active community environments” include complete sidewalks and cycle routes, interconnected streets with low levels of vehicle traffic, and mixed land use with shops and community services located close to homes—a condition which is often made possible through higher densities. (Badland & Schofield 2005, Troped et al 2001)

Most responses to traffic danger tend to involve limiting the independence of young children, an adaptation not without repercussions on childhood health and development (Hillman, 1993). It has been suggested that this loss of independent mobility and freedom to play in the streets has had measurable developmental consequences in the form of higher rates of dyslexia, and other learning disabilities. (Douthwaite, 1992)

Social Degradation

“People had withdrawn altogether from (the heavy traffic street), leaving it to the traffic.”
-Donald Appleyard (1981)

Healthy social networks are not only crucial to happiness and quality of life- they also defend against multiple forms of mortality: “over the last 20 years more than a dozen large studies have shown that people who are socially disconnected are between 2 and 5 times more likely to die from all causes, compared with matched individuals who have close ties with family, friends, and the community.”(Putnam, 2000 as cited by Leyden, 2003)

Research carried out since Appleyard’s groundbreaking study confirms his initial findings, and provides greater detail about the mechanisms of social breakdown in residential areas suffering from traffic intrusion. For example, Griefahn (2000) found that people living on busy streets spend less time in their gardens, and have fewer visitors compared with people living on quiet streets. A study by Kevin Leyden (2003) carried out in and around Galway, Ireland found that “persons living in walkable, mixed use neighbourhoods were more likely to know their neighbours, participate politically, trust others and be socially engaged, compared with those living in car-oriented suburbs.” A study of the health-related quality of life (HRQOL) of older women living in Australia observed that “where women described relationships with neighbours and those in the community as close and trusting, concurrent descriptions of the physical environment as ‘nice and livable’ might reflect the safe and comfortable social climate within which they live.” (Walker and Hiller, 2007) There is evidence that richness of social life shapes emotional states, which subsequently shapes the perception of a physical environment. As the research cited above seems clearly to indicate, the physical environment also affects mood, which can in turn, influence social life. It is clearly a complex series of interactions, but what is clear from many studies is that environmental quality is often a necessary precondition for street level social connections to develop. And traffic is perhaps *the* most effective way to erode the environmental quality of an area.

Traffic Impacts in Bristol, UK

Bristol is the most populated city in the southwest of England, with nearly 400,000 residents living within 110 square km. Transport is a particular problem for the city, with congestion and pollution among the worst in the UK, and public transport viewed as being “poor.” (GOSW, 2005)

Each year, Bristol City Council (BCC) administers a citywide survey to assess the quality of life (QOL) of its residents. The Quality of Life in Your Neighbourhood Survey was initiated in 2001, and is intended to identify progress toward goals related to sustainability, environmental quality, economic progress, education, and health. (Bristol City Council, 2006). Together with data from city and regional transport plans, the results from this household survey provide insights into how traffic is affecting the quality of residents’ lives within Bristol.

Car ownership in the Greater Bristol area is higher than the UK average, with nearly 5% fewer car-free households (21.9%) than the national rate (26.8%). (Bristol City Council, 2000) Nine billion km are driven in Bristol every year and this number has been growing. (Bristol City Council, 2000) Especially rapid growth in car journeys has been occurring in the north fringe of Bristol, an area just to the north of the area studied as part of this research. Traffic growth in this area has been above the national average, increasing 30% between 1994 and 2004, reflecting the rapid increase in employment in the area that has occurred without supporting public transport infrastructure. (ibid) Lack of adequate and reliable services as well as high prices have contributed to a decline in bus patronage between 2000 and 2005. (West of England Partnership, 2006) Vehicle use in the Joint Local Transport Plan area (the region comprising Bristol City, South Gloucestershire, Bath and Northeast Somerset, and North Somerset) has increased 21% between 1994 and 2004, a faster rate than that of Great Britain as a whole. (ibid) As a result, congestion in Bristol is a major problem, worse than that of any of the ‘core’ English cities, with an average peak hour speed of only 16mph, just above bicycle speed. (ibid) Congestion is now so bad that 21% of travelling time at peak periods is spent stationary. (ibid)

As traffic has increased in the Bristol area over the last decade, so has the casualty rate, defying an overall decrease in road casualties in Great Britain. Every year, about 500 people are killed or seriously injured on the roads in Greater Bristol. (Bristol City

Council, 2006) While casualties among car passengers and pedestrians decreased slightly between the mid 1990's and 2000's, the number of cyclist casualties increased by 42% and motorcyclists by 68%. (West of England Partnership, 2006) Bristol is failing to meet its own targets to reduce this high toll, particularly crashes involving child pedestrians that increased 13% between 2005 and 2006. (Bristol City Council, 2000, 2006) A particular concern is the inequitable distribution of these types of collisions, which tend to be clustered within the poorest areas of Bristol. Specifically, 24% of childhood pedestrian casualties in 2005 occurred in the most deprived neighbourhoods, while only 1% occurred in the least deprived areas. (ibid) This is consistent with research findings that reveal clusters of child pedestrian casualties concentrated in high deprivation areas across England. (Graham et al, 2005) Beyond the human cost of these tragedies, road crashes burden the taxpayer with more than £96 million annually in emergency services and hospital costs. (Bristol City Council, 2006)

Air quality is also badly affected by traffic. Over 100,000 Bristolians live in areas where air quality is considered to be potentially damaging to health. (West of England Partnership, 2006) The source of the vast majority of this pollution is motor vehicle traffic, with 97% of nitrogen oxide pollution originating from the tailpipe. (ibid) The city also contributes significantly to climate change. Over two million tonnes of carbon dioxide are emitted by Bristol annually with 18.5% produced by road transport. (Bristol City Council, 2006)

Not surprisingly, indications are that quality of life is being diminished by motor vehicles more than any other single cause. Though most of the indices that measure quality-of-life in Bristol have been improving, the noticeable exceptions are primarily transport-related, including road traffic casualties, traffic noise, traffic pollution and satisfaction with bus service, which have all been getting progressively worse in recent years. (Bristol City Council, 2006)

Considering the disproportionate toll that traffic takes on the quality of life within Bristol, the city was seen to be an ideal location for this study.

CHAPTER 3: RESEARCH SETTING AND METHOD

Background

This research was designed to replicate aspects of Appleyard's neighbourhood interaction study within the City of Bristol. The intention was also to connect theory identified in the literature review to real peoples' lives on streets with different levels of vehicular traffic. Sixty households were interviewed and observations were carried out to determine the physical characteristics and range of activities on the three streets selected for study. Like Appleyard's original research, these interviews sought to gather information about the quality of the physical and social environment, the nature of street-based social networks, levels of irritation with traffic impacts, strategies of adaptation to those impacts, and any ideas that residents had to address the issues raised. (Appleyard, 1981)

The qualitative nature of the interviews allowed residents to speak freely about the impacts of traffic on their lives, building on the primarily quantitative questions asked as part of the Bristol Quality of Life Survey. (Bristol City Council, 2006) The Bristol Survey asked about contacts with friends in general, in person or through e-mail or phone contact, without specifying the residential location of these social contacts, a detail crucial to assessing locally based social capital. Thus, during the interviews, residents were asked to identify their friends and acquaintances living on their street.

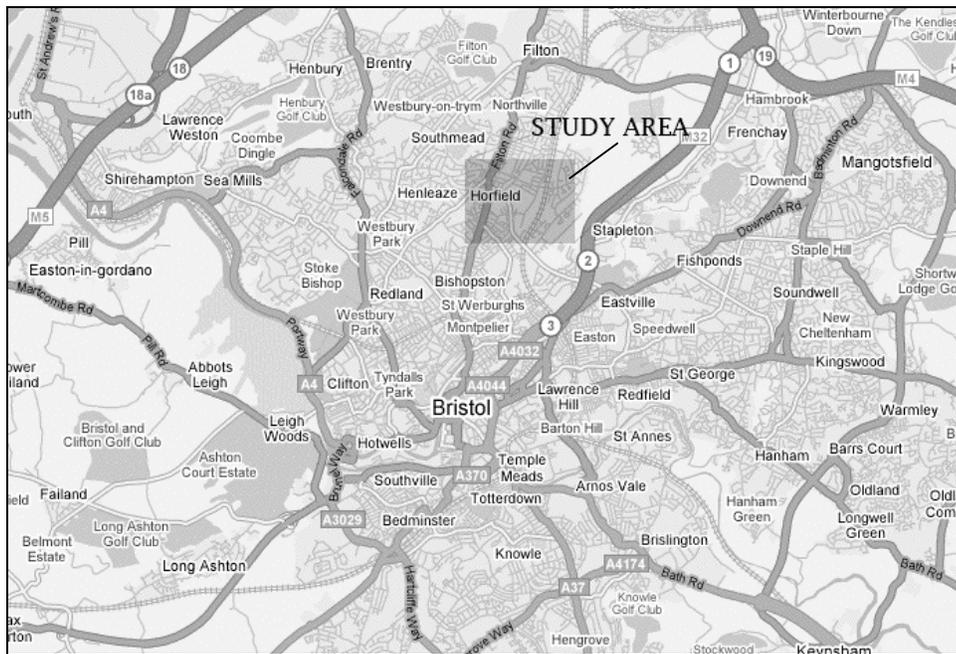


Figure 3.1 Map of study area

The area selected for study is situated along the edge of the Lockleaze, Bishopston and Horfield council wards (see fig. 3.1). This mid-density residential area is located three miles north of Bristol’s City Centre, and is characterized by row houses built primarily in the pre and post-world war II period of the first half of the 20th century. The neighbourhood is adjacent to the Bristol Rovers Football Club Memorial Stadium, which hosts both rugby and football matches.

Method

Street Selection Method

A preliminary visit was made to the three streets to be studied, to ensure that they were similar in as many respects as possible, except the one variable that was the focus of the study: traffic. Traffic volume data from the Bristol City council was used to identify appropriate streets that were close to the original range specified by Appleyard for the medium and heavy traffic categories, while counts were made directly along the low traffic street.

Table 3.1 Three Bristol streets selected for study

Street	Category	Ward	Traffic Volume
Dovercourt Road	LIGHT	Lockleaze	140 vehicles/ day
Filton Avenue	MEDIUM	Horfield/ Lockleaze	8,420 vehicles/ day
Muller Road	HEAVY	Bishopston/ Lockleaze	21,130 vehicles/ day

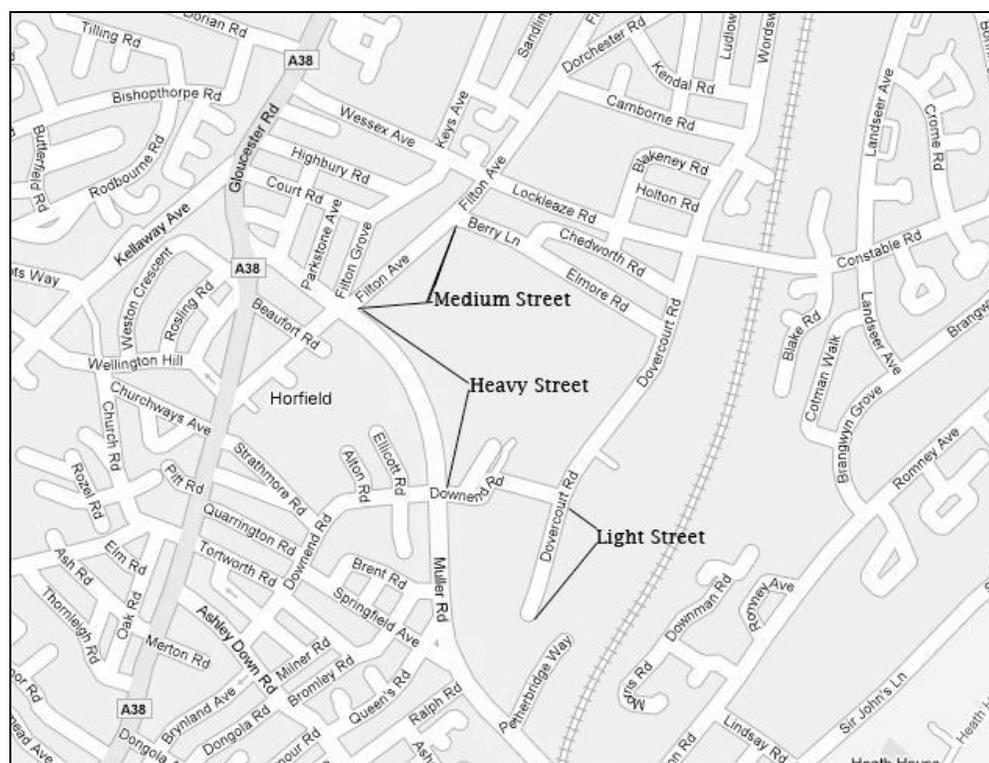


Figure 3.2 Map of north Bristol neighbourhood showing location of three streets studied

The streets selected for study were the Dovercourt Road cul-de-sac (LIGHT traffic, 140 vehicles/ day), Filton Avenue (MEDIUM traffic, 8420 vehicles/ day), and Muller Road (HEAVY traffic, 21,130 vehicles/ day). While Dovercourt Road was located within the Lockleaze council ward, Filton Avenue straddled the Horfield and Lockleaze wards, and Muller Road straddled the Bishopston and Lockleaze wards. Explanations of traffic volume calculations are included as Appendix A.

Survey Method

It was felt that a survey administered through a direct, semi-structured interview, carried out on a door-to-door basis, would be the ideal method for carrying out this

research. Because of the nature of the questions to be asked, a self-completion questionnaire was seen as ill suited to the task. Questions regarding social life and street activities needed to be asked without specific reference to the issue of traffic, which would have potentially influenced the responses. Since it is impossible for the researcher to control the order in which a participant responds to questions on a self-completion questionnaire, an interview method was seen to be preferable. (Robson, 1993) In addition, the presence of an interviewer meant that any confusion about the meaning of specific questions, especially completion of the neighbourhood interaction diagrams, could be clarified. (ibid) The set of questions was pilot tested, and the wording was simplified as a result.

Introductory letters (see Appendix B) were delivered to 161 households on the three study blocks, explaining the purpose of the research as being a study of neighbourhood life and how it could be improved. Like the original Appleyard study, residents were not told that the study was focused specifically on the effects of traffic, as this could have biased the results. (Appleyard, 1969) The letter included a local phone number and e-mail address if residents wished to schedule their interview for a specific time. Three responses were received by e-mail. Two residents apologized for being unavailable during the survey times, and one requested a telephone interview, which was subsequently scheduled.

The majority of the questions used during the interviews originated from Appleyard's Livable Streets study (1981) in order to gauge whether findings from nearly four decades ago in the heart of an American city would still hold true in the suburbs of Bristol UK in 2008. Several additional subject areas were explored with residents, including a question about the number of motorised and non-motorised trips taken on an average day, and inquiries regarding awareness of and attitudes toward traffic conditions prior to moving to the street. This was an attempt to determine whether a self-selection bias was at work- in other words, do people who are inherently more social move to streets with less traffic, thus confounding the results?

The interview itself (see Appendix C) contained six areas of questioning: demographic data, an open ended street description, recollection of street activities, identification of friends, acquaintances, and home territory on an aerial photograph of their block, identification of the most stressful aspects of living on the street, and finally a detailed

inquiry into the specific impacts of traffic on their streets, and adaptations that were employed.

A special effort was made to knock on doors and conduct interviews at different times of the day, and different times during the week in order to not bias the sample toward any particular group. For example, carrying out interviews predominantly in the middle of the day during the week would have likely resulted in a sample bias toward retired people and stay at home parents, with respect to their actual proportion of the street's residents. Approximately half of the interviews were conducted during the day on weekdays, and half during the evenings and weekends. Fifty-nine of the interviews were conducted in person, either in living rooms or on doorsteps, while one was carried out over the phone, for a total of 60 interviews, with 20 on each street, and 10 on each side of each street. This compares with 12 households per street in the original Appleyard study. The interview times ranged from 5 minutes to 45 minutes, depending on the time the interviewee had available and their interest in discussing the subject at length.

Neighbourhood Quality of Life Background

Judging from the results of the Bristol Quality of Life Survey, there is a large socioeconomic gap between the wards that were identified for study, and related differences in the different measures of quality of life. (Bristol City Council, 2006) Horfield, and especially Lockleaze contain neighbourhoods that are in the 10% most deprived areas nationally, while the entire Bishopston ward is among the 10% least deprived nationally. (ibid) While Lockleaze has a significantly lower than average livability rating, Horfield and Bishopston are more livable than average, according to an index of QOL indicators. (ibid) All three wards are slightly below the Bristol average for total reported crimes. However, residents of Horfield and Lockleaze have a greater fear of crime.

Consistent with its high deprivation ranking, residents in Lockleaze are less satisfied with their neighbourhood- especially the appearance of their streets. They volunteer less frequently, feel less like they belong to their neighbourhood, exercise less frequently, are more obese, and suffer from worse health, in comparison with the adjacent Bishopston and Horfield wards, and with Bristol residents generally. (ibid)

However, Lockleaze residents report that air quality and traffic pollution is less of a problem than residents of Horfield and Bishopston, perhaps because of the ward's greater distance from the city centre, and from heavily trafficked Gloucester Rd. Yet they report traffic noise as a greater problem than either Horfield or Bishopston. (ibid)

It was felt that differences in ward characteristics would not bias the survey, as the three streets were located in such close proximity to each other, in an area where physical and demographic variables were relatively consistent.

Physical Characteristics of the Three Streets

The sample streets were selected because of the similarity in the physical characteristics of their streetscapes, equal proximity to open space (each street is within 500m of playing fields), equal proximity to shopping facilities (each street is within 500m of a convenience store), proximity to each other, and similar socioeconomic and ethnic makeup.

Some minor physical differences between the streets were noted. Whereas Filton Avenue and Dovercourt Road are straight, Muller Road is curved slightly. While the block of Filton Avenue is reasonably flat, Dovercourt and Muller Roads are slightly graded, sloping down to the south. In addition, a greater frequency of off-street parking and detached housing was observed on Filton Avenue compared with the other two streets. These minor differences were seen to be insignificant, taking into account the other similarities between the streets, including street width, pavement width, (lack of) street trees, similar building set backs, and housing type.

Table 3.2 Physical and safety characteristics of the three streets selected for study

STREET CHARACTERISTICS	DOVERCOURT ROAD (LIGHT STREET) 140 CARS/ DAY	FILTON AVENUE (MEDIUM STREET) 8,420 CARS/ DAY	MULLER ROAD (HEAVY STREET) 21,130 CARS/ DAY
Number households in study area	56	48	57
Type of houses/ dwellings	Mostly adjoined row houses, stucco	west side mostly adjoined- east side mostly duplexes	Mostly adjoined row houses, stucco
Front Gardens	~20-30% paved or gravel	~60% paved or gravel	~30-40% paved or gravel
Street grade/ curvature	Slight rise to the north, straight	Flat, straight	Slight rise to the northwest, slight curve to the west
Typical bldg. setback	14'	12'	16'
Proximity to shops	~500m	~500m	~500m
Mean speed	~25mph	~30-35mph	~30-35mph
Roadway width	31'	30'	33'
Pavement width	9.5'	10'	8'
Number moving lanes	2, two-way street	2, two-way street	2, two-way street
Trees/ vegetation	Total two trees, limited shrubbery in front gardens	Total one tree, some shrubbery in front gardens	Total two trees, some shrubbery in front gardens
Parking	Mostly on-street, no observed pavement parking	Half on-street, half off street, most cars partially on pavement	Mostly on-street, 2/3 of vehicles partially on pavement
Number reported crashes btw cars & cyclists/ peds within last 5 years (BCC)	0	2	1
Number reported crashes btw cars within last 5 years (BCC)	0	7	14
Maximum Noise Levels (Bristol City Council, 2005)	< 20 dB(A)	< 60 dB(A)	<70 dB(A)

Dovercourt Road (LIGHT Street)



Dovercourt Road is a street with very little traffic, apart from that generated by residents, delivery vehicles, and the occasional driver unfamiliar with the area who tries to get through to Muller Road.

While Filton Avenue and Muller Road are both through roads, Dovercourt is a cul-de-sac, located just south of Downend Road, at the end of what is otherwise a moderately trafficked street. Dovercourt Road connects Downend Road on the south with Lockleaze Road to the north, and is located just to the west of the main rail line connecting the City of Bristol to South Wales. The street is lined mostly with adjoined houses, and some have been converted to flats.

Dovercourt Road was initially planned to extend south to Muller Road but either because the city ran out of money, or because of the location of the bus depot along Muller Road (residents and city officials were uncertain), the extension was never completed. Because of the initial plan, the street was built to collector road specifications, and is unusually wide for such a quiet residential street. This quirk of

history provided a valuable opportunity to study a light traffic street with very similar dimensions to the medium and heavy traffic streets but with only a fraction of the traffic. In many ways, Dovercourt Road acted as the control for the study, an opportunity to study a residential environment largely unsullied by the impacts of heavy vehicle traffic.

The cul-de-sac ends at a retirement home complex and an area of open space with trees and grass where people frequently walk their dogs. A pedestrian/ bicycle pathway at the south end of the cul-de-sac runs through the vegetable growing allotments, providing access for cyclists and pedestrians to Muller and Downend Roads, an example of the urban design concept of 'filtered permeability.' (see Chap. 6)

Filton Avenue (MEDIUM Street)



Filton Avenue (MEDIUM street) is a street with a moderate amount of traffic that extends from the commercial corridor of Gloucester Rd. north to Filton Abbey Wood rail station, the Ministry of Defense, Filton Avenue Junior School and the University of the West of England (UWE) Frenchay campus. The block selected for study is

between Muller Ro. (HEAVY street) and Lockleaze Rd., a level, wide, and straight section of roadway with similar dimensions and characteristics to the other two streets under study. On the west side of the street, there are mostly adjoined, smaller row houses, while on the east side of the street, facing the playing fields, the house are larger, mostly detached duplexes.

Because of the connection to large employment centres, the street experiences a significant increase in vehicular traffic during the morning and evening commutes, and significant flows of bicycle and pedestrian traffic. During weekend midday observations of the three streets, more cycle and pedestrian traffic was observed on Filton Ave. than Dovercourt and Muller Roads combined. Most of the cyclists observed were riding on the wide pavements, most likely out of fear of traffic on the street. Several bus lines use the street, including the 73, U2, and 70 route, the main bus line between the city centre and the UWE's large Frenchay Campus.

Muller Road (HEAVY Street)



Muller Road, or B4469 (HEAVY street) is a heavily trafficked major collector that connects Horfield to the M32 motorway, and the adjacent Eastgate Retail Centre, which includes Tesco and Ikea superstores. According to several of the residents, it is the “longest street in Bristol without a pub”(this claim was not independently verified). The area of Muller Road that was selected for study is located between Filton Avenue (MEDIUM street) and Downend Road. The block is sited between playing fields on one side and the Bristol Rovers stadium on the other. A convenience store can be found just to the south of the study area. Buses, especially route 70, connecting the City Centre to the University, drive up and down the road frequently, and the First Bus depot is located just to the south of the study area. During peak times, the road is often gridlocked with traffic, and even in the middle of the day the traffic is often constant.

Demographic Analysis

Data from the interviews indicate that for the most part, the three streets selected are very similar in terms of their demographics. The average age on all three streets was within the forties, with HEAVY street being home to the youngest residents (average age 41.4), most likely a reflection of the greater number of student lets on that street. MEDIUM street was the oldest on average, with the average respondent nearly 50 years old, while LIGHT street fell in the middle with an average age of 46.2 years. LIGHT and MEDIUM street residents had lived in their homes for almost the same period of time, an average of over 21 years, while on HEAVY street, people had only been residents for an average of just under 13 years, reflecting the higher turnover due to the greater proportion of rentals (5 on HEAVY street vs. 4 on MEDIUM street and 3 on LIGHT street) and possibly degraded environmental conditions, based on anecdotal evidence from the interviews that past residents had moved out because of the impacts of the heavy traffic. Residents on all three streets were predominantly white, with the exception of one black household on LIGHT street, three Asian households on MEDIUM street, and one black and one Asian household on HEAVY street.

In contrast with Appleyard’s findings, more single people and slightly fewer families with children lived on LIGHT street. One possible explanation was that many of the residents had raised children who had subsequently grown up and moved elsewhere, while the elderly parents elected to remain on the street. Two of the households interviewed on HEAVY street were short-term lets that were shared by students.

Table 3.3 Demographic characteristics of residents interviewed on each street

DEMOGRAPHIC CHARACTERISTICS OF THE THREE STREETS	DOVERCOURT ROAD (LIGHT STREET)	FILTON AVENUE (MEDIUM STREET)	MULLER ROAD (HEAVY STREET)
	140 VEHICLES/ DAY	8,420 VEHICLES/ DAY	21,130 VEHICLES/ DAY
Total households interviewed	20 (10 on either side of the street)	20 (10 on either side of the street)	20 (10 on either side of the street)
Average age	46.2	49.9	41.4
Average length of residence	21 years 11 months	21 years 5 months	12 years 11 months
Number of homeowners	16/20	17/ 20	15/20
Ethnic background	White: 19 Black: 1 Asian: 0	White: 17 Black: 0 Asian: 3	White: 18 Black: 1 Asian: 1
Family status	Single: 10 Married: 9 Partners: 1 Shared housing: 0	Single: 6 Married: 13 Partners: 1 Shared housing: 0	Single: 9 Married: 8 Partners: 1 Shared housing: 2
Sex of respondents	Male: 9 Female: 8 Couple: 3	Male: 4 Female: 11 Couple: 5	Male: 13 Female: 5 Couple: 2
Educational level	Prim. School: 0 Sec. School: 11 College: 1 University: 6 Postgraduate: 2	Prim. School: 1 Sec. School: 12 College: 0 University: 6 Postgraduate: 1	Prim. School: 0 Sec. School: 11 College: 1 University: 6 Postgraduate: 2
Number of families with children	7	8	8

On MEDIUM street, there seemed to be a higher proportion of married couples and of women (at least in the sample group) compared to the other two streets. Educational level was remarkably consistent between the three streets, with more than half of participants having gained a secondary school education, with about a third having gone on to university or a postgraduate education.

CHAPTER 4: RESEARCH FINDINGS

Street Observations

Thirty-minute observations were carried out on each street on a sunny, mild and breezy Saturday afternoon in March. Results were consistent with reported observations by residents during the subsequent interviews. Considerably more leisure time was spent outside on LIGHT street, compared with MEDIUM or HEAVY traffic streets. There were many more cyclists and pedestrians observed on MEDIUM street, likely because this is a main non-motorised transport route that provides access to local schools and employment centres. It was notable that while observing activities with clipboard in hand on MEDIUM and HEAVY streets, no one approached to ask what the purpose of the survey was, while on the quiet street, one of the residents walked up and asked what was going on.

Table 4.1 Observations Summary Table

OBSERVATIONS OF THE THREE STREETS	LIGHT STREET - 140 VEHICLES/ DAY	MEDIUM STREET- 8,420 VEHICLES/ DAY	HEAVY STREET- 21,130 VEHICLES/ DAY
Greetings	3	1	0
Conversations	0	0	0
Children playing	5	0	0
People spending time on the street	9	0	0
People working on a project	2	0	1
Cyclists on street	3	6	1
Cyclists on pavement	0	12	2
Pedestrians	25	45	23
Of total pedestrians, number walking to/ from car	8	8	8

It was evident that MEDIUM and HEAVY streets were more anonymous environments, while LIGHT street was a place where the residents actively monitored and took responsibility for what happened on the whole street. This was later confirmed by comparison of the extent of home territory between the three streets. (see page 47)

Interview Summaries

The interview process provided a glimpse into the lives of residents on the three streets that were selected for the study- streets that were very similar apart from the volume of vehicle traffic. On all three of the streets, for the most part people were very welcoming, frequently inviting me into their living rooms and offering cups of tea. In some interviews, residents who only reluctantly agreed to talk to me, claiming they only had 5 minutes, would end up being very forthcoming, discussing their street in detail for 45 minutes or more. Once they began to discuss the issues, problems, and benefits to living on their street, occasionally it was difficult to draw the interview to a close. Yet through the process of interviewing 60 separate households on what turned out to be three very different and unique streets, a detailed picture of the dramatic effect of motor vehicle traffic on the quality of daily life emerged.

LIGHT Street (140 vehicles/ day)

Judging from physical appearance alone, LIGHT street is very similar to MEDIUM and HEAVY streets. However, from the 20 interviews with residents, it appears to be a much more closely knit community. Much of this social capital may be associated with the environmental conditions on the street, which are remarkably unpolluted and quiet. This may be one reason why 6 out of 20 of the residents reported that there wasn't a single stressful aspect of life on their street (compared with 2 on HEAVY street and 3 on MEDIUM street). Some noise comes from the rail line to the east of the street, but none of the residents cited this as a huge problem: "The noise from the railway doesn't bother me even if trains come 100 times," said one resident. There is a home improvement store located about 100m south of the end of the cul-de-sac, a recycling centre located just to the east, and a bus depot located 100m to the southwest, and these were occasionally mentioned by residents as being a minor source of noise and air pollution.

The lack of trees, combined with the unusual width for such a low traffic street, leads to a bit of a desolate feel. Residents have described the street environment itself as "bare," "boring looking," and "not very pretty." However, the descriptions of the social environment of the street were far more positive. A majority (13 out of 20) described the street in positive social terms. "(LIGHT street) is a friendly street- most people know other people," says a 49-year-old woman, and "good communication between houses, togetherness" from a 15-year-old boy. Especially the elderly residents living

alone felt supported and cared for by the tight knit community on the street. A 70-year-old woman who lived alone remarked that, “people on the street have always helped each other in times of illness and difficulty.” Another older lady living alone felt lucky to live on such a street where “everyone’s kind, thoughtful, helpful, and really lovely to me. You feel safer when the neighbours check in on you- when my next door neighbour hasn’t seen me for a few days, he knocks just to see if I’m okay....there are more families here- people who stay for a while and put down roots. We share plants and look after each other. There is really a sense of community.”

Of course, the street, just like any other, has its problems. Many of the older generation lamented about the deterioration of the street’s social life, in spite of the fact that most of them still had quite a few friends and acquaintances nearby. One 60-year-old man who has lived in the same house most of his adult life, told me that LIGHT street “lacks the community it once had. At one time you knew everyone on the road.” Another man who had lived on the street for 42 years said that “people don’t talk in the street as much as they used to. Everyone here used to know each other. We used to sit on the wall and chat- there would be 4 or 5 of us- those in their 60’s would chat with those in their 30’s. I haven’t seen that since the 1980’s.” This kind of intergenerational socializing that is essential to healthy communities (Benson, 2002) was often centred around the minding of children who would play in the street, an activity that still occurred, but far less frequently than before. One resident explains why: “when our kids were small, they were always in the street- there were fewer cars then.” Even on one of the quietest streets in Bristol, with only about 140 vehicles per day, the occasional speeding car was enough to create the perception of a potentially dangerous environment, and prevent children from playing in the street. In a knock on effect, this also prevented adults (who would mind their children while they were playing) from socializing in the street.

Several of the residents, especially those with young children, reported that occasional speeding cars were a real concern to them. This confirms Appleyard’s finding that on quiet streets, the biggest threat is the “occasional hot rodder who was, in some instances, a greater menace than the steady stream of traffic on HEAVY street” (Appleyard, 1981) This exact sentiment was echoed by an older woman on the street: “the speed they drive up and down- even worse because it’s quiet.” Fast traffic was also the most frequently cited cause of stress. A single mother of a young child, who

had only lived on the street for 18 months, commented that “a few cars come very quickly and threaten people in the street. I am constantly worried that my 2-year-old will dart out at the wrong time.” A married couple, aged 40, who had lived on the street for 9 years, noted that the problem was “especially delivery drivers, who hammer down the street- they are a threat to children and pets.” One major cause of unnecessary speeding on the street was identified by a couple in their late 30’s with three children: “if you don’t live on the road, there’s no dead end sign, so people come down too fast.” An elderly, single woman confirmed this: “sometimes a car comes speeding down and they think they can get to Muller Rd.” Indeed the layout of the road, which was originally planned as a collector, gives that impression. Just a faint dashed white line on the road, and a small, easy to miss dead end sign is all there is to tell the uninformed traveller that they are entering a cul-de-sac.

Car ownership and annual vehicle miles travelled have been rising in the UK generally (DfT, 2005) and LIGHT street is no exception. In addition, the conversion of houses to flats for short term let to students has led to an increase in cars and a lack of parking. A middle-aged couple on the street complained that “parking is a problem- households that have four cars are the problem.” “The street is saturated with cars,” observed one senior lady who relies on buses and rides from friends to get to the shops.

The lane through the allotments at the end of the cul-de-sac is a convenient shortcut for cyclists and pedestrians, but was also the subject of considerable concern related to past incidents of crime, especially among older residents of the street. Several reports emerged of muggings that had occurred there. This criminal activity affected the behaviour of some by restricting the time of day they would use the lane. Some even refused to use it at all, opting to walk all the way around on the street instead. One woman who had just moved to the street said she “thought it was pretty peaceful until my boyfriend got attacked outside the house the other day.” Residents reported that this kind of random violence was increasing, and largely attributed it to youth gangs from Lockleaze, passing through their neighbourhood.

Many residents commented on the irony that often such difficult circumstances can bring neighbours together and create social bonds. One such event that had happened recently on the street was law enforcement’s discovery of a “grow house,” a house rented for the sole purpose of growing marijuana plants for sale on the black

market. One of the houses at the end of the cul-de-sac had been raided by the police in early February, creating quite a spectacle and generating a crowd on the ordinarily quiet street as officers brought out dozens of plants and lighting equipment. While the “big event on the street” was disturbing to many of the residents, who were shocked to “find out they had a drug factory down the street,” it also served as a talking point between neighbours for weeks afterward. “Can you believe we had absolutely no idea?” was a popular refrain.

All in all, LIGHT street is a community where people were relatively content with the local environment and their neighbours- a street with a healthy social life, a lower incidence of stress than the other two streets, and a support network that they could rely on during rough times- for example when they became ill, or after the death of a spouse.

MEDIUM Street (8420 vehicles/ day)

MEDIUM street is a primary access for the Bristol Rovers Memorial Stadium, and the impacts resulting from this proximity, including parking and traffic congestion and vandalism on match days, were of considerable concern. Nine out of twenty mentioned the football stadium as a source of stress in their lives. “Every other Saturday we can’t leave the house- we had a riot a year ago with 70 police, and a number of fights took place.” Although there was apprehension about the planned expansion of the stadium and its effect on the neighbourhood, some residents welcomed the pause in activity: “I’m looking forward to them knocking down the Rovers stadium because I’ll get two years of peace- then the chaos will return worse than ever.”

Crime was another source of stress for residents, especially petty vandalism, theft, and fighting. Residents linked the majority of this criminal behaviour to the football matches at the stadium down the street. Criminal activity seemed to be particularly endemic on MEDIUM street, and was mentioned as being stressful twice as often as either of the other two streets. Like LIGHT street, a ‘grow house’ had recently been raided by the police, though not all of the residents knew about this, potentially a reflection of the lower frequency of social channels on the street. (see page 45)

Though the football stadium and crime created stress in the lives of local residents, traffic was an even greater stressor, mentioned by 12 out of 20 households. Beyond the immediate environmental impacts such as noise, air pollution, and traffic danger which were all mentioned independently by those living on the street, many seemed to realize that the traffic was taking a toll and eroding the social life of the street. An elderly couple who'd lived in their house for 48 years, said that MEDIUM street is "not very neighbourly or friendly because you're on a main road." Another couple who had lived on the street for 50 years, said that they were "inclined not to know the people opposite because the road is so busy."

The oldest inhabitant interviewed on MEDIUM street, a 91 year old man who had been living in the same house for 81 years, remembered what life was like in the 1920's: "This was originally a country lane with hedgerows along it- it was really the countryside here then- I used to go 'birdnesting' and climb trees when I was a boy." When asked to describe his street he said "traffic is really the main thing- life has changed tremendously because of the car. Neighbours don't see each other like they used to, because people get out of their front door, get in the car, and visa versa when they get home."

A 30-year-old married woman with two young children told me that they "tend to only know people who live near us, because it's busy." From another young couple with children: "it's not a pleasant place to hang out because of the pollution and noise." Another woman with two young children who had lived on the street only 2 years, reported that she "doesn't see anyone on the street here- it's just not friendly. People shut their doors and come out only when they have to." A single woman in her twenties described MEDIUM street as being "busy in terms of the traffic, quite impersonal- part of the busyness means that it doesn't feel much like a community place." One older woman even went as far as to say that "if you were to die here, nobody would know."

Yet despite the bleak reality of a neighbourhood impacted by the noise and fumes of traffic, many of the residents expressed an appreciation of their neighbours and a desire to see a more fully-fledged community develop. A single woman in her 30's said that "we need to be a bit more friendly on this street- it's important to know your neighbours." Another middle-aged woman described the street as "busy, with too

much traffic, but friendly neighbours....there is more of a community here. Local chatting is quite a thing.”

Though clearly impacted by the proximity to the football stadium, the threat of crime and significant levels of traffic, there were pockets of dense social networks in several areas of the street, suggesting that social connections on higher trafficked streets tend to remain more localized than on light traffic streets, where social connections were widespread and dense. (see page 45)

HEAVY Street (21,130 vehicles/ day)

The dominant picture of HEAVY street that emerged from the interviews is that of a street where residents largely keep to themselves, and have arranged their lives in such a way as to minimize the primary source of stress on their street, which they identified, more than any other cause, as the heavy vehicular traffic (14 out of 20 households).

Although several residents mentioned their “friendly neighbours” and two residents said that they “swap Christmas presents, and often have meals together,” more often than not these friends and/ or acquaintances were located in close proximity to the interviewee’s home, and only rarely across the street. More residents expressed negative observations about the street than positive.

A middle-aged man living alone described HEAVY street traffic as a “mountain range, cutting you off from the other side of the road.” He describes the street environment almost like a war zone: “The street is hellishly busy....it’s a bloody nightmare. The buses and lorries shake the house when they come by. The air pollution can be quite bad out the front, sometimes during rush hour you feel the air getting thicker and thicker.” He went on to say that “people have moved out because of the traffic.” Despite the constant grind, he regularly tends his front garden, though he is frustrated by the constant influx of trash coming through the gate. “People just throw their takeout rubbish in my garden.”

Poor air quality turned out to be a major irritant and source of frustration on the street. A married couple in their late 30’s who have been living on the street for 6 years, and have a four year old girl, seemed at their wit’s end: “This street is unfriendly,

suspicious, dirty, and not very family friendly. We don't like it, mostly because of the traffic." The father told me that air pollution is a constant irritant. He worries about his little girl: "We're very concerned about her health- she has a constant cough- and we limit the amount of time she spends outside. We use a humidifier to try and reduce the pollution, but it doesn't work," he said. Remarking that he had cleaned the television screen the day before, he took a clean white paper towel, wiping it across the screen. He showed it to me and it was black- totally filthy. "We're constantly breathing this in," he said, exasperated.

Black soot was evident on the front windowsills, doorway, and even on surfaces inside the homes all along HEAVY street. A divorced, middle-aged man who grew up on HEAVY street, and moved back into the house when his parents died, has noticed a huge increase in traffic. "The air pollution is really very bad- it's annoying when the dirt builds up in the kitchen. There's just always so much dirt, grit, and grime around. I've considered moving out because of this." When asked to describe his street, he said it is "busy, dirty, unfriendly, old- everything has aged significantly, everything is looking old and tired."

The prevalence of car crashes, and lack of safety was another major area of concern for residents on HEAVY street. Several reported that their or their neighbours' parked cars had been struck, often late at night and without the at fault driver stopping to take responsibility. According to several residents, crashes on the street are a frequent occurrence. A middle-aged man who has lived on HEAVY street for 27 years, told me that "a cyclist who lives on this block got hit crossing the road, and his leg was broken. A pedestrian was killed crossing at the lights. There have been many deaths and casualties on the road." A middle-aged man with 3 children told me "there have been 15-20 crashes on this block in the last 6 years- four of these happened right outside our house."

Taken together, the quantitative survey data and qualitative interviews paint a picture of a street under stress, where people have sealed the front of their houses with double glazing and permanently closed windows because of the constant grinding traffic noise, and have retreated to the back of their houses. Even within their homes, the impacts from traffic are often visible and hard to ignore- the black soot accumulating on every surface and the health impacts alone have become almost

intolerable for several of the residents. With the people living on the street hunkered down in the back of their homes, often only emerging to get in their cars, and with the street environment dangerous, polluted and noisy, there are very few opportunities to meet one's neighbours, and this was reflected in the number of social connections. (see page 45)

Street Activities

During the interviews, residents were queried about how often they observed certain activities on their streets. (see Fig. 4.1) While the frequency with which some activities were observed varied considerably between the three streets, other activities seemed to be unaffected by the volume of traffic. Specifically, active, transient types of activities such as cycling and jogging were common on all three streets, while stationary recreational activities such as sitting outside in the front of the house and playing games were considerably reduced on both MEDIUM and HEAVY streets. In fact, less than 3 out of 20 residents interviewed on MEDIUM and HEAVY streets stated that these activities happen at all on their street.

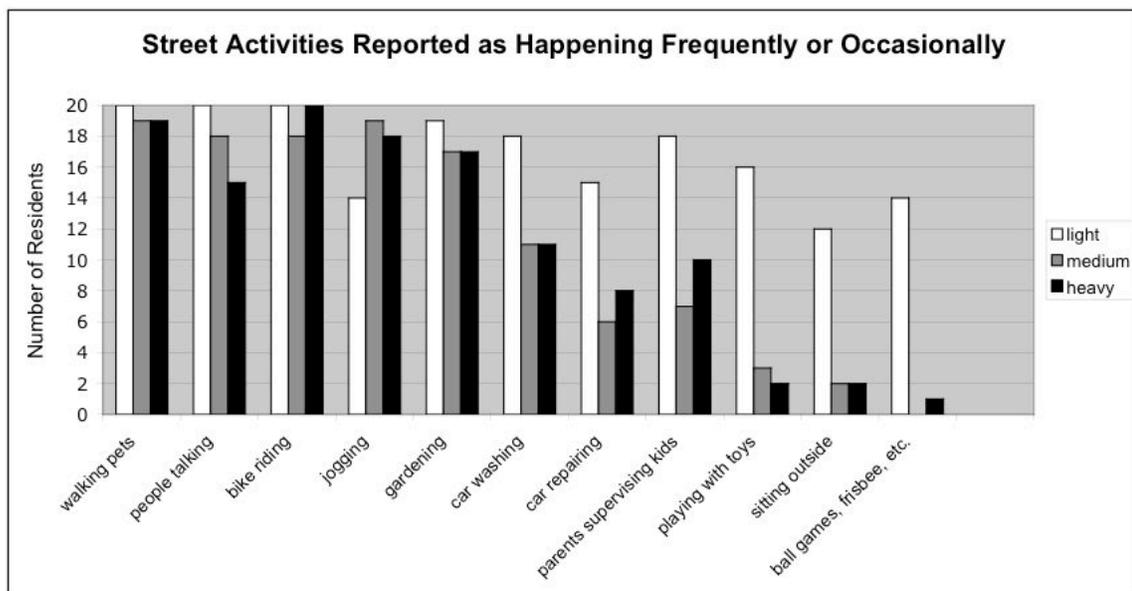


Figure 4.1 Street activities reported as happening frequently or occasionally on the street

Figure 4.1 presents the number of residents on each street who reported that certain activities take place either frequently or occasionally on their street. While the chart seems to illustrate little difference between the three streets in the reported frequency of such activities as walking pets, people talking, and gardening, the number who

reported that these activities happen *frequently* showed large differences. (see figure 4.2) Interestingly, out of 60 residents on all three streets, not a single one reported that playing with toys or sitting outside happens frequently on their street.

All of these activities are affected to varying degrees by each of the major types of impact from motor vehicles described in chapter 2. While ball games and frisbee tend to require considerable space, requiring use of the street area, and are particularly vulnerable to traffic danger, other activities such as gardening, sitting outside, and playing with toys tend not to involve any direct interaction with traffic, yet are particularly sensitive to the environmental effects such as noise, air pollution, and visual blight. The frequency of people talking in the street depends on a relatively noise-free environment, and MEDIUM and especially HEAVY street failed to provide this, an obvious deterrent to the formation of social connections, especially incidental formation of casual acquaintances.

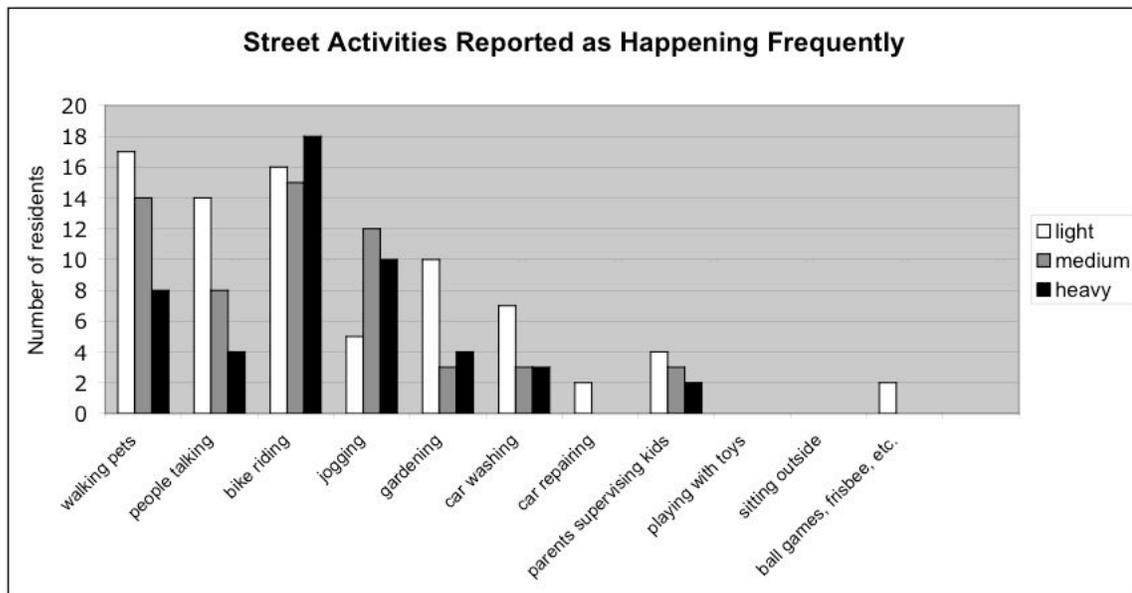


Figure 4.2 Street activities reported as happening frequently on the street

Traffic Irritation

In order to ascertain general levels of irritation resulting from the three types of direct traffic impacts (air pollution, noise, and danger) on the three streets, residents were asked to rate how much they were bothered by each, as well as trash, on a scale from one to ten.

Results indicated that on MEDIUM and HEAVY streets, levels of irritation with traffic impacts were very similar, with air pollution being the most significant irritant (average score of 5.8 and 5.9 respectively). This is consistent with research that identifies road traffic and vehicle exhaust as “probably the largest contributor to outdoor public environmental nuisance.” (Williams & McCrae 1994) On LIGHT street, trash bothered residents the most, perhaps because vehicle related irritation was lower, in comparison with the heavier traffic streets, increasing the relative irritation from litter. Traffic danger was the second biggest irritant on LIGHT street, consistent with reports of infrequent, speeding cars posing a threat, especially to pets and children.

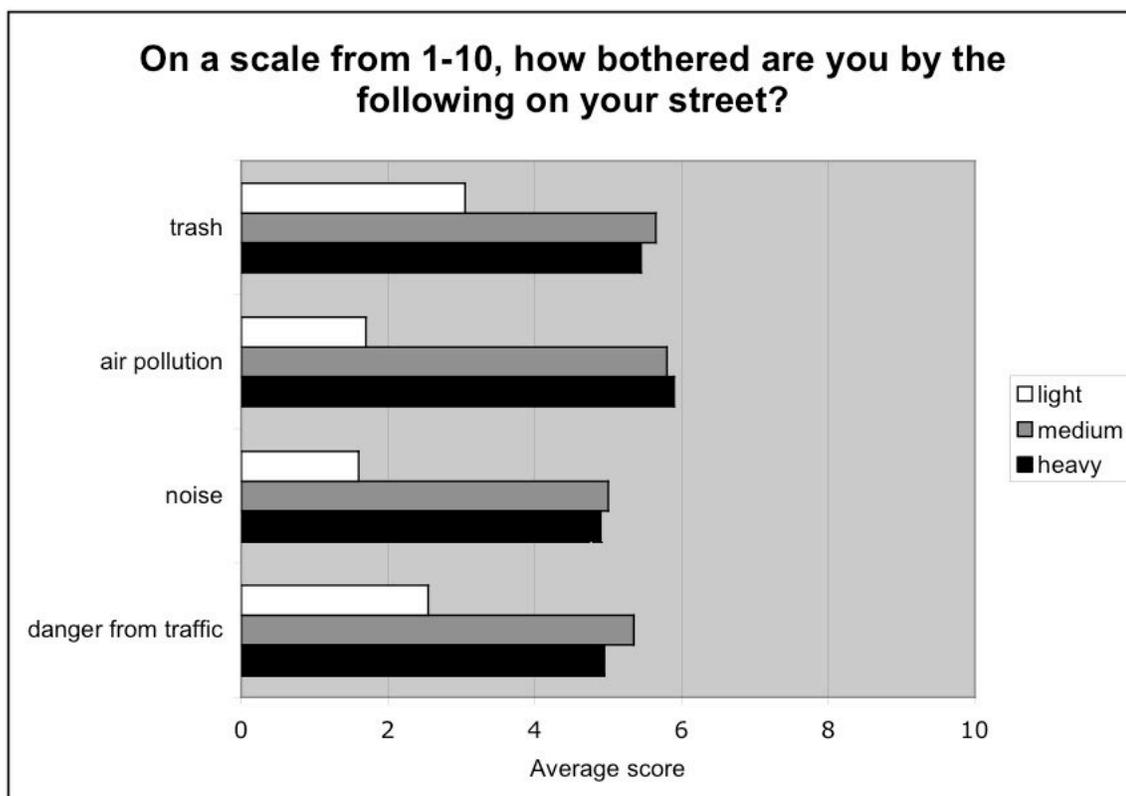


Figure 4.3 Levels of irritation from major environmental impact areas

Residents were also asked about how often they were irritated by traffic while carrying out certain regular activities, in their home and in the neighbourhood. (see Figure 4.4, below) As would be expected, those living on MEDIUM and HEAVY streets again expressed the greatest irritation with the impacts of traffic during their activities. However, a difference between MEDIUM and HEAVY street residents emerged in responses to these questions, as opposed to ratings of their overall levels of irritation. (Figure 4.3, above)

This finding could demonstrate either how asking participants to recall a specific activity increases the salience of the subject in question, or the degree to which those on the HEAVY street have either adapted to the more severe traffic impacts, or simply moved out if the impacts became too great to bear.

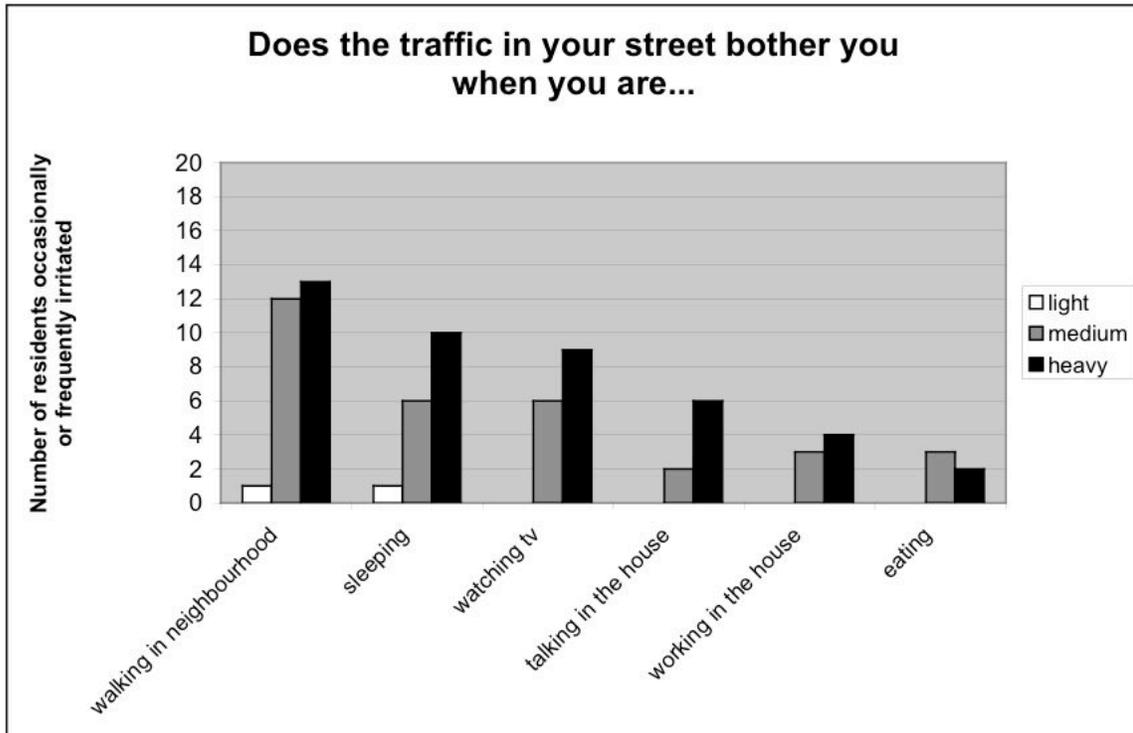


Figure 4.4 Levels of traffic irritation reported while taking part in various activities

On LIGHT street, only two residents reported any irritation with traffic whatsoever- one who was frequently bothered by traffic while walking in the neighbourhood and one who was only occasionally bothered by traffic while sleeping- in this case taxicabs coming down the street late at night, and discharging their noisy passengers.

It was a different picture on MEDIUM and HEAVY streets. At least 12 out of 20 residents reported being at least occasionally irritated by traffic while walking in their neighbourhood, the activity where irritation was most common, followed by sleep disturbance, which affected 6 out of 20 on MEDIUM street and 10 out of 20 on HEAVY street. More residents were irritated during each activity on HEAVY street than MEDIUM and LIGHT streets, except for eating, where slightly more MEDIUM street residents expressed an irritation. This could be due to the fact that the noise was so

constant on HEAVY street that most residents had moved their dining area into the rear of the house, a common adaptive response to high levels of traffic noise.

Adaptive Responses

The people interviewed for this research demonstrated real resilience in the face of impacts from traffic that at times became quite severe, especially on HEAVY street. From rearranging the schedules of visitors, shifting activities to the back of the house, to selecting décor that would hide the constant particulate build-up, they displayed an impressive degree of creativity in covering up, insulating against, and displacing the impacts of traffic on their daily lives. This section describes and analyses the adaptive strategies used in response to each major category of traffic impacts. As there was very little traffic on LIGHT street, there was, of course, a reduced need for adaptations. Thus the vast majority of the adaptive behaviour described here was reported by residents living on either MEDIUM or HEAVY street. Appleyard (1981) observed that as environmental quality on streets deteriorates from rising traffic levels, people tend to “adapt, withdraw, or migrate.” The adaptations that residents utilise in order to cope with traffic, as well as examples of withdrawal and migration, will now be discussed within each impact area.

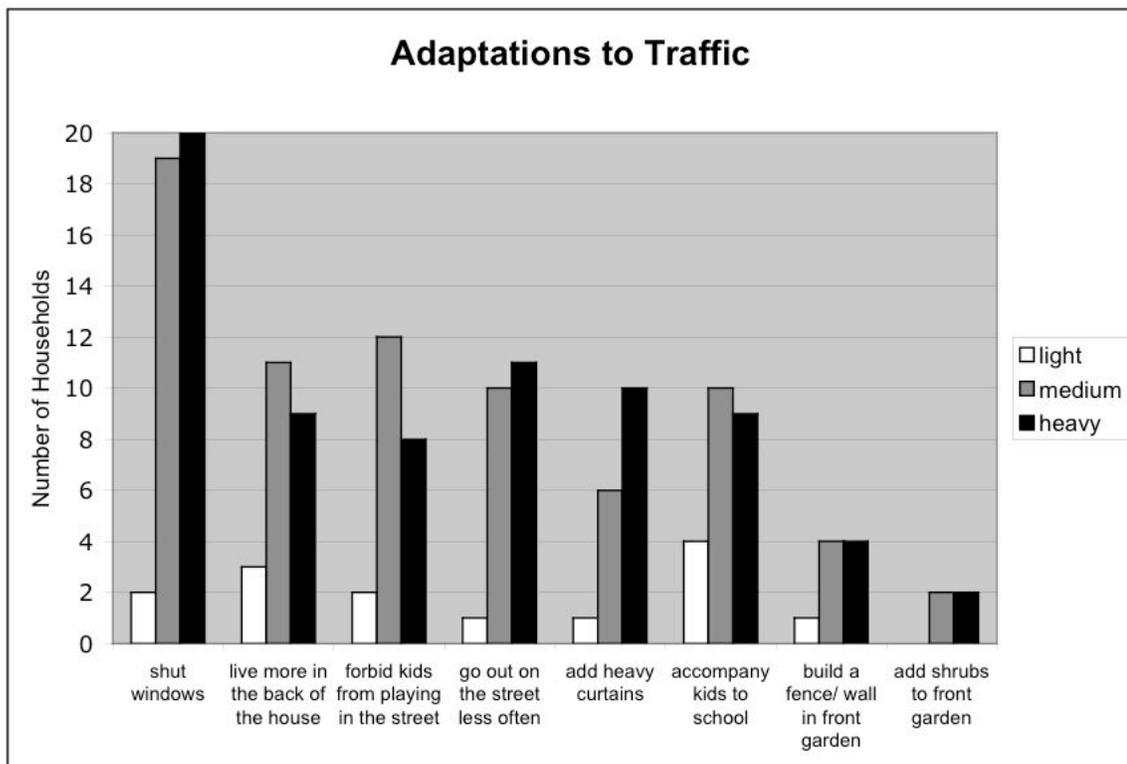


Figure 4.5: Adaptations utilised by residents to impacts from motor vehicle traffic

Adaptations to Noise and Vibration

Noise pollution from traffic is a serious threat to health and wellbeing (see Chapter 2). Residents on MEDIUM and HEAVY streets, with 8,420 and 21,130 vehicles/ day respectively, expressed both frustration and resignation at the impact of traffic noise on their lives, which tended to be virtually a constant influence on the heavy traffic street, and on both streets during peak traffic periods. The vast majority of these residents (with only one or two exceptions) had installed double glazed windows in the front of their home, and these windows were very rarely opened, in order to reduce noise, but also to keep polluted air from entering the house. In contrast, residents of LIGHT street frequently kept their front windows open for ventilation, and when double-glazing was installed, it was utilised only as an insulation and energy saving measure. One man who had lived on LIGHT street for 42 years, stated that his “bedroom windows (in the front of the house) are always open- I think they’ve been open since we moved in.” This reflects not only the improved environment of living on a low traffic street, but also a greater degree of trust in his neighbourhood.

Many of the residents on MEDIUM and HEAVY streets had also installed closed patios, to buffer against the noise and keep the heat in. Yet traffic was likely a larger factor than was acknowledged, as the number of patios observed on the light traffic street was only 2 compared with 18 on MEDIUM and 5 on HEAVY street.

Traffic noise is a significant disturbance of sleep for residents living on the MEDIUM and especially the HEAVY traffic streets. Some residents reported the use of earplugs at night, and several have moved to a bedroom at the back of the house. One woman, whose bedroom overlooks MEDIUM street, turns up her stereo so she doesn’t have to hear the constant traffic. Spending more time in the rear areas of the house was a common adaptation to traffic, reported by 11 out of 20 residents on the HEAVY street, 9 out of 20 on MEDIUM street, and 3 out of 20 on LIGHT street. Another woman said that when she moved in she installed the telephone by the front door, but she had trouble hearing the person speaking on the line, so she moved it to the back of the house. She said that when she has visitors, “they tell her they couldn’t live with this amount of noise.” “But,” she says, “when you live here this long you get used to it.” Many of the residents reported similar habituation, an impressive example of the power of human adaptability in the face of constant and invasive impacts such as traffic noise.

Adaptations to Air Pollution and Soot Buildup

Polluted air is a major factor leading to a deteriorated quality of life, health problems and premature death, as well as being a constant irritant for the people who live near the sources of pollution, in this case significant vehicle traffic along residential streets (see Chapter 2). As reported on page 38, air pollution was rated by residents of MEDIUM and HEAVY streets as being the most irritating of any of the traffic impacts, consistent with past studies. (Williams and McCrae 1995) Perhaps this is in part due to the fact that there are so few adaptive responses available to reduce the impact, apart from simply removing oneself from the environment.

Strategies that residents utilised to cope with air pollution included cleaning up or camouflaging soot build up, or avoiding outdoor exposure. The problem of air pollution was particularly severe on HEAVY street, where people reported choosing black curtains and painting their front door black to hide the build up of soot, washing the car, the front of the house, and indoor surfaces more often than would usually be required, keeping the windows shut, and use of a humidifier in a mostly vain attempt to reduce indoor air pollution. Parents of a young girl living on HEAVY street reported that they attempted to reduce the amount of time their daughter spent on the street, though they admitted that the levels of air pollution inside were little better, as the air intake for the furnace was located in front of the house. In the most extreme cases, the only adaptation remaining was to move to a street with lower traffic levels, and it was clear from the interviews that this was an option that had been exercised in the past, and was being considered by those remaining on the street.

Adaptations to Traffic Danger

Very few adaptations mentioned in interviews focused on shielding adults from road traffic, as it is likely assumed that adults have already adapted their behaviour, through education and experience, to protect themselves from being injured by cars. Thus the adaptations carried out by residents focused on limiting the exposure of those deemed to be the most unpredictable and vulnerable groups- young children and pets- from the danger posed by passing traffic.

The fear of car traffic leads many parents to restrict their children's activities, by either forbidding them to play in the front garden, pavement, or street, or requiring that they be accompanied to school, the most common adaptations to traffic danger mentioned

by residents on all three streets. One mother on MEDIUM street even stated that she actively discouraged her children from forming friendships across the street, in order to reduce the risk of crossing the busy road on a regular basis- direct evidence that traffic flows can hinder the development of social networks. While every single parent who lived along MEDIUM and HEAVY streets accompanied their children to school (mostly by car), only 8 out of 20 of those on LIGHT street did so. This is not likely to be due to ward-based differences in schools as parents in Bristol can send their children to the school of their choice. (Bristol City Council, 2008). In addition, objective safety criteria appear to be the same, as children on all three streets must cross equally busy streets on their way to school. It's likely that this large disparity in the degree of independence granted to children originates from parents' perceived level of traffic threat, shaped to a large extent by what is immediately outside of their front door, a finding consistent with past research. (Timperio et al, 2004) The major influence of the immediate residential environment on travel mode choice has substantial implications for transport policy, especially the focus of social marketing programs that encourage people to adopt non-motorised modes, social programs that place families with children on roadways with varying levels of traffic, as well as the overall desirability of locating residential development (especially housing intended for families) along major arterials.

One effect of the danger posed by cars is the 'invisibility' of children. Residents from all three streets made similar observations to a woman who said that "there are only about 3 children on the street." Yet in going door to door it turned out that there were at least 13 children on all three streets - and these were just in the twenty households interviewed. Yet there was hardly any public presence of the children, who often went directly from car door to front door. A mother of two young children who had lived on the medium traffic street for 2 years told me that "there will never be a time when kids can play unsupervised."

Other measures taken by residents to protect themselves and their loved ones against traffic danger included sealing off front hallways with a child safety gate to prevent children or pets from suddenly running into the street (MEDIUM street), washing the car in a back lane or a side street to avoid the risk of being hit by passing traffic (MEDIUM street), and parking with two wheels on the pavement to reduce the risk of damage from passing traffic. (HEAVY street)

Traffic and Community on Three Streets

Social Connections

Residents were asked to identify the locations of friends, acquaintances, and family members living on their street using an aerial photograph provided. (see Appendix D) Figure 4.6 graphically demonstrates the outcome of this exercise, in the format of Appleyard's original social diagram. (see fig. 2.1)

Table 4.2 Comparison of research findings with original study by Donald Appleyard

	LIGHT STREET		MEDIUM STREET		HEAVY STREET	
Study	SF	Bristol	SF	Bristol	SF	Bristol
Traffic Volume	2,000	140	8,000	8,420	16,000	21,130
Avg. # Friends	3	5.35	1.3	2.45	0.9	1.15
Avg. # Acquaintances	6.3	6.1	4.1	3.65	3.1	2.8

Results confirm the effect identified by Donald Appleyard's original study- that as traffic volumes increase, the average number of friends and acquaintances decreases (no one reported family members living on the same street). The average number of friends reported on LIGHT street (5.35) was greater in the Bristol study than in the original San Francisco study (3.0) (see table 4.5). This difference could be attributed to the much lower traffic volume of the LIGHT street selected for this research, compared with Appleyard's study (140 vs. 2,000 vehicles/ day). Otherwise the average numbers of acquaintances reported on the LIGHT streets were remarkably similar (6.3 for Appleyard vs. 6.1 for Bristol). This could indicate a natural level of community interaction when levels of traffic are low. In the same way, the average number of friends and acquaintances reported on HEAVY street was similar to that found by Appleyard, indicating a possible "subsistence" level of socializing on residential streets burdened with heavy traffic.

Community Interaction on Three Bristol Streets

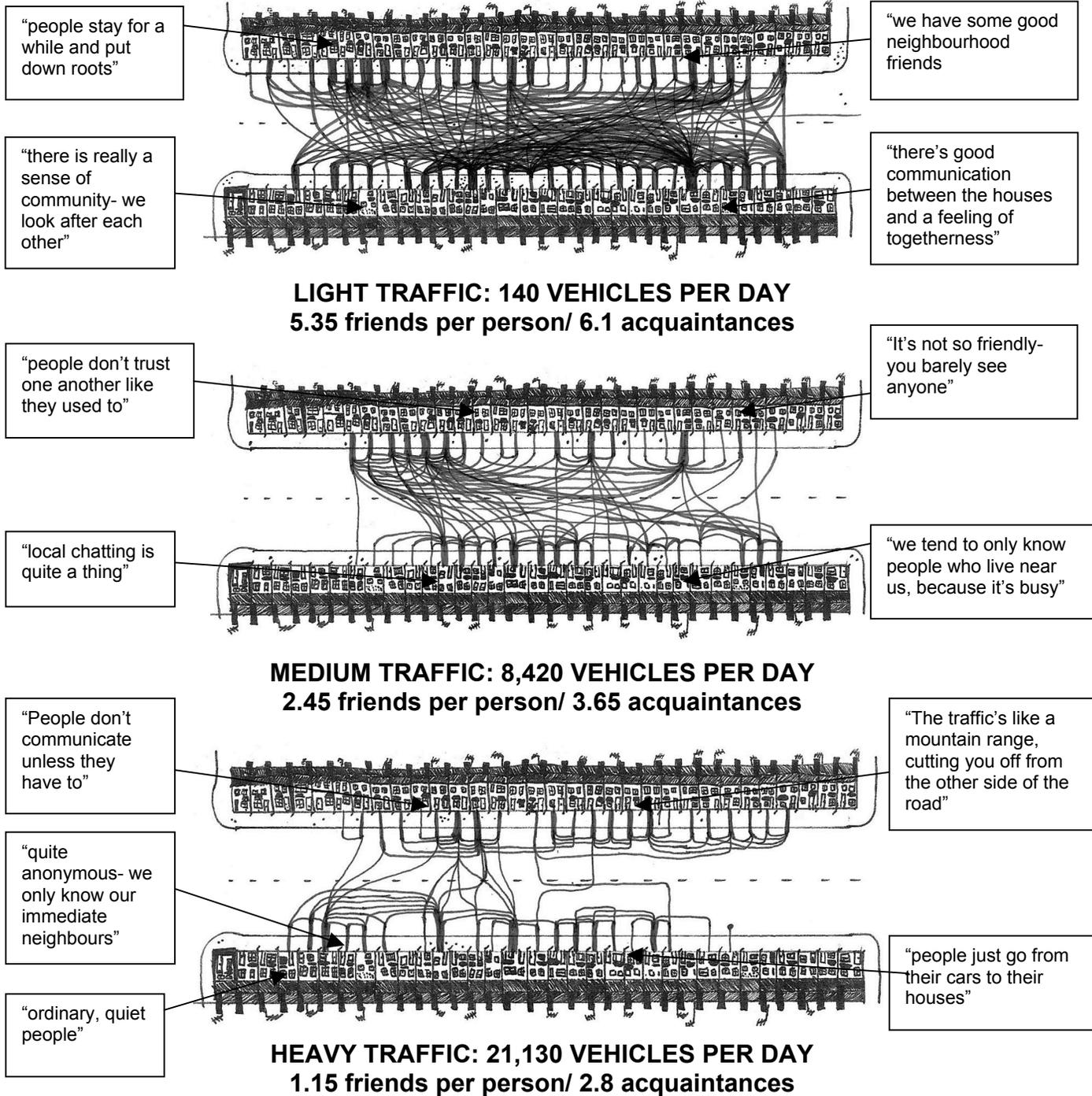


Figure 4.6 Community interaction on three Bristol streets: lines represent friendships or acquaintances, dots represent where people are said to gather and chat.

What are the mechanisms behind traffic's apparent erosion of social capital? First, activities that lend themselves to social interaction- such as gardening and sitting outside- are especially vulnerable to traffic-related environmental impacts, particularly noise and air pollution. Second, as traffic increases, so does the barrier effect between opposite sides of the street- residents on HEAVY street often had to wait as long as 5 minutes just to cross to the other side. It is notable that the difference between the average number of social ties on HEAVY and LIGHT streets who were known across the street is far greater than those known on the same side. (see figure 4.7 and table 5.1 and refer to self-selection bias discussion in chapter 5) Finally, the threat of being hit and injured or killed by a car in the street environment not only discourages people from spending time there, but those who do may be more likely to be on the defensive, and less inclined to engage in a spontaneous discussion with a stranger.

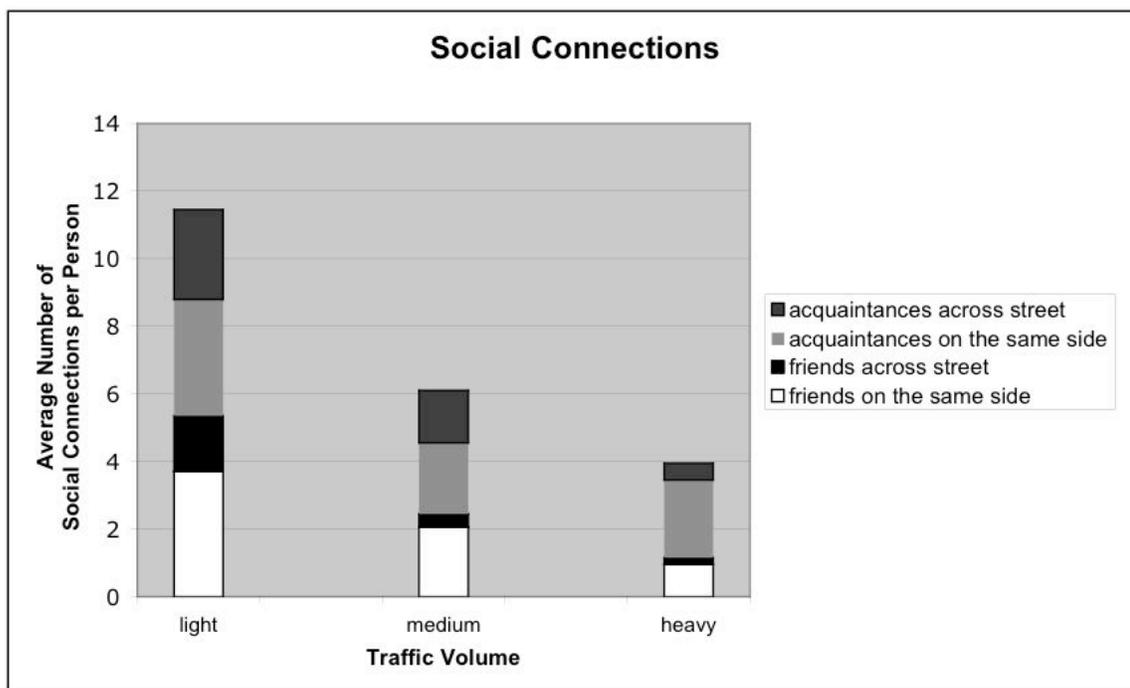


Figure 4.7 Average number of social connections: by street, type, and side of the street

Gathering Locations

After identifying the locations of friends and acquaintances living on their street, residents were asked to indicate places where they see people gather and chat on their street, if any. These are represented by dots on figure 4.6, and numerically in figure 4.8. Results show that residents on LIGHT street reported almost three times the number of gathering locations on their street, compared with MEDIUM or HEAVY street.

The number of gathering locations did not follow the pattern of social connections, however, with HEAVY street residents reporting slightly more social activity on their street than MEDIUM street residents.

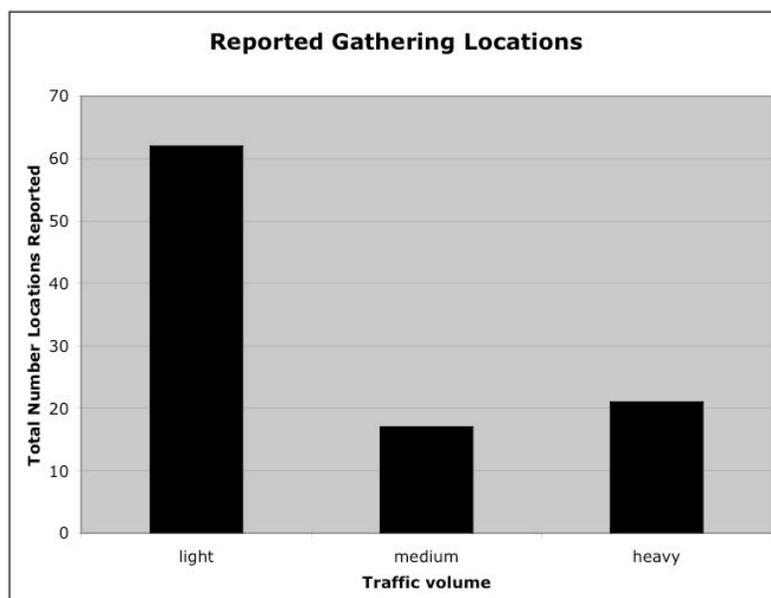


Figure 4.8 A comparison of the number of gathering locations reported

Home Territory

Next, on the same aerial photograph, residents were asked to draw their 'home territory.' Home territory was defined as the "area over which you feel you have a sense of personal responsibility or stewardship." (Appleyard, 1981) An analysis of the results from this exercise can be found below, in figure 4.9. Single diagrams of each street showing the results from all 20 residents are included as figure 4.10. As Appleyard also found, many of the residents on LIGHT street defined their home territory in broad terms, with half the residents including at least some part of the street itself and over half including other people's homes within their own 'home territory,' a strong indicator of community, and the presence of a sense of shared responsibility over the neighbourhood. In comparison, on the HEAVY street, only 2 out of 20 street residents included other people's homes within their 'home territory' and only 1 out of 20 included the street itself.

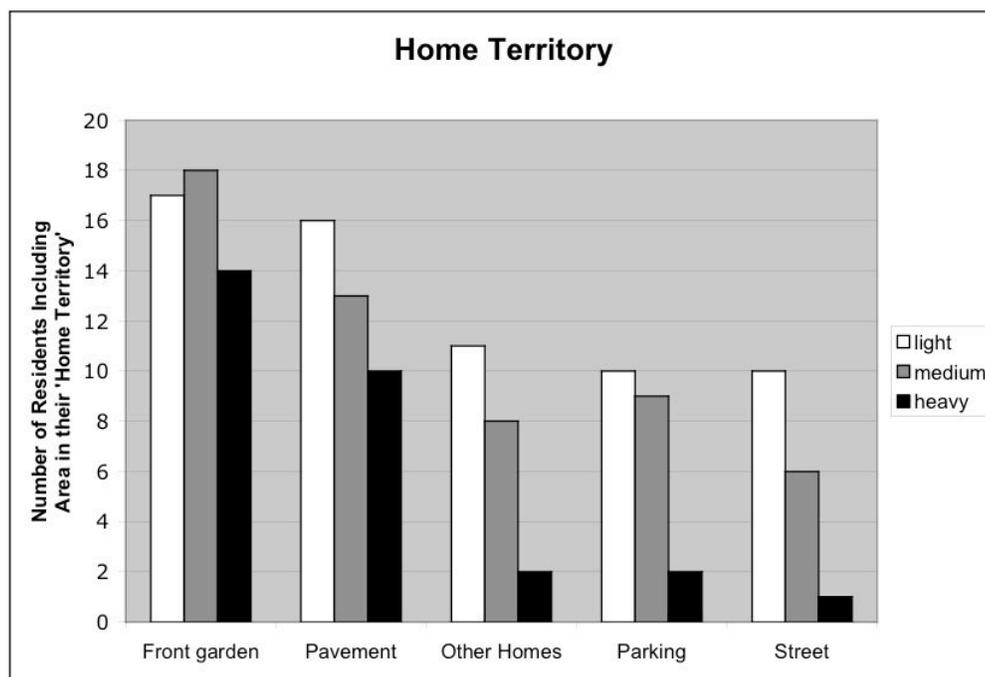
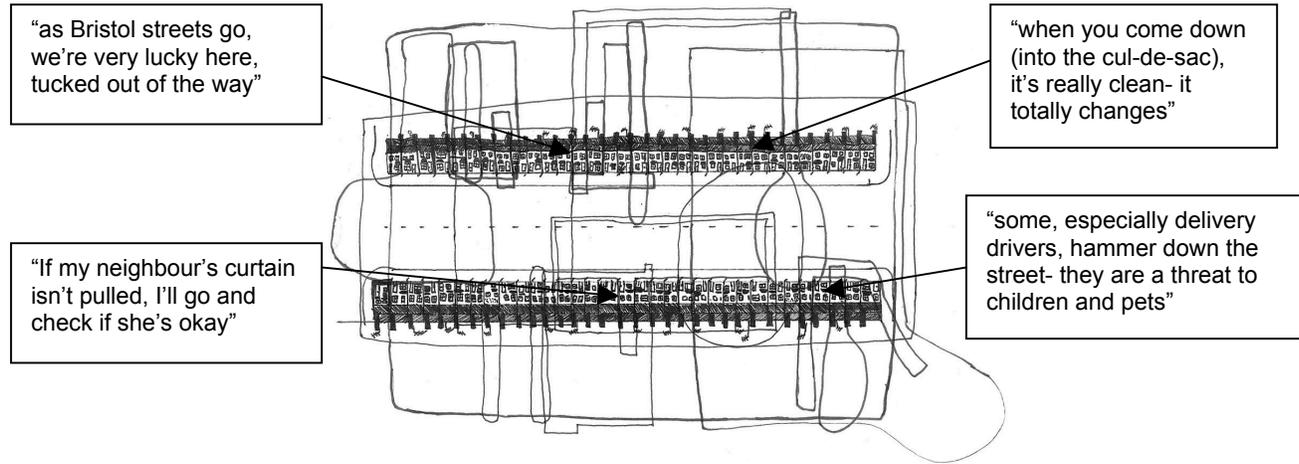


Figure 4.9 Extent of residents' 'home territory'

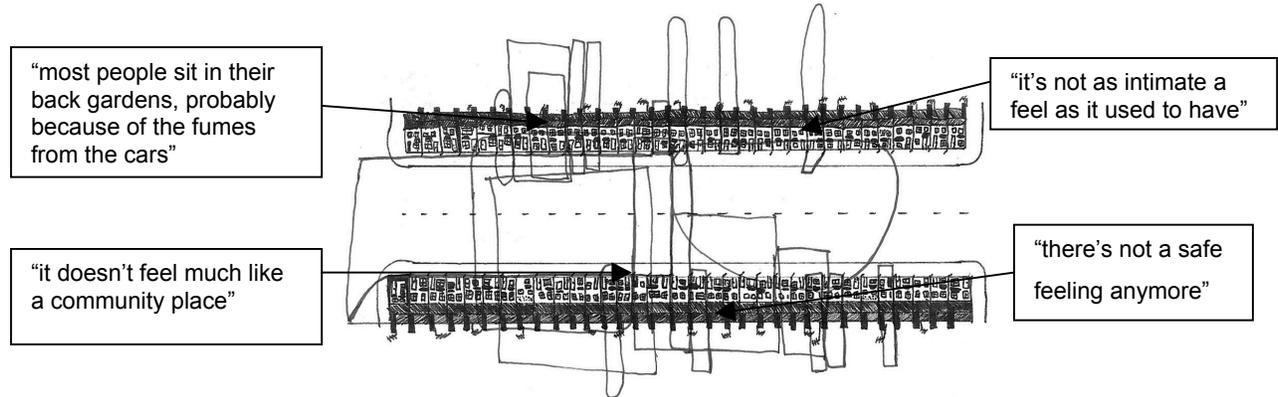
Possible explanations for higher traffic volumes eroding the size of home territories include the following:

- 1) Because people spend less time on the street, due to the aforementioned environmental deterioration, they have less direct personal experience and memory of the specific aspects of the street, and identify less with them.
- 2) Because they spend less time on the street, they know fewer people and thus feel less responsibility for the areas near others' homes, as they remain strangers.
- 3) Aside from the specific environmental impacts of cars, having several thousand people pass the front of one's house everyday likely has some effect of narrowing individual territory as the street enters the larger public domain, as many use it as a thoroughfare on their way to somewhere else.

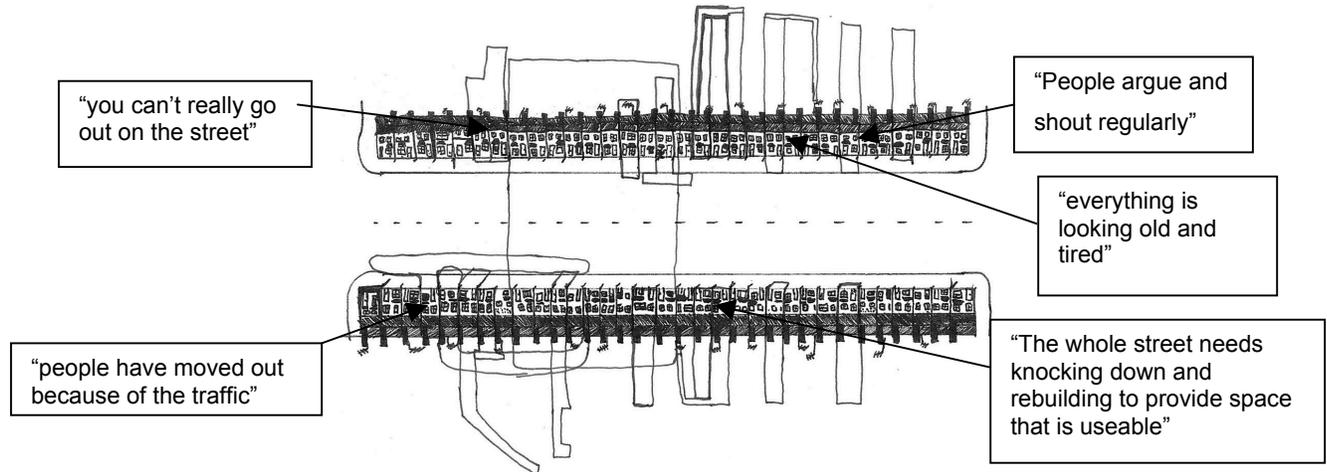
Home Territory on Three Bristol Streets



LIGHT TRAFFIC: 140 VEHICLES PER DAY



MEDIUM TRAFFIC: 8,420 VEHICLES PER DAY



HEAVY TRAFFIC: 21,130 VEHICLES PER DAY

Figure 4.10 Residents were asked to draw their home territory (the area over which they felt a sense of personal responsibility or stewardship) on an aerial photo of their street.

CHAPTER 5: DISCUSSION OF RESULTS

This study has confirmed the primary findings of Appleyard's original research- that higher levels of automobile traffic have a considerable negative impact on the social and physical environment. Put into context with the large body of research carried out since his death in 1982 that has documented the severity of these impacts, a bleak picture emerges of a growing deterioration of the quality of life, especially along major roads. As was reported in the original study (Appleyard, 1969), these impacts take a particularly heavy toll on children and the elderly, who are not only particularly vulnerable to all the local impacts of traffic in their neighbourhood, but are often dependent for their mobility (and ability to escape the impacts of vehicle traffic) on adults with a driver's license and access to a car. (Jain & Guiver, 2001)

Self-Selection Bias

There has been criticism of the original Appleyard study that it failed to take into account the bias of self-selection- that people who tended to be less social and for whom a close knit neighbourhood was less important tended to move into busy streets, whereas highly social people would choose quieter streets where there was a close knit neighbourhood. While it is probably true that those who are most sensitive to traffic choose to live away from it, and those who are already adapted to heavy traffic, or aren't particularly bothered by it are more amenable to living on a busier street, it's uncertain whether those who are more social will choose streets with stronger communities.

Yet the immediate effects of traffic on the street environment (where most incidental social contact occurs) are hard to deny. Air pollution makes it unpleasant to spend time on the street. The noise makes casual conversation much more difficult. The barrier effect of traffic creates impediments to freedom of movement. The threat of a crash causes parents to keep their children 'on a short leash,' and to forbid playing in the street. No matter the type of person living on the street, these factors will tend to hinder formation of community. Judging from the sixty interviews conducted along three Bristol streets, there are more important factors than traffic and social networks in determining residential location, including proximity to family and friends, price, neighbourhood characteristics, and availability of a garden. No studies that examine this topic specifically were identified during the course of this research.

When asked what factors influenced their decision to move into a particular house, it was clear that residents living on busy streets fell into four distinct categories:

- 1) people who didn't realize the amount of traffic on the street when they moved in, but had learned to adapt and 'live with it.'
- 2) people who didn't realize the amount of traffic on the street when they moved in, and were clearly suffering in their daily lives because of it.
- 3) people who did realize the amount of traffic on the street when they moved in, and were concerned but decided they could live with it in order to be able to afford other features they considered important (such as a large back garden).
- 4) people who did realize the amount of traffic on the street, but weren't at all bothered, or were already adapted to life on a street with a lot of traffic.

Clearly those in category 2, such as the father of the young girl on HEAVY street, who found life on a busy street intolerable, were either searching for a place to move, or were bound to the street by economic circumstances. These "trapped" residents are the ones who particularly suffer from heavy traffic flows. (Appleyard, 1981) The results of the traffic irritation question (figure 4.3) indicate that when asked to rate how much aspects of traffic bother them, levels of irritation on MEDIUM and HEAVY streets were very similar, despite a clearly higher level of environmental impact on HEAVY street. This could indicate a type of filtering effect, where those most irritated by traffic choose not to live on HEAVY street, or relocate as conditions become intolerable. This tendency demonstrates a self-selection of those sensitive to environmental impacts in their immediate environment, yet there is little evidence that this represents any more than a weak association with levels of sociability.

Table 5.1 Ratio of social connections between the light and heavy traffic street, illustrating the substantial barrier effect of traffic that inhibits formation of social ties across the street

	Same Side of Street	Across Street
Acquaintances	.667	.189
Friends	.257	.121

There is also evidence from the interviews that the reduced numbers of social connections found on MEDIUM and HEAVY streets are a direct result of traffic volumes, not reflections of the type of people living on those streets. If the primary influence on

street-level social capital is the personality of those living on the street, one would expect to see a uniform decline in the number of social connections on both sides of the street, as the primary influence on social ties would be internal, not external. However, in comparison with the light traffic street, the number of friends living across MEDIUM, and especially HEAVY streets, fell to a greater extent than would be expected if traffic were not a factor. (see figures 4.6 and 4.7 and table 5.1) The number of acquaintances in particular fell precipitously, indicating that traffic has a devastating effect on the formation of the type of relationships that are typically formed during casual and incidental interactions on the street.

Political Solutions to the Traffic Crisis: Views from the Street

Many of the people living along the three streets in Bristol volunteered their own ideas on what communities and the government can do to reduce the vehicle-related impacts that continue to affect their lives. Though some were fatalistic about the traffic, believing that it will continue to worsen whatever is done, others expressed a deep-seated desire to see things change: “I think there should be less traffic” said one woman.

People frequently voiced support for viable alternatives to the car, such as improved public transport, which is of notoriously poor quality in Bristol. A woman living on the medium street suggested that “it’s just one of the things of modern life- no one ever puts a viable alternative forward. They say use public transport but the buses are so awful. They’re expensive and unreliable. They need to be made more reliable and cheaper for them to be a viable option for people.”

Others were more specific about the improvements they would like to see in the public transport services offered. A single man who owned a car, but also cycled to work, said, “I’d be happy to have a bus service to the railway station, not just to the centre.”

A couple in their late 30’s who lived on LIGHT street noted the impacts of a warming climate on the burgeoning rodent population under their rear deck, were angry at the government for failing to do enough to reduce traffic and its associated emissions, suggested that the government incentivize travel by non-motorised modes- they “should give cyclists 10p per kilometre for travelling without emitting CO2.”

One man had just returned home to HEAVY street from his job maintaining the motorways and told about having to clean up a particularly gruesome car crash on the M5. He expressed a deep-seated desperation about the conditions they were living in, clearly sensing something in their lives was badly awry, yet seemingly not able to imagine a life without the misery of constant traffic. His suggestion for how to improve the quality of life in the neighbourhood was that “the whole street needs knocking down and rebuilding. There needs to be more space that is useable.”

Others who were specifically concerned about the threat of speeding cars, said that “(HEAVY street) needs speed cameras on it.”

One man told me that the solution to Bristol’s transport problems is to “take everyone else’s car off the road except for mine” as he needed his car to go for walks in Severn Beach “where the air is clean.” This is a good example of the dilemma that transport planners and politicians face when they attempt to address problems caused by auto traffic.

There was hope however- even on the heavier traffic streets- of a shift in personal travel behaviour: “I sold my car a month ago- I just didn’t need it anymore,” said one woman.

Reversing The Vicious Cycle of Car Dependence

“Cars not only create environmental problems and social exclusion but progressively re-order time and spatial relations, committing society to a spiral of ever more car use.”

-Juliet Jain and Jo Guiver, *Turning the Car Inside Out*

It seems that individuals would like to maintain the level of mobility they are accustomed to, while avoiding the negative impacts of other’s mobility. In other words, we want to be able to drive through other people’s neighbourhoods- we just don’t want anyone driving through our own. (Patton, 2007) Most of us want the best of both worlds. We want to live in a safe neighbourhood free of noise and air pollution. We want to be a part of a healthy local community with many friends and acquaintances. We want to live in a world without the threat of potentially catastrophic future climate change. Yet we still want to retain unlimited automobility, and perceive

any attempt to reign in the ever growing traffic as a restriction on our personal freedoms- even our quality of life (Steg and Gifford, 2005). Yet obviously it is impossible to have both mass unfettered mobility and a quality environment. The “freedom” promised by the automobile has clearly been “muted by its’ mass use.” (Jain & Guiver, 2001)

While most of the participants in the survey were aware of and forthcoming about the negative impacts of traffic on their lives, they very seldom mentioned these impacts in connection with their own driving behaviour. Most of those interviewed considered traffic levels on their street to be fixed and immutable, like the weather (though as it turns out, this too is being affected by road traffic). One woman, a 38 year resident of HEAVY street, when asked “on a scale from 1-10, with 1 being not at all, and 10 being severely, please rate how much the following disturbs you,” initially labelled air pollution a “one.” When asked about it she said, “well you can’t do anything about it so why worry about it.” I replied that the point of the question was to ascertain the level of irritation she experienced from air pollution. Whether or not it was possible to affect the source of the irritation was not the issue. She changed her answer to a “ten,” revealing her severe irritation with the polluted air around in and around her house, an irritation she had seemingly repressed as she felt it was inevitable, and nothing could be done to change it. In another example, a woman living on MEDIUM street described the traffic on the street as “horrendous,” yet took an average of 18 car journeys every day in spite of her distaste with others’ driving. It has been observed that most people inhabit multiple roles in the transport world: “people are not even consistent from hour to hour- it is notorious that a person at one moment, when driving, can be intolerant of pedestrians, but a few minutes later, as a pedestrian himself, can fulminate against pedestrians.” (Buchanan, 1963)

One older lady living on LIGHT street seemed to recognize the addictive properties of the car: “I’m glad that I didn’t get a car because I’d be dependent on it now. *Some of my friends would rather go without food than give up their car.* I value my independence too much.”

Recommendations for Further Study

Further enquiry is needed into several aspects of theory that this research touches upon. For example, how do traffic volumes interact with residential relocation? A

study using longitudinal research could track individuals over several years to determine the answer. In addition, inquiries into the specific nature of the interaction between residential traffic volumes, perception of safety, and the likelihood of using active transport- an effect observed in this study, and in Australia- (Timperio et al 2004) would be useful to policymakers looking at encouraging greater transport related physical activity. For example, is speed or traffic volume the dominant influence on safety perceptions? Research is also needed to determine whether there is a greater localization of street-based social networks on busier streets, as was observed in this study.

It has been postulated that heavy traffic volumes affect the mood of people spending time on the street. Future studies could examine to what extent the presence of traffic affects emotional responses that are critical to formation of new social ties.

Finally, it has been noted that the physical presence of people socialising in the street is often enough to slow (and/ or discourage) traffic on a residential street. (Engwicht, 2005) Studies are needed to measure this effect, and inform future policies affecting our residential spaces.

CHAPTER 6: POLICY RECOMMENDATIONS

“no person confronted with the issues, from accidents to visual intrusion, and burdened with the responsibility of deciding upon them, could do other than conclude that they are indeed very serious matters.....society will have to ask itself seriously how far it is prepared to go with the motor vehicle.”

-Colin Buchanan, *Traffic in Towns*, 1963

If the increase in car traffic isn't simply the inevitable, yet mundane annoyance of modern life it seems to be on the surface, but is in fact a crisis of deepening proportions, it is the responsibility of all of us, and especially our political leaders, to set ourselves on a new trajectory toward a sustainable future. If we fail, we will have created a world of “mutual detriment and significant loss where everybody suffers.” (Whitelegg, 1997)

We must address the traffic crisis not by simply strengthening adaptations, but by seeking overall reductions in traffic across the board so that many of the adaptations outlined in chapter 4 (that are often damaging in their own right) are no longer needed. Significantly reducing the number of cars in the industrialised world may seem like a

utopian dream divorced from reality, but it's important to remember when the automobile was introduced in the late 19th century, "many argued that it posed a danger and a nuisance, and as such should be denied the use of the public streets." (Southworth & Ben-Joseph, 1997)

One of the reasons why there hasn't been more of an outcry about traffic is the gradual nature of its growth, over the past several generations. In *Livable Streets*, Appleyard (1981) discusses how creeping traffic volumes create a "target for resentment (that) is elusive and unclear" as opposed to a new motorway where the target is clear and identifiable. Whereas both may have huge impacts on the environment, often only the latter will prompt protests.

This section will examine how to mend the stagnant politics and stale discourse surrounding transport, and how new policies can restore civility to public places, improve urban and rural environments, and ensure a reversal of the steadily eroding quality of life in most of our towns and cities.

Transport Policy and Changing Travel Behaviour

Since the 1998 publication of the UK Government's white paper, *A New Deal for Transport* (DETR, 1998), much has been made publicly in the UK about the need for 'sustainable transport.' Yet since then, traffic has continued to grow, fuelled partially by new and widened roads, despite evidence that expansion doesn't just accommodate existing motorised travel demand, but induces new demand, above what would have been expected without the additional capacity. (SACTRA, 1999)

Taking this evidence into account, a moratorium should immediately be placed on the construction of new or expanded roads. In addition, policies must be enacted that ensure a shift of public investment from prioritising the car to a coordinated plan that will promote quality, accessible networks that favour cyclists, pedestrians, and public transport users, especially linkages between these modes.

The importance of a balanced transport policy that discourages further growth in automobile use is acknowledged at academic as well as policy-making levels. However, the challenge has been overcoming the public perception that any government led efforts to reduce car use- such as attempted increase in the petrol tax

in 2000 and recent proposals to implement a national road charging scheme- constitute an attack on the rights of the oppressed car user. If the worst of the effects of mass car use are to be curtailed, government and advocacy organisations need to do a much better job at putting such a shift in policy into context when communicating the issues to the public. Too often, the dominant discourse surrounding the issue of car dependence treads lightly so as to avoid 'offending' drivers. The issues, however, are too important not to be alarmingly explicit in their directness. It's important to remember that criticism of our damaging system of car dependence is very different from criticism of the individual driver, who makes travel decisions within a context shaped by mutual expectations, social norms, and the reality of present land uses. The public needs to understand that they stand to gain far more from the new transport policy agenda than what they will lose. A clear vision of these gains must be articulated.

Information Provision

The power of information should not be underestimated. Individualised social marketing programs that simply disseminate information about the availability of public transport, walking and cycling, have been shown to result in up to a 20% reduction in driving. (Ashton-Graham et al, 2002) Especially when carefully targeted, efforts to change transport behaviour through knowledge sharing can be very effective. (Socialdata and Sustrans, 2004)

If any attempt at reforming transport policy is to be successful on the broad scale necessary, it is crucial to inform the general public not only about bus timetables and cycle networks, but also the truth about the impacts of car use, a truth that is not widely known at present. (Steg and Gifford, 2005) Though they are likely to be fiercely resisted by entrenched interests in the auto and oil industries, government funded public awareness campaigns should begin to discourage driving just as they do smoking.

Provision of information can only go so far, however. The real prize is to make car-free transport appeal to people's concern with their self-image. Studies have found that driving behaviour is far more influenced by social norms, emotions, and vanity than actual need, despite what people say. Linda Steg (2005) found that while most people offered mainly practical excuses for their driving behaviour, the symbolism of

driving (perpetuated by the media) and the emotional attachment to the car is far more influential in determining one's travel choices.

While any attempt to “get people out of their cars” will be met with some resistance, especially by people not familiar with the reasons why this is necessary or desirable, the transition need not be disruptive as long as the process is started soon. In reality millions of people are “getting out of cars” every year while millions more are “getting into cars,” representing a continuous “churn” of the population's travel habits.

(Goodwin, 1999 as cited by Chatterjee, 2001) We need to ensure that our transport policies end up increasing the former while decreasing the latter. Over time this “asymmetric churn” will result in a significant effect on traffic volumes. (ibid)

Parking Policy

Enacting policies that affect the price and availability of parking is one of the most effective tools with which to manage levels of traffic in an urbanised area. There is evidence that it can have an even greater influence on modal choice than provision of public transport. (DfT, 2001) Urban planners increasingly point to the bountiful supply of free parking in many areas and the fact that parking is often kept outside the model of market economics, as factors that contribute to high levels of car dependence.

(Shoup, 2005) In addition, most “free parking” at supermarkets, shopping, and employment centres is not actually free but is included in the products that are bought, or is deducted from employee payrolls, penalizing those who walk, cycle, or take public transport, while rewarding car drivers. (ibid) Requiring retail centres and employers to charge for parking are essential policies needed to rebalance the transport equation. Overall parking supply also needs to be constrained, as excessive levels have been described as a “fertility drug for cars.” (ibid)

One example of how to push “churn” in a positive direction can be found in the plan to gradually limit the parking supply in Copenhagen's city centre, which avoided the kind of disruption to accessibility that could have triggered a political backlash. Since cars were banned along the city's main shopping street in 1962, the city has reduced the amount of parking in the area by 2-3% per year, while investing in the quality of public spaces, and boosting public transport provision. Over the past several decades, this policy has effectively improved urban livability and widened travel choices, yet the reduction in parking was hardly noticed, as it happened so gradually. (CABE, 2002)

Whether there is time left for such gradual and gentle policies, however, remains to be seen.

Street Design

While there is strong evidence that the price and availability of parking and road space, as well as information provision can affect modal choice and thus overall traffic levels, there is increasing evidence that the physical residential environment has a major ability not only to influence driver behaviour but also impact individual travel choices. (Giles-Corti & Donovan, 2002)

It is fitting that a large part of the solution can be found where the impact of heavy traffic is often the worst, but also where the traffic begins every day- along the residential street. A transformation of residential neighbourhoods themselves- from polluted, dangerous thoroughfares to quality environments directly outside one's front door can- in and of itself- encourage walking and cycling, and discourage driving. (Killingsworth et al, 2003)

The key challenge for policymakers is to attempt to maximise livability by reducing motorised traffic volume and speed through residential neighbourhoods while preserving accessibility and modal choice. Any solution proposed must take into account the circular and reinforcing effect of motorised travel on wider travel choices.

Research indicates that physical traffic calming measures such as chicanes, street narrowing, and tree planting can not only slow down existing traffic and reduce overall traffic volumes- they can also significantly boost the number of non-motorised trips taken. (Morrison et al, 2004) It is these virtuous cycles government policies need to begin to encourage, not the vicious cycles of car dependency that have led to polluted air and noisy, dangerous, anonymous neighbourhoods. Thankfully, at least in the UK there seems to be progress toward a consensus around these issues. Planning guidance published by the government in 2001 states that "people should come before traffic." (DfT, 2001) The new Manual for Streets, published in 2007, proclaims that "for too long the focus has been on the movement function of residential streets. The result has often been places that are dominated by motor vehicles to the extent that they fail to make a positive contribution to the quality of life." (DfT, 2007) It remains to be seen the extent to which these words are reflected in the built environment in coming years.

Shared Spaces

A number of theorists have placed the blame for our hostile streets on a planning code that fails to distinguish between the highly predictable world of the highway, and the urban places where people live, work, and play. (CABE, 2002) They have argued for a new design “language” that seeks to explicitly differentiate between these two worlds, conveying appropriate behaviour to drivers not through signs and regulations but through an “enhanced sense of place.” (Hamilton-Baillie, 2004) These ‘shared space’ principles have been implemented in many European cities and towns, improving livability while retaining accessibility. The concept, advanced by urban designers such as Hans Mondermann from Friesland in the Netherlands, involves eliminating signs, boundaries, and barriers that seek to separate pedestrian and automobile spaces in urban areas. Although it is counterintuitive, by actually decreasing the degree of *perceived* safety, it is possible to influence the degree of care that road users exercise when in conflict with each other, and increase the degree of *actual* safety. (Hamilton-Baillie, 2004) By requiring that all road users think for themselves and react to their environment instead of blindly following the lines, the implementation of shared spaces in urban areas can improve safety, reduce congestion, and allow a new level of accessibility for those on bike or foot. Hans Mondermann says, “Never treat drivers as idiots! We know from teaching that treating children as idiots prompts idiotic behaviour. And idiotic behaviour from drivers kills people!” (ibid)

The implementation of shared space concepts alone can do much to tame traffic, but will likely do little to reduce it. Enter the concept of “filtered permeability,” (Melia, 2007) a recently coined term but an old concept- originally applied in the cul-de-sacs of the Garden city movement of the early 20th century, where bicyclists and pedestrians retain full access to the street network, while cars are restricted by bollards at certain junctions. This concept, which designs a non-motorised advantage into the built environment, has been applied in many Dutch and German residential neighbourhoods as well as bicycle boulevard networks in Palo Alto and Berkeley, CA (where Donald Appleyard was involved in the planning of the project).

The Woonerf and Livable Residential Spaces



Photo Courtesy Ben Hamilton-Baillie

When applied in a residential context, the idea of shared space can open up new possibilities for urban living, especially the liberation of previously traffic bound areas for children's play and adult socializing and conversation. The need to make residential spaces safe places again is urgent, as children are most often hurt or killed by cars in residential areas. (Bristol City Council, 2000) Referred to as 'home zones' in the UK, 'woonerven' (literally 'living yard') in the Netherlands, 'rehov meshulav' (integrated street) in Israel, and 'unified street systems' globally (Southworth and Ben-Joseph, 1997), these spaces allow pedestrians to retain priority within their immediate residential environment, while cars are welcome if they travel at a walking speed. The design factors that make up a woonerf often include narrowing of the right of way, elimination of long sight lines and curbs, installation of rough surfaces (often using paving stones), and introduction of street furniture such as planter boxes and benches. These techniques, when applied collectively, have been shown to reduce traffic volume and speeding (Janssen, 1991), improve safety (Badland & Schofield, 2005), increase children's play (Eubank, 1987 as cited by Ben-Joseph, 1995), increase pedestrian activity (Morrison et al, 2004), and enhance a street's social capital. (Ichikawa, 1984, as cited by Southworth & Ben-Joseph, 1997)

Woonerven (the plural of woonerf) were pioneered in the Netherlands- the first ones appearing in the City of Delft in 1969, the same year that Donald Appleyard's neighbourhood traffic study was first published. These "outdoor living rooms" were inspired by *Traffic in Towns*, the seminal work written by the British urban planner Colin Buchanan, who is still referred to by the Dutch as the "father of traffic calming." (Southworth & Ben- Joseph, 1997) Since then, woonerven have been installed

extensively throughout the Netherlands, spreading to Germany, Sweden, Denmark, Israel, Japan and finally in 1999, (30 years after the original woonerf) to the UK.

There is significant potential- in the UK and especially in the US- to significantly expand the application of home zone treatments to existing residential areas, and require that developers of new housing adopt this type of street as the norm. Two major barriers to enactment of these policies are public perception and the fear of local government of liability as a result of departing from commonly accepted street standards. (CABE, 2002) Updating these standards would allow local governments the flexibility to introduce unified street systems without fear of litigation. Local opposition to the establishment of home zones is associated with a lack of knowledge about these types of streets. (Southworth and Ben-Joseph, 1997) Changing the perception of home zones from a quirky experiment in street design into a potential major strategy for traffic reduction and quality of life improvement is a prerequisite for their wider application. From research carried out in the Netherlands however, it is evident that residents are willing to live with reductions in automobile access in exchange for an enhanced residential environment. (Kraay, 1985)

Legal Measures

Updating laws to reflect a new priority on quality of life and urban livability is another strategy for addressing the traffic crisis. As discussed in chapter 2, vehicle speed is a major cause of pedestrian and bicyclist injuries, as well as being a deterrent to these forms of active transport. Since 1999, local authorities in the UK have had the flexibility to implement the 20mph speed limit outside of “main traffic routes” without obtaining the consent of the secretary of state. (DfT, 2006) Research indicates a 56% reduction in the number of killed or seriously injured on streets in London that have implemented a 20mph limit. (Webster & Layfield, 2003) Portsmouth is the first town in the UK to exercise this option on all non-arterial roads. (Portsmouth City Council, 2007) A 20 mph speed should be set at the national level for all residential streets, and strictly enforced. This policy has already been adopted in Scandinavian countries (Whitelegg, 2007) and will do much to make cycling and walking safe, attractive options.

In much of mainland Europe, pedestrians and cyclists have special legal rights on the road that are denied them in the UK and the US. These laws place the burden of responsibility upon the motorist in a collision, thus increasing the caution exercised by

drivers, and the confidence and safety of cyclists and walkers. This legal protection contributes to the bicycle's major role in individual transport in those countries, consisting of up to 57% of all trips (in Groningen, Netherlands). (Fietsberaad, 2006)

While laws can be passed and enforcement of those laws increased, ultimately the most powerful form of enforcement is social pressure from one's peers. These new laws must be grounded in a large-scale public discussion and debate, just as the smoking ban came about. A consensus is needed if these laws are to be effective, as justification and understanding leads to social enforcement, and formation of new behavioural norms. (Hamilton-Baillie, 2004)

Planning Codes

In addition to upgrading traffic law, planning codes should be strengthened to improve local quality of life, and reduce the need to drive. Such changes could include requiring that new residential developments face onto a low traffic area that will promote social interaction, locating new developments only in close proximity to shopping, schools, and other frequently needed destinations, and ensuring they are well served by public transport, cycling and walking routes so that a car is not a daily necessity. (Barton, 2003) Employment centres should be located within the existing urban fabric and in close proximity to public transport stops or stations. These types of compact land uses are associated with lower levels of car use, and improved air quality. (Frank et al, 2000)

Final Word

"Like the smoker, we cannot know for certain what course our dependency might take. Society may still continue to function for another forty years with its growing dependency on mobility. Yet we know that to do nothing about our dependency equates to taking a risk with the health of society. We also know that to do too little too late could result in sealing our fate."

-Glenn Lyons (2003)

This study provides a small snapshot of the social and environmental impacts of vehicle traffic on three streets in one neighbourhood in Bristol UK. But of course the presence of vehicle traffic is a nearly universal aspect of modern life, especially in the industrialised countries, but increasingly in the developing world as well, which is motorising faster than the industrialised countries ever did, often without awareness of,

or attempts to mitigate the worst of the repercussions of this policy. The current situation is bad enough. The bigger threat is what's to come if transport policy continues on its current trajectory: significant amounts of additional traffic being added to streets that are already suffering from the effects of existing vehicle numbers- light streets becoming medium streets, medium streets becoming heavy streets, and heavy streets becoming very heavy streets, with all that these increases in traffic entail for the erosion of environmental quality, health and safety, loss of community, and stability of our climate. We cannot drive blindly into this future.

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Appendix A: Traffic volume calculations for three
study streets

Dovercourt Road- Light Traffic Street

Manual count carried out Monday, March 2 2008 0830-0930 100m south of junction of Dovercourt Road and Downend Road: **13** vehicles

13 x 8.55 (expansion factor derived from...)

Lockleaze Rd. Bristol 12 hour count (3542)

Lockleaze Rd. 0830-0930 count (**414**)

= **111.22** (12 hour count)

111.22 x 1.236 (12 to 24 hour expansion factor derived from Bristol City Council Planning Transport and Development Directorate's 1997 seasonal variations and expansion factors for traffic counts table 4)

= **137.47** rounded to nearest 10=

= **140**

Dovercourt Road adjusted traffic count: 140 vehicles/ 24 hours

Filton Avenue- Medium Traffic Street

12 hour count of 2-way flow at junction of Filton Avenue with Lockleaze Road and Wessex Road, about 100m to the north of the study area: **6,810** (1 December 2004 Crossroads turning count obtained from Bristol City Council transport division)

6810 multiplied by **1.236**

= **8417.16** rounded to nearest 10:

= **8,420**

Filton Avenue adjusted traffic count: 8,420 vehicles/ 24 hours

Muller Road- Heavy Traffic Street

12 hour count of 2-way flow north of Shaldon Road, about 700m south of the study area, under the railway line: **17,092** (20 May 2004 Bristol Link Census obtained from Bristol City Council transport division)

17,092 multiplied by **1.236**

= **21,125.712**

rounded to nearest 10:

= **21,130**

Muller Road adjusted count: traffic count: 21,130 vehicles/ 24 hours

Appendix B: Notification letter distributed to
residents along study streets



February 28, 2008

Dear resident,

My name is Joshua Hart, and I am a postgraduate student studying at UWE's Faculty of the Built Environment. I am writing my dissertation on the topic of neighbourhood life and how it can be improved.

Your street has been selected to be part of our research project. The results of this study will help residents and local government make decisions that will improve our neighbourhoods.

We're asking you to participate in a short interview during the first two weeks of March which will seek to gather your thoughts about neighbourhood life. I will be knocking on doors over the next few days, during the day and in the evenings.

I would be very grateful if you could find the time to participate in this survey. The information you provide will remain anonymous and will help to improve quality of life for you and your neighbours. If you'd like to schedule a specific time to be interviewed, or have any questions, you can contact me preferably via e-mail at streetlifestudy@yahoo.com or on Bristol 0117 330 9524.

Again, thank you for your help with this important research.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Hart', is written above the printed name.

Joshua Hart
Msc student, Built Environment

Appendix C: Interview schedule

Address:

S: M F E: W B A L A: 1 2 3 4 5 6 7 8

NEIGHBOURHOOD SURVEY

- Hello- My name is Josh Hart, I am conducting a survey of neighbourhood life for my masters dissertation in planning.
- Did you receive the notice I put through your letterbox?
- Great, do you have a few minutes to answer some questions now?
- Or if now is not convenient is there a time I can come back?
- I want to assure you that your answers will be kept in the strictest confidence, and your name and address will not be attached to any of your responses in the final report.
- Do you have any questions before we begin?

1. Do you own your home or rent?

Own/ Rent

2. How long have you lived in this neighbourhood?

3. If you were to describe your street, what are the first 4 or 5 things that come to mind?

- i. Walking pets
- ii. People talking
- iii. Bike riding
- iv. Gardening
- v. Car washing
- vi. Playing with toys
- vii. Sitting outside
- viii. Car repairing
- ix. Parents supervising children
- x. Ball games, Frisbee, etc.
- xi. Jogging
- xii. Pavement sales (?)

5. I'd like to ask you about the people you know on this street. Here is a photograph of both sides of your street. Please identify the friends, acquaintances, and family members who live on your street, if any. Also, please indicate where, if anywhere, people gather on your street.

- H – Your Home
- G – Gathering Locations
- F -- Friend
- A -- Acquaintance
- M -- Family

6. Do you feel like you have sufficient privacy in your home?

7. Please show on this diagram where you consider your home territory (over what area do you have a sense of stewardship, personal responsibility?)

8. How many car journeys do you make on an average day?

9. How many cycling or walking trips do you make on an avg day?

10. What are the most stressful aspects of living on this street? <open-ended question- follow up>

11. On a scale from 1-10, with 1 being not at all, and 10 being severely, please rate how much the following disturb you:

- a. danger from traffic
- b. Noise
- c. Air pollution
- d. Trash and litter

12. Which of the following do you do because of air pollution and/ or noise: (yes, no, n/a)

	YES	NO	
	N/A		
a. Keep windows shut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Live more in back of house	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Forbid children to play on street	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Go out on street less often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Add heavy curtains, drapes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Accompany children to school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Fenced or walled in yard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Planted trees or shrubs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

i. Other

13. Does the traffic in your street bother you when – (Frequently/
Occasionally/ Never)

a. Tv watching

b. Walking in neighbourhood

c. Sleeping

d. Talking in house

e. Working in house

f. Eating

14. Do you have anything else you'd like to add regarding life on your street?

Appendix D: Interview aerial photographs

Dovercourt Road (LIGHT Street)



H – Your Home G – Gathering Location F – Friend A – Acquaintance M – Family

Filton Avenue (MEDIUM Street)



H – Your Home G – Gathering Location F – Friend A – Acquaintance M – Family

Muller Road (HEAVY Street)



H – Your Home G – Gathering Location F – Friend A – Acquaintance M -- Family

Appendix E: LIGHT Street interview notes

D01- White Female 73 living alone lived in house 47 years

-DescribeStreet: very quiet, quite neighbourly, nice and open at the back, open space

-Stressful Aspects of Street life: lack of amenities, lack of public transport to local shops. If I had to go into an old folks home, it wouldn't be in this area because of the lack of public transport.

-My house was built in 1949, most of the houses on even side of the street were built in late 1940's postwar. Most of the houses on the odd side of the street were built in 1930's.

-There used to be a post office 20 years ago at the corner of Bromley and Ashley Down Rd.

-The council was going to extend Petherbridge Way 25-30 years ago, but they ran out of money I think.

-Dovercourt Rd. was originally planned to go through to Muller Rd. That's why it's so wide.

-I have to walk all the way to the shops and the post offices on Gloucester Rd. As I've been getting older, it has become more difficult.

-The buses used to do a loop that would connect the residents here with the shops on Gloucester Rd. Now public transport is just set up to serve commuters, not the daily needs of those of us without a car.

-Some of the old people living in the retirement home at the end of the street have to pay some guy to run them to the shops.

-I'm glad I didn't get a car because I'd be dependent on it now. I shop at the top of the hill at the corner store. Some of my friends would rather go without food than give up their car- I value my independence too much.

-Life is geared toward car owners- which is fair enough- most people own cars.

-The street is saturated with cars.

-People have died, and the flats and houses are just 6 month leases now.

-The raid on the cannabis house at number 50 happened in early February 2008- it was a big event on the street.

-People look out for each other- especially for elderly people living alone.

-My daughter says she always misses Dovercourt Rd. because there was always something going on.

-It was annoying when there was a big fight to keep it open, cyclists are taking it over- you had to leap out of the way of motorbikes. Pedestrians are always expected to get out of the way.

-Since the pathway was used for over 25 years, local government must keep it open.

-As a pedestrian, when I walked through there, I am subject to abuse by cyclists- they threatened me.

-I moved in Dec. 1960. The end of the street were allotments. The retirement home was built on the site in 1975-76.

-Sometimes a car comes speeding down Dovercourt and they think they can get to Muller Rd.

-In 1977, there was a street party celebrating the queen's silver jubilee- everyone decorated their windows- it was a lovely time.

-There's a higher turnover now.

D02- White male living alone 73 years old, lived in house 48 years

DescribeStreet:

-When I first came here it was a family oriented street with lots of kids, now there are a lot of students and renters. Cyclists and motorcyclists use the pathway at the end of the street.

-Young guys stole the lead from my roof- I stopped them from stealing the lead from the neighbours' roof- there are a lot of problems happening just recently

-quite a friendly street- most people are friendly

-my wife lived across the street, we moved in here because it was close to her family.

Privacy- yes, but a bit concerned about the lane next door- someone tried to break in back door- I went out back and saw someone lurking around in the shadows- I tackled him, and he turned out to be a police officer.

Stressful- car parking, there is a lot of demand, the car is never available outside the house

-I walk to Gloucester Rd. frequently to keep fit.

-The bus station and all the diesel exhaust that come from it affects me.

-The railway noise doesn't bother me even if it comes 100 times, but the noise from cars bothers me, deliver vans, etc.

-The street has changed- lots of families, children have grown up, parents have died.

D03- White couple 30 years old, no children, lived in house 2 years

Describe Street: quiet street, long street, good car parking spaces, not very pretty, boring looking, nice

Enough Privacy?:

Stressful Aspects of Streetlife: not very many stressful aspects. Sometimes groups of teenagers are noisy around midnight. It's not really stressful at all though.

Other: The street is absolutely fine, there's quite a high turnaround on the street, which affects the social aspects.

There is variation in the houses as to how well kempt the gardens/ front of the houses are.

D04 White 15 year old male living with parents and sibling

Describe Street: friendly, (good) communication between houses, togetherness, safe area, less safe up the road, usually no trouble, not much traffic cause it's a cul-de-sac.

Enough Privacy? yeah

Stressful Aspects of Streetlife: mostly relaxed, not stressful

-Some taxis come late and make noise when I'm sleeping

D05 Black single mother of two, age 44

Describe Street: good street- alright, not a problem

Enough Privacy?: yes

Stressful Aspects of Streetlife: There aren't any activities for children, there are no parks nearby, the buses are rubbish, I waited at the bus stop for 1 hour and 5 minutes with my kids the other day.

Other: 7 year old is allowed to play in the street

D06 White married male 58 years old no children, 20 year resident

Describe Street: used to be alright- now it's gotten to be a tip. I can't get up and down the back lane (in the car). They're converting all the houses to flats. It's gotten a lot busier because of that. They block our driveway.

Enough Privacy?: yes

Stressful Aspects of Streetlife: finding out you have a drug factory down the street, noisy neighbours

Other: parking is a problem. Households that have four cars are a problem- they should park them out back (in the lane).

D07 White married female, 49 years old, 17 year resident

Describe Street: The street is relatively quiet as it's a cul de sac, residential area, fairly friendly, most people know other people

Enough Privacy?: yes

Stressful Aspects of Streetlife: people who come through the footpath, muggings and attacks, people breaking into rear garages, suspicious people, fires started

D08 White female, 18 years old, living with parents, lived on street whole life

Describe Street: quiet, spacious, road's really wide, friendly, clean

Enough Privacy?:

Stressful Aspects of Streetlife: noise, kids, young threatening teenagers, cars screeching around Downend corner

D09 White couple, late 30's with 3 young children, 4 year residents of the street

Describe Street: quiet, family homes (at least they used to be), friendly

Enough Privacy?: yes

Stressful Aspects of Streetlife: parking, because it's a wide road, if you don't live on the road, there's no dead end sign, so people come down too fast.

Other: We chose to live here because it's quiet. It's actually a really nice street. When you come down past Downend (where the traffic goes), it's really clean- it totally changes. There's some noise from the landscaping business, but not too bad. There are more rodents these days because of the warmer weather- climate is getting warmer, and they nest under the rear decking.

The government needs to require solar panels on new homes, provide better public transport. I take the bus into the centre of Bristol because of the lack of parking. The buses don't run when I go to work.

They should give cyclists 10p per kilometer for traveling without emitting CO2.

D10 Single white mother of young child living with sister, 26, 18 month resident

Describe Street: I thought it was pretty peaceful until my boyfriend got attacked/ mugged last week outside the house. They threw a rock through the door and hit the wall inside. Other than that, it's nice and quiet- there are friendly, mostly elderly neighbours

Enough Privacy?: yes

Stressful Aspects of Streetlife: a few cars come very quickly and threaten people in the street. The football matches are stressful- there's a lot of traffic that comes via Downend onto the upper part of Dovercourt, because it's near the stadium.

-My 2 year old darts out into traffic

Other: I like it because everyone's friendly and working class, not posh. Everyone knows each other.

D11 Widowed white woman, 70, 56 year resident of the street

Describe Street: always been a very neighbourly and quiet road. Not so much in the last 18 months.

-There are more asylum seekers these days. People bought houses to let and to convert to flats.

-People on the street have always helped each other- in times of illness, etc.

Enough Privacy?: yes

Stressful Aspects of Streetlife:

-There's not enough parking. I don't have a car, but my daughter can't park when she comes to visit.

-The speed they drive up and down- even worse because it's quiet

-If you're walking, the boys on bicycles- a boy on a bike nearly ran me down the other day.

Other:

-There are only about 3 children on the street.

-I can't hear the traffic

-It could be worse. As Bristol streets go, we're very lucky here, tucked out of the way, it's better than Downend Rd. (busier street around the corner)

-The street has changed dramatically in the last 10 years. It used to be very family oriented- kids played in the street- there weren't so many cars.

-Now it's deserted during the day.

D12 Single white male, 31, 3 year resident of the street

Describe Street:

-It's quiet, clean, not safe enough, well-served by bus, too far from shops, chaotic when there's a Rovers match

Enough Privacy?: yes

Stressful Aspects of Streetlife:

-don't think there's anything stressful- there's no noise, sometimes there are not well lighted areas

Other:

-Sometimes train noise is heard, especially when the wind blows in the right direction

-The recycling center or whatever it is causes some pollution.

-We didn't choose to live here because it's quiet- we just ended up here.

D13 Married white male, 67, resident for 42 years

Describe Street:

-nice little cul de sac, quiet, flat conversions are causing parking problems, there's a lot of rubbish that piles up.

-When we first came there were more families, now there are more flats, students.

-We get little respect from the students and young people

-There's always a gang of kids playing in the road

Enough Privacy?:

Stressful Aspects of Streetlife:

-bin men at 7am in the morning, sometimes the scrap place makes noise, but it's not so bad.
-lots of people come down the street fast, not realizing it's a cul-de-sac.

Other:

People don't talk in the street as much as they used to. Everyone here used to know each other. We used to sit on the wall- there would be 4 or 5 of us- Those in their 60's would chat with those in their 30's. This stopped mostly in the 70's/ 80's.

-The street has gone downhill a little bit because of (flat conversions, etc.)

-At one time there were over 60 children on the street under 15- we counted them.

-We keep keys for about a dozen people in the cul-de-sac.

-If (my neighbour's) curtain isn't pulled, I'll go and check if she's okay.

-I feed our neighbour's cats, watch their houses when they go away

-We moved in because it was cheap and also a safe quiet street

-When our kids were small, they were always in the street- there were fewer cars then.

-You get used to the trains

-It's like living in the country out in the back next to the allotments.

-My wife wouldn't walk through the pathway to Muller Rd. for fear of crime. I walk through the path anytime, even at night.

-Our bedroom windows (in the front) are always open- they've been open since we moved in.

D14 Single white male university student, 21, 6 month resident of the street

Describe Street: quiet, cul-de-sac, no road traffic, accessible to Uni, everywhere, buses, we like the street- it's quite peaceful

Enough Privacy?: yes

Stressful Aspects of Streetlife: love it- nothing stressful

D15 Widowed white male, 77, 50 year resident of the street

Describe Street: no through road (cul-de-sac), quiet, fairly friendly, changing

Enough Privacy?: yes

Stressful Aspects of Streetlife: not sure whether there are any stressful aspects

Other:

-I remember the beginning of World War II when I was nine years old. I was coming home from school one day, and I was standing at the corner of Muller Rd. at the traffic lights and all the army vehicles were coming down Muller Rd. in a column. That was the beginning of the war in 1939.

-In 1960, I stopped cycling for the most part when I bought a car.

-During the war, we would grow food on every available open space: in parks, most back gardens, and on the sides of the roads- they planted vegetables along the grass verges in the countryside.

-I had an allotment until about ten years ago, when it became a difficult to dig and haul earth.

-The pathway at the bottom of the road is not 100% secure- there have been some muggings.

-When we first came here there were quite a lot of families with young children.

-We bought our house for £1850 in 1958- we bought mainly because of price

-There are considerably more cars on the street than there were in 1960.

-There are more lettings to students and young business people which has brought in the cars- they also don't look after their properties the same

D16- Single white female, age 60, resident of the street for 26 years

Describe Street: neighbourly and friendly, nice street, mixture of people, not too much trouble, very quiet street, not a lot of thru traffic. It's been 26 years now- there must be a reason why I stayed.

Enough Privacy?: yes I do really yes

Stressful Aspects of Streetlife: I don't feel stressed at all- I feel quite safe and happy, with a lot of support from neighbours

Other:

-There aren't too many kids- there's a little boy living across the way who kicks the ball around in the street every once in a while.

-I decided to get rid of my car because of my worsening vision.

-I walk a lot these days, though I don't use the lane at the end because I'm afraid of being mugged- there was an incident a few years ago.

-I've lived in lots of places, but this is a nice little street. It's not like the rest of Dovercourt (the higher traffic section). There, they have more renters- there is a higher turnover. There are more families here- people who stay for a while and put down roots. We share plants- we look after each other. There is really a sense of community.

-People tend to socialize in the back lanes rather than the street.

-Young people don't have much in common with the older generation.

-Some people just don't seem to want to mix.

-I'm happy here, but I have problems with maintaining the house and garden. I'm thinking about moving into a flat.

-I'm lucky living here. Everyone's kind, thoughtful, helpful, and really lovely to me. You feel safer when the neighbours check in on you- when my next door neighbour hasn't seen me for a few days, he knocks just to see if I'm okay.

D17 Married white male, no kids, age 60, resident of the street for 40 years

Describe Street:

-At the beginning it was a nice community. Now flat conversions have become student lets and the street has changed.

-It lacks the sense of community it once had. At one time you knew everyone in the road.

-The houses have gone downhill. The gardens aren't looked after, the dustbins are left out for days at a time.

-There are more cars- parking is a problem, especially on match days at the Rovers stadium.

-Young people are not so social- they don't seem so interested in the street.

Enough Privacy?:

Stressful Aspects of Streetlife: Crime, the lane at the end of the street, damaged cars, aerials broken off, wing mirror's broken, vandalism. My wife doesn't walk there at all. I don't walk down the lane at night.

Other: The footpath at the end of the street has become a cycle path. There are more cyclists on the pavements these days, which aren't wide enough to accommodate them.

D18- White married couple with 2 children, age 40, residents for 9 years.

Describe Street: Some of the houses are a bit neglected. There are no trees, though the backs of the houses are nice because of the allotments. The street looks a bit bare, but it's okay- quite quiet. We moved here because it's off a main road.

Enough Privacy?: yes

Stressful Aspects of Streetlife: The lane at the end- you get riff-raff, drunks, vandalism to cars every now and then.

Other:

-Some, especially delivery drivers, hammer down the street- they are a threat to children and pets.

-We have some good neighbourhood friends.

-It's lovely and quiet in the summer.

-It's a good street to ride bikes on, especially down the grassy area.

-We have a big garden to play in.

-The allotments in back are the best bit- seeing people working their plots.

-There are loads of newsagents, and pubs- it's really convenient.

D19 Single white male, aged 34, resident of the street his whole life

Describe Street: peaceful, friendly people

Enough Privacy?: yes

Stressful Aspects of Streetlife: loneliness, occasional motorbike being tested on the street

Other:

-I go for walks with my care worker

-The people I know are very helpful to me since I've been ill- it makes things much more bearable- they are very good people.

D20 Married white female, aged 40, two young children, resident for 12 years

Describe Street: immediate neighbours are very friendly, everyone looks out for each other. There are parking problems.

Enough Privacy?: yes

Stressful Aspects of Streetlife: parking can be a problem, quite quiet though

Other:

-Flat conversions have resulted in parking problems

-The corner (at Downend Rd.) is quite dangerous

-Kids play on bikes on the street

Appendix F: MEDIUM Street interview notes

F01 Married white female age 49, no kids, resident on street for 10 years

Describe Street:

busy street, too much traffic, noisy, friendly neighbours. I call it 'Horfield Village as a send up of Granny's village or Clifton Village (higher income area in northwest of Bristol). It's nicer than the other end of Filton Ave. (which has higher levels of traffic). There are lots of trees around in back of the houses. There is more of a community around here. Local chatting is quite a thing.

Stressful Aspects of Street Life: noise, crime

Enough Privacy: yes, semi-private

Other: -I use earplugs when I'm sleeping. The noise and air pollution from the traffic is a problem. But other than the things you mentioned, there is nothing much you can do about it.

-When a bus goes by, the whole house shakes

-Bristol's a city with a lot of traffic.

F02 White Married couple ages 73 and 80, resident on the street for 48 years.

Describe Street:

-We've seen changes, not for the better. The Rovers' stadium expansion is a problem, especially related to traffic.

-It's got so much more cosmopolitan. There are all different nationalities living here now.

-It's very busy, not very neighbourly or friendly because you're on a main rd. People don't trust one another like they used to.

-When our kids were young, we didn't encourage friendships across the street because of the danger from traffic.

-In 1960, I could put my child out in a pram on the street on a lovely sunny day, but you wouldn't do that these days- there's not a safe feeling anymore.

-It's too busy a road- too dangerous for kids to play on the street.

Stressful Aspects of Street Life:

- Bristol Rovers, sheer volume of traffic, sometimes you get idiots racing like there's no tomorrow. Here you have the traffic lights, and they start accelerating right by the front of our house.

Enough Privacy: yes

Other: -When you're in the garden in the summer, you can hear a lot of noise from traffic.

-You get used to the traffic

F03 Married white male, aged 71, resident for 38 years

Describe Street: noisy with all the buses going by, lots of traffic, it's like a normal street anywhere in Britain. You get to know some of the neighbours- some you don't.

Stressful Aspects of Street Life:

-We can't do much about the traffic, so we don't worry about it. There aren't any noisy families- nothing much stresses me out.

Enough Privacy: yes

Other: -It's too dangerous for kids to play in the street. It's too windy for people to sit outside. Most people sit in their back gardens, probably because of the fumes from the cars.

- I used to ride my bike in Ireland when there weren't many cars.
- Air pollution from the street bothers us, especially when the wind is blowing in the right direction.
- There's fast traffic on our street- a lot of noise, but the double glazed windows have helped.
- Parking when the Rovers are playing is difficult- especially annoying when we have visitors

F04 White married couple, aged 73, residents for 50 years

Describe Street: busy with the cars, don't know so many people as we used to. There are many more apartments and flat conversions. There are convenient bus routes. We're inclined not to know the people opposite because the road is so busy.

Stressful Aspects of Street Life: Rovers (the Rugby's alright though), parking, traffic. Our car was stolen from the side of the house.

Enough Privacy: yes

Other: -It bothers us when people park and block our driveway.

F05 White married female, age 51, 1 child, resident for 30 years

Describe Street: busy traffic wise, noisy, easily accessible for amenities, on bus route, nice neighbours

Stressful Aspects of Street Life:

-football, when the matches are on, violence

-The noise is there, but we're used to it now. When we first moved in, it was very noisy- now we take no notice. The double paned windows help.

Enough Privacy: yes

Other: -Traffic in our street bothers us frequently when we're eating, as the dining room is at the front of the house.

-It's quite busy all the time here.

F06 Single white female aged 36, no children, resident for 3 weeks

Describe Street: busy, traffic, noisy, also quite peaceful despite all that, nice kind of atmosphere

Stressful Aspects of Street Life: Rovers football ground- nightmare when the games are on, quite a lot of hoodies on bikes- could be intimidating.

Enough Privacy: yes

Other: -Parents watch their kids because of the traffic.

-I don't own a car- I've always cycled or walked.

-The noise bothers me, but I just put on the stereo.

-This street is quite a safe, secure environment.

F07 Widowed white male, age 91, resident for 81 years

Describe Street:

-Traffic is really the main thing- life has changed tremendously because of the car. Neighbours don't see each other like they used to, because people get out of their front door, get in the car and visa versa when they get home- neighbours rarely see each other.

-Young people are listening to their earphones, and they get used to speaking very loud- they have loud conversations on the pavements.

Stressful Aspects of Street Life:

-I think the traffic is the biggest problem of all- the noise for instance. When I was a boy, my mother would sit in the window and we would look at the countryside. When we had kids, we used to take them into the garden and show them the stars. Now you can barely see any stars because of the light pollution.

Enough Privacy: yes

Other: -This Earth is going downhill.

-When the houses were built, they had to have back access for the dustmen- that's why they built lanes behind the houses.

-I still drive, though my garage was burnt down a while back by vandals

-Car washing happens rarely- the road is too busy and dangerous.

-Kids never play out front- there's too much traffic

-My front wall was damaged after a football match

-My grandson can't sleep in the front room because of the noise, we have to put him in the back when he comes to stay.

-You become so accustomed to the noise, you don't notice it.

-I use my car to get out of town and do the shopping. I drive out to Severn Beach a couple times a week- there's cleaner air there.

-The solution to Bristol's transport problems: take everyone else's car off the road except for mine.

-The real reasons for the problems we have today is that there are just too many people.

-When I was young, we had to go shopping nearly every day. My mother would think nothing of walking to the shops on Gloucester Rd. or Ashley Rd. Now we drive to Tesco and shop for the week.

-The traffic has gotten progressively worse since the war. Filton Ave. was originally a country lane with hedgerows along it. I used to go birdnesting and climb trees when I was a boy.

-My house is on the old part of Filton Ave. which was built between 1900 and 1910. On one side of Muller Rd. there are older type terraced houses built either just before or after WWI.

-The milkman used to come around and ladle milk out of a churn.

F08 White married female, age 57, resident for 26 years

Describe Street: busy, getting noisier and noisier, we don't know so many people nowadays as a lot of the houses have turned into flats.

Stressful Aspects of Street Life: noise from cars, parking

Enough Privacy:

Other: - We originally chose the bedroom in the front of the house- now we sleep in the back because of the noise from the traffic

-This used to be a family neighbourhood- now there are mostly student lets

F09 White married couple with two teenage children, residents for 17 years

Describe Street: The street is going downhill fast. If I'd have known about the Rovers ground, we would have never moved here. The parking and crowds and vandalism are a problem. The football has changed things significantly. Before it was just rugby, then around 2000 the football came in. Cars have been stolen or vandalized.

Stressful Aspects of Street Life: The traffic. It's horrendous. I guess it's just one of the things of modern life- no one ever puts a viable alternative forward. They say use public transport, but the buses are so awful. They're expensive and unreliable. They need to be made more reliable and cheaper for them to be a viable option for people.

(18 car journeys in an average day)

Enough Privacy: yes

Other: -It's too dangerous for kids to play on the street
-Out the back it's totally different. It's nice and quiet
-Adaptation: she uses a doggie gate to stop the dog running into the street.
-I quite like living here, despite what it sounds like
-We didn't realize we were moving on to a main road.
-If we knew now what the street is like when we moved in, we wouldn't have moved in.

F10 Married white female with two young children, age 36, resident for two years

Describe Street: bloody rovers, neighbour friendly, everything fairly close, there are fights on the street.

Stressful Aspects of Street Life: Rovers fans, because they park outside the house, blocking our driveway- they park anywhere they want to.

Enough Privacy:

Other: -You get used to the noise- it's worse in the day. (no double paned windows)

F11 Married white female aged 30 with two young children, resident for 15 yrs

Describe Street: busy road, well placed, close to doctors, school, Tesco, we tend to only know people who live near us, because it's busy. I don't know, there are a mixture of people and flats and houses.

Stressful Aspects of Street Life: football matches, lots of traffic congestion, drug houses, etc.

Enough Privacy: yes

Other: -I've only sat outside in the front once when I was watching the children in the front yard.

-A dog gate and two doors are lines of defense against kids running out into traffic- "I wouldn't need the dog gate if it was a quieter street."

-We sleep in the back because of the noise

-We added our front porch to reduce the noise, to keep in the heat.

-People cycling on pavements bothers me- people can be really rude

F12 Married white couple early 30's, no children, resident for 13 years

Describe Street:

-football, busy on match days, difficult parking, good neighbours, in past there have been issues with noise and vandalism.

-I call it my 'lego car' because I have to detach all the vulnerable bits before going to bed- wing mirrors, windshield wipers, etc.

-I feel a bit of futility about the street- vandalism is a huge problem

-The roar from the crowd at the football stadium can be quite intense

Stressful Aspects of Street Life: football supporters- there are just so many of them- their cars, etc., vandalism, I'm also suspicious of the Bristol City Council- they are corrupt.

Enough Privacy:

Other: -There aren't any kids playing on this street- though there are on (the quieter side road). They play ball all the time, and I try to slow down so I don't knock them over

-The air pollution on the street bothers me because I have to wash my car so often.

-The motorcycles screaming up the hill is bothersome

-There's a real difference in the type of noise- kids playing football (in the football ground behind the house) is not an unpleasant sound. Traffic is a dangerous sound- makes me think of dangerous drunk drivers.

-Gloucester Rd. used to be the most polluted road in Europe. (apparently)

-There's a big police presence here.

F13 Asian married couple, aged 30, with two young children, residents for 7 years

Describe Street: It's difficult to describe, the traffic- it's very busy, congestion, proximity to football ground, not too bad.

Stressful Aspects of Street Life: traffic and congestion, noise, vandalism

Enough Privacy: yes

Other: -There's a certain type of resident here, being a busy main road. It's not a pleasant place to hang out because of the pollution and the noise.

-Window double glazing helps reduce the noise

F14 Married Asian male, aged 32, with one young child, resident for 2 years, asylum seeker

Describe Street: very nice, good place, when I left my car running once, someone knocked on my door and told me, it's very quiet and nice here.

(they came from a busy road in London)

Stressful Aspects of Street Life: nothing stressful

Enough Privacy: yes

Other: no complaints, like it very much

F15 Married white female, aged 36, two young children, resident for 2.5 years

Describe Street:

-There's a real contrast- there's a real divide in the road socioeconomically

-There's a difference in sections of the road itself- other sections are more disadvantaged.

-It's not so friendly- you barely see anyone

-My husband calls it the descent of man

-There are plenty of unsavory characters- the local pub was raided by the police for dealing crack.

-I have nothing positive to say, really.

-There are scummy people here

-There's a lot of vandalism- our gate was kicked in, and our shed was broken into. The windscreen wipers were nicked from the car. The bin will occasionally get kicked over.

-There's a nice view into the field opposite

-It's not the prettiest street- it's average I guess- just okay.

-I felt safer in St. Pauls than Filton Ave.

-People talk rarely on the street

Stressful Aspects of Street Life: I've already mentioned vandalism, burglaries, we're woken up by people walking back from the pub late. Our son has run out into the road twice.

Enough Privacy: yes

Other: -Double paned windows help with the noise.

-We're near the football ground- every other Saturday we can't leave the house- we had a riot a year ago, 70 police, massive fighting, when certain teams play (city vs. rovers) there's fighting, it's dangerous. The roads are very congested on match days.

-Cannabis house on street

-I grew up in a village where the kids could play

-I don't see anyone on the street here- it's just not friendly. People shut their doors and come out only when they have to.

-There will never be a time when kids can play unsupervised.

F16 Divorced white female, aged 54, no children, resident for 2 years

Describe Street: through road, very long, quieter than expected in terms of the volume of traffic. For me, the view at the back outweighed the traffic.

Stressful Aspects of Street Life: Bristol Rovers. When the Rovers lose, there is lots of vandalism. The parking is fine though, not a problem.

Enough Privacy: yes

Other: -Parents supervise children only to get into and out of the car.

-Double glazing helps with the noise. I sleep in back because of the noise.

-I'm quite satisfied with the street really. I'm looking forward to them knocking down the rovers stadium because I'll get two years of peace, then the chaos will return worse than ever. It's interesting the difference between football and rugby fans- I guess it's a class thing, as rugby is taught in posh schools.

F17 Single Asian female, aged 32, no children, resident for 2 years

Describe Street: fairly friendly, people will stop and talk to you, good neighbours. When I moved in, I introduced myself only to my immediate neighbours, as opposed to my old house, when I dropped cards at all the houses on the street. I guess because it's a wide street with a lot of traffic. I used to live on Parley- there was less traffic- I knew more neighbours on the street.

-I loved the neighbourhood when I visited. I liked the area, the wide road

Stressful Aspects of Street Life: none

Enough Privacy:

Other: -People tend to use the back rather than the front.

-I sit out on the front porch when it's a sunny day, but I don't see anyone else doing that.

-Double glazed windows help with the noise

-I sold my car a month ago- I just didn't need it anymore

-You get used to the noise.

- We need to be a bit more friendly on this street- it's important to know your neighbours

F18 White female w/ partner, no children, aged 25 years, resident for 1.5 years

Describe Street: busy in terms of the traffic, quite impersonal, part of the busyness means that it doesn't feel much like a community place, quite varied in terms of character, many first time buyers, wide, feeling of space.

Stressful Aspects of Street Life: traffic noise, kids and teenagers breaking into our garden from the back, football occasionally, traffic congestion

Enough Privacy: yes

Other: -It's too busy for kids to play in the street.

-Double glazing helps with the noise

-We chose the bedroom in the back because of the noise

F19 Separated white female living with adult son, aged 62, resident for 36 years

Describe Street: First 16 years were brilliant, now it's unfriendly. The neighbours are in and out next door. I don't want to have anything to do with the neighbours close by. The street has gone downhill over the years. On the weekends you have the thugs around, breaking into people's properties. The broken bottles ruin the tires of the car, there are drunkards around. I won't give up though.

Stressful Aspects of Street Life: If you were to die here, nobody would know- woman living two doors down, she used to cry to me that nobody would notice if I died- people don't care about each other anymore.

Enough Privacy: not really, no. People around here are very nosy. We have the curtains drawn all the time. We've been broken into before. (Sounds very suspicious)

Other: -Traffic (congestion) is annoying

-It's easy enough to walk through our yard- kids knocking around the garage

-People don't look out for each other- most people keep to themselves

F20 Single white male, no kids, aged 72, resident for 45 years

Describe Street:

-I've not seen so many changes- a lot of houses have been converted to student lets.

-Convenient-- good bus services into town, easy motorway access, good view onto the playing field at the back.

-It's a busy road, there's a lot of traffic, drunk students

-A lot of my friends have died off- it's not as intimate a feel as it used to have

Stressful Aspects of Street Life: watch security at the back because of the field, council tax

Enough Privacy: yes

Other: -front of the house gets a bit dirty because of air pollution from the cars

-Double glazed windows help with the noise

-There's no visible police presence- the nearest police station was closed years ago

-I knew more people then

-Over time, traffic has become worse

Appendix G: HEAVY Street interview notes

M01 Married white female, aged 59, resident for 38 years

StreetDescribe: busy- I think it's interesting because it's busy. It's nice to see families walking along the road to the football, expressions on people's faces, excitement, etc. In recent years, we've had a lot of problems because of people from other areas. When it gets dark in the autumn, vandalism always increases.

Stressful Aspects of Street Life: vandalism- that's the only thing

Enough Privacy:

Other? -Residents don't gather in the street. J: Why not? I don't know- there's no need.

-Five years ago, you would have found a community. Since 2000, there has been a complete change. Now you're getting people living quite individually.

-People don't communicate unless they have to. When there are problems from outside, vandalism, etc. it brings people together. It's a strange way of it happening.

-Adaptation- she chose a black door to hide the dirt

-I think there should be less traffic

-You get used to it though, it'd be nice if it wasn't there. I wouldn't want to be somewhere it was so quiet though.

-She initially labeled air pollution as a "1" when asked about it- she said, well you can't do anything about it so why worry about it. She changed it to a '10' upon further questioning.

-I used to have the phone by the door, but the noise from traffic interfered with my conversations.

-You make adjustments- you live more in the back of the house.

-When you live here this long, you get used to it.

-Visitors tell me that they couldn't live with this amount of noise.

-We do everything in the back of the house.

-Terraced houses have been developed into flats.

M02 Married white male, aged 42 with 3 children, resident for 6 years

StreetDescribe: overpopulated with students, busy, too fast, lack of community spirit. J: why? Because there's so many student let properties and such a high turn over. It's murder on football days.

Stressful Aspects of Street Life: match days

Enough Privacy: no, because of the other people living in the back (who look in on us)

Other? -Parents only supervise their children in the back gardens. Front gardens aren't big enough for ball games, or Frisbee.

-There have been 15-20 accidents on this block in the last 6 years. Four of these happened right outside the house.

-The double glazing helps with the noise

-Kids: you can't really go out on the street anyway

-The traffic noise doesn't bother us because we have the TV in the back of the house.

-We rarely walk in the neighbourhood

-The traffic bothers us when we are sleeping, especially in the summer when the windows are open.

-This road needs speed cameras on it.

M03 Single white female, age 48, with 2 year old daughter, resident for 2 years

StreetDescribe: busy main road, nice neighbours, nice big garden, parking can be a nightmare

Stressful Aspects of Street Life: traffic, really- the speed at which it travels, the danger, being careful of the little one- the volume of traffic. In the middle of the night, they go 50-60mph.

Enough Privacy: yes

Other? -When I decided to buy this house, you know, we wanted a big garden, and to be within walking distance of my family. The road was the down side.

-I sleep and work at the back of the house because of the noise.

-I like living here, despite all I've said about the traffic- I like that I can walk to the Gloucester Rd. (shopping street), school, shops, etc. It's a nice, friendly house. I'm worried about the redevelopment of the (Rovers) stadium- the scale is huge- the parking problems are going to become even worse. I'm also concerned about the light pollution.

M04 Single white male aged 50, no children, resident for 18 years

StreetDescribe: -hellishly busy. It's a bloody nightmare

-It often takes 5 minutes to cross the road- there's just constant traffic

-It's like a mountain range, cutting you off from the other side of the road.

-I don't expect community so much these days, especially on a main rd.

-People have moved out because of the traffic.

-Certain types of people live on this street

-For the first time in 15 years, there are kids living on the street.

-This is the longest road in Bristol that doesn't have a pub.

-A lot of the houses are being converted to flats

Stressful Aspects of Street Life: -parking, traffic, especially with the football

Enough Privacy: yes

Other? -There was a garden competition in the Horfield area and I got a special mention.

-People don't hang about in the street- they just come in and go out

-Ball games and the like are pointless with all the traffic.

-The double glazing helps with the noise, but the buses and lorries still shake the house when they come by.

-The air pollution can be quite bad out the front, sometimes during rush hour you feel the air getting thicker and thicker.

-Traffic is bad, but it's more the congestion that's a problem more than the air pollution or noise. My mobility is affected, especially during the gridlock of a match day. Sometimes it takes 45 minutes to an hour just to go to Tesco on a Saturday afternoon.

M05 Married white couple, mid thirties, 2 young children, residents for 18 months

StreetDescribe: main road, busy, very long road, quite anonymous, we only know our immediate neighbours

Stressful Aspects of Street Life: parking, especially on match days, rush hour congestion, speed of the traffic

Enough Privacy: yes

Other? -The double glazing helps with the noise.

- We notice dirt from air pollution on the cars, and on the front of the house
- We knew it was a busy road when we moved in, but we just kind of accept it.

M06 White and Black Single University Students, aged 20, residents for 8 months

StreetDescribe: busy, lots of cars, long road, people just go from their cars to their houses.

Stressful Aspects of Street Life:

- It's a nightmare on football days
- So many cars all the time
- It didn't quite click when we moved in just how many cars there are on the street.

Enough Privacy:

Other? -We've gotten used to the noise now- though one housemate (living in the front of the house) has problems with it still.

-If we're going out, we're going out. There's no point in hanging around on the street.

M07 Married Asian male, aged 28, one young child, resident for 1 year

StreetDescribe: busy road, lot of traffic, no parking when the football is on.

Stressful Aspects of Street Life: no stress really nothing, the emergency vehicles with their sirens can be stressful

Enough Privacy: yes

Other? -We keep the (double glazed) windows shut- that's all we can do.

M08 Single white university student, aged 21, resident for 6 months

StreetDescribe: busy

Stressful Aspects of Street Life: parking, busy road, too many cars, congestion, delay

Enough Privacy: yes

Other?

M09 Single white male, late seventies, no children, resident for 76 years

StreetDescribe:

- The road is very busy with traffic- it's a lot busier than it used to be.
- The M32 into Bristol was built in the seventies- motorway access was built at Muller Rd. and this really increased the traffic.
- I've noticed a change in the area- the number of houses that are let to students is increasing- there's a mix of family and students
- My house was built in 1928

Stressful Aspects of Street Life: rugby and football- lots of cars parked, I don't go out at all when a match is on- I never use the car on match days because the traffic congestion is so bad.

Enough Privacy:

Other? -I had the hedge cut because of visibility- sometimes cyclists come speeding down the pavement.

-You get used to the traffic after so many years.

-I usually go out and go for a walk away from the traffic

-I'm quite happy here

M10 Single white female, age 70, no children, resident for 23 years

StreetDescribe:

-Traffic's doubled in 20 years- from 4 o'clock onwards it's nose to tail gridlock

-No pubs or clubs so nothing like that

-Ordinary, quiet people

-Partly because of the flat conversions, people live here only temporarily- they don't integrate into the social networks, and parking has become more of a problem.

-Planning permission shouldn't be given for flat conversions- the council people say that if bicycle sheds are put in then people will go green and ride bicycles- yeah right!

-People from St. Paul's are ruining the neighbourhood

Stressful Aspects of Street Life: traffic I suppose- it's getting worse- parking is a big problem.

Enough Privacy: yes

Other? -There is a community on this side of the street- we swap Christmas presents, sometimes have meals together- it's like it used to be years ago- you don't get that nowadays

-There's too much cycling on the pavements

-People haven't been keeping up their gardens as much in recent years.

-There's not many children these days- mostly older people

-Double glazing helps with the noise. I couldn't stand it if it was quiet though. I'd rather live in the city with all the traffic than in the countryside with the cows.

-The Bristol Planning Department are corrupt and totally out of control- I'm very angry about the Rovers stadium (expansion). They used to have coaches to bring in the players and the coaches- now they all drive. We can't get our cars out on match days. The council doesn't give a shit- they're totally unresponsive. They are getting payoffs from the developers. We didn't want the lights. We're getting more flooding problems since the paving associated with the new developments. There are drainage problems in the back lanes.

-I'm a member of ROSE, the local neighbourhood group opposed to the Rovers stadium expansion.

M11 Married white male aged 40, one child, resident for 24 years

StreetDescribe: busy, friendly, convenient bus stops, close to work and school, lots of traffic, noisy

Stressful Aspects of Street Life: not really any stressful aspects of living on the street, a few burglaries, it's difficult to park

Enough Privacy:

Other? -There aren't many kids on the street

-You get used to the traffic- double glazed windows help

-It's a very friendly area, we get on well with the neighbours, we go for meals together. It's close to the Gloucester Rd.

-There have been more flats converted from houses in the last 20 years.

-If I could change anything, I'd move to a quieter street, though I suppose the noise reduces house prices.

-Social stuff- pubs are closer

M12 Single white male, aged 51, no children, resident for 20 years

StreetDescribe: a main thoroughfare, but with a residential, suburban character, a lot of traffic, congested traffic, especially on match evenings and weekends

Stressful Aspects of Street Life: match days- increased amount of people walking in front of the property, strangers. Traffic (congestion) is stressful if I want to go somewhere, I have to pick and choose when I go.

Enough Privacy: yes

Other? -Double glazed windows help with the noise

-I never spend time in the front of the house

-There have been lots of changes in the last twenty years. There are far more let accommodations now, so you get quite a turnover of inhabitants. You get less families these days- they've moved elsewhere.

-There have been more burglaries and vandalism recently.

-I'm aware of the traffic, but I have rear access so it's not a huge issue for me.

M13 Married white couple, late thirties, 4 year old daughter, residents for 6 years

StreetDescribe: busy, traffic, congested, unfriendly, suspicious, dirty, not very family friendly. We don't like it, primarily because of the traffic. It's very much a student area, there aren't enough facilities for children, there's inadequate parking

Stressful Aspects of Street Life: traffic and football, congestion, we would never let our four year old play out in the front

Enough Privacy:

Other? -People argue and shout regularly.

-People never sit out in the front.

-The noise bothers us, but the double glazed windows help- and we sit out at the back mostly.

-They were very pessimistic about people, the country- "this country is going downhill quick"

-Pollution- there's not a lot you can do- the stupid laws in this country- because of our gas heater, they require an air intake from the front of the house where all the pollution is.

-He said he'd cleaned the television screen yesterday- then took a clean, white paper towel, wiped it across the screen, and it came out black, totally filthy.

-We're concerned about our little girl's health- she has a constant cough- we limit the amount of time she spend outside.

-We use a humidifier to try and reduce the pollution in the house, but it doesn't work.

-The whole street needs knocking down and rebuilding to provide a lot more space that is useable

M14 Married white male aged 56, no children, resident for 27 years

StreetDescribe:

-The biggest mistake the council made was putting the football ground in there- there should be only rugby. They say (the expansion) will bring jobs to the area, but it's not true.

-Muller Rd. is gridlock on game days- emergency vehicles can't get through. Since Muller Rd. was connected to the M32, everything comes down here.

-Pavement parking is a problem- it's a bad thing- I don't agree with it, but it's necessary to let the emergency vehicles through.

-The council's not thinking- they allow houses to be converted into flats, and then there's a problem with the parking. There have been 6 flat conversions on this block alone.

Stressful Aspects of Street Life: parking, football

Enough Privacy: yeah

Other? -My curtains are black to hide the dirt from the pollution.

-The bus drivers used to count their money in front of our houses with the engine running, and the pollution would come straight in our window.

-I used to sleep in the front, now I sleep in the back because of the traffic noise.

-There have been a lot of crashes on this street. A cyclist who lives on this block got hit crossing the road, and his leg was broken. A pedestrian was killed crossing at the lights. There have been many deaths and casualties on the road. A few years ago, a car got stuck between the traffic lights and the wall at the junction of Downend and Muller.

-Muller Rd. is a relatively straight and wide road. People forget it's a 30mph limit. It seems like courtesy on the road doesn't exist practically.

-The noise is a real pain during rush hour.

-The traffic is getting worse- the stress, the congestion.

M15 Single, white male aged 39, no children, resident for 2 years

StreetDescribe: convenient, on the edge of decency (between Bishopston and Lockleaze), there's lots of crime and hoodies, it's noisy, I feel vulnerable to vandalism and theft. Cars have smashed into my car parked on the street twice.

Stressful Aspects of Street Life: meeting stray people when walking outside, there have been incidents that could have escalated but I didn't make anything of it, people keying the brick wall, vandalism

Enough Privacy: yes

Other? -I knew it was busy when I moved in, but I don't mind so much

-I'd be happy to have a bus service to the railway station, not just to the centre.

M16 Single white male, aged 20, no children, resident for 1 year

StreetDescribe: convenient for work, affordable, noisy at the weekends with the football

Stressful Aspects of Street Life: problem with the neighbours, match days

Enough Privacy: neighbours

Other? Fairly decent

M17 Married white female, aged 30, 2 young children, resident for 18 months

StreetDescribe: busy, pretty friendly, good location

Stressful Aspects of Street Life: Rovers, football matches, we have a garage round the back so parking is not a huge issue, traffic's more busy, the sirens are very loud because we're close to the junction.

Enough Privacy: yes definitely

Other?

-Double paned windows help with the noise

-We forbid the kids to play on the street because of the traffic.

-Rovers traffic is a problem- there's a neighbourhood group advocating against the expansion

M18 Divorced white male, 53, 2 teenage kids, resident for 7 years, grew up on street

StreetDescribe: busy, dirty, unfriendly, old (everything has aged significantly, everything is looking old and tired). The houses are looking old, because it's busy, things are looking tired.

-There was a lot more in the way of children back then- it was more family orientated- it was a completely different culture- people are off somewhere else now

Stressful Aspects of Street Life: volume of traffic, I've had two cars that have been hit on the street, they both caused severe damage. It happened once on Christmas morning, the driver didn't stop.

Enough Privacy: yes

Other?

-The pollution is really very bad- there's black soot on every surface- it's annoying when the dirt builds up in the kitchen. I've considered moving out because of this. There's just always so much dirt, grit, and grime around.

-I grew up with car accidents happening all the time, now I park the car with two wheels on the pavement. There are accidents between cars, pedestrians, and cyclists. It seems to be a regular occurrence. I crashed my Dad's car when I was a teenager. My sister was knocked over by a lorry when she was 7 years old, and hit her head, but she was okay.

-They're redeveloping the stadium across the road, there's bound to be an increase in traffic and congestion. We have to rearrange visitors' schedules to avoid conflict with the matches- I have people come before or after match days.

M19 Single white male, 28, no kids, resident for 1 year.

StreetDescribe: quite cosmopolitan, close to the centre, good location for going out, friendly

Stressful Aspects of Street Life: When I used to own a car, the football matches caused a problem with the parking. The football fans on foot. There are lots of emergency vehicles as Muller is a trunk road.

Enough Privacy: yes, there is a fairly private garden

Other? Quite friendly place- never had any problems

-I sleep in the back of the house because of the noise.

M20 Unmarried white couple, late twenties, no kids, residents for 18 months

StreetDescribe: noisy, safe, friendly, quite diverse, parking is a problem

Stressful Aspects of Street Life: traffic

Enough Privacy:

Other? -Kids never play ball in the street because they might get run over

-Double paned windows help with the noise.

-We only ever open the windows in the back of the house.