The Role of Local Facilities in Fostering Social Interaction in Suburban Housing Developments in England

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This thesis is dedicated to my mum,

Dr Elke Dahm

Who made me the person I am today,
Who gave me the confidence to start this PhD,
But who was taken from us, so suddenly,
And did not live to see its completion.

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Abstract

Mixed-use development, in the form of local facilities, has been promoted by the UK government in new housing developments as an urban form which provides opportunities for people to interact which in turn is seen as a prerequisite for 'building new communities'. There is a lack of empirical evidence testing the claimed relationship between the provision of local facilities, their use and social interaction levels at them. Therefore, the aim of this research is to determine whether these claimed relationships exist and to what extent local facilities are used as service providers and to what extent they constitute places of frequent social interaction. In order to investigate the different factors affecting local facility use and social interaction at those facilities, the factors were grouped into those relating to the facilities themselves (including micro-scale, urban design features), the area the facilities are located in and the profile of the users.

The methodology adopted in this research is primarily quantitative, using a survey questionnaire and structured observations to collect the data and the nature and extent of relationships were investigated through statistical analysis and behaviour mapping techniques. The findings show that a number of factors positively influence frequent use and frequent social interaction at local facilities. With regard to the role of local facilities as service providers, the findings highlight the importance of providing adequate and accessible local facilities for different groups of residents, but also highlight that perceived homogeneity and social ties between residents in the wider area influence whether local facilities are used. The findings also support the assertions that local facilities can make a contribution towards the building of communities through constituting places of frequent social interaction. However, this only extends to **certain** facility types and **certain** residents, questioning the government's implied assertion that communities can be built as long as any mix of facilities is supplied in any type of neighbourhood. Furthermore, perceived homogeneity in the area the users lived in was found to influence the frequency of social interaction at local facilities. This has wider policy implications regarding the role local facilities can play in reducing social segregation.

Chapter One

Introduction

INTRODUCTION

> 'The planning system can play an important role **in facilitating social interaction and creating** healthy, inclusive **communities**….Planning policies and decisions should aim to achieve places which promote…opportunities for meetings between members of the community who might not otherwise come into contact with each other, including **through mixed-use developments**, **strong neighbourhood centres** and active street frontages which bring together those who work, live and play in the vicinity' (NPPF, 2012, p.17)

The new Coalition government has maintained the policy of the last Labour government asserting that planning policies and the built environment have a role to play in 'creating communities' (NPPF, 2012; ODPM, 2005a). One way of achieving the creation of new communities is through the building of mixed use developments, mixing residential areas with services and facilities intended to serve the local population. This is particularly relevant for suburban housing developments (defined as 'low-density, residential environments on the outskirts of larger cities' (Nicolaides and Wiese, 2006, p.7)), built on Greenfield sites and large enough to sustain a range of different facilities such as supermarkets, schools and leisure centres to serve their 'recently created' residential population. The frequent use of these facilities by the local population is claimed to facilitate positive social interaction (NPPF, 2012). Whilst this policy has been promoted for some time now, there is a lack of empirical evidence to corroborate such claims of a relationship between the existence of local facilities, their use and their influence on positive social interaction. The objective of this research is to address the lack of empirical evidence by testing whether local facilities are used and whether they constitute places of positive social interaction for the population they serve in suburban housing developments in England. Furthermore, the research tests which factors are associated with frequent use of local facilities and frequent positive social interaction at them. The following sections set out the need for this research and outline the methods that will be used to test these relationships.

1.1 THE FOCUS ON LOCAL FACILITIES AS SERVICE PROVIDERS

Following the Rio earth summit in 1992, the principles of sustainable development have been adopted worldwide (United Nations, 1993) and have been translated into specific policies in the EU (CEC, 1990) and UK (DETR, 1999). Sustainable development incorporates aims of environmental, economic and social sustainability (DEFRA, 2005; DETR, 1999). With regard to the built environment, mixed use development, through the provision of accessible facilities, is claimed to reduce reliance on the car, thereby improving *environmental* sustainability, (DoE,

1994), as well as providing equal access to facilities, thereby improving *social* sustainability (Dempsey *et al.*, 2009). The mixed use principle was first introduced into English land use planning policy in the form of Planning Policy Guidance (**PPG**) 13 on Transport (DoE, 1994) and has since been re-iterated in other land use planning policies (DCLG, 2006; ODPM, 2005a)[1]. Surprisingly, whilst the mixed use principle has been promoted for over 15 years in the UK, government guidelines make few recommendations about the exact type of facilities needed or indeed their location or specific design (with the notable exception of the PPG 17 companion guide providing such guidance on sports and recreation facilities (ODPM, 2001). PPG 13 (DoE, 1994) refers to '*everyday activities*'; Planning Policy Statement (PPS) 1 (ODPM, 2005a) to 'health, education, shops, leisure and community facilities, open space, sport and recreation' (Para 27) and PPS 3 (DCLG, 2006) requires housing to be developed 'in suitable locations which offer a range of community facilities and have good access to jobs, key services and infrastructure'(Para 36).

The importance and benefits of *access* to local facilities for groups with low mobility, such as children, the old and the poor has been widely researched (Lang, 1994, Gordon *et al.*, 2000; Bowling *et al*., 2006). The preference for local facilities has also been investigated concluding that residents highly value the provision of shopping facilities and parks/open spaces in their residential environment (CLG, 2009). However, whilst the preference for and benefits of having local facilities have been researched, a recent review found that there is a lack of studies investigating whether the provision of local facilities actually **results in their use** (Barton and Hills, 2005). Furthermore, few studies have analysed **which factors influence local facility use**, which of these are the most important and whether they are equally important for different types of local facilities. Some studies have analysed one type of facility (Giles-Corti et al., 2005; Gold, 1972; Riva et al., 2007), others, that have examined several types of facilities, have found no consensus as to which factors are the most important. For example, Foley (1950), Ahlbrandt (1984) and Fisher and Bramley (2006) concluded that personal characteristics of the users were most important in influencing use, whereas Macintyre and Ellaway (1998) and Lang (1994) concluded that area characteristics were more important. Hence, there is a need for further research into whether local facilities are used, which factors influence that use and what their relative importance is.

1.2 THE SIGNIFICANCE OF SOCIAL INTERACTION IN NEIGHBOURHOODS

The idealised notion of 'communities' where residents know their neighbours and others living in the same area and are able to rely on them for help and support as a desirable form of living is deeply ingrained (Rudlin and Falk, 2009). Furthermore, this ideal conjures up images from the pre-

[1] Whilst this government guidance has now partially been replaced, it informed the building of the residential developments that are now complete and lived in which are the subject of this research.

industrialised era and is spatially located in villages. Rapid urbanisation has long been feared by some to lead to a loss in neighbouring and the fragmentation of local communities (Wirth, 1964). However, studies have shown that communities do exist in many urban and post-industrialised communities (Jacobs, 1961; Young and Willmott, 1957) and can also exist in post-modern, suburban areas (Campbell and Lee, 1992; Casey *et al.*, 2007; Plas and Lewis, 1996; Skjaeveland and Garling, 1997). Positive social interactions have been found to be an important first step to establishing bonds between individuals (Goffman, 1963), hence there is a need to better understand what affects the nature and strength of these interactions.

Residential neighbourhoods have been found to be places in which social interaction occurs (Forrest and Kearns, 2001; Stafford and McCarthy, 2006) and numerous studies have found that this can have wider benefits both for **individual residents** as well as the **collectivity of people living in the area**: With regard to **individual residents**, positive social interaction has been found to be important for providing relief from daily routines (Dines and Catell, 2006), place attachment (Riger and Lavrakas, 1981), social networks (Granovetter, 1973), social support (Stansfeld, 2006), wellbeing (Dines and Cattell, 2006) and ultimately health (compositional effects) (Cattell, 2001; Leventhal and Brooks-Gunn, 2003; Pickett and Pearl, 2001). This can be particularly important for certain groups such as older people (Duff and Hong, 1982; Kim *et al.*, 2005; Pinquart and Sörensen, 2001) and poor people (Gordon *et al*., 2000) who spent more time in their neighbourhood and depend more on their neighbourhood ties for social support (CLG, 2009). Whilst positive social interaction can contribute to all of the above, negative social interaction in neighbourhoods can also result in serious problems for individuals, such as fear of crime, lack of perceived personal safety and lack of trust (Ross, 2000), ultimately negatively affecting the health of individuals (Macintyre *et al.*, 2002). With regard to the **collectivity of people** living in a neighbourhood, positive social interaction has been found to help alleviate tensions in neighbourhoods (Dines and Catell, 2006) improve a sense of community (Chavis and Pretty, 1999; Kim and Kaplan, 2004; McMillan and Chavis, 1986; Nasar and Julian, 1995) increase social capital (Forrest and Kearns, 2001) which in turn has a direct impact on social cohesion (Dempsey, 2008) and health (Pearce and Smith, 2003; Pickett and Pearl, 2001). Positive social interaction has been found to help reduce the occurrence of crime (Warner and Rountree, 1997) and other problems such as teenage delinquency (Sampson *et al.*, 2002). Given the importance of social interaction for individual and collective well-being, as well as the recent riots in London and other cities, policy makers in the UK have been increasingly interested in promoting positive social interactions between residents in neighbourhoods (DETR, 2000; ODPM, 2003b; DCLG, 2012).

There is an on-going debate however about whether socio-economic factors or environmental factors are the most important determinants of social interaction and to what extent the latter determines social behaviour and interaction in neighbourhoods (Haggerty, 1982). Whilst some authors have argued that social interaction levels are highly influenced by the demographic make-up of its residents (Gans, 1962), others have suggested that the design of the built environment (Festinger, 1950; Gehl, 2001; Holahan, 1979), such as the development layout (Rogers and Sukolratanametee, 2009; Williams, 2005), dwelling density (Bramley *et al.*, 2009) or the inclusion of semi-private spaces, such as front porches and communal gardens (Skjaeveland *et al*., 1996) is able to increase incidences of social interaction. An architectural movement, New Urbanism, has also made claims that the design of neighbourhoods, including placing local facilities in walking distance to people's home, increases social interaction amongst residents (Duany *et al.*, 2000; Katz, 1994), without sufficient empirical data supporting these claims (Lund, 2003; Talen, 1999). The process through which mixed use areas might increase social interaction levels was set out by Achimore (1993) in that these areas 'create **multipurpose spaces** in which lingering is encouraged, creating a setting for 'repetitive chance encounters' which, in turn, builds and strengthens community bonds'(p.163). As local facilities are a manifestation of mixed land uses, and current policies and practice support the provision of multipurpose spaces in which lingering is encouraged, the next section explores the asserted relationship between local facilities and social interaction.

1.3 THE FOCUS ON LOCAL FACILITIES AS SETTINGS FOR SOCIAL INTERACTION

The need for neutral ground as a meeting place for strangers (Simmel in Spykman, 1925) and a location where friends and strangers can socially interact has long been recognised (Sennet, 1990). At the city level, public spaces such as market places (Watson, 2009), parks and town squares (Holland *et al.*, 2007) have been found to offer the opportunity for high levels of interaction between persons of different social and ethnic backgrounds (Lofland, 1998; Fainstein, 2005) and, due to their continued presence in the same place, were found to support both weak and one-off interactions as well as strong and more structural interactions (Lofland, 1998). At a neighbourhood level this idea was picked up by Perry (1939) in his *neighbourhood unit concept,* whose very influential idea was to build small areas with primary schools and recreational facilities at the centre as they would give people the opportunity to meet or simply see each other and thereby reinforce their identity. But not just primary schools and recreational facilities are thought to increase social interaction; local facilities generally, including privately owned shops and supermarkets have been claimed to 'bring residents together and reinforce community' (Llewelyn Davies, 2000). The latter facilities are primarily designed as places for consumption by

their owners/operators, hence to what extent they also constitute places of social interaction remains debated and has not been sufficiently researched. Notwithstanding these issues, the assertion has retained its powerful logic and has been re-emphasized in recent government guidance (NPPF, 2012). Research that has investigated the relationship between local facilities and social interaction levels has focused on the existence of local facilities in a housing development as a key variable that encourages people to walk (Giles-Corti and Donovan, 2003a) and hence provides opportunities for social interaction 'en-route' (Casey *et al.*, 2007). Whether the facilities themselves constitute places of social interaction, however, has been insufficiently researched.

At the micro-scale level, the design features of some facilities, such as parks (Golicnik and Ward-Thompson, 2010; Moore and Cosco, 2007), shopping malls (Feinberg *et al.*, 1989), and supermarkets (Sommer, 1998) and their influence on social interaction has been researched. There is also a substantial literature analysing which design features support well-used and social public spaces (Carr *et al.*, 1992a; Cattell *et al.*, 2008; Cooper Marcus and Francis, 1990; Francis, 2003; Gehl, 2001). However, this has not been linked to the public realm surrounding local facilities where the facility itself provides a reason for using that space. There is also a lack of studies analysing design features at a number of local facilities rather than just one type.

Hence, this study will address the identified gaps in research, testing the claimed associations between facility provision, facility use and social interaction. The study tests these claims by analysing use and social interaction at a range of different local facilities, investigating which macro and micro-scale factors influence use and social interaction at those facilities. Having set out the justification for this research, the next section sets out the aim and objectives.

1.4 RESEARCH AIMS

The aim of the research is to understand what contribution facilities make towards fostering social interaction in suburban housing developments in England and which factors have an impact on levels of local use and social interaction. In order to achieve this aim, the following 5 objectives were developed:

1. To identify the **extent** to which **local facilities are used** by the local population in suburban housing developments,
2. To identify which **factors** relating to the facilities (e.g. type, location), the area they are located in (e.g. level of crime) or the individuals (e.g. age, gender) **affect the use** of local facilities,

3. To identify the **extent** to which **social interaction** occurs between residents at local facilities in suburban housing developments,
4. To identify which **factors** relating to the facilities, the area they are located in or the individuals affect **social interaction** at facilities,
5. To understand which micro-scale **urban design features** may influence the type, location, frequency and duration of social interaction at these facilities (with particular reference to town centres).

1.5 RESEARCH APPROACH

This study addresses the identified gap between assertions of the importance of facilities for social interaction by collecting and analysing empirical data testing these. Hence, the research analyses the relationships between local facilities and how characteristics of the facility itself, the area the facility is located in and the residents might influence use and social interaction. The study follows a deductive research strategy testing, in its broadest sense, the claims that the physical environment (here in the form of facilities) can influence human behaviour. More specifically it tests claims made implicit in government guidelines that mixed-use areas necessarily lead to a sense of community.

The study was supported by an EPSRC studentship grant concerned with understanding social sustainability in a built environment context. The research followed a mainly quantitative research approach, trying to establish common associations and patterns between variables measured across many people and several facilities. A cross-sectional rather than an experimental or longitudinal design was adopted and two methods (survey and observation) were mixed sequentially in this research to triangulate the data (Bryman, 2004). First, three suburban areas in an English city with a range of local facilities were chosen as populations to draw primary data from. The study investigated which facility, area or personal factors contributed to the use of and social interaction at local facilities. Households were selected by random sampling within the three suburban areas using a self-completion survey questionnaire. The data was then analysed using logistic regression. Second, two town centres within the large sample areas were selected as spaces to conduct structured observation. Behaviour mapping was used to record actual user behaviour and analyse whether any micro-scale urban design features had an observable influence on the type, location, frequency and duration of social interaction at these locations.

The next section briefly describes the content of each chapter and how they are linked together to fulfil the research objectives.

1.6 THESIS STRUCTURE

The ensuing nine chapters follow the stages of literature review, methodology, analysis and conclusion (see Figure 1-1 below).

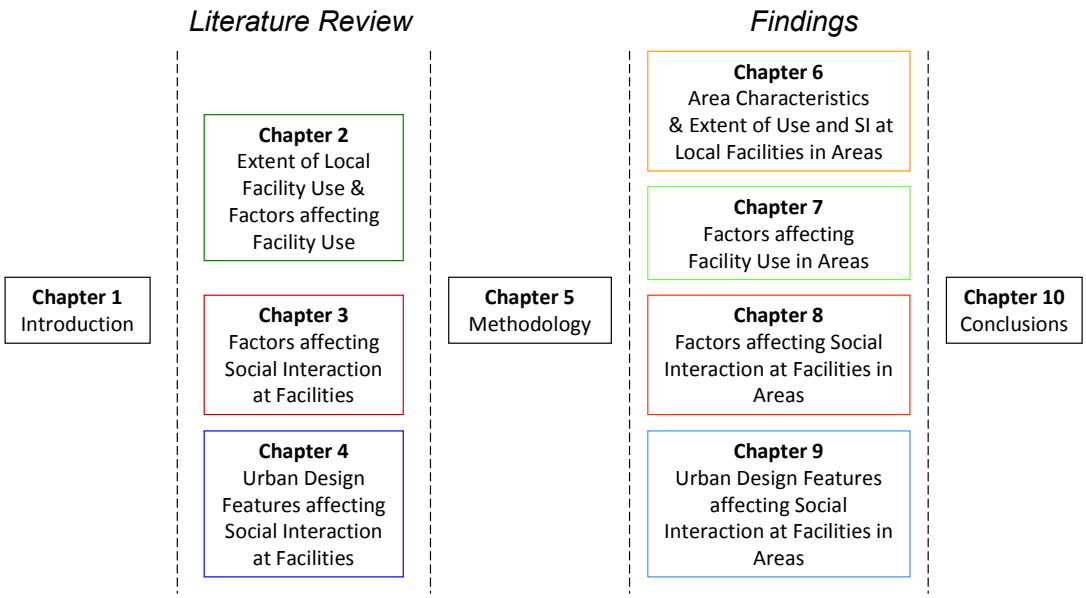


Figure 1-1: Structure of thesis by chapters

Chapter 2 defines the term local facilities as it will be used throughout the thesis. This is followed by a review of literature that has analysed to what extent local facilities are used by the populations they are intended to serve. Furthermore, it draws on relevant literature to identify key factors that are likely to affect use of local facilities. These are organised into facility, area and personal characteristics following a framework developed by Fisher and Bramley (2006).

Chapter 3 defines what is meant by 'social interaction at local facilities' and reviews how this concept has been conceptualised in the literature. The work is set within a wider theoretical framework of environment-behaviour studies, with a brief discussion of the main viewpoints/theories on how and to what extent the environment can influence human behaviour. This is followed by identifying factors likely to affect social interaction at local facilities based on a review of existing literature. These are equally grouped into facility, area and personal characteristics to provide a consistent approach with comparable results in later chapters.

Chapter 4 is the final literature review chapter, which mainly draws on urban design literature to identify micro-scale, urban design features at or around facilities that might impact on social interaction levels at local facilities. The chapter organises the factors into two main groups of features that are most likely to influence the type, location, frequency and duration of social interaction: features increasing the length of stay of users and features affecting visibility and

movement of users. Relevant factors relate to the facilities themselves, as well as the surrounding public realm.

Chapter 5 explains the methodology employed to address the research aim and objectives. The definitions and concepts discussed in the previous three chapters are operationalised as indicators in order to be measured empirically. The area selection process for the data collection methods is set out and the format and validity of the collection methods are discussed. This is followed by an explanation of the main analytical methods used: statistical methods and GIS analysis.

Chapter 6 describes the characteristics of the sample population and the sample areas. It also provides descriptive information on the type and location of local facilities present in the study areas. Furthermore, it addresses research **objectives 1 and 3** in that it uses descriptive statistics to demonstrate the extent of local facility use and social interaction frequency by the sample.

Following descriptive results in the previous chapter to demonstrate the extent of local facility use in the sample, *Chapter 7* uses quantitative statistical methods (mainly logistic regression) to analyse the relationship between facility, area and personal characteristics and use of local facilities. It also analyses the relative importance of different characteristics on the use of local facilities, thereby addressing research **Objective 2**.

In *Chapter 8* statistical analysis is used again to test which of the facility, area and personal characteristics affect social interaction levels at local facilities. It explores the relative importance of different factors on social interaction levels at local facilities, thereby addressing research **Objective 4.**

Chapter 9 calls on descriptive statistics to compare social interaction across the two selected sites. ArcGIS thematic maps and images are used to analyse the extent to which the previously identified micro-scale urban design features exist on the sites and to what extent those features influence the type, location, frequency and duration of social interaction, thereby addressing research **Objective 5**.

Chapter 10 provides a review of the results and discusses the wider implications of the findings in terms of the contributions they have made to theory as well as policy. Limitations of the thesis are discussed and the chapter concludes with suggestions for future research investigating the relationship between the built environment and human behaviour.

Chapter Two

Local Facilities and Factors Influencing Their Use

2.1 INTRODUCTION

The main aims of this chapter are to define the terms 'local facilities' and 'facility use' and to identify the key factors from existing literature that affect use of local facilities in suburban housing developments in England thereby addressing **Objective 2**. The key factors identified from the literature will then form the basis for developing indicators in the methodology Chapter 5. Although the main focus of the study is on social interaction levels at local facilities, use of local facilities is given such prominence, as it is considered a precondition for social interaction at the facility. If there are no people at the facility, then social interaction can not occur. Hence, understanding which factors affect use of local facilities is a necessary first step before analysing other factors affecting social interaction at local facilities. Furthermore, the extent to which local facilities are used by the local population is an understudied subject (Barton and Hills 2005) which requires further analysis.

Whilst the emphasis of the thesis is on the local facilities themselves, they are situated within a wider geographical area whose characteristics (for example crime levels) might have an independent effect on the use of these facilities irrespective of features they exhibit themselves (for example affordability). Furthermore, it has been found that people's individual circumstances can affect the use of local facilities, even if the provision is identical (Macintyre and Ellaway, 1998). Hence, key factors affecting use, have been divided into three parts in this Chapter, relating to facility characteristics, area characteristics and individual characteristics following a distinction suggested by Fisher and Bramley (2006) and based loosely on the ecological systems theory developed by Bronfenbrenner (1977).

Before discussing factors affecting use however, different lists of local facilities, as used in the literature, are discussed and a selection of local facilities most useful for answering the research objectives of this thesis is made.

2.2 DEFINING LOCAL FACILITIES

As set out in Chapter 1, sustainable development has been heavily promoted since the early 1990s incorporating not just the aims of environmental and economic sustainability, but also social sustainability (Dempsey *et al.*, 2009). Social sustainability is concerned with *inter-generational equity* (future generations should have the same or greater access to social resources as the current generation) and *intra-generational equity* (there should be equal access to social resources *within* the current generation)as stated by the UNDP (1997). Within a land-use framework, intra-generational equity is promoted, inter alia, through *equal access* to key local

facilities across geographical areas (Dempsey *et al*., 2009) which has been labelled *horizontal equity* (Kay, 2005). Hence, a number of government policies have been put forward stressing the importance of enhancing the availability and accessibility of facilities within walking distance of people's homes (DETR, 1998; ODPM, 2003b; ODPM, 2005a; Social Exclusion Unit, 2003). Whilst PPG13 (DoE, 1994) refers to day-to-day activities and sets out a list identifying shopping, play areas, open space, schools, health centres, branch libraries and local authority offices, empirical research into which facilities are frequently used and could be described as day-to-day facilities has been limited (Barton and Hills, 2005; DoE, 1994).

Whilst some literature concentrates on a few key facilities that people should have local access to, such as stores, schools and parks (Talen, 2003) or community centres (Aldous, 1992), others have chosen a larger range of facilities. For example, a study focusing on components of the compact city and their effect on social equity identified the provision of facilities as one such component. The study identified 7 key facilities (newsagents, restaurants/cafes, takeaways, food stores, banks/building societies, chemists, doctor surgeries) which were deemed to be **representative of the whole range** of facilities (Burton, 1997).

Other studies have grouped facilities according to their main **purpose**. For example, Atkinson and Kintrea (2001) and Camina and Wood (2009) divided activities into shopping and services (covering all visits to shops, financial services, public offices and personal services) and leisure (covering all sports, arts and leisure activities including eating and drinking), but also noted whether an activity had taken place locally (on the estate) or off the estate. Similar distinctions were made by Casey *et al.* (2007) and Barton *et al.* (2007) examining food shopping, leisure, eating and drinking and indoor and outdoor activities. The latter divided food shopping into various categories according to the type of food shop visited (e.g. superstore or corner shop) (see Table 2.1 below). Bramley *et al.* (2009) distinguished between '*everyday utility services*' (chemist, shop, supermarket, post office and bank) and '*leisure and cultural services*' (café, pub, library, sports facility, community centre and facilities for children) whilst Urban Forum (2009) distinguished between types of *shops* (post offices, cafes and restaurants etc.) and types of *services and facilities* (doctors' surgeries, community centres, public transport etc.). None of the above specified a criteria list as to why some facilities were included whilst others were not.

A notable exception to this is the research by Winter and Farthing (1997) who examined the use of **all** facilities within new housing developments and then established a list of day-to-day eight facilities on the basis that they scored highest across three criteria which were:

- the number of developments on which they were provided,
- the level of local **use**, and
- the **frequency of trips** to the facilities.

The day-to-day eight were food-shop, newsagent, supermarket, post office, open space, pub, primary school and secondary school (ibid).

The 1999 Poverty and Social Exclusion (**PSE**) Survey grouped local facilities by **provider**, i.e. public and private provider and asked respondents whether they used the facilities provided and whether these were adequate (Gordon *et al.*, 2000) (see Table 2.1 below). The same survey also required respondents to state whether they felt a service to be **essential.** The services that were considered most universal and essential by respondents in 1999 were doctors' surgeries, post offices, supermarkets and chemists. Whilst they included built facilities, they also included a number of services that were not located in a building, such as home help and Meals on Wheels (ibid). Hence, although they are important services they can not be considered 'physical' facilities. Another study compared findings from the 1990 **PSE** survey with findings from the 1999 **PSE** survey and concluded that 'general public services open to all have tended to display a decline in usage over the 1990s and this is associated with a decline in the proportion of people regarding these services as essential' (Fisher and Bramley, 2006, p.241).

Dempsey *et al.* (2009), in reviewing the literature on facilities, found that there appeared to be general agreement in the literature on the services and facilities to which residents should have good access to and established a list of 14 types of local facilities and services, excluding district wide or regional facilities such as secondary schools and hospitals due to their large **catchment areas** (see Table 2.1 below).

	DoE, 1994	**Dempsey *et al.*, 2009**	Winter and Farthing, 1997	Gordon *et al.*, 2000	Fisher and Bramley, 2006	Burton, 1997	Barton *et al.*, 2007	Casey *et al.*, 2007	Bramley *et al.*, 2009	Atkinson and Kintrea, 2001
General purpose										
Shopping	√									√
Food-shop/Food shopping			√			√	√	√		
Non-food shopping							√			
Leisure activities								√		√
Indoor/Outdoor Activities							√			

	DOE, 1994	**DEMPSEY *ET AL.*, 2009**	WINTER AND FARTHING, 1997	GORDON *ET AL.*, 2000	FISHER AND BRAMLEY, 2006	BURTON, 1997	BARTON *ET AL.*, 2007	CASEY *ET AL.*, 2007	BRAMLEY *ET AL.*, 2009	ATKINSON AND KINTREA, 2001
Specific Types										
Supermarket		√	√	√	√				√	
Newsagent			**√**			√				
Post office		√	√	√	√				√	
Bank/building society		**√**		√	√	√			√	
Corner shop		√		√	√				√	
Facility for children/Play Areas	√	√			√				√	
Primary school	√	√	√				√			
Secondary school	√		√				√			
Nurseries/Playgroups					√					
Public open/green space/Park	√	√	√							
Community centre		√		√	√				√	
Place of Worship				√	√					
Sports/Recreation facility		√		√	√			√	√	
Cinema				√	√					
Library	√	√		√	√				√	
Museum and Galleries				√	√					
Pub		√	√	√	√				√	
Restaurant/café/takeaway		√				√		√	√	√
Chemist		**√**		√	√	√			√	
Optician				√	√					
Doctor/GP surgery	√	**√**		√	√	√				
Dentist				√	√					
Hospital with A and E Department				√	√					
Local office of the LA	√									
Petrol Station				√	√					
Bus Services/train/tube station				√	√					

Table 2-1:Examples of local facility lists as used in the literature

In summary, the above literature has highlighted a range of different dimensions by which local facilities have been selected or grouped:

- the **catchment area** they serve (Barton *et al.*, 2007; Dempsey *et al.*, 2009)
- their **primary purpose/function** (Atkinson and Kintrea, 2001; Barton *et al.*, 2007; Bramley *et al.*, 2009; Casey *et al.*, 2007; Dempsey *et al.*, 2009),
- their **provision levels** (Winter and Farthing, 1997)
- the assumed/actual **frequency of use** (Bramley *et al.*, 2009; Winter and Farthing, 1997),

- the **frequency of trips** to the facility (Winter and Farthing, 1997)
- the **provider** (Gordon *et al*., 2000), and
- whether they are considered **essential** by the users (Fisher and Bramley, 2006).

Another criterion that could be used to distinguish facilities (but was not found in the literature) relates to the **accessibility** of facilities with regard to whether residents have to fulfil a criterion to use the facility (nursery/schools/children's play area) require membership (leisure centre/library) or require some other precondition to use the facility (doctor surgery).

For this research, facilities were grouped into two lists according to their **catchment areas**, one encompassing a range of **neighbourhood facilities** (within 10min walking distance) based on Perry (1939) and one encompassing a range of **district facilities** (within 5 minutes drive) based on the definition of district centres in PPS6 (ODPM, 2005b). The idea behind these two groups was that the different catchment areas of the facilities would have an impact on the frequency of their use and also on the potential for social interaction as they would attract different numbers of people. Whilst regional facilities were excluded (such as hospitals) as they were not considered to be 'local', secondary schools were incorporated as it was felt that they had smaller catchment areas than libraries/large supermarkets/leisure centres which serve populations of roughly 20,000 people (Barton *et al.*, 2003). The facilities were not distinguished by **provider**, whether they were considered **essential by users** or because of an assumed **high frequency of trips**, as the research was interested in the breadth/range of local facilities present in residential areas. The facilities were also not grouped by **purpose/activity** (e.g. food shopping) as it was felt that the use of each individual facility type (e.g. corner shop, supermarket) required individual investigation and that important information could have been lost by grouping them.

When considering **which facility types** to include, the list of 14 core facilities to which residents should have access to (Dempsey *et al.*, 2009) was used as a starting point. Newsagent was added as it had been highlighted in the Winter and Farthing study to have a very high level of local use (75% of local trips). All health related facilities (GP/Chemist/dentist) were excluded due to the **precondition** of their use. Secondary schools were added due to their district catchment area (see above) and nurseries were added as it was felt that they constituted another important child related service in addition to primary and secondary schools. Bus stops were added as the importance of access to public transport had been mentioned in the literature. Place of Worship was also added as they had been mentioned in the literature to be used very frequently in the past and to constitute very social places (Ahlbrandt, 1984). Banks/building societies were

excluded due to the sensitive nature of activities in banks, which could potentially reduce the prospect of social interaction in those locations.

Employment services were also not included. Firstly, many people do not work in the same locality where they live and secondly (as demonstrated above) in guidance such as PPG13, facilities are always considered a separate group from employment uses as their function is to provide a service to the local residential population. The final list of local facilities used in this thesis thus consists of:

Neighbourhood Facilities:

- Corner shop
- Newsagent
- Post Office
- Hairdresser/Barber
- Take Away
- Local Café/Restaurant/Pub
- Green Space
- Children's Play Area
- Bus Stop
- Primary School
- Nursery

District Facilities:

- Supermarket
- Library
- Leisure Centre
- Park/Large Green Space
- Place of Worship
- Community centre
- District Centre
- Secondary School
- District Café/Restaurant/Bar
- Large Children's Play Area

Having established the group of local facilities the thesis is chiefly concerned with, this is now followed by a brief overview of previous studies which have defined and measured facility use.

2.3 DEFINING AND MEASURING LOCAL FACILITY USE

According to one of the earliest studies measuring local facility use, 'use of facility' and 'facility use' are used synonymously as generic terms and have been defined as 'the functional dependence by residents on such organized, specifically located meeting places or service centres as stores, places of employment, schools, churches, doctors, and cinemas' (Foley, 1950, p.238). Alternative ways to measure 'facility use' reliably are discussed in detail in Chapter 5, Section 5.6.1.

Given that local facilities are in place to serve the local population, the degree to which they are actually used by the local population is of interest. Hanson (1982) demonstrated that the provision of local facilities was associated with increased journey frequency, i.e. greater use. However, Barton and Hills (2005, p.226) found in a recent review that use of local facilities is an understudied subject and that very few studies have focused on facilities themselves and the use which residents make of these as topics of study in their own right. Five studies have compared

the percentage of the population that use a range of different local facility types (see Table 2-2 below), but have not recorded the frequency of their use, e.g. daily, weekly etc. The most recent study undertaken in an English suburb, found that most households made trips to all the local facilities recorded – both food and non food (Horswell and Barton, 2010). They found that superstores and pharmacies were accessed by over 90% of households; smaller food stores, banks, post offices and newsagents by at least 75% of households; indoor leisure facilities, however, were used by barely 50% and outdoor recreation facilities by just over 25% (ibid). Duffy (2000) compared service use in deprived and non-deprived areas asking households whether they used the service at least monthly. Whilst this included non-physical services, such as social workers and home helps, they also included a range of facilities, as shown in Table 2.2 below. Given the difference in location (US, UK and Scotland) and the different age of the studies, the results are probably not directly comparable, but provide an idea about the percentage of people using local facilities. It also highlights the importance of local food shopping for a majority of the population as well as some smaller facilities, such as the post office, corner shops and play areas.

% Of Respondents Using Local Facilities	Ahlbrandt (1984)	Macintyre and Ellaway (1998)	Duffy (2000) Deprived Areas	Duffy (2000) Non-deprived	Fisher and Bramley (2006)	Horswell and Barton (2010)
Supermarket/ Food stores	63%	41%			90%	90%
Libraries			35%	42%	63%	
Post office					90%	75%+
Corner shop/ Newsagent					80%	75%+
Pub		51%			59%	
Cinema					50%	
Sports facilities	20%	31%	26%	33%	48%	50%
Outdoor leisure			59%	53%		25%
Place of worship	51%				30%	
Bus services			75%	44%	55%	
Nursery Schools			19%	10%		
Play area					63%	

Table 2-2: Summary of studies reporting % of residents using local facilities

Three studies, two undertaken in the 50s and 60s in the US (Foley, 1950; Ross 1962) and one more recently in the UK by Winter and Farthing (1997) analysed specifically the number of trips to facilities undertaken locally versus non-local. Foley (1950) found that 70% of trips to food stores, 70% of school trips, 77% of church visits and 58% of cinema trips were undertaken locally, which he defined as within five blocks from home. Since the 1950s, car ownership rates in the US have changed dramatically and, in its wake, a process of centralisation of many commercial and leisure facilities followed, such as cinemas into multiplexes and local grocery stores into large

supermarkets. Hence, some facilities, such as cinemas (see Table below) that were considered in the 1950s study, would nowadays not be expected to be provided 'locally' (also see also Section 2.6.2.1). Only a decade later, Ross (1962) investigated similar facilities (apart from cinema) and found that 80% of food shopping, 36% of church attendance and 22% of entertainment was still done locally, (which he defined by asking people what the name of the place was where they lived and where the boundaries of that place were) but other facility usages such as clothes and furniture shopping were found to be pre-dominantly non-local. He concluded that convenience shopping (food) was still undertaken locally, whereas comparison shopping (clothes, bulky goods) was not (Ross, 1962).

% of trips to facilities conducted locally	Winter and Farthing (1997)	Foley (1950)	Ross (1962)
Supermarket	76%	69%	80%
Food Shop	55%		
Schools		68%	N/A
Sec Schools	68%		
Primary School	47%		
Libraries	15%		
Post office	60%		
Newsagent	67%		
Pub	41%		
Cinema/entertainment		58%	22%
Children's Play Area	44%		
Leisure Facility	7%		
Open Space	35%		
Community Centre	42%		
Place of worship/Church	21%	77%	36%

Table 2-3: % of trips to local facilities

Over 30 years later in the UK, Winter and Farthing (1997) also analysed the percentages of trips to facilities undertaken either locally (facilities on the estate) or non-local (off the estate and further afield). They found that locality was of different importance depending on the type of facility but nonetheless they corroborated some of Foley's findings with regard to food shopping and schools. They found that:

- Local supermarkets, secondary schools and newsagent attracted up to 75% of trips,
- Post offices, health centres, doctor's surgeries, food shops and chemists attracted 50% or more, and
- Primary schools, play areas, community centres, public houses and open space attracted between 30 and 50% of trips.

Other facilities, such as church, library, dentist and leisure facility, were considered to be more varied and specialist in nature, hence locality was not the most important aspect of use (7-21%)[1]. The continuous importance of local food shopping has also been supported by other studies (Dempsey *et al.*, 2012; Horswell and Barton, 2010). Having established that certain types of local facilities are frequently used by the local population, the factors affecting such use are discussed below.

2.4 FACTORS AFFECTING LOCAL FACILITY USE

Behaviour in this thesis is understood as a function of the person and their environment (Lewin, 1935). Bronfenbrenner (1977) developed Lewin's idea further into ecological systems theory which states that human behaviour is affected by its immediate settings, as well as the larger social contexts, both formal and informal, in which the settings are embedded. Correspondingly, in the case of local facility use and factors affecting use, the behaviour (use) is expected to be affected by a **person's characteristics** such as age, gender and socio-economic variables as well as the **social and physical area** the facility is located in, such as crime or social networks as well as **features relating to the facility itself**, such as type and location. These characteristics can also mutually affect each other and the resultant behaviour, for example crime levels in an area might affect whether people feel safe in the area and hence use local facilities (see figure 2-1 below).

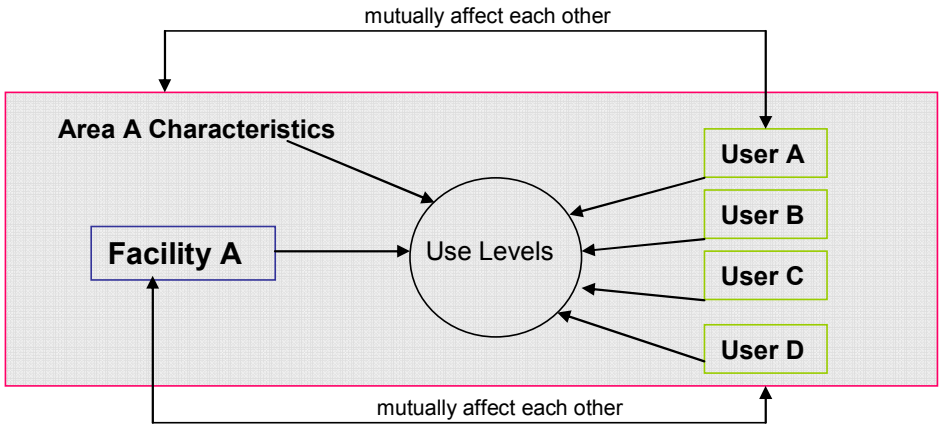


Figure 2-1: Analytical framework to investigate local facility use

With regard to empirical data, only a handful of studies have looked at different factors affecting the use of a **range** of local facilities. Whilst they have all made references to the three different sets of characteristics affecting local facility use, the majority of studies have focussed more on the personal and area characteristics than the facility characteristics, for example: Riva *et al*.

[1] The difference in church use in the US and UK is probably less to do with distance than the different role the church has in US and UK society.

(2007) analysed factors affecting sport and recreation facilities and found that both personal and area characteristics were associated with the likelihood of using local facilities to engage in physical activity. Macintyre and Ellaway (1998) also concluded that characteristics of the area were as important as characteristics of the person in predicting whether or not activities (such as shopping) were undertaken locally. Conversely, Fisher and Bramley (2006) concluded that local service use was more driven by household than by area characteristics. Ahlbrandt (1984) found that a range of demographic factors were associated with higher local facility use as well as the income of the area, its ethnicity and the level of local ties in the area, without stating which characteristics had the predominant influence. Foley (1950) in the US, found that a number of personal factors and one area characteristic, high residential density, was associated with higher levels of local facility use. The latter was supported 50 years later in the UK by Bramley *et al*. (2009) who also found that higher densities (over 300 DPH) was associated with greater use of local facilities.

With regard to characteristics of the facilities themselves, a number of studies have focused mainly on the accessibility and distance to a range of local facilities (Barton and Hills, 2005; Gordon *et al.*, 2000; Winter and Farthing, 1997). Others have investigated a particular type of local facility, such as parks and identified facility factors (such as design) relating specifically to the use of that particular type of facility (Giles-Corti *et al.*, 2005; Gold, 1972). The only exception is a study undertaken by Fisher and Bramley (2006), who developed a framework to explain usage of a **range** of local services, which included factors from **all three sets** of facility, area and personal characteristics (without specifically grouping them into these categories). Their framework was felt to be fairly comprehensive and with a sufficient number of sub-categories to organise the different factors identified in the literature. Hence, the following sections use that framework as a starting point to organise the facility, area and personal characteristics highlighted in the literature as affecting the use of a **range of local facilities**.

2.5 LOCAL FACILITY CHARACTERISTICS AFFECTING THEIR USE

The framework developed by Fisher and Bramley (2006) to explain *service* usage encompassed the following 'facility factors':

- The **supply** of services in the locality, including the budgets of local authorities and other agencies;
- Physical **accessibility** of those services to residents, affected by facilities, settlement patterns and transport
- **Rationing/eligibility** rules where applicable

This framework is concerned with 'services' not the physical manifestation of services in the form of facilities. Hence, **rationing/eligibility rules** are not appropriate as they do not relate to a physical form. Facilities also have additional **spatial options**, (such as mix and location) which could affect their use. The **supply** of facilities includes their availability and choice, but also their quality and affordability. **Accessibility** includes more than just the physical access, and can also relate to costs of getting to a facility. Finally, the above framework focuses on the institutional not the social aspects of facilities, but it was felt that **other users** could also be an important aspect that affects people's use of local facilities. Whilst this could be argued to be a personal characteristic, these users are spatially located at a facility and hence serve as an attraction or detraction from using a particular facility at a particular time.

This section is thus sub-divided into the following facility characteristics which should be relevant to most facilities and not just one type of facility:

Supply

- Availability of Local Facilities
- Quality and Affordability of Facilities

Spatial Distribution

- Location, Mix and Spatial Arrangement

Accessibility

- Distance and Convenience
- Mode of Transport and Temporal Constraints

Other Users

2.5.1 Supply

2.5.1.1 Availability of Local Facilities

The first aspect of supply is the extent of provision, i.e. whether a facility is available locally and how many of the same type there are to choose from within the local area. Provision can be based on market demand (commercial facilities) or need projections (public facilities) as set out in Government Guidance (ODPM, 2001; ODPM, 2005a). Provision of public services has been found to be determined by equity and efficiency considerations as well as lobbying (Witten *et al.*, 2003). Lack of availability and quality of local services and facilities is particularly important for some groups such as households with limited mobility and personal resources as their ability to use non-local facilities is restricted (Altschuler *et al.*, 2004; Witten *et al.*, 2003). Access and cost of access to facilities is further discussed in Section 2.5.3.

Given the importance of local facilities for people with limited financial resources, a number of studies analysed provision of services in different neighbourhoods and found that poorer/ethnic minority neighbourhoods either had fewer facilities and/or that their quality was less compared to more affluent neighbourhoods: For example, in the US this held true for a range of local facilities (Ahlbrandt, 1984), or specific types, such as commercial physical activity-related facilities (Powell *et al*., 2006), chain supermarkets (Powell *et al*., 2007) and parks (Talen, 1997). In the UK, this was found to hold true for public services such as refuse collection (Hastings, 2009), publicly provided facilities such as schools and health centres (Turok *et al.*, 1999), banks and building societies (Rossiter, 1997), and commercial facilities such as pubs, local shops and hairdressers (Donnison, 1998). A study by Macintyre *et al*. (1982) in Scotland investigating a large number of different facility types found that provision of facilities depended on the type of facility. Whilst some facility types were more frequently sited in *more affluent areas*, such as public secondary schools, private schools, banks, private health clubs and swimming pools, bowling greens and parks, other types were more frequently sited in *more deprived areas* such as public nurseries and primary schools, pharmacies, post offices, bus stops, bingo halls, public swimming pools, public sports centres and outdoor play areas. Others, such as private nurseries, general and dental practices, pawn brokers, ATMs, supermarkets, fast food chains, cafes, public libraries, and cinemas showed *no clear pattern* by deprivation. Twenty years after the Macintyre *et al.* (1982) study in Scotland, the UK **PSE** survey concluded that lack of availability or 'collective exclusion' rather than lack of affordability or 'individual exclusion' was the main barrier to use and affected nearly one-third of respondents for both public and private services (Gordon *et al.*, 2000). Conversely, Smith *et al.* (2010) (also in Scotland) comparing urban and rural places found that the *most deprived neighbourhoods* had the best access to grocery stores generally and grocery stores selling fresh produce and that the 'deprivation amplification' hypothesis did not hold. Hence, evidence regarding inequitable facility and services provision remains contested.

Notwithstanding the debate of equitable provision of services, even if facility provision is good, the direct link between availability and use is contested. For example, Riva *et al*. (2007) found no association between the number of physical activity facilities and the likelihood of use of local facilities for physical activity. Although other studies had supported the association between availability and accessibility of resources and involvement in physical activity, Riva *et al.* (2007) felt that those findings were inconsistent as associations appeared to vary depending on the type of facilities and physical activity levels measured (van Lenthe *et al*., 2005). Whilst this has only been tested for physical activity facilities, it questions the assumption that simply providing a facility will result in it being used. Other factors may also have a part to play.

2.5.1.2 Quality and Affordability of Facilities

The second main aspect of supply is the **quality** of a facility which is likely to influence its use (Witten *et al.*, 2003). Fisher and Bramley (2006) found that lack of availability or *perceived inadequacy* appeared to be the main barriers to use of both public and private services rather than affordability. Casey *et al*. (2007) found that renters and home owners placed different importance on quality as home owners expected higher quality of local sports and leisure facilities (including drinking and eating out) and were more likely to use facilities outside the local area if the quality of local facilities was perceived to be poor. These findings were corroborated by Atkinson and Kintrea (2000) who also found that owners would use facilities (such as supermarkets, pubs) further away from the local area if their quality was deemed better, despite local alternatives.

For people with reduced mobility (also see 2.5.3.2) or residents in poor neighbourhoods low quality of services is often endured due to a lack of choice (Turok *et al.*, 1999). Twenty years ago, a study in the US had already highlighted that lower quality provision (in addition to fewer facilities) was linked to poorer neighbourhoods with higher proportions of ethnic minority populations (Ahlbrandt, 1984). The more recent **PSE** survey in the UK confirmed that exclusion from adequate services was higher than the availability of services suggested, as a large number of respondents used services/facilities despite regarding them as inadequate due to the lack of alternatives (Gordon *et al.*, 2000). However, another study re-analysing data from the People's Panel (MORI, 1998) found similarities between people in deprived and non-deprived areas as to how satisfied they were with the quality of local services (Duffy, 2000). This might be partially explained by the different expectation levels regarding the quality of local facilities as identified by Casey *et al*. (2007).

One aspect of quality, particularly with regard to parks and green spaces, is size of the facility, which has been found to be an important factor affecting its use (Boyle, 1983). Giles-Corti *et al.* (2005) found that once distance to public open space was taken into account, **size** was more important than attractiveness in encouraging use. Another aspect can relate to the **quality of the building** in which a facility is located, particularly for civic facilities. For example, following the opening of the new Peckham Library building, which was praised for its design, annual visits increased from 171,000 to 500,000 per annum (CLG, 2009).

Issues with measuring high quality across a *range of local facilities* is again problematic, as objectively measured ratings by providers such as children's play space audits, school league tables etc. are only relevant for a specific facility type. Investigating the impact of quality on the

use of a range of facilities is most appropriately measured as perceived by the user as this will inform whether people use the facility or not, irrespective of whether the provider believes it is a high quality facility (Witten *et al.*, 2003).

With regard to **affordability** of local facilities, Gordon *et al.* (2000) found that lack of affordability, or 'individual exclusion', affected only 1 in 10. The main facilities for which charges were cited as a deterrent were visits to the pub or cinema/theatre. However, Gordon *et al.* (2000) claimed that these figures were likely to be underestimates rather than overestimates of individual exclusion, since 'some people would prefer to say that they do not want services than to admit that they cannot afford them' (p.57). More positively, the fact that local food shops were cheaper was cited as a reason by respondents in another study for using local food shops (Casey *et al.*, 2007, p.326). Overall, to what extent affordability affects the use of a range of local facilities appears to be an understudied subject. Measuring affordability and choice raises similar issues to quality (as discussed above) and should thus also be measured by asking the users.

2.5.2 Spatial Distribution

2.5.2.1 Spatial Arrangement and Mix of Local Facilities

Facilities are physically located in an area and different spatial arrangements could have an impact on the use of those facilities. In theory, facilities can be clustered in groups (linear or 'square) or be provided as a stand alone unit with an even spread across the area or an uneven dispersion/spread (corner of main routes, single units are all along a major route at different intervals but not in the rest of the area) (see images below).

Images 2-1: Different spatial arrangements for pubs/restaurants

Furthermore, clusters of facilities can be located in the centre or the periphery of an area (Barton *et al.*, 2003). The location and distribution can be dictated predominantly by *market forces*, including land values and availability, or predominantly *government guidance*, including planning policy and needs calculations, or a combination of both.

Penn *et al*. (2009) has described 3 competing *market forces* in the distribution of commercial facilities/uses:

1. a process driving towards aggregation of similar kinds of activity to support comparison,
2. a process driving towards aggregation of different kinds of activity to support multi-purpose trips, and
3. a process driving dispersion amongst similar activities in order to offer convenience by minimising travel distance to local catchments.

The first two processes would result in a cluster of facilities albeit with a different mix of uses. During the last 30 years these processes have resulted in a retail revolution, with the rise of out-of-town, car-based shopping centres away from the traditional, pedestrian focused high streets often with a detrimental impact on the vitality of these high streets (Dawson, 1983). The third process would result in a dispersion of single facilities where each facility is located at equidistance to avoid overlapping catchment areas (i.e. the area and population they are meant to serve). This phenomenon was first analysed by the German geographer Christaller in 1933 and developed into the *central place theory* seeking to explain the location and size of settlements in terms of functioning as service providers (see Figure 2.2 below) (Christaller, 1933).

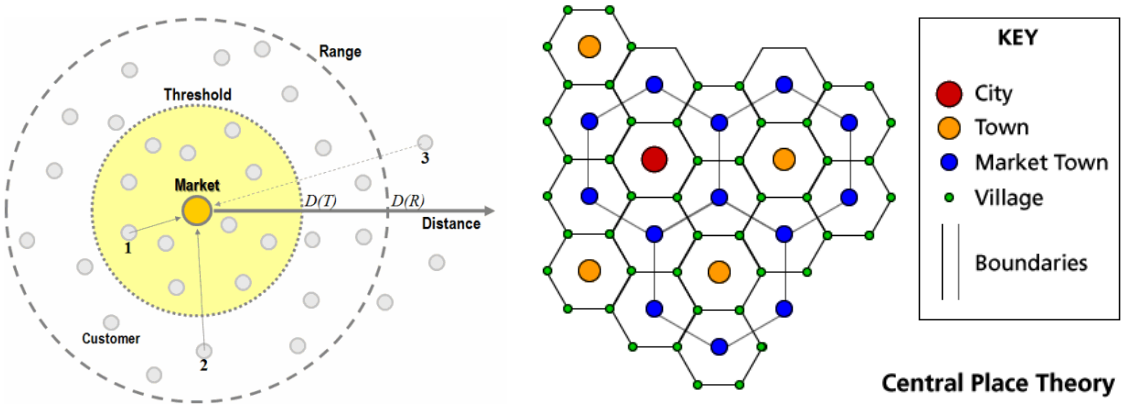


Figure 2-2: Central Place Theory

This explanatory theory became very influential in Germany as a normative theory promoting a hierarchy of centres as the most efficient form of service provision (*ROG*, 1997) and also found its way into current UK government guidance such as PPS1 and PPS6. Hence, even facilities that are not subject to market forces are often located in centres or at least clusters of facilities to increase their accessibility and to allow multi purpose trips (e.g. library, leisure centre). Whether this increases the frequency of use of local facilities has not been tested. With regard to the location of local facilities, Barton *et al*. (2003) suggest that these should be located away from the centre

of neighbourhood areas (where they will only be apparent to a small number of people) and be situated on a main route and adjacent to other neighbourhoods and transport interchanges to increase their visibility. With regard to the type of clustering of facilities, Barton *et al*. (2003) recommend that facilities should be grouped 'in linear clusters akin to traditional high streets, which offer variable catchments that can adapt to changing market conditions as the high street is a series of interlinked activity generators – bus stops, supermarkets, community/religious buildings, cafes, shops and small scale offices' (p.96). However, neither of these recommendations have been tested empirically. Similarly, the mix of facility types – aggregation of similar or different types – could have an impact on the use of these facilities, but this has equally not been tested, hence this thesis is analysing these factors in later chapters.

2.5.3 Accessibility

The Social Exclusion Unit (**SEU**) (2003) defines accessibility as the extent to which people can '*get to key services at reasonable **cost**, in reasonable **time** and with reasonable **ease***' (p.1). The first section below deals with the distance to the facility (time), whilst the second section deals with the mode of transport and associated costs and the third section with convenience (ease) of using the facility. The cost of getting to a facility affects some groups more than others, particularly the poor, the disabled and children (Talen, 2003). Children and the disabled are not the focus of this thesis hence access issues relating to these two groups, such as requirements set out by the Disability Discrimination Act, are not covered here.

2.5.3.1 Distance

Distance has been found to be a major factor influencing the use of some facilities, such as parks (Tinsley *et al.*, 2002), public open space (Giles-Corti *et al.*, 2005), leisure centres (Smale, 1985) and supermarkets (Barton *et al.*, 2007).

One of the earliest studies looking at a **range** of local facilities was undertaken in an urban neighbourhood in the US in the 1950s, which found that 41% of all reported facility uses were within **1 mile** of the user's home and of those, 30% within half a mile (Foley, 1950). This showed for the first time that the use of facilities located close to home was extensive even though the area in the study was located within a larger city. Following the rise in car ownership, later studies only partially agreed with Foley's findings. The study by Winter and Farthing (1997) only recorded whether the facility was within the development or further away but did not look at specific distances. Another study analysed characteristics of local centres and travel behaviour and found that centres which were located physically closer to the resident population were used more frequently (ECOTEC, 1993). Given the importance of distance as a factor to use local facilities, several authors have made recommendations about maximum distances that key services and

facilities should be located to achieve good access to facilities for residents Barton *et al.*, 2003; Urban Task Force, 1999; DoE, 1994; ODPM, 2001). However, there is no consensus on what an appropriate distance to different types of facilities is (Dempsey, 2006). This holds particularly true for certain groups such as adults with children and older people who might find regular recommended distances such as 800 metres to local facilities too far to walk (Ellaway *et al.*, 2001; Schwirian and Schwirian, 1993).

2.5.3.2 Mode of Transport

Government policy for sustainable development and social inclusion lays great emphasis on enhancing the availability of facilities within walking distance of people's homes (DETR, 1998; ODPM, 2005a; Social Exclusion Unit, 2003;). Whilst facilities serving a neighbourhood catchment area (defined in this thesis as within ten minutes walking distance) fulfil these requirements, facilities serving a district catchment area (defined in this thesis as being situated within five minutes drive time of a person's house) require some form of motorised transport.

Whilst car ownership is very high in the UK, certain groups (the poor, families with one car, children, older people) have to rely on public transport to reach these facilities (Altschuler *et al.*, 2004). Whilst providing people with a choice of transport and particularly the option of cheap, frequent and reliable public transport is seen as important (Social Exclusion Unit, 2003), in reality, access to public transport has been found to be problematic for a significant minority of the population (Gordon *et al.*, 2000). The **PSE** survey found that 15% regarded bus services and 10% train services as unavailable and 11% regarded train services as unaffordable (ibid.). Consequently, for groups who depend on public transport, the ability to use better facilities and services outside the local area is constrained, so standards of consumption are inferior compared to groups who do have access to cars (Turok *et al.*, 1999).

2.5.3.3 Convenience

Convenience has also been found to be an important factor for physical activity use (Andrew *et al.,* 1981; Sallis *et al.* 1990). Casey *et al.* (2007) found that employed people who used food shopping facilities elsewhere stated that the main reason for shopping outside the area was convenience of using bigger shopping centres and supermarkets which fitted in with 'busy lifestyles' given that their employment was also outside the areas studied. Another study also confirmed that some people chose supermarkets close to/en-route to their place of employment for convenience reasons (Dempsey *et al.*, 2012). Apart from a facility being situated in a convenient location, convenience can also relate to the *opening times* of a facility (to fit in with employment and other commitments). With regard to temporal constraints of using facilities, recent spatio-temporal accessibility research found that women have lower levels of access to

urban opportunities than men (Kwan, 1999). Whilst the relaxation of opening times (later in the evening, on the week-end) has improved access for people in full-time employment to shopping facilities, the promotion of the night-time economy in city centres has led to a rise in alcohol related entertainment which in turn resulted in increased fear of crime and antisocial behaviour for some groups (women, older people) which made city centres less accessible to them (Roberts, 2006). This is discussed in more detail in the following section.

2.5.4 Other Users

Other users can be an attraction **or** a deterrent to using a facility. Most of the facilities analysed in this thesis function similar to public space, i.e. there are few restrictions (such as membership, age restriction etc) on who can use them. This can be seen as an opportunity in that 'public spaces are the *glue* that hold society together, the places where we meet different people, share experiences, and learn to trust each other' (CABE, 2003, p.5). However, it also means that people who would not otherwise routinely share space may do so in the public spaces and this 'includes marginal and *othered* groups' (Holland *et al*., 2007, p.65). Due to the heterogeneity of these different groups there is also potential for conflict between groups which can result in less users. Several studies have examined user conflicts (Carr *et al.,* 1992b; Gehl, 2001; Kaplan et al., 1998) and have identified several types of conflicts ranging from conflicts between different types of users (age – teenagers and older people) (Holland *et al*., 2007) to more complicated cultural differences (between economic and ethnic groups) (Peters *et al*., 2010) or just the domination of one user group over others (Holland *et al*., 2007).

Apart from actual conflict the main concern for people to use and enjoy facilities is to **feel safe** (Francis, 2003). A study found that whilst safety from crime was not perceived separately from other concerns about the social and physical environment in terms of whether a place was felt to be safe or unsafe, the primary concern stemmed from particular social groups and their behaviour (Pain and Townshend, 2002). In the city centres this was found to be related primarily to 'binge drinking' of young males, which turned some city centre areas into effective 'no-go areas' for people over the age of 30 (Roberts, 2006). However, this is also relevant for the suburbs, where Casey *et al.* (2007) found that a significant number of residents stated that they did not use local pubs, because they were 'thought to be rough and used by people that were, for one reason or another, regarded as undesirable' (Casey *et al.*, 2007, p.327). Other aspects relate to particular groups, such as 'teenage loitering' in public spaces or around facilities which has been found to increase fear of crime (Lavrakas, 1982).

Whilst it has been argued that increasing the density and diversity of users is one of the best ways to reduce conflicts and increase public space use (Francis, 2003), other studies have concluded that to 'make certain environments feel safer for more people may be contingent on the exclusion of some others' (Tiesdell and Oc, 1998, p.653). Exclusion from public spaces however raises questions of social equity (Minton, 2009) and also of which groups to exclude:

> 'For example, young women, parents or older people may fear young men, football fans or homeless people, yet the latter groups may be at much greater risk of crime' (Pain and Townshend, 2002, p.117)

In reality, many facilities devise a management strategy which results in making facilities less accessible to some user groups. For example, malls have been shown to be popular as they are in effect semi-private space, with restricted opening times and the ability to restrict certain user groups (teenagers, homeless) or undesirable behaviour (drinking, skateboarding) through the use of security personnel (Feinberg *et al.*, 1989). These semi-private spaces have been found to be particularly welcomed by certain types of user groups, notably older people who have been found to be actively discouraged from fully using public places, especially after dark by security concerns (Holland *et al.*, 2007).

Other users can also be an incentive to use a facility in order to socialise and meet people. Tauber (1972) claimed that consumers have social and psychological motives for shopping beyond acquiring necessary purchases which involves the need for social interaction. This concurred with findings from a study undertaken by Horswell and Barton (2010) which found that people who shopped locally stated convenience and the potential for casual social encounters as their main reasons for using local shops. Observational studies in public spaces have also shown that the main attraction of using public space is watching other people and/or socialising with them (Gehl, 2001; Whyte, 1980).

Having discussed factors which relate directly to the facility itself, the next section reviews literature pertaining to characteristics of the wider area a facility is situated in which have been found to influence facility use.

2.6 AREA CHARACTERISTICS AFFECTING LOCAL FACILITY USE

Fisher and Bramley (2006) suggested the following 'area' factors in their framework to explain usage of local services:

- Social, cultural, and environmental aspects of the neighbourhood that may affect people's willingness to use services

They argued that

> whilst many of the factors affecting service usage are essentially attributes of the individual, or household in question, some are also attributes of the area and/or the collectivity of people living in it. Those latter factors and the way that they interact with individual factors raise the possibility of *area effects* on service usage (ibid. p.231).

The importance or even existence of *area effects* on deprivation and social exclusion continues to be debated[2]. With regard to use, however, considering *area effects* as an explanatory factor for facility use was corroborated by Ahlbrandt (1984) who found that 'the neighbourhood context (such as income levels, ethnicity and social ties) was important in that it affected the uses made of the neighbourhood for grocery shopping, shopping for small items and attending religious services' (p.144). Area characteristics could thus be described as moderating effects (Evans *et al.*, 2003), which affect the use of a particular facility in addition to a person's individual characteristics and the facility itself. For example, a mother with young children is less likely to use a high quality, conveniently located children's playground if the surrounding area is perceived to be unsafe.

Few studies have specifically analysed the effect of area factors on facility use, with Fisher and Bramley's (2006) only 'area characteristics' being rural/urban and north/south. The few studies that have looked at these factors have highlighted the following factors, which are discussed below:

- Crime and deprivation,
- Social mix and social ties,
- Neighbourhood form and walkability, and
- Density.

[2] see (McCulloch, 2001) and (Dorling, 2001) for a recent debate on whether place matters and whether poverty reduction policies should be focused on areas or individuals.

2.6.1 Social and Cultural Characteristics of the area

2.6.1.1 Crime and Deprivation

Actual crime in an area, as well as perceived safety of the area, is likely to have an influence on facility use, particularly when the mode of transport is by public transport or on foot. Various aspects of the urban environment have been found to have an impact on fear of crime which varies from neighbourhood to neighbourhood (Maxfield, 1984). Perceived safety has been found to be negatively associated with the presence of litter, graffiti, vandalism, and poorly maintained buildings (Lewis and Maxfield, 1980; Miles, 2008). The relationship between visible disorder and crime was coined *the broken windows syndrome* by Wilson and Kelling (1996) and widely publicised although other authors have since found that the relationship between visible disorder and crime only holds true for certain crimes, such as robberies (Sampson and Raudenbush, 1999).

Fear of crime in turn appears to have an impact on use of facilities, Bramley *et al.* (2009) found negative associations between use of neighbourhood facilities both with 'area deprivation' and with 'rundown areas', suggesting that 'for these places there may be safety and quality issues which deter use of services' (p.2136). A comparative study across several European cities found that parents living in neighbourhoods with signs of low or moderate physical disorder (litter, graffiti, lack of greenery) were more than twice as likely to encourage their children to use the local playgrounds than parents living in areas with signs of high physical disorder (Miles, 2008). A study in Scotland also found that local facilities (shopping and drinking) were less used in more deprived areas (Macintyre and Ellaway, 1998). Two studies investigating the use of physical activity facilities also found that respondents living in areas characterized by populations with low socio-economic status (**SES**) used those facilities less (Giles-Corti and Donovan, 2003a; Riva *et al.*, 2007).

2.6.1.2 Social Mix and Social Ties

In the US, areas with predominantly black residents have been found to suffer from multiple deprivation, including having access to fewer facilities (Wilson, 1987). A study comparing predominantly white and black areas in the US found that people living in the latter areas used facilities (shopping, church etc) less often, even after controlling for income of the area but concluded that this was most likely due to inferior quality of provision in predominantly black areas (Ahlbrandt, 1984).

In the UK context ethnicity itself is not as strongly linked to area deprivation as in the US as different ethnic minority groups have been found to be differently affected by deprivation

(Dorsett, 1998). However, other aspects of the mix of residents, such as perceived social class and income, referred to as perceived homogeneity, have been found to have more of an impact on facility use (Evans, 2009). Lang (1994), in the US, claimed that 'when populations are highly heterogeneous, the facilities people use will be based on common values rather than propinquity' (p.268).

Considering the applicability of this statement for the UK, the following has been found: The previous Labour government was concerned with increased segregation and *ghettoisation* and people being stigmatised by where they lived, hence it promoted the creation of socially mixed communities through tenure mix (DCLG, 2006; Jupp, 1999) and more specifically tenure-blind *pepper potting* of affordable housing to reduce visible segregation (Roberts, 2007). A number of studies has analysed whether people living in mixed communities used facilities in the same way: Casey *et al.* (2007) analysing residential areas that had originally been planned as mixed communities found that more renters used the local shops but more owners used local leisure facilities and that there was no clear distinction made between 'renter' facilities and 'owner' facilities. In areas where the differences in income/social class were more pronounced (for example a social housing estate with the recent addition of private housing), studies found that owners and renters led almost separate lives when it came to the use of local facilities and that renters depended much more on the local facilities than owners who often chose to use facilities outside their residential areas (Atkinson and Kintrea, 2000, Camina and Wood, 2009). MacIntyre and Ellaway (1998) also found that differences between the use of local facilities in different neighbourhoods remained even after controlling for social class, age and gender and thus concluded that 'characteristics of the place might be as important as characteristics of the person in predicting whether or not activities (such as shopping, walking and going to the pub) are undertaken locally' (ibid, p.92).

Residents in more homogeneous areas have also been found to have more social ties (Kim and Kaplan, 2004). The only study which investigated whether stronger social ties were associated with facility use was Ahlbrandt (1984) who found that people living in strong-tie neighbourhoods made more use of neighbourhood facilities than residents in weak-tie neighbourhoods.

2.6.2 Environmental Characteristics

2.6.2.1 Urban Form and Walkability of Area

Particular models of neighbourhood design are powerfully advocated as likely to promote the use of local facilities and greater reliance on walking and cycling (Aldous, 1992; Calthorpe, 1993; Urban Task Force/DETR, 1999) and this has been incorporated into UK policy (ODPM, 2003b;

ODPM, 2005a). This assumption was supported by Handy (1996) who found that the urban form of neighbourhoods was an important factor in that grid-based traditional neighbourhoods had a much greater choice of local facilities than cul-de-sac developments and that the proportion of people walking was also much higher. This finding can be explained with Space Syntax, which is a method that analyses the relationship of the morphological structure of urban areas with movement patterns using axial lines to calculate different levels of integration (connectedness) of routes (Hillier and Hanson, 1984). It has been used to predict movement patterns and resulting land use in urban areas and favours the grid-based urban form, as it provides a much higher level of connectedness and choice of routes compared to cul-de-sac developments (ibid.) Furthermore, it allows people on origin-destination trips to pass by outward facing building blocks and facilities en-route, thereby encouraging their use (Hillier, 1996).

Bramley *et al*. (2009) also highlighted the relationship between walking and facilities and found that where services were less frequent (lower density) and respondents found it less easy to access public transport on foot due to the increased distance to bus stops (for example in suburban areas) there was a significant negative association with use of local facilities. Interestingly, a study comparing different European cities found no significant association between parents living on a quiet street (with little traffic) or in an area with predominantly single-family residences (as opposed to multi-family) and their readiness to encourage their children's use of local playgrounds (Miles, 2008).

2.6.2.2 Density of Area

It has been suggested that higher densities may make access to services and facilities both easier and more economically viable (Burton, 2000; ODPM, 2003a; Williams, 2000). This in turn would result in greater use of facilities which was confirmed by Foley (1950) who found that residential density showed a greater significance than home ownership in its association with local facility use. A more recent study looking at a wide range of different densities (<20 dwellings per ha (**dph**) to over 300 dph) found that up to 150 dph, use of neighbourhood facilities rose, then fell off before rising somewhat in the very highest density band (Bramley *et al.*, 2009). This relationship was found to be driven both by urban form and by location/access effects and not reduced by any countervailing socio-demographic effects (Bramley and Power, 2009).

2.7 PERSONAL CHARACTERISTICS AFFECTING LOCAL FACILITY USE

Fisher and Bramley's (2006) framework to explain and account for usage of local services includes the following **personal** types of explanatory factors:

- **Demographic characteristics** of individuals and households that affect relevance, need and demand,
- **Socio-economic characteristics** of individuals and households relating to occupation, economic activity, income and wealth that affect the demand for services and for complementary or substitute goods and services,
- **Time to use services**, related to economic activity and to domestic responsibilities, and
- **Cultural factors**, which may be proxied by variables such as ethnicity, social class and length of residence that affect preferences.

The remainder of the section is subdivided accordingly, apart from 'time to use services' which is covered under socio-economic characteristics which include an individual's employment situation.

2.7.1.1 Demographic Characteristics

One of the earliest studies into local facility use found striking differences in the use of facilities within the same family as well as differences in **gender** (Foley, 1950). 'In contrast to that of the adult male, the adult-female average is kept closer to home by non-employment, by the need to do extensive shopping, and by considerable participation in local leisure activities' (ibid, p.245). Whilst female employment levels have changed dramatically, local food shopping still appears to be done primarily by women, as a study found more recently in Scotland (Macintyre and Ellaway, 1998). They also found that whilst there were few differences between the sexes on using facilities generally, there were differences in the extent that they were done locally, as women were significantly less likely to drink in the area and a great deal more likely to shop for food in the area. A study analysing gender in conjunction with tenure also found that women had higher activity patterns and usage of suburban areas, irrespective of tenure (Camina and Wood, 2009).

With regard to **age** Foley (1950) was one of the first to find that young persons (<12) and persons over 65 make relatively the most extensive use of local facilities, whilst young adults, 18-34 make the least. This has been confirmed by a more recent study (Casey *et al.*, 2007). Looking at age and household type together Bramley *et al.* (2009) also found that older and family/larger households were more likely to use neighbourhood services, whereas younger and single-person households were less likely to use them. This was however not supported by other studies, such as Macintyre and Ellaway (1998) who found that whilst younger people were more likely than older people to drink alcohol and take exercise there were few age differences in whether these were done

locally. A recent study investigated facility use of older people in a Swedish town centre and found that pharmacies, post offices and banks were used (but not frequently) by the majority of respondents in their study, whilst cafes and corner shops were used very frequently (but only by a minority) of their respondents (Valdemarsson *et al.*, 2004).

With regard to park use, Payne *et al.* (2002) lamented the dearth of research examining age *differences* with respect to local and regional park use and summarised that the few studies that did exist had generally concluded that as age increases, participation in outdoor recreation and physical activity decreases. The latter findings have raised concerns about their impact on health of older people in the UK (Joint Health Survey Unit, 2004) and hence a recent study investigated which aspects of green spaces would increase the amount of outdoor activity for the older population, finding that good paths to open spaces and good facilities (such as toilets) could increase levels of walking for transport for this group (Sugiyama and Ward Thompson, 2008).

2.7.1.2 Socio-economic Characteristics

Poverty was found to have a negative influence on using museums and galleries, public sports facilities, doctors, chemist, pub, cinema/theatre, community hall, place of worship and children's play facilities (Fisher and Bramley, 2006). The latter might reflect issues of access to safe and good quality play facilities as 17% of households stated that they used play facilities which were inadequate and another 20% stated that they did not use play facilities as they were unavailable or unsuitable, however it is not clear from the data whether these 37% of households were also poor. Foley (1950), who initially thought that lower economic status was connected to greater use of local facilities found that this association disappeared once car ownership was controlled for.

Having a higher **income** was found to have a positive influence on the use of childcare, dentist, hospital, petrol station, and place of worship but a negative influence on the use of libraries, bus service, opticians, train/tube services and community halls (Fisher and Bramley, 2006). The same authors also found that being in full-time employment had a positive influence on the use of museums and galleries and reinforced the conclusion that these services were used more by higher socio-economic groups and less by the poorest groups. Furthermore, they stated that 'other income-related factors, such as receiving benefits, being a council tenant, and being in full-time employment are significant influences on the use of opticians, corner shops, pubs, places of worship and cinema/theatres' (ibid. p.236), but did not provide any data.

Whilst Fisher and Bramley highlighted the importance of 'time to use services' in their framework, they did not report any results relating to this issue. Ahlbrandt (1984) in the US found that **larger**

households used local facilities more frequently, which was supported by a more recent study in the UK (Bramley *et al.*, 2009).

With regard to **tenancy**, renting**,** particularly local council renting in the UK, can be used as a proxy to measure poverty, as this sector has been reduced, since the introduction of the Right-to-Buy scheme in the 1980s, to providing accommodation for the poorest of society, long term sick and unemployed (Malpass, 1986). Atkinson and Kintrea (2000) and Casey *et al.* (2007) found that tenure made a difference whether people were using shops and facilities on-site or off-site (apart from primary schools which were used equally by both groups) with renters depending more on the local facilities than owners, whilst working households were less likely to use neighbourhood services. However, this was contested by Camina and Wood (2009) who found that women had higher activity patterns and usage of neighbourhood areas, irrespective of tenure. However, the studies were mainly qualitative with small sample bases, (e.g. n=25), hence the different findings are not surprising.

2.7.1.3 Cultural Characteristics

Studies into **ethnicity** as a predictor for use of facilities in the UK have mainly centred on health-related facilities/services, for example mental health services (Feder *et al.*, 2003). A few studies have also looked at the design of parks to understand perception and to increase use of these spaces by ethnic minorities (Rishbeth, 2001; Woolley and Amin, 1995). The only study in the UK comparing a range of facilities was Fisher and Bramley (2006) who found that being of Asian or Black ethnic background had a strong negative influence on the use of public sports facilities, banks/building societies, chemists, dentists and pubs but a positive influence on the use of bus services, places of worship, supermarkets and community halls. In the US, studies considering ethnicity as a predictor for facility use are more widespread: For example Ahlbrandt (1984) found that people of white ethnicity used their neighbourhood facilities more frequently, even after the availability of facilities had been controlled for. Tinsley *et al.* (2002) found significant differences among ethnic groups in the use of park facilities (Caucasians visited parks significantly more often than Asians, Hispanics or African-Americans) which was confirmed by a study by Payne *et al.* (2002). The use of shopping facilities in the US has also been found to be influenced by ethnicity (Donthu and Cherian, 1994; Wang and Lo, 2005). This was also the case in Israel where ethnicity has been linked to the use of food stores with Israelis preferring supermarkets and Palestinians preferring food purchases in small, specialised retail food formats (Goldman and Hino, 2005).

With regard to **social class**, being upper middle and middle class was found to have a positive influence on using libraries, museums and galleries, adult evening classes, cinema/theatre, train/tube service and place of worship and a negative influence on using childcare (Fisher and

Bramley, 2006). Conversely, Macintyre and Ellaway (1998) found that the only class difference between low income and high income households in doing activities local was for drinking locally, which was more common in households working in non-manual, skilled occupations. They concluded that

> 'Some of these findings run counter to conventional stereotypes of patterns of highly localized activities in close knit working class communities, compared to more wide ranging activities in more affluent, car-owning, communities in Britain (e.g. popping out on foot to the local pub, club or corner shops in poorer areas, compared to driving to clubs or supermarkets in richer areas)' (Macintyre and Ellaway, 1998, p.92).

The only study looking at **length of residence** and how that affected use of local facilities was Ahlbrandt (1984) who found that those living in the neighbourhood for longer periods of time used local facilities more frequently than other residents. A more recent study found that facilities were one of the reasons why people remained in a neighbourhood for longer together with other factors such as the respondent's age and household composition (Dempsey *et al.*, 2012).

2.8 SUMMARIES

The above review has highlighted the diverse literature focussed on factors affecting local facility use but has also demonstrated that this is an understudied subject, which merits further research. The main objectives of this review were threefold: Firstly, to identify an appropriate list of local facilities for further analysis in this research, secondly to define local facility use and thirdly, to highlight the factors most commonly mentioned to impact on local facility use thereby addressing **Objective 2**. They have been found to be:

Facility Characteristics

- Availability
- Quality
- Affordability
- Spatial Location
- Mix of Facilities
- Distance
- Mode of Transport
- Convenience
- Other Users

Area Characteristics

- Crime Levels
- Deprivation Levels
- Resident's Social Mix
- Resident's Social Ties
- Urban Form
- Walkability of Area
- Density of Area

Personal Characteristics

- Age
- Gender
- Household Composition
- Income
- Tenancy
- Ethnicity
- Social Class
- Residence Length

The review of the literature provides the foundation for the next stage, developing a range of indicators for the research in order to assess the relative importance of each of these characteristic groups on the use of local facilities. These are discussed in detail in Chapter 5. Through the subsequent analysis, it will be possible to address research Objectives 1 and 2, namely to identify the extent to which local facilities are used by the local population and to understand the key factors that determine local usage. As use of local facilities is only an antecedent for the main focus of this thesis, social interaction at facilities, the next Chapter will focus on establishing the key factors affecting social interaction at facilities based on a critical review of the literature.

Chapter Three

Factors influencing social interaction at local facilities

3.1 INTRODUCTION

Having discussed the literature pertaining to factors affecting the use of local facilities, this chapter is concerned with understanding social interaction at facilities. The purpose of the chapter is to define social interaction at local facilities according to how it has been conceptualised in the literature and identify those factors which have been found to affect social interaction at local facilities thereby addressing **Objective 4**. The factors affecting social interaction at local facilities have been grouped into facility, area and personal characteristics in the same way as in the previous Chapter (see section 2.4). Micro-scale urban design features affecting social interaction are discussed separately in Chapter 4. A summary section at the end of this chapter highlights the factors found. This review forms the basis for developing indicators in Chapter 5.

3.2 CONCEPTUALISING SOCIAL INTERACTION AT LOCAL FACILITIES

3.2.1 Defining Social Interaction at Local Facilities

Social interaction has been defined as 'the acts, actions, or practices of two or more people mutually oriented towards each other, that is, any behaviour that tries to affect or take account of each other's subjective experiences or intentions' (Rummel 1976, p.371). Rummel (1976) stated that 'people do not need to be within sight of each other, hence computer gaming, being on the phone, and email writing all constitute social interaction as long as there is mutual recognition according to this definition' (p.373). He stated that in order to be mutual, social interaction had to be direct, interactive and reciprocal, excluding forms of interaction which are not interactive (such as spying), or not reciprocal (torture) (ibid).

Social interaction is not only a function of the situation (Argyle, 1969) but also the spatial configuration (Festinger *et al.*, 1950). This research is concerned with social interaction that is spatially located at local facilities and hence requires both parties to be within sight. Face to face encounters have been defined by Goffman (1959) as 'the reciprocal influence of individuals upon one another's action when in one another's immediate physical presence' (p.xx). Within this physical presence, social interactions can take many forms, such as smiles, gestures and eye contact (Argyle,1969).

Social interaction can also take different forms with regard to the intensity, duration and familiarity of the participants and can be verbal or non-verbal encompassing a whole range of actions, such as waving, hand shaking, talking intensely and embracing (Argyle, 1969). Finally,

social interaction can be positive (friendly) or negative (threatening)(ibid). As set out in Chapter 1, this research is focussing on the role facilities can have in fostering **positive social interaction** between residents which has been found to enhance a sense of community (Jacobs, 1961). Whilst facilities can also be places where negative social interaction happens (Carr *et al.*, 1992a), this is not the focus of this thesis and has been discussed elsewhere (Kaplan *et al.*, 1998). Social interaction for this research is thus defined as **all verbal and visible non-verbal communication (such as waving) between residents that are social and positive in nature and located at, around or in local facilities.**

Relationships between residents that develop as a consequence of social interaction vary enormously in terms of the level of intimacy between the participants (Lindsay, 2010) and follow a process of relational closeness through gradual self-disclosure (Altman and Taylor, 1973). Granovetter (1973) described the range of these relationships as strong and weak ties within a community where strong ties reflect a high level of intimacy (e.g. between family members, close friends or gang members) and weak ties reflect a low level of intimacy (e.g. between neighbours or distant relatives). Granovetter's argument has been that weak ties within a community allow for a better exchange of information and support across the community and are thus preferable for a community than strong ties. Neighbourhood research into the existence of and value attached to weak ties found that the number of weak ties was significantly greater than the number of strong ties and that the former meant a 'feeling of home', 'security' and 'practical as well as social support' for residents (Henning and Lieberg, 1996, p.22) They were also found to provide important bridges between networks of strong ties and were thus of particular importance to vulnerable and marginal groups (ibid.). Whilst weak ties are regarded as preferable to strong ties, a reduction of ties and social interaction within neighbourhoods has been stipulated to cause a reduction in social capital and social cohesion (Putnam, 2000). In order to improve this situation, a number of studies and entire built environment philosophies such as New Urbanism have identified measures claimed to increase social interaction between neighbours to generate more weak ties and ultimately help foster a sense of community in neighbourhoods (Katz, 1994; Kavanaugh *et al.*, 2005; Keane, 1991; Laurier *et al.*, 2002; Lund, 2003; Stafford and McCarthy, 2006; Stansfeld, 2006). Providing *local facilities* has been identified as one of the features that can promote positive social interaction and develop weak ties (Riger and Lavrakas, 1981) and thus forms the focus of this thesis.

3.2.2 Measuring Social Interaction at Local Facilities

Several studies have measured social interaction at specific types of facilities/locations such as malls (Feinberg *et al.*, 1989; Kim *et al.*, 2005; Sommer, 1998; Sommer *et al.*, 1981), public spaces

(Holland *et al.*, 2007) open space (Sugiyama *et al.*, 2008; Sullivan *et al.*, 2004), shopping streets (Mehta, 2007; Mehta, 2009) indoor markets (Watson, 2009) and public squares (Gehl, 2001; Whyte, 1980). In addition, a number of studies have measured social interaction between neighbours (Lochner *et al.*, 1999; Raman, 2010; Riger and Lavrakas, 1981; Skjaeveland and Garling, 1997), patterns of neighbouring (Skjaeveland and Garling, 1997; Stafford and McCarthy, 2006) and social interaction in neighbourhoods (Camina and Wood, 2009; Casey *et al.*, 2007; Cattell, 2001; Crowe, 2010; DCLG, 2009; Evans, 2009; Haggerty, 1982; Williams, 2005). However, there is a lack of studies measuring social interactions between residents across a **range of local facilities**.

Reviewing the above literature to identify how social interaction between residents has been measured, the studies are grouped with regard to the different aspects of social interaction that have been measured/investigated:

- the *frequency* of social interaction,
- the *type of person* the interaction is with,
- the *type* of social interaction either distinguished by *level of intensity* of social interaction (described by Thomas (1991) as the ladder of community interaction) or *purpose* of social interaction, and
- the *quality* of social interaction.

Most researchers have recorded the frequency of social interaction (e.g. once a week, every day etc), but a few authors have also focused on **the type of person** the interaction is with (i.e. direct neighbours (Skjaeveland and Garling, 1997; Stafford and McCarthy, 2006) older people (Ajrouch *et al.*, 2001), specific ethnic backgrounds (Peters *et al.*, 2010), inter-tenure (Atkinson and Kintrea, 2000)). As this thesis is not concerned with a particular sub-group of local facility users, this social interaction aspect has not been measured.

With regard to different *types* of social interaction, several authors have distinguished social interaction by **intensity levels**. The importance of weak and strong ties in a community has already been discussed. Haggerty's (1982) study on the impact of socio-economic and built environment factors on social interaction levels was one of the first to distinguish between frequency of social interaction and different levels of intensity (waving, chatting outside, visiting inside and long, personal discussions). He found that both sets of factors impacted differently on the different levels of intensity (see 3.3 below). Whilst Haggerty (1982) analysed the different intensity levels separately, many other studies have aggregated these into summarised scores

(e.g. combining waving and talking to neighbours) for later analysis making it impossible to evaluate them individually (Casey *et al.*, 2007; du Toit *et al.*, 2007; Kim *et al.*, 2005; Talen, 1999).

Some authors have distinguished *types* of social interaction by **purpose** to record social interaction in shopping environments (malls and farmer's markets) (Feinberg *et al.*, 1989; Sommer *et al.*, 1981). They classified social interaction into 3 types:

- *perfunctory* – an acknowledgement of another person's presence which does not necessarily require a verbal response e.g. hello, excuse me, have a good day
- *informational* – either asking a question or providing an answer – e.g. how much does this cost
- *social* – a conversation between two or more people on any topic

This research is concerned with social interaction at local facilities amongst residents not staff. Hence, the above distinction by purpose was not considered useful for this research, as all the types of social interaction investigated were of a social nature with 'perfunctory interaction' being considered a less intense level of social interaction.

The **quality** of social interaction has also been measured mainly in the health/loneliness literature, which has focused on the three research constructs of *quantity* (e.g. frequency of SI), *quality* (e.g. satisfied, feeling loved, feeling understood) and *sources of interaction* (eg family members, social ties). Both quality and quantity of interaction have been hypothesized to have a positive relationship with well-being or life satisfaction and have a negative relationship with loneliness or psychological depression (Duff and Hong, 1982; Pinquart and Sörensen, 2001). As the study focuses on local facilities and other factors that might influence levels of social interaction but not on the perception of residents as to whether the level is adequate, the quality of social interactions is outside the remit of this study and has not been measured.

Consequently, the main measures used in this research to quantify the extent and types of social interaction at a range of facilities are

- the *frequency* of social interaction, and
- the *type* of social interaction distinguished by *level of intensity*.

The precise format of the specific measurements is discussed and set out in detail in the methodology Chapter 5.

3.3 FACTORS INFLUENCING SOCIAL INTERACTION AT LOCAL FACILITIES

Before identifying the key factors affecting social interaction from the relevant literature, it is useful to highlight the wider **debate** in the social sciences concerning the relative importance of factors affecting social behaviour. There are two distinct explanations, one favouring *personal characteristics*, the other *(built) environment characteristics*. The two positions, claiming that social behaviour is determined by personal characteristics vs social behaviour is determined by the (built) environment [nature vs nurture; agency vs structure] can be regarded as the two ends of a spectrum with a number of different intermediate theoretical positions, where the centre represents the view that both sets of factors are equally important (see Figure below).

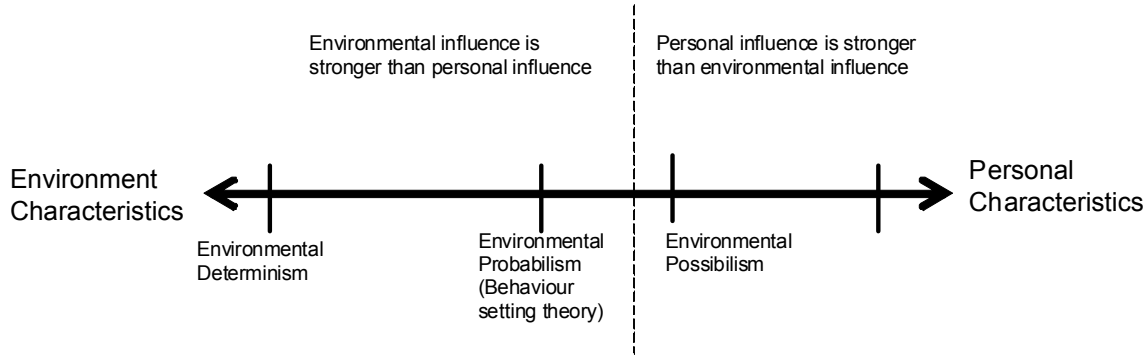


Figure 3-1: Positions in debate over predominant factors influencing social behaviour

Starting with one extreme of the spectrum above, explanations that favour environmental characteristics, such as density, housing types and land use mix as constraining, fostering, causing or eliminating certain types of behaviour have been described as **environmental determinism**. 'In its most extreme form, the physical environment is seen as the only – or at least the primary – cause of behaviour' (Bell *et al.*, 2001, p.373). For example, Whyte (1956) found that functional proximity induced social interaction between neighbours irrespective of their socio-demographic make-up:

> 'In suburbia, friendship has almost become predictable… it is possible deliberately to plan a layout which will produce a close-knit social group…certain kinds of physical layouts can virtually produce the 'happy group' (Porteous, 1977, p.204).

Environmental determinism has since been heavily criticised for negating the role of human agency, ignoring the importance of interactions among several environmental variables and understanding environment-people interaction as a one-way process (Franck, 1984).

Two other viewpoints which consider environment-people interaction as a two-way process where physical factors are not the exclusive or dominant influence on behaviour but afford certain opportunities (Carmona *et al.*, 2003) are **environmental probabilism** and **environmental possibilism**. The latter believes that people choose among the environmental opportunities available to them (Michelson, 1977). Extreme possibilists question whether human behaviour is determined at all, which resulted in a strong possibilistic-deterministic controversy during the 1950s which largely discredited environmental determinism (Porteous, 1977). The more recent and more moderate viewpoint, **environmental probabilism** stipulates that the setting of the environment suggests certain behaviour i.e. 'in a given physical setting some choices are more likely than others' (Carmona *et al.*, 2003, p.106). Within this school of thought, Barker developed his **behaviour setting theory**. The *behaviour setting* is defined as a milieu with a recurring pattern of behaviour (Barker, 1968). The milieu, composed of fixed and semi-fixed elements, carries meanings and defines the 'stage' within which expected behaviours frequently occur (ibid). The concept of 'space' differs from 'setting' in that 'space' can contain many settings simultaneously or may become different settings at different times (Bell *et al.*, 1990). The concept was originally applied to public places (facilities) and occasions (e.g. auction) by Barker (ibid).

Environmental probabilism was not only influential in theory, but also in practice. An architectural movement, *New Urbanism*, is based on the belief that the design of neighbourhoods can have an influence on building relationships between residents (Keane, 1991). Advocates believe that building pedestrian-oriented neighbourhoods, including a concentrated core of retail and employment, dedicated public and open spaces and connected street networks will lead to more residents interacting in the public realm (Calthorpe, 1993; Katz, 1994). Others have heavily criticised the underlying assumptions of new urbanism (Ellis, 2002; Talen, 1999). 'The movement considers community and neighbourhood as a physical rather than social entity, as if community resulted from the built form rather than from the people who inhabit it' (Southworth, 1997). Notwithstanding the criticism, these ideas became well publicised and were also incorporated into national policy in the UK with the government promoting the 'design of development that creates socially inclusive communities' (ODPM, 2005, p.7) including good public spaces that foster social inclusion and citizenship (DTLR, 2002). Conversely, badly designed spaces are claimed to incite anti-social behaviour (Brook Lyndhurst, 2004).

Given the strong theoretical and policy driven assertions that built environmental factors affect social behaviour, a number of studies have tested those assertions. Festinger *et al.* (1950) found that natural, shared gathering places in neighbourhoods had a positive impact on social interaction levels. Later studies qualified these findings somewhat in that gathering spaces were

found successful in supporting informal social interaction when they were functionally shared between residents but allowed individual residents to comfortably occupy the territory whilst keeping a comfortable social distance (such as dog walks, community gardens, front steps, laundry rooms, back yards and shared mailboxes) (Porteous, 1977; Sommer, 1969; Williams, 2005). Fleming *et al*. (1985) reviewed evidence which demonstrated that environmental design can have an effect on the frequency and quality of social contacts and group formation and he suggested that this in turn created social support. Conversely, Haggerty (1982) found that the relative importance of the environment on social interaction between neighbours diminished as the intensity of social contacts increased and that socio-demographic characteristics of residents were more important for the latter type of social interaction. Another study found that a certain level of homogeneity (socially, culturally and economically) of residents was a necessary antecedent for social interaction levels to be influenced by physical features (Lang, 1994). With regard to facilities, studies have found that the presence of a convenience store in a homogenous area (Riger and Lavrakas, 1981) and the use of neighbourhood facilities (Ahlbrandt, 1984) can have a positive impact on social interaction levels in some neighbourhoods. Overall, it appears that the stated associations between built environment features and social behaviour are not clear cut with some socio-demographic features also playing a role in determining behaviour and further empirical testing is therefore required.

Other studies have claimed that socio-demographic variables, such as age and stage in the life cycle, socio-economic status, labour force participation and self-selection are the major explanations for differential patterns of social interaction across neighbourhoods. Gans (1962) for example claimed that class and commonality of values were very important for the development of a community whilst environmental features of the neighbourhood had no direct impact. Other empirical studies, whilst not negating the influence of environmental factors, nevertheless concluded that only modest associations between the organising power of space and social interaction had been demonstrated (Brown and Cropper, 2001; Lund, 2002) and that demographic factors were more important for social interaction than physical features (Campbell and Lee, 1992; Kim and Kaplan, 2004). The relevance of physical proximity as a factor for social interaction between residents was also questioned by Wirth (1938) who found that residents chose 'homogenous, like minded social groups' for social interaction irrespective of how far or close they lived. In other words,

> 'sharing space does not always bring about the proximity of residence that constitutes places. The reciprocity of 'nearness' can vary for different people from regular, low level acquaintance to strong interpersonal intimacy and commitment' (Kearns and Parkinson, 2001, p.2104).

Having set out the different positions of the debate and highlighted the gaps and contrasting evidence, this thesis adds to the body of knowledge by providing empirical data testing the claimed relationship between certain features of the physical environment (local facilities) and particular human behaviour (social interaction). It is not taking a theoretical position along the spectrum as to which side of the debate it supports, but uses empirical data in the following chapters to test the implied relationships and varying degrees of importance for the different factors.

The short overview above has highlighted a number of factors influencing social interaction in neighbourhoods which relate to the residents in the area (e.g. age) and the neighbourhood (e.g. homogeneity). With regard to local facilities, previous studies have measured whether facilities exist (Riger and Lavrakas, 1981) and whether they are used (Ahlbrandt, 1984), but no other facility characteristics (e.g. location, mix) have been investigated. Hence, the next sections are grouped into facility, area and user characteristics to investigate in later chapters which of these factors influence social interaction at local facilities (see Figure below). **Facility characteristics** relate to physical aspects of the facility, (type, location, mix), the use level of the facility and the perception of residents about the sociability of the facility. **Area characteristics** relate to the physical (density etc) and social area characteristics (crime, deprivation) but also to familiarity with the area (such as social networks, place attachment and length of residence). The latter is covered under the area characteristics section as it relates to a particular geographical area as perceived by its residents. This is different to non-spatial socio-demographic characteristics of a person such as age, gender and class which are discussed in the final section of **personal characteristics**.

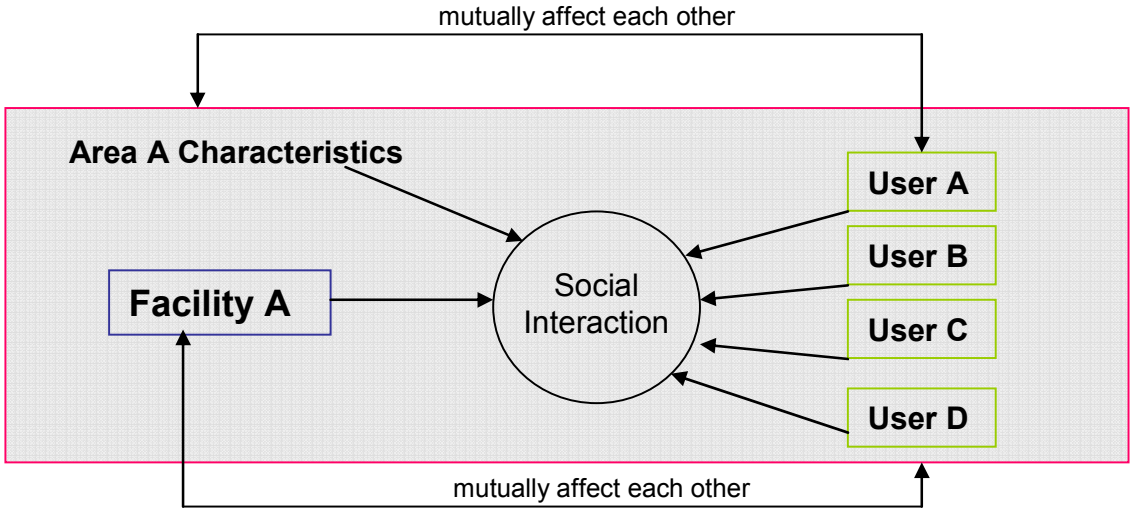


Figure 3-2: Conceptual framework for analysing factors affecting social interaction at local facilities

3.4 LOCAL FACILITY CHARACTERISTICS

There are several studies investigating either how the presence of a range of facilities affect social interaction with neighbours or in the neighbourhood generally, or what affects social interaction at one particular facility type. However, there is a lack of studies looking at what facility characteristics affect social interaction at a **range of local facilities**. Given that the range of local facilities considered here encompasses many different types of facilities (as set out in Chapter 2), the factors identified here are relevant for all the neighbourhood and district facilities. Urban design features affecting social interaction levels at facilities are discussed separately, in Chapter 4, due to their micro-scale and applicability only to built facilities. This section discusses the following local facility characteristics as identified from the literature:

- Level of Use,
- Type of Facilities,
- Social Characteristics, and
- Physical Characteristics.

3.4.1 Level of Use

There is an implicit assumption that a mixture of residential and commercial land uses will create multiple spaces in which lingering is encouraged, creating a setting for 'repetitive chance encounters' (Achimore, 1993, p.34), which was first highlighted by Jane Jacobs in 1961. In testing these claims some studies have found a relationship between facility use and social interaction. For example, Ahlbrandt (1984) found that the use of certain local facilities (for shopping, worship or recreation) was linked to higher levels of resident interaction **in the neighbourhood**. Hunter (1975) in the US analysing the use of several local facilities (grocery shopping, church and movie going, doctor visit and banking) found that local facilities had a positive independent effect on informal **neighbouring**. Casey *et al*. (2007) in the UK partially confirmed these findings by stating that whilst residents from all tenures made reasonable use of local facilities this brought varying levels of social interaction between the different tenures. Hence, the relationship between local facility use and social interaction in the neighbourhood is remains debated.

Another aspect relates to whether increased facility use leads to more social interaction or whether people use local facilities <u>because</u> they are hoping to have social interaction. Tauber (1972) claimed that consumers have social and psychological motives for shopping beyond acquiring necessary purchases, which involves the need for social interaction. This concurred with findings from another study, which found that people who shopped locally stated convenience

and the potential for casual social encounters as their main reasons for using local shops (Horswell and Barton, 2005).

With regard to social interaction **at a local facility**, use of the facility is expected to be a necessary antecedent but this has not been researched. Cattell *et al*. (2008) analysing social interaction in public spaces found that people stated regular use as one of the prerequisites for casual social exchanges in public spaces. The frequency of use necessary for engaging in social interaction at local facilities however, has also not been investigated and will thus be tested here.

3.4.2 Type of Facilities

Whilst there is a lack of studies comparing social interaction patterns at a **range of facilities**, several individual types of facilities have been analysed with regard to social interaction patterns of users or their association with social interaction levels in the wider neighbourhood. Key findings from that literature are set out in the following section.

3.4.2.1 Leisure and Recreation Facilities

A few studies have analysed social interaction in parks and green spaces analysing which features affect social interaction. Peters *et al*. (2010) analysed social interaction, particularly inter-ethnic social interactions, in five Dutch parks and found that there were relatively few social interactions and of the interactions observed, most were of a cursory nature (saying hello, having a short chat). They also found that the size of the park did not affect levels of interaction. Whilst most interactions were one-offs and unstructured, visitors nevertheless found that these cursory interactions were valued and made people feel at ease. Whilst people often stated that the park was a place to meet 'other' people, 'others' were mainly people the visitors knew already.

Studies in the US have also investigated the impact that the existence of parks and open spaces has on social interaction within a neighbourhood. For inner-city residents well-used, green spaces have been linked to stronger ties to neighbours (Kuo *et al.*, 1998; Kweon *et al.*, 1998). This also applies to suburban areas, as a study by Kim and Kaplan (2004), comparing a traditional suburb with a New Urbanist development, found that natural features and open spaces were both rated very high with perceived importance for social interaction. The importance of natural elements in the residential environment has been demonstrated in several studies (Kaplan and Kaplan, 1989; Kaplan, 1995). The level of greenery has also been investigated by Sullivan *et al.* (2004) looking at inner-city, open spaces with different levels of 'greenery' in the US finding that 'the presence of trees and grass is related to the use of outdoor spaces, the amount of social activity that takes place within them, and the proportion of social to non-social activities they support' (p.678).

In addition to vegetation levels, studies in other countries have found that spaciousness and arrangement of open spaces (Abu-Ghazzeh, 1999; Skjaeveland and Garling, 1997) are also connected to casual contact and social interaction between neighbours. Private residential outdoor spaces have also been found to make a contribution towards social interaction between neighbours (Lindsay, 2010) and this function has been found to be particularly valued by older people (Burton *et al.*, 2012).

3.4.2.2 Commercial Facilities

Supermarkets/Malls/Indoor Markets

Shopping as an activity can be understood as an 'essential chore' or a 'leisure activity'. Tauber (1972) investigated different shopping behaviour and shopper types and found that shopping can meet social motives (e.g. social experiences outside the home, communication with others having a similar interest) as well as personal motives (e.g. diversion, browsing, self-gratification). He developed a typology of shoppers, of which *'*recreational shoppers*'* have been found in several studies to be more likely to shop with others and less likely to have a specific purchase in mind when shopping (Bellenger and Korgaonkar, 1980; Westbrook and Black, 1985).

With regard to the *place of shopping*, several studies have analysed the role of the US mall for social interaction, and have claimed that part of the success of the shopping mall stems from the social nature of this type of shopping environment (Isogai and Matsushima, 1972 in Feinberg et al., 1989). It is claimed that mall entrepreneur Victor Gruen when pioneering the development of the suburban mall intended the concept to both serve the deficiency of local retailing and to provide a community centre where residents would converge for cultural activities and for social interaction (Kowinski, 1985). Different designs of malls can affect social interaction within these spaces, which is discussed further in the Urban Design Chapter 4. Gruen's assertion was tested in two studies in the US by Sommer *et al.* (1981) and Feinberg *et al.* (1989). They compared perceptions of a mall, a downtown shopping area and a supermarket and found that the mall was perceived as a more social shopping environment than the downtown district or the supermarket. They also confirmed this perception empirically by recording the percentage of singles and groups arriving at a mall and a downtown shopping area and concluding that more singles and more groups were going to the mall, suggesting that 'in addition to fostering the social behaviour of larger groups, the mall may serve as a magnet for single individuals because of the potential for social contact.' (Feinberg *et al*. 1989, p.53). In the UK, which has fewer malls than the US, Barton *et al.* (2007) found that local supermarkets are the most visited local facility and, using focus groups, established that some stores had a very important local social function, which was

supported by a more recent study by Dempsey *et al.* (2012). Another UK study investigated social interactions in an indoor market and found that 'the informality of market trading and shopping, the openness of market spaces, the proximity of stalls to one another, the lack of restraint on entering and leaving market sites gave rise to a multitude of easy encounters and informal connections' (Watson, 2009) p.1582). Watson observed not just cursory interaction in markets but also longer conversations between individuals and groups.

In addition, she noticed that women spent more time on socialising than men and that older people socialised not just with other customers but also traders, with whom they had often established long standing relationships, thereby highlighting differences between *different user groups*. Ishii-Kuntz (1990), who analysed the importance of shopping for older people had observed that encounters with store personnel, service agents, or other regular shoppers could become a critical means for providing complementary support for older people whose loneliness originated from a lack of social contact. Furthermore, it was asserted that older consumers' consumption satisfaction comes not from consuming for the sake of consumption but from consuming for such experiences as enjoying displays and ambience and having a friendly conversation with someone (Sherman *et al.*, 1988 in Kim and Kang, 2005). Other studies highlighted the fact that not just pensioners, but also adults and teenagers have social motivations to visit a mall (Kim *et al.*, 2003). A study in a deprived part of Glasgow also found that the local community-based, food co-operative was a meeting point and facilitated social interaction particularly for mothers (single mothers) and older people who had limited opportunities for social interaction in their daily lives and used grocery shopping as an opportunity to 'get out of the house' and socialise (Piacentini *et al.*, 2001). They concluded that 'augmenting or diminishing the opportunities to seek non-functional benefits from shopping is likely to have more important consequences for disadvantaged consumers than for the wider population'(Piacentini *et al.*, 2001, p.155).

Corner shops/newsagents

Few recent studies have analysed social interaction at small corner shops or newsagents. In 1960s New York, Jane Jacobs (1961) had enthusiastically reported on the levels of social interaction in small shops and the plethora of support shopkeepers would give to their customers:

> 'There are plenty of opportunities for public contact in the enterprises along the sidewalks, or on the sidewalks themselves as people move to and fro or deliberately loiter when they feel like it, and also because of the presence of many public hosts, so to speak, proprietors of meeting places like Bernie's [the owner of

> the delicates shop] where one is free to either hang around or dash in and out, no strings attached' (p.62).

Since then, the topic seems to have received less interest. There is a fleeting reference in Plas and Lewis (1996) that the local grocery store was highlighted as an important place for social interaction in a New Urbanist development and a study undertaken in Japan found that neighbourhood stores still served important functions for the community even though many had been closed due to the proliferation of supermarkets. The study found that older people frequently used neighbourhood stores as they were within walking distance to their homes. Furthermore, older people who enjoyed communicating with neighbours in the store also enjoyed using the store (Sone and Kayama, 2009).

3.4.2.3 Educational and Community Facilities

Camina and Wood (2009) demonstrated the importance of schools, 'the school gate' and after-school activities in the lives of those under 45 years, particularly women. Other studies have emphasised the importance of school and children's play areas as arenas for social interaction between residents from different tenures (Jupp, 1999; Silverman *et al*., 2005). Jupp (1999) concluded that 'schools and nursery schools are by far the most powerful amenity for meeting other people' (p. 47). The school context has been found to provide a place for a host of processes such as peers interacting with each other, children observing role models, parents exchanging information and the establishment of social norms (Jenks and Mayer, 1990).

Whilst churches are often mentioned in the literature as social places, few empirical studies have analysed this relationship. Ellison and George (1994) found that frequent churchgoers (in a southern US community) indeed reported larger social networks and more contact with network members than their un-churched counterparts. Religion has also been found to make a positive contribution to subjective and physical wellbeing of older adults (Krause, 1997). For young people, religious affiliation has also been found to improve social support later in life (Snell, P. 2009) and social capital (Muller and Ellison, 2001), but there appears to be a lack of studies investigating different places of worship and social interaction.

In areas of multiple deprivation, community groups organising small scale facilities and services such as play areas, youth groups or community cafes have been found to not only successfully support social interaction between their members but also the wider community increasing chances to develop more social capital in these areas (Richardson and Mumford, 2002). Studies concerning other community facilities, such as libraries, pubs, hairdressers or community centres

as places of social interaction have not been found in the literature search. Following the discussion on different types of facilities providing opportunities for social interaction, the next section discusses users of the facilities and their influence on social interaction.

3.4.3 Social Characteristics

As set out in the second Chapter, other users can be an incentive or disincentive to using local facilities and public spaces (Carr *et al.*, 1992b; Cooper Marcus and Francis, 1990; Francis, 2003). Whilst the presence of some users can have a detrimental effect on others resulting in feeling unsafe, this is considered to primarily affect the *use* of local facilities as found by Holland *et al*. (2007):

> 'Older people and children are particularly likely to feel marginalised or excluded at particular times of day due to the presence of certain users or lack of most other users.'(p.45)

As this part of the thesis is concerned with *positive social interaction* (see definition in 3.2.1 above) the social characteristics of a local facility most likely to influence positive social interaction is whether other people are present and whether the facility is perceived as a place to meet other people. Some places, although not initially designed as community facilities, such as large supermarkets, have nevertheless been found to function as important community places with frequent positive social interaction (Bramley *et al.*, 2009; Dempsey *et al.*, 2012).

3.4.3.1 Perception of Local Facilities as a Third Place

Local facilities that are places to meet other people and positively socialise at them have been described as *third places* by urban sociologist Oldenburg (1999) who defined a third place as a place of refuge other than the home or workplace where people can regularly visit and commune with friends, neighbours, colleagues, and even strangers. Whilst some authors refer to third places as 'public space' generally (Francis, 2003), a study by Mehta and Bosson (2010) found that *third places* can encompass a whole range of different types of facilities such as cafes, coffee shops, pubs, restaurants, community centres and general stores. They concluded that the main distinction of a *third place* was its social aspect in that 'a *third place* was welcoming and comfortable, visited by regulars, and a place to meet old friends and make new ones' (p.780). The study defined a *third place* based on perception of residents; the facility types included most coffee shops and all bars in the study area, but only a minority of restaurants, some convenience/deli stores, a book shop, an ice cream shop and a thrift store. Their data also suggested that perception of a place being a *third place* was different for different groups and influenced by the residents' duration of stay in the neighbourhood, age, class, and attitudes (ibid.)

Several studies have also analysed social interaction in public spaces, some of which included facility types such as parks (Cattell *et al.*, 2008; Francis, 2003; Holland *et al.*, 2007). However, their conclusions were not set out specifically for a particular facility but as a summary of social interaction in public spaces. Cattell *et al*. (2008) found that people often described public open spaces in terms of their interaction with other people. Several other studies have also shown that people are attracted to places with people in them to watch or socialise with (Morris, 1978; Whyte, 1980). Having discussed how the social characteristics of a local facility can affect/is affected by social interaction levels of its users - a characteristic that most users would be aware of - the next section deals with physical characteristics of local facilities that have been found to have a bearing on social interaction levels – characteristics that most users may be less aware of.

3.4.4 Physical Characteristics

3.4.4.1 Mix and Location of Facilities

As set out in Chapter 2, there are different market forces driving the distribution and mixing of private facilities (Penn *et al*., 2009) and there are also different need requirements for the dispersal and mixing of publicly provided facilities (ODPM, 2001). Rodenburg and Nijkamp (2004), in their definition of multifunctionality, identified three types of mixing:

- the mixing of *different* functions (e.g. supermarket and leisure centre)
- the mixing of a number of different units of the *same* function (e.g. three small convenience shops rather than one supermarket)
- the mixing of functions *closely* located rather than *scattered* (e.g. mixing vertically or fine grain horizontally)

Whilst the **different types of mixing** are not driven by the goal of enhancing social interaction, they nevertheless have an influence on:

- the *frequency of using* the facility (e.g. whether the mix includes facilities that are used daily such as supermarkets),
- the *duration of the visit* (e.g. number of comparison shops),
- the *number of users* people will encounter (e.g. is the facility mixed with residential use or other facilities), and
- the *type of users* people will encounter (e.g. children's play area mixed with school, different from mixed with leisure centre).

All of these aspects could conceivably have an impact on social interaction at local facilities. As set out by Rowley (1996), activities and land uses differ in terms of the `comings and goings' that they

generate and hence the degree of vitality that they might stimulate. 'Whilst some uses have very little direct effect on public life, others have considerable potential to stimulate social activity' (McCormack, 1983, p.59). Mehta (2009) found that a fine grain mix of uses and a large variety of stores worked best for social interaction, supporting previous observations (Jacobs, 1961). With regard to the type of shops, the most successful high street commercial blocks contained places to eat/drink, to shop daily/weekly (convenience goods) and to shop less frequently and more specialised (comparison goods) suggesting that rather than the land use, the *purpose* of the facilities should be mixed and varied. He also highlighted that smaller shops (often independent) allowed a finer grain mix of businesses supporting a high density and proximity of third places due to their short street frontage (ibid).

In addition to the types of vertical and horizontal mixing identified by Rodenburg and Nijkamp (2004), local facilities can also be mixed *over time/temporarily* (dual-use), (e.g. school during day and leisure centre in the evening) which could lead to more social interaction as users of one function (leisure) might already know each other from the other function (school). At a larger scale, urban designers have promoted 24 hour use of areas by situating complementary functions in close proximity and keeping places 'active' for longer durations (Bentley *et al.*, 1985). As discussed in Chapter 2, this has not always lead to more positive social interaction between users and residents particularly in city centre areas (Roberts, 2006).

With regard to the *spatial arrangement* of a mix of facilities, i.e. whether they are grouped around a central area or along a street, Barton *et al.* (2003) recommend that facilities should be grouped in linear clusters akin to traditional high streets, and Mehta (2009) whilst assessing linear commercial streets suggests more specifically to cluster activity-supporting businesses within a block as far as possible. Given these findings and recommendations, different locations, group sizes, mixing styles and functions of local facilities and their association with social interaction are tested in later chapters in this thesis.

3.4.4.2 Visibility of Facilities

Raman (2010), in analysing different densities and their layout on social interaction and social networks found that social spaces that were physically and visually well connected to other spaces and adjoined well-connected pedestrian routes had the highest number of social interactions. However, if a space was so well visually connected that it negatively influenced the extent of its levels of privacy (i.e. overlooking), there was still a large number of movements but less social interaction. Other studies into the use of urban spaces have also highlighted the

importance of visibility (called *visual accessibility* by Whyte (1988)) for a wide variety of users (Cooper Marcus and Francis, 1990), hence visibility of local facilities is tested in later chapters.

3.5 AREA CHARACTERISTICS

The place where people live as a setting for social processes, including social interactions has been widely researched (see (Forrest and Kearns, 2001)) or (Sampson *et al.*, 2002) for a meta-review). A number of studies have analysed area characteristics affecting social interaction between neighbours (Henning and Lieberg, 1996; Skjaeveland and Garling, 1997; Talen 1999), but there are no studies analysing how area characteristics affect social interaction **at local facilities**. Given the importance of a number of area characteristics for social interaction (such as homogeneity of residents, perceived crime etc.) within a neighbourhood generally, it is possible to infer that they might also have an impact on social interaction at a specified location within the neighbourhood, i.e. local facilities. Hence, the following physical and social area characteristics have been included in this research to test their relevance for social interaction at local facilities. As already set out above, some factors that could be considered personal characteristics, such as length of residence and number of social ties in the area are included here, as they relate to a particular geographical area, whereas non-spatial, demographic factors are discussed under personal characteristics.

3.5.1 Perceived Social Area Characteristics

Perceptions of the area people live in and their neighbours have been found to be an important consideration in enabling or hindering certain behaviours. Lund (2003), for example, confirmed findings from Kitamura *et al.* (1997) which suggested that personal attitudes towards a certain behaviour (e.g. walking) were more important than objective neighbourhood characteristics. Subjective perceptions have also been found to be more important for psychological well-being than the objective environment (Dempsey, 2006; Schwirian and Schwirian, 1993). Hence, several aspects of perceived social neighbourhood characteristics, such as homogeneity, perceived safety and perceived levels of crime are discussed further below with regard to their possible influence on social interaction.

3.5.1.1 Homogeneity of Residents

A number of studies have found that homogeneity (perceived or real) enables and increases social interaction **within a neighbourhood** (Hunter 1975, Keane 1991 in Talen, 1999). Homogeneity is also termed *social proximity* to highlight the fact that this relates to residents' perceptions of each other in terms of their attitudes, opinions and social characteristics rather than their actual match in all socio-economic variables (Porteous, 1977). In fact, Snow, Leahy and Schwab (1981) found that contact among neighbours remains superficial unless reinforced by social and demographic

homogeneity. A number of authors have argued that the importance of homogeneity for social interaction is greater than any built environment features: Gans (1962) suggests that architectural design would only influence positive interaction if substantial similarities in social class and commonality of values are present. Hunter (1975) found that a sense of community was lasting due to shared values even if the use of facilities in a neighbourhood had declined sharply. Talen (1999) speculates that whilst research had shown that architectural form and site layout could increase the frequency of resident interaction, 'homogeneity of residents might be a pre-requisite for that to happen' (p.1368). Rosow (1961) in an earlier review came to the same conclusion.

Conversely, where people perceive their neighbours to be more heterogeneous, neighbourhood participation has been found to decline (Tomeh, 1969). Stratification theory suggests that this is explained by the fact that social relationships are formed between people of equal status or shared values to avoid conflicts (Bottero and Prandy, 2003). As an example, suburbs, due to the similarities in social class and life-cycle stages of their residents, have been found to have high levels of neighbouring (Gans 1962). In other areas of cities where there is a greater social mix, Keane (1991) found that women who felt other families were different to their own had more dispersed community ties as 'heterogeneity reduces the desire for interaction with many of those who are nearby, thereby 'pushing' the individual into social bonds outside the development' (p.41). Musterd (2008) also claimed that social networks were weaker in socially mixed environments and that 'positive socialisation processes may simply not occur, because people have too little in common to reach a sufficiently high level of interaction, which is required to get to positive socialisation' (p.898).

Porteous (1977) concluded that resident homogeneity appeared to be the main factor for spatially determined friendship, but that it was unclear what kind of homogeneity it was. (Athanasiou and Yoshioka, 1973) found that life-cycle stage, social status, ethnicity and social attitudes were most important but that, for some groups (women with small children), *propinquity* was also important in maintaining friendships even if the women had little in common besides the life-cycle stage.

Whilst the above literature has analysed the importance of homogeneity for neighbouring or social interaction within a neighbourhood, there is a lack of studies analysing how homogeneity influences social interaction **at facilities**. Although Lang (1994) claims 'it is clear that local facilities work best as catalysts for local affiliations in areas with homogenous populations' (p.268), no empirical evidence was provided to support this statement.

3.5.1.2 Perceived Visible Segregation

As perceived or actual heterogeneity of residents has been shown to be an important factor reducing social interaction in a neighbourhood, one physical manifestation of heterogeneity is the visible distinction between tenures in the same neighbourhood. The last Labour government encouraged a greater mix of housing types in housing developments to improve social inclusion, sustainability, cohesion and balance (Tunstall and Fenton, 2006). Mixed-tenure was judged successful if it could be built 'tenure blind' without residents noticing the difference between owned and rented properties, which was meant to be achieved by pepper-potting rental accommodation across sites rather than in groups and by producing the same external design of buildings of different tenure (Roberts, 2007). Research has found that 'provided that the layout draws on established principles of urban design and no stigma can be attached to the social housing through its visual appearance, then a degree of social interaction between different income groups is facilitated even if the design and layout does not conform to an ideal notion of tenure blind development'(Roberts, 2007, p.201). Again, perceived visible segregation has been included in the thesis to test whether it has an impact on social interaction at local facilities.

3.5.1.3 Perceived Safety from Crime and Anti-social Behaviour

This aspect relates to 'feeling safe' in the area the facility is situated in, rather than at the facility itself. Lund (2003) found that positive perceptions of the local walking environment (including feeling safe and walking after dark) related to more frequent levels of neighbouring even after controlling for actual walking behaviours. The relationship between feeling safe and higher levels of neighbouring had been established in the 1970s as well as the finding that feeling *unsafe* could result in a withdrawal from public life (Newman, 1995). Feeling unsafe can relate to objectively measurable physical aspects of the environment, such as poor condition and maintenance [broken windows syndrome] (Wilson and Kelling, 1996; Wood *et al.*, 2008), traffic levels (Miles, 2008) or lack of surveillance and clearly marked territory (Newman, 1995). The latter observations led Newman to develop his 'defensible space' theory which popularised the idea that architectural/urban design can play a part in preventing crime (Newman, 1973). Whilst some aspects of Newman's theory have been criticised, such as the power of defensible space in areas with fragmented social fabric (Merry, 1981) or the assumptions about the interaction of human behaviour and the environment (Steventon, 1996), other elements such as the natural surveillance component (first mentioned as 'eyes on the street' by Jacobs (1961)) were empirically tested and found to reduce residential burglary and vandalism in multi-unit housing (Poyner, 1983).

Feeling unsafe can also relate to other people, particularly observable anti-social behaviour (Pain and Townshend, 2002, Roberts, 2006) or general crime levels. Research has shown that social ties and social interaction can buffer the negative effects experienced by living in crime and disorder ridden neighbourhoods (Ross and Jang, 2000) and can be effective in decreasing crime rates (Glaeser *et al*., 1996) but that not all social ties are equally effective: Warner and Rountree (1997) found that the neighbourhood context in which ties occur is related to their effectiveness in reducing crime, and Rountree and Warner (1999) found that female social ties were more effective in controlling crime than male social ties. Perception of crime and 'feeling safe' in an area have been included in this research to test their association with social interaction at local facilities.

3.5.2 Physical Area Characteristics

The main three physical aspects of neighbourhoods discussed in the literature to influence social interaction levels in neighbourhoods are the walkability of the area, the density and the connectedness of the area. The relevance of these for social interaction at local facilities is discussed in the following sections.

3.5.2.1 Walkability of Area

In the wake of the obesity crisis facing the US and UK, a number of studies have analysed to what extent and what aspects of the built environment determine levels of physical activity and walking (Frank *et al.*, 2005; Giles-Corti *et al.*, 2005; Giles-Corti and Donovan, 2003b; Panter and Jones, 2008; Pikora *et al.*, 2003; Southworth, 1997). Several studies have argued that the presence of facilities, distance and access to them and the directness of routes to the facilities are all critical factors in influencing the levels of walking (Dieleman *et al.*, 2002; Handy, 1996; Handy, 2002; Handy and Clifton, 2001). Walking to facilities is, in turn, expected to increase opportunities for local social interaction en-route and the development of a sense of connection between people and the places where they live (Filion, 2001; Gehl, 2001; Leyden, 2003; Whyte, 1980).

Hence, new urbanism advocates the provision of local facilities <u>together</u> with a walkable environment which in theory should encourage people to walk <u>and</u> have more of a chance for repetitive chance encounters (Achimore, 1993). This has also been stated in government reports, which assert that 'streets and squares designed with pedestrians in mind will encourage social interaction, community cohesion and a sense of place' (CLG, 2009, p.13). However, the social outcomes claimed by proponents of pedestrian-friendly environments, such as the development of socially inclusive and cohesive communities remain contested. For example, Kim and Kaplan (2004) found that the physical environment was of little importance for social interaction to their

respondents, particularly those living in the most walkable neighbourhood, which was supported in another study by du Toit *et al.* (2007). Conversely, Plas and Lewis (1996) found that residents in older, traditional neighbourhoods walked more AND had higher levels of interaction amongst the communities and concluded that this was due to the physical layout, particularly the accessibility of retail shops and open spaces together with a pleasant walking environment. These findings were corroborated in a study by Casey *et al*. (2007) and partially supported by Lund (2002) who found that people in neighbourhoods with local access to parks (but not to retail shops) had higher levels of social interaction. Lund (2002) distinguished between strolling trips and destination trips and found that strolling trip frequency but not destination trip frequency was the most significant predictor for 'unplanned social interactions with neighbours' suggesting perhaps that people interact 'en route' when they are not in a hurry to get to a certain destination. Other aspects that have been found to increase **social interactions 'en route'** were reduced traffic levels (Appleyard, 1981; Hart, 2008) and certain spaces along the routes such as shared parking lots (Cooper Marcus 1965 in Nasar and Julian, 1995). Given the above evidence, walkability of the area and how this is associated with social interaction was included in this research to be tested.

3.5.2.2 Density and Permeability

With regard to density, Raman (2005) found that social interaction levels were higher in neighbourhoods with a density of 70-80 dwellings per ha, but lower above and below. A similar result emerged from a study by Bramley *et al.* (2009) who found social interaction levels were highest at medium densities (up to a density level of 100 dwellings per ha (net)), with low levels at the top and the bottom end of densities. The relationship between density and social interaction is less clear cut in the literature, as a number of mediating effects, such as high densities result in more flats, result in younger, more transient population together with more facilities might all have an effect on social interaction levels that influence the relationship, rather than density itself.

Another aspect that, according to the literature, has a positive impact on social interaction levels is **permeability,** defined as 'the quality of a place to provide people with a choice of access routes through' (Bentley *et al*., 1985, p.12). Hillier and Hanson (1984) claim that permeable configurations of neighbourhood spaces can enhance social behaviour by creating opportunities for (unplanned) encounters, and, therefore increase the number of social interactions between residents. Raman (2005) supported this to some extent as he found that locally well integrated spaces in neighbourhoods had more frequent social interaction. However, he also found that if the entire neighbourhood was well integrated, social interaction levels were less frequent (ibid). Dempsey (2009) also found no relationship between connectedness, permeability and social

interaction dimensions within a neighbourhood. As this research is concerned with social interaction at local facilities, it is easy to see how the permeability or legibility (ease of wayfinding) of a neighbourhood might affect the use of local facilities or the mode of transport to them. However it is not clear how this would directly affect social interaction levels at facilities. The legibility of specific facilities is covered in more detail in Chapter 4.

Having discussed relevant physical characteristics for social interaction at local facilities, the discussion turns to the final aspect of area characteristics, the familiarity and social ties of residents within an area.

3.5.3 Familiarity with the local area and residents

This section discusses the three concepts of place attachment, social networks and length of residence which have been found in the literature to be individually associated with social interaction, as well as being associated with each other.

3.5.3.1 Place Attachment

Place attachment is a construct which is measured in several dimensions and has been shown to have a relationship with social interaction: for example, Mesch and Manor (1998) tested to what extent people felt attached to where they live and to what extent this was due to local social interaction. They found that most urban residents were attached to their place of residence and whilst this increased with the number of close friends and neighbours known/living in the same area, the perception of the local environment was also found to have a direct and *independent effect* on neighbourhood attachment. Most studies have found that place attachment is linked both to a physical/time (perception of neighbourhood/length of residence) component, and social (social ties/social interaction) component (Janowitz and Street 1978, Nasar and Julian, 1995, Riger and Lavrakas, 1981). This is debated however, as other studies have questioned the importance of social interactions for place attachment: Haggerty (1982) and Plas and Lewis (1996) found that place attachment was more related to the prestige of the area than the frequency of social contact. (Hunter, 1975). Lund (2002) also found that a 'feeling of belonging' to a neighbourhood was quite distinct from local social involvement and concluded that this might have different antecedents or correlates.

In addition to a debate about the *significance* of social interaction for place attachment, the *direction of influence* is also debated: Janowitz and Street (1978) argued that local attachment was predominantly the **result** of local relationships neighbours develop through time and Mesch and Manor (1998) corroborated this finding by concluding that level and frequency of local social

interaction positively affected place attachment. Conversely, Skjaeveland and Garling (1997) found the relationship to be inverse as their conclusion was that place attachment had a positive **impact** on social interaction amongst neighbours.

3.5.3.2 Social Networks in Local Area

The number and type of a resident's social network within a neighbourhood has been found to be important for their ability to have social interaction in that neighbourhood. For example, Riger and Lavrakas (1981), found that age together with the presence or absence of children had an effect on place attachment, suggesting that certain groups, i.e. young people without families and older people whose families were no longer present, were equally lacking in links to social networks within neighbourhoods.

The necessity of having local ties, however, is debated: Wellman (1977) pointed out that in a more mobile society, social network members are based on affinity not proximity, unless one is in a group which has limited resources or mobility, such as mothers with young children at home, older people or long term sick. This was supported by Henning and Lieberg (1996) who found that the aforementioned groups spent a significant amount of time in and around the home and the decline of local facilities in their study had restricted their social network opportunities. Where individuals have smaller networks with fewer contacts however, they often constitute more intense social contacts (Casey *et al.*, 2007, Campbell and Lee, 1992, Riger and Lavrakas, 1981). For example, Ajrouch *et al*. (2001), claim that women from a black ethnic background have smaller networks than women with a white ethnic background and that those networks are dominated by kin rather than friends. Yancey (1971) argued that informal networks among neighbours are an important means by which the urban lower and working classes cope with poverty and deprivation and that these networks are at least in part dependent on the semi-public space and facilities that are present in many working and lower class neighbourhoods. Henning and Lieberg (1996) also found that weak ties (low level of intimacy) could provide important bridges between networks of strong ties (high level of intimacy) and were thus of particular importance for vulnerable and marginal groups. Strong and weak ties have also been discussed in 3.2.1.

3.5.3.3 Length of Residence

Length of residence has been found to be a contributing factor to place attachment (Riger and Lavrakas, 1981) and is thus also discussed under area factors. It has also been found to have a positive impact on social interaction (Bramley *et al*., 2009), neighbouring (Kasarda and Janowitz, 1974), developing social ties in a local area (Riger and Lavrakas, 1981), the number of friends and close acquaintances residents have in an area and sense of community (Plas and Lewis, 1996).

The three concepts of place attachment, length of residence and social ties in an area have been shown to be inter-related with social interaction and with each other. Hence, this research measures all three concepts separately to analyse whether there is an individual relationship with any of these concepts and the frequency of social interaction at local facilities.

3.6 PERSONAL CHARACTERISTICS

A number of personal characteristics have been discussed in the literature to have an influence on social interaction in a neighbourhood. Similar to Chapter 2, the section is subdivided into demographic and socio-economic characteristics.

3.6.1 Demographic Characteristics

Gender has been found to be important for social interaction in a number of studies (Campbell and Lee, 1992; Skjaeveland *et al.*, 1996; Unger and Wandersman, 1982). Specifically, women have been found to have higher levels of social interaction (Camina and Wood, 2009), be more active in voluntary organizations (Deem, 1968 in Crow and Allan, 1994) and have a wider variety of contacts (Cornwell, 1984 in Crow and Allan, 1994). Another study qualified these findings by asserting that women only had more local ties when they were older, married and in full-time employment, whilst men had more local ties when they were older and unmarried (Keane, 1991).

As highlighted in the previous section, with regard to **ethnicity**, a study by Ajrouch *et al.* (2001) found that people from a black ethnic background have smaller networks, more family members in their networks and more contact with network members. Argyle (1986) and Depeau (2001) claim that previous research has shown variations among different cultural groups in the norms of participation in social interaction, hence it is important to test the relationship between ethnicity and social interaction levels at local facilities.

Haggerty (1982) found that a respondent's **stage in life cycle** (measured as a composite including age, marital status, and children at home) affected their levels of social interaction. This was supported by other studies analysing individual factors such as age (Ajrouch *et al*., 2001; Campbell and Lee, 1992; du Toit *et al*., 2007; Skjaeveland and Garling, 1997; Talen, 2003) and the presence of children at home (du Toit *et al*., 2007). Children have been identified as 'catalysts for adult interaction as they know other children from local schools' (Lang, 1994, p.268). Given that several studies found these factors to be relevant, they have often been included as control variables in regression models, even if their individual impact on social interaction has not been tested. For example Lund (2002) used age group, gender, race, number and age of children and whether the

respondent identified as a homemaker as control variables when testing whether the pedestrian environment influenced social interaction in the neighbourhood.

3.6.2 Socio-economic Characteristics

Whilst several authors have argued that the frequency of social interaction is higher for people with high socioeconomic status (Campbell and Lee, 1992) and more prevalent in upper and middle-class suburbs (Whyte, 1956) other authors found that urban working classes had stronger interpersonal networks with neighbours and friends living close by (Crowe, 2010; Gans, 1962; Yancey, 1971) and more frequent and more intense social interaction (Yancey, 1971) than the middle and upper classes. The latter was supported by other authors, claiming that for working classes the neighbourhood and its residents as a support and friendship network were more important than for the middle classes (Henning and Lieberg, 1996). Conversely, middle classes have been found to be superficially friendly with many neighbours, but close friendships are more likely based on common interests than on physical proximity (Gans, 1962) and hence residents with economic choice have a wider geographical range of contacts available to them and thus less friendship contacts in their neighbourhoods (Ahlbrandt, 1984). This was not supported by studies analysing the influence of **employment status** on social interaction levels. Fischer (1982 in Keane, 1991) found that being employed resulted in more local ties rather than ties outside the neighbourhood (dispersed ties) and Keane (1991) found that women who were employed had concentrated their social ties in the locality compared to unemployed women who had more dispersed ties.

With regard to **education**, Keane (1991) found that for males, the higher the education the more geographically dispersed (i.e. further away from the neighbourhood) their social ties were. This was corroborated by findings from (Fischer 1982 in Keane 1991) who found a positive relationship between education and dispersed social ties irrespective of gender. Yancey (1971) also found that the longer the resident's education had lasted, the more social interaction they had. However, this was reversed when measuring income and social interaction (i.e. people with low income engaged in more social interaction).

Tenure in Britain can be seen as a proxy measure for wealth/affluence due to the increase in home ownership rates following the introduction of the Right-to-Buy scheme in the late 1970s, with a simultaneous reduction in housing finance (Bramley, 1994). This resulted in a much smaller affordable/social rental sector, which houses only the most marginalised (and most in need) groups of society, rather than lower middle and working classes as had previously been the case (Malpass, 1986). The resulting stigmatisation of the affordable rental sector encouraged the last

Labour government to require the private sector to produce mixed-tenure housing developments (Jupp, 1999, Roberts, 2007). Several studies have investigated inter-tenure social interaction on such mixed-tenure developments which is partially relevant to this research: Kleinhans (2004) did a review of mixed tenure literature which did not support the idea that there was significant social interaction between residents in different tenures. This was supported by a study by Atkinson and Kintrea (2000) who found that renters and owners inhabited different worlds rarely interacting with each other. These findings were contested by Camina and Wood (2009), who used the same methodology, but found that there was a considerable degree of social interaction between the groups. Explanations provided by Camina and Wood (2009) include the fact that the socio-economic differences between the tenure groups were considerably less than in the Scottish example. The necessity for a certain level of homogeneity to encourage social interaction (not just with regard to tenure, but also class, ethnicity etc) has previously been discussed in Section 3.5.1.1. Apart from inter-tenure social interaction, **home ownership** in itself has been found to be an important predictor for sense of community (Davidson and Cotter, 1986) as making a long-term economic commitment such as ownership of properties can be seen as an incentive to invest in a community and also feel attachment to places (McMillan and Chavis, 1986).

3.7 SUMMARIES

The above review has highlighted factors from the literature mainly pertaining to social relations in neighbourhoods which are also likely to have an impact on social interaction at local facilities thereby addressing **Objective 4**. They relate to the facilities themselves, the area the facilities are located in and the personal characteristics of the users.

Facility Characteristics

- Type of Facility
- Level of Use
- Perception as *Third Place*
- Mix of Facilities
- Location of Facilities
- Visibility of Facilities

Area Characteristics

- Homogeneity
- Visible Segregation
- Crime & Deprivation
- Walkability of Area
- Density of Area
- Place Attachment
- Length of residence
- Social Network

Personal Characteristics

- Age
- Gender
- Life Cycle Stage
- Household Composition
- Social Class
- Employment Status
- Tenure

This review of the literature provides the foundation for the next stage, of developing a range of indicators for the research in Chapter 5 to assess the relative importance of each of these characteristic groups on social interaction at local facilities. Through the subsequent analysis, it will be possible to address research Objective 3, to understand which factors influence social interaction at local facilities. Before developing indicators however, the final aspect of factors affecting social interaction - micro-scale urban design features at and around facilities - is reviewed in the following chapter.

Chapter Four

Urban Design Features Influencing Social Interaction at Local Facilities

4.1 INTRODUCTION

Chapter 3 highlighted the literature pertaining to factors affecting social interaction at a range of local facilities. This chapter focuses on the micro-scale urban design features that are claimed to have an impact on social interaction at local facilities and their surrounding public realm thereby addressing **Objective 5**. The chapter focuses on design features relating to built facilities, as research into the design of parks and green spaces and their impact on social interaction levels has already been widely undertaken (Golicnik and Ward-Thompson, 2010; Moore and Cosco, 2007; Peters *et al.*, 2010) whereas research comparing the influence of design features of commercial and leisure facilities on social interaction is an understudied subject. Due to the scarcity of studies analysing facility features, much of the following literature is based on studies either analysing buildings or hard surfaced public spaces to highlight relevant design features for social interaction at facilities and their surrounding public realm.

4.2 CATEGORISING URBAN DESIGN FEATURES OF FACILITIES AND SURROUNDING PUBLIC REALM

In the realm of social interaction, designers have claimed that the layout or plan of the physical environment will have effects upon behaviour (Gutman, 1966). Urban design as a discipline is dominated by normative theory (how space or society ought to be) with a conspicuous lack of empirical studies testing these normative theories (Carpman and Grant, 2002). Empirical studies which analyse the relationship between design and behaviour tend to be from the fields of sociology or environmental psychology (ibid). For example, using large scale observations, Roger Barker (1968), was the first to identify that environmental situations had a greater impact on people's behaviour than their individual characteristics. From this finding, he developed the concept of behaviour settings, which he described as public places or occasions (called 'the milieu') which invoke their own typical patterns of behaviour (called 'standing patterns of behaviour') (ibid). The similar structure between people's actions and the physical and social characteristics of a behaviour setting are called *synomorphy* (Bell *et al*., 1990, p.564), e.g. if the behaviour setting is a classroom in a lecture-oriented course then the standing patterns of behaviour would include lecturing, listening and sitting (Bell *et al.*, 1990). The assertion is that many behaviour settings can be achieved through architectural design and planning (Sommer, 1998) and that people, whilst moving from one space to another, change their behaviour accordingly (Lang, 1994).

With regard to design features affecting social (interaction) behaviour, a number of studies have identified them within public open spaces such as urban squares and plazas (Carmona *et al.*, 2003;

Carr *et al.*, 1992a; Carr *et al.*, 1992b; Cooper Marcus and Francis, 1990; Gehl, 2001; Pushkarev and Zupan, 1975; Shaftoe, 2008; Urban Forum, 2009; Whyte, 1980). As this thesis is concerned with social interaction **at facilities**, design features need to be selected which are part of or linked to facilities. Given the range and diversity of facility types, this is not trivial. Two possible ways of selecting and grouping design features would be:

a) by the **physical area**, or
b) by their **purpose** with regard to social interaction.

The **physical areas** where social interaction between residents at facilities might occur can be described as:

- Indoors/inside the facility,
- In the entrance area of the facility on arrival/departure, and/or
- Outside the facility in the *surrounding public realm*.

For the purpose of this study, the boundary of the *surrounding public realm* has been defined as the minimum distance where people can still recognise each other. Alexander (1977) found that in a plaza of less than 70 feet (20m) in diameter, people were still able to 'make out the faces and half hear the talk' (p. 313), which appears to be a good distance to use as a buffer around facilities for the purpose of social interaction. Beyond that boundary social interaction is classified as happening 'en-route' rather than at or around the facility.

The second option would be to group design features by their **purpose** with regard to social interaction. It has been argued that design features can influence how many people use public space, how long individual activities last and which activity types can develop (Gehl, 2001). Gehl claimed that well designed spaces can increase the occurrence of optional activities (e.g. visiting the park) and *social activities* (greetings and conversations), whereas badly designed public spaces tend to be dominated by necessary (e.g. food shopping) activities (ibid.). This can be directly translated for this research. Firstly, in order for social interaction to occur, other people need to be present at or around the facility hence features attracting people to a facility are important. Secondly, the opportunity for social interaction to occur, increases if people remain in the same space (facility or surrounding public realm) for longer. Thirdly, the way people move around in that space, their ability to see others and have unplanned encounters, will greatly increase opportunities for social interaction. This means that the primary purposes of design features at facilities for social interaction are to

1. attract people/users,
2. retain people longer at or around the facility, and/or
3. affect the movement patterns at facilities to allow for visual and physical contact.

Because the aforementioned physical areas are linked and difficult to delineate precisely (e.g. what is the boundary of an 'entrance area') as well as likely to have similar design features (e.g. benches) in their interior, exterior and surrounding public realm, grouping them **by physical area** was not considered a suitable option. The distinction **by purpose,** however, allowed for a more useful grouping of design features and was thus adopted for the remainder of this Chapter and the analysis in Chapter 9.

The first aspect – design features attracting people/users – is of paramount importance for the use of public open space (Carmona *et al.*, 2003; Carr *et al.*, 1992b; Francis, 2003; Gehl, 2001; Holland *et al.*, 2007; Whyte, 1980). However, this research is concerned with design features at or around **facilities**. The main attractions of facilities (apart from parks and green spaces) are the goods and services they provide (i.e. their main function) together with other factors such as affordability, accessibility, feeling safe, urban form etc. (as discussed in Chapter 2). Hence, what attracts people to a facility has already been discussed. This section therefore focuses on what happens when people are already present at or around the facilities by reviewing which design features (pertaining to retaining people longer in the same space or affecting their visibility and movement) affect the type and location of social interaction.

4.3 DESIGN FEATURES RETAINING PEOPLE LONGER AT OR AROUND A FACILITY

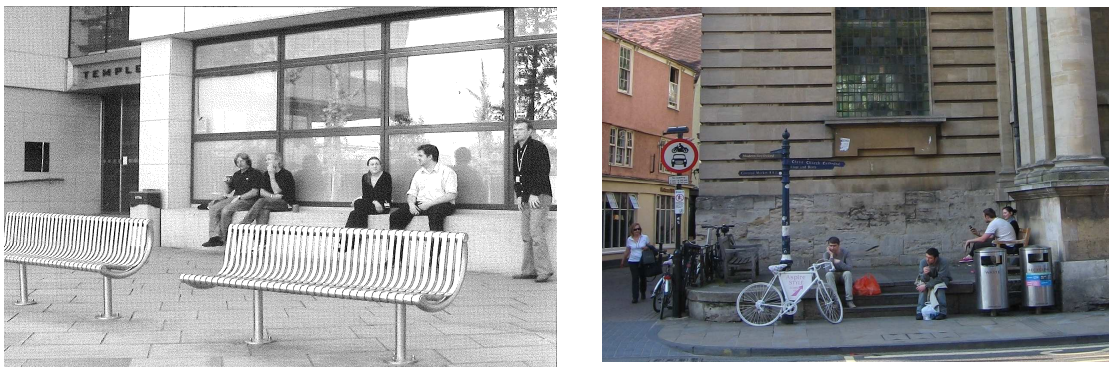
Design features which increase the length of stay of users (beyond the initial purpose of shopping/borrowing books etc.) in the public realm or inside facilities can broadly be grouped into two main categories: **Comfort and Curiosity**. Comfort deals with a user's need for seating, eating and drinking, shelter, relaxation etc. whilst curiosity covers the range of activities (performers) and features (aesthetics, stalls, advertising) that attract people's attention and hence encourages them to stay longer (Carr *et al.*, 1992; Gehl, 2001). Facilities themselves can also perform this function, for example an ice-cream van or café situated just outside another facility, such as a supermarket or library, can encourage people to linger in the surrounding area of the facility after their primary purpose has been fulfilled.

4.3.1 Comfort

Comfort is considered a basic human need (Maslow, 1968) and has been found to be an important prerequisite for the use of public spaces (Carr *et al.*, 1992b; Gehl, 2001). Whyte (1980), in doing his seminal study on small urban spaces in New York, was the first to realise that sitting space ('People tend to sit most where there are places to sit' (p.28)), food, access to sun/shade, protection from wind/rain and the provision of water and vegetation were essential ingredients for a well used public space and for people to remain in it for longer. Different user groups have been found to have different requirements for comfort, for example older people require different spaced and designed seating than younger people (Burton and Mitchell, 2006; Gehl, 2001). Access to public toilets have also been found to be an important aspect of comfort and inadequate provision has been found to have a particularly discriminatory effect against older people, those with children and people with disabilities (Holland *et al.*, 2007).

4.3.1.1 Sitting and Resting Features

Sitting space has been identified as one of the most important characteristics in retaining people in public spaces and potentially supporting social behaviour (Whyte, 1980; Gehl, 2001; Mehta, 2009). This can take the form of benches, chairs or other surfaces at an appropriate height (such as ledges, planters, steps, bollards), which have been termed by Gehl (2001) as *primary* (chairs and benches) and *secondary* seating (ledges etc). The siting, location, design and material of seating is also very important as to how well they are used and by whom. Movable chairs are a desirable form of seating due to the choice, flexibility, and comfort they offer (Whyte, 1980). Holland *et al*. (2007) found that benches had to be positioned in locations with good viewpoints and 'something to look at' to be used. This was supported by Gehl (2001) who found that sitting space was most used when 'at the edge of open spaces, where the sitter's back is protected from passersby and the view is unobstructed' (p.158) (see images 4-1 below).



Images 4-1: The sitter's back is protected from passersby on a ledge in Bristol unlike the benches in front (left). Bench on the left has an unprotected back and sitters can't view passing people, hence it's unoccupied and people prefer sitting on bench on the right side or steps in front in Oxford (right).

Conversely, seating can be designed to actively *discourage* use for example when the design's main purpose is to make it 'vandalism proof' (Worpole and Knox, 2008) or stop homeless people from using it to sleep (Whyte, 1980) (see Images 4-2) or the design is so modern and unusual, that some users (for example older people with dementia) fail to recognise it as seating at all (Burton and Mitchell, 2006).

Images 4-2: 'Vandalism proof' seating in Oxford; Not comfortable to sit, hence people sit on top

Benches with back and arm rests have been found to retain people longer and are the preferred form of benches for older people (Holland *et al.*, 2007). Older people have also been found to require sitting space to be positioned every 100m and require a narrower range of seating height to get up again (Gehl, 2001). Whilst several authors (Argyle, 1967; Hall, 1966; Lawson, 2001) have found that the positioning of seating has a major impact on the likelihood of conversations to develop, Mehta and Bosson (2010) found that outdoor seating (irrespective of the position or design) generally increased sociability.

Disparities between '*potential*' environments (as intended by the designers) and '*effective*' environments (as used by people irrespective of the designer's intention), were first described by Gans (1968). Sitting space is no exception. For example, Mehta and Bossom (2010) found that benches, chairs, tables and integral seating acted as furniture that people used for purposes other than sitting, such as reorganising bags and belongings. They also acted as physical artefacts for children to play on and for adults to stand next to, lean on, use as a table, and so on, and supported other postures and activities that encouraged social behaviour (Mehta, 2009). This supports the *theory of affordances* of objects which Gibson (1977) described as 'properties of the environment that offer action possibilities which are perceivable by an observer' (p.143) (i.e. a chair can be used to sit on or stand on as long as the user is capable of doing so). Whilst designers often focus on form, users tend to experience the functional opportunities (*affordances*) of a place and hence use the features as they see fit by, for example, sitting on steps rather than standing (Nasar, 2011). Gehl (2001) suggested that many elements in city spaces (such as stairways, fountains with wide bases, streetlamps etc.) could be designed in a way that they would serve their primary function but would also double up as secondary seating opportunities, providing so called '*sitting landscapes*'.

4.3.1.2 Features to Mark Personal Space for People to be Comfortable

Physical artefacts, such as bollards, bicycle stands, bins, sign posts, railings, flower boxes etc which have been placed in the setting for aesthetic or functional purposes were found in several studies to attract people and certain types of behaviour. A study by Preiser (1972), for example found that such artefacts had observable radii of attraction in which specific behaviours took place. Whilst group behaviour was less tied to physical artefacts, particularly solitary purposive behaviour, such as reading, required some space sheltered from the mainstream of circulation. Stilitz (1969) noted that such shelter was most frequently found in the vicinity of columns, edges, niches and corners (see below).


Images 4-3: People waiting for the bus in Estação Square (left) and children engaging in playful activities in Liberdade Square in Belo Horizonte (right) (Barros, 2010).

In a time lapse study of 6000 users in ten plazas in Vancouver, it was found that less than one percentage of visitors carried out activities in the open pavement away from any physical artefacts (Pushkarev and Zupan, 1975). Mehta (2009) confirmed these findings 30 years later, concluding that

> 'more than 90% of the more than 13,000 people observed carried out most of their stationary and social activities on or near some physical artefact ... on which the users sat or leaned or just stood next to' (p51).

Pushkarev and Zupan (1975) observed that people looked for anchors to which they could attach themselves, either physically (sitting, leaning against) or symbolically (standing near, looking at). This behaviour might best be explained with the need for personalisation and the marking (and defence) of personal space, called *territoriality* (Porteous, 1977). Dubos (1965) stated that 'laying claim to a territory and maintaining a certain distance from one's fellows are probably as real biological needs in man as they are in animals, but their expressions are culturally conditioned' (p.108). This is particularly pertinent in relatively noisy, crowded situations, such as supermarkets and outdoor space, where people frequently feel the need to have a place of their own where

environmental stimuli can be reduced and privacy assured (Porteous, 1977) as discovered by Preiser (1972). Public settings thus demand space for both privacy seeking behaviour (*sociofugal*) and communication seeking behaviours (*sociopetal*) on the part of each individual (Osmond, 1957). Gehl (2001) referred to this phenomenon as the 'varied transitional forms between being alone and being together' (p.19) and suggested that urban spaces provide opportunities for varying degrees of engagement and disengagement from contact. This in turn allows people to mark and claim their own territory, be able to keep an appropriate distance to others and provide standing or sitting areas which cover one's back and/or provide a vantage point to observe others (Alexander *et al.*, 1977; Shaftoe, 2008).

4.3.1.3 Food Provision

Public spaces with food vendors/kiosk within or cafes/restaurants adjacent have been found to increase the length of stay and the number of people using the space (Whyte, 1980). This has been noticed by the retail sector leading to a rise in cybercafés, bookshops with cafes inside etc. Seating in conjunction with eating (particularly outdoor seating) has also been found to enhance levels of social interaction as people frequently combine eating and drinking with socializing (Mehta, 2009; Watson, 2009; Whyte, 1980). A study found that 'outdoor seating in conjunction with a shop extended the territory of the shop and thus allowed people to engage in social activities on the street space adjacent to the business, making the public realm more sociable' (Mehta, 2009, p.46).

4.3.1.4 Microclimate and Greenery

Research into the effects of environmental factors on human behaviour shows that comfortable microclimatic conditions, including temperature, sunlight, and shade are important for supporting outdoor activities (Cooper Marcus and Francis, 1990; Mehta and Bosson, 2010; Pushkarev and Zupan, 1975; Rapoport, 1977; Whyte, 1980). A study by Lieberman (1984) on downtown plazas in San Francisco found that people rated access to the sun as higher than the proximity of the space or its social aspect. Whilst sunlight, up to a certain temperature, is something that draws people to places, Whyte (1980) and Zacharias *et al.* (2001) both found that people require shade once the temperature moves over 20 degrees and hence a space should contain sunny areas as well as areas providing shade through trees, awnings, canopies, and overhangs. Shelter from wind and cold is also a major issue (Cooper Marcus and Francis, 1990; Gehl, 2001) which indoor spaces, such as malls can avoid with climate-controlled environments all year round, providing light but sheltered venues for both casual social encounters and organised meetings (Evans, 2009).

Running water and trees, green spaces and higher levels of greenery in public areas have been found to have a positive impact on the preference for such spaces (Herzog, 1992), their use

(Whyte, 1980; Kuo *et al.*, 1998; Kweon *et al.*, 1998), social interaction within these spaces (Sullivan *et al.*, 2004) and relaxation (Carmona *et al.*, 2003; Carr *et al.*, 1992b; Cooper Marcus and Francis, 1990; Kaplan and Kaplan, 1989). Furthermore, there is evidence that visiting or viewing natural places has a *restorative effect* on people (Ulrich, 1984), which could be considered a psychological **comfort**. Two contrasting explanations have been developed to elucidate the mechanisms through which this might happen: firstly, Ulrich (1979, 1986, 1991) undertook a series of studies which demonstrated that people's stress levels reduced by viewing nature scenes, leading to the development of the stress reduction model. Secondly, Kaplan and Kaplan (1989) and Kaplan (1995) developed Attention Restoration Theory (ART), which states that directed (focused) attention (tasks including mental efforts) leads to fatigue, which can be restored by the fascination of restorative (natural) environments (e.g. a view of running water or birds) which requires little mental effort. Given the above evidence that microclimate and greenery can increase people's stay in areas and increase social interaction, this research tests both factors and their relationship with social interaction in chapter 9.

4.3.2 Curiosity

Apart from feeling comfortable in a space, the other major aspect that retains people longer in a space or around a facility can be described as curiosity and discovery. *Discovery*, according to Carr *el al.* (1992a), 'represents the desire for stimulation and the delight we all have in new, pleasurable experiences' (p.314), which can take many forms ranging from viewing public art and sculpture to stumbling upon unexpected places (Francis, 2003). It can relate broadly to two categories, **aesthetics and activities** (ibid).

Aesthetics deals with the visual richness a space or building has that promotes discovery and a desire to remain in that space, whereas *activities* are 'people based' discoveries retaining people in a space due to the behaviour of other users of the space or street performers which can help strangers to initiate and generate conversations. Whyte (1980) described the phenomenon of two strangers starting to interact due to a mutually observed activity as *triangulation*. Whilst *activities* have been found to be a powerful tool for keeping people in spaces (Gehl, 2001; Morris, 1978; Whyte, 1980), only *aesthetics* relates to physical urban design features and is therefore of relevance here. Aesthetic features, encouraging or maintaining the curiosity of users, is divided into features relating to visual appearance, variety and focal points.

4.3.2.1 Maintaining Curiosity through Visual Appearance

Formal aesthetics of buildings, such as architectural style, proportion, rhythm, scale and form contribute to an overall physical appearance and corresponding aesthetic response, which are

important for human experience (Nasar, 1994). **Colour** has also been claimed to affect people's perception, but a review by Bell *et al.* (2001) concluded that research into the application of colour was surprisingly limited and inconclusive. Places convey an ambiance or meaning that people relate to/feel (Rapoport, 1993). Several studies found that **attractive environments** affect behaviours within the environments (Skjaeveland and Garling, 1997), for example people in an office environment where more likely to talk to each other in a 'pleasant' environment (Russell and Mehrabian, 1978). Places with a nice appearance may create attributions, social identity and effects which significantly influence social acts. If residents prefer a place, they are more likely to stay there, to feel well, and to use the place as an objectification of the neighbourhood's social identity (Augoustinos and Walker, 1995).

However, there is little agreement as to what constitutes an **attractive environment**, as visual appreciation is a product of perception and cognition, socially and culturally constructed and, due to individual taste, is highly subjective (Carmona *et al.*, 2003). Nevertheless, studies have tried to objectively measure what aspects influence people's preference for particular physical environments (Herzog, 1992). Kaplan and Kaplan (1982) developed a framework with a temporal component, which identified 'coherence' and 'complexity' as immediate aspects for appreciation, followed by 'legibility' and 'mystery' as aspects which encourage the future exploration of the environment. Cullen (1961) also found that spaces which allow for discoveries while moving through them (so called *unfolding townscapes*) held more attraction to users than spaces which 'revealed all' at first sight. Whilst agreement exists between **legibility** and **complexity** constituting the two key aspects, Rapoport (1977) suggested that these were relevant for different scales, in that clarity (coined *legibility* by Lynch (1960) was needed at a large scale to move around urban blocks but that at a small scale *complexity* was needed for people to experience richness and interest. Complexity is relevant not just for natural environments but also hard surfaced public spaces (Herzog, 1992). More complex but ordered public places with regard to density and variety as opposed to sparseness and repetition were found to be better liked by users (Joardar and Neill, 1978; Nasar, 1994) (see below).


Images 4-4: Examples of complex spaces, showing sub-divisions and contrasting parts

Conversely, large open spaces devoid of planting, street furniture or people were found to intimidate most people who preferred to be 'enclosed' rather than 'exposed' and hence moved through spaces quickly or skirt the edges of a space (Cooper Marcus and Francis, 1990; Holland *et al.*, 2007) (see below).

Images 4-5: Examples of simple, unstructured spaces

Subdivision into smaller spaces has been found to not only create visually pleasing appearances but can also give people the option to find their own enclosed niche and linger for a while (Cooper Marcus and Francis, 1990) thereby allowing individuals and groups to position themselves more specifically (see discussion on *territoriality* above) (Holland *et al*., 2007). Careful **changes in level** have also been found to be aesthetically more pleasing for people than entirely flat spaces and allow for an easy separation between circulation space and sitting space (Cooper Marcus and Francis, 1990) with the potential for creating vantage points to facilitate '*man watching*' (Morris, 1978). However, significant differences in elevations (up or down) which act as visual or physical *barriers* (i.e. without steps to move from one level to the other) have been found to be less used by people (Pushkarev and Zupan, 1975).

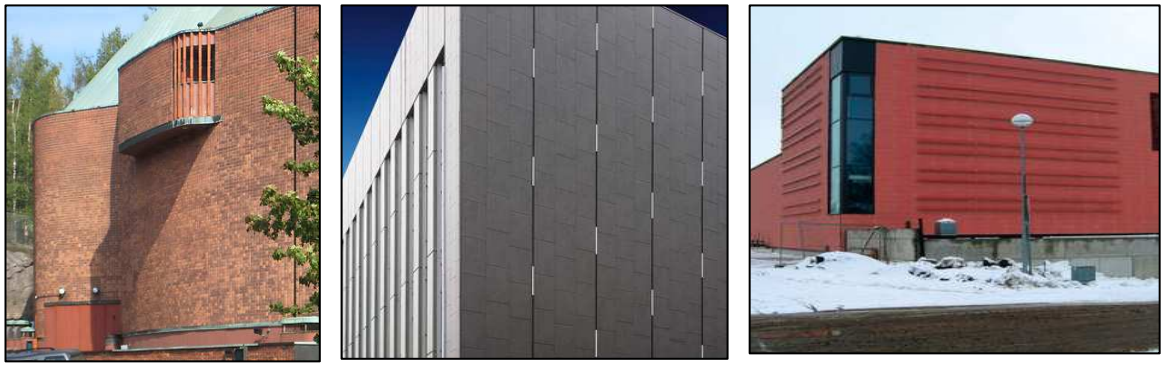
Complexity has also been found to be relevant for internal and external aspects of buildings (called *visual richness* by urban designers – see Bentley *et al.*, 1985). For example, Gilboa and Rafaeli (2003) found that the same preference for more complex environments is also relevant to indoor store environments. With regard to the external architecture, particularly façade design, different architectural styles have produced very different levels of complexity on their facades. An example of a complex façade is shown in the image on the left below, whereas the right image shows are more 'simple' facade.

Images 4-6: Examples of a complex (Harrods) and a simple (Canary Wharf) façade, both in London

Nasar (1994) differentiated between two types of architectural aesthetic design characteristics, *formal aesthetics* (shape, proportion, scale, complexity, novelty and illumination) and *symbolic aesthetics* relating to meaning (naturalness, upkeep, intensity of use, style). With regard to style, it has been found that **vernacular and traditional architecture** is appreciated more than modern styles by most people (Herzog and Gale, 1996). A review by Craik (1970) indicated that people's preferences for building facades with regard to *formal aesthetics* were related to intermediate amounts of complexity. Maintaining a level of **complexity at different *scales*** is also important as set out by Llewelyn Davies (2000):

> 'Great urban architecture requires that at every scale, from a range of viewing distances, a building's surface appears rich in detail. The key is to emphasise vertical rhythm in particular and avoid exposing blank walls' (p.91).

Furthermore, **openings in a facade** (i.e. doors and windows) can help to provide a human scale (Lawson, 2001) as well as giving an indication as to what the use and activities are inside a building (see 4.3.2.2. below on transparency). The left image below shows an example where it is very difficult to gauge the size or function of the building due to its blank walls and lack of openings. **Building materials for facades** that offer a *human scale* have also been found to be important for aesthetic preferences. For example, large scale cladding systems (see centre and right image below) tend to pose difficulties in evoking human scale due to their inability to produce small-scale details (Llewelyn Davies, 2000).



Images 4-7: Examples of facades with few openings (left) and large scale cladding systems (middle and right) [URL - http://www.architonic.com/pmsht/exterior-fibrec-rieder/1156094]

Having discussed how aesthetics might affect the preference for a particular type of space or building and how it can stimulate and maintain curiosity, which in turn can increase a person's stay at or around local facilities, the next section discusses how variety can have a similar effect.

4.3.2.2 Maintaining Curiosity through Variety

One way of advertising variety and changes of goods and displays is linked to the **transparency of shops**/shop windows onto the public realm. Bentley *et al*. (1985) suggested that terraces to

pubs/restaurants and display areas for shops are typical forms of edge design that increase transparency between (indoor, private) building activity and the adjacent (outdoor) public space. Mehta (2009) used the concept in their study and defined *transparency* of shops as to 'how far the inside of a shop and its goods and activities could be seen, heard, touched and or smelled from the outside'(p.55) (see examples of transparent and non-transparent frontages below). Many small shops in Mehta's study were able to raise and maintain the curiosity of passersby due to their transparent shop fronts.


Images 4-8: Examples of highly transparent shop front (left) and non-transparent shop fronts (centre & right) [URL- http://slimline-warehouse.blogspot.co.uk/2010/01/shop-window-display-inspiration.html]

Watson (2009), analysing social behaviour in markets also found that unusual goods in shops led to longer conversations between individuals and groups in proximity to a specific stall where conversation was interspersed with comments about the produce. **Variety of goods** can also be achieved by temporary stalls, markets**,** ice-cream vans etc. to provide changing and interesting settings within a more static built environment on different days/weeks, thereby keeping the locations interesting. Inside facilities, particularly commercial facilities such as supermarket and large shops, a range of methods is employed to maximise profits (e.g. to stimulate impulse buys through signage, advertising, artificial smells, or highly visible and convenient locations of products) which also often result in customers spending longer inside the facility than anticipated (Underhill, 1999).

Mehta (2009) found that the liveliest urban blocks had a very fine grain mix with 7-8 businesses for every 200 feet length of block, displaying a **variety of uses** (called *diversity* by Jacobs, (1961)). In order to achieve this fine grain mix, businesses had to be quite small with a short street frontage permitting more variety through increased number of businesses per unit length of the street (Mehta, 2009). With regard to the type of uses needed to produce active frontages, cafes, restaurants and bars have been found to interact actively with the surrounding public realm (Cooper Marcus and Francis, 1990) as they attract a diversity of people (Project for Public Spaces Inc, 2000). McCormack (1983), discussing the 'osmotic' properties of the street, referred to *transactional qualities* of land uses and distinguished between 'local transactions' and 'foreign transactions', the latter being able to locate anywhere due to their regional or national scale of

operations and internalised activities. He recommended locating 'foreign transactions' away from public space (ibid). Other authors have also made recommendations to increase the 'activity' of a frontage through certain land uses. For example, Whyte (1980) suggested that at least 50% of the total frontage of an urban open space be allocated to retail or service establishments and Mehta (2009) recommended more specifically reducing the amount of street frontage taken up by banks and services, such as insurance companies (A2 land uses) which engage less actively with pedestrians, and provide longer street frontages for businesses such as shops and places to eat and drink. Variety of uses can also relate to the temporal mix of uses as discussed in Chapter 2. To reiterate the discussion, urban designers have promoted 24 hour activities in public spaces to help increase presence of people and a reduce crime (Bentley *et al.*, 1985). However, in Britain, the promotion of the 24 hour economy has led to an increase in alcohol-related establishments in most city centres, which in turn has resulted in many city centre areas becoming virtual no-go areas in the evening for some residents due to fear of anti-social behaviour and crime (Roberts, 2006).

A third aspect of variety relates to the **variety in the articulation of buildings at street level**. Buildings at street level with highly articulated facades (including nooks, corners, alcoves, small setbacks, steps and ledges) have been found to not only be aesthetically more interesting, but also to provide opportunities for interaction with these buildings and other users (Mehta, 2009):

> 'Pedestrians used these spaces to seek shelter from the sun or rain, to get out of the pedestrian traffic flow for a moment, to stop and rearrange their belongings or to use a cell phone. Business owners used the spaces to personalize their interface with the street by the placement of signs, information boards, decorations, planters, flower boxes and items for sale. This personalization in turn provided an opportunity for people to see or do something on the street without entering the store, often encouraging passive or active social interaction via *triangulation*' (p.49).

Image 4-9: Example of articulated building at street level in Oxford

The **number of doors/entrances** onto public space has also been found to be a good indicator for the potential of street life (Carmona *et al.*, 2003). Supermarkets, for example, 'tend to conceal their transactions within the building envelope and are thus difficult to relate to the street and the people using it' (McCormac, 1983, p. 59). More generally, non-articulated, non-transparent or blank walls have been found to deaden space and to discourage lingering activities (Whyte, 1988). Llewelyn Davies (2000) devised a scale rating measuring the overall intensity of active frontage, which combines the fine grain mix of uses, measuring the number of premises per 100 metres, and the variety of openings and articulation measuring the number of doors and windows, depth and relief in building surface and the number of blank facades. The latter will form a starting point for the analysis in Chapter 7.

4.3.2.3 Maintaining Curiosity through Multi-Sensory Focal Points

Finally, objects of art or focal points more generally can increase people's stay in an area as a form of active or passive engagement with the environment (Carr *et al.*, 1992a and b) as long as they are designed in a way that stimulates curiosity (Project for Public Spaces Inc, 2000). Alexander *et al.* (1977) asserts that a public space 'without a middle is quite likely to stay empty' and recommends that between 'the natural paths which cross a public square…choose something to stand roughly in the middle: a fountain, a statue, a clock tower etc.' (p.606). Particularly objects which are attractive to different senses (called *richness* by Bentley *et al.*,1985), such as sound and touch (left image below) tend to keep people around for longer as well as objects that are flexible displaying different colours, patterns, movements (centre image below) and objects that allow direct interaction with them (right image below).

Images 4-10: Examples of passive (left) and active (centre and right) engagement with multi-sensory focal points

Water features generally have been found to be highly desired features for users (Carr *et al.*, 1992b). Crowhurst Lennard and Lennard (1987) suggests that art in public places should stimulate play, creativity or imagination by creating a form that could be manipulated, sat on, walked under etc and they found that sculptures that intrigue children also generally intrigue adults. Whyte (1980) also found that these features can encourage strangers to talk to each other because of the interest shown in the object/performance, a process he called *triangulation*. Having discussed

how design features of facilities and their surrounding public realm are likely to retain people longer at these locations, the movement patterns of users are discussed below.

4.4 DESIGN FEATURES AFFECTING MOVEMENT PATTERNS AT FACILITIES

These design features are of particular relevance to users who 'bump into' acquaintances that they already know but who have not accompanied them to a facility. This has been referred to as *community life* (sociability with people you know) rather than *public life* (sociability with a diversity of strangers) (Brill, 2001), the latter being encouraged by triangulation (Whyte, 1980), whilst the former is more relevant for this section. Gehl (2001) has argued that talking to acquaintances 'takes place without any great dependence on place and situation. People stop to talk where they meet' (p.170). Hence, the question is which design features encourage people to meet (in person) in a certain space. Logically, both parties need to be in the vicinity/same space to allow this to happen, but even if in the vicinity, they have to be able to see each other (see image 4-11 below) and/or to physically bump into each other for social interaction to take place[1]. Design can be manipulated to increase or reduce visual and physical permeability (Hertzberger, 2000). The connection between urban design and social interaction has been highlighted by Penn (2008):

> 'It is space through which people move and in which they are brought into face-to-face contact with one another. Contact in turn is a prerequisite for interaction, communication and the transactions of social and economic life. In this way it seemed possible to make the link between design and social outcome' (p.19).

The quality of a place to provide people with a choice of access routes through it has been termed *permeability* (Bentley *et al.*, 1985). The two aspects of permeability relevant for social interaction can be divided into visual and physical permeability. **Visual permeability** is affected by the number and length of unobstructed line of sight across a facility and its surrounding public realm, the transparency of units to allow for an interface of outdoor and indoor activities, and the existence of central gathering/waiting points where people are easily seen/can see other users. **Physical permeability** is affected by the number, location and type of access points to facilities and the surrounding public realm and the function, layout, character and choice of pedestrian routes inside and around facilities.

[1] Hearing acquaintances in the same space has been excluded as this would depend on at least one party making a sound which could then be correctly identified by the other acquaintance.

4.4.1 Visual Permeability

4.4.1.1 Sightlines

Settings which tend to bring people together and promote their social interaction are called *sociopetal* spaces (Osmond, 1957). Eye contact has been found to be the action by which people signal and initiate the intention to interact with others (Argyle and Dean, 1965). The maximum distance of seeing facial expressions is 20-25 metres, whilst the maximum distance to see events is 70-100 metres (Gehl, 2001). Where eye contact is not possible within a setting, it is very unusual for socialisation to occur (Brebner, 1982). In addition to distance, overview and unobstructed sight lines are also important (Gehl, 2001). Hence, facilities and their surrounding public realm that contain long and unobstructed sightlines (for example with elevated seating or standing positions around the edge of a site) are expected to be more *sociopetal* places with higher social interaction levels. Hillier and Hanson (1984) in developing space syntax theory proposed that sightlines are important for people to decide how to move through space and that visually well connected (integrated) spaces attract more movement of people and hence increase the chance of encounters (see a discussion on space syntax in Section 4.4.2.2). This was first established by Whyte (1988) in analysing use of public spaces in New York:

> 'The real estate people are right about location, location, location. For a space to function truly well, it must be central to the constituency it is to serve –and if not in physical distance, in **visual accessibility'** (p.128).

Obstructions to sightlines can be caused by facilities themselves, walls, fences and vegetation. Another aspect relates to changes in level across areas. Whilst the small raising of some areas can improve sightlines through the establishment of vantage points, public spaces with considerable grade changes to surrounding pedestrian routes have been found to be used less as this functions as a **visual barrier** across the site (Pushkarev and Zupan, 1975) (see images below). Even a minor barrier or level change has been found to be less liked by people and can considerably reduce the number of passersby who enter/use public spaces (Gehl, 2001; Whyte, 1980).


Images 4-11: James Barton Roundabout, Bristol. Aerial and pedestrian view across space with traffic above

4.4.1.2 Transparency of Frontages

As already discussed above, transparency of commercial premises (shops, cafes etc.) may encourage users to stay for longer or attract them to the place in the first instance as their curiosity is awakened through goods on display, or the sound or smells of products (Mehta, 2009; Gehl, 2001). This also relates to seeing people inside a facility that one is familiar with/acquainted or viewing people from the inside walking past. Hence, sightlines or visual permeability does not only relate to lines across inside or outside space, but also **across the interface of outdoor and indoor space** (also called *threshold*[2] by urban designers (Llewelyn Davies, 2000)). Making the threshold more permeable can be achieved by providing spill-out areas (such as seating inside a clearly demarcated/raised area), raising the inside level for people to view the outside space from a vantage point or providing balconies, bays, awnings and colonnades to allow for weather independent viewing (ibid).

4.4.1.3 Central Waiting/Vantage Points

The focal points discussed above in section 4.3.2.3. can function not only as a point of interest and interaction, but may also constitute a landmark to help wayfinding (called *legibility*) around sites (Lynch, 1960) and function as natural gathering or waiting points (Alexander, 1977). If they are raised they can also constitute vantage points from where it is easier to see other people and be seen (Carmona *et al*., 2003). Festinger (1950) found that functional distances, such as shared walking routes or natural gathering places, affected social interaction more than proximity (*distance propinquity*). Hence, depending on their location and design these gathering points could be areas around facilities with higher levels of social interaction.

4.4.2 Physical Permeability

Physical Permeability has been defined as the 'degree to which an area has a variety of pleasant, convenient and safe routes through it' (DETR/CABE, 2000, p.91). With regard to facilities, this relates to the design and location of access points for each facility and the physical routes created inside and outside facilities and their surrounding public realm. Whilst the access points and routes are predominantly built to help wayfinding[3] for users, their design may also influence which routes or access points people choose, which direction they choose and their likelihood to 'bump' into each other. Studies have shown that this is linked primarily to two dimensions:

- pedestrian volume, and
- pedestrian flow with regard to speed and direction.

[2] Bentley *et al*. (1985) define a threshold as 'a physical link between different people's domains. It is therefore a key area for the display of a person's or a group's own values' (p.103).
[3] Wayfinding has been defined by Carpman & Grant (2002) as 'knowing where you are, knowing your destination, knowing and following the best route (or at least a serviceable route) to your destination, being able to recognise your destination upon arrival, and reversing the process to find your way back out' (p.427).

A high volume of pedestrians (Whyte, 1988), reduced speed of pedestrian flow (Sommer, 1998) and bidirectional or intersecting pedestrian flows (Llewelyn Davies, 2000) have all been found to impact on social interaction levels. How access points and routes affect these dimensions is discussed below.

4.4.2.1 Access Points of Facilities and Surrounding Public Realm

Access points determine where, how and when a facility can be accessed. Whilst many access points allow for many choices to enter and leave a facility (e.g. parks), commercial premises tend to have one main entrance for reasons such as keeping the delivery area separate from the entrance area, using the entrance area to display goods, advertise, captivate users, provide a reception and to allow easier surveillance of customers (e.g. supermarkets). Access points in stores have also been found to slow down the pedestrian flow, as illustrated by Underhill (1999):

> 'Have you ever seen anybody cross the threshold of a store and then screech to a dead stop the instant they're inside? …What happens once the customers get inside? They are making adjustments, simultaneously slowing their pace, adjusting their eyes to the change in light and scale, taking in smell and sounds, temperature etc. They haven't fully arrived yet, if you watch long enough you'll be able to predict exactly where most shoppers slow down and make the transition from being outside to being inside – in other words, shoppers need a landing strip' *(*p.56-47).

Access points may be shared (mall) or separate for each facility, particularly if they access small premises. Entrance areas often constitute the 'showcase' for the products sold/the activities happening inside a facility (right image). Entrance points can be used to physically draw people in (centre image) or to form an integrated part of the advertising of goods on display (left image).


Images 4-12: Example of different designs of access

Access points can restrict access temporarily (when the facility is closed) or by the number of users it allows to pass through (i.e. whether it is a broad space or whether it creates a bottleneck). Studies in crowd management have found that separating bidirectional pedestrian streams

through doors for each direction maintains a higher speed of pedestrian movement than one door that is twice as big (Helbing and Molnár, 1995). From a social interaction viewpoint however, slowing down the pedestrian flow and being able to see oncoming pedestrians should enhance the probability of social encounters, as found by Sommer (1998).

Access points that give access to more than one facility but are restricted in their number to concentrate pedestrian flows are also expected to provide areas where the opportunity for social interaction is high. Sommer (1998) found that people are more likely to socially interact when the pedestrian flow is slowed down and Whyte (1980) found that people prefer to stop and talk in the middle of the pedestrian flow. Another study, however, concluded that 'the lack of restraint on entering and leaving market sites clearly gave rise to a multitude of easy encounters and informal connections' (Watson, 2009, p.1582), suggesting that dispersed or unrestricted access points can make people feel at ease and therefore also facilitate social interaction.

Another type of access is an **urban portal or gateway** to a public space or facility with the dual purpose of land-marking the entry point to the space and at the same time 'signalling the end of a forward movement along a path to the place experience of arriving' (White, 1999, p.188). This is most often understood as a portal to an open space (see left image below), but could also be used to describe entrance points into covered markets. The portal reduces the speed of the pedestrians while moving through it as the scale inside the portal is smaller than the spaces either side of the portal. In addition, it concentrates the pedestrian flow at the same time which might also improve opportunities for social interaction.


Images 4-13: Examples of urban portals at a grand scale in Milan (left) and a smaller scale in Oxford (right).

4.4.2.2 Function and Character of Routes

Generally, 'the frequency with which relative strangers meet each other, and the conditions under which they do so affects the probability of their conversing together' (Brebner, 1982, p.133). The type and design of the route (with traffic, blank walls, many shops etc.) can have an

effect on the volume of pedestrians using it and the speed of pedestrian flow, hence increasing the potential for physical encounters and social interaction.

With regard to the **speed of pedestrian flow**, it has been found that people generally conform their speed to that of people around them (Preiser, 1973) with larger crowds moving slower (Bell *et al*., 1990). Other factors often used to manipulate speed of pedestrian flow inside facilities are the pace of background music and the type of flooring (ibid). Negotiating traffic or passing through a crowded parking lot en-route to a facility has also been found to reduce pedestrian speed (Henderson and Jenkins, 1974). Preiser (1973) developed the **friction-conformity model** where frictions (e.g. obstacles, traffic, crowds, stationary people etc.) impede pedestrian flow, whilst conformity pressures (e.g. speed of others, or music) exert additional influence on movement. Whilst particularly long bottlenecks in bidirectional pedestrian flows have been found to slow down the speed of pedestrians considerably, a series of permeable obstacles such as railings, trees, or columns have been found, surprisingly, to have the opposite effect and *increase* the speed of bidirectional pedestrian flows, as pedestrians stop overtaking and, therefore, getting into conflicts with oncoming pedestrians (Helbing *et al*., 2005). Reducing the speed of the pedestrian flow can lead to more social interaction in some circumstances: in comparing co-operative food stores with supermarkets, Sommer (1998) found that 'aisles in the supermarket which resemble highways for shopping carts were narrowed in the co-ops and interrupted by bulk bins and dispensers. This interrupted the linear flow of traffic and required people to stop and perform multiple operations rather than grab and run' (p.51). This is in turn encouraged social interaction between customers (ibid).

With regard to the **volume of pedestrians**, this is affected by the preference of people for a particular route within a given setting (where they have a choice). The main two aspects affecting the preference for routes are

- The *function* of the route, and
- The *character* of the route.

Considering the *function* of a route first, people tend to choose **simple, direct routes** with the fewest steps possible to reach a destination (Bitgood and Dukes, 2005). A visual representation of this are so called *desire paths* or trails which are developed by surface erosion caused by footfall or by bicycle from people taking the shortest route (Preiser, 1972). Research has shown that the large-scale spatial features of trail systems in green spaces can be accurately predicted taking into

account pedestrian motion, orientation and feedback from the surrounding environment (Helbing *et al*., 1997).

Another aspect that has received considerable attention is the relationship between **urban form** and a choice of route. Space Syntax is a method that analyses the relationship of the morphological structure of urban areas and movement patterns using axial lines to calculate different levels of integration (*connectedness*) of routes to predict movement patterns (and resulting land use) in urban areas (Hillier and Hanson, 1984). The urban grid is seen as the urban form 'by which the town becomes a *mechanism for generating contact*, and it does this by ensuring that origin-destination trips take one past outward facing building blocks en-route. That is, they allow the by-product effect to maximise contact over and above that for which trips are originally intended' (Hillier, 1996, p.260). Whilst influential, space syntax has been criticised for being less good in predicting pedestrian movement than car movements (Teklenburg *et al*., 1992). Furthermore, space syntax establishes the 'natural movement' determined by the structure of the urban grid rather than magnet land uses and does not take into account other factors, such as accessibility and character of urban places (Gehl and Gemzøe, 2000).

Duany *et al.* (2000) highlighted the importance of worthwhile **destinations** for pedestrians walking and choosing a particular route. Being aware of and choosing the most direct route to a destination/facility is called *wayfinding* as has already been highlighted**.** Gärling *et al*. (1986) found three main characteristics of physical settings that affect wayfinding:

- the degree of *differentiation* (how distinctive different parts of the environment look like e.g. colour coding, material, form),
- the degree of *visual access* (how well distinctive parts of settings can be seen from vantage points – e.g. landmarks), and
- the *complexity of the spatial layout* (amount and difficulty of information that has to be processed to move around the environment).

Architectural simplicity has in fact been found to be more important for wayfinding than familiarity (Moeser, 1988). So whilst complex architectural form might increase a user's stay near the facility (see section 4.3.2.1 above) because of its interest and curiosity, it might have an adverse impact on the user's ability to find their way around. With regard to facility layouts, the relationship of the main entrance to vehicular arrival and the parking area exit has also been found to affect wayfinding (Carpman and Grant, 2002). Hence many purpose built facilities tend to orientate their main entrance towards the car parking area, as this is the space where people

arrive and are able to see the facility aiding their wayfinding and ultimately their consumption (see image below). However, studies have found that people walk through car parking areas at fairly fast speed, as the character or ambience of the area is not inviting people to stroll but to get through as fast as possible (Underhill, 1999).

Images 4-14: Waitrose in Oxford with a side entrance facing the main road (left image) and the main entrance facing the car park (right image)

With regard to the *character* of the route, **feeling safe** is another important consideration when choosing routes: whilst curved paths (deflected vistas) have been found to be perceived as offering more new information ahead and are thus preferred to straight lines when people feel safe (Kaplan and Kaplan, 1989), the opposite is true when people feel vulnerable (i.e. in the dark) where blocked vistas and places of refuge ahead (for people to hide in) increase fear of crime (see images below) and thus avoidance (Nasar and Fisher, 1992; Nasar and Fisher, 1993). The design, spacing and format of lighting can also improve the feeling of safety along routes and in places (Carmona *et al.*, 2003; Llewelyn Davies, 2000).



Images 4-15: Examples of curved and straight paths in Oxford. Interesting or unsafe?

Traffic levels on routes shared by cars and pedestrians have also been found to have an adverse effect on pedestrians using those routes and having social interaction along them (Appleyard,

1981; Hart, 2008). This can also relate to bicycle 'traffic' or parked cars on pavements which make it difficult (particularly for older or disabled people) to navigate them (Burton and Mitchell, 2006).

Whilst routes in some facilities are designed for circulation only, others almost constitute linear plazas with a variety of shop fronts along them constituting destinations in themselves inviting people to stop and linger (White, 1999). Alexander (1977) coined these *promenades* where 'people with a shared way of life gather together to rub shoulders and confirm their community' (p.169). The **type of paths** can have an impact on people's preference for them: Whilst straight paths facilitate longer *sightlines* (but can be experienced as dull), other path plan geometries 'can entice and tease, inviting the user to come and see what's around the bend' (White, 1999), p.189). The latter form can also reduce the *experienced distance* of a route as it is experienced in different stages and thus feels shorter (Gehl, 2001).

Another aspect of routes affecting preference is whether using the route entails climbing or descending (Shaftoe, 2008). Gehl (2001) found that most pedestrians tend to circumvent or avoid the problems of **changing level**, as this requires more effort and an interruption in the walking rhythm. Hence, he recommends avoiding variation in levels whenever possible and, if unavoidable, using ramps rather than stairs or short flights of stairs with flat resting spaces (see left and right image below) rather than long continuous stairs (see centre image below) (ibid).



Images 4-16: Examples of stairs with resting spaces in Rome (left) and Oxford (right) and long continuous stairs in Mallorca (centre).

Path ambience generally has been found to have an impact on choosing a particular route and is affected by individual preferences for scale, composition, surface material, microclimate and crowds (White, 1999). For example, research has found that older people can only cope with crowded places if they have enough space on footways to walk along unimpeded and without being jostled (Burton and Mitchell, 2006). Gehl (2001) states that the upper limit for an acceptable density of bi-directional pedestrian traffic is around 10-15 pedestrians per minute per metre. Above this, he observes that people form opposite streams and follow the person in front in ranks, which reduces the ability to see oncoming people and/or stop for social interaction (ibid).

The above section has summarised which design features affect aspects of pedestrian volume and pedestrian speed, both of which have been found to increase the potential for social interaction at facilities.

4.5 SUMMARIES

Drawing on urban design, environmental psychology and architectural literature, the chapter has highlighted urban design features relevant for social interaction linked to built facilities and their surrounding built public realm thereby addressing **Objective 5**. As discussed in the first section, what attracts people to facilities has been discussed in Chapter 2 and was thus not repeated here at a micro-scale. Rather, design features which encourage people to remain longer in the space (extending their primary facility use) relating to comfort and curiosity have been discussed as well as features that have an influence on the movement pattern of users and their ability to see other users who are also at the facilities. These are:

Features retaining People at Facilities

- Sitting and Resting Features
- Features to Mark Territory
- Food Provision
- Microclimate and Greenery
- Aesthetics
- Variety
- Multi-sensory Focal Points

Features affecting Movement and Visibility

- Sight Lines
- Transparency of Frontages
- Central Gathering/Vantage Points
- Access Points
- Function of Routes
- Character of Routes

Furthermore, as the research is concerned with positive social interaction (as set out in Chapter 2), this chapter has only briefly described features that discourage social interaction. Finally, design features relevant for the night time, such as lighting, have not been discussed at any depth, as the local facilities considered in this thesis tend to be open only during daytime.

The aforementioned features are operationalised in the following chapter and form the basis of the analysis in Chapter 9.

Chapter Five

RESEARCH METHODOLOGY

5.1 INTRODUCTION

Having defined and operationalised the key concepts relating to local facility use and social interaction at local facilities in Chapters 2, 3 and 4, the next stage is to identify the methods and analyses which best achieve the research objectives. To re-iterate, the research objectives are:

1. To identify the **extent** to which **local facilities are used** by the local population in suburban housing developments,
2. To identify which **factors** relating to the facilities (e.g. type, location), the area they are located in (e.g. level of crime) or the individuals (e.g. age, gender) **affect the use** of local facilities,
3. To identify the **extent** to which **social interaction** occurs between residents at local facilities in suburban housing developments,
4. To identify which **factors** relating to the facilities, the area they are located in or the individuals affect **social interaction** at facilities,
5. To understand which micro-scale **urban design features** may influence the type, location, frequency and duration of social interaction at these facilities (with particular reference to town centres).

As previously discussed, the objectives have been developed to fill an empirical gap testing the alleged claims of UK government guidelines that mixed-use and more specifically facilities have a positive impact on social interaction.

This chapter sets out the overall methodological approach discussing the chosen research design and its discarded alternatives, followed by the selection of indicators, method of sample selection and data collection and the compilation and analysis of the collected data.

5.2 SCOPE & OVERALL RESEARCH STRATEGY

The **scope** of the study has been limited to English suburban housing developments. Suburban areas in this thesis are defined as residential areas that have been built post 1945 on the periphery of existing cities and towns (greenfield sites as opposed to previously developed land), large enough to sustain neighbourhood unit and district-wide facilities, such as corner-shops, supermarkets and leisure centres. These suburbs typically display the following features: the land is owned by a developer/developer consortium who constructs the entire area. The area has typically been allocated in a Local Plan/Core Strategy due to its size and the requirements of supporting infrastructure, such as roads, schools, supermarkets and has either a policy setting out

the development requirements, or a Master Plan or an outline consent to establish the principles of the development. The housing in these areas is produced by volume house builders who built from pre-established 'pattern book' (identical across the country) and without architectural input. The areas tend to have a phasing approach due to their size and, in recent years, emphasis has been put on building facilities at an early stage during the construction of the residential areas.

These suburban areas, compared to inner city or rural areas, are places that large numbers of people move into within a relatively short time frame (i.e. as soon as the estate is built and ready for occupation) without having previous contacts in the area (as no houses previously existed), which is very different to the more organic, gradual population changes in established areas. This sudden arrival of a new 'population' raises questions of how to turn these into 'communities' and government guidelines in England have promoted mixed-use estates with local facilities as a key to 'building communities' (ODPM, 2003b, ODPM, 2003a). However, as set out in Chapter 1 and 3 there is currently insufficient empirical data to substantiate the claims of a positive relationship between facilities and social interaction, so in order to test these claims, a **quantitative research strategy** was followed. This is defined by Bryman (2004) as a strategy that entails a deductive approach by testing theories, emphasizes quantification in the collection and analysis of data, incorporates the practices and norms of the natural scientific model (positivism) and embodies a view of social reality as an external, objective reality.

The quantitative research strategy was chosen as the research is primarily concerned with characteristics affecting the behaviour of the collectivity of all residents, not the individually perceived reality of some residents, which would have required a qualitative research strategy. In addition, the researcher has been working in a professional environment for a decade and is aware of the 'call for' measurable data in practice and for policy guidelines given the last government's increasing enthusiasm in policy for developing 'measurable indicators'.

5.3 DATA TYPES, FORMS AND SOURCES

Before setting out how the data was collected to answer the research objectives, the type of data, its source and the selection of the data are discussed first. The **type of data** collected for this thesis was predominantly primary with some supporting data from secondary sources, such as Census data. The data collection methods used are set out below in Section 5.5. Furthermore, with regard to the **form of data**, this was mainly quantitative. Some qualitative data was also collected, but was not analysed separately, rather it helped to illustrate some of the findings made from the quantitative data.

With regard to the **sources of data**, the data was collected from (natural) social settings at the micro level (the individual/household) which was supported by official statistics, (or *social artefacts* (Blaikie, 2000), whereas other source options, such as experiments or simulations were discarded. Experiments are particularly valuable when it is possible to maintain many factors constant and manipulate only the variable the researcher is interested in, for example in drug treatment (ibid). Given that the social world is open and that it is most likely that a whole range of factors affect a single outcome, an experiment was not considered the best source of data for answering the research questions.

5.4 SELECTION FROM DATA SOURCES

'All social research involves decisions about how to select data from the sources, which is true regardless of the type or form of the data or methods of data collection and analysis' (Blaikie, 2000, p.197). To do this, it is necessary to define the *population* first, which is defined by Blaikie (2000) as the 'aggregate of all cases to conform to some designated set of criteria' (p.198). This can be done in 'whatever way is considered appropriate to address the research question and can constitute people, actions, events, places, time or things' (ibid. p.198). Once the *population* is defined a sampling method can be selected and applied.

For this research, **two *populations* in a nested structure** were defined: firstly, three residential areas with a range of neighbourhood unit and district wide facilities were selected from which individual residents were sampled to provide empirical data on the macro-scale factors affecting local facility use and social interaction levels at those facilities. Secondly, based on findings from data collected from the three residential areas, two groups of facilities located within the above residential areas were chosen as settings to collect empirical data on micro-scale, urban design features affecting social interaction at them. The criteria for determining both *populations* are set out below, followed by the sampling method used for each population.

5.4.1 Selection of Residential Areas

The literature review identified a range of factors which could influence social interaction at local facilities. To reduce some of these factors, such as the distance to the city centre, the cultural behaviour of the residents and general socio-economic factors, three sub-areas within **one city** and within the same Local Authority were chosen to have a consistent approach to facility provision and management.

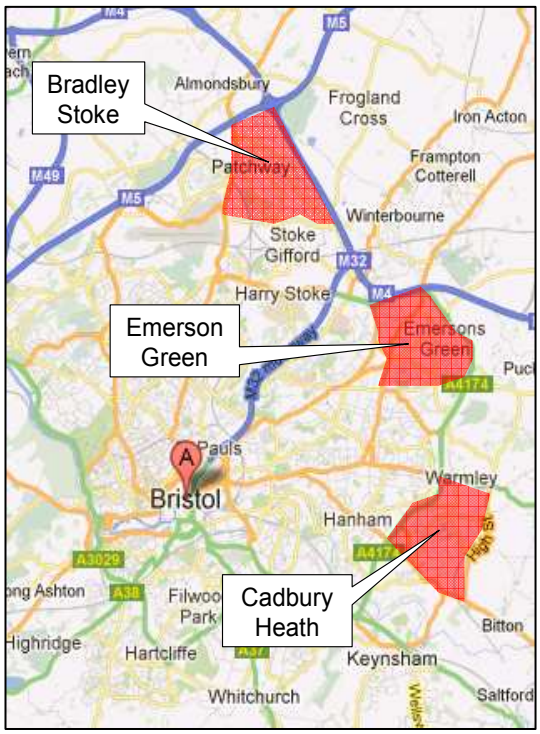
The criteria for choosing that city were:

- one clearly defined city centre with surrounding suburbs at a sufficient distance,
- major expansion of the city in the last 30 years,
- an average population profile, and
- a good mix and spread of neighbourhood and district facilities.

The Office for National Statistics (ONS) identifies 57 urban areas in England which are cities over 100,000 population. London and Birmingham were excluded due to their size (over 1 million people) and within the remainder of the group, many smaller cities/towns were typical for a particular function, i.e. university town, seaside retirement etc, but cities above 200,000 people appeared to have varied functions. From this list of 16 cities the North East, North West, Yorkshire & Humberside region plus some areas of the South West region would have been very expensive to travel to and from to carry out the research. Nine cities were judged to be within travelling distance and of those another eight were discarded for reasons, such as forming part of a larger metropolitan area (Coventry & Wolverhampton), having an unusual population mix (Leicester), being very deprived (Stoke-on-Trent), having an unusual primary function/employment sector (Plymouth and Southampton), having little recent expansion (Nottingham) and having a competing city centre close by (Reading and Derby). The remaining city was **Bristol**, which was found to be very suitable as it is a large, stand-alone city, with a clearly defined city centre and large housing expansions during the last 30 years with several distinct 'suburban housing estates' to choose from.

When examining the different suburban housing extensions around Bristol, it became apparent that many of the post 1945 extensions to the south and north of Bristol were dominated by large scale, social housing projects (e.g. Knowle, Southmead, Hartcliffe) (Malpass and Walmsley, 2005) with high levels of deprivation. Areas located to the east of the City however, had been developed later (from 1970s onwards), were predominantly owner occupied, had a similar distance to Bristol City Centre, displayed average deprivation levels and population profiles (Census, 2010) and were located within the same Local Authority (South Gloucestershire Council) which influence public service provision such as libraries and parks, and had a good range and spread of local facilities.

Considering the eastern expansion areas and their facility provision further, it became clear that there were three large sub-areas on the periphery of the built-up area of Bristol that fitted well into the above definition of 'suburban housing developments' with regard to their size (about 20,000 population each) and the fact that they were mainly greenfield developments planned and constructed as an entire area. They had easily definable boundaries, such as motorways and major distributor roads and were each served by a new built, large supermarket or town centre to serve their entire population as well as a number of neighbourhood facilities such as children's



Map 5-1: Location of chosen residential areas in Bristol

play areas and primary schools serving smaller catchment areas. These smaller catchment areas did not always have clearly identifiable boundaries and did not contain all the different facility types the research was interested in. To investigate both neighbourhood and district facility use/social interaction levels, the three large residential areas were chosen as *populations*. These are referred to throughout this thesis as **Bradley Stoke, Emerson Green and Cadbury Heath** (see map 5-1 to the left). These areas were used to collect primary data on macro-scale factors affecting the use and social interaction levels at local facilities.

With regard to the sampling method, a database was set up showing all residential address points registered with Royal Mail for each area. This was then followed by *systematic sampling*, whereby every n^{th} address in the database was selected for data collection.

5.4.2 Selection of Local Facilities for Micro-scale Urban Design Features

The second *population* that needed to be defined for analysing micro-scale urban design features affecting social interaction at local facilities had to constitute a number of facilities for comparison. There appeared to be two options for selecting these facilities:

- to collect data from **many individual facilities** across the residential areas, or
- to collect data in a **few locations with groups of facilities.**

Collecting data at **many individual facilities** was problematic as the density of users per facility might have been too low to afford social interaction (i.e. if three people per hour visit a stand alone facility, the likelihood of social interaction is very low). In addition, some facilities might only be visited by particular user groups (i.e. schools) which would not provide a good setting for collecting data relevant to all residents. Finally, each individual facility might not have all the urban design features identified in the literature review, hence a comparison of these features across different individual facilities would have been difficult.

Conversely, collecting data in a **few locations** containing **groups of facilities** increased the likelihood of sufficient numbers and sufficient variety of people to be present, which in turn might provide opportunities for social interaction to occur. In addition, a number of facilities in one location offered a larger number of relevant urban design features. The facilities most frequently visited by the widest range of people were found to be the three **large supermarkets.** In Emerson Green and Bradley Stoke these were located within designated town centres (South Gloucestershire Local Plan, 2006). They had each been purposefully designed as a large complex, providing space for different and often complimentary functions, such as shopping and cafes and contained a range of different urban design features (as discussed in Chapter 9). They had both attempted to create usable public space surrounding the main facilities including benches for resting and greenery. They were designed to be easily accessible by a range of transport modes, were open most days without formal criteria of membership, constituted 'neutral ground' for residents to enter and leave undisturbed and were built with the expressed aim of becoming the 'heart of the new suburban communities' (Bradley Stoke Town Council, 2008). The aforementioned qualities also made them ideal locations for containing or constituting third places (Oldenburg, 1999).

The large supermarket in the third area, Cadbury Heath was not located in a town centre, but provided as a stand alone facility. Whilst there is an entertainment complex with multiplex cinema, bowling alley and fitness club on the other side of the dual carriageway ring road, these facilities serve larger catchment areas. Furthermore, although only a short distance away, it is not possible to reach these facilities on foot from the supermarket due to the dual carriageway barrier. From preliminary observations, it was clear that the large supermarket itself was well used by local people and fulfilled a similar 'social function' to the town centres in the other two areas (e.g. many people, whilst inside the facility, could be observed bumping into neighbours/friends and standing in the isles chatting), but the lack of urban design features around the supermarket made this site unsuitable to address Objective 5.

Sampling at the two town centres in Emerson Green and Bradley Stoke followed a *non-random sampling process*, called purposive sampling (Galloway, 2005) or more specific *behaviour sampling* (Sommer and Sommer, 2002), whereby data was only collected for people who engaged in stationary activities at or around the town centres. Given this was a non-probability sample, the data collected has limitations in terms of its generalisability and is thus reported with caution (Bryman, 2004).

5.5 DATA COLLECTION METHODS, MIXING AND TIMING

In order to fulfil the research objectives, **three methods of primary data collection** were used. The first four objectives could be investigated by *asking* people directly about their actions (e.g. use of facility) and attitudes (e.g. reason for using facility), which is usually investigated in the form of surveys, interviews or focus groups (Creswell, 2009). To answer these objectives fully however, objective data on the characteristics of local facilities (e.g. type, location, form) was also collected to triangulate the information with the information on perceptions gathered and to analyse separately the contribution of the built environment on social interaction, which required undertaking site surveys to measure the different aspects. The fifth objective focuses on behaviour that respondents might not have been aware of and that was not easy to memorise or articulate, hence this was investigated by observing actual behaviour rather than asking people, as suggested by Sommer & Sommer (2002). Again, this was supplemented by a site survey to establish the location and type of micro-scale urban design features to test their relationship with actual behaviour (see Figure 5-1). The three methods of **primary data collection** were thus:

- A survey of local facilities in each suburban area to support **objective 1 and 3** and a survey of the micro-scale urban design features at the two district centres to support **objective 5**,
- A self-completion household survey questionnaire administered to a sample within each of the selected residential areas to address **objectives 1-4** , and
- Structured, non-participant observation at the two town centres in Emerson Green and Bradley Stoke recording a sample of behaviour in each town centre to address **objective 5**.

Secondary sources included Ordnance Survey Maps, Google Maps and Street View together with local plan maps to initially locate facilities in a desk-top based exercise, before conducting the local facilities survey. Planning application maps were used to create base maps for the recently built Bradley Stoke town centre (which was too recent to be shown on Google Maps) and Census data was used to compare the sampling population characteristics with the actual population characteristics.

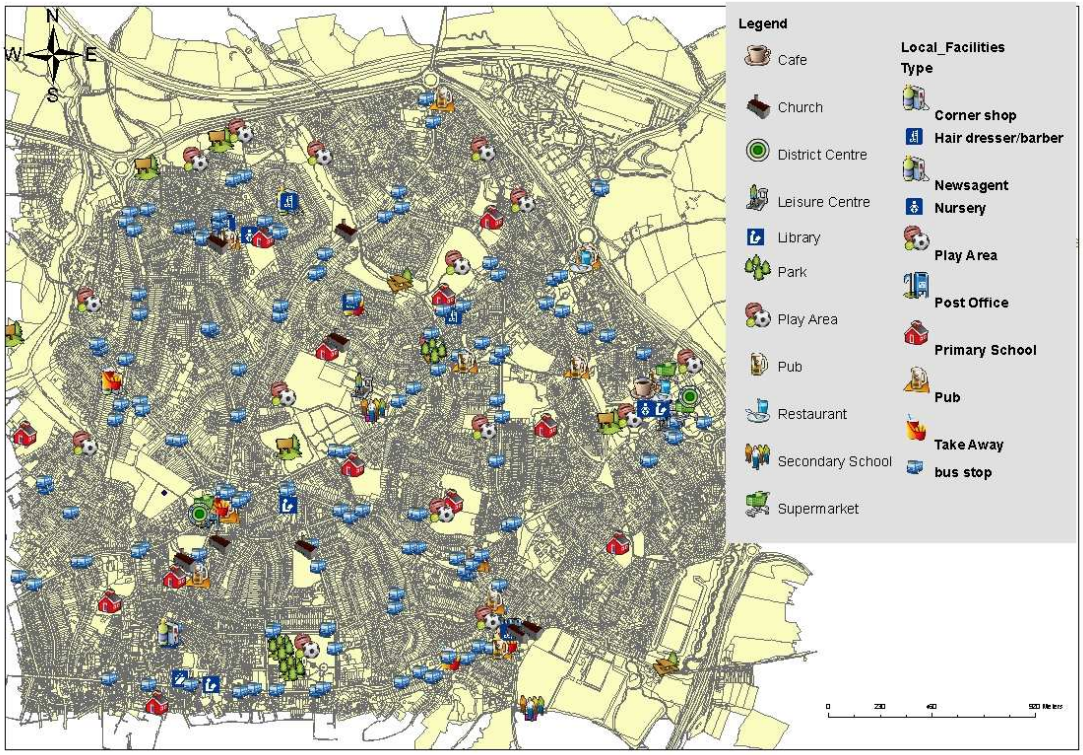
Given that different data collection methods were employed, it is worth briefly discussing how they were mixed/linked together. Hammersley (1996) proposed three approaches to **multi-strategy research**: triangulation, facilitation and complementarity. The methods were used *complementarily* to investigate different aspects of the research, chiefly, *reported* behaviour and *actual* behaviour. They were also used *sequentially* (Morgan, 1998) as the results from one method were analysed before proceeding to the next method (Creswell and Plano Clark, 2007). In this case, results from the survey questionnaire determined the most frequently used facilities

which then informed the selection of the second *population* i.e. which facilities to choose for observation. As set out by Gilbert (2008) sequential studies often use the first method to help with the operationalisation of concepts in the second part: the methods are thus *interdependent*.

Ethical approval was granted for all the data collection in this research by Oxford Brookes University Research Ethics Committee. The development and implementation of the three primary data collection methods is described below.

5.5.1 Local Facilities & Urban Design Features Survey

The local facilities survey consisted of a mixture of desk-based methods and visits to the facilities. The desk-based exercise used data from Ordnance Survey, Google Maps and Street View to confirm the location and type of all facilities in the neighbourhoods. This was used to establish thematic maps (see map 5-2 below) to support the analysis in later chapters. The survey was also used to subjectively rate a sub-set of the facilities. Respondents were asked in the household questionnaire to name the three facilities they used most frequently in the last year – this resulted in 365 named facilities, many of which were named by several respondents. 106 individual facilities could finally be located within the sub-areas and rated with regard to their location, mix and urban form indicators as discussed in more detail below. Some of the measures were dichotomous (i.e. was the facility stand alone or not), whilst others were in scale format (number of units in group).



Map 5-2: Local facility provision in Emerson Green

In addition, several visits to the town centres were undertaken to record the location and specificities of the micro-scale urban design features, plot them on large scale maps and double check before the observation that these were still accurate.

5.5.2 Household Survey Questionnaire

Survey questionnaires are widely used in social science and are a cost-effective method of asking a large number of people in a given geographical area non-sensitive questions (Bryman, 2004). Survey questionnaires are particularly suited to such environment behaviour topics as perception, aspiration, knowledge and attitudes where the researcher is trying to discover regularities among groups of people by comparing answers to the same set of questions across large numbers of people (Zeisel, 2006). For the aforementioned reasons, survey questionnaires were considered a suitable option to collect the data required for answering the research objectives.

Interviews were considered, but concluded to be an unsuitable method given that the type of data needed was non-sensitive, did not require careful probing and unstructured/semi-structured interviews would have made it very difficult to compare results between a large number of people. *Focus groups* were also considered, but not used for two reasons: firstly, given the wide range of topics covered in the survey (use and social interaction at a range of different facilities, social network in area, socio-economic data), focus groups would not have been able to capture the breadth of information required without requiring excessive time on the part of participants. Secondly, focus groups tend to be used to glean information on issues from participants as *members of groups* or with a shared interest rather than individuals (Bryman, 2004), whereas in this case data was sought on individual behaviours and perceptions.

It is important to note that self-completion questionnaires have *limitations.* They could be misinterpreted by the respondents without guidance from a researcher and so need to be designed carefully to avoid confusion (Fink, 1995). They need to be short enough for respondents to fully complete them and they might also be subject to a low response rate, particularly when administered by post (de Vaus, 2002). However, these limitations can be reduced by using reminder letters to increase the response rate and by piloting the design and wording of the questionnaire to ensure they are well understood (Oppenheim, 2005), preferably on people of a similar type to that of the intended sample (Walliman, 2005). The survey questionnaire was piloted in one of the residential areas (Emerson Green) and, following comments from respondents, a small amendment was made to the questionnaire adding ‘places of worship’ as a local facility.

The main survey questionnaire (820 copies) was posted in April 2010 with freepost return envelopes and an option to complete the questionnaire on-line via the Oxford Brookes University website (see Appendix 1). It was decided to post them due to the large areas involved and considerable spread of addresses in these areas and the lack of private transport on the researcher's side. Following a low initial response rate, the decision was taken to send out a second round of questionnaires to a fresh set of addresses within the residential areas (again using systematic sampling) to improve the response rate. The researcher received 167 valid questionnaires in total, which constituted around 50 cases per area which was considered a sufficiently large number for statistical analysis although the response rate remained low (see Table below).

	Bradley Stoke	Emerson Green	Cadbury Heath
Questionnaires received	53	65	49
Sent out	546	546	546
Response Rate	9%	12%	8.9%

Table 5-1: Household Questionnaire Response Rate

Low response rates are considered by some to be an important indicator of survey quality (Rea and Parker, 2005), however other studies comparing response rate levels of studies (between 5% and 54%) found that surveys with much lower response rates were only minimally less accurate (Holbrook *et al.*, 2007). In addition, having a sufficient amount of cases for statistical analysis is of greater importance (de Vaus, 2002), for example, having a 85% response rate of 30 survey questionnaires is not useful for statistical analysis, although the response rate is extremely high. Given that this was a questionnaire sent out to households that did not necessarily have a particular interest in the topic or previously been made aware of the questionnaires, a low response rate was to be expected. Collecting questionnaires in person was considered to be a way of increasing the response rate (Bryman, 2004), however this option was discarded due to the large areas involved and the spread of addresses. In addition, most people would probably only be at home in the evenings and there were safety concerns over a single, female researcher approaching people's houses in the evening unannounced.

5.5.2.1 Timing of Survey Data Collection

With regard to the *timing* of the survey data collection, this was undertaken as a *cross-sectional study* which collected data on many cases at a single point in time (Blaikie, 2000). The alternative to a *cross-sectional design* would have been a longitudinal study, which was considered but discarded for the following reasons. It is unlikely that social interaction levels would radically change over 1-2 years within the same neighbourhoods as residents tend to live in residential areas for longer times. Furthermore, given the constraints of a PhD research project, longer time

frames (such as over a 10 year period) were also not possible. Cross-sectional designs require random sampling to have strong external validity (May, 2001) which was done in this research. It is also not possible to establish causal relationships between variables in a cross-sectional study as the researcher cannot be certain whether a relationship denotes a causal relationship because the features of an experimental design are not present. All that can be said is the variables are related (Bryman, 2004). As already set out above, given that it is not possible to control for all aspects within a social setting, this research was interested in whether there were associations between variables and what the strength of the association was, but not the causality of the relationship.

5.5.3 Structured Observation using Behavioural Maps

Using only a survey questionnaire for this study would have left a potentially major problem unresolved, the problem that 'attitudes and actions are two different things, or what people say they do is very different from what they actually do' (May, 2001, p.113). Other aspects of *asking* respondents are equally problematic for this research: the behaviour in question 'social interaction' happens frequently and is neither particularly dramatic nor unusual enough to be easily recalled by respondents. As Objective 5 aims to analyse the relationship between urban design features and social interaction, other researchers have noted that 'for assessing physical conditions and social interactions within neighbourhood settings survey respondents may be incapable of describing these accurately' (Sampson and Raudenbush, 1999, p.606). Also, respondents might simply not be aware of the exact location where social interaction happened. In addition, 'social interaction' for this research included non-verbal elements, such as greeting someone in passing which is again of very short duration, the person might not be aware of the exact location and it is also not easily remembered. Sommer & Sommer (2002) in their book on behavioural research state that observation is the ideal method for studying 'commonplace nonverbal behaviours, such as gestures, postures or seating arrangements in which people may not be consciously aware of how they are acting' (p.47).

Hence, observation was chosen as a data collection tool to allow for the recording of actual behaviour in a natural setting (i.e. the town centres). Structured observation was chosen (as opposed to unstructured) because it was expected that there would be large numbers of people with a correspondingly large number of social interactions, which needed to be recorded in a small time frame making it unfeasible for one researcher unless the behaviour to record was pre-coded. In contrast to participant observation, understood in its ethnographic sense as 'an extended involvement of the researcher in the social life of those he or she studies' (Bryman, 2004, p.291), it was felt that this behaviour could easily be observed in public spaces and did not

necessitate the researcher being part of a particular group for a considerable time due to the nature of the social interaction. Several studies have used observation to record social interaction in public spaces, such as markets (Watson, 2009), public squares (Gehl, 2001; Whyte, 1980), supermarkets and farmer's markets (Sommer *et al.*, 1981), shopping malls (Feinberg *et al.*, 1989) and shopping streets (Mehta, 2009).

Observation has several advantages, such as allowing the recording of behaviour while it occurs (including unexpected behaviour) and providing the researcher with first hand experience (Creswell, 2009). As it is undertaken without the subject's knowledge, it also minimises responses that are the result of people knowing they are being watched, providing natural, un-altered behaviour (Kellehear, 1993). The main disadvantage is that the quality of the observations is largely dependent on the researcher's ability to have good attending and observing skills (Bell *et al.*, 1990), so activities might occur too quickly to be coded correctly or behaviour might be misinterpreted by the observer (ibid).

There are four main ways of sampling behaviour when making observations. According to Martin and Bateson (1986) these are ad libitum, focal, scan and behaviour sampling. Ad libitum is a technique that chooses few instances of unusual behaviour, focal sampling involves choosing an individual/group and recording all their behaviour/physical features over a specific period of time. Scanning involves rapidly scanning a whole group or individual at regular intervals and then recoding this, noting the presence or absence of certain activities. Finally, behaviour sampling involves selecting a particular behaviour and noting who does this and the context which prompts it. As this research is only concerned with certain types of social interaction, *behaviour sampling* was used to record types of social interaction that were pre-determined (as highlighted in Section 5.4.2 above). This approach has also been used in a study analysing social interaction, outdoor space and greenery (Sullivan *et al.*, 2004).

5.5.3.1 Behavioural Mapping

During the observations, behavioural mapping was used which is a technique 'for systematically recording people's locations and actions' (Sommer and Sommer, 2002, p.64). It was developed by Ittelson *et al.* (1976) to record behaviour in a design setting and has been widely used in environment-behaviour research (see Proshansky *et al.*, 1970). Behavioural mapping links the design features of the setting or location with behaviour in both time and space (Bechtel and Zeisel, 1987). It can be used for a variety of purposes: firstly, to describe behaviours in a particular setting, secondly, to compare behaviours occurring in different settings or in the same setting at different times of the day, thirdly, to learn about actual (rather than intended) use of

equipment/areas and fourthly, to predict the use of new equipment/areas (Bell *et al.*, 1990). Mehta (2007; 2009) made extensive use of behaviour mapping to investigate the relationship between temporal and spatial forms of physical settings and people's behaviour along a high street (i.e. whether they walked, sat, stood, gathered or socialised), mainly using it for the first purpose. Another study (Sullivan *et al*, 2004) used it to compare different types of settings and the behaviour occurring within them.

Given that objective 5 aims to identify urban design features that might have an impact on social interaction levels and therefore connects people's behaviour to a certain location (feature) at a particular time, *behaviour mapping* was considered a good method to link observed behaviour to a spatial location. There are two **types of behavioural maps**, place-centred and individual-centred. Whilst the former records behaviour and people's locations in a particular setting, the latter records individual's behaviour across time and different settings (Sommer & Sommer, 2002). As this research is interested in the urban design features at facilities and their relationship with social interaction levels, *place-centred behavioural maps* were used.

With regard to the **process of behavioural mapping** this loosely followed the series of steps developed by Ittelson *et al*. (1976): First, the area to be investigated was defined: the two town centres in Emerson Green and Bradley Stoke were identified as suitable sites for observations as discussed in Section 5.4.2 above. The researcher then undertook several visits to both sites in Spring 2010 and Autumn 2010 to familiarise herself with the sites, useful boundaries for observation and the urban design features in situ to produce behavioural base maps as accurate as possible showing features such as benches, plants, steps, bollards, sheltered areas etc. Those features were then added via GISArc onto ordnance survey base maps. A **pilot study** was first undertaken to aid the following processes/decisions:

- final check of accuracy of the behavioural maps (shops and decoration had changed),
- the best format for 'unsuspicious' recording (reduce size of recording sheet from A4 to A5 booklet form),
- final decision on good (and unsuspicious) observation points (where to sit or stand for full view of the setting),
- decision to split the settings into 2 to 3 sub-settings to allow complete overview of one sub-setting per time period,
- preliminary observation of people and their behaviour at the setting with the aim of developing a precise and easy to use coding form, and
- final decision on the length of time each observation period would cover.

The recording sheets used consisted of two elements. Firstly, a detailed base map on which to record the **exact location** of individuals marked with a number. Secondly, a table containing **rows that corresponded to a person** observed in space (with the corresponding number on the map) and columns to record information about the individuals (e.g. gender, age, group format), the type of activity (e.g. talk, greet, phone, smoke), the estimated duration of the activity and whether the activity was undertaken standing or sitting.

Any stationary activity (sitting or standing) was recorded as well as greeting whilst walking, but people who were just passing through the space were not recorded. The activities were coded into *social and non-social activities. S*imilar to Sullivan *et al.* (2004), if a group of individuals sat down and ate together this was classified as social, if the person was sitting and eating by themselves it was classified as non-social. People who walked and greeted had to make a visible sign (e.g. wave hand) to be coded as social. Using the same coding allowed for a comparison of the two sites with regard to the general level of stationery activities, as well as the ratio of social to non-social stationary behaviour, giving an indication of the 'sociability' of each site as had been used by Sullivan *et al.* (2004). Results from the observations are set out in Chapter 9.

It is important to note that individuals observed in this study may or may not have been residents of the sub-areas but might have been visiting or working there (also true for other studies, such as Sullivan *et al.* 2004). In addition to the above described recording of people and their actions, field notes were also used to describe unusual behaviour, annotations to behaviour and the general feel of the sites during the day.

5.5.3.2 Timing of Observation Data Collection

Given that the research was trying to identify whether there was a **pattern** between certain design features and certain behaviour, it was not considered necessary to record observations on a 'typical' day, at a 'typical time' or with a 'typical' amount of people present but to record as many data points as possible during the observations to increase the likelihood of patterns to emerge.

The weather should not adversely affect the 'affordances' (Gibson, 1977) the design features may offer (e.g. fewer people tend to sit on wet benches), or the potential for optional activities (Gehl, 2001) to occur, hence both observations days were chosen on sunny and warm days to control for the influence of weather. Whilst this might have increased the length of optional activities (Gehl, 2001) on the sites (such as sitting and chatting), the type and location of activities and their relationship with the design feature would have been less affected.

As different groups of people (e.g. teenagers and pensioners) might respond to/use design features in different ways, observations were done on a week day and a week-end day from 9am in the morning to around 7pm in the evening when most facilities on site were closing and footfall was greatly reduced. This helped to record a broad range of different age groups (e.g. pensioners in the morning, teenagers after school), different formats of users (parents with children, office workers having lunch, friends meeting for coffee) and different levels of footfall.

Each sub-setting was recorded for 30 minutes, four times (morning, lunch, afternoon, evening) on two days (week-day, week-end day) producing 16 separate maps for each town centre or 40 different maps for the sub-sections which were combined during the compilation and analysis stage.

5.6 INDICATORS

To answer the research objectives it is necessary to measure the different concepts of local facilities, use and social interaction. Indicators are a well established way to measure a concept when the concept is not easily quantifiable (Bryman, 2004). Indicators are developed by 'descending the ladder of abstraction' (de Vaus, 2002), operationalising the theoretical definitions of the concepts from abstract to more concrete dimensions, sub-dimensions and finally exact measures, so called indicators.

Whilst indicators are widely used in social research, they nevertheless have a number of potential issues such that they are proxies for more abstract concepts (Dempsey, 2006), they are not value free as value judgements are involved at all stages of the process (Coombes and Wong, 1994) and the list of indicators will be selective with pragmatic considerations playing a major role (de Vaus, 2002). They also have to be reliable (obtaining the same result every time) and valid (measuring the concept intended to be measured). Validity can be enhanced by using existing indicators or well established definitions to establish indicators (ibid). Reliability of indicators can be improved by using *multiple-level indicators* or piloting a survey questionnaire carefully and amending indicators which produced different results (ibid).

Chapter 2 and 3 highlighted the different characteristics likely to affect local facility use and social interaction at those facilities. Most of the personal factors could be measured using established surveys such as Census, Survey of English Housing and Housing Attitude Survey whilst several of the facility factors were easy to measure numerically e.g. number of facilities in a group. However, the area characteristics in particular required the development of indicators as concepts, such as

place attachment, are not easily quantifiable and hence needed to be turned into measurable indicators, often using multiple-level indicators to measure one concept. In order to increase validity and reliability, the research used established indicators from existing surveys and research wherever possible and piloted the survey questionnaire.

The following sections discuss the indicators used in this research which formed the basis for the survey questionnaire. Sometimes the same indicator was used to measure an effect on use and on social interaction. To make it easier for the reader and reduce repetition, all 'use' indicators have been given a reference number which is then utilised to refer back to an already established indicator.

5.6.1 Indicators of Local Facility Use

There are potentially two ways of measuring facility use, either **objectively** or **subjectively**. Objectively, facility use could be measured in terms of the frequency, the intensity of facility use (Foley, 1950) and the duration of the use. Measuring use objectively would require direct observation of users and would require the researcher to make a decision on minimum thresholds, such as being in a park for less than five minutes might be classified as not 'using' the park, but just passing through.

Given the potential for misinterpretation, most studies analysing use have opted for subjective measures and asked respondents themselves, whether or not they used a facility, leaving the decision as to when a visit constitutes a 'use' to the respondents (Atkinson and Kintrea, 2000; Barton *et al.*, 2007; Fisher and Bramley, 2006; Riva *et al.*, 2007). The importance of subjective measures has been highlighted in related fields, for example the perceived walkability to facilities was found to be a more important determinant for people's actual walking behaviour than objectively measured walkability (Handy, 2002).

With regard to the form of measurement, most studies have measured use in the form of *frequency* of visits to a facility (Barton *et al.*, 2007; Bramley *et al.*, 2009; Casey *et al.*, 2007; Winter and Farthing, 1997). Other studies have asked respondents *whether* they use a particular facility at all and whether they use a facility despite them considering it to be inadequate, thereby connecting the issue of use to the issue of quality of provision (Fisher and Bramley, 2006; Gordon *et al.*, 2000). Lack of quality can result in non-use of local facilities which has been investigated for example by Gold (1972) for urban local parks and Gordon *et al.* (2000) for a range of local facilities. Measuring non-use has been done in the same way as use, by asking respondents (Gordon *et al.*, 2000). Whilst an interesting and also understudied topic, factors affecting non-use

are not the main focus of the research as the interest ultimately lies with social interaction at facilities, which requires use of the facility as a prerequisite. Given the advantages and disadvantages discussed above, for this research, use has been measured as a frequency (daily, weekly etc.) and has been defined by the respondents themselves rather than objectively measured.

Ref	What is being measured	Unit of Measurement/Categories	Source
A1	Frequency of using a facility	Daily; Weekly; Monthly; Less than monthly; Never	Household survey

Table 5-2: Indicators measuring local facility use

5.6.2 Indicators of Social Interaction

As already discussed in Chapter 3, the main measures used in this research to quantify the extent and types of social interaction at local facilities are the *frequency* of social interaction (Casey *et al.*, 2007), and the *type* of social interaction distinguished by three *levels of intensity*: 'recognise, greet and talk to' (Haggerty, 1982). With regard to the different units of measurement, a scale variable (e.g. number) would have provided more options for the analysis at a later stage, however it was felt that it would be easier for respondents to remember 'how often' they had seen, greeted or talked to people at their most used facility by offering them ordinal categories, i.e. every time, most times etc., rather than asking them for an exact 'number of times'. Because ordinal variables have no equidistance between items and are not absolute mathematical values, there are certain limitations to their statistical analysis, which is discussed in Section 5.7.1.1.

What is being measured	Unit of Measurement/Categories	Source
How often residents recognise other users at the 3 facilities they have visited most often in the last year	Every time; Most times; Some times; Rarely; Never	Household survey
How often residents greet other users at the facilities		
How often residents stop to talk to other users at the facilities		

Table 5-3: Indicators measuring social interaction

5.6.3 Indicators of Facility Characteristics Affecting Use

The literature review highlighted the following *facility characteristics* as potentially having a relationship with the use of local facilities: they relate to physical elements such as supply, spatial distribution and accessibility as well as other users.

5.6.3.1 Supply

The review in Chapter 2 highlighted that supply appeared to be a key variable that would affect use of local facilities. The first aspect of supply is concerned with the availability of facilities. Lack of availability has been found to affect use (Gordon *et al*., 2000) for some services, however other

authors have questioned the relationship between availability and use levels (Riva *et al.*, 2007). Availability was measured in two ways, one indicator being 'subjective availability' where residents were asked whether a facility was located within ten minutes walk or five minutes drive of their home, whilst another indicator measured objectively which facilities were available in the area (based on the facilities survey) to compare perceived and actual availability. Two other aspects of supply affecting use of local facilities are quality and affordability (Witten *et al.*, 2003, Gordon *et al.*, 2000). Both concepts are best measured as perceived by the user as this will inform the actual use of the facility (Witten *et al.*,2003), hence both indicators were measured as subjective indicators.

Ref	Name of Indicator	Unit of Measurement/Categories	Source
B1	Availability (objective)	Location	Facilities Survey
B2	Availability (subjective)	Are facilities available?, If not, which ones are missing?	Household Survey
B3	Perceived quality	Good quality, bad quality, good reputation	
B4	Perceived affordability	Cheap, Too expensive	

Table 5-4: Supply of facilities

5.6.3.2 Spatial Distribution

The literature review highlighted that there are some recommendations about the location (central or periphery) or spatial arrangement (cluster/linear) of local facilities to maximise their visibility and use (Barton *et al.*, 2003), but that these had not been tested empirically. Hence, this research tested a number of indicators, which were all measured by the researcher based on the facilities survey. With regard to mixing, research tends to measure which facilities exist in residential areas (Lindsay, 2010) but not what type of mixing might have an effect on social interaction. Hence, a range of 'facility mixing' indicators were developed measuring whether a facility was stand alone or in a group, the size of the group, and the type of mixing (horizontal, vertical etc.) as each one of them might have an impact on the frequency of use of local facilities (see Table 5-5).

With regard to spatial arrangement the indicators measured the location and urban form (as suggested in the literature) as well as the street type and shape the facility was located (categories were based on indicators developed by Burton and Mitchell (2006). It also measured the visibility of a facility (visible from the main road or actual road) as the recommendations set out by Barton *et al.* (2003) on location justified a location on the periphery of a neighbourhood as it would be more visible to passing trade and residents from adjoining neighbourhoods.

Ref	Name of Indicator	Unit of Measurement/Categories	Source
C1	Location	On periphery or central to area	Facilities Survey
C2	Format	Stand alone, part of a group	

Ref	Name of Indicator	Unit of Measurement/Categories	Source
C3	Number of units in group	Number	Facilities Survey
C4	Mixing type	Horizontal, vertically, temporarily, none	
C5	Urban form	Linear along street, corner, cluster off road	
C6	Street type	Dual carriageway, A-road (high street), B-road, residential spine road, residential through street, residential cul-de-sac	
C7	Street shape	Straight, curve, cul-de-sac, square, other	
C8	Visibility	Visible from main road or adjacent road	

Table 5-5: Spatial Distribution of Facilities

5.6.3.3 Accessibility

Indicators of accessibility of facilities included the distance to the facility, the convenience of using the facility (e.g. in combination with other facilities) and the mode of transport available to reach the facility.

Distance and Convenience

Distance has been found to be a decisive factor for the use of several facility types (Barton *et al.*, 2007; Giles-Corti *et al.*, 2005). It was measured here as an objective indicator, calculating the distance between the location of the respondent's home and the location of the named facility following the plotting of both on GIS using Euclidian[1] distance and actual walking distance for a sample of facilities. Convenience, particularly for convenient shopping (supermarkets), has also been found to be important for use (Casey *et al.*, 2007, Dempsey, *et al.*, 2012) as people have been found to use facilities that are either en-route to other facilities or work. Again, this is a subjective indicator and has been measured asking respondents whether they use a particular facility frequently because it is located close to home, close to work or close to other facilities.

Mode of Transport

Having a choice of transport modes, including walking or using public transport to facilities, has been heavily promoted by the government to help improve social inclusion (D0E, 1994; DETR, 1998; ODPM, 2003). This is particularly relevant for groups of people who do not have access to a car (Turok *et al.*, 1999) and might thus be excluded from using some facilities. This was measured using two indicators: asking respondents which mode of transport they had chosen to a facility and whether this particular facility was located within ten minutes walking distance. Furthermore, an objective indicator assessed the distance of the facility to its nearest bus stop (measuring actual distance along roads/pathways) using GIS and the facility survey to show whether it was convenient to use public transport if the facility was not located within ten minutes walking distance.

[1] Euclidian distance = as the crow flies, a crude way of measuring distance without taking into account availability of roads or pathways

Ref	What is being measured	Unit of Measurement/Categories	Source
D1	Actual Distance	Distance between respondent's house and named facility in metres	GIS/Survey
D2	Perceived convenience	Close to home, Close to work, Close to other facilities: Each Yes/No	Household Survey
D3	Perceived distance	Within 10 min walking distance: Yes/No	
D4	Mode of transport to facility	Car, Walk, Bicycle, Motorcycle, Bus	
D5	Distance of Facility to nearest bus stop	Distance between facility and nearest bus stop in metres	GIS/Survey

Table 5-6: Accessibility of Local Facility

5.6.3.4 Other Users

As reviewed in Chapter 2, other users may be a deterrent (Pain and Townshend, 2007; Holland *et al.*, 2007) or an attraction (Gehl 2001, Whyte, 1980) to using a facility. It was concluded that this was best measured subjectively by the respondent as their perceptions would ultimately inform their action to use a facility or not. Hence the indicators asked whether meeting other people or avoiding other users was an important reason for using/non-using a facility.

Ref	What is being measured	Unit of Measurement/Categories	Source
E1	Other users as attraction	Reason for using a facility: meet other people yes/no,	Household Survey
E2	Other users as deterrent	Reason for not using a facility: other users yes/no	

Table 5-7: Other users affecting local facility use

5.6.4 Indicators of Facility Characteristics affecting Social Interaction

The next section discusses which indicators were used to measure facility characteristics affecting *social interaction* at local facilities. Some of these were identical. Where this was the case, the indicator is shown with its reference number without further discussion. The characteristics of facilities affecting social interaction therein have been grouped in the literature review into level of use, the type of facility, perceived sociability of the facility and physical characteristics (mix, location and visibility).

5.6.4.1 Level of Use & Type of Facility

The literature review highlighted that frequent use of facilities can lead to social interaction *within neighbourhoods* (Ahlbrandt, 1984; Casey *et al.*, 2007). To test whether this is also relevant for social interaction *at facilities*, the 'level of use' indicator (A1) was used as a variable to test its effect on social interaction.

Different types of facilities have also been highlighted in the literature as constituting places of increased social interaction, such as green spaces (Kuo *et al.*, 1998), supermarkets and shopping

malls (Feinberg *et al.*, 1989; Sommer, 1998), corner shops (Jacobs, 1961) schools (Jupp, 1999) and churches (Ellison and George, 1994). Hence, the different individual facility types were measured as well as different groups of facilities (i.e. leisure, commercial and educational).

Name of Indicator	Unit of Measurement/Categories	Source
Type	Supermarket; Place of worship; Schools; Play area; Leisure centre; Park/open space; Restaurant/pub/café; Library; District centre; Post office; Corner shop/newsagent; Others	Household Survey

Table 5-8: Type of facility

5.6.4.2 Perception of local facility as 'third place'

In order to ascertain whether users would consider a facility a social/'third place' (Oldenburg, 1999) four indicators were developed to measure different aspects of 'perception of a third place'. Respondents were asked whether they had met friends or neighbours initially at the facility, whether they continued to plan meeting up with people there and how important they would rate the facility for social interaction in the area. The latter indicator used a Likert scale which is particularly useful when the feature does not have an inherent numerical measurability (de Vaus, 2002, Oppenheim, 2005). These were originally devised in psychometric tests to ascertain a person's level of agreement or disagreement on a symmetric agree-disagree scale across several questions to measure their feeling towards particular subjects (Burns and Burns, 2008a). Traditionally they use uni-dimensional 5-point scales. This form of measurement has been used for this indicator as well as some of the indicators relating to perception of the area (see below). It is important to bear in mind that the scores assigned to each category have no absolute value (=ordinal variables) but must only be considered in relation to one another, which has implications for statistical analysis (de Vaus, 2002).

Name of Indicator	Categories	Source
Having met friends initially at the facility	Dichotomous: yes; no	Household Survey
Having met neighbours initially at the facility		
Plan to meet friends at the facility		
Considers facility important for social interaction	Very important, fairly important, slightly important, not too important, not at all important	

Table 5-9: Sociability of local facility

5.6.4.3 Physical Characteristics of Facilities

Physical characteristics likely to affect social interaction were grouped in Chapter 3 as the mix, the location and the visibility of local facilities.

Mix of facilities

It has been argued that mixing frequently used facilities with less frequent facilities, or mixing in social places, might have an impact on the potential for social interaction (McCormack, 1983). Hence, the established indicator number of units (C3) was measured together with an additional indicator measuring whether the group included a 'third place' or not. Third place was defined as a place that had been stated by respondents to be 'important or very important' for social interaction in the area. In addition, the facility types were put into two groups depending on whether the majority of respondents had stated that they used the facility daily or not. The daily used (frequently used facilities) were:

- Supermarket, district centre, corner shop/food store/newsagent, park/green space, bus stop, children's play, primary school, secondary school and nursery.

The low frequency used facilities were:

- Post office, leisure centre, café/restaurant/pub, place of worship, library, community centre, take away and hairdresser/barber.

The indicator then measured the ratio of high frequency use facilities to low frequency use facilities within the same group of facilities.

Furthermore, existing indicator 'mixing type' (C4) was measured to see whether horizontal/ vertical or temporal mixing might have an impact on social interaction, given that Jacobs (1961) and Mehta (2009) both concluded that a fine grain, horizontal mix was most suitable for high levels of social interaction.

Two final additional indicators were the mix of different functions (see Table below) and the number of different functions to test whether the mixing of certain functions, e.g. shopping, faith, education, within a group of facilities would have an impact on social interaction levels.

Name of Indicator	**Unit of Measurement/Categories**	**Source**
Function Mix	Number of third places in group	Household Survey
Mixing of frequencies	Ratio of high frequency facilities to low frequency facilities in group	Facilities Survey
Type of different functions	Functions: convenience shopping, comparison shopping, outdoor recreation, leisure, sport, socialising, education, faith, transport	
Number of different functions in group	Number of above functions	

Table 5-10: Mix of Facilities

Spatial Arrangement and Visibility

As set out in Chapter 3, Raman (2010) found that social spaces were those that were physically and visually well connected to other spaces and adjoined well-connected pedestrian routes. Hence, the established indicators of location (C1), urban form (C5), street shape (C7), street type (C6) and visibility (C8) were used to measure this aspect (see table 5-5).

5.6.5 Indicators of Area Characteristics affecting Use

Area characteristics of importance for use have been grouped into social and cultural characteristics (crime and deprivation, social mix, and social ties in area) and physical area characteristics (perceived walkability and accessibility, density of area and physical form).

5.6.5.1 Social and Cultural Characteristics of the Area

Crime and Deprivation

Starting with crime and deprivation, both fear of crime and actual crime have been found to have an impact on the use of facilities (Maxfield, 1984; Bramley *et al.*, 2009) as has the level of deprivation in an area (Macintyre and Ellaway, 1998). Hence, actual crime and deprivation indicators were derived from the Index of Multiple Deprivation 2010, comparing the relative rank of crime/deprivation across all English wards. Both perceived safety and crime indicators were based on questions which had previously been used in a number of studies, asking respondents a Likert scale question as to whether they agree with the following statements: 'it feels safe walking in the area after dark' and 'there is a lot of crime in the area' (Gordon *et al.*, 2000; Dempsey, 2006).

Ref	Name of Indicator	Unit of Measurement/Categories	Source
F1	Perceived safety to walk at night	Agree strongly; Agree; Neither agree/nor disagree; Disagree; Strongly Disagree	Household Survey
F2	Perceived crime levels		
F3	Actual crime levels	Scale: rank in wards across UK	The Index of Multiple Deprivation 2010
F4	Actual Deprivation		

Table 5-11: Crime and deprivation of area

Social Mix and Social Ties

The social mix of an area has been found to have an impact on facility use (Evans, 2009), particularly if there are considerable and visible differences between people, for example in mixed-tenure communities (Camina and Wood, 2009). Whilst it is possible to measure 'similarness' objectively (e.g. using census data comparing income, ethnicity, age etc.), it has been found that homogeneity relates to resident's perceptions of each other in terms of their attitudes, opinions and social characteristics, not necessarily their actual match in all socio-economic variables (Porteous, 1977). Hence, indicators measured subjective perception of homogeneity,

again using a Likert scale, by asking respondents to agree with the statements 'I think I am similar to other people in this area'.

Ref	Name of Indicator	Unit of Measurement/Categories	Source
G1	Homogeneity of area	Agree strongly; agree; neither agree/nor disagree; disagree; strongly disagree	Household Survey

Table 5-12: Social mix of area

With regard to social ties, Ahlbrandt (1984) found that people living in communities with more social ties, made greater use of their local facilities. In order to measure social ties and what type of social network people have, a combination of indicators has been used, measuring the number of neighbours known, the type of people known in the area and how often people visit or are being visited at home.

Ref	Name of Indicator	Unit of Measurement/Categories	Source
H1	Number of neighbours known by face, greeting or talking	Number	Household Survey
H2	Current social network (do you know anyone now)	Family; friends; acquaintances; immediate neighbours	
H3	Frequency of visiting/being visited from people of the area (combined)	Daily; weekly; monthly; less than monthly; never	

Table 5-13 : Social ties in an area

5.6.5.2 Environmental Characteristics of the Area

Walkability and Access to Public Transport and Density

As already set out under accessibility above, the distance to facilities has an impact on their use (Barton *et al.*, 2007). Even when facilities are located within walking distance, the perceived walkability of the area (e.g. footpaths, pleasantness, directness of routes etc.) can have an influence on whether people actually use those facilities (Casey *et al.*, 2007). Whilst many physical features contribute to making an area walkable (Lindsay, 2010) and these aspects could have thus been measured objectively, it has been found that the perception of walkability is more important in determining behaviour than objectively measured aspects (Lund, 2003). Hence, the research used two subjective indicators asking respondents to agree to the statements, 'It is easy to walk around' and 'There are many footpaths available'.

Another aspect that has been found to have an influence on facility use is accessibility of bus stops in an area as well as the density of the area (Bramley *et al.*, 2009). Whilst density was found to have an impact on facility use, this was not a linear relationship, but medium residential density seem to result in more facility use (ibid). With regard to measuring density, this can be measured in a variety of ways which can make comparisons difficult (Jenks and Dempsey, 2005). Persons per hectare (**PPH**) was available at super output area level in the Census and has thus

been used, directly from the Census. Whilst the Census data is now over 10 years old, most of the residential areas were built very efficiently with little space for increasing density at a later stage.

Ref	Name of Indicator	Unit of Measurement/Categories	Source
I1	Perceived availability of footpaths	Agree strongly; Agree; Neither agree/nor disagree; Disagree; Strongly Disagree	Household Survey
I2	Perceived easiness to walk around		
I3	Access to bus stops	Respondent's house within 400m radius of bus stop	Facility Survey
I4	Density (persons per ha)	<20 pph, 20-40 pph, 40-60 pph, 60-80 pph	Census

Table 5-14: Physical area characteristics

5.6.6 Indicators of Area Characteristics Affecting Social Interaction

Area characteristics potentially affecting social interaction at local facilities have been grouped into social area characteristics (perceived homogeneity, visible segregation and safety) physical area characteristics (walkability, permeability) and familiarity with the area (place attachment, residence length and social networks in area).

5.6.6.1 Perceived Social Area Characteristics

As set out in Chapter 3, perception of the social aspects of the areas residents live in, particularly with regard to homogeneity and perceived safety from crime has been claimed to be more relevant than objectively measured area statistics, such as crime or deprivation as, for people to interact with others, they have to feel safe and/or comfortable (Kitamura *et al*., 1997). Thus, indicators representing social area characteristics used already established indicators of **perceived homogeneity** (G1) and **perceived crime levels** (F2).

5.6.6.2 Physical Area Characteristics

As discussed in Chapter 3, there is a debate whether **walkability** of an area has an affect on social interaction within a neighbourhood or not (du Toit *et al.*, 2007;Casey *et al.,* 2007), hence, the perceived walkability (I2) indicator was used.

As discussed in the literature review, it is not clear how **density** might directly affect social interaction <u>at</u> facilities, rather it is assumed that this is done via mediating effects, such as in relation to the number of facilities available. The same is true for the permeability of an entire neighbourhood. Again, density (**PPH**) (I4) was used to test this relationship.

5.6.6.3 Familiarity with area and its residents

Place attachment and social interaction in a neighbourhood are associated, however the direction is not clear (Mesch & Manor, 1998). Most studies have suggested that place attachment is linked

both to a physical/time component and a social component (Janowitz and Street, 1978; Nasar and Julian, 1995; Riger and Lavrakas, 1981). Hence, place attachment has been measured using three related indicators; respondents were asked, using a Likert scale, to agree with the following statements: 'I enjoy living in this area' and 'I would like to stay for several years' together with measuring actual residence length (indicator J10) which was found to have a separate positive impact on social interaction (Bramley *et al.*, 2009).

Name of Indicator	Unit of Measurement/Categories	Source
Enjoy living in area	Agree strongly; Agree; Neither agree/nor disagree; Disagree; Strongly Disagree	Household Survey
Like to stay in area		

Table 5-15: Place attachment

Studies have suggested that the number and type of a resident's social networks within a neighbourhood is important for their ability to engage in social interaction in that neighbourhood (Riger and Lavrakas, 1981). This is debated and has not been tested for local facilities, hence the research measured social networks using the indicators already established: number of neighbours known (H1), type of people known (H2) and frequency of visiting/being visited (H3).

5.6.7 Indicators of Personal Characteristics affecting Use and Social Interaction

Relevant personal characteristics which may have an impact on local facility use were grouped in the literature review as demographic, socio-economic and cultural characteristics. The indicators have been adapted from established surveys, such as the Census. Social class was measured by asking respondent's current or last occupation and then applying the Standard Occupational Classification 2010 developed by ONS to the stated occupation into one of the classes. Problems with classifying stated employments are further elaborated on in the following chapter. The indicators J1-J9 have also been used for assessing their impact on social interaction.

Ref	What is being measured	Unit of Measurement/Categories	Source
J1	Age of respondent	18-24; 25-29; 30-44; 45-59; 60-74; 75-89; 90 and over	Household Survey
J2	Gender of respondent	1=female; 0=male	
J3	Household Composition	One person household: professional; pensioner; other; One family only: married or cohabiting household with : no children; dependant children; all children non-dependant; lone parent household with: dependant children; all children non-dependant; other household: all student (shared); all professionals (shared)	

Ref	What is being measured	Unit of Measurement/Categories	Source
J4	No of Children	0-4 years; 5-11 years; 12-18 years;	Household Survey
J5	Tenancy	Tenant: private rented; social rented owner: with mortgage; owned outright; shared ownership	
J6	Ethnic Origin	White British; white European; white other; black; Asian; mixed; other; I would prefer not to say	
J7	Profession (used for J8 see below)	Open answer	
J8	Socio-economic Class	Managers and senior officials; professional occupations; associate professional and technical occupations; administrative and secretarial occupations; skilled trades occupations; personal service occupations; sales and customer service occupations; process, plant and machine operatives; elementary occupations; permanently sick or disabled	SOC 2010 used and compiled in reference to the household survey
J9	Employment Situation	Full-time employed; part-time employed; self-employed; looking after home/family; full-time student; unemployed; retired; permanently sick or disabled; other; I would prefer not to say	Household Survey
J10	Length of residence	Measured in years and months	

Table 5-16: Personal demographic characteristics

5.7 COMPILATION AND DATA ANALYSIS

5.7.1 Household Survey And Facilities Survey

The quantitative data from the facilities survey and the survey questionnaires were entered into the Statistical Package for Social Sciences (SPSS) programme for analysis to address the first four research objectives. The remainder of the facilities survey data was spatially located and put into feature classes in ArcGis, together with the location of each respondent. This formed the basis of calculations of some of the indicators (e.g. distance between respondents house and nearest bus stop). The research objectives two and four are focused on associations between variables, hence statistical analysis was used to identify such associations in the data.

First, **descriptive statistics** were created to describe the sample profile and the study areas. Census data was used to compare the sample characteristics with the wider population. Chapter 6 presents the descriptive statistics in the form of tables and diagrams which are also used to show to what extent the respondents used their local facilities and engaged in social interaction at them, thereby addressing research objectives one and three. Data from the facilities survey was used to triangulate that information using **thematic maps** and buffer maps.

To understand the factors affecting use of and social interaction at local facilities, **correlations** were first run to identify associations between variables and to identify the strength of associations (Black, 2005) thereby addressing objectives three and four. Furthermore it was possible to analyse the *relative* impact that particular factors (or groups of factors) have on the outcome variable *social interaction*. Regression analyses was selected as an appropriate method to compare the relative strength of individual variables and groups of variables on a single outcome variable and thereby predicting a change in the outcome variable through a change in predictor variables (Blaikie, 2003). The same was not possible for the outcome variable *use* due to specific limitations of the data explained in Chapter 7.

5.7.1.1 Regression Analyses

Logistic Regression can be used to analyse a mix of all types of predictors (continuous, ordinal or dichotomous), does not require a continuous outcome variable and is 'especially useful when the distribution of responses on the dependent variables is expected to be nonlinear with one or more of the independent variables' (Tabachnik & Fidell, 2007, p.437). Hence, it was considered a good choice for this analysis and used widely in Chapter 8. The outcome variable 'use' was first transformed from an ordinal variable to a binary variable distinguishing between high frequency (daily/weekly) and low frequency (monthly, less than monthly, never). The social interaction outcome variable was also transformed: First, the mean recorded *frequency* of social interaction of 'greet' and 'talk' for each respondent across the three facilities was established and it was found that the mean values for 'greet' and talk' were significantly and highly correlated (Kendall's tau = .853). Hence the two values were averaged again to produce a combined value for greet and talk per respondent (= positive social interaction) and this was then turned into a binary variable with 0 = low frequency (sometimes, rarely, never) social interaction and 1 = high frequency (most times, every time) social interaction.

As it was easy to transform both outcome variables into binary outcome variables, binary logistic regression was primarily used in this research given its greater flexibility. Logistic regression has no assumptions about the distribution of the predictor variables unlike for example *discriminant analysis*,; in logistic regression, the predictors do not have to be normally distributed, linearly related or of equal variance within each group (Tabachnik and Fidell, 2007). The predictors also do not need to be discrete unlike for example in *multiway frequency analysis*; the predictors can be any mix of continuous, discrete and dichotomous variables. Logistic regression is, however, also based on a few assumptions, which are less worrying for this research. *Outliers*[2] can result in a

[2] An outlier is one that appears to deviate markedly from other members of the sample in which it occurs (Grubbs, 1969)

poor fit of the model, but these can be found by examining the *residuals*[3]. Furthermore, logistic regression, like all varieties of multiple regression, is sensitive to extremely high correlations among predictor variables. This can be avoided by carefully examining correlations between individual variables before undertaking the regression. It also assumes that responses of different cases, here, respondents, are independent of each other, which was the case in this research (Tabachnik and Fidell, 2007).

Logistic regression can be carried out (similar to multiple linear regression) directly (when all predictor variables are entered into the regression model in one block) or as a stepwise regression (forward or backward, including or excluding predictors at each stage depending on the value of the score statistic (significant or not). Field (2005) emphasizes the importance of only including predictors which are based on previous literature and a good theoretical understanding of the concepts involved. The stepwise method allows the computer to generate models *purely based on mathematical criteria*, i.e. differences in the semi-partial correlations. This could lead to the *exclusion* of a predictor because it was 'bumped out' by another predictor rather than because it has no correlation with the outcome (ibid.). Hence, for this research, careful selection of a few predictors for each model was undertaken, grounded in previous research and the direct method was chosen throughout.

An example of a binary logistic regression is shown in the table below:

	B	S.E.	Wald	df	Sig.	Exp(B)
Yes, children	**.812**	**.392**	**4.302**	**1**	**.038**	**2.253**
full-time			**10.307**	**4**	**.036**	
part & self employed	**.868**	**.428**	**4.107**	**1**	**.043**	**2.382**
home/family	.818	.902	.823	1	.364	2.266
retired	**1.165**	**.444**	**6.886**	**1**	**.009**	**3.207**
all others(unemp/sick)	-.314	.751	.175	1	.675	.730
Constant	-.714	.317	5.074	1	.024	.490
a. Variable(s) entered on step 1: childrenbinary, empreduced.						
Model predicts 60.5% correctly Note R2= 0.08(Cox & Snell), 0.11(Nagelkerke); Model x2(1)= 14.7; p=<0.05						

Table 5-17: Example of a Logistic Regression Table

To aid the reader's understanding of the different components of a logistic regression model the example table above is discussed in detail, comparing it to the more widely used *linear multiple regression*. The two key variables (or predictors) tested in this table were 'having children' and 'employment status', as can be seen in the penultimate row (highlighted in green). 'Having

[3] Residual (or error) represents unexplained (or residual) variation after fitting a regression model. It is the difference between the observed value of the variable and the value suggested by the regression model (Easton and McColl, 2007).

children' was a binary variable with yes/no categories, and 'no children' was chosen as the reference category as it had more cases. Employment Status is a categorical variable, which was turned into a series of dummy variables (retired, full-time etc. *highlighted in italics*) with full-time employment being the reference category.

When looking at the results, the first information (highlighted in red in the last row) relates to the model as a whole setting out how well both predictors together predict the outcome variable against a constant only model. In this case, the full model when tested against a constant only model was statistically significant (chi square = 14.7, p<.005), indicating that the predictors reliably distinguished between householders with non frequent social interaction and householders with frequent social interaction at facilities. The models prediction success rate was an unimpressive 60.5% or in other words, the model predicted 60.5% of cases correctly. Logistic regression has different measures that attempt to approximate R^2 in linear regression demonstrating the strength of relationship between prediction and grouping (Hosmer and Lemeshow, 2000, Nagelkerke, 1991), but they do not predict variability of outcome as in linear regression where R^2 explains variance (Long and Freese, 2006). The Nagelkerke estimate is the most reported of the R^2 estimates ((Burns and Burns, 2008b), calculated in such a way as to be constrained between 0 and 1, hence it can be evaluated as indicating model fit with a better model displaying a value closer to 1. In this example, R^2 is 0.11 which indicates a weak relationship of 11% between the predictors and the prediction (Burns and Burns, 2008b).

With regard to the contribution of **each individual predictor**, the crucial statistic is the Wald statistic, (calculated in the same way as the t-statistic in linear regression - Wald = B/SE) which has a chi-square distribution and assesses whether the b-coefficient (B) for that predictor is significantly different from zero (sig is < 0.05) (Field, 2005). It tests the unique contribution of each predictor, in the context of the other predictors – that is holding the other predictors constant. In the table above, 'having children', being full time employed, part time employed or retired all made a significant contribution to the outcome variable as p< 0.05 (**highlighted in bold**). 'Looking after the home/family' and 'all others' were not significant predictors. The Wald statistic should be treated with caution when the regression coefficient (B) is large as the standard error tends to be inflated resulting in the Wald statistic being underestimated (Field, 2005), however this is not the case in this example and the Wald statistic can thus be used. Most useful for the interpretation of logistic regression results is the value of Exp(b) which is the change in odds resulting from a unit change in the predictor. If the Exp(b)value is greater than 1, then it indicates that as the predictor increases, the odds of the outcome occurring increases (and vice versa)(Tabachnik & Fidell, 2007). For example, in the table above, in the sample, a respondent

with children was two times (or twice) (highlighted in orange) more likely to have high frequency social interaction at local facilities than respondents without children, assuming that the employment situation is held constant. Sometimes, B is negative, which means that as the predictor increases, the odds of the outcome occurring decreases. For example, if the 'all others' category (highlighted in violet) would have been significant, then it would have been 0.7 times less likely to have high social interaction at facilities than residents in the full-time category. Because this is difficult to grasp, it is easier to use the inverted odds ratio (1/Exp(b)) which would be 1/0.730=1.36, and it can then be said that 'other employed' respondents are 1.36 times less likely to have frequent social interaction at local facilities. With regard to the importance of individual predictors, Tabachnik and Fidell (2007) suggest interpreting statistically significant predictors with the largest odds ratio (furthest away from 1) as the most important. Whilst the exact odds ratio is calculated in the context of the other predictor variables, it provides an approximation of its importance.

As multiple (linear) regression analysis is the most commonly used method of regression analyses in the social sciences, the final model in Chapter 8 also tested the same predictors in a multiple linear regression model and an ordinal regression model. Multiple linear regression requires a continuous outcome variable (Field, 2005), hence the ordinal format was treated as a 'pseudo continuous' variable with 1 meaning 'less frequent interaction' and 5 meaning 'very frequent interaction'. For ordinal regression, the same direction (5 = most frequent) was used for the outcome variables. Whilst ordinal regression would not have required the transformation of the outcome variables, its results were considered less useful for this research as it provides the odds ratio for the change in outcome from one level to the next (i.e. from never to rarely, rarely to often etc) rather than from 'non-frequent' to 'frequent' social interaction – as in binary logistic regression.

5.7.1.2 Interactions among Predictors

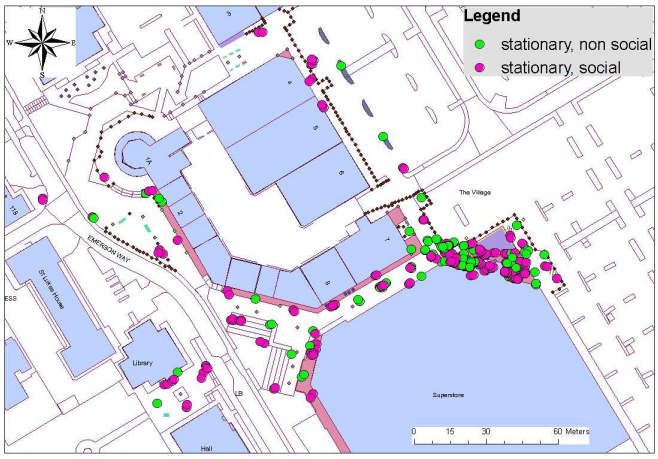
Not all predictor variables showed a significant effect on an outcome variable by themselves. It is possible in binary logistic regression to test for interaction effects between two or more variables on a single outcome variable (Tabachnik & Fiddell, 2007). An interaction effect is a case where one variable becomes stronger or weaker depending on the level of the other variable. A classic example of an interaction effect is the sinking of the Titanic, whereby being female and in 1st class substantially improved your survival chances, whereas being just female, or just 1st class, did not. If there are interactions among continuous variables (or powers of them), multicollinearity is avoided by centring the variables. 'Like individual predictors, interactions may complicate a model without significantly improving the prediction'(Tabachnik and Fidell, 2007 p.440). For this

research interaction effects have been tested separately, for example gender and household composition, but could not be included in larger models, as the n number for each class of predictors would have been too low to produce significant results.

Another way of testing the effect of an interaction between predictor variables would have been Factorial ANOVA (Field, 2005). However, ANOVA has assumptions about the data which should be met to ensure the validity of the analysis. These are similar to multiple regression and require the data to be normally distributed, the variances between groups to be evenly spaced, the predictor variables to be independent of each other and the outcome variable to be continuous (ibid). Again, the data for this research did not satisfy these criteria and this option was thus discarded.

5.7.2 Structured Observation and Urban Design Features Survey

The data from the urban design features survey (features and their attributes) and the observations themselves (people and their attributes) were recorded in ArcGIS, combining all sub-settings into one composite map per town centre. Each 'dot' in the map 5-4 below represents one individual engaged in stationary behaviour at Emerson Green.



Map 5-3: Recorded stationery behaviour at Emerson Green District Centre

One limitation of place-centred maps is the difficulty to identify within and between individual variations when presenting a high frequency of dots. Hence, it is also difficult to deal with them statistically (Tiburcio and Finch, 2005). However, this is less important for this research, as the research is interested in the pattern between urban design features and people. Hence, even if the same family stops to greet someone on the way into the facility and then talks to someone else on the way out, this is not having an adverse impact on the results, as the location of their behaviour is most important.

Throughout the analysis in Chapter 9, the two town centres are compared with regard to similar and diverging patterns of behaviour and features. First, a brief overview of the two town centres is presented, followed by descriptive statistics comparing the observed frequency, duration and location of social interaction at the two town centres. This is followed by a short section investigating to what extent people's attributes had an impact on the frequency, location and duration of the observed behaviour.

Each town centre site is then analysed with regard to whether the previously identified urban design features exist on the sites and, with the aid of a number of thematic maps produced in ArcGIS, it is then tested whether any of these urban design features had an observable influence on the location, frequency and duration of social interaction. This is also supplemented with photographic evidence of the interaction between behaviour and urban design features.

5.8 SUMMARIES

The overarching quantitative research strategy, mixing two methods sequentially in a cross-sectional study has been set out in this chapter. The rationale for the selection of the sample areas and observation sites has been explained. The different types of data collection methods and have been discussed and how they were used to fulfil the research objectives. The development and description of indicators measured in this research has been set out to lead into the next chapters demonstrating the results together with the analysis methods used for the different types of data collected.

To summarise, objectives one and three were achieved by collecting survey data from a sample of people and facilities in three chosen case study areas which was then analysed using descriptive statistics and buffer maps to highlight the extent of facility use and social interaction in the sample. Objectives two and four were achieved using the same data identifying correlations to show relationships and strengths between the predictor and both outcome variables (use and social interaction). Furthermore, for social interaction, this was followed by more sophisticated regression analyses (logistic, ordinal and OLS) to demonstrate the relative importance of the different predictor variables on social interaction levels at local facilities. Finally objective five was achieved by collecting observation data at two district centres within the case study areas and using thematic and place-centred maps to analyse to what extent urban design features have an affect on the type, location, frequency and duration of social interaction at these sites.

The following chapter provides information about the characteristics of the sample and the selected areas to demonstrate how representative the sample is and to provide some background information for further analysis. Furthermore, it shows the extent to which the sample population used local facilities and had social interaction at those facilities, thereby addressing Objectives one and three.

Chapter Six

Residential Area Profile and Extent of Local Facility Use and Social Interaction in the Sample

6.1 INTRODUCTION

Following Chapter 5, which set out, inter alia, how the questionnaire data were obtained and how the residential areas were chosen, this chapter now has two purposes:

Firstly, to set out sample characteristics from the household survey and facility characteristics from the facilities survey using descriptive statistics such as tables, diagrams and maps to describe the sample and the selected residential areas. Where available, data from the sample was cross-checked with other existing statistics and surveys, (e.g. Census data, Index of Multiple Deprivation, British Household Panel Survey) or data from the facility survey was used alongside to triangulate data from the household survey (e.g. perceived and actual facility provision). Most of the data is arranged to present the three residential areas as well as an overall column to provide an overview of the differences between the areas. The descriptive data provides background information to help with the understanding of the results from the analysis undertaken in Chapters 7 and 8.

Secondly, the chapter uses descriptive analysis to demonstrate the extent of local facility use by the sample as a whole and the extent of social interaction at local facilities by the sample, thereby addressing **Objectives 1 and 3**. There was no statistically significant difference between the sub-samples from the three residential areas with regard to use and social interaction levels (e.g. 'area' was not a significant predictor for either outcome variable). Furthermore, the sample size for each residential area was too small for a comparative analysis, hence from this point forward the dataset is analysed as a whole.

6.2 SAMPLE CHARACTERISTICS AND RESIDENTIAL AREA PROFILE

6.2.1 Personal Characteristics of the Sample

The socio-economic variables are variables which have also been recorded by the Census. Each table thus shows the data from the Questionnaire and 2011 Census (in brackets) for each selected area and the average across the three areas to compare the entire sample with Census data. A number of chi-square tests have been undertaken to identify whether differences between the sample and the Census data are statistically significant. The Census data have been aggregated from the relevant Lower Layer Super Output Areas (LSOA) (13 to 17 per residential area). Whilst the dividing lines between output areas did not always correspond exactly to the built-up area/major roads, these were the best local tables available for comparison. Whilst the data from the three areas is analysed as a group from this point forward, differences between the areas are

nevertheless discussed and a number of chi-square tests have been undertaken to identify whether these differences are statistically significant.

6.2.1.1 Gender

The overall proportion of female respondents in the sample was 61% and males 39% whereas the 2011 Census data for the areas showed 51% and 49% respectively. The sample area best resembling these gender proportions was Bradley Stoke which had 56% of female respondents and 44% of male respondents. Emerson has the largest percentage of female respondents, but a chi square test revealed that the differences between the three areas were not statistically significant (p=>.05).

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	Census 2011
Male	44.0 [49.7]	34.9 [49.8]	39.1 [48.2]	39.0	49.3
Female	56.0 [50.2]	65.1[50.1]	60.9 [51.7]	61.0	50.7

Table 6-1: Gender of respondents by area, Average and Census 2011 (%)

6.2.1.2 Age

Age distribution of the sample (see Table below) showed that younger adults, particularly 18-29 year olds, were underrepresented and older groups, particularly 60-74 years, were overrepresented. The differences with the 2011 Census were statistically significant (p=.000). For a postal questionnaire this is not surprising as retired/older people maybe more inclined to fill in a questionnaire. With regard to the three sub-areas, older respondents were overrepresented in the Cadbury Heath area, whereas middle aged respondents were overrepresented in Bradley Stoke. The differences between the sub-areas were statistically significant (p=.03).

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	Census 2011
18-24	0.0 [8.98]	0.0 [7.2]	3.0 [8.64]	0.8	8.27
25-29	4.8 [8.76]	2.1 [4.47]	0.0 [5.71]	2.4	6.3
30-44	30.1 [26.7]	21.6 [21.9]	15.2 [20.26]	22.8	22.95
45-59	12.0 [18.96]	19.6 [19.62]	24.2 [22.28]	18.3	20.28
60-74	13.3 [9.46]	17.5 [14.82]	19.7 [15.25]	16.7	13.1
75-89	1.2 [3.45]	5.2 [8.7]	10.6 [6.7]	5.3	6.28
90 and over	0.0 [0.22]	0.0 [0.74]	0.0 [0.74]	0.0	0.56

Table 6-2: Age of Respondents (Adults) by area, average and Census 2011 (%)

Looking at the percentage of dependent children in the three areas, younger children (0-11 years) in the sample were overrepresented in Bradley Stoke and Emerson Green, whereas older children (12-18 years) were overrepresented in Cadbury Heath. However, the difference between the overall sample and the Census 2011 was not statistically significant.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	Census 2011
0-4	14.1 [7.87]	8.1 [6.49]	3.8 [5.69]	8.9	6.68
5-11	10.9 [9.94]	14.1 [9.94]	7.7 [8.61]	11.3	9.33
12-18	8.6 [6.16]	6.0 [6.12]	13.5 [6.12]	8.9	6.13

Table 6-3: Age of Children by area, average and Census 2011 (%)

Further analysis in later chapters requires not only knowing the number of children, but also the percentage of respondents who had children in a certain age group (see Table 6-4 below). Comparing the three areas in this way, the Bradley Stoke sub-sample had the largest percentage of respondents with dependent children and also the largest percentage of 30-44 year olds, whereas the Cadbury Heath sub-sample had the largest proportion of pensioners, the lowest proportion of respondents with small children (0-11) but the highest for older adults (45-59) and respondents with older children (12-18). Comparing this with Table 6-20 (residency length) this seems to indicate the difference between the areas where Bradley Stoke has many starter homes with some parts of the area having only recently been completed. They attracted young families who moved there in the last 2-5 years (30%) whereas Cadbury Heath has 30% of respondents who have lived there for over 20 years and another peak of people (18%) who have lived there for 5-10 years.

% OF RESPONDENTS WITH CHILDREN AGED:	BRADLEY STOKE	EMERSON GREEN	CADBURY HEATH	AVERAGE
0 - 4	16.9	11.3	4.5	11.4
5–11	13.3	15.5	9.1	13.0
12-18	8.4	7.2	13.6	9.3

Table 6-4: % of Respondents with children in specific age group by sub area and Average.

6.2.1.3 Ethnic Origin

The sample appeared somewhat overrepresented by some categories (i.e. EU and other White) and underrepresented by others (i.e. Asians) compared to the 2011 Census data with the differences between the whole sample and the census being statistically significant (p=.000). The 'white EU' category did not correspond well to the census categories 'white Irish' or 'white other' and might include a number of White British respondents which felt more European than British. The 'other' category included people who chose 'I'd prefer not to say'. From the Census data it can be concluded that these areas are traditional 'white, working class, suburban areas' with very small proportions of ethnic minorities. Looking across the three areas Bradley Stoke appears to be the most 'mixed' community where 86% of respondents considered themselves to be White British, whereas Cadbury Heath was the most ethnically homogenous area with nearly 94% of respondents stating that they considered themselves White British. A Fisher's exact test revealed that the differences between the sample areas were not statistically significant (p=.187).

	BRADLEY STOKE	EMERSON GREEN	CADBURY HEATH	AVERAGE	CENSUS 2011
White British	86.0 [85.6]	90.6 [92.2]	93.8 [95.9]	90.1	91.2
White Irish (White EU)	2.0 [0.5]	3.1 [0.4]	2.1 [0.4]	2.5	0.4
Other White	4.0 [2.8]	3.1 [2.0]	0.0 [1.07]	2.5	2.0
Asian	2.0 [5.2]	0.0 [2.5]	0.0 [0.9]	0.6	2.8
Black	2.0 [1.2]	1.6 [0.8]	0.0 [0.5]	1.2	0.8
Mixed	2.0 [1.9]	0.0 [1.35]	0.0 [1.0]	0.6	1.4
Other	2.0 [0.7]	1.6 [0.6]	4.2 [0.1]	2.5	0.5

Table 6-5: Ethnic Origin of Respondents by area, Average and Census 2011 (%)

6.2.1.4 Employment Status

As expected from the age profile, the overall sample had more retired respondents (13% more), fewer students and was somewhat underrepresented with full-time respondents compared to the 2011 census population, the difference was statistically significant (p=.000). Looking at the three areas in turn, the Bradley Stoke sample had a higher proportion of part-time respondents as well as stay-at-home parents than would have been expected from the Census data. It also had fewer self-employed, students and permanently sick or disabled respondents than in the Census data. The Emerson Green and Cadbury Heath samples, in comparison, had lower proportions of people being full-time employed and self-employed but a much higher proportion of retired people and in Cadbury Heath a much higher proportion of permanently sick/disabled people, but the differences between the sub-areas were not statistically significant.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	Census 2011
Employees Full-time	51.0 [51.1]	34.4 [42.3]	31.3 [43.5]	38.7	45.6
Employees Part-time	21.6 [15.8]	18.8 [17.8]	20.8 [18.0]	20.2	17.2
Self-employed	2.0 [6.6]	4.7 [9.0]	6.3 [8.9]	4.3	8.1
Average in employment	74.6 [73.5]	57.9 [69.1]	58.4 [70.4]	63.2	71.0
Looking after home / family	7.8 [3.5]	1.6 [3.1]	4.2 [3.1]	4.3	3.2
Full-time student and student	.0 [3.0]	.0 [3.15]	2.1 [3.0]	.6	3.0
Unemployed	.0 [2.9]	1.6 [2.6]	4.2 [2.7]	1.8	2.7
Retired	17.6 [9.95]	34.4 [14.7]	25.0 [13.8]	26.4	13.0
Permanently sick / disabled	.0 [2.25]	3.1 [2.25]	6.3 [2.6]	3.1	2.3
Other	.0 [1.2]	1.6 [1.2]	.0 [1.1]	.6	1.1

Table 6-6: Employment status of respondents by area, average and Census 2011 (%)

6.2.1.5 Tenure

Given that a considerably higher number of respondents were retired, it was not surprising that the percentage of home owners without a mortgage was also somewhat higher than reflected in the Census, again, the difference between the entire sample and the 2011 census was statistically significant (p=.000). Surprisingly however, was the much higher rate of respondents who stated

they lived in shared ownership with a correspondingly much lower rate of respondents stating that they lived in social rented accommodation. This could be due to the increased stigma attached to rented social housing (Malpass, 1986). Given that the sample contained almost no students and very few young adults, the very low figures for private renting in Bradley Stoke and Cadbury Heath were not too surprising. Given the large differences between the three areas in the rented/shared ownership sector, the differences across the three areas were found to be statistically significant using Fisher's exact test (p=.034).

		Bradley Stoke	Emerson Green	Cadbury Heath	Average	Census 2011
Owner Occupied	Owns outright	30.0 [24.5]	44.8 [36.6]	39.6 [34.8]	38.5	31.9
	Owns with a mortgage or loan	56.0 [45.2]	43.1 [40.9]	43.8 [43.9]	47.4	43.3
	Shared ownership	6.0 [0.35]	.0 [0.27]	8.3 [0.4]	4.5	0.34
Rented from	Private landlord or letting agency	4.0 [18.6]	10.3 [9.8]	.0 [8.7]	5.1	12.3
	Social (Council or HA/RSL)	4.0 [11.2]	1.7 [9.6]	8.3 [10.3]	4.5	10.4
	Other					1.2

Table 6-7: Tenure of respondents by area, average and Census 2011 (%)

6.2.1.6 Household Composition

The questionnaire asked 'Which of the following describes your **current** household composition'. As it did not include a category of 'one family, all pensioners' (as per 2011 Census), this was combined with the category '*married or cohabiting with no children*'. The categories 'with dependent children/all pensioner' in 'other household' were also not included. The overall sample was overrepresented by families with children and underrepresented by single households. A chi square test revealed that these differences between the whole sample and the Census 2011 population data was statistically significant at p=.043. Whilst families with dependent children were overrepresented in the Bradley Stoke sample, single pensioners were overrepresented in the Emerson Green and Cadbury Heath samples, these differences were also just statistically significant (p=.048).

		Bradley Stoke	Emerson Green	Cadbury Heath	Aver-age	Census 2011
One person	Pensioner	4.2 [7.65]	20.3 [13.9]	14.6 [11.0]	13.8	11.0
	Other	10.4 [19.8]	3.1 [12.4]	16.7 [15.3]	9.4	15.8
One family and no others	Married and cohabiting households: No children	22.9 [20.6]	23.4 [18.5]	18.8 [20.26]	21.9	20.1
	Married and cohabiting households: With dependent children	41.7 [24.8]	32.8 [25.5]	20.8 [21.5]	31.9	24.0
	Married and cohabiting households: All children non-dependent/All Pensioners	12.5 [11.3]	10.9 [17.2]	22.9 [17.36]	15.0	15.2
		Bradley	Emerson	Cadbury	Aver-	Census

		Stoke	Green	Heath	age	2011
One family and no others	Lone parent households: With dependent children	8.3 [7.25]	4.7 [5.6]	6.3 [6.9]	6.3	6.5
	Lone parent households: All children non-dependent	0.0 [2.7]	1.6 [2.8]	0.0 [3.4]	0.6	2.9
Other house-hold	With dependent children					1.3
	All student	0.0 [0.0]	0.0 [0.1]	0.0 [0.1]	0.0	0.0
	All pensioner					0.3
	Other	0.0 [3.4]	3.1 [2.7]	0.0 [2.5]	1.3	2.8

Table 6-8: Household composition of respondents by area, average and Census 2011 (%)

6.2.1.7 Social Class by Occupation

With regard to occupation classifications, the numbers established from the sample have to be treated with great care as many respondents made unclear statements such as 'civil servant' without indicating level of seniority, hence it is possible that the higher percentage of professional occupations (Class 2) in the sample, included a number of respondents with senior or managerial roles in professional occupations (Class 1) which were misclassified. In addition, as more women filled in the questionnaire, the higher percentage of admin/secretarial occupations, particularly in Emerson Green, might not reflect the main householder's occupation, which is what was requested in the questionnaire, but a part-time occupation of the wife/partner who was also caring for children. Not surprisingly, a chi square test revealed that this difference between the sample and the Census 2011 population data was statistically significant at p=.000. Differences between the three sub-areas however were not statistically significant.

Class	Standard Occupational Classification 2010	Bradley Stoke	Emerson Green	Cadbury Heath	Average	Census 2011
1	Managers and senior officials	2.2 [9.0]	5.1 [11.2]	2.4 [9.1]	3.4	9.7
2	Professional occupations	42.2 [19.0]	33.9 [20.3]	40.5 [13.8]	38.4	17.8
3	Associate professional and technical occupations	17.8 [13.0]	13.6 [13.8]	14.3 [12.3]	15.1	13.1
4	Administrative and secretarial occupations	22.2 [14.2]	33.9 [14.2]	16.7 [16.0]	25.3	14.8
5	Skilled trades occupations	11.1 [10.4]	8.5 [11.6]	7.1 [13.6]	8.9	11.9
6	Personal service occupations5.9	.0 [7.3]	1.7 [8.2]	4.8 [9.1]	2.1	8.2
7	Sales and customer service occupations	4.4 [10.5]	1.7 [7.9]	4.8 [10.3]	3.4	9.5
8	Process; plant and machine operatives	.0 [6.1]	.0 [4.8]	4.8 [6.9]	1.4	5.9
9	Elementary occupations	2.1 [10.4]	1.7 [7.8]	2.4 [8.7]	2.1	8.9

Table 6-9: Class by occupation (based on soc 2010) of respondents by area, average and Census 2011 (%)

Overall, due to the method of data collection (postal survey questionnaire) the sample contained a higher percentage of older people and people with more time (e.g. part-time employed), which

had an effect on other socio-economic variables such as the employment situation, tenure and household composition. The sample therefore showed statistically significant differences in its socio-economic profile to the 2011 Census data for the same area. The implication of this is that the findings from this research can not be generalised to a larger population, unless supported by previous findings from the literature. Careful attention has been paid to this fact throughout the thesis and findings are discussed bearing in mind the limitations of this sample.

Some of the socio-economic variables also show statistically significant differences between the three sub-areas. However, the analysis in Chapters 7 and 8 only uses the total sample hence this aspect is of lesser concern for the findings as some of the differences cancel each other when using the overall sample.

6.2.2 Area Characteristics

Area characteristics as rated by the sample were measured using the following indicators: perceived homogeneity of residents, perceived crime, perceived walkability and traffic levels, place attachment, residence length and social networks. Where useful and possible, objective indicators from existing surveys (e.g. crime and deprivation ranks from the Indices of Multiple Deprivation 2010) were used to triangulate/corroborate the results from the sample.

6.2.2.1 Perceived Homogeneity of Residents

Perceived homogeneity of an area can be understood by respondents as 'feeling' similar to others in the same area in a number of aspects: ethnicity, class, age etc. Perceived homogeneity has been found to be an important predictor for social interaction between neighbours (Keane, 1991) and has been used in several waves of the British Household Panel Survey (BHPS) by asking respondents to what extent they agreed with the statement: '*I like to think of myself as similar to the people who live in this neighbourhood*'. Overall, all three areas reflected a high percentage of perceived homogeneity as over 60% of all respondents agreed or agreed strongly with the statement. This compared well with the last BHPS that included the question in 2009, (see table below), a chi-square test undertaken showed that the difference between the sample and the BHPS was not statistically significant (p= .260). Comparing the three areas, the highest percentage of respondents agreed with this statement in Emerson Green (67%) and the lowest percentage in Bradley Stoke (54%) and the observed differences between the areas were not statistically significant.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	BHPS 2009
Agree/Agree strongly	54.0	66.6	62.3	66.4	63.3
Neither/nor	34.0	19.0	28.9	26.6	20.7
Disagree/Disagree Strongly	12.0	14.3	8.9	12.0	15.9

Table 6-10: I feel similar to other people in the area (in %) and BHPS 2009

6.2.2.2 Crime and Deprivation

Over 70% of respondents in Bradley Stoke and Emerson Green stated that there was not a lot of crime. In Cadbury Heath, 15% of respondents stated that there was. National surveys (such as the British Crime Survey) tend to ask to what extent residents feel worried about being affected by crime, or how they feel crime rates have changed over time (British Crime Survey, 2007-2008) neither of which allows for a direct comparison with this data. Whilst respondents in Cadbury Heath were overrepresented in believing that there was crime, differences between the sub-areas were not found to be statistically significant.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Agree/Agree strongly	6.0	3.2	15.5	7.6
Neither/nor	24.0	25.4	40.0	29.1
Disagree/Disagree strongly	70.0	71.4	44.5	63.3

Table 6-11: Perception of crime in the area (in %)

Comparing the perception of crime with actual crime data, the Index of Multiple Deprivation 2010 ranks all 32,482 Lower Super Output Areas (LSOA) in the UK according to their levels of crime. With the number 1 being the area with the highest crime levels (Oldham) and the number 32,482 being the area with the lowest crime rate (Forest Heath). As can be seen from the Table below, there are differences in the level of crime across the three areas, with Cadbury Heath having higher crime rates than the other two areas, including pockets of high crime rates (see map 6-1 below) hence, perceived crime in the sample appears to relate well to actual crime levels.

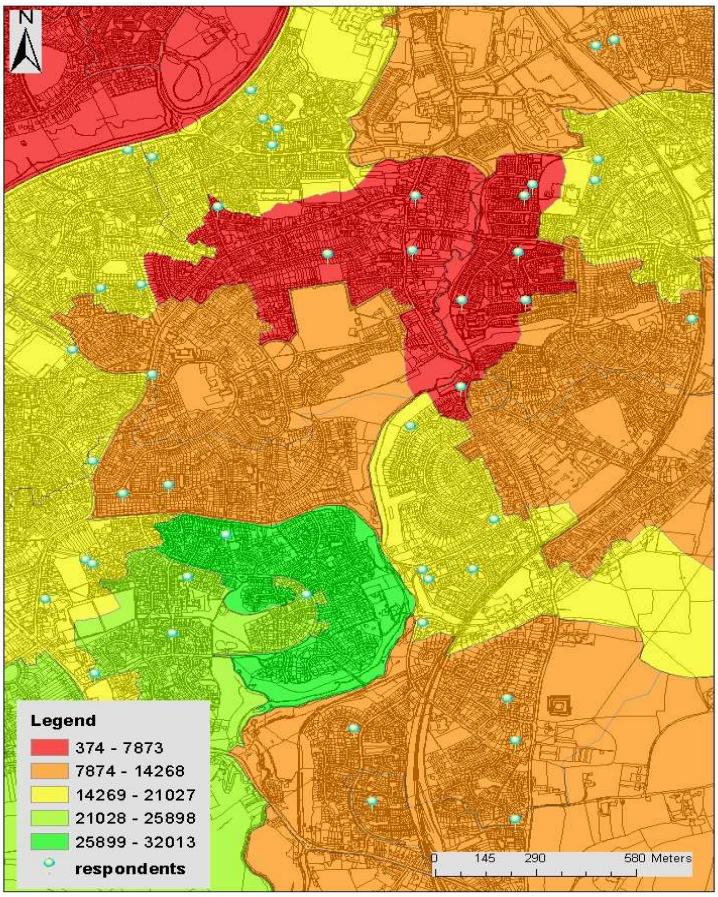
	Bradley Stoke	Emerson Green	Cadbury Heath
Average Area Crime Rank	20297	19396	14594
Highest crime rank LSOA	13931	14875	11262
Lowest crime rank LSOA	26488	23018	20308

Table 6-12: Crime ranking based on Index of Multiple Deprivation 2010

With regard to overall deprivation of the area, a similar picture emerges:

	Bradley Stoke	Emerson Green	Cadbury Heath
Average Area Deprivation Rank	27827	26167	24244
Highest Deprivation rank LSOA	23526	16396	19671
Lowest Deprivation rank LSOA	30734	31485	29775

Table 6-13: Deprivation rank based on Index of Multiple Deprivation 2010



Map 6-1: Crime Levels per ward across Cadbury Heath area, based on Index of Multiple Deprivation 2010

The perception of crime is associated with 'Feeling safe walking in the area after dark' in that over 60% in Bradley Stoke and Emerson Green agreed with his statement, but only 50% agreed with this in Cadbury Heath. Furthermore, nearly a quarter of respondents in Cadbury Heath did not feel safe walking in the area after dark compared to 10% in the other two areas. These differences were not statistically significant. Comparing this to a national survey, the BHPS 2008, respondents in the sample feel overall less safe walking after dark in their area than the national result. As a national study includes rural and remote areas, this is not surprising.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	BHPS 2008
Agree/Agree Strongly	64.0	66.6	51.1	61.3	71.1
Neither/nor	26.0	23.8	25.5	25.0	N/A
Disagree/Disagree strongly	10.0	9.5	23.4	13.7	16.8

Table 6-14: I feel safe walking in this area after dark (in %) and BHPS 2008

6.2.2.3 Walkability and Traffic Levels

Around half of the respondents in the three samples felt that there was a lot of traffic in the area; in Emerson Green this figure was 60%. The Census provides information on traffic incidences in areas and the Department for Transport undertakes traffic counts on motorways and A roads. However, in the areas investigated, these traffic counts tend to be on the main roads surrounding

the three areas and are thus not helpful in comparing actual traffic levels. It has also been found that perception of traffic levels in a neighbourhood is higher for people who walk more frequently in that neighbourhood (Giles-Corti,B. and Donovan, R.J.,2002). Emerson Green had the largest number of respondents who agreed that there was a lot of traffic, but these differences between the areas were not statistically significant.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Agree/Agree Strongly	53.1	60.0	47.8	54.4
Neither/nor	28.6	16.9	32.6	25.0
Disagree/Disagree strongly	18.4	23.1	19.6	20.7

Table 6-15: There is a lot of traffic in this area (in %)

The vast majority of respondents (around 90%) in all three areas stated that there were large networks of footpaths around the area and that it was easy to walk around. Using a Fisher's exact test, it could be confirmed that there were no statistically significant differences between the areas with regard to footpaths and ease of walking.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Agree/Agree Strongly	94.0	90.6	89.4	91.3
Neither/nor	4.0	6.3	6.4	5.6
Disagree	2.0	3.1	4.3	3.1

Table 6-16: There is a large network of footpaths around here (in %)

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Agree/Agree Strongly	94.0	92.2	89.4	91.9
Neither/nor	6.0	4.7	8.5	6.2
Disagree	.0	3.1	2.1	1.9

Table 6-17: It's easy to walk from one part of this area to another (in %)

6.2.2.4 Density

With regard to density, this was measured for each Lower Super Output Area (LSOA) using readably available 2011 Census data which measured persons per ha (ppha). As can be seen from the table below, the areas show quite a range of densities between less than 20 persons per ha and up to 80 persons per ha. For the entire area, the mean density was 41.2 persons per ha with a minimum of 1.7 ppha and maximum of 75.5 ppha. For comparison, the City of Bristol has a mean density of 39.1 ppha, but South Gloucestershire Unitary Authority only has 5.3 ppha, due to it also encompassing large rural areas.

Bradley Stoke, which is the most recently completed area also has the highest densities (in line with more recent policy guidelines on increasing density), with above average densities of 60-80 persons per ha, whereas in Cadbury Heath (the oldest area) over 50% of the area was built at a density of less than 40 persons per ha.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
<20 persons per ha	0.0	4.0	18.4	7.5
20-40 persons per ha	20.8	30.0	32.7	27.8
40-60 persons per ha	49.1	66.0	30.6	48.5
60-80 persons per ha	30.2	0.0	18.4	16.2

Table 6-18: Density Bands based on Census 2011 (in %)

6.2.2.5 Place Attachment

With regard to respondents' attachment to the area, this was measured by two variables: '*Enjoyment of area*' and '*Planning to stay for several years*'. Around 90% of respondents enjoyed living in their area and over 80% stated they would like to stay for several years. When comparing this to the national BHPS 2009, it also found that over 90% of respondents liked living in their neighbourhood. Planning to remain in the area was also a question of the BHPS 2009, and the sample shows a statistically significant difference (p=.000) to the 2009 national result, with respondents from the sample being more affirmative towards staying in this area. Comparing the three sub-areas, respondents in Bradley Stoke appeared somewhat less enthusiastic about both questions whilst respondents in Emerson Green were more enthusiastic, but the differences were not found to be statistically significant.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	BHPS2009
Agree/Agree strongly	88.5	92.2	91.8	90.9	94.6
Neither/nor	11.5	4.7	6.1	7.3	n/a
Disagree/Disagree strongly	.0	3.1	2.0	1.8	5.4

Table 6-19 : I enjoy living in this area (in %) and BHPS 2009

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	BHPS2009
Agree/Agree strongly	80.0	86.0	86.6	84.3	74.9
Neither/nor	16.0	7.8	8.9	10.7	12.3
Disagree/Disagree strongly	4.0	6.2	4.4	5.0	12.8

Table 6-20: I would like to stay for several years (in %) and BHPS 2009

6.2.2.6 Length of Residence

Comparing the three areas with regard to respondent's length of residence, as already discussed in Section 6.2.1.2., Bradley Stoke appeared to be the 'youngest area' with 30% of respondents stating that they had lived there for 2-5 years, whereas Cadbury Heath was the 'oldest area' where over 30% of respondents stated that they had lived there for 20-30 years. The differences between the areas were found to be statistically **significant using a chi-square test (p<0.001).**

As shown in Table 6-7 above, Bradley Stoke was also the area with the highest percentage of respondents owning a house with a mortgage (56%) and the lowest percentage of outright home owners (30%). When comparing the overall sample to a national survey, there were fewer

respondents in the sample with short residence length and more who have lived in the area for 5-10 years.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	Family Resources Survey 2010/11
Less than 2 years	10.0	14.1	.0	8.6	18
2-5 years	30.0	7.8	8.3	14.8	17
5-10 years	16.0	34.4	18.8	24.1	17
10-15 years	14.0	14.1	10.4	13.0	20
15-20 years	16.0	6.3	6.3	9.3	
20-30 years	8.0	7.8	33.3	15.4	28
Over 30 years	6.0	15.6	22.9	14.8	

Table 6-21: Length of residence of respondents by area, and average (%) and Family Resources Survey 2010/11

6.2.2.7 Social Networks in Area

As set out in the previous chapter, 'social networks' of respondents were measured using five variables: frequency of visit to people in area, frequency of being visited, number of neighbours known (by sight, to say hello to and to chat to), type of people previously known in the area and type of people known now. A number of national surveys were measuring similar concepts relating to social networks, but the format of the questions were too dissimilar to allow direct comparison. For example, the BHPS 2000 asked how frequently respondents met friends/relatives they did not live with but not whether these friends/relatives were from the same neighbourhood whilst the British Social Attitudes Survey 2003 enquired where closest friends lived with 22% stating that they lived in their local neighbourhood.

With regard to visiting and being visited, both variables were highly correlated and have been transformed into one variable in future analysis. Looking at both questions in turn, however, it can be seen that almost 40% of respondents in Cadbury Heath frequently visited/had been visited by people from the development, whereas the largest percentage of 'less frequent' visits was undertaken by respondents in Bradley Stoke and the largest percentage of 'never visiting/being visited' was stated by respondents in Emerson Green. The latter is somewhat surprising given the medium length of residence in Emerson Green as discussed above. However, the Emerson Green sample had the largest group of retired, single pensioners and this could highlight a certain lack of social networks for older people in the area. In any case, the differences between the areas for both variables were not statistically significant (p=.06 and p=.09)

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Frequently (Daily/Weekly)	29.4	22.0	39.6	33.3
Less frequent (Monthly/less than monthly)	49.0	47.6	35.4	44.4
Never	21.9	30.2	25.0	25.9

Table 6-22 : Frequency of respondent visiting people from the area at their home (in %)

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Frequently (Daily/Weekly)	25.5	19.1	41.7	27.8
Less frequent (Monthly/less than monthly)	51.0	54.0	37.5	48.1
Never	23.5	27.0	20.8	24.1

Table 6-23: Frequency of people from this area visiting respondent (in %)

Looking at how many neighbours respondents knew by sight, say hello to and chat to, the vast majority knew between 1 and 20 neighbours. Respondents in Emerson Green knew more people by sight and 'say hello to', but over 40% in all three areas stated they had 1-5 neighbours they would talk to. This is quite surprising given the very long residency length in Cadbury Heath which would suggest a slow turnover of neighbours/houses. On the other hand, these are suburban areas in England where it might not be unusual to only know next-door-neighbours (different to rural areas).Again, differences between the areas were not statistically significant. With regard to national surveys, other surveys have used different categories such as I am friendly with all/most/some/a few/none of my neighbours, which does not allow direct comparisons.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
1 – 5	19.1	19.0	7.5	15.9
5 – 10	36.2	24.1	37.5	31.7
10 – 20	31.9	36.2	32.5	33.8
20 – 30	6.4	3.4	12.5	6.9
Over 30	6.4	17.2	10.0	11.7

Table 6-24: No of neighbours known by sight (in %)

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
1 – 5	36.2	26.7	18.6	27.3
5 – 10	25.5	33.3	46.5	34.7
10 – 20	27.7	26.7	25.6	26.7
20 - 30	6.4	6.7	7.0	6.7
Over 30	4.3	6.7	2.3	4.7

Table 6-25 : No of neighbours known well enough by respondent to say hello to (in %)

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
1 – 5	56.3	44.4	42.2	47.4
5 – 10	22.9	28.6	28.9	26.9
10 – 20	16.7	17.5	26.7	19.9
20 - 30	.0	4.8	.0	1.9
Over 30	4.2	4.8	2.2	3.8

Table 6-26 : Number of neighbours respondent talks to (in %)

Looking at previous social networks of respondents, a large percentage (35%) of Cadbury Heath respondents knew family members in the area before they moved there and this had increased to 44%. This suggested a large number of close ties, and tallies with being visited weekly but only knowing a few neighbours and the household profile of a higher number of single person pensioners. In Bradley Stoke, nearly 50% of respondents (46%) already had friends and nearly a

third (32%) already knew work colleagues in the area before moving there whereas Emerson Green respondents knew considerably fewer family members, friends and work colleagues than the average of the three areas before moving there. Surprisingly, the rather large differences observed between the different areas were not found to be statistically significant.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Family	20.0	8.7	35.1	20.3
Friends	46.3	28.9	37.8	37.4
Acquaintances	20.0	22.2	21.1	21.1
Work Colleagues	32.5	11.1	13.5	18.9

Table 6-27 : Type of people respondent knew in study area before moving there (in %)

Looking at the **current social network** of respondents in Emerson Green, respondents still knew substantially fewer family members and friends than in the other two areas, but given that only 8-29% knew anyone before moving to the area, between 65-84% knew friends/acquaintances/neighbours at the time of the survey. Hence the results did not indicate that this area was 'less social' but that the residents had different types of social networks, characterised by more 'weak ties' (Granovetter, 1973). This tallies with Emerson Green respondents having/making fewer visits than respondents in the other two areas. Again, the differences were not statistically significant.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Family	28.3	15.3	44.2	27.7
Friends	77.6	66.1	82.2	74.4
Acquaintances	72.9	65.1	57.8	65.4
Immediate Neighbours	83.7	83.9	84.8	84.1

Table 6-28: Do you know anyone in this area now? (in %)

Whilst many Cadbury Heath respondents already had contacts in the area before moving there, nonetheless these networks had further increased and respondents knew substantially more friends than the average of the three study areas at the time of the survey. With regard to immediate neighbours, however, the three areas were comparable.

6.2.3 Facility Characteristics of the Study Areas

Again, this is a mixture of results from the household survey corroborated/triangulated with information from other sources, such as the Census (2011) and the Facilities Survey. It covers the following sections: availability of Neighbourhood and District wide facilities, quality and affordability, perception as third place, mix of facilities, spatial arrangement and visibility of facilities, distance and convenience and mode of transport to the facilities.

6.2.3.1 Availability of Neighbourhood Facilities

Looking at the perceived provision of facilities of the **Bradley Stoke** sample this was overall very high (Figure 6-28). Over 80% of respondents stated that 8 of the 11 local facilities were available within ten minutes walking distance. Notable exceptions were the post office, where nearly 40% stated that they had to walk further than ten minutes to the next post office and hairdresser/barber where 20% had to walk further than ten minutes. The nursery is an exception as nearly 30% of the respondents did not know whether there was a nursery. However, given that over 60% of the sample had either no children or grown up children, this table is probably not surprising.

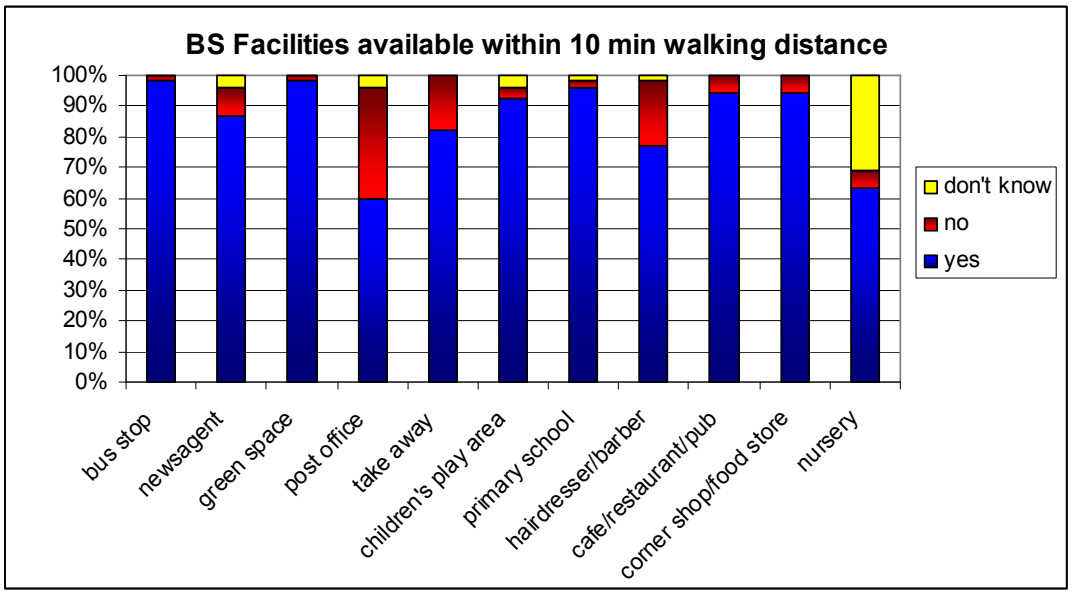
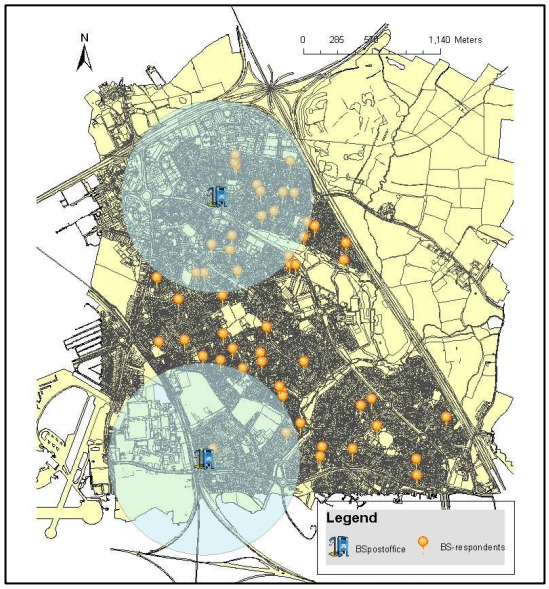
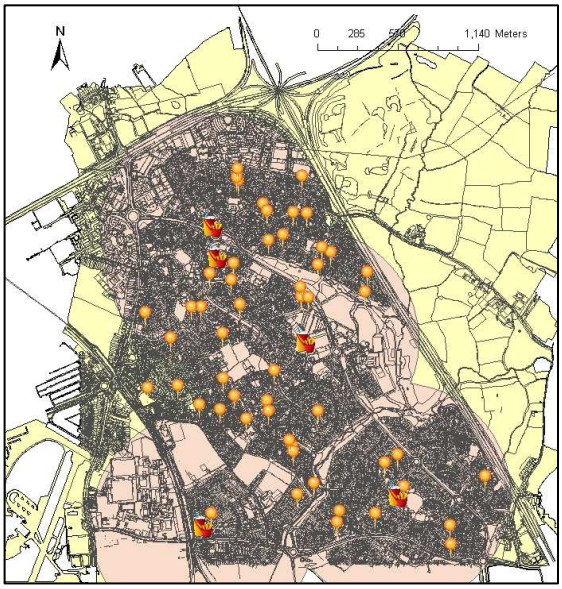


Figure 6-29: Bradley Stoke facilities available in ten minute walking distance

When considering actual post office provision in Bradley Stoke (based on the facilities survey) the respondent's views could be confirmed. There were only two post offices serving the entire area and when an 800m buffer was shown around them (800m was the assumed distance a person would walk in ten minutes (Knoblauch *et al.*, 1996) the map shows clearly that quite a few respondents lived outside those 800m catchment areas. It was thus not surprising that nearly 30% of respondents stated that they did not live within ten minutes walking distance of a post office.

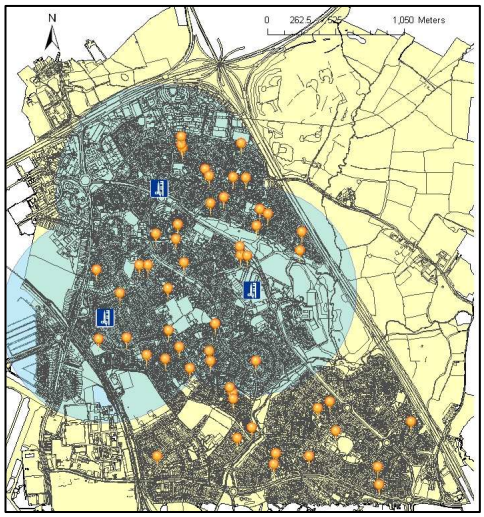


Map 6-2: Post Office provision in Bradley Stoke



Map 6-3: Take away provision in Bradley Stoke

With regard to takeaways, the facility survey recorded six takeaways for Bradley Stoke. Two were located in the main town centre. Map 6-2 shows almost entire coverage of the area using the 800m buffer, hence it was surprising that nearly 20% of respondents stated that they had no take away within ten minutes walking distance. This could be for a number of reasons such as that people only used a particular type of takeaways that were not located within ten minutes walking distance or that people did not use takeaway frequently and were thus not aware of their location. With regard to hairdresser/barber (see Map 6-4), the facilities survey recorded four in the area, with two being located in the same parade of shops. This left the south-eastern part of Bradley Stoke devoid of hairdressing salons and it was thus not surprising that over 20% of the respondents stated that there was no hairdresser /barber within ten minutes walking distance of their home.



Map 6-4: Hairdresser/Barber provision in Bradley Stoke

When comparing **Emerson Green** to the other two areas, the hairdresser/barber provision was higher and more people were aware that there was a nursery within ten minutes walking distance, but the post office provision was perceived to be as bad as in Bradley Stoke and the perceived provision of takeaways was the lowest in the 3 areas.

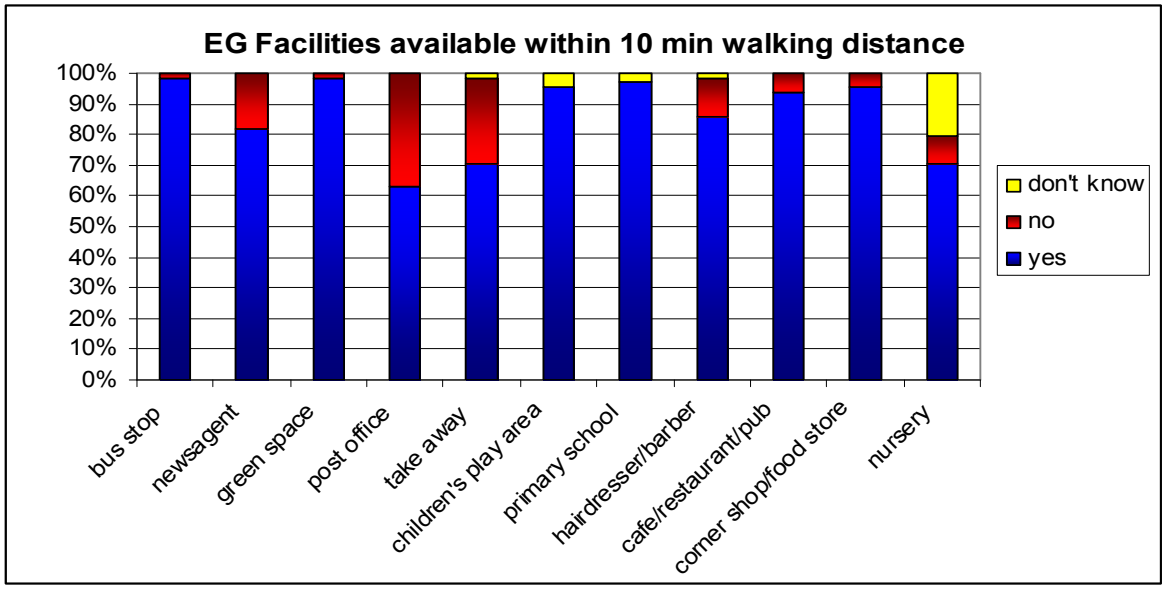
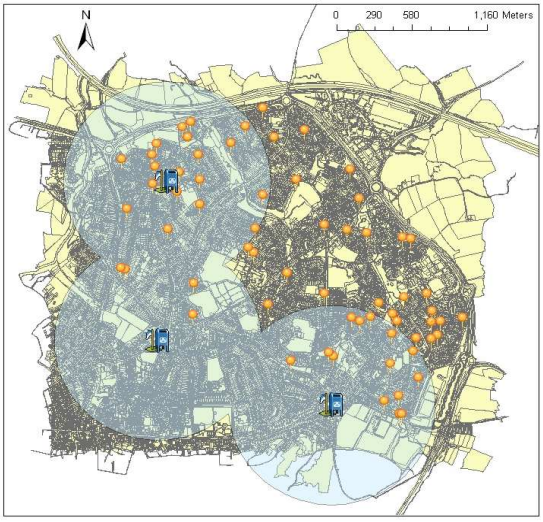
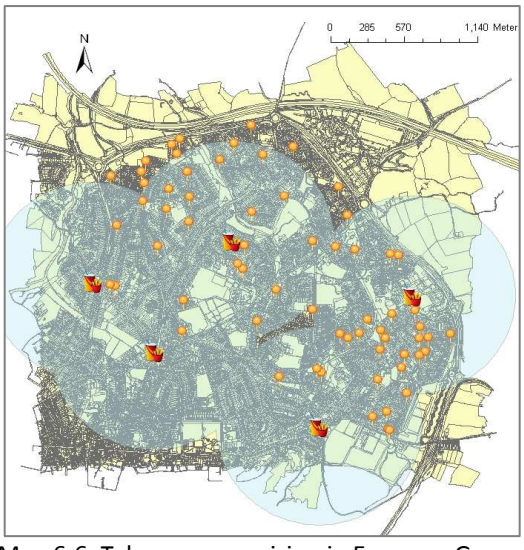


Figure 6-30: Emerson Green facilities available in ten minutes walking distance

As can be seen from the maps below, post office provision in Emerson Green did not cover the entire area, and about 40% of respondents did not live within 800m of a post office. With regard to takeaway provision, the map below shows that there appears to be quite a wide cover of takeaways. Looking at the map, only about 10-20% lived outside the 800m catchment area of a take away.



Map 6-5: Post office provision in Emerson Green



Map 6-6: Take away provision in Emerson Green

In **Cadbury Heath**, perceived provision of post offices and takeaways was higher than in the other two areas but hairdresser/barber provision was the lowest in the three areas. The lack of knowledge about nursery provision was similar to Bradley Stoke and probably due to respondents having few young children.

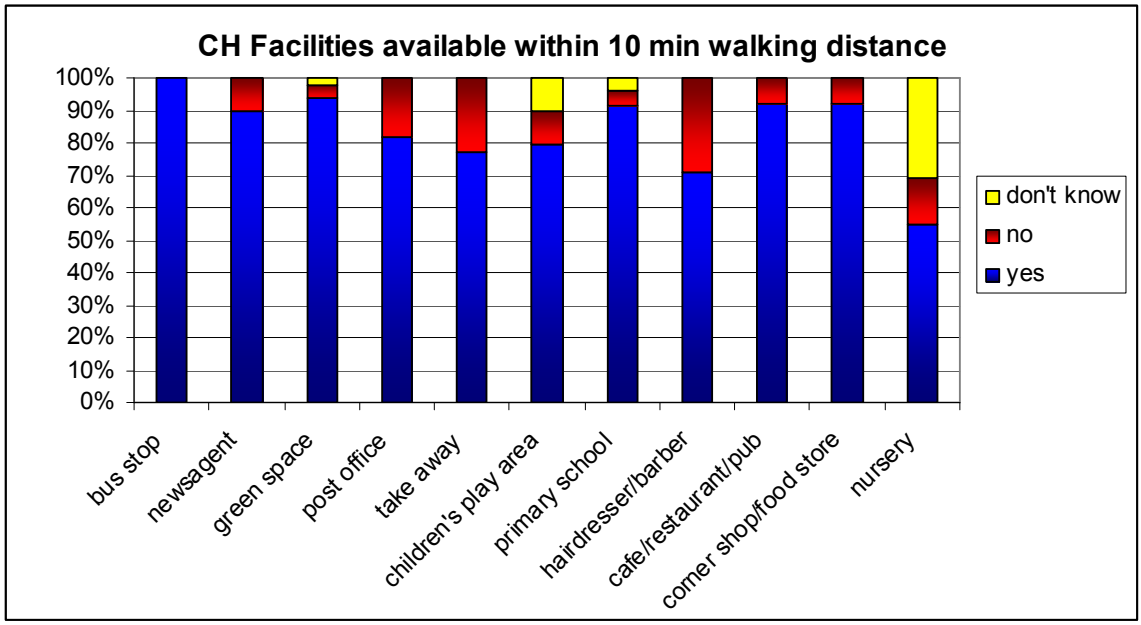
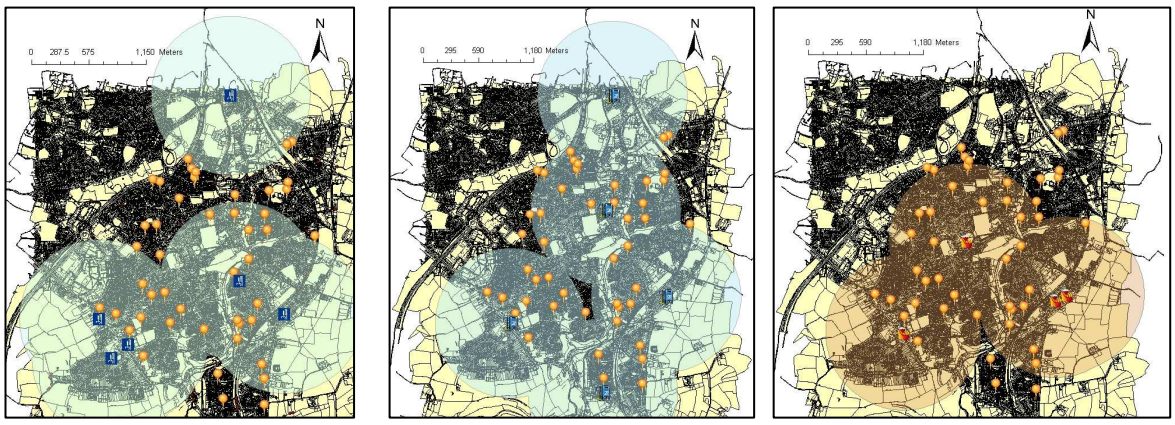


Figure 6-31: Cadbury Heath facilities available in ten minutes walking distance

When considering the actual provision of hairdresser/barbers in Cadbury Heath the distribution was such that almost 30% of respondents did not live within ten minutes walking distance of those facilities as stated by the respondents. Looking at the post office provision the availability was higher and more equally distributed than in the other two areas, hence it is somewhat surprising that nearly 20% stated that they have to walk further than ten minutes to their post office. On the other hand, many of the respondents were pensioners who might take longer than ten minutes to cover an 800m distance. Looking at the takeaway provision this again appears quite high, but 20% of respondents stated that there was no takeaway within ten minutes walking distance of their house.



Map 6-7: Hairdresser, post office and takeaways provision in Cadbury Heath

6.2.3.2 Availability of District Facilities

When comparing district facilities perceived provision was very high in the **Bradley Stoke** sample with 90% of respondents stating that most facilities were available within five minutes drive time.

A notable exception was availability of a large green area/park which nearly 10% of respondents stated was not situated within that distance.

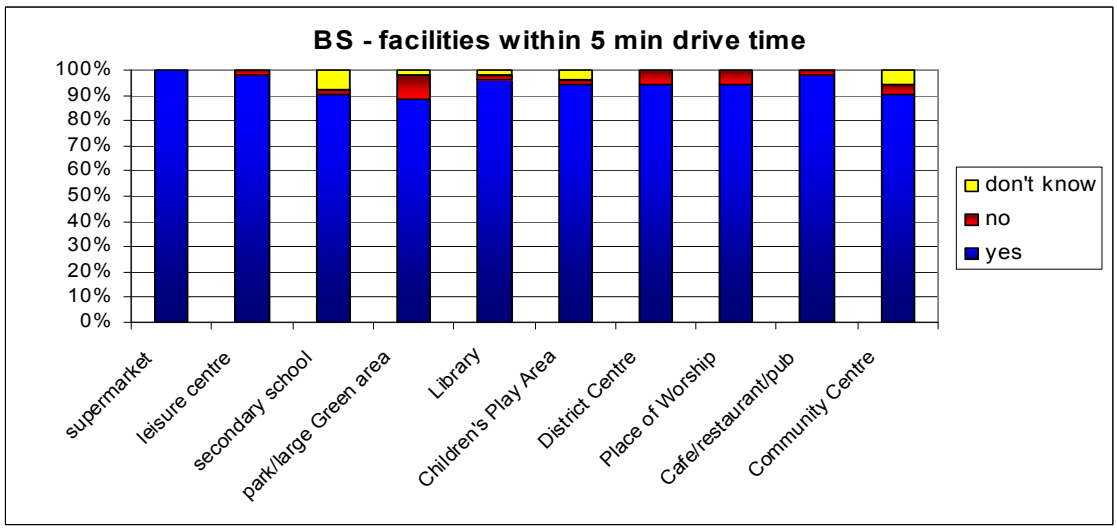


Figure 6-32: Bradley Stoke facilities available in five minutes drive time

In **Emerson Green** provision was also high apart from the perceived lack of a leisure centre (60% of respondents) and almost 10% of respondents did not think that there was a community centre within five minutes drive time.

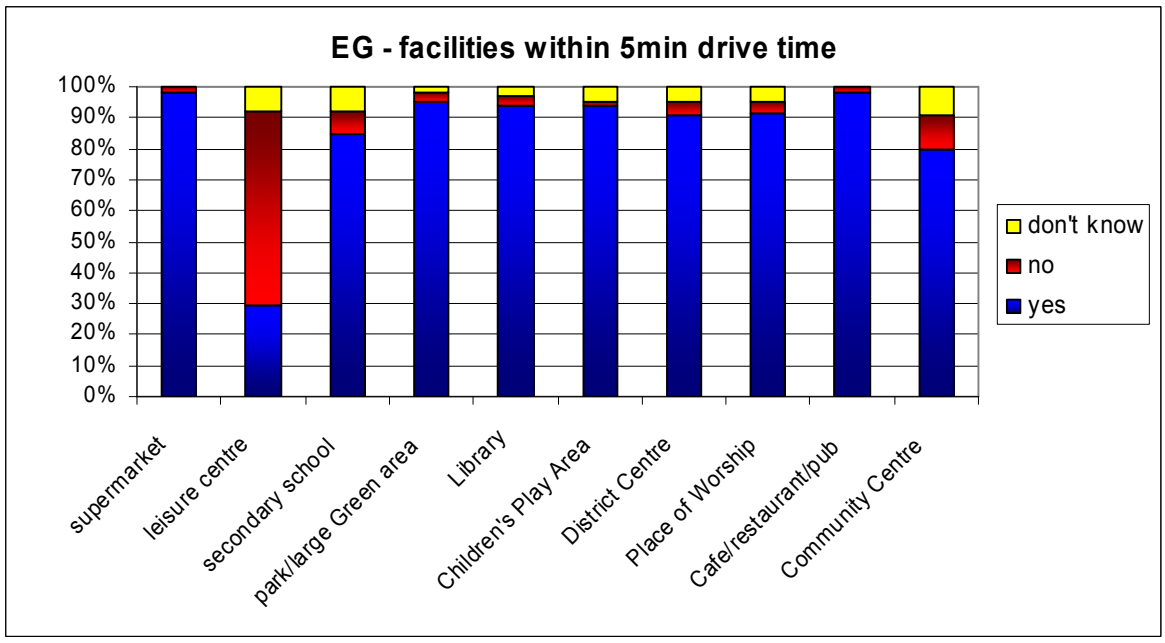
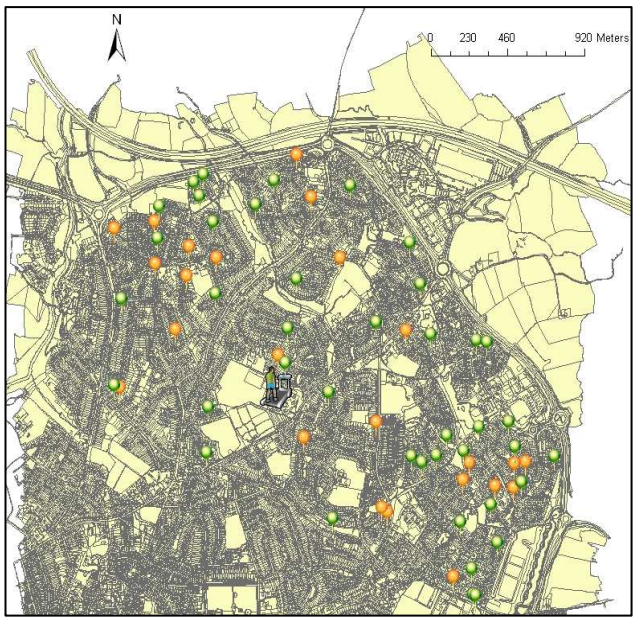


Figure 6-33: Emerson Green facilities available in five minutes drive time

When considering the provision of leisure centres in Emerson Green as identified in the facilities survey, a leisure centre does exist at Downend (as shown on the map below) which is situated within a school. Assuming that a five minutes drive time in a residential area would translate into



a 1.6 miles (2.57 km) catchment area (assuming an average speed of 20 mph) this leisure centre would serve the entire Emerson Green area. When analysing the geographical spread of respondents who stated that the facility was available within five minutes drive time (orange dot in the map) and the respondents who stated that it was not (green dot) there is no obvious connection between the location of the respondent and their knowledge about the leisure centre. When inspecting the leisure centre in more detail, it is run by South Gloucestershire and provides a range of pitches and courts (squash etc) but it does not have a swimming pool or a gym. This might be the one of the reasons for the geographically mixed responses. Another one might be that only residents with children at that school are aware of its dual-use as a sports facility. There is also an extant planning permission for a David Lloyd private leisure centre just to the east of the ring road, which suggests that there is unmet commercial demand for a gym in the area.

In **Cadbury Heath** perceived facilities provision was overall slightly lower than in Bradley Stoke, with over 10% stating that there was no district centre within five minutes drive time. Looking at the actual provision, whilst there is a leisure complex with a cinema, bowling alley and restaurants, this area lacks the type of shopping district area that the other two areas have. On the other hand, the town centre in Emerson green can probably be reached within five minutes drive from many places in Cadbury Heath as it is along the ring road. In line with the low number of children in Cadbury Heath fewer people were also aware whether there was a secondary school or children's play area within five minutes drive.

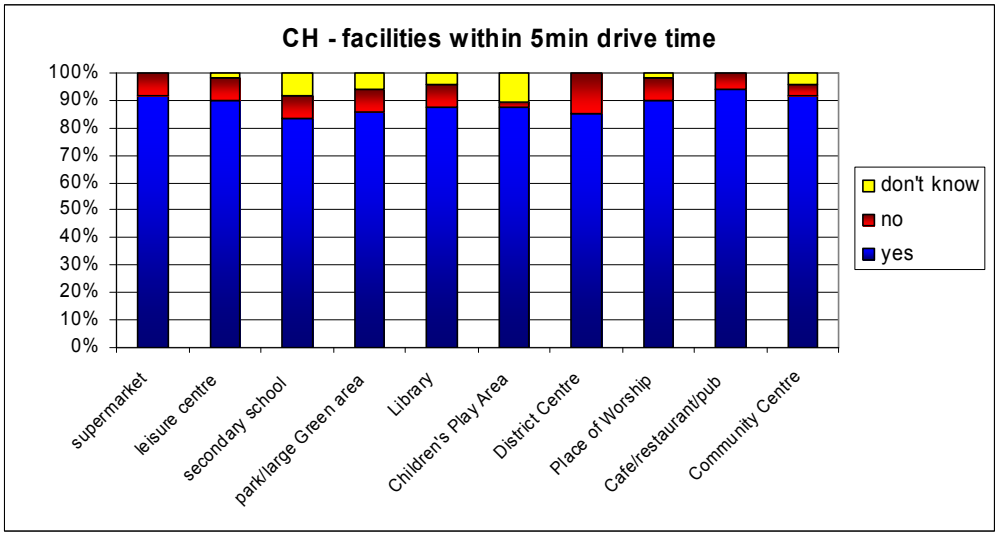


Figure 6-34: Cadbury Heath facilities available in five minutes drive time

6.2.3.3 Quality and Affordability

With regard to quality and affordability, respondents in the three areas were asked to name three facilities they had used most frequently in the last year and to give reasons why they chose to use each facility. When comparing the three areas, residents in the Bradley Stoke sample mentioned good quality and good reputation more than the other two areas, whereas the sample in Cadbury Heath appeared to be more concerned with the facility being cheap.

	Bradley Stoke	Emerson Green	Cadbury Heath
Cheap	18.1	5.2	18.5
Good Quality	44.9	32.0	37.9
Good Reputation	25.4	19.0	23.9

Table 6-35: Quality and Affordability

6.2.3.4 Perception as third place

When asked whether respondents had met friends or neighbours initially at these facilities or whether they ever planned to meet up, the results were as follows:

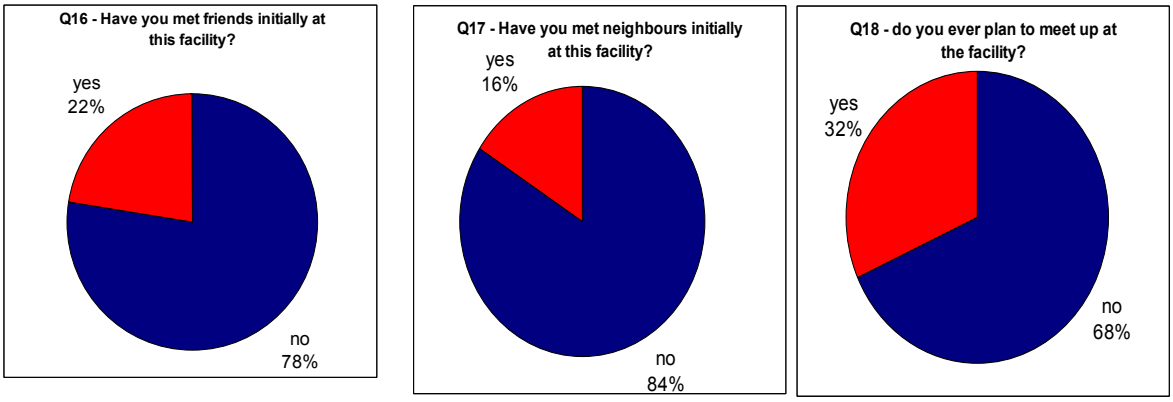


Figure 6-36: Facility as a third place

About 22% of respondents stated that they had met friends initially at the facility and around 16% stated that they had met neighbours initially through the facility. Over 30% stated that the facility was important for on-going social interaction as they made plans to meet people there. Comparing this with whether the facility was considered important for social interaction (see Figure 6-40 below), the same 30% seemed to agree that the facility was fairly to very important. Facilities that were rated by the respondents as important or very important for social interaction are referred to as *third places* in the ensuing analyses.

Comparing the three areas, respondents in Bradley Stoke reported a lower than average rate of meeting friends and neighbours initially at a facility, whereas respondents in Cadbury Heath were above average in initially meeting friends and neighbours at facilities.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
No, I haven't met friends initially	81.4%	76.0%	75.0%	77.4%
Yes, I have met friends initially	18.6%	24.0%	25.0%	22.6%

Table 6-37: Have you met friends initially at this facility?

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
No, I have not met neighbours initially	88.3%	83.8%	80.6%	84.3%
Yes, I have neighbours initially	11.7%	16.2%	19.4%	15.7%

Table 6-38: Have you met neighbours initially at this facility?

Comparing whether respondents ever planned to meet up at a facility, respondents in Cadbury Heath and Bradley Stoke both showed a larger than average percentage.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
No, I don't ever plan to meet up with people	65.2%	71.8%	65.1%	67.8%
Yes, I do plan to meet up with people	34.8%	28.2%	34.9%	32.2%

Table 6-39: Do you ever plan to meet up with people at these facilities?

When looking at the **importance for social interaction** that respondents have attributed to the same facilities, an interesting picture emerges: Whilst an equal number of 30% of respondents feel that the facilities are very or fairly important, nearly 50% feel that they are not important.

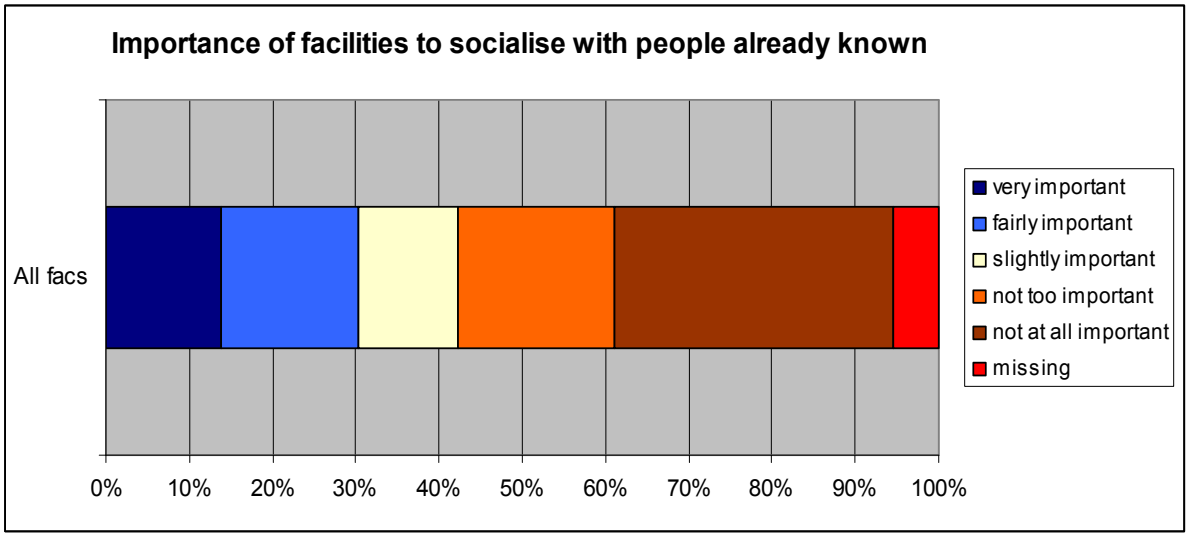


Figure 6-40: perceived importance of facility for socialising with others

Comparing the three areas, in both Cadbury Heath and Bradley Stoke 17% of respondents stated that the facility was very important for social interaction. Looking at an amalgamated table below, however, nearly 60% of respondents in Cadbury Heath stated that they didn't think that the facility was important for social interaction. Almost 50% of Emerson Green respondents rated the facilities as important for social interaction.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Important	44.8	46.4	42.4	44.7
Not important	55.2	53.7	57.6	55.3

Table 6-41: perceived importance of facility for social interaction

With regard to the type and location of these facilities, the following list shows facilities (within the group of most frequently visited facilities) that were rated as important or very important for social interaction by more than 2 people:

	Facility
Bradley Stoke	▪ Tesco at Willowbrook Centre ▪ Bradley Stoke Library ▪ Bradley Stoke Leisure Centre ▪ Baileys Court Inn (Pub) ▪ Wheatfield primary School
Emerson Green	▪ Sainsbury's at Emerson Green Town Centre
Cadbury Heath	▪ ASDA at Longwell Green ▪ Longwell Green Leisure Centre

Table 6-42: Third places as stated by more than 2 respondents

Interestingly, respondents from Bradley Stoke stated many more facilities than those in the other two areas. It is also interesting that the three large supermarkets in the area were mentioned as important places for social interaction.

6.2.3.5 Mix of Facilities

Within the group of the three most visited facilities, **106 individual** facilities were identified and located within the three areas (see Chapter 5) and rated in terms of their spatial arrangement, mix and visibility.

Starting with the location of the three most frequently used and identifiable facilities, in the Cadbury Heath sample these were above average stand alone facilities whereas in the other two areas, particularly in Emerson Green, they were part of a group. This is not too surprising, as Emerson Green and Bradley Stoke both have town centres which include a variety of shopping, leisure and community facilities, many of which were in the list of most frequently used facilities. Cadbury Heath, on the other hand, is lacking that central town centre and has stand-alone supermarkets, libraries etc.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Stand Alone	31.0	29.5	45.5	35.3
In Group	69.0	70.5	54.5	64.6

Table 6-43: Format of named facilities

When a facility was situated within a group, the number of different units within that group were counted. Again, Cadbury Heath appears to have more single units than the other two areas, whilst Emerson Green has large groups of facilities and Bradley Stoke has a range of 'local centres' with two to five facilities in which the most frequently used facilities are located.

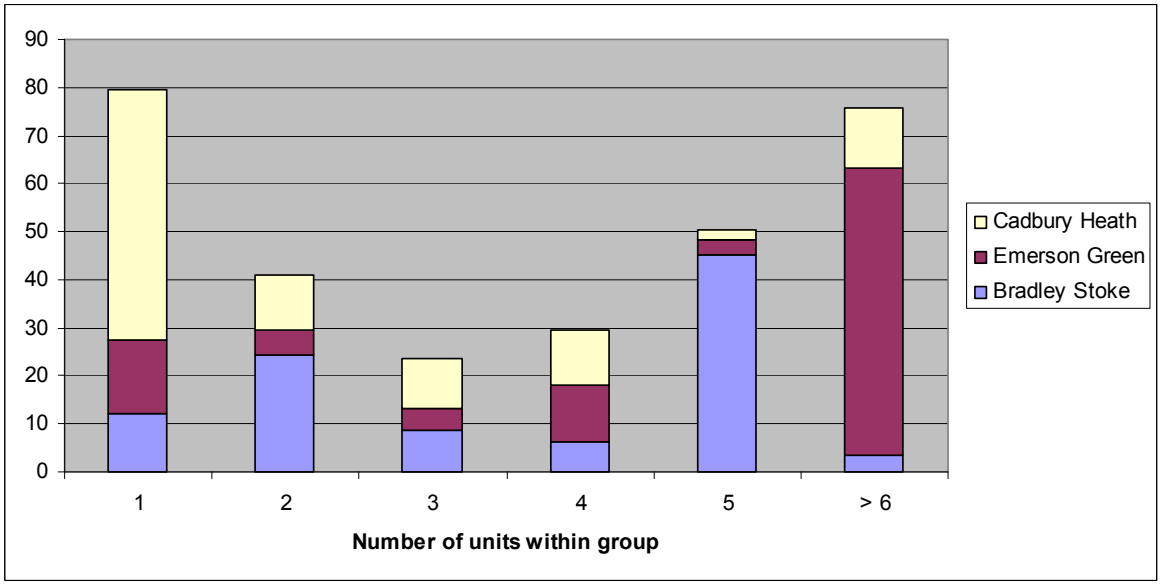


Figure 6-44: Number of units in group (in %)

When considering the type of mixing in these groups, vertical mixing was much less represented in the three areas. Whilst 'living above the shop or restaurant' is a very established way of living in Germany or France, in the UK this is a less favoured option by developers and potential buyers, often due to anticipated issues related to environmental health such as odour (from restaurants

etc) and noise (guests entering and leaving, goods delivery). Interestingly, Emerson Green had an above average share of vertically mixed facilities whereas Bradley Stoke had more facilities with shared entrances, probably due to the town centre which features a mall with a large number of shops and the leisure centre/library/café complex.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Horizontally	75.0	68.8	93.8	79.1
Vertically (e.g. flat above shop)	5.0	31.3	6.3	14.2
Same building/shared access	15.0	0	0	5.0

Table 6-45: Mixing type (in %)

When considering the number of different functions (convenience shopping, comparison shopping, outdoor recreation, leisure, sport, socialising, education, faith and transport) within a group, a large number of groups was dominated by one function in Cadbury Heath, whilst Emerson Green had the largest percentage of multi-functional groups.

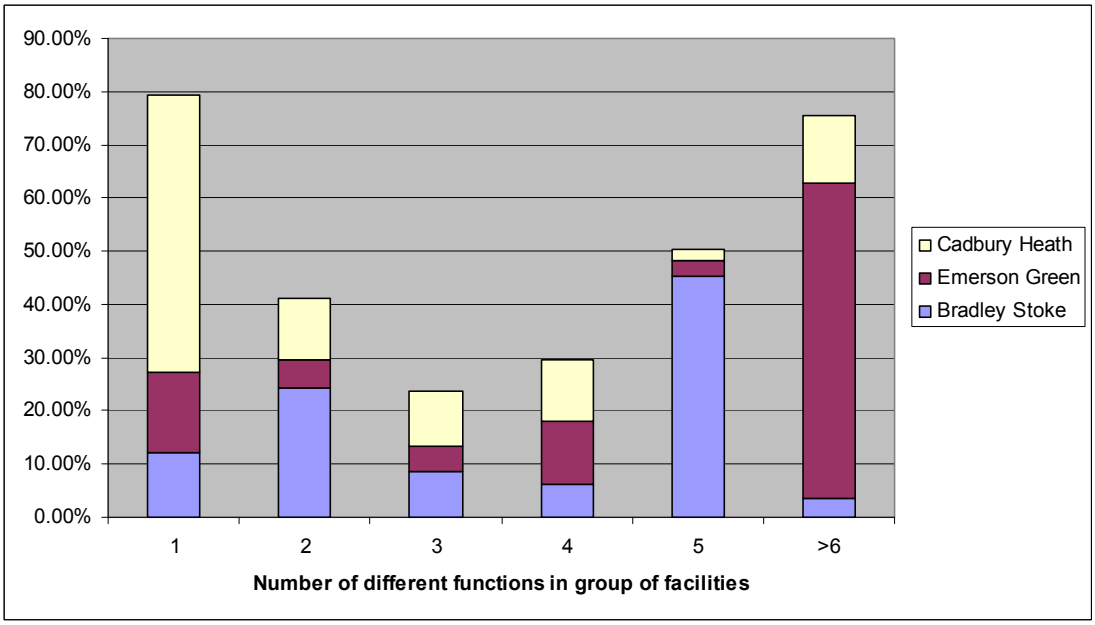


Figure 6-46: Number of different functions in same group of facilities (in %)

6.2.3.6 Spatial Arrangement and Visibility

The most frequently used facilities that could be located within the three areas were also rated with regard to their spatial arrangement and visibility. As can be seen from the table below, the majority of those facilities were situated central to the area, not on its periphery.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
On periphery of area	34.5	40.9	48.5	41.3
Central to area	65.5	59.1	51.5	58.7

Table 6-47: Location of Facilities (in %)

In Bradley Stoke a higher percentage of these facilities were located in corner positions than the average would suggest; in Cadbury Heath more of these were located along a street and in Emerson Green almost half of all these facilities were located in clusters off the street.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Along Street	41.4	38.6	51.5	43.8
Corner of 2 or more streets	20.7	11.4	12.1	14.7
Cluster off street	37.9	50.0	36.4	41.4

Table 6-48: Urban Form of Facilities (in %)

With regard to the street type and street shape, Cadbury Heath is the oldest area, with a traditional High Street (Longwell Green) on its periphery, but is also characterised by many cul-de-sacs. Bradley Stoke on the other hand is the most recent area to be built and is organised through a number of large residential spine/distributor roads to mark the smaller neighbourhoods, with several 'local district centres' with small supermarket, take away etc. located on these distributor roads.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Dual Carriageway	21.4	9.1	15.2	15.2
A Road (High Street)	0	20.5	33.3	26.9
Residential spine/distributor road	53.6	47.7	21.2	40.8
Residential through street	10.7	20.5	9.1	13.4
Residential cul-de-sac	14.3	2.3	21.2	12.6

Table 6-49: Street Type of Facilities (in %)

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Straight	70.4	79.5	60.6	70.1
Curve	14.8	15.9	9.1	13.2
Cul-de-sac	14.8	4.5	30.3	16.5

Table 6-50: Street Shape of Facilities (in %)

With regard to the visibility of the most frequently used facilities, the vast majority of facilities are visible either from the road they are on or a major road. Exceptions to this rule were often found to be primary schools, tucked away in residential areas.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Visible from main road	75.9	88.6	81.8	82.1
Visible from adjacent road	93.1	95.5	87.9	92.1

Table 6-51: Visibility of Facilities (in %)

6.2.3.7 Distance and Convenience

The distance between a resident's home and their named facilities was measured. Surprisingly, not much difference was found in the three areas, with the average of most frequently visited facilities lying between 1km and 1.5km with residents in Emerson Green travelling the furthest to their most frequently used facilities.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Distance in metres	1,074.59	1,689.52	1,147.25	1,303.78

Table 6-52: Distance to 3 most frequently used facilities in metres

Comparing the three areas with regard to the convenience of using these facilities, over 80% of respondents in the Emerson Green sample stated that 'Close to home' was an important consideration for using these facilities, which was considerably higher than the average of the three areas. More respondents in Bradley Stoke said that 'Close to work' and 'Close to other facilities' was an important consideration. Overall a very small percentage of respondents were employed at the facilities.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average
Close to Work	9.0	3.6	1.2	4.6
Employed at facility	0.6	0.6	1.8	1.0
Close to Home	74.3	80.2	60.5	71.7
Close to other facilities	19.2	16.8	14.4	16.8

Table 6-53: Convenience of using most frequently used facility (in %)

6.2.3.8 Mode of Transport

Examining car ownership rates in the three case study areas, Bradley Stoke has the highest rate of car ownership and Emerson Green the highest rate of car-less households. Cadbury Heath appears to be within the average of the three areas. Comparing this to the national average, it is apparent that these areas have much higher rates of households with two or more cars or vans. This is probably not too surprising, given that the areas are quite affluent and built as 'suburbs' with ample car-parking and the expectation that residents will use the car to access employment.

	Bradley Stoke	Emerson Green	Cadbury Heath	Average	England average
Households with no cars or vans	11.9%	13.9%	11.7%	12.5	25.8
Households with one car or van	48.3%	40.1%	42.7%	43.7	42.2
Households with two or more cars or vans	39.8%	46.0%	45.6%	43.8	26.0

Table 6-54 : Car ownership rates as per Census 2011 (in %)

Looking at the mode of transport respondents in the sample chose to reach the three facilities **they used most frequently**, respondents in Cadbury Heath used the car above average while respondents in Emerson Green walked above average, however these differences were not found to be statistically significant. It is difficult to compare this to a national survey, as the National Travel Survey 2011 records number of trips per mode, but these include employment/leisure trips, not just those to very local services, where lower car use would be expected. Accessibility statistics on the other hand measure how many minutes it takes by different modes to reach key services (Department for Transport, 2011), which does not record which mode was chosen.

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	Bradley Stoke	Emerson Green	Cadbury Heath	Average	National Travel Survey 2011 (% of trips by mode)
Car	55.3%	46.2%	61.1%	54.2%	64%
Motor bike	0.6%	1.0%	1.4%	1.1%	2%
Bus	2.6%	1.0%	0.0%	1.3%	7%
Walk	41.3%	51.6%	37.3%	43.4%	23%

Table 6-55: Mode of transport to 3 facilities used most often (in %)

Looking at whether these facilities were located within ten minutes walking distance or five minutes drive time, the biggest difference between a facility being situated within walking distance and people actually walking to it was found in the Bradley Stoke sample (72% stated that the facility was within walking distance, but only 41% walked there), whereas in Emerson Green there was quite a close match between the perceived closeness and respondents walking to the facility. This might also be influenced by the different car ownership rates as discussed above.

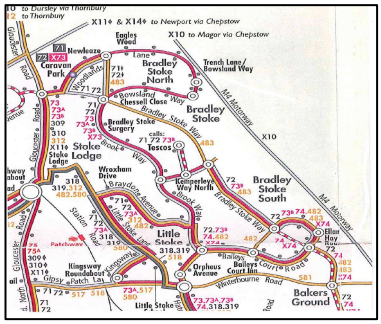
	Bradley Stoke	Emerson Green	Cadbury Heath	Average
yes	72.0%	59.3%	49.2%	60.2%

Table 6-56: Facility is located within ten minute walking distance (in %)

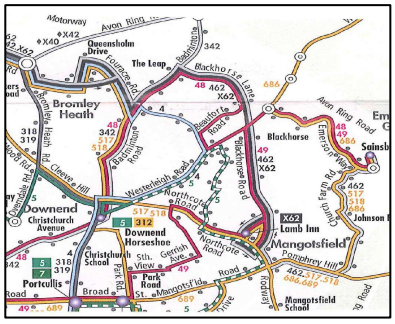
	Bradley Stoke	Emerson Green	Cadbury Heath	Average
yes	98.7%	91.0%	88.7%	92.8%

Table 6-57: Facility is located within five minute drive time (in %)

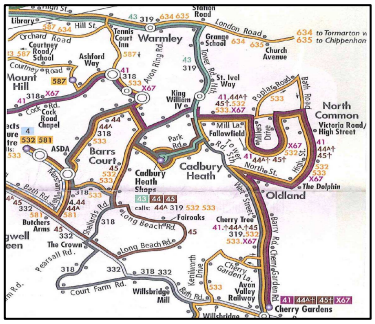
As was shown above (Table 6-55), very few respondents stated that they used the bus to reach their three most visited facilities. Bradley Stoke had a higher percentage (3%) than the other two areas, which was somewhat surprising, given that Bradley Stoke also had the largest percentage of car ownership. Looking at the bus networks below it is not immediately apparent that the Bradley Stoke area has a 'better' bus network than the other two areas.



Bradley Stoke



Emerson Green



Cadbury Heath

Finally, the distance between the facilities and their closest bus stop was measured in metres following actual roads or pedestrian pathways. As can be seen from the figure below, a considerable number of facilities have a bus stop located within 100 metres, with Emerson Green being the area with the closest bus stops to facilities.

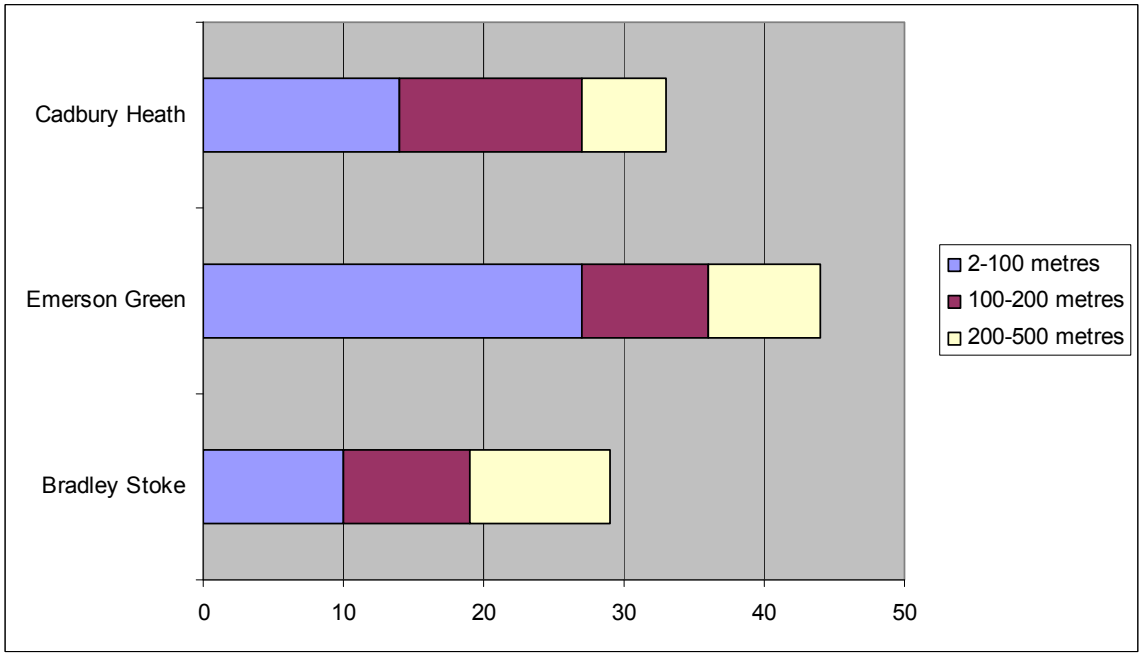


Figure 6-58: Number of facilities per distance category to nearest bus stop in metres

6.2.4 Summary Area Profiles

6.2.4.1 Bradley Stoke

Demographic Characteristics

- Youngest area, still some housing completions, 30% of respondents lived in area 2-5 years
- Most young families (30-44) with very young children (0-4),
- Most ethnically diverse (of the 3 areas) with 86% White British
- Highest employment rate (75%) and fewest retired people (18%), also highest rate of people looking after home/family (8%) of the three areas,
- Highest rate of home owners with a mortgage (56%) and high rate of ownership overall (86%),
- Highest percentage of married households with dependent children (42%) and lowest percentage of single pensioner households (4%)
- Highest percentage of professional occupations (42%) and associate professional and technical occupations (18%)

Social Characteristics

- 50% visit people from area monthly or less
- Highest percentage of respondents who talk to 1-5 neighbours (56%)
- Highest percentage of respondents who knew friends before moving to the area (46%) and over 30% increase (to 78%) of knowing friends and acquaintances in area now. Also, over 33% knew work colleagues in the area before moving there
- Lowest percentage of respondents who enjoy area and would like to stay for several years (80%)

Perception of Sample about the Study Areas

- Lowest percentage of perceived homogeneity (54%) and highest % of perceived visible social segregation (37%) but fairly low levels of perceived and actual crime.

Facility Characteristics of the Study Area

- Good local and district facility provision, exceptions; post office and hairdressers

6.2.4.2 Emerson Green

Demographic Characteristics

- Medium residency length, 35% of respondents lived in area for 5-10 years
- Most older families (45-59) with older children (5-11 years)
- High percentage of White British (91%)
- Lowest % of employed respondents (57%) and highest % of retired people (34%) in the three areas,
- Highest rate of home ownership (88%) and also highest rate of outright owners (45%), also highest rate of private rented (10%) of the three areas
- Highest percentage of single pensioner households (20%) and lowest percentage of married households with non-dependent children (11%) but over 30% of households are married with dependent children
- High percentage of professional occupations (34%) and administrative /secretarial occupations (34%)

Social Characteristics

- Highest percentage of people who never visit people in the area (30%)
- Highest percentage of respondents talking to over 20 neighbours (5%) but 44% of respondents only talk to 1-5 neighbours
- Lowest percentage of respondents having family in the area (15%) but high increase in having friends and acquaintances since moving to the area (from 30% to 66%)
- Highest percentage of respondents who enjoy living in the area and would like to stay for several years (~92%)

Perception of Sample about the Study Areas

- Highest % of perceived homogeneity of area (67%) and very low perceived (72%) and actual crime levels; highest % of respondents feeling safe walking in area after dark (67%)
- Also highest % of respondents feeling that there is a lot of traffic in the area (60%)

Facility Characteristics of the Study Area

- Perceived good local provision, apart from post office, takeaways and newsagent; ;district provision shows a perceived lack of a leisure centre

6.2.4.3 Cadbury Heath

Demographic Characteristics

- Long residency, 33% of respondents had lived in area for 20-30 years
- Highest % of White British and other (94%),
- Most older people and pensioners (60-89 years) and most teenage children (12-18 years)
- Low employment percentage (58%) and quite high retired percentage (25%) and highest percentage of permanently sick/disabled respondents (6%)
- Lowest home ownership rate (83%) and highest social housing rate (8%)
- Large percentage of single pensioner households (15%), lowest percentage of married couples with dependent children (21%) and highest percentage with married couples and non-dependent children (23%)
- High rate of professional occupations (41%) but also highest rates (around 5%) of semi skilled professions and 2.4% permanently sick or disabled

Social Characteristics

- Highest percentage of respondents who visit people in the area daily or weekly (40%)
- Highest percentage (56%) of respondents talking to 5-20 neighbours and lowest percentage of people talking to 1-5 neighbours (42%)
- Over 35% of respondents had family before moving to the area and this has increased to 44% since moving there. Also highest percentage of respondents stating that they have friend in the area (82%)

Perception of Sample about the Study Areas

- High levels of perceived homogeneity (over 63%) and very low levels of visible social segregation (58%) but area with highest perceived (45%) and actual crime rate and highest % of respondents who do not feel safe walking after dark (24%)

Facility Characteristics of the Study Area

- Perceived availability of local and district facilities is good apart from hairdressers and takeaways

6.3 EXTENT OF FACILITY USE BY THE SAMPLE

Having provided an overview of the sample characteristics and the three sample areas, this section addresses research **Objective 1**, by establishing the extent of local facility use in the sample. As highlighted in the literature review, very few studies have analysed the extent of local facility use across a range of local facilities, hence there was a need to revisit this, extend the range of facilities and also analyse whether there was a difference between the use of **neighbourhood facilities**, (defined by the respondents as within ten minutes walking distance from their home) and **district facilities** (defined by respondents as being situated within five minutes drive time of their home). The latter facilities are still local enough to be situated within the residential areas but serve a wider catchment area, such as a large supermarket.

When combining the groups of neighbourhood and district facilities into one group, this did NOT include schools, nurseries and children's play areas as they require someone to have children to be used, whereas all other facilities do not have a prerequisite for use. Furthermore, nurseries and primary schools were used daily by about 90% of the people who did use them, which would have skewed usage levels for other facilities within the same group. These were only tested as individual facility types.

When inspecting the frequency of use of **all facilities together** (excluding children related facilities as discussed above), it becomes apparent that only about a quarter of the facilities in the area were *never used* by respondents in the sample, whereas around 35% of all facilities were *used daily or weekly* by the respondents (see figure below).

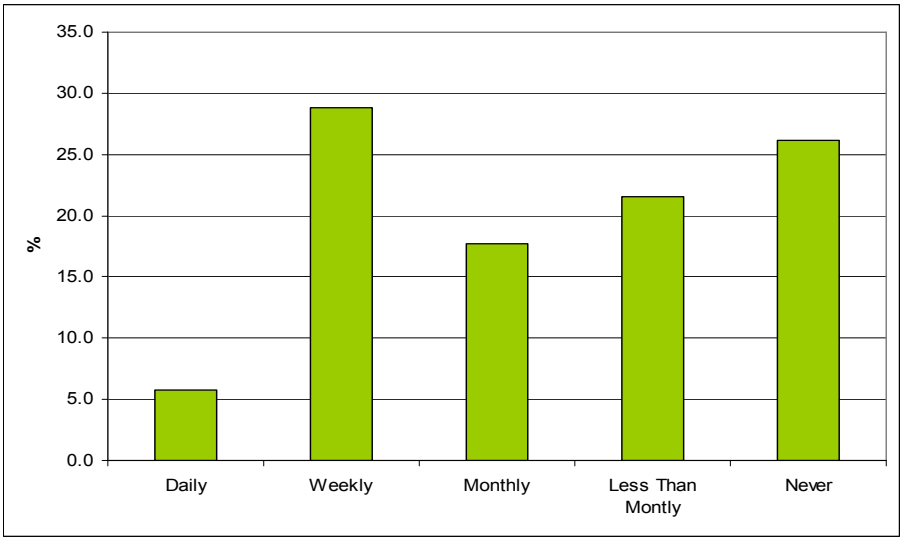


Figure 6-59: % of use of all Facilities tested

Given the different types of facilities included in the group and the fact that they have different catchments this is not very informative. The first step has been to divide the facilities into neighbourhood and district facilities. As a reminder, the two groups include:

Neighbourhood Facilities

- Newsagent
- Corner shop/food store
- Hairdresser/barber
- Takeaway
- Bus stop
- Post office
- Local café/restaurant/pub
- Green space
- Children's play area
- Primary school
- Nursery

District Facilities

- Supermarket
- District Centre
- Place of worship
- Library
- Café/restaurant/pub
- Park/large green area
- Community centre
- Leisure centre
- Secondary school
- District children's play area

Primary schools, nurseries and children's play areas (highlighted in blue) were excluded from the list due to the issues set out above. When looking at the remainder of the group, and comparing this with the use of all district facilities as a group, it becomes obvious that neighbourhood facilities were used more than district facilities overall (20% never used compared to 27% never used), but not more frequently, as 45% of neighbourhood facilities were used monthly or less, whereas only 34% of district wide facilities were used monthly or less. With regard to daily and weekly use, more of the district facilities were used more frequently. As will be discussed in more detail below, supermarkets were in the group of district facilities and were used daily or weekly by a large percentage of the respondents (94%), hence this could have had an effect on the group of district facilities.

	Neighbourhood Facilities	District Facilities
Daily or Weekly	33 %	37 %
Monthly or less than monthly	45 %	34 %
Never	20 %	27 %

Table 6-60: Use of neighbourhood and district facilities

6.3.1 Individual Facility Types

When analysing individual facility types, the use categories have been summarised into

- **frequent use** (daily or weekly use), and
- **non-frequent use** (monthly, less than monthly and never).

For hairdresser/barber and takeaway, these categories were changed to include monthly in the 'frequent use' category, as these facilities are considered to be used less frequently, and a regular monthly use is considered a 'frequent use' of that facility type.

Within the group of district facilities (see figure below), **supermarkets and district centres** were the facilities used frequently by the majority of the respondents in the sample: 94% and 68% respectively. This confirms findings from other studies who also found that supermarkets were frequently used by the majority of the population. Dempsey *et al.* (2012) found that 70% of residents in the sample used the supermarket in their local area at least once a week whilst other studies found that around 90% of people used supermarkets in their local area (without considering different frequencies) (Fisher and Bramley, 2006; Horswell and Barton, 2010). Interestingly, a study in Scotland comparing different highly deprived areas found that in those areas only about 41% of respondents used local supermarkets (Macintyre and Ellaway, 1998), which points towards other issues such as the quality, affordability and accessibility of supermarkets, which are discussed in Chapter 7. Previous studies looking at facilities have not specifically measured the frequency of use of district centres, but have gathered information on the use of 'local shops' which was high (Dempsey *et al*., 2012).

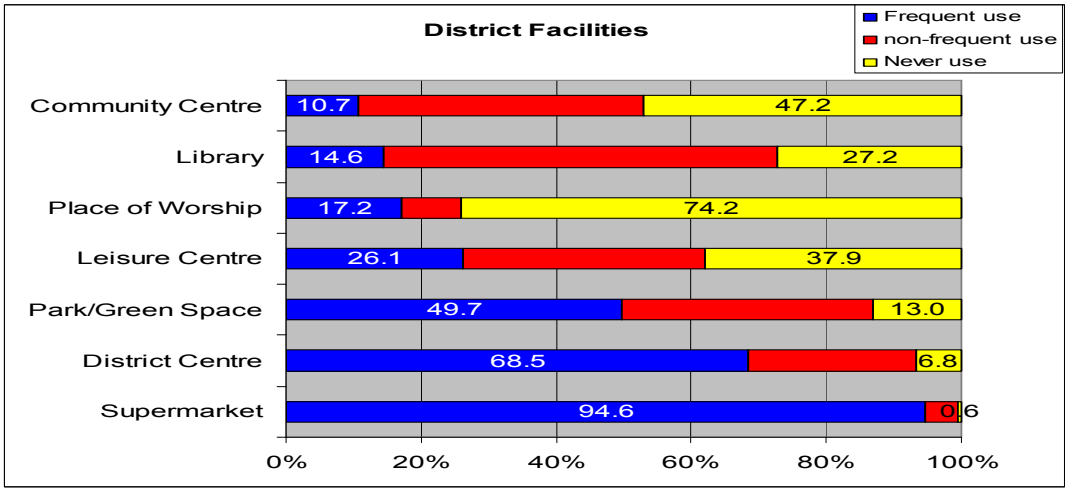


Figure 6-61: Frequency of use of district facilities

With regard to district wide **leisure and sports facilities and parks/green spaces**, Horswell and Barton (2005) found that around 25% of residents made use of outdoor leisure facilities, but this

appeared to be much higher in this sample (close to 50% of respondents used parks/green spaces frequently). Sports facilities on the other hand, have been found to be used by over 50% (Horswell and Barton, 2010) or 48% (Fisher and Bramley, 2006), which was supported by this study which found that over 60% of respondents stated that they used the leisure centre, but only 26% used it frequently.

With regard to **libraries** Fisher and Bramley (2006) found that 63% of respondents made use of the library. This was even higher in this study with 72% using the library, but only 15% using is frequently. Use of a **place of worship** in the UK was found to be 30% (ibid.), which was a little bit less in this study with 26% with just over half of those using the facility stating that they used it frequently. Interestingly, similar studies in the US showed place of worship use to be around 51% (Ahlbrandt, 1984), which shows the prominence of religion in US society compared to British society.

When considering use of neighbourhood facilities (see figure below), **corner shops** have been found to be used by the majority of local residents, around 80% (Fisher and Bramley, 2006). This has been confirmed by this study which found that 94% of respondents stated that they used a corner shop/small food store and 65% of respondents used that facility type frequently.

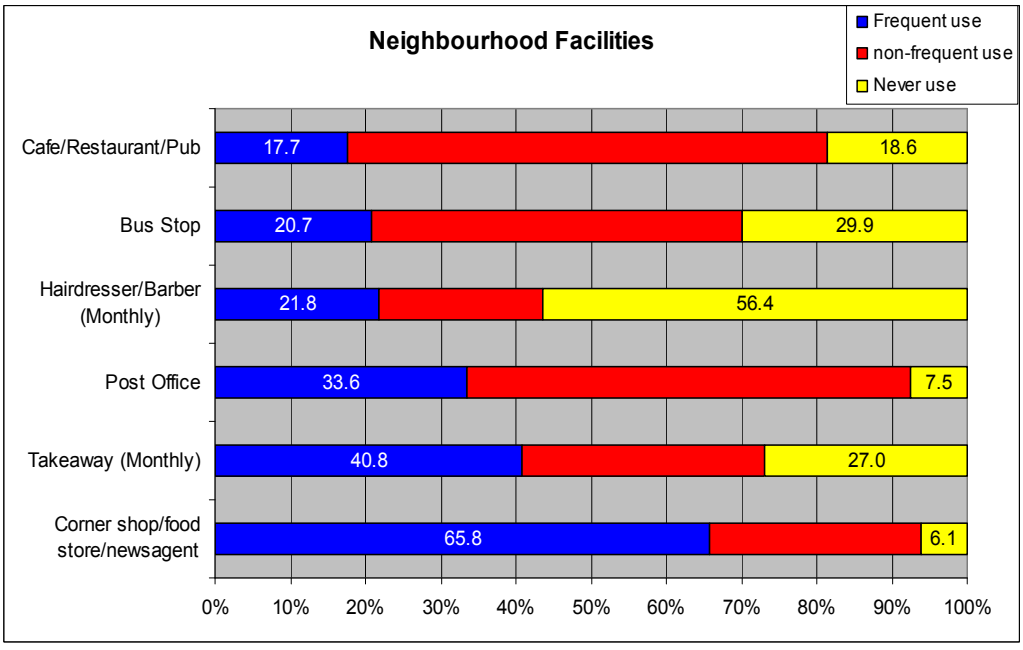


Figure 6-62: Frequency of Use of Neighbourhood Facilities

Post offices have also been found to be used by a large proportion of the population, for example over 75% (Horswell and Barton, 2005) or even 90% (Fisher and Bramley, 2006). This was

confirmed by this study with 92% of respondents stating that they used the post office at some stage, however only about a third of respondents frequently used this facility.

Bus services were found to be used by 55% of the population (Fisher and Bramley, 2006), which was surprisingly higher in this study with over 70% of respondents claiming they used the bus stop from time to time, but only 20% stating they used it frequently.

This study did not distinguish between **pubs, restaurants and cafes**, whereas other studies specifically found that pubs were used by 59% (ibid.) down to 51% in the study considering high deprivation areas in Scotland (Macintyre and Ellaway, 1998). In this study, cafes, pubs and restaurants as one category were used by around 80% of respondents with 17% stating that they used them frequently.

Other neighbourhood facilities were **takeaways** and **hairdressers/barbers**, which were found to be used by 70% and 44% respectively with 40% and 21% of users reporting to use those facilities at least monthly or more often. Hairdressers were used by a surprisingly low number of respondents but the main reason stated for not using those was that people had 'visiting/mobile' hairdressers.

When analysing children-related facilities (see Figure 6-63 below), such as **schools, nurseries** and **children's play areas**, it is important to remember that the percentage of respondents who had children aged 5-11 years was just over 19% in the sample, indicating that anyone with children in that age group was using primary schools and was using them frequently. With regard to older children, the percentage of parents with children aged 12 to 18 years old was around 13% in the sample, hence all parents brought children to secondary school at some stage, but only 10% did so frequently. Nurseries were somewhat different as around 17% of respondents had children aged 0-4, but only around a third used nurseries, as they were often stated to be too expensive. Of those people who did use nurseries, over 90% used them frequently. This highlights that schools, which are often thought of as ideal places for social interaction, are only used by and, therefore relevant for less than 20% of the adult population as places to have social interaction, as will be discussed in Chapter 8.

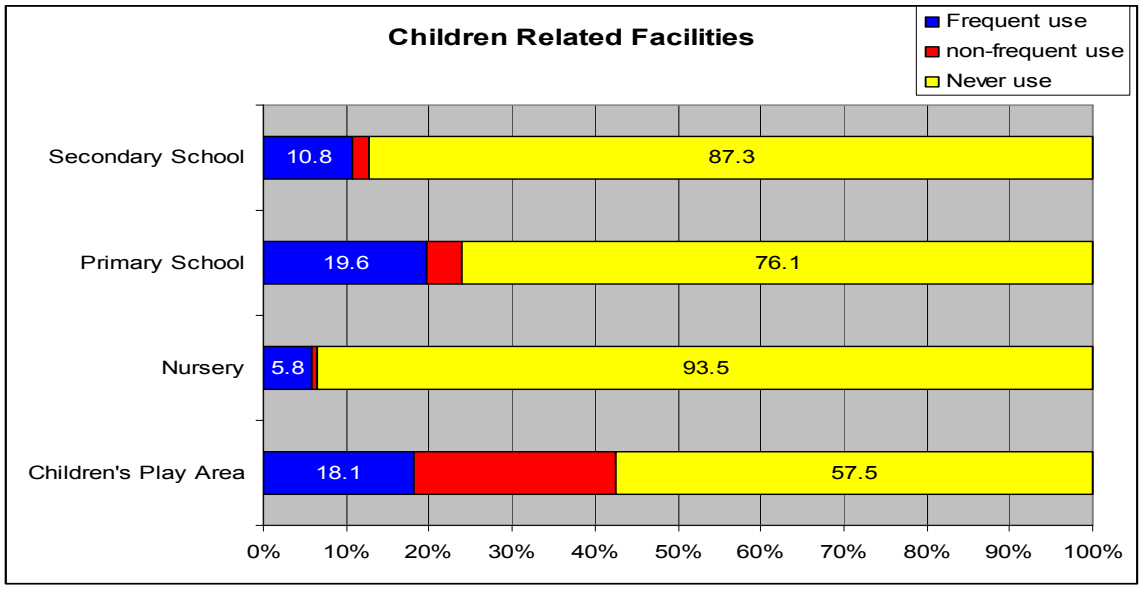


Figure 6-63: Frequency of Use of Children Related Facilities

Children's play areas were measured as neighbourhood and district wide types, but the frequency of use was identical, hence their results have been combined here. Fisher and Bramley (2006) found in their study that 63% of the population used children's play facilities, which was not the case in this study, where the figure was close to 42%. Even that figure is surprisingly high given that only 36% of respondents stated that they had children aged 0-11, which would encompass the age range within which children's play areas are normally used. As only 18% stated that they used those frequently, one possible explanation would be that grandparents, other relatives or divorced parents who did not have young children living with them permanently, might nevertheless use children's play facilities infrequently (monthly or less than monthly) when the children were visiting.

In summary, the section has shown that it is important to analyse factors affecting use of facilities for each individual type, as they have very **different use levels** and even differences as to what constitutes frequent use.

6.4 LOCAL FACILITIES AS PLACES FOR SOCIAL INTERACTION

Having discussed to what extent residents in the sample used local facilities in the area with particular reference to the different types of facilities, this section discusses to what extent the group of '*most frequently used facilities in the last year*' are places of social interaction.

Whilst the 'use' questions related to **facility types** available in the area, i.e. supermarkets, libraries etc., this part of the survey questionnaire asked respondents about **specific facilities** which they had used most frequently during the last year. Only by gaining information on a specific facility

about social interaction levels, mode of transport etc. was it possible to also rate that specific facility with regard to its facility characteristics (spatial arrangement, mix, etc.) and establish associations between predictor variables (e.g. mix) and the outcome variable (social interaction levels at that specific facility). In other words, the outcome variable (social interaction) had to be exactly geographically located at a facility in order to assess the impact of the facility characteristics on the outcome variable.

Considering the survey results, respondents were asked how often they *saw other people they recognised*, *greeted other people* or *stopped to talk to other people* at the three facilities they used most often. Figure 6-64 below shows that between 30% and 45% of those facilities were named by respondents as places where they frequently engaged in social interaction (every time or most times). Even if seeing familiar people was excluded, as this does not strictly constitute an 'interaction', 45% of facilities were still reported to be places that residents greeted other people they recognised and at a third of facilities respondents frequently stopped to talk to people they knew. Conversely, between a quarter and a third of the most frequently used facilities were places where respondents stated that they rarely or never engaged in any form of social interaction (see Figure 6-64).

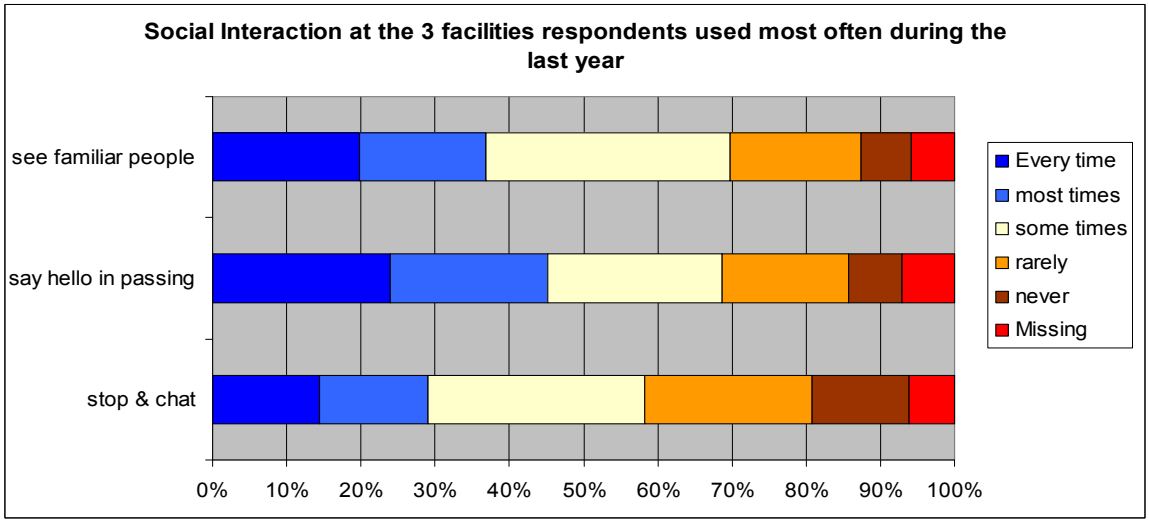


Figure 6-64: Combined types of Social Interaction at Facilities

6.4.1 Facility Groups and Individual Facility Types

Given that between a third and half of all local facilities constitute places for frequent social interaction it is interesting to divide facilities into sub-groups, for example distinguishing between **educational, commercial and leisure facilities** to see whether these groups of facilities have a common pattern.

When analysing groups of facilities, the frequency of social interaction categories have been summarised as

- **frequent social interaction** constituting most times, every time, and
- **non-frequent social interaction** constituting some time, rarely and never.

Furthermore, only 'greeting' and 'stop to talk to' are reported here, as they constitute 'active social interaction'. The facilities were grouped into three categories:

- **Leisure** - park and green spaces, children's play, leisure centre, library, place of worship, community centre, and café/restaurant/pub
- **Educational** - all schools and nurseries
- **Commercial** – supermarket, corner shop/newsagent, post office, district centre, hairdresser, takeaway, bus stop

When considering the figures below, it is noticeable that almost 80% of educational facilities (within the group of most frequently used facilities) were reported to be places where people frequently talk to other people. This confirms findings by other researchers relating to the importance of schools and nurseries as social hubs for anyone using them (Camina and Wood, 2009; Jencks and Mayer, 1990; Jupp, 1999, Silverman *et al.*, 2005).

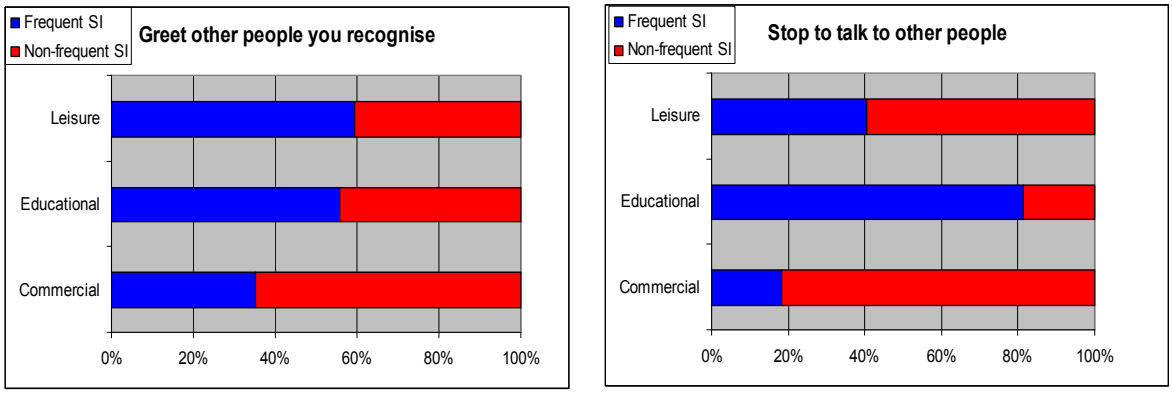


Figure 6-65: % of leisure, educational and commercial facilities used for frequent social interaction

For leisure facilities, whilst 60% of facilities were places where respondents greet others, only 40% are places where respondents frequently stop to talk to each other. These are still considerable percentages of those facilities, which supports other studies claiming that children's play areas and green spaces can make an important contribution to social interaction within neighbourhoods (Sullivan, 2004; Skjaeveland and Garling, 1997).

Commercial facilities as a group were less likely to be places of high social interaction: In the sample only 38% of commercial facilities were stated to be places where respondents greeted other people and less than 20% were places where respondents stopped to talk to others. Supermarkets constituted by far the largest group of frequently used commercial facilities, hence these finding support Barton *et al*. (2007) and Piacentini (2001) who found that supermarkets are not only the most frequently visited local facility, but also that *some* local supermarkets constituted important social hubs for the community. Overall this group has not as many 'social' places as the other two groups. The literature has highlighted a number of specific facility types as places with potentially higher levels of social interaction, such as green spaces (Kuo et al, 1998), supermarkets and shopping malls (Feinberg and Sommer), corner shops (Jacobs, 1961) schools (Jupp, 1999) and churches (Ellison and George, 1994) hence, it is interesting to also analyse social interaction levels for each individual facility type.

Before reporting the social interaction levels, the most frequently used facilities in the last year **by facility type** were:

- Supermarkets (named 146 times)
- District Centres (45 times)
- Restaurant/Pub/Café (44 times)*
- Park/Open Space (33 times)*
- Library (29 times)
- Schools (25 times)
- Leisure Centre (23 times)
- Corner shop/Newsagent (19 times)
- Place of Worship (18 times)
- Play Area (12 times)
- Post Office (11 times)

Other facilities, such as community centre, hairdresser, take away and bus stop were mentioned less than five times, so they have been grouped in the category of 'others' in the following figures.

Examining Figure 6-66 and Figure 6-67, overall facility types are more often places where people greet other people than where they talk to each other. Almost all of the frequently used places of worship and schools are places where people greet and talk to each other.

More than half of all frequently used parks/open spaces, leisure centres and play areas are places where respondents greet other people, but fewer facilities in this category are also places where people talk to others.

Between one fifth and one third of all post offices, newsagents and district centres are places where people greet others, and this reduces considerably more when talking to others is considered. The difference between the percentage of facilities where people greet others and where they talk is particularly pronounced for post offices and libraries, the latter perhaps due to the requirement of providing a quiet reading environment.

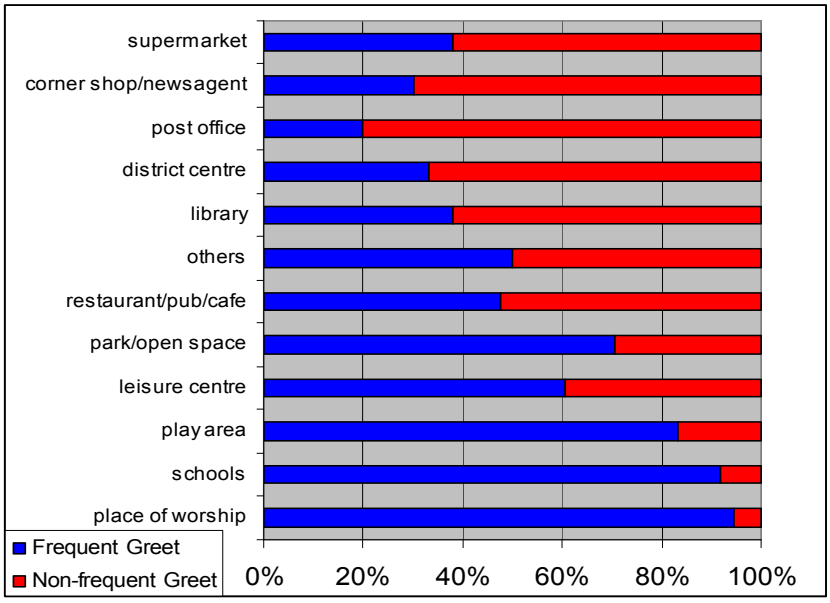


Figure 6-66: % of facility types places of greeting other people

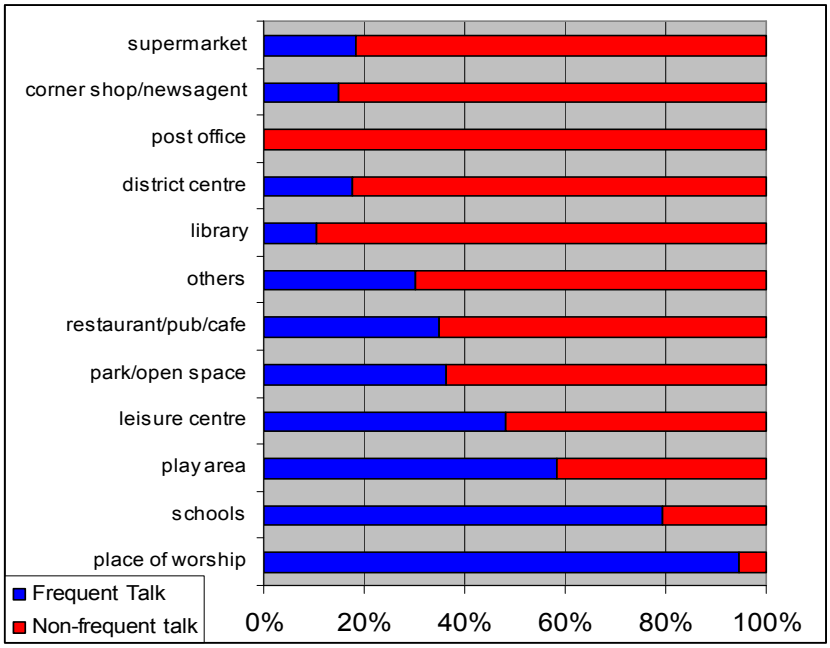


Figure 6-67: % of facility types places of talking to other people

A final method of grouping and comparing facilities is **by their catchment area**. When comparing neighbourhood facilities to district facilities (as grouped in Section 6.3 above), it can be observed that 60% of neighbourhood facilities were named by respondents to constitute places where they greet others and 40% to be places where they talk to others, whereas the corresponding percentages for district facilities are lower at 43% and 26% respectively. This demonstrates the importance of neighbourhood facilities with very small catchment areas for social interaction and requires more investigation to understand why this difference occurs.

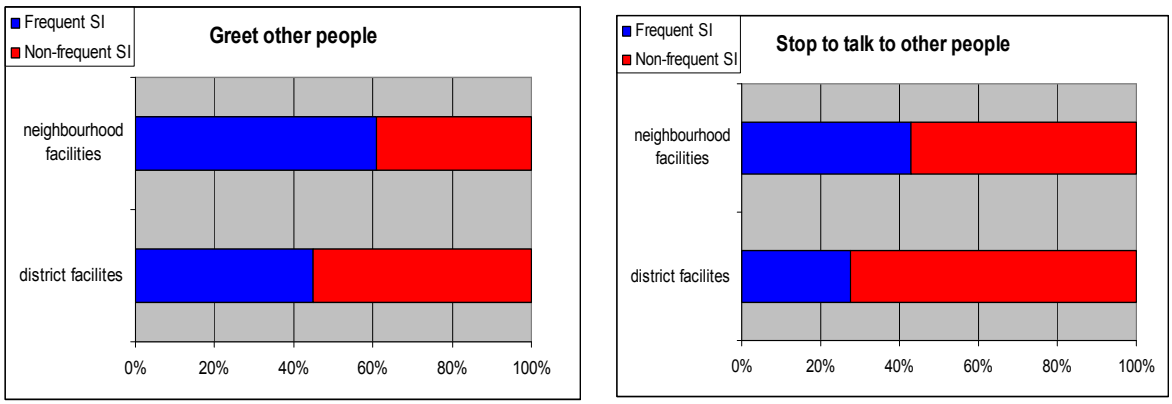


Figure 6-68: % of neighbourhood and district facilities constituting places for frequent social interaction

6.5 SUMMARIES

This chapter firstly aimed to provide an overview of the characteristics of the sample and the sample areas using information from the facilities survey, the survey questionnaire and secondary data sources, such as the Census. Differences and similarities between the areas were highlighted to give an idea about the type of areas they are and the population that live there.

Secondly, the chapter addressed **objectives 1 and 3** using descriptive statistics to show to what extent local facilities were used by the sample and to what extent social interaction occurred at these facilities. To summarise, over a third of all local facilities were used frequently by respondents and some facility types, such as supermarkets, district centres and corner shops were used frequently by the majority of respondents. With regard to social interaction, between a third and half of all frequently used local facilities were places where respondents engaged frequently in social interaction. Again, there were considerable differences between facility types, with over two thirds of all frequently used places of worship, schools, children's play areas and parks/open spaces constituting places where respondents frequently engaged in social interaction. Whilst certain relationships between the respondents, the facilities, their use and the social interaction at them seem to be apparent in the data, further analysis is necessary in the following chapters to understand these relationships and to ascertain their significance. The next two chapters analyse in detail the factors affecting the use and social interaction at facilities using statistical analysis.

Chapter Seven

Findings: Factors Influencing Local Facility Use

7.1 INTRODUCTION

The last Chapter used descriptive analysis to show, inter alia, the extent of local facility use by the sample in the selected areas thereby addressing research Objective 1. This chapter follows on to address **Objective 2** by analysing which factors influence the level of use of local facilities. Based on the literature review in Chapter 2, the factors are divided into the same three broad categories for analysis. First, facility characteristics relating to the facility and perception of it, followed by area characteristics relating to the area the facilities are located in and resident's perception of it and finally personal characteristics of the users of the local facilities.

The analysis uses a mix of methods from descriptive statistics such as cross-tabulations and maps to more sophisticated analysis of logistic regression where possible. Throughout the chapter the reasoning behind using these methods is explained to aid the reader's understanding. In the area characteristics and personal characteristics sections, factors influencing frequent use are first tested grouping the facilities into neighbourhood and district facilities, followed by testing specific facility types. The latter was necessary as the previous chapter has demonstrated that specific facility types (e.g. school, supermarket) have very different use levels.

Each section has a short summary highlighting and comparing the factors identified to influence use at the end and the chapter as a whole concludes with an overview and summary of the findings from the main sections.

7.2 FACILITY CHARACTERISTICS AFFECTING LOCAL FACILITY USE

The section concerning facilities and their characteristics affecting use follows Fisher and Bramley's framework (2006) as discussed in Chapter 2, considering the following characteristics in turn:

- **Supply** i.e. availability, quality and affordability
- **Accessibility of facility** i.e. distance, convenience and mode of transport
- **Other users** at facility i.e. as a attraction or detraction
- **Spatial distribution**, i.e. location, mix and spatial arrangement

7.2.1 Supply

Supply has several aspects to it which relate to the availability of local facilities in neighbourhoods as well as the quality and affordability of the facilities. All three elements were expected to have an influence on the frequency of use of the facilities and have been analysed in turn.

7.2.1.1 Availability of Local Facilities

There is an implicit assumption that facilities will be used if they are available. This has however been questioned, for example Riva *et al.* (2007) found no association between the number of locally available physical activity facilities and the likelihood of their use. In this study, respondents were asked whether certain facility types were within ten minutes walking distance of their home (neighbourhood facilities) or within a five minute drive time of their home (district facilities). Graphs and maps in Sections 6.2.3.1. and 6.2.3.2. have shown that the overall provision of facilities was very high in the three selected residential areas and well distributed across the areas. Also discussed in Chapter 6, deprivation levels across the three areas were similar hence there were no obvious differences in the provision of facilities due to the economic situation of the three areas, as has been found in other studies (Turok *et al.*, 1999; Macintyre *et al.*, 1982). Whilst a*ccessibility* of facilities is discussed further below, availability as a variable that could influence frequency of use is discussed here.

A logistic regression model was used testing the percentage of different neighbourhood facilities present in the area and whether this influences the frequency of their use. An example of a full logistic regression table and the information it provides is described in Section 5.7.1.1., here the results are only summarised. The overall model for neighbourhood facilities was significant (p=<0.05), indicating a medium relationship of 51% between the predictor and the prediction, correctly classifying 65% of cases. The model demonstrated that the more facilities were available in the area the more frequently they were used and that this applied both to neighbourhood and district facilities.

	B	Wald	Sig.	Exp(B)
% of neighbourhood facilities available in area	.025	6.069	.014	1.025
Constant	-1.496	3.021	.082	.224
Model predicts 65.1% correctly Note R^2 = 0.37 (Cox and Snell), 0.51 (Nagelkerke); Model x^2 = 6.28; p=<0.012				

Table 7-1: Availability of neighbourhood facilities on use of those facilities

	B	Wald	Sig.	Exp(B)
% of district facilities available in area	.025	5.157	.023	1.026
Constant	-1.699	2.883	.090	.183
Model predicts 65.1% correctly Note R^2 = 0.33 (Cox and Snell), 0.46 (Nagelkerke); Model x^2 = 5.624; p=<0.018				

Table 7-2: Availability of district facilities on use of those facilities

When considering individual facility types, the table below shows whether or not a significant association between the existence of specific neighbourhood and district facility types exists and how strong the association is, using Phi for two binary categorical variables. Whilst some of these results were as expected, such as primary and secondary school and green space, people also

used the district centre more frequently if it was located locally, but not the supermarket or the library. Clearly other factors have a bearing on whether this facility was used frequently or not, which will be explored below.

	Facility type	Significant Association?	Phi	Strength of Association*
Local Facilities	Bus Stop	No		
	Newsagent	No		
	Local Green Space	Yes	.198	Low
	Post Office	No		
	Take away (monthly)	No		
	Very Local Children's Play Area	Almost (0.053)	.153	Low
	Primary School (parents only)	Yes	.423	medium
	Hairdresser/Barber (monthly)	No		
	Local Café/Restaurant/Pub	No		
	Corner shop/food store	No		
	Nursery	No		
District Facilities	Supermarket	No		
	Leisure centre	Almost (0.054)	.174	low
	Secondary School (parents only)	Yes	.377	medium
	Park/large green area	Yes	.244	low
	Library	No		
	District wide children's play area	No		
	District Centre with a range of shops	Yes	.322	medium
	Place of Worship	No		
	District Café/Restaurant/pub	No		
	Community Centre	No		

Table 7-3: Association between availability of facilities and frequency of use of facilities.
de Vaus (2002) Correlation 0.1-0.29=low, 0.3-0.49 = medium, 0.5-0.69 = high

Before moving on to how quality and affordability impacts on frequency of use, certain limitations of the data need to be discussed which informed the choice of methods of the ensuing analysis. As set out in Chapter 6, respondents were first asked how frequently they used different types of facilities and were then asked a number of questions relating to the **three facilities they had used most often** during the last year. This was done to enable the collection of data relating to specific facilities (e.g. their location, spatial arrangement, urban design features etc.) to analyse the impact of those primarily on social interaction. The most frequently used facilities by facility type were:

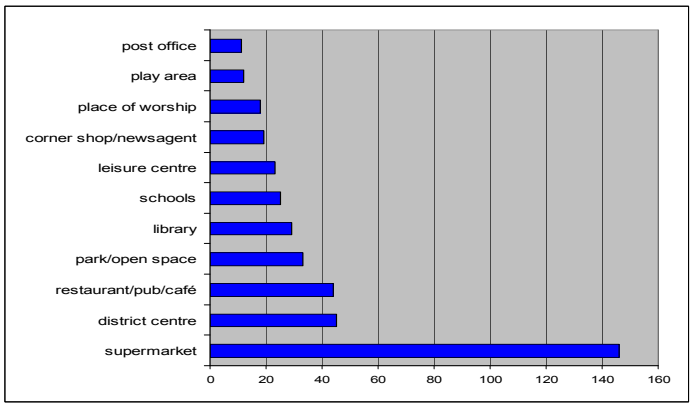


Figure 7-1: Most frequently used facilities by type

With regard to use, the group of 'most frequently used facilities' displays the following variance in use frequency for each facility type: Figure 7-6 below shows that some facility types, such as schools, were used daily by a large percentage of respondents whilst others, such as place of worship, supermarket and leisure centres, were used predominantly weekly, demonstrating clearly that the **type of facility** has a strong bearing on the frequency of its use.

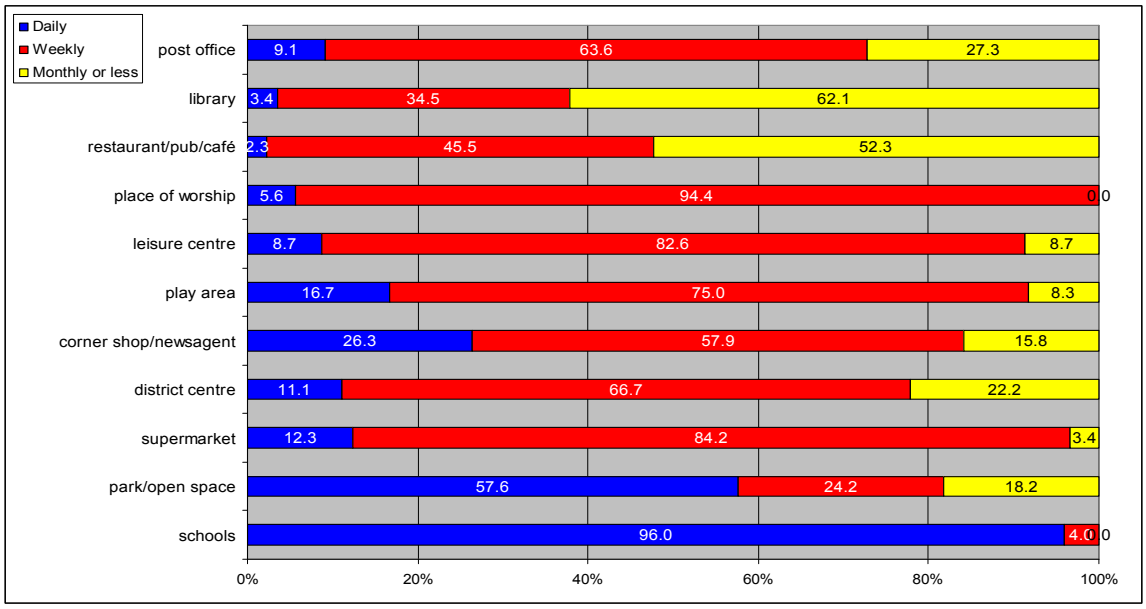


Figure 7-2: Percentage of use of most frequently used facilities by type

Where there was more of a variance in frequency use, for example post office, district centre and park/open space, the actual number in each category was too low (1-3 cases) to conduct more advanced statistical analysis such as regression (see Figure 7-3).

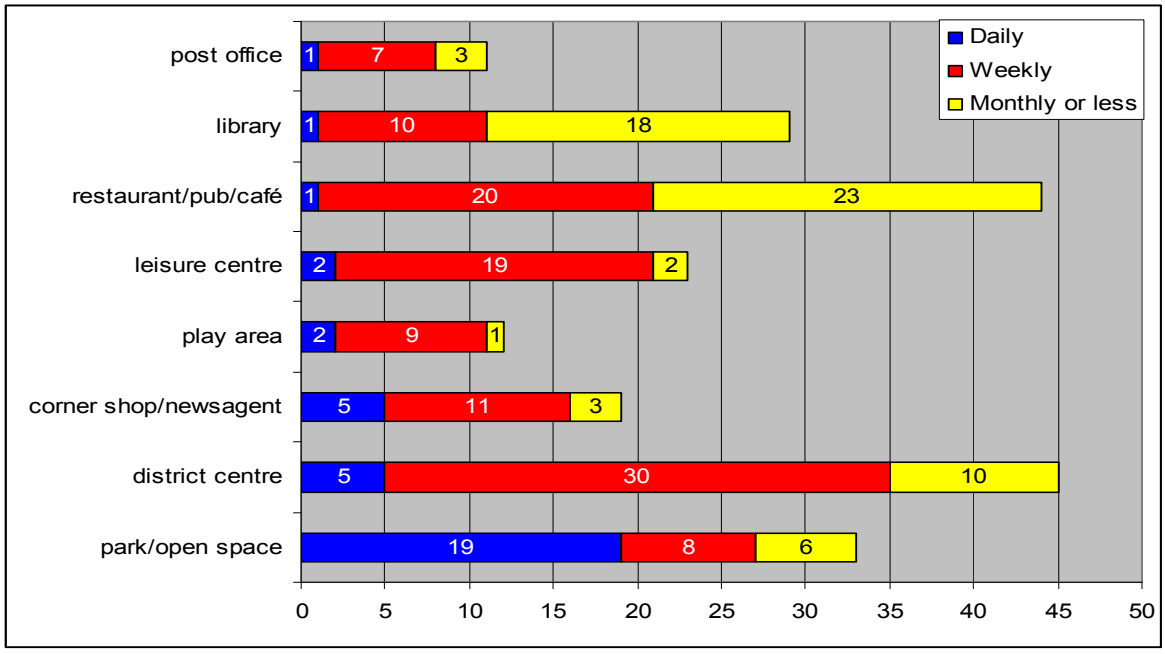


Figure 7-3: Number of frequency use per facility type

Whilst it would have been possible to consider the facility factors affecting the use frequency of the entire group using more advanced statistical methods, the above figures have demonstrated that the type is an important factor influencing the frequency of use of the facility and hence, each facility type should be considered separately. The following sections **present the profiles of the most frequently used facilities**, comparing the different facility types with regard to reasons for choosing them, mode of transport to them and so on using cross-tabulations and correlations.

7.2.1.2 Quality and Affordability of Facilities

The quality of a facility has been found to have a significant influence on its use. Witten *et al.* (2003) and Fisher and Bramley (2006) found that perceived inadequacy of a service was a more major barrier to its use than affordability, while another study reported that a number of residents used facilities despite regarding them as inadequate Gordon *et al*., 2000). Affordability was mainly found to affect leisure facilities whose use was optional, such as pubs or cinema/theatre, compared to more 'necessary' facilities such as supermarkets (ibid.). Quality in this research was measured with the variables 'good quality' and 'good reputation' and affordability with 'cheap'.

Considering the table below, it appears from the sample that, as expected, good reputation was an important reason for choosing the most frequently used schools and good quality was important for choosing the most frequently used cafes/restaurants/pubs, leisure centres and supermarkets. The quality of play areas was also stated as very important, which is also not surprising and has been reported elsewhere (Woolley, 2003). Affordability was only considered important for the choice of supermarkets and, to a lesser extent, café/restaurant/pubs and leisure centres.

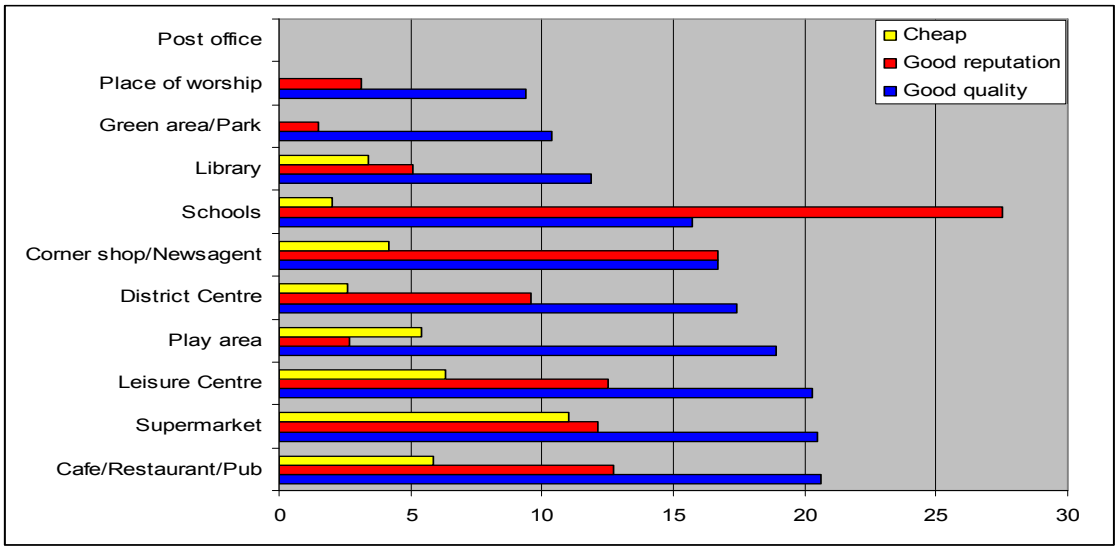


Figure 7-4: Percentage of respondents stating quality and affordability as main reason to use most frequently used facilities

7.2.2 Accessibility

As set out in Chapter 2, aspects of accessibility relate to people's ability to reach facilities that are conveniently located and easy to reach by a range of alternative transport modes. Hence, this section first deals with distance to the most frequently used facilities, then whether it is considered convenient to get to the facility and following that whether the facility is accessible by a range of different modes, particularly walking and public transport.

7.2.2.1 Distance

Distance has been found to be an important influence on the use of some facility types, such as parks (Giles-Corti *et al.*, 2005), public open space (ibid.), leisure centres (Smale, 1985) and supermarkets (Barton *et al.*, 2007). Considering the chart below, the average distance to the most frequently used facilities in the sample was less than 1.7km (or 1 mile) across all facilities, with supermarkets, leisure centres, district centre and pub/restaurant/café being the only facilities that were more than 1km away from a respondent's home.

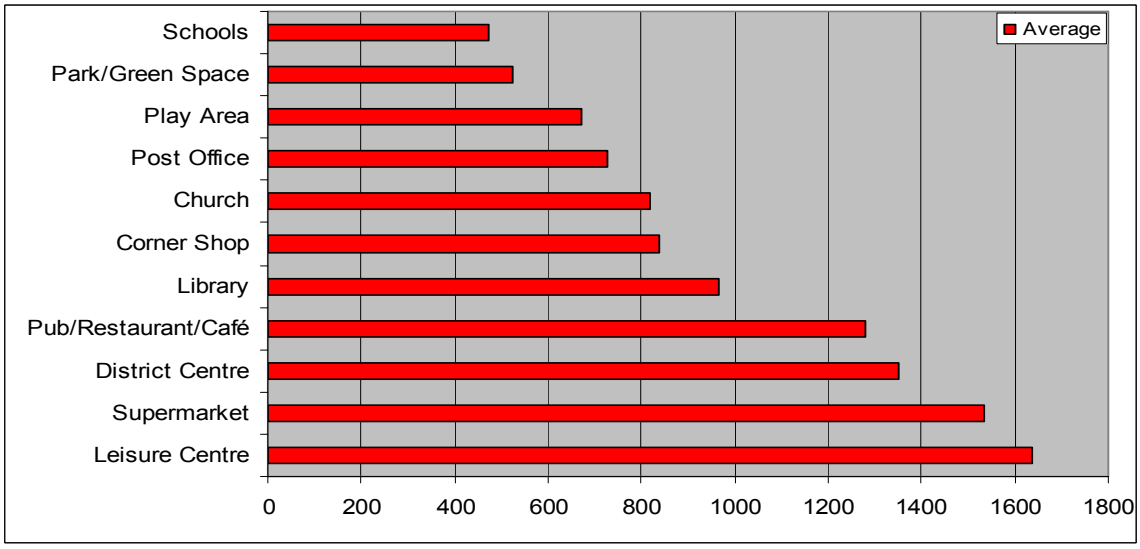


Figure 7-5: Average distance from respondent to most frequently used facility

Interestingly, Foley in 1950 in the US found that 41% of all reported facility use was undertaken within 1 mile (1.7km) of the user's home and of those 30% were within half a mile (850 metres). Comparing these findings with this dataset, over 50% of the most used facilities were located within half a mile (850m) of the respondent's home. An additional 32% of most frequently used facilities were within 1 mile of their home. This indicates how important the proximity of facilities to people's homes is for frequently using those facilities.

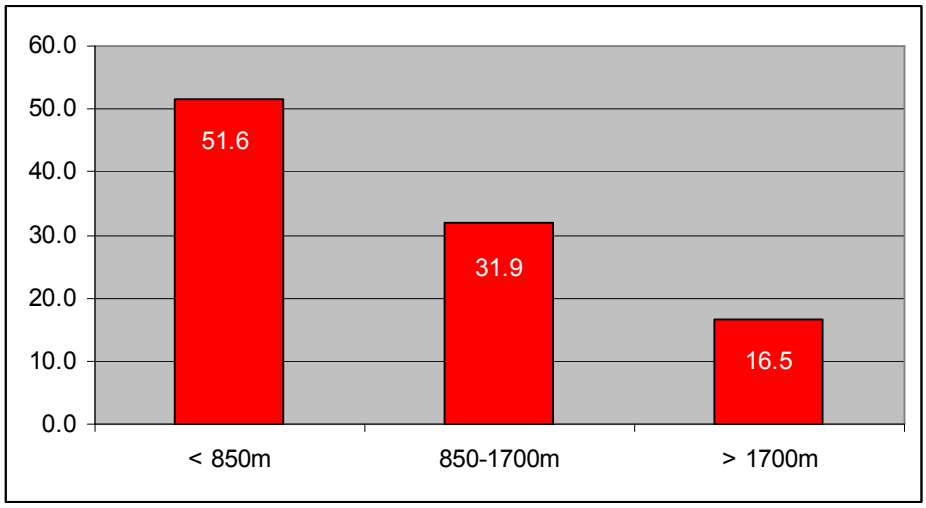


Figure 7-6: % of respondents distance to their most used facilities

7.2.2.2 Convenience

Alongside distance, convenience has also been found to be an important factor for use (Andrew *et al.*, 1981). In this study, convenience was measured with the variables 'close to home', 'close to work' and 'close to other facilities'.

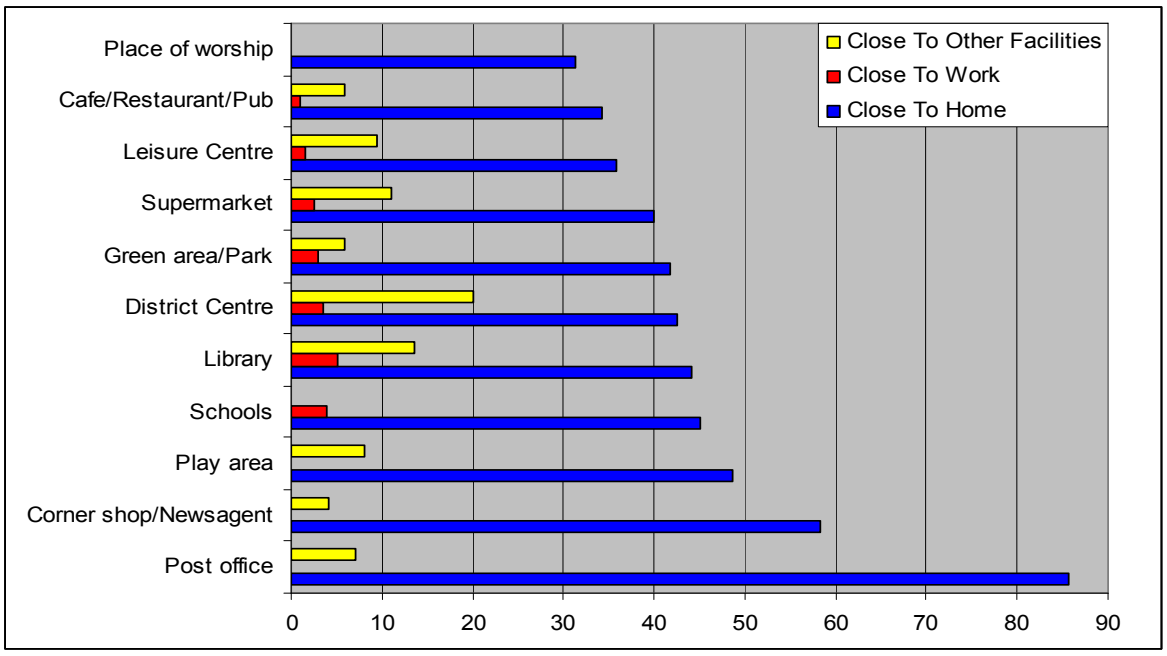


Figure 7-7: % of Respondents stating close to home, work or other facilities as main reason to use most frequently used facilities

The figure above shows that proximity to *home* was a very important reason to use a facility for the majority of residents in almost all categories, apart from supermarket, leisure centre, café/restaurant/pub and place of worship. The latter three also constituted the only facility types where quality was rated important by about 20% of respondents (see Figure 7-4). Hence, it appears that there is a trade-off between convenience and quality, whereby facilities that are of good quality will also be used frequently even though they are not close to home. Proximity to

work was not really important for any facility type in the sample, which was contrary to previous findings stating that supermarkets are often chosen as they are close to work (Casey *et al.*, 2007; Dempsey *et al.*, 2012). With regard to the proximity to *other facilities*, this was most important for district centres, as they have a number of different shops, this was not surprising. This was also stated to be important for libraries and supermarkets. Some of the libraries and supermarkets in the three areas were also situated close to district centres/within groups of facilities, as will be discussed further in Section 7.4.4.1., hence this result was also not surprising.

7.2.2.3 Mode of Transport

Government policy in promoting social inclusion and sustainable development has strongly promoted the availability of local facilities within walking distance to people's homes (DETR 1998, Social Exclusion Unit 2003). What is less certain is to what extent the availability of a facility within walking distance affects the choice of transport mode and increases people walking to it. Inspecting first how many of the most frequently used facilities were **perceived** by respondents as being located within ten minutes walking distance, the following can be observed:

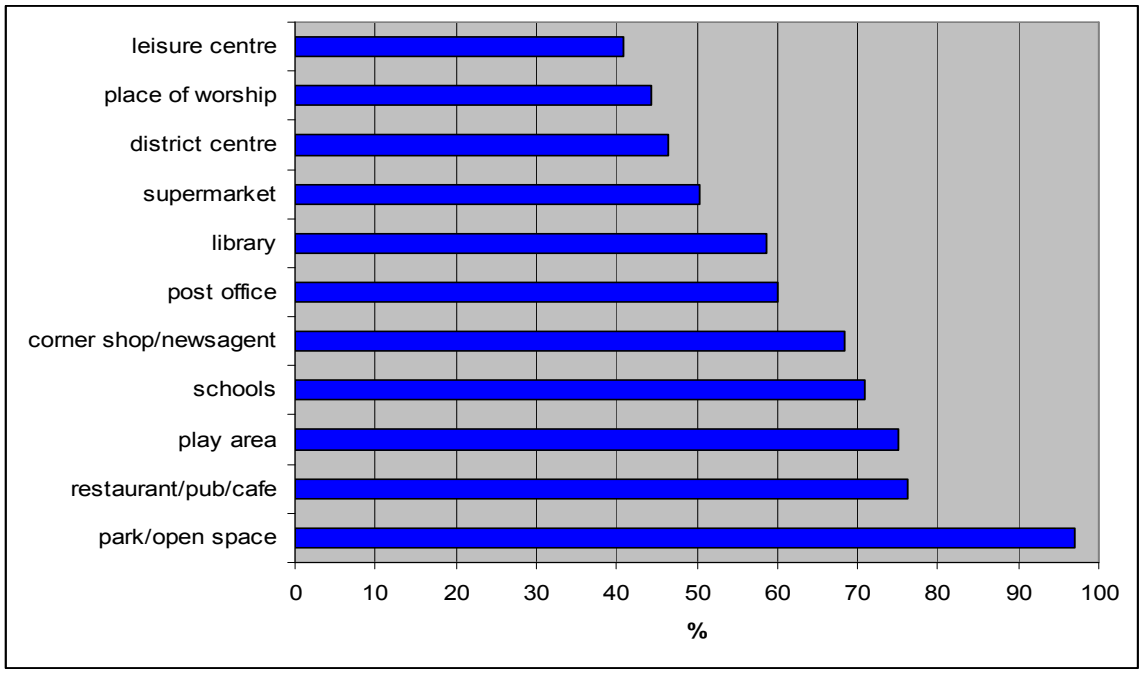


Figure 7-8: % of Respondents stating that facility was located within 10 min walking distance
Note: The relationship between the type of facility and whether it was perceived to be within walking distance is significantly correlated with a medium strength of association (Cramer's V= .327).

Post offices, corner shop/newsagent, (primary) schools and play areas are **neighbourhood** facilities which should be available within ten minutes walking distance, whereas restaurant/café/pub and park/open space can relate to neighbourhood or district catchment areas. Respondents stated that almost all of their most frequently used parks/open spaces were situated within ten minutes walking distance of their home. Whilst only 41% of users said that this was the main reason for using a park/green area close to home (see Figure 7-7), the vast majority

of those facilities were perceived to be situated close to home. In fact, over 50% of the most frequently used facility types were perceived to be situated within ten minutes from home, whether or not this was rated as an important feature for their use.

Leisure centres, libraries, places of worship, district centres and supermarkets are **district facilities** which are expected to serve larger catchments. Hence it is surprising that between 40% to 60% of respondents stated that these types of their most frequently used facilities were within ten minutes walking distance of their home. With regard to the place of worship, using a facility that offers a specific type of faith is probably more important than its location, for example a number of respondents visited a Catholic Church located outside the areas as none was available within the areas. For 35% of leisure centre users, the fact that they were located close to home was considered important (see Figure 7-7 above) and 40% of leisure centres were indeed perceived to be located within walking distance. District centres serve a 'district wide' catchment area, hence many people would not be expected to be living within ten minutes walking distance of them.

Having considered *perceived* walking distance to facilities it is also interesting to compare this with actual distances between respondents and their most frequently used facilities. Assuming average human walking speed of 5km/h (Knoblauch *et al*., 1996), an average fit person would walk 800-850 metres in ten minutes.

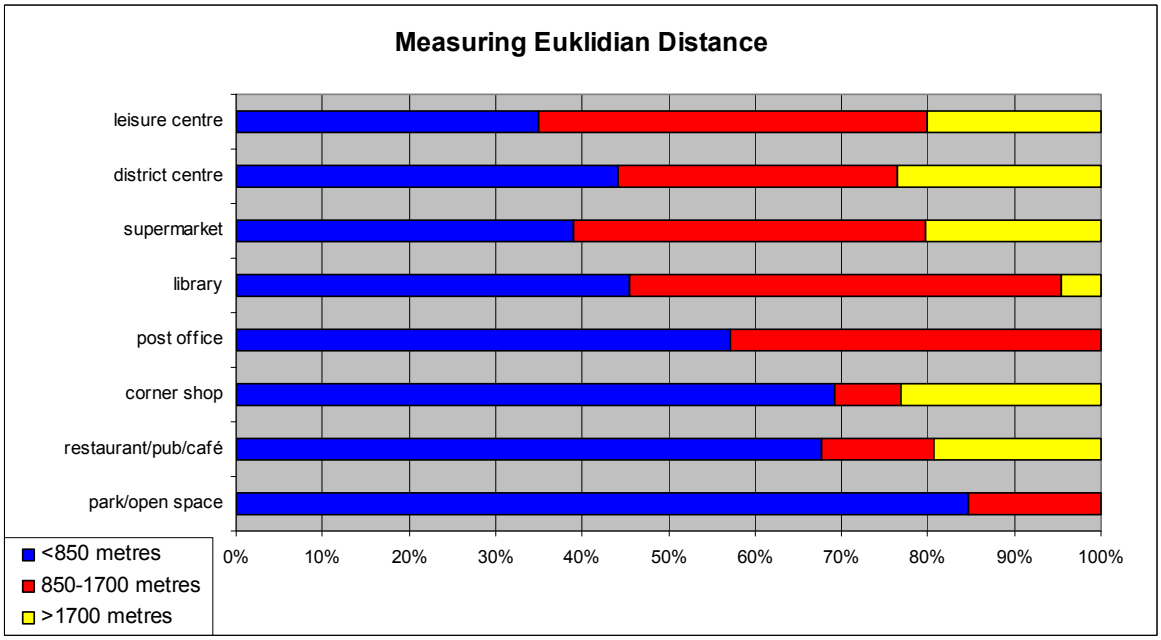


Figure 7-9: Actual distance categories between respondent and facility type

Comparing Figure 7-8 (above) and Figure 7-9 (above) shows some interesting differences: in the group of neighbourhood facilities, a higher percentage of respondents (96%) thought that their

most frequently used park/open space was situated within ten minutes walking distance than was actually the case when using < 850 m as a ten minute walking distance (82%). This is particularly interesting, as the Euclidian distance (= straight line) was calculated, hence it is possible that respondents had to walk considerably further to actually reach the facility. For most of the facilities, the percentage of respondents *believing* that it was within walking distance was higher than it actually was. However, for place of worship, schools and play areas the reverse was true. Hence, for these three facility types the 'walking distance' was measured, which again shows that a higher percentage of respondents thought that their most frequently used place of worship (44%), school (71%) and play area (75%) (see Figure 7-8 above) was situated within ten minutes walking distance than they actually were (37%; 68% and 42% respectively – see figure 7-10 below).

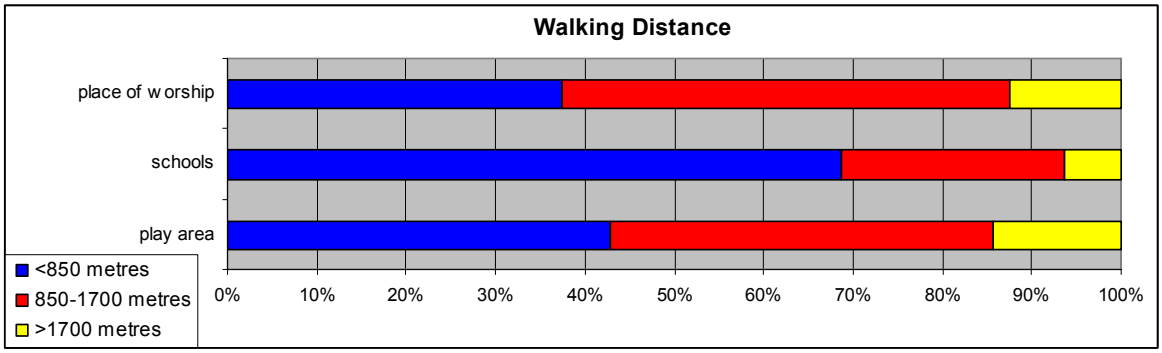


Figure 7-10: walking distance categories between respondent and facility type

Overall, the percentage of most frequently used facilities within ten minutes walking distance was surprisingly high, reiterating the importance of very local facilities. Car ownership rates in the selected areas were also very high (see Chapter 6) so, given that the majority of frequently used facilities were located within perceived walking distance, did this have a bearing on the mode of transport people used to reach these facilities? Looking at the table below, there is a significant and high relationship (Cramer's V=.531) between whether a frequently used facility was perceived to be within walking distance and which mode of transport respondents use to reach it. Over 60% of respondents walked to a facility that was within ten minutes walking distance and 37% still drove, whereas if it was not considered to be within walking distance then nearly 90% of respondents accessed it by car.

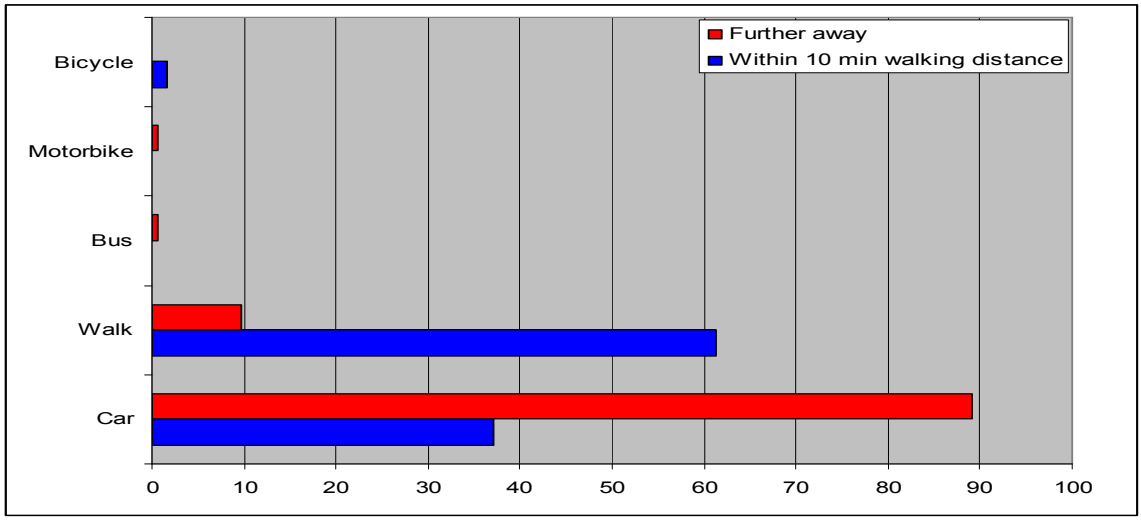


Figure 7-11: Mode of Transport by distance of facility to resident's home

In fact, when using proximity of a facility as a *predictor* for mode of transport (using a logistic regression model), respondents were nearly 14 times more likely to use non-motorised transport when the most frequently used facility was located within ten minutes walking distance (see Table below).

	B	WALD	SIG.	EXP(B)
Within walking distance	2.630	82.460	.000	13.872
Constant	-2.101	66.880	.000	.122
a. Variable(s) entered on step 1: Q12b. Model predicts 73.2% correctly Note R^2 = 0.25 (Cox and Snell), 0.34 (Nagelkerke); Model x^2 = 104.1; p=<0.000				

Table 7-4: Perceived distance and mode of transport chosen

Whilst these findings relate to all facilities, when distinguishing between different facility types, the following picture emerges:

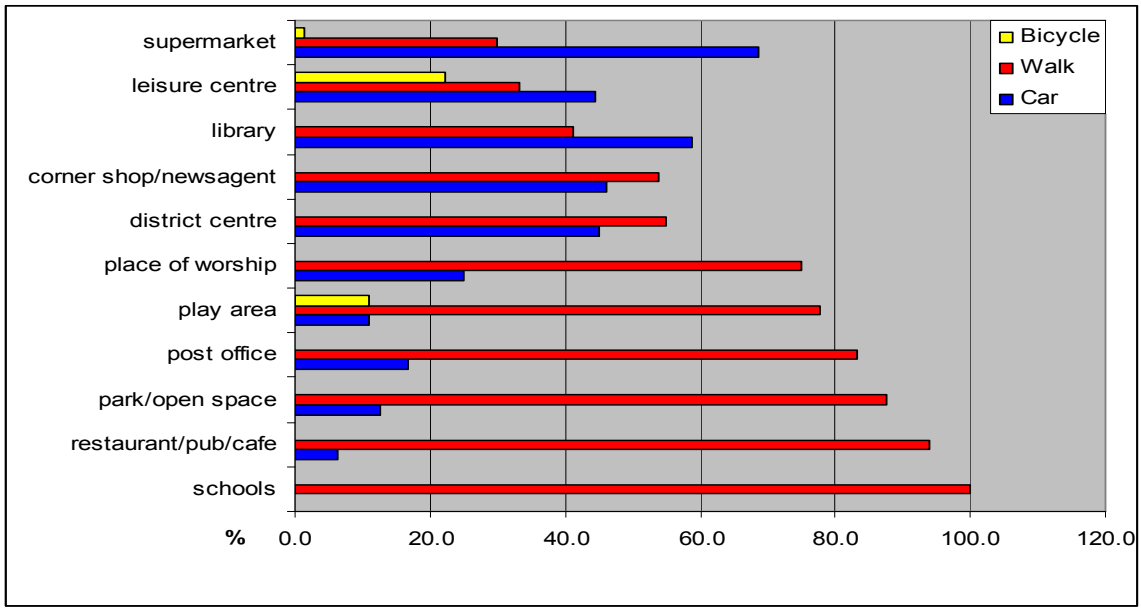


Figure 7-12: Mode of transport by facility type

Within the group of most frequently used facilities *perceived* to be within ten minutes walking distance, 100% of respondents using schools stated that they walked to them. Parks, play areas, post office and restaurant/pubs/cafes were also walked to by a majority of respondents (78-90%). A surprisingly large percentage of respondents used the car to drive to a corner shop/newsagent (over 50%), library (over 40%) and leisure centre (30%), potentially to save time (corner shop), to use other facilities in the vicinity, such as the supermarket (library) or to avoid walking home after exercise (leisure centre). Supermarkets were expected to be predominantly accessed by car, as they were mainly used for weekly shopping, which was considered difficult to carry. Another study has found that around a third of city centre residents (who could conceivably have a supermarket within walking distance) used a car to do their main food shopping, whilst around 50% walked or cycled to those (Dempsey *et al.*, 2012). In this sample, bicycles were only used to reach the leisure centre or play area and buses were not used at all for this distance. Although car ownership rates in the UK are high, certain groups can not afford to own a car and hence, providing people with a choice of public transport, particularly buses for short to medium term distances (as opposed to trains) has been seen to be important for social inclusion (Altschuler *et al.*, 2004). Whilst no-one in the sample used a bus for facilities within ten minutes walking distance, and only 0.6% used buses for facilities further away, accessibility of facilities by bus routes/stops was actually very high in the areas: **all** of the most frequently used facilities had a bus stop within 350m or less and this distance was measured along roads and paths (see Figure 7-13). In addition, as set out in Chapter 6, section 6.2.3.8, the areas are all covered by good bus networks. Respondents who stated they 'never' used the bus stop often gave 'I have a car' as the reason.

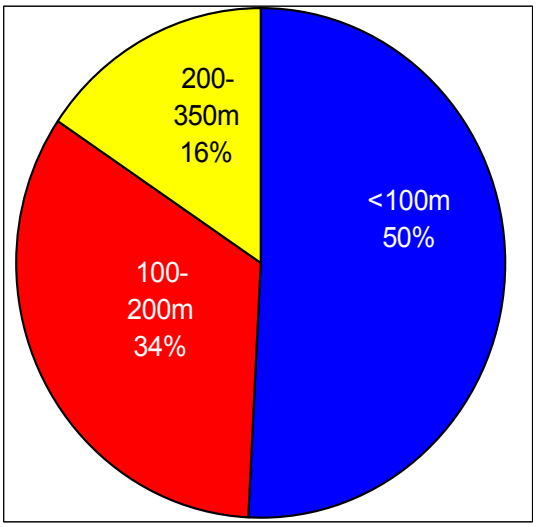


Figure 7-13: Distance from most frequently used facility door to bus stop

7.2.3 Other Users

Other users can be a reason for people to use a particular facility (Gehl, 2001; Whyte, 1980). This was measured by asking respondents whether '*meeting others*' was one of the main reasons for choosing their most frequently used facilities. Considering the data in the table below, some findings are not surprising, for example places of worship, cafes/restaurant/pub, play areas and parks were facilities where the majority of respondents stated that one of their main reasons for choosing these particular facilities was to *meet others*. Given that the question was asking for the main reason for choosing this facility, the data below also shows that some respondents gave this

as their main reason for using supermarkets and libraries. Again this supports previous findings, such as Dempsey *et al.* (2012) who found that some supermarkets were considered important meeting places for the community and places of social interaction, particularly where alternatives were missing. This is investigated in more detail in Chapter 8.

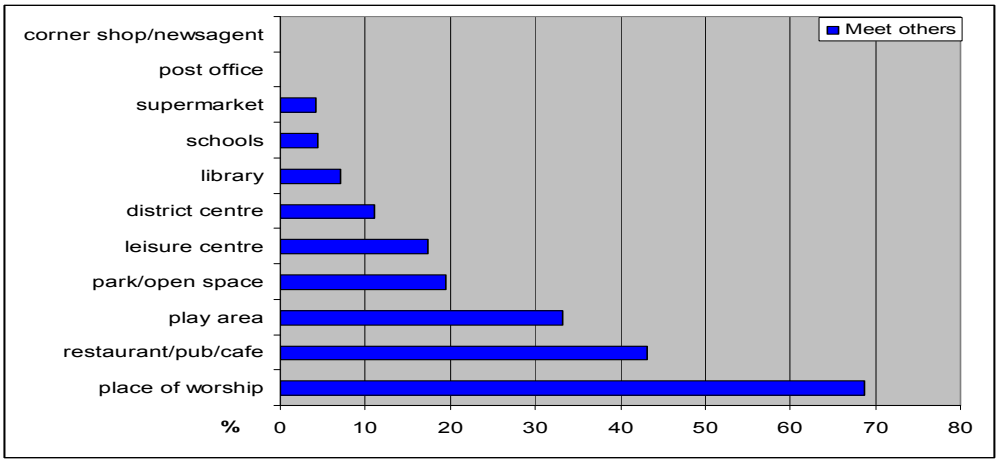


Figure 7-14: % of Respondents stating that meeting people was a reason for choosing the most frequently used facility
Note: The relationship between the type of facility and whether people choose them to meet other people is significantly correlated with a medium strength of association (Cramer's V= .476).

Other users may also be a deterrent, as found out by Holland *et al.* (2007), with the potential for user conflict of heterogeneous groups in the same spaces (Francis, 2003) and the displacement of some user groups because of fear (Holland *et al*., 2007). Respondents who stated that they *never used a facility* were asked for the reasons; the following facility types were mentioned as facilities that respondents never used because of 'other users': bus stops, hairdresser/barber, café/restaurant/pub, green spaces, newsagents and corner shops. However, as discussed in Chapter 6, only a very small proportion of respondents (less than 6%) stated that other users were a reason for them to 'never' use a facility.

7.2.4 Spatial Arrangement and Mix of Facilities

As already discussed in Chapter 5 and 6, of the 445 most frequently used facilities, **106 specific facilities** could be located within the sample areas and were then rated individually with regard to their spatial distribution, mix and visibility. Section 6.2.3.5 described these features, comparing the facilities as a group across the 3 areas. In this section, the specific facilities are compared across the different facility types (see Figures 1-6 in Appendix 2). Most correlations between facility types and their spatial arrangement/mix were medium to high correlated (Cramer's V lies between 0.4 and 0.5) but not strong enough to state that each facility type has a typical spatial arrangement and mix.

Considering the different aspects in turn and starting with the **location** of the specific facilities, whilst all the leisure centres in that group were located on the periphery of each area, schools within the group were always located in a central position in each area. All other facility types in this group showed a mix of locations (see Figure2 in Appendix 2). With regard to the **urban form** (see Figure 4 in Appendix 2) of where the facilities were located, only libraries, place of worship, corner shop/newsagent and restaurant/pub/café in this group were located in *corner positions*. Only post offices and libraries in this group were predominantly located *along streets*, whereas all other commercial and leisure facilities (supermarket, district centre, leisure centre, play areas) were predominantly located in *clusters off the street*. 50% of schools and parks/green spaces were also located in clusters off the street. Small commercial facilities such as restaurants/pubs/cafes had an almost equal split (30% each) across being located along a street, on a corner or in a cluster off the street.

With regard to the **street type** they were located on (see Figure 7-15 below), schools and play areas in this group were always located on a *residential road*, with 40% of schools and 20% of play areas being located on a *residential cul-de-sac*. Post offices (60%) and corner shops (40%) in this group were often located along *high streets/A-roads*. Supermarkets, district centres, leisure centres and libraries in this group were often (between 40% and 60%) located on *major roads* such as dual carriageways in most accessible and most visible locations. Less than 20% of parks were also located on major roads, with the majority being located on *residential spine roads* and another 20% on smaller residential roads.

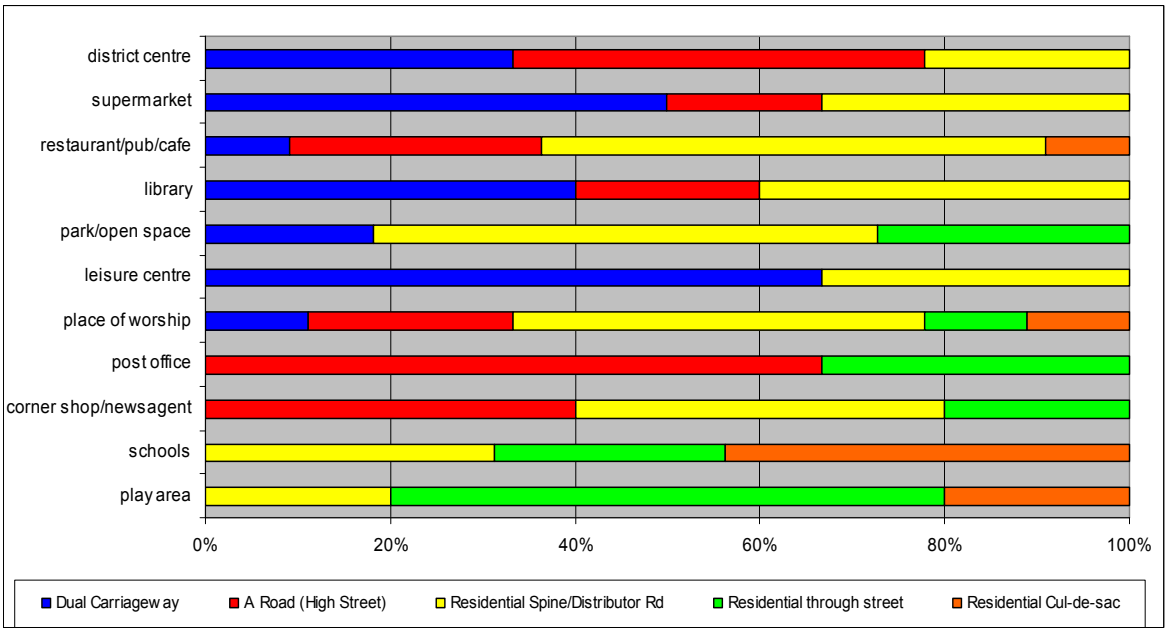


Figure 7-15: Facility type by street type; medium correlation of Cramer's V = .460

With regard to the **shape of the street** the vast majority of most facility types in this group were located along a straight road, with the only exceptions being play areas, leisure centres and schools, which tended to be located on cul-de-sacs or curved roads (see Figure 6 in Appendix 2).

With regard to visibility, the vast majority (between 66% and 100%) of facilities in this group were visible from the road they were located on and the main road their road was connected to (see Table below). Exceptions were primary schools tucked away in residential areas and play areas and small green areas in similar locations.

	Visible from main road	Visible from road
Place of worship	88.9%	88.9%
Schools	68.8%	100.0%
Play area	80.0%	60.0%
Leisure centre	100.0%	100.0%
Park/open space	66.7%	83.3%
Restaurant/pub/cafe	81.8%	90.9%
Library	100.0%	100.0%
District centre	100.0%	100.0%
Post office	100.0%	100.0%
Corner shop/newsagent	100.0%	100.0%
Supermarket	83.3%	83.3%

Table 7-5: Visibility of named and located facilities

Considering aspects of the *mix of facilities* in this group, starting with whether facilities were stand alone or **part of a group** (see Figure 1 in Appendix 2), the data showed that the majority of schools and places of worship in this group were stand alone facilities, whereas all post offices, district centres and leisure centres in this group formed part of a group. Less than 20% of supermarkets in this group were stand alone facilities and only 20% of libraries, corner shop/newsagent and play areas were stand alone facilities. Corner shops/newsagent are somewhat surprising, however, as the design of the more recent residential housing areas is such that local food stores tend to be located in groups (see picture below) with other neighbourhood facilities such as takeaways or pubs rather than widely distributed across residential areas on corners, as would be the case in older residential areas.

Image 7-1: Baileys Court 'local centre' in Bradley Stoke; aerial photo and image

Of the facilities situated within a group, the **number of units in the group** (see 5 in Appendix 2) also varied by facility type (Cramer's V=.484). Whilst over 60% of supermarkets and district centres in this group were provided in centres that had over 15 units, 65% of leisure centres and a surprisingly large number of corner shop/newsagents (80%) in this group were located within groups of 6 to 15 units. Local centres, as defined by PPG6, should contain 2 to 5 units including facilities such as newsagents, post offices etc., and indeed around 50% of the post offices in this group were situated in this group size. 6 to 15 units, however, would almost constitute a district centre and typical neighbourhood facilities, such as corner shops, would not normally be expected to be provided in those.

With regard to the **type of mixing** (see Figure 3 in Appendix 2), the vast majority of facilities situated within a group were mixed horizontally, apart from libraries which were either mixed vertically or shared an entrance with other facilities. Schools were also mixed temporarily (dual-use) and about 30% in this group shared an entrance with other facilities, such as churches. This supports findings from other studies that fine grain, vertical mixing was problematic for developers as flats above shops had not been attractive to the market and had largely not been built/failed to be occupied (Grant, 2002).

7.2.5 Comparison of Facility Characteristics

To summarise, availability of facilities was found to influence the frequency of use of neighbourhood and district facilities. With regard to the remaining facility characteristics, the format of the data did not allow to test which predictors had an influence on the frequency of use of facilities. Rather, respondents stated which three facilities they had used most often during the last year and these frequently used facilities displayed the following characteristics:

- **Type** – supermarkets were by far the most frequently used facilities in the sample
- **Quality** – 20% of leisure centres, supermarket and pubs/restaurants/cafes were chosen for their quality and over 30% of schools for their good reputation
- **Affordability** – this was only an important consideration for less than 10% of each facility type and most often stated for supermarkets
- **Distance to facility** – all the most frequently used facilities were (on average) within 1.7km (1 mile) of the respondent's house and 50% of those were within 850m (1/2 mile)
- **Convenience** - *close to home* was an important consideration for over 60% of newsagent/corner shops and post offices as well as over 30% of all other facility types; *close to other facilities* was less important (20% of district centres) and *close to work* not important for the vast majority of facility types

- **Mode of Transport to Facility** – if a facility was perceived to be within a ten minute walking distance, 60% walked to the facility. With regard to different facility types, the majority of neighbourhood facilities were walked to whereas the majority of district facilities were accessed by car with hardly any use of buses or bicycles
- **Other users** – Place of worship, restaurant/pub/café and play areas were predominantly chosen to meet others; less than 10% of respondents stated that they did not use facilities due to other users
- **Spatial Arrangement** – this showed quite mixed results with certain facilities, such as schools, more likely to be located as stand alone and hidden in residential areas whereas commercial facilities were more often found in groups and along major roads

Having explored the characteristics of the most frequently used facilities, the next section analyses to what extent the area the facility is located in affects frequency of use.

7.3 AREA CHARACTERISTICS AFFECTING LOCAL FACILITY USE

This section follows Fisher and Bramley's (2006) framework to explain usage of local services, which included the following area characteristics as discussed in Chapter 2.

- **Social and Cultural Characteristics of the area** such as crime and deprivation, social mix and social networks in the area,
- **Environmental/Physical Characteristics,** such as walkability of area, access to public transport, neighbourhood form and density.

In order to test how these characteristics affect the frequency of use of local facilities, the following methods were used. First, bivariate analysis was undertaken to identify which factors had a significant association with frequent use. If the factor to be tested was not in binary format, but in ordinal or categorical format, it was included in small logistic regression models to test which sub-categories had a positive relationship with frequent use. For example, if age and frequent post office use was found to have a significant relationship, the age-group that most frequently used the post office (e.g. respondents over 60) was then established through a logistic regression. If the factor was in binary format (e.g. feel safe, don't feel safe) this was not considered necessary. The logistic regression models were done for the two groups of neighbourhood and district facilities and also for individual facility types. As the individual facility testing resulted in a large number of tables, significant models have been appended to the document in Appendix 3.

The outcome variable 'frequency of use' was a transformed, binary variable where frequent use constitutes daily or weekly use, and non-frequent use constitutes monthly or less than monthly

use (see section 5.7.1.1.). The only exception were hairdressers and takeaways where 'frequent use' included monthly as these facilities had been shown to be used much less frequently in the sample. The reverse was done for supermarkets where frequent use constituted daily only, as weekly shopping at supermarkets was done by the vast majority of people and not considered particularly 'frequent'.

7.3.1 Social and Cultural Characteristics of the Area

Area effects can be understood as attributes of the area or the collectivity of people living in it (Sampson *et al.*, 2002). The social and cultural characteristics in this section are concerned with the latter aspect, whilst the environmental characteristics section deals with the former. An important distinction when measuring characteristics of an area is to use either objective measures or subjective measures. For example, the level of crime in an area might have an impact on the frequency of use of facilities. However, people perceive levels of crime in different ways and hence the *perceived* level of crime is most likely to influence people's behaviour. Where possible the sections below have compared objective and subjective measurements and their influence on frequently using local facilities. Some area characteristics that could be considered characteristics of people (such as number of friends, perception of crime) have been included in this section as they relate to the area the respondents live in. Characteristics that relate to the person irrespective of their location, such as age and ethnicity were covered under personal characteristics in Section 7.4.

7.3.1.1 Crime and Deprivation

As set out in Chapter 2, both actual and perceived crime within an area could potentially have an impact on the *frequency* of using local facilities, although studies have not analysed this relationship. **Perceived safety** in an area is important as it affects people's action irrespective of actual crime levels. The variable *feeling safe to walk at night* had only one significant and weak association with the frequent use of **corner shops** (see table 7-6).

Variable	Feeling safe	Perceived crime levels	Actual crime ranking	Actual deprivation ranking
Significance Test	**Phi**	**Cramer's V**	**Cramer's V**	**Cramer's V**
Newsagent		.148		
Children's Play Area		.154		
Primary School		.172		
Corner Shop	**.247**			
District Centre		.232		
Secondary School			.209	
Place of Worship			.219	
No significant association for the following facility types: Post, Bus Stop, nursery, take away (monthly), green Space, hairdresser (monthly), supermarket (daily), park, district café/pub/restaurant, leisure centre, library and community centre + group of district and local facilities				

Table 7-6: Significant Associations between crime & deprivation factors and frequent use of facilities

Perceived levels of crime in the area had a significant relationship with the frequent use of **newsagents, children's play, primary schools** and **district centres** in that respondents who believed that crime rates were high in the area were less likely to frequently use facilities, such as the district centre (see Appendix 3).

Chapter 6 (Section 6.2.2.3) demonstrated that actual crime levels across the 3 areas differ particularly between Cadbury Heath and the other two areas. There was a significant association between *actual crime levels* and the frequency of use of **secondary schools and places of worship** indicating that residents living in the highest ranked crime area (4.200-10.000) were more likely to frequently use these facilities. As the survey was completed by adults, this might indicate that parents in high crime areas more often accompany their secondary school children to school than in other areas.

Deprived and rundown areas have been found to negatively impact on perceptions of safety (Miles, 2008), which in turn results in people using services less often (Bramley *et al.*, 2009). As set out in Chapter 6, Section 6.2.2.3, **deprivation levels** across the three areas were not high and were also quite similar across the three areas. Deprivation was not found to be significantly associated with the frequent use of any of the facilities in the dataset (see table 7-6).

7.3.1.2 Social Mix and Social Ties of Area

As set out in Chapter 3, whilst different ethnic backgrounds can play an important role in US society (Wilson 1987), in the UK context other aspects of the mix of residents, such as class, income or age are also very important for people to feel whether they are similar to others they live with or not (Evans, 2009). Studies comparing areas with different social (tenure) mix in the UK have found that there were differences in the use of facilities by different tenure groups (Atkinson and Kintrea, 2000; Camina and Wood, 2000). Again, perceived 'similarity' appears to be more important for people's actions, hence perceived homogeneity was recorded as a measure to test whether the perceived **social mix** had an influence on the frequency of use of facilities in areas which have a similar supply of facilities as set out in Section 7.3.1.1 above. Significant associations between *feeling similar to people in the area* and the frequent use of the group of neighbourhood and district facilities, the newsagent, take away, children's play area, primary school, corner shop and cafes/restaurants/pubs could be found in the dataset. The group of neighbourhood facilities and take away had the strongest (medium) significant associations (see table below).

	Perceived homogeneity	Having friends in area	Have family in area	Have Acquaintances in area	Know >20 neighbours	Visit frequently (daily/weekly)
Significance Test	**Phi**	**Phi**	**Phi**	**Phi**	**Phi**	**Phi**
Neighbourhood Facilities	**.397**	**.169**				
Newsagent	.206		.155		.155	
Bus Stop				-.180		
Take Away	.335					
Children's Play Area	.173					
Green Space		.152			.169	
Primary School	.218	.189				
Corner Shop	.182	.157				
District Facilities	**.237**				**.173**	**.232**
Supermarket				.171		
Secondary School		.157				
Café/Pub/Restaurant	.164	.158		.190		
No significant association for the following facility types: Community centre, place of worship, library, leisure centre, park, district centre, nursery, hairdresser, post						

Table 7-7: Significant Associations between social mix & social ties and frequent use of facilities
de Vaus (2002) Correlation 0.1-0.29=low, 0.3-0.49 = medium, 0.5-0.69 = high

With regard to **social ties**, a study by Ahlbrandt in the US (1984) was the first to find an association between strong social ties in an area and more frequent use of facilities. To test this assumption the social network of respondents, including the number of neighbours residents know in the area, whether they know family, friends, acquaintances or immediate neighbours that live in their area and the extent to which they visit (or are being visited) by other people from the area they live in were tested for significant associations with frequent use of facilities. *Frequent visits* from people in the area was only significantly associated with the frequent use of the group of **district facilities** and *having family* in the area was only significantly associated with the frequent use of the **newsagent**. *Having friends* in the area was significantly associated with the frequent use of a number of facilities, such as **green space, primary and secondary school, corner shop and café/pub/restaurant** (see table 7-7). Interestingly, *having acquaintances* in the area has a negative significant association with the use of the **bus stop**, i.e. knowing more acquaintances, is coupled with less bus stop use, whilst it had a positive relationship with frequent use of the **supermarkets** and the **café/pub/restaurant** (see table above). Finally, knowing a considerable number of *neighbours* was positively associated with the frequent use of very local facilities, such as the **newsagent and green space** and also with the group of district facilities.

7.3.2 Environmental Characteristics: Perceived Walkability, Accessibility of Public Transport and Density of the Area

As set out in Chapter 2, availability of fewer facilities coupled with greater distances to bus stops has been found to have a significant negative association with the use of local facilities (Bramley *et al.,* 2009). The availability of facilities within the sample areas has already been discussed in Section 7.2.1.1 above and it was confirmed that having more facilities within an area did result in more frequent use of local facilities. Whilst accessibility of **individual facilities** has been analysed in section 7.2.2 above, this section analyses perceived walkability of the sample **areas,** accessibility of public transport in the area as well as the density of the area.

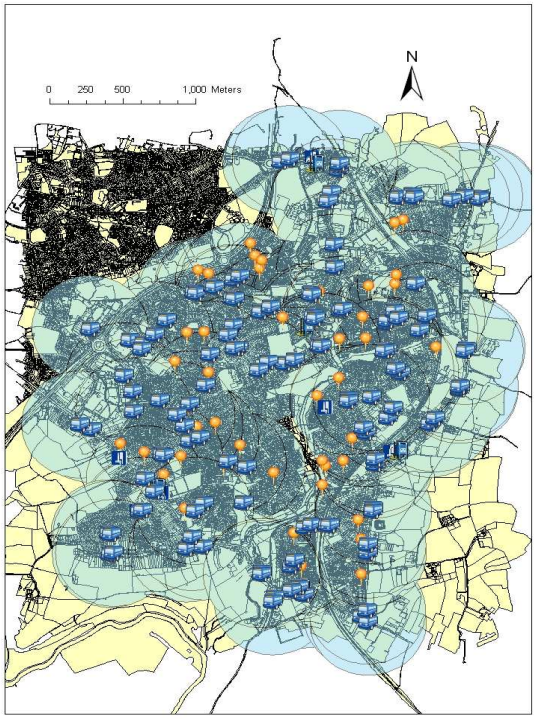
As neighbourhood facilities (within ten minutes walking distance from home) by definition are meant to be accessed by walking to them, it is important to understand whether the perceived **walkability** of the area influenced the frequency of use of those facilities and whether the presence of footpaths in the area made any contribution towards the frequent use of neighbourhood facilities. The *existence of footpaths* had a significant positive association with the frequent use of a number of very local facilities, such as the **bus stop** which supports the findings from Bramley *et al.* (2009) that people use local facilities more frequently if they find walking to public transport easy. It was also significantly associated with the frequent use of local **green space, corner shop** and the group of neighbourhood facilities overall (see table 7-8).

	Easy to walk	Many footpaths in area	High density (>60 p per ha)
Significance test	**Phi**	**Cramer's V**	**Phi**
Local Facilities		**.231**	
Bus Stop		.201	
Green Space	**.320**	.297	
Nursery			**.266**
Corner Shop		.207	
District Facilities		**.253**	
Supermarket (daily)		.259	
Park		.209	
No significant association for the following facility types: Community centre, place of worship, library, leisure centre, district café/pub/restaurant, secondary school, district centre, hairdresser, primary school, district children's play area, take away, post office, newsagent			

Table 7-8: Significant Associations between environmental area factors and frequent use of facilities

With regard to district-wide facilities, it was also positively associated with the frequent use of **parks and supermarkets** and the group of district facilities (see table 7-8). Given that a number of district facilities were located within perceived walking distance (see Section 7.2.2.3) this result was not surprising. With regard to supermarkets, Dempsey *et al.* (2012) found that the physical infrastructure of streets had a strong influence on the extent of use of particular supermarkets in Edinburgh and Oxford, which is supported by the data of this study.

Whether it was *easy to walk around the area* had a significant association only with the frequent use of **local green space** (see table 7-8). Using a logistic regression model, respondents who felt that it was *not easy to walk* around the area were nearly six times less likely to use local green space than people who *strongly agreed* that walking around the area was easy (see Appendix 3), demonstrating how important the siting of local green space and the supporting footpath infrastructure can be for its use. This was supported by a study which found that a pleasant walking environment could increase the frequency of using outdoor parks and green spaces for older people (Sugiyama and Ward Thompson, 2008).



Map 7-1: Showing Bus Stops with 400m buffer across one sub-area with orange pins constituting respondents

Considering availability of and access to public transport in the area, Chapter 6 highlighted that **all three areas are well served by public transport**. As a visual example, the map 7-1 below shows the Cadbury Heath area with 400m buffers around each bus stop as recommended by Barton *et al.* (2003), which covers the entire area. Hence accessibility to bus stops in the sample areas was not found to be a problem that could restrict the use of local facilities.

With regard to **density**, several studies comparing different types of neighbourhood forms and densities, such as suburban versus central and grid-based versus cul-de-sac developments, found that centrally located case studies have better provision of services and facilities than other locations (Jenks and Jones, 2010). As discussed in Section 7.2.1, having a larger supply of local facilities within residential areas increases the frequency of use of those facilities. This was supported by a previous study which found significant differences in the frequency of use of services by respondents in centre, intermediate and outer case study neighbourhoods (Dempsey *et al.*, 2012). However, the increase in frequency of use is most likely due to the increased supply of facilities (constituting a mediating effect) rather than the physical form of the area. Hence, when using focus groups to identify physical characteristics that were affecting the frequency of supermarket and 'local stores' use, Dempsey *et al.*, (2012) concluded that there was '*no clear association between resident's use of facilities and neighbourhood density*' (p.26). As set out in Chapter 6, there is some variation in density bands within the three areas ranging from <20

persons per ha up to 80 persons per ha. Only the frequent use of **nurseries** was significantly associated with *high density* (>60 persons per ha) in this dataset in that frequent use of nurseries was higher in high density areas.

7.3.3 Comparison of Area Characteristics

In summary, the table below highlights which area characteristics were found to be significantly associated with the frequent use of local facilities in this study. Deprivation has been excluded from the table as it was not found to have a significant association with any individual facility type or group of facilities. Similarly, facility types whose frequency of use was not associated with any of the area characteristics, such as leisure centre, library, community centre, hairdresser and post office are also excluded from the table below.

	Crime	Social Ties & Social Mix	Walkability & Density
Neighbourhood Facilities		Having friends in area/Feeling similar	Many footpaths
Newsagent	Low perceived crime	Have family in area/Know >20 neighbours/Feeling similar	
Bus Stop		Don't have acquaintances in area	Many footpaths
Take Away		Feeling similar	
Children's Play Area	Low perceived crime	Feeling similar	
Green Space		Have friends in area/Know >20 neighbours	Find area easy to walk/many footpaths
Primary School	Low perceived crime	Have friends in area/Feeling similar	
Nursery			High density
Corner Shop	Feeling safe walking after dark	Have friends in area/Felling similar	Many footpaths
District Facilities		Know >20 neighbours/be frequently visited by people from area/Feeling similar	Many footpaths
Supermarket		Have acquaintances in area	Many footpaths
District Centre	Low perceived crime		
Secondary School	High actual crime levels	Have friends in the area	
Park			Many footpaths
Place of Worship	High actual crime levels		
Café/pub/restaurant		Have friends & acquaintances in area, Feeling similar	
No area factor has significant association with frequency of use of: Leisure centre, library, community centre, hairdresser and post office			

Table 7-9: Summary of area characteristics affecting individual facility types and groups of facilities

The frequent use of some facilities in this dataset was only influenced by a single area factor, for example the frequent use of parks was only influenced by the existence of footpaths, place of worship by high crime levels, district centre by perceived high crime levels, take away by perceived similarity to others in the area and nursery by high density.

The frequent use of the remaining facilities was significantly associated with a number of area factors. Of particular importance for the frequent use of local facilities appears to be the existence of good footpaths to reach the facilities. With regard to crime, perceived crime appears to be more important for the frequent use of a number of local facilities than actual crime levels. Whilst of importance for some individual facility types, crime and perception of crime was not found to have an association with the frequent use of the group of neighbourhood or district facilities.

This dataset also found that a number of respondents made more frequent visits to local facilities when the felt they were 'similar' to others, whether this was with respect to class, income, ethnicity or other aspects was not ascertained. Similar, people who stated that they had a good local network with friends, family and acquaintances living in the area, also visited local facilities more frequently. A bivariate association can not glean any insight into the direction of this relationship, but it is also conceivable that respondents who frequently use local facilities develop a better social network than those who use facilities outside the area.

Overall, this section has demonstrated that social and environmental aspects of the neighbourhood the facilities are located in can have an effect on the frequency of their use. The next section will discuss the influence personal characteristics of the users have on the frequent use of the different types of local facilities.

7.4 PERSONAL CHARACTERISTICS AFFECTING LOCAL FACILITY USE

As set out in Chapter 2, Fisher and Bramley (2006) devised a framework to help explain and account for usage of local services/facilities. This included the following personal characteristics, which were tested below:

- **Demographic** characteristics, such as gender and age,
- **Socio-economic characteristics,** such as household composition, having children, employment situation and tenancy, and
- **Cultural characteristics,** such as ethnicity, class and length of residence.

These were tested in the same way as the area characteristics above testing bivariate relationships and using small logistic regression models to identify relevant sub-groups. Only significant models and predictors are reported and the tables of these are in Appendix 3. The groups of neighbourhood and district facilities did **not** include children related facilities, such as schools, nurseries and children's play areas as they required respondents to have children to be used. Hence, if put in the model with other facilities, they would have skewed the results for

personal characteristics, by making 'having children', 'households with children' and ' younger age groups' significant predictors for frequent use of all facilities.

7.4.1 Demographic Characteristics

The frequent use of a number of individual facility types was significantly associated with **age** (see table 7-10). Logistic regression models were used to identify which age groups used which facilities the most. **Bus stops, newsagents** and **post offices** were more likely to be used frequently by respondents aged above 60 years than younger age groups (see Appendix 3). The opposite was true for **children's play areas, nursery, and primary school** where people aged less than 44 years were more likely to frequently use those facilities than other age groups. For the use of **secondary schools**, middle aged people (45 – 59 years old) were most likely to frequently use those. Finally, age was also a significant predictor for frequent use of the **leisure centre** with people aged less than 44 years being more likely to use the leisure centre than people in other age groups.

	Age	Gender
Significance Test	Cramer's V	Phi
Newsagent	.226	
Post	.431	
Bus Stop	.286	
Children's Play Area	.392	
Primary School	.374	
Nursery	.314	
Secondary School	.284	
Leisure Centre	.215	
Place of Worship		.200
No significant association was found for the following facilities: Community Centre, Library, district centre, café/pub/restaurant, park, supermarket, corner shop, hairdresser, green space, take and the group of neighbourhood and district facilities		

Table 7-10: Significant Associations between demographic characteristics and frequent use of facilities

Most of these findings are not surprising. Younger people are expected to do more exercise locally or otherwise, which has been confirmed by other studies such as MacIntyre and Ellaway (1998) who also found that older people were less likely to do sport and to do it locally. People with young children visiting nurseries, primary schools and children's play areas tend to be younger than 44 years, whereas, correspondingly, people with older children visiting secondary school are also older themselves (see Chapter 6). With regard to older people (over the age of 60), it is also not surprising that they would use the bus more, as they might not be able to drive anymore, are eligible for a buss pass and may have mobility problems (Burton and Mitchell, 2006). It has previously been pointed out that not enough data has been collected about the use of supermarkets and shopping facilities for older people (Brook Lyndhurst, 2004) and the importance of newsagents and post offices for older people also appears to be an understudied subject. Reasons for the frequent use of those facilities could be to do with the accessibility of the

facilities (closer to home than larger facilities) or with the types of services the post office offers, such as banking etc. The use of neighbourhood or district facilities as groups were not affected by age, which was contrary to previous studies, that found that children (Casey *et al.*, 2007) and older households (Bramley *et al.*, 2009) were more likely to use neighbourhood services, whereas younger adults were less likely to use them (ibid.). Information on children's and teenagers' use of facilities were not recorded for this study.

Gender was only significantly associated with the frequent use of place of worship, in that women used places of worship more frequently. Whilst other studies have claimed that women make more use of local facilities (Camina and Wood, 2009), particularly with regard to food shopping (MacIntyre and Ellaway, 1998), this was not supported by the data in this study, the latter being demonstrated by the table below.

	NOT FREQUENT	FREQUENT	TOTAL
Male	9.70%	90.30%	100.00%
Female	4.10%	95.90%	100.00%

Table 7-11: Gender and frequency of use of supermarket

7.4.2 Socio-economic Characteristics

Socio-economic characteristics included employment, household composition, tenure and having children. Whilst some studies found that poverty also had a bearing on the use of local services (Fisher and Bramley, 2006), individual poverty was not measured in this study and associations between deprivation of an area and facility use have already been discussed in Section 7.3.1.1 above.

Employment status was not found to have a significant association with neighbourhood or district facilities. This is contrary to another study which found that working households were less likely to use local services (Bramley *et al.,* 2009). Testing individual facility use, the employment status of respondents had a significant association with a number of neighbourhood facilities (see table 7-12) and logistic regression models were used to identify which these were (see Appendix 3). *Retired* respondents were more likely to frequently use the **bus stop, newsagent and take-away** than full-time employed respondents, which tallies with the findings about age above. In addition, respondents who were *sick/unemployed* were more likely to use the **bus stop**, perhaps due to insufficient income for a car or an inability to drive due to sickness. Respondents looking after the *home/ family* were also more likely to use **the primary school, children's play areas**, **newsagent and post office** than full-time employed respondents. The latter highlights that newsagents and post offices were not only important for older people, but also for women who were staying at home to look after the family (100% of respondents who stated they looked after home/family

were female in the sample). *Part-time or self-employed* respondents made more use of **green space, children's play area and primary schools**, indicating that respondents in this group also had child rearing responsibilities.

	Employment status	Tenancy
Significance Test	**Cramer's V**	**Cramer's V**
Neighbourhood Facilities		
Newsagent	.341	
Post	.337	
Bus Stop	.340	
Take Away (monthly)	.253	
Children's Play Area	.363	
Green Space	.294	
Primary School	.398	
Nursery		
District Facilities		
District Centre		**.242**
Secondary School	.271	
Park		
Café/Pub/Restaurant		
Leisure Centre		
Library		
No significant association was found for the following facilities: Place of Worship, Community Centre, Supermarket, Corner Shop, Hairdresser,		

Table 7-12: Significant Associations between socio-economic characteristics and frequent use of facilities

Tenancy was **neither** significant for frequent neighbourhood facility nor district facility use. Two other studies previously found that renters made more use of local facilities (Atkinson and Kintrea, 2000; Bramley *et al.*, 2009) whereas Camina and Wood (2009) contested these findings by stating that women, irrespective of tenure made more use of local facilities. It is difficult to compare these findings as they were a mix of quantitative and qualitative studies. With regard to specific facilities here, tenure was only found to be a significantly associated with the frequent use of **district centres**. In this case, home owners were more likely to frequently use the district centre than people who rented.

As expected, **having children** was found to have a significant positive association with the frequent use of **schools and nurseries**, with a less strong relationship between having children and taking them to nursery than going to primary school, as the former is voluntary and was mentioned by several respondents to be 'too expensive'. Respondents with children were also more likely to use **children's play areas, local green spaces, parks and libraries** as well as the group of district facilities (see table 7-12). The latter is interesting as the group of district facilities did not include secondary schools and children's play areas as explained above.

	Have children	Household composition
Significance Test	**Phi**	**Cramer's V**
Neighbourhood Facilities		**.275**
Newsagent		.311
Post		
Bus Stop		.305
Take Away (monthly)		.286
Children's Play Area	.470	.468
Green Space	.177	
Primary School	.543	.561
Nursery	.289	.286
District Facilities	**.266**	**.334**
District Centre		.266
Secondary School	.401	.428
Park	.249	.292
Café/Pub/Restaurant		.282
Leisure Centre		.187
Library	.150	
No significant association was found for the following facilities: Place of Worship, Community Centre, Supermarket, Corner Shop, Hairdresser,		

Table 7-13: Significant Associations between socio-economic characteristics and frequent use of facilities

With regard to **household composition** this showed a significant association with the frequent use of most facilities (see table 7-13). Married/cohabiting couples *with children* were most likely to frequently use the **group of district facilities**, **children's play areas**, **nurseries, schools and parks** as expected given the high correlation between having children and household status (.908). Interestingly, for the frequent use of children's play areas the employment status of the parent was not a significant predictor when controlling for 'having children' at the same time[1] and neither was social class, even when not controlling for any other variables.

Pensioners living alone and other single households were less likely to frequently use **district facilities, takeaways and the group of local facilities overall** than married couples with dependent children (see Appendix 3). This supports findings from previous studies which also found that family/larger households were more likely to use local facilities than older, childless households (Dempsey *et al.*, 2012) or single-person households (Bramley *et al*., 2009).

Single parents with dependent children were found to be less likely to use the **newsagent** than married couples with dependent children. Conversely, single parents with dependent children were more likely to use a **café/restaurant/pub** than married couples with dependent children. With regard to frequent **bus use**, only married couples without dependent children were significantly associated with frequent bus use. Given that 50% of the married couples without

[1] On its own, the employment status model is highly significant (p=0.000 and Chi square= 18.5) with being in full-time employment, staying at home and being retired all constituting significant predictors with staying at home respondents being six times more likely to use children's play areas than those who are full-time employed.

dependent children were above the age of 60 the identified influence of age on bus use might also contribute to this finding.

7.4.3 Cultural

Cultural characteristics have been measured by proxy variables such as ethnicity, class and length of residence as suggested by Fisher and Bramley (2006) in their framework for explaining different use levels of local facilities. **Ethnicity** was **not** found to have a significant association with the frequent use of the groups of neighbourhood or district facilities. Whilst Ahlbrandt (1984) in the US had found that residents with a white background used their neighbourhood facilities more frequently than those of Black ethnicity, this observed difference could be specific to American society and might not apply with the same degree to the UK context. With regard to individual facility use, Fisher and Bramley in the UK (2006) found that being of an Asian or Black ethnic background had a strong negative influence on the use of public sports facilities, banks/building societies, chemists, dentists and pubs but a positive influence on the use of bus services, places of worship, supermarkets and community halls. Only the influence on **places of worship** could be corroborated with this study, where respondents who stated that they were non White-British (which included Eastern Europeans) were found to use this facility more frequently than other groups. The sample areas were very homogenous, where non-white ethnic minorities constituted less than 3% of the population (ONS, Census 2011) (see Chapter 6). Hence, whilst these areas constitute typical examples of newly built housing estates on the periphery of a large city, they are less useful for showing differences of facility use across different ethnicities.

	Ethnicity	Class	Residence Length
Significance Test	Phi	Cramer's V	Cramer's V
Newsagent			.275
Post			.263
Take Away		.201	
Children's Play Area			.234
Primary School			.348
Nursery			.248
District Facilities		**.209**	**.305**
Supermarket			.253
Secondary School			.218
Leisure Centre			.265
Café/pub/restaurant		.278	
Place of Worship	**.187**		
No significant association was found for the following facilities: Community centre, library, park, district centre, corner shop, hairdresser, green space, bus stop and the group of neighbourhood facilities			

Table 7-14: Significant Associations between cultural characteristics and frequent use of facilities

With regard to **social class**, this was only found to have a significant association with the frequent use of takeaways, cafe/pubs/restaurants and the use of the group of district facilities. The

different classes were based on the ONS Standard Occupation Classification (SOC) 2010, as set out in Chapter 6 (see Table below).

Class	Description of Occupations
1	Managers and senior officials
2	Professional occupations
3	Associate professional and technical occupations
4	Administrative and secretarial occupations
5	Skilled trades occupations
6	Personal service occupations
7	Sales and customer service occupations
8	Process; plant and machine operatives
9	Elementary occupations
10	Permanently sick or disabled

Table 7-15: Class based on SOC 2010, ONS

Respondents in classes 5 to 10 were found to be more likely to use **district facilities, takeaways and cafes/restaurants/pubs** than respondents in class 1 and 2. Whilst Fisher and Bramley (2006) found that being in class 1 or 2 had a positive influence on the frequent use of a number of facilities, such as libraries, museums and places of worship, this could not be confirmed by this study. Another study in Scotland expected to find many differences between the classes as to whether an activity was done locally or not but found the only difference was that class 3 (non-manual households) were drinking locally more frequently than other classes. The latter tallies with the findings above, although the facility category includes pubs, restaurants and cafes. As set out in chapter 3, working classes have been found to have stronger links with neighbours and family living in the same area, using them as support networks (Yancey, 1971). The more frequent use of local facilities and particularly social facilities, such as pubs/restaurants and cafes, by respondents in classes 5 to 10 in this study supports the notion that the working classes are more oriented towards their residential areas with ensuing higher levels of social interaction amongst residents of this class (Henning and Lieberg, 1996).

The final personal characteristic aspect was **length of residence**. Respondents who had lived in the area over 20 years used **newsagents and post offices** more frequently. In the group of people who have lived in the area for over 20 years, 62% were over 60 years old and as old age had also been found to be significantly associated with the use of these facilities, this result was expected. Ahlbrandt (1984) found that those people living in the neighbourhood for longer used local facilities more frequently than other residents, however his 'local' facilities were a mix of facilities classified here as neighbourhood and district facilities, hence his findings are not directly comparable with the findings here.

Children related facilities, such as **nurseries, primary schools, children's play areas and secondary schools** were most frequently used by residents who had lived in the area for less than 20 years which tallies with the previous findings on age.

The frequent use of **leisure centres** was also significantly associated with residence length in that people who had lived in the area for 11-20 years were more likely to use the leisure centre than people who had lived in the area for over 20 years. Previous findings in this section found that age was a significant predictor for frequent use of the leisure centre with people aged less than 44 being three times more likely to use the leisure centre than people aged above 45. Inspecting a crosstab between residence length and age groups (see below), a medium association between age group and residence length (chi-square sig=0.000 and Cramer's V=.373) was identified. Only 28% of people aged less than 44 had lived in the area for 11-20 years, whereas over 65% of that age group had lived in the area for less than 10 years, hence residence length appeared to be a separate influence on the use of leisure facilities.

	<5 YEARS	5-10 YEARS	11-20 YEARS	>20 YEARS
<30-44	35.90%	29.70%	28.10%	6.30%
45-59	15.60%	20.00%	31.10%	33.30%
>60	7.50%	7.50%	26.40%	58.50%

Table 7-16: Cross-tabulation of age and length of residence

Supermarkets were used more frequently (daily) by respondents who had lived in the area for 5-10 years. Considering table 7-16 above, it is not clear why this would be the case. Whilst this group has a large share of younger people, age itself was not significantly associated with the frequent use of local supermarkets.

7.4.4 Comparison of Personal Characteristics

In summary, the table below sets out the characteristics which were found to be significantly associated with the frequent use of neighbourhood and district facilities as a group and of individual facility types. Facility types whose frequency of use was not associated with any of the personal characteristics, such as hairdresser, corner shop, and community centre are excluded from the table below.

	Demographic	**Socio-economic**	**Cultural**
Neighbourhood Facilities		One person pensioner *use less*	
Newsagent	>60 years	Retired; Home/family, Married with dep. children	> 20 years
Post Office	>60 years	Home/family	>20 years
Bus Stop	>60 years	Retired; sick/Unemployed, Couples without dep. children	
Take Away		Retired, One person pensioner *use less*	Class 5-10

	Demographic	Socio-economic	Cultural
Children's Play Area	< 44 years	Home/family, part/self employed, Married with dep. children	<20 years
Green Space		Part/self employed, have children	
Primary School	< 44 years	Home/family, part/self employed, Married with dep. children	<20 years
Nursery	< 44 years	Married with dep. children	<20 years
District Facilities		**Married with dep. children**	**Class 5-10/<20 years**
Supermarket			5-10 years
District Centre		Owners use more, One person other *use less*	
Secondary School	45-59 years	Married with dep. children	5-10 years
Park		Married with dep. children	
Café/Pub/ Restaurant		Single parents with dep. children	Class 5-10
Leisure Centre	< 44 years	Married no children	11-20 years
Library		Have children	
Place of Worship	Female		Non-white British

Table 7-17: Summary table of demographic characteristics affecting facility use

It is apparent from the table that different 'groups' of people use different facilities frequently. With regard to age, very local facilities such as newsagent and post offices are more frequently used by older people but also by people who are staying at home. The group of married/cohabiting couples with dependant children make frequent use of a number of expected local facilities, such as nursery, primary school, secondary school, parks and children's play areas, but also the newsagent. Users that have children but are not in a married/cohabiting household make frequent use of the library and green spaces and single parents with children make frequent use of social places like cafe/pub/restaurant perhaps with the plan to meet other people. Conversely, single households and single pensioner households make less frequent use of the group of neighbourhood facilities, takeaways and the district centre.

With regard to class, users with a working class background used local takeaways, cafes/pubs/restaurants and the groups of district facilities overall more frequently.

These findings highlight that different facility types serve different users and if they are to serve as a place of social interaction for the entire community this differential use might hinder this as some members of the community do not use these places frequently enough to meet people they recognise. Implications of these findings are discussed in Chapter 10.

Tenancy, gender and ethnicity was only found relevant for a single facility type each, in that females and non-white British users made more frequent use of places of worship and owners made more frequent use of the district centre.

7.5 SUMMARIES

The chapter has investigated which factors influence the level of use of local facilities, thereby achieving **Objective 2**. It analysed which area and personal characteristics were significantly associated with the frequent use of local facilities and what the profile of the most frequently used facilities were with regard to their location, accessibility, mix and perceived advantages. Due to data limitations, as discussed above, it was not possible to go beyond bivariate analysis and compare the relative importance of the facility, area and personal characteristics on the frequency of local facility use in a combined regression model.

Summarising the profile of the most frequently used local facilities, supermarkets were by far the most frequently used local facility. Quality and affordability considerations did not play a large role in choosing the local facility, more important was the fact that it was conveniently located close by, which meant that all frequently used facilities were within a mile of the user's home and half of those within ½ mile. Given its proximity, over half of the most frequently used facilities were walked to. Considering the social aspect of facilities (rather than their utilitarian purpose) places of worship and cafes/pubs/restaurants were predominantly chosen to meet others. No clear profile with regard to the spatial arrangement of these facilities could be found in the dataset.

With regard to the wider area the facilities were located in, subjective perceptions about crime levels, provision of public footpaths and ease of walking around were found to be positively associated with the frequent use of a number of different local facility types. Having a social network in the area and perceiving others in the area a being similar to oneself were also positively associated with the frequent use of several local facilities.

With regard to personal characteristics of the users, their age, employment status, household composition and residence length were all associated with the level of use of local facilities. The results highlighted the fact that different user groups use different types of local facilities and that, whilst families with children make substantial and frequent use of local facilities, other groups, particularly single households and people without children used local facilities less.

The next chapter will investigate which factors affect social interaction at local facilities, including 'frequent use' as a predictor for frequent social interaction.

Chapter Eight

Findings: Factors influencing Social Interaction at Local Facilities

8.1 INTRODUCTION

Having analysed to what extent local facilities were *used* by the sample and which factors affected their frequency of use, the research now turns to the question of *social interaction* at local facilities. Having set out in Chapter 6 the importance of some local facilities as places of frequent social interaction in the sample, the following sections analyse which factors affect the **frequency of social interaction** at those facilities, thereby addressing Objective 4. As discussed in Section 5.7.1.1., the outcome variable 'frequent social interaction' is a transformed, binary variable where '1' stands for people who 'greeted' or 'talked to' others at a facility 'every time' or 'most times' they used that facility whilst '0' means that they engaged in the same types of social interaction at local facilities 'some times', 'rarely' or 'never'.

The factors potentially affecting social interaction, as highlighted in the literature review, are again organised into facility, area and personal characteristics in this chapter. First, a series of bivariate analysis is used to ascertain which factors show a relationship with frequent social interaction. Secondly, those factors that have shown a significant relationship with frequent social interaction are combined in regression models (logistic, ordinal and multiple) to test which factors retain a significant association with social interaction levels whilst controlling for other factors.

Overcoming the problem of multiple facilities and an even greater number of users, **each recorded social interaction at a facility** was considered a single case. Whilst respondents visited up to three facilities and some facilities were named by several respondents, the social interaction levels recorded were influenced during each trip by the specific facility and its specific user. For example, respondent number 1 is a retired, female respondent who lives alone and most frequently visited the supermarket, the church and the hairdresser. Whilst she recorded that she had frequent social interaction at the church, she only had infrequent social interaction at the supermarket and the hairdresser. Hence, the 3 visits were considered 3 separate cases.

The first section analyses characteristics of the facilities themselves that might have an influence on social interaction levels at local facilities.

8.2 FACILITY CHARACTERISTICS

The literature review highlighted the following key facility factors with potential relevance for social interaction at local facilities:

- Level of use,
- Type of facility,
- Social characteristics of the facility and its users, and
- Physical characteristics, such as mix, spatial distribution and visibility.

A number of bivariate relationships between social interaction levels and the measured facility factors were found in the dataset as discussed below.

8.2.1 Level of Use & Type of Facility

As stated in Chapter 3, the use of local facilities has been found to lead to higher levels of social interaction and neighbouring *in a neighbourhood* (Ahlbrandt, 1984; Hunter, 1975). As the focus of this research is on social interaction *at local facilities,* the use of those facilities are considered a prerequisite. Whether more frequent use (rather than use or no-use) of those facilities leads to higher levels of social interaction at those facilities has, however, not been tested to date. The data in this research showed a significant, albeit of low strength, association between frequency of use and frequency of social interaction for all facilities (see Table 8-1). The frequency of using individual facility types, such as supermarkets, parks/open spaces, district centres and libraries were also tested, but none showed a significant association with social interaction. The only exception was the frequent use of restaurants/cafes/pubs which was significantly associated with frequent social interaction.

FACILITY FACTORS	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	CRAMER'S V
Level of Use	Yes	Low	.249
Frequent use of cafe/pub/restaurant	**Yes**	Low	.219
Individual Facility Type	**Yes**	**Medium**	**.379**
Type Group (Education, Leisure, Commercial)	**Yes**	**Medium**	**.305**

Table 8-1: Associations between facility factors and frequent social interaction

Several specific types of facilities have also been highlighted as being prominent locations for social interaction, such as schools and children's play areas (Camina and Wood, 2009; Jupp, 1999), parks (Sullivan *et al*., 2004; Kuo *et al.*, 1998) churches (Ellison and George, 1994) and supermarkets (Sommer, 1998). Individual facility types had a medium strong significant association with social interaction. To test which specific facility types were predictors of frequent social interaction and which ones were not, a simple logistic regression model was used which showed that schools, play areas, leisure centres and places of worship were indeed places of frequent social interaction, whereas supermarkets (the most frequently used facility across the community) were found to be places of limited social interaction (see Table 8-2).

	B	WALD	SIG.	EXP(B)
Supermarket		**40.621**	**.000**	
Place of worship	**3.351**	**10.328**	**.001**	**28.536**
Schools	**2.555**	**16.104**	**.000**	**12.869**
Play area	**1.057**	**4.386**	**.036**	**2.878**
Leisure centre	**.977**	**5.810**	**.016**	**2.658**
Park/open space	.672	3.431	.064	1.958
Restaurant/pub/café	.473	1.909	.167	1.606
Others	-.070	.014	.905	.933
Library	-.080	.038	.846	.923
District centre	-.271	.583	.445	.763
Post office	-.581	.713	.398	.560
Corner shop/newsagent	-.175	.126	.722	.839
Constant	-.518	9.414	.002	.596
a. Variable(s) entered on step 1: newtypesort.				
Model predicts 64.8% correctly Note R^2 = 0.127 (Cox and Snell), 0.169 (Nagelkerke) Model $x^2(1)$ = 61.57 ; p=<0.000				

Table 8-2: Type of facility and social interaction

Other facility types had not shown a significant association and given the low numbers of some types of facilities, they were summarised into the following three larger groups:

- **leisure** (park and green spaces, children's play, leisure centre, library, place of worship, community centre, allotment and café/rest/pub),
- **educational** (all schools and nurseries) and
- **commercial** (all remaining types).

These were found to be significantly associated with social interaction levels (see Table 8-1) and a logistic regression model highlighted the fact that educational and leisure facilities were more likely to constitute places of frequent social interaction than commercial facilities.

8.2.2 Social Characteristics

Cattell *et al*. (2008) found that people often described public spaces in terms of their interaction with other people and Whyte (1980) found that people were attracted to spaces which were frequented by a large number of people. This study asked respondents whether certain facilities were places through which or at which they had initially met friends or neighbours or places which were used for on going social interaction as a place for meeting friends, to test whether there were significant associations between those and frequent social interaction. All of these factors were found to have a significant association with frequent social interaction, but only having met friends initially at a facility had a medium strength association (see Table 8-3).

FACILITY FACTORS	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	PHI
Initially met Neighbours at Facility	Yes	Low	.182
Initially met Friends at Facility	**Yes**	**Medium**	**.402**

Facility Factors	Significant association	strength of association	Pearson's
Plan to meet with friends at Facility	Yes	Low	.293
Is Facility considered a 3rd place	**Yes**	**Medium**	**.426**

Table 8-3: Associations between social characteristics of facilities and frequent social interaction

This research also asked respondents how important they felt certain places were for them to socialise with people they knew to ascertain whether any of the most frequently used facilities were considered '**third places**' by the respondents (Oldenburg, 1999). This was significantly associated with frequent social interaction (Phi = .426) (see Table 8-3) but not as high as might have been expected, indicating perhaps, that people feel other places (e.g. at home) are more important places to socialise with friends than facilities where they have frequent, but relatively short social interaction (e.g. a short chat in the supermarket).

8.2.3 Physical Characteristics : Mix of Facilities

As highlighted in Chapter 3, there is a lack of research analysing how different types of *facility mixing* might impact on social interaction levels at them. Some recommendations have been made by urban designers without providing empirical evidence of their recommendations. Hence, this section is written up as a series of exploratory hypotheses that have been tested with regard to the mixing of facilities, some of which have been found to have a significant association with social interaction levels whilst others have not.

The first hypothesis was that a group of facilities which contained at least one third place would be associated with more frequent social interaction at facilities. This association was not found in the dataset (see Table 8-4).

FACILITY FACTORS	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	PHI * CRAMER'S V
Outdoor Recreation Function present in group of facilities	Yes	Low	.184
Children leisure function present in group of facilities	Yes	Low	.215
Leisure function present in group of facilities	Yes	Low	.171
Socialising function present in group of facilities	Yes	Low	.267
Education function present in group of facilities	Yes	Low	.136
Faith function present in group of facilities	Yes	Low	.193
Medical function present in group of facilities	Yes	Low	.224
Comparative shopping function present in group of facilities	Yes	Low	.272

FACILITY FACTORS	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	PHI * CRAMER'S V
Convenience Shopping function present in group of facilities	Yes	Low	.237
Number of different functions in group	**Yes**	**Medium**	***.342**
Mixing Types (vertical/horizontal/temporal)	Yes	Low	.189
Percentage of high frequency units in group	**Yes**	**Medium**	**.412 (ETA)**
No significant association: Group of facilities contains a 3rd place			

Table 8-4: Associations between different types of mixing of facilities and frequent social interaction

Rodenburg and Nijkamp (2004) identified in their definition of multifunctionality different types of mixing: the mixing of different functions, the mixing of a number of units of the same function and the mixing of functions closely located. With regard to social interaction levels the hypothesis was that the following aspects would increase the frequency of social interaction at those facility groups:

- The number of different functions,
- Certain types of functions, and
- A finer grain of mixing functions.

To test these three hypotheses, first the different facilities within a group were divided into their **main function**, which were convenience shopping (food), comparative shopping (clothes etc.), outdoor recreation, leisure (incl. libraries etc.), leisure for children (such as play areas and skate parks), socialising (community centres, pubs, etc.), faith and medical. Only the main function was recorded, for example if a large supermark*et al*so sold comparative goods, such as clothes, electrical items etc., it was still rated by its primary function, which was food shopping, classified as convenience shopping. Each of these functions showed a low association between their presence in a group and social interaction levels at facilities (see table 8-4).

Then the **number of different functions** within a group was tested and it was found that there was a medium strength association between the number of different functions and social interaction levels at facilities. Different **forms of mixing** (vertically, horizontally, temporal) also showed an association with social interaction, albeit a low correlation (see table 8-4).

The final aspect of mixing that was tested was the hypothesis that *having more frequently used facilities in the same group would also result in more frequent levels of social interaction* as people would visit the facilities more often and therefore have more frequent chances to bump into people they knew. Hence, as set out in Section 5.6.4.3, facilities were grouped into **high frequency use** commercial and leisure facilities (as rated by the respondents to be supermarkets,

corner shop, newsagent, park/green space, children's play and district centre shops) and low frequency use (post office, leisure centre, café/restaurant/pub, place of worship, library, community centre, take away, hairdresser/barber). The percentage of high frequency use facilities within a group was associated with medium strength (ETA = .412) with frequent social interaction levels at facilities (see Table 8-4).

8.2.4 Physical Characteristics: Spatial Distribution and Visibility of Facilities

With regard to the location and spatial arrangement of facilities and centres, Barton *et al.* (2003) suggested locating facilities on the edge of a neighbourhood on a main route and adjacent to another neighbourhood to attract higher levels of footfall and visibility. Raman (2010) also found that social spaces that were physically and visually well connected to other spaces and routes had the highest number of social interactions. In this study, this was only partially confirmed (see Table 8-5). Visibility, street shape (straight, curved, on square) and urban form (cluster off road, situated on corner, along linear street) had no associations with social interaction levels at local facilities, whereas location (central or peripheral), format (stand alone or group), and street type (main road or residential) were significantly associated with frequent levels of social interaction at the facility.

FACILITY FACTORS	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	PHI * CRAMER'S V
Location in centre of area or periphery	Yes	Low	.262
Format - stand alone facility or in group	Yes	Low	.202
Number of units in the group	**Yes**	**Medium**	***.345**
Street type	Yes	Low	.284*
No significant association: Urban form, street shape, visible from main road, visible from road facility is located on			

Table 8-5 – Associations between spatial distribution and visibility of facilities and frequent social interaction

The number of units had the strongest association (Cramer's V = .345) with social interaction levels, which was similar to the number of functions within a group (see Table 8-4 above). As the number of units and the number of functions were highly correlated (Pearson's R = 0.636), the similarity of the result was not that surprising.

8.2.5 Comparison of Facility Factors

The facility factors which had shown a bivariate relationship with frequent social interaction levels at local facilities and which were not too highly correlated with each other were tested in a series of binary logistic regression models to ascertain which factors combined and individually were most successful predictors for frequent social interaction. When fitted into one final model, the remaining significant predictors that had a positive effect on frequent social interaction levels were the type of facilities, frequent use, the facility being located along a residential

spine/distributor road and respondents stating that they had met friends (but not neighbours) initially at this facility. The overall model classified 69% of cases correctly, indicating a medium relationship of 30% (R^2= .30) between predictors and prediction (see Table 8-6).

		B	WALD	SIG.	EXP(B)
Type	Commercial		15.691	.000	
	Educational	2.082	6.682	.010	8.024
	Leisure	.934	10.880	.001	2.544
Physical Characteristics	Residential Spine/Distributor Road Location	1.021	14.382	.000	2.775
Use	Non-Frequent use	-1.034	7.730	.005	.355
Social Characteristics	Yes, met friends initially at facility	1.804	25.177	.000	6.074
	Constant	-1.083	31.174	.000	.339
a. Variable(s) entered on step 1: Facgroup, resi_spine_road, use_level_binary, Q16					
Model predicts 69%; Note R^2 = **0.22** (Cox and Snell), **0.30** (Nagelkerke) Model $x^2(1)$ = 89.6 ; p=<0.000					

Table 8-6:Combined Facility Factor Model

Looking at individual factors, the predictor with the largest odds ratio was the type of facility being an education facility which were 8 times more likely to constitute places of frequent social interaction (keeping all other factors constant) than commercial facilities (see Table 8-6). Leisure facilities were twice as likely to constitute places of frequent social interaction than commercial facilities. Facilities located along a spine/distributor road in a residential area were nearly 3 times more likely to constitute places of frequent social interaction than in other locations. Facilities that were frequently used, were also 2.8 times (inverse odds ratio) more likely to constitute places of frequent social interaction than facilities that were used less often. Finally, facilities at which respondents had met friends initially were 6 times more likely to constitute places of frequent social interaction.

8.3 AREA CHARACTERISTICS

The literature review highlighted the importance of residents' perceptions about the area where they live and where their local facilities are situated. As discussed in Chapter 3, perception in this case has been found to be more relevant than actual area statistics, such as crime or deprivation as, for people to interact with others, they have to *feel* safe and/or comfortable (Kitamura, 1997). This depends on the individual and their circumstances and for example crime levels in an area can be individually perceived in different ways. Hence, this section focuses overwhelmingly on respondents' perceptions of their area, which can relate to several aspects of the area:

- Social area characteristics (perceived homogeneity of residents, perceived and actual crime and deprivation levels in the area),
- Physical area characteristics (walkability, feeling safe to walk, density), and
- Familiarity with area and its residents (place attachment, residence length and social network in area).

A number of bivariate relationships between the above variables and social interaction levels at facilities were found in this dataset as discussed below.

8.3.1 Social Area Characteristics

Perceived homogeneity has been found to increase or enable social interaction (Hunter, 1975, Snow *et al*., 1981). Feeling unsafe can relate to physical aspects of the environment (DETR, 1999) or other people (Pain and Townshend, 2002; Holland *et al.*, 2007), which was measured in this study by asking people whether they felt *there was a lot of crime in the area*. Feeling safe in a neighbourhood has been linked to increased neighbouring (Newman, 1995) and was thus included to test its relevance for social interaction at local facilities. However, only perceived homogeneity had a significant association with social interaction levels at facilities in this dataset (see Table 8-7).

	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	PEARSON'S
Perceived homogeneity	Yes	Low	.117
No significant association: Perceived crime, actual crime ranking, actual deprivation ranking			

Table 8-7: Association between social area characteristics and frequent social interaction

8.3.2 Physical Area Characteristics

Walking to local facilities has been found to increase social interaction within residential areas (Casey *et al.*, 2007), although this remains contested (du Toit *et al.*, 2007). Hence, this study measured whether respondents felt it was '*easy to walk around the area'*. **98% of respondents agreed** or agreed strongly with this statement, hence there was not enough variance in this indicator to analyse an effect on social interaction levels.

In addition to the ease of walking around an area, density of the area has also been found to influence levels of social interaction in neighbourhoods (Bramley *et al.*, 2009; Raman, 2005) and the data in this research also showed that density was related to frequent social interaction at local facilities (see Table 8-8).

	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	PEARSON'S
Density	Yes	Low	.132
No significant association: Walkability of Area			

Table 8-8: Association between physical area characteristics and frequent social interaction

8.3.3 Familiarity with the local area and residents

As set out in the literature review in Chapter 3, this section covers two aspects of familiarity with the area: residence length and attachment to the area as well as the social network a respondent had in their sample areas.

Residence length has been found to have a positive impact on social interaction (Bramley *et al.*, 2009). Furthermore, Dempsey (2006) found that positive judgement of the area a resident was living in was a significant predictor for high levels of social interaction in a neighbourhood. Actual residence length, enjoyment of the area and intent to stay in the area were all significantly associated with frequent social interaction at local facilities, with the length of residence having the strongest positive association (Pearson's = .331), but the variance in 'enjoyment of area' was insufficient to use in more sophisticated statistics (see Table 8-9).

	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	PEARSON'S
Enjoy living in area	Yes	Low	.186
Planning to stay in area	Yes	Low	.155
Length of Residence	**Yes**	**Medium**	**.331**

Table 8-9: Associations between familiarity with the area and frequent social interaction

The number and type of a resident's social network has been found to be important for their ability to have social interaction within a neighbourhood (Riger and Lavrakas, 1981). This was analysed in relation to social interaction at local facilities, testing whether the **number of neighbours known, the previous social network, the current social network or the frequency of visiting and being visited at home** were significant predictors for frequent social interaction. Having friends or family in the area, visiting people regularly in the area and the number of neighbours known all showed significant positive associations with frequent social interaction at local facilities (see Table 8-10).

	SIGNIFICANT ASSOCIATION	STRENGTH OF ASSOCIATION	PHI
Having family in the area	Yes	Low	.143
Having friends in the area	Yes	Low	.277
Visiting people from the area	Yes	Low	.218
Number of neighbours known	Yes	Low	.198
No significant association: Knowing neighbours in area, having acquaintances in area			

Table 8-10: Associations between social networks in area and frequent social interaction

8.3.4 Comparison of Area Characteristics

Again, the area characteristics which had shown a significant association with social interaction were tested in a number of combined logistic regression models, with the following remaining significant predictors of social interaction at local facilities:

		B	WALD	SIG.	EXP(B)
Perception of area (social)	Not feeling similar to others	-1.339	8.506	.004	.262
Social Networks	No friends known in area	-1.605	12.558	.000	.201
	0-20 neighbours known	-1.302	10.457	.001	.272
Density	60-80 persons per ha	1.172	4.047	.044	3.228
	Constant	1.374	19.310	.000	3.949
a. Variable(s) entered on step 1: newhomo, Q22freinds, Q23binary, highdensity					
Model predicts 69%; Note R^2 = **0.22** (Cox and Snell), **0.30** (Nagelkerke) Model $x^2(1) = 36.6$; p=<0.000					

Table 8-11:Combined area characteristics and social interaction

The overall model was significant, indicating only a weak relationship of 16% between the predictors and the prediction and correctly classifying only 64% of cases. With regard to individual predictors, not having friends and knowing few neighbours in the area meant that a resident was 3.5 and 2.1 times respectively **less likely** to have frequent social interaction at local facilities, whereas a resident who lived in an area with a density of more than 60 persons per ha was 2.4 times **more likely** to have frequent social interaction at local facilities (see Table 8-11). Respondents who felt dissimilar to other people in the area were nearly 4 times less likely to have frequent social interaction at facilities than respondents who perceived themselves as similar to others. Comparing the odds ratio, having no friends in the area appears to be the strongest predictor.

8.4 PERSONAL CHARACTERISTICS

8.4.1 Demographic and Socio-economic Factors

Gender (Talen, 1999), **age** (Campbell and Lee, 1992) and **ethnicity** (Argyle, 1969) have been found to have an influence on levels and types of social interaction. Hence, those variables were tested in this research, as to whether they had a significant association with frequent social interaction at local facilities. None of these showed a significant association (see Table 8-12).

	SIGNIFICANT ASSOCIATION.	STRENGTH OF ASSOCIATION	PHI
Part and self employed	Yes	Weak	.137
Retired	Yes	Weak	.105
Having children	Yes	Weak	.144
Class 6-10	Yes	Weak	.208
No significant association: Gender, age, ethnicity, tenure, full-time employment, household composition			

Table 8-12: Associations between demographic and socio-economic factors and frequent social interaction

This is quite surprising given that other authors have found that age (Ajrouch *et al.*, 2001; du Toit *et al.*, 2007) and gender (Camina and Wood, 2009; Campbell and Lee, 1992; Skjaeveland and Garling, 1997) by themselves were important predictors for social interaction. However, other studies have highlighted that not age and gender by itself, but a respondent's life cycle stage (e.g. having young children and being at home) was related to high levels of social interaction (Haggerty, 1982). To investigate this claim further, a number of interaction effects between variables such as gender and household composition were analysed in Section 8.4.2 below to shed light on this matter.

Other socio-economic factors have also been highlighted in the literature to be relevant for social interaction in neighbourhoods. The presence of children at home (du Toit *et al.*, 2007) and being in employment (Haggerty, 1982) have been found to have a positive impact on social interaction. Pensioners/retired people have also been found to have higher levels of social interaction in shops and markets due to the need for more social contact (Ishii-Kuntz, 1990; Watson, 2009). Furthermore, working classes have been found to engage in more frequent social interaction (Yancey, 1971) and to have higher intensity of social interaction, using neighbours and friends as a support network (Henning and Lieberg, 1996). Bivariate analysis of this dataset showed significant associations between having children, being retired or part-time employed and being in class 6-10 (see table 8-12).

8.4.2 Life Cycle Stage (Interaction Effects)

As discussed above, some authors have found that important factors for social interaction were not individual personal factors, such as age or gender, but a person's life cycle stage, combining several factors, such as being a woman plus having children at home plus being part-time employed. To test these assertions, a number of interaction models have been run, whereby the combined effect of two factors is analysed; that is the effect where one variable becomes stronger or weaker depending on the level of the other variable as discussed in Section 5.7.1.2.

The first significant interaction effect was found for a model (p=.014) testing interaction between **gender and household composition**, where being married with dependent children was the reference category (see Table 8-13). The odds ratio of men having frequent levels of social interaction compared to women in the same reference category was .205. Hence, men who were married with dependent children were 4.8 times **less likely** to have frequent social interaction than women who were married with dependent children. Considering the odds ratio of men in other household types, this showed that men living either in a single person, non-pensioner household or in a couple household with grown up or no children were 16 and 12 times

respectively **more** likely to engage in frequent social interaction at a local facility than women in the same type of household.

	B	WALD	SIG.	EXP(B)
Married with dep. Children		11.955	.008	
One person pensioner	-1.232	2.932	.087	.292
One person other	-1.925	8.531	.003	.146
Married no or old kids	-1.817	9.848	.002	.163
Male	**-1.587**	**6.137**	**.013**	**.205**
Gender * household composition		11.695	.009	
Male by One person pensioner	.517	.188	.665	1.676
Male by One person other	**2.819**	**5.732**	**.017**	**16.762**
Male by Married no or old kids	**2.529**	**8.942**	**.003**	**12.536**
Constant	1.386	9.225	.002	4.000
a. Variable(s) entered on step 1: householdred2, Q32, Q32 * householdred2 .				
Model predicts 64.5% correctly ; Note R^2 = 0.10 (Cox and Snell), 0.14 (Nagelkerke) Model $x^2(1)$ = 17.5 ; **p=<0.014**				

Table 8-13: Gender and household interaction effect on social interaction

The same effect was detected when analysing the interaction effect for **gender and having children** (p=.027) (see Table 8-14 below) indicating that women who had children were nearly four times **more likely** than men who had children to have frequent social interaction at facilities. These are interesting findings, qualifying the assertions that 'having children' per se results in higher levels of social interaction (du Toit *et al.*, 2007), as this only held true for women in this sample. Given that this study was analysing social interaction at local facilities, this might also point towards women predominantly taking children to school and then engaging in social interaction at those schools. Contrary to stereotypes as well are the findings that single men and men in childless household were more likely to have frequent social interaction levels at facilities than women in the same households (see Table 8-14).

	B	WALD	SIG.	EXP(B)
Women	-.419	.996	.318	.658
Yes, children	-.054	.011	.918	.947
Women by having children	**1.374**	**3.925**	**.048**	**3.952**
Constant	.054	.027	.869	1.056
a. Variable(s) entered on step 1: Q32, childrenbinary, Q32*childrenbinary Model predicts 58.9% correctly				
Note R^2 = 0.056 (Cox and Snell), 0.075 (Nagelkerke) Model $x^2(1)$ = 9.3 ; p=<0.027				

Table 8-14: Gender and having children interaction effect on social interaction

Having ascertained that having children affected women and men differently, a further interaction was found between **having children and the age group** a respondent was in, having first checked that age and having children was not too highly correlated (.511). Under 44 years of age was the reference category, people with children in that age group were 16 times more likely to have frequent social interaction at facilities than people who did not have children (see Table 8-15). However, when considering the results for the different age groups, respondents aged 45

to 59 years with children were 18 times **less likely** to have frequent social interaction at facilities than respondents who were aged less than 44 years with children. This might be due to the age of the children, where most respondents in the sample who had young children would take them to primary schools and had high levels of social interaction there, whereas fewer respondents with older children were taking them to secondary school.

	B	WALD	SIG.	EXP(B)
< 44		11.361	.003	
45–59	1.897	6.840	.009	6.667
> 60	2.303	11.361	.001	10.000
Yes children	**2.780**	**15.416**	**.000**	**16.111**
Age * having children		9.932	.007	
45-59 by having children	**-2.897**	**9.538**	**.002**	**.055**
>60 by having children	-2.492	2.979	.084	.083
Constant	-1.897	9.389	.002	.150
a. Variable(s) entered on step 1: age3groups, childrenbinary, age3groups * childrenbinary .				
Model predicts 64.2% correctly; Note R^2 = 0.13 (Cox and Snell), 0.17 (Nagelkerke) Model $x^2(1)$ = 23.3 ; p=<0.000				

Table 8-15: Age group and having children interaction effect on social interaction

Having found that **age** (whilst not a significant predictor on its own) was significant in interaction with having children, other demographic factors were also tested for interaction effects with age. **Employment status and age** was another significant interaction effect (p=.002) (see Table 8-16). Less than 44 years of age was the reference category; respondents who were not in full-time employment in that age group were nearly five times *less likely* to engage in frequent social interaction at facilities than respondents who were. Comparing the same category for respondents at the age of 45 to 59 years, those respondents were over five times *more likely* to engage in frequent social interaction at facilities than younger respondents (<44) who were not employed full-time. This is an interesting finding and not easily explained. Potentially more respondents at the age of 45 to 59 are part-time or self employed and this makes them more likely to engage in frequent social interaction.

	B	WALD	SIG.	EXP(B)
<44		3.293	.193	
45 -59	-.943	2.541	.111	.390
>60	.018	.001	.976	1.018
Not fulltime	**-1.585**	**8.570**	**.003**	**.205**
Age * not fulltime		4.339	.114	
45-59 by not fulltime	**1.680**	**4.339**	**.037**	**5.367**
>60 by not fulltime	.720	.210	.647	2.054
Constant	.847	4.523	.033	2.333
a. Variable(s) entered on step 1: age3groups, fulltime, age3groups * fulltime .				
Model predicts 63.0% correctly Note R^2 = 0.091 (Cox and Snell), 0.122 (Nagelkerke) Model $x^2(1)$ = 13.3 ; p=<0.002				

Table 8-16: Age and employment type interaction effect

8.4.3 Comparison of Personal Factors

The above bivariate analysis of personal factors affecting frequent social interaction at local facilities has demonstrated that the following individual predictors had a significant association with frequent social interaction at local facilities:

- Having children,
- Employment status, and
- Being in Classes 6-10.

As well as the following interaction effects:

- Gender and household type,
- Gender and having children,
- Age and having children, and
- Age and full-time employment.

As with the previous sub-sections, it would have been interesting to test a combined model with all previously identified significant predictors. However, adding individual predictors and the interaction effects into one model would have required a much larger dataset to calculate significant results hence, only the significant *individual* predictors were tested in a combined model (see table 8-16). The overall model remained significant, with a weak relationship of 13% between predictors and prediction, correctly classifying only 60% of cases. With regard to individual predictors, being in social classes 6-10, being retired and having children remained significant predictors. The strongest predictor was class, as respondents in classes 6-10 were 5 times more likely to have frequent social interaction at facilities than people who were in other classes (see table 8-17).

	B	WALD	SIG.	EXP(B)
Yes, children(1)	.819	.409	.045	2.269
Class 6-10	1.644	.817	.044	5.178
Reference category: all other types of employment			.051	
Retired	.910	.458	.047	2.484
Part or self-employed	.862	.452	.057	2.368
Constant	-.685	.323	.034	.504
a. Variable(s) entered on step 1: childrenbinary, Classbinary, empstatus2				
Model predicts 60.4% correctly Note R^2 = 0.10 (Cox and Snell), 0.13 (Nagelkerke) Model $x^2(1)$ = 15.6 ; p=<0.004				

Table 8-17: Combined personal factors and social interaction

8.5 COMPARISON OF ALL FACTORS

The chapter has analysed which of the facility, area and personal characteristics identified in the literature review in Chapter 3 had a significant association with levels of frequent social interaction at local facilities using bivariate analysis and logistic regression models. This final section shows the results from a combined model containing only the previously identified significant predictors from each set of characteristics comparing results from logistic (1=frequent SI, 0=non-frequent SI), ordinal (1-5 never to every time) and multiple linear regression (average of 'talking to' and 'greeting').

Each group of characteristics (facility, area and personal) were added as blocks to each model which improved the overall predictability (see Table 8-18). For example, using multiple linear regression, the model only including facility characteristics was able to explain 22% of variance, together with area characteristics 38% of variance and in the final model including personal factors 40% of variance for social interaction at local facilities. The contribution of each predictor variable in multiple linear regression is expressed as a coefficient which can be negative or positive whereas in logistic and ordinal regression the contribution is shown as an odds ratio, which has a negative influence when it is below one and a positive influence when it is above one (see also section 5.7). As can be seen from the table below, the different regression methods achieved a fairly high degree of consistency for the model overall and individual predictors.

	COEFFICIENTS/ODDS RATIO			SIGNIFICANCE		
	Facility Model	+Area model	+Person model	Facility Model	+Area model	+Person model
Binary Logistic Regression (Odds Ratio)						
Commercial	Reference Category			.000	.000	.000
Educational	16.667	11.988	13.004	.000	.002	.002
Leisure	3.482	4.029	4.041	.000	.000	.000
Facility located along residential spine road	2.904	2.807	3.060	.000	.001	.001
Non frequent use of facility	.340	.345	.375	.006	.013	.024
Having no friends in the area		.375	.350		.004	.002
Knowing less than 20 neighbours		.393	.434		.007	.019
Not feeling similar to others in the area		.318	.387		.000	.003
>60 persons per ha		2.347	2.175		.040	**.082**
Being Retired			1.272			**.502**
Being in Class 6-10			4.708			.034
Having children			1.925			**.076**
Cox & Snell R^2	**.16**	**.27**	**.29**			
Nagelkerke R^2	**.21**	**.36**	**.39**			
Ordinal Regression (Odds Ratio)						
Commercial	Reference Category					
Educational	15.721	11.134	10.528	.000	.000	.000
Leisure	3.714	3.380	3.877	.000	.000	.000

	COEFFICIENTS/ODDS RATIO			SIGNIFICANCE		
Facility located along residential spine road	1.976	1.970	2.217	.002	.004	.002
Non frequent use of facility	.247	.261	.259	.000	.000	.000
Having no friends in the area		.349	.338		.000	.000
	Facility Model	+Area model	+Person model	Facility Model	+Area model	+Person model
Knowing less than 20 neighbours		.314	.313		.000	.000
Not feeling similar to others in the area		.356	.306		.000	.000
>60 persons per ha		1.411	1.394		.265	.331
Being Retired			1.828			0.39
Being in Class 6-10			2.016			.147
Having children			1.597			.088
Cox and Snell's R^2	**.21**	**.34**	**.40**			
Nagelkerke's R^2	**.22**	**.36**	**.42**			
Multiple Linear regression (β)						
Commercial vs Educational	-1.695	-1.391	-1.313	.000	.000	.000
Commercial vs Leisure	-.756	-.710	-.694	.000	.000	.000
Facility located along residential spine road	.445	.361	.353	.001	.004	.005
Non frequent use of facility	-.748	-.647	-.601	.000	.000	.000
Having no friends in the area		-.547	-.555		.000	.000
Knowing less than 20 neighbours		-.563	-.509		.000	.000
Not feeling similar to others in the area		-.609	-.531		.000	.000
>60 persons per ha		.123	.111		.441	.503
Being Retired			.256			.031
Being in Class 6-10			.392			.076
Having children			.313			.059
Adjusted R^2	**.22**	**.38**	**.40**			

Table 8-18: Combined model of all factors affecting frequent social interaction

With regard to individual predictors, in each regression method, density was not found to remain significant in the final model (see Table 8-18). Neither were the personal factors, suggesting that a person's perception of the area, their social network and the facility itself are more important than the socio-demographic profile of a person in determining whether a person frequently engages in social interaction at local facilities or not.

With regard to the ***facility itself***, the type of facility remained a significant predictor in that educational and leisure facilities were considerably more likely to be places of frequent social interaction than commercial facilities (see Table 8-18). Facilities that were used less frequently, were also less likely to be places where residents engaged in frequent social interaction. Furthermore, facilities that were located along residential spine roads were more likely to constitute places of frequent social interaction.

With regard to the ***area the facility is located in***, residents who knew few neighbours in the area, had no friends in the area or felt dissimilar to others in the area generally were also less likely to frequently engage in social interaction at local facilities (see table 8-18).

With regard to the ***residents***, in logistic regression, those in the social classes 6-10 were more likely to engage in frequent social interaction at local facilities, which supports previous findings. Using ordinal and multiple linear regression, retired residents were more likely to engage in social interaction frequently, whilst class did not remain significant (see table 8-18). As shown in the analysis of interaction effects, women with dependent children and younger residents (<44) with children were also more likely to engage in frequent social interaction at local facilities (see Tables 8-14 and 8-15), potentially due to visiting schools.

8.6 SUMMARIES

This chapter has analysed which of the facility, area and personal characteristics identified in the literature review in Chapter 3 had a significant association with frequent social interaction at local facilities, thereby addressing Objective 4. Whilst a large number of bivariate relationships could be established, some of these significant associations disappeared when controlling for other factors at the same time. To summarise, using the list established in Chapter 3 containing factors that are likely to affect frequent social interaction at facilities, the lists below show which factors had no significant associations with frequent social interaction at facilities in this dataset (*in italics*), which factors had a bivariate relationship only (shown with a *) and which factors remained significant in the final model (**in bold**), whilst controlling for other characteristics of the facility itself, the area it is located in and the personal characteristics of its users.

Facility Characteristics

- **Type of Facility**
- **Level of Use**
- Perception as 'Third Place'*
- Mix of Facilities*
- **Location of Facilities**
- *Visibility of Facilities*

Area Characteristics

- **Homogeneity**
- *Crime & Deprivation*
- *Walkability of Area*
- Density of Area*
- Place Attachment*
- Length of residence*
- **Social Network**

Personal Characteristics

- *Age*
- *Gender*
- **Life Cycle Stage**
- *Household Composition*
- **Social Class**
- **Employment Status**
- *Tenure*

Having analysed macro-scale factors influencing social interaction levels at local facilities, the next chapter investigates micro-scale, urban design features and their influence on the location, frequency and duration of observed social interaction at the two town centres of the selected residential areas.

Chapter Nine

Findings: Urban Design Features Influencing the Type, Location, Frequency and Duration of Social Interaction

9.1 INTRODUCTION

Having analysed which factors affect social interaction at all local facilities making use of statistical analysis of the household questionnaire results, this chapter now addresses **Objective 5**, analysing which urban design features influence the *type, location, frequency and duration* of social interaction at local facilities.

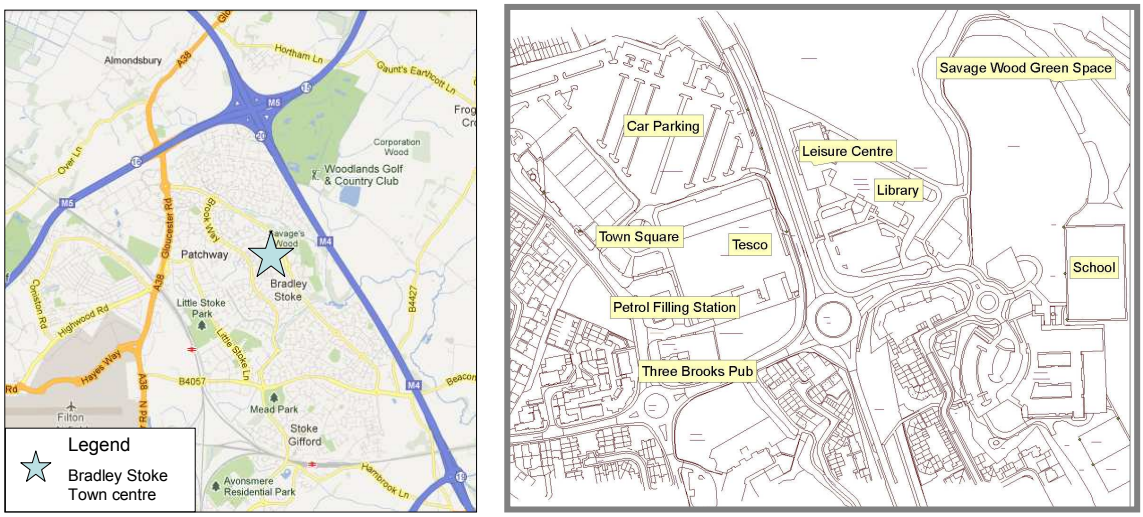
As stated in the methodology Chapter, due to the micro-scale of the features and the high likelihood that users of the facilities would not necessarily be conscious or aware of these features, unobtrusive observation was chosen as the method of analysis. This was conducted in the two new town centres (Bradley Stoke and Emerson Green), which contained a range of different facility types, variety of urban design features, building styles and surrounding public realm and were used by a majority of the residents on a frequent basis as identified from the survey questionnaire. They were thus selected as sites for the observation to allow comparisons.

The chapter starts with a brief overview of the two town centres, with regard to their history and policy background. This is then followed by a section showing the type, frequency, location and duration of the social interaction recorded, including a brief section on whether this was affected by people's attributes. This constitutes the descriptive part of the recorded data. It was felt that it would be easiest to keep the 'descriptive' part and the analysis in the same chapter to avoid frequent moving and cross-checking between chapters.

The chapter then presents analyses of social interaction with regard to the design features identified in the literature review in Chapter 4, relating to **features that retain people for longer in a space** (relating to comfort and curiosity) and **features that affect the movement of pedestrians** (relating to visual and physical permeability) using spatial analysis (through ArcGIS) and photographic evidence. Finally, the main findings are drawn together in the conclusion.

9.2 BACKGROUND TO CASE STUDY SITES

An area centrally located in Bradley Stoke was allocated as a site for a new town centre for Bradley Stoke in the approved 2006 South Gloucestershire Local Plan. It was intended to serve as 'both a shopping and service destination for the surrounding population which is due to grow to approximately 20,000 during the plan period' (South Gloucestershire Local Plan, 2006, Para 9.14). The map below shows the location of the town centre in relation to Bradley Stoke.



Map 9-1: Location of Bradley Stoke Town centre

Whilst permission for a comprehensive redevelopment had been granted in 1991, only a Tesco supermarket and filling station was built (South Gloucestershire Council, 2006). The adopted Local Plan stated that the Council was concerned about achieving a mixed use scheme with high quality design on the site. To that effect the Council commissioned a Joint Retail and Leisure Study in 1997, which recommended, inter alia, redeveloping the existing Tesco supermarket, concentrating on retail provision, allowing for the building of large space users (with a restriction of 1000 sq. m. gross of unit size) and to allowing an extension to the Tesco store (South Gloucestershire Council, 2006). All these recommendations had a direct implication on the eventual design of the town centre (see section 9.4.2.1.).

The application that formed the basis of the current town centre was submitted in 2005 by Tesco Stores Ltd and was judged against Policy RT4 of the South Gloucestershire Local Plan. The application was for the demolition of the existing Tesco store and petrol filling station to construct 'a mixed use development to include retail, leisure, community facilities, public open space, bus station, shop mobility centre, petrol filling station and associated car parking and access works'(Planning Officer's Report, 2006, p.2). The initial layout of the application was considerably revised to include an outdoor 'town square', rather than a covered mall with indoor spaces (see superseded Figure 9-1 and approved plans Figure 9-2 below. The revised application eventually received planning permission in 2006 and the entire site (8.5ha) was developed at the same time. The site now contains 27,441m^2 of floor space, including 11,450 m^2 of a new Tesco Extra and 1130 car parking spaces (South Gloucestershire Council, 2006).

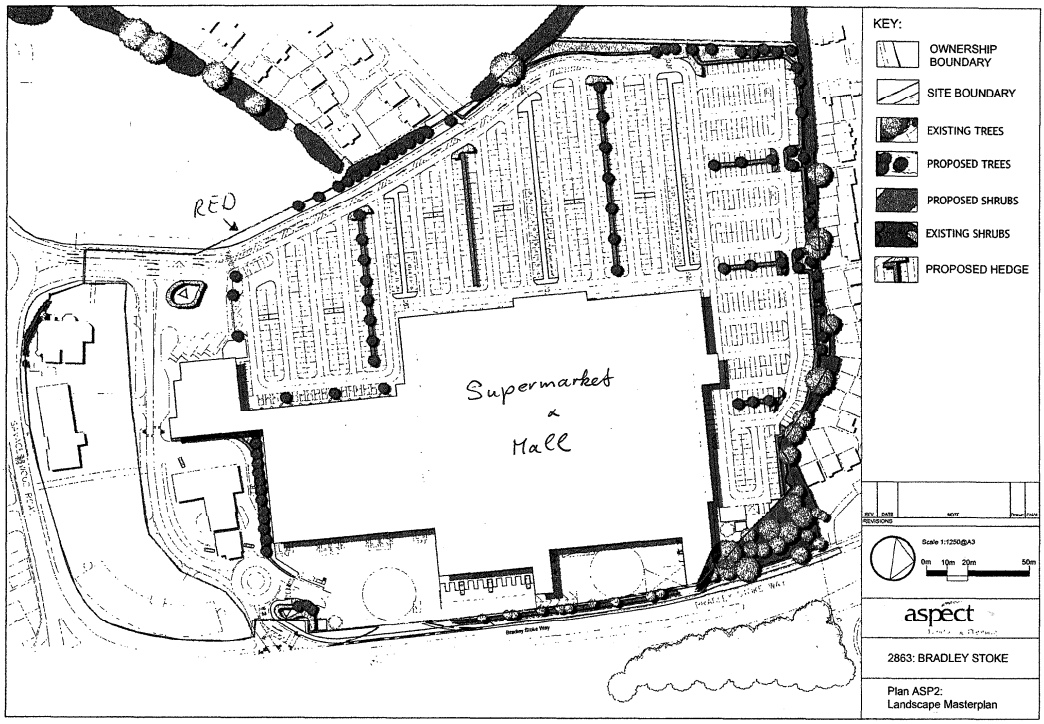


Figure 9-1: : Superseded application plan for Bradley Stoke town centre

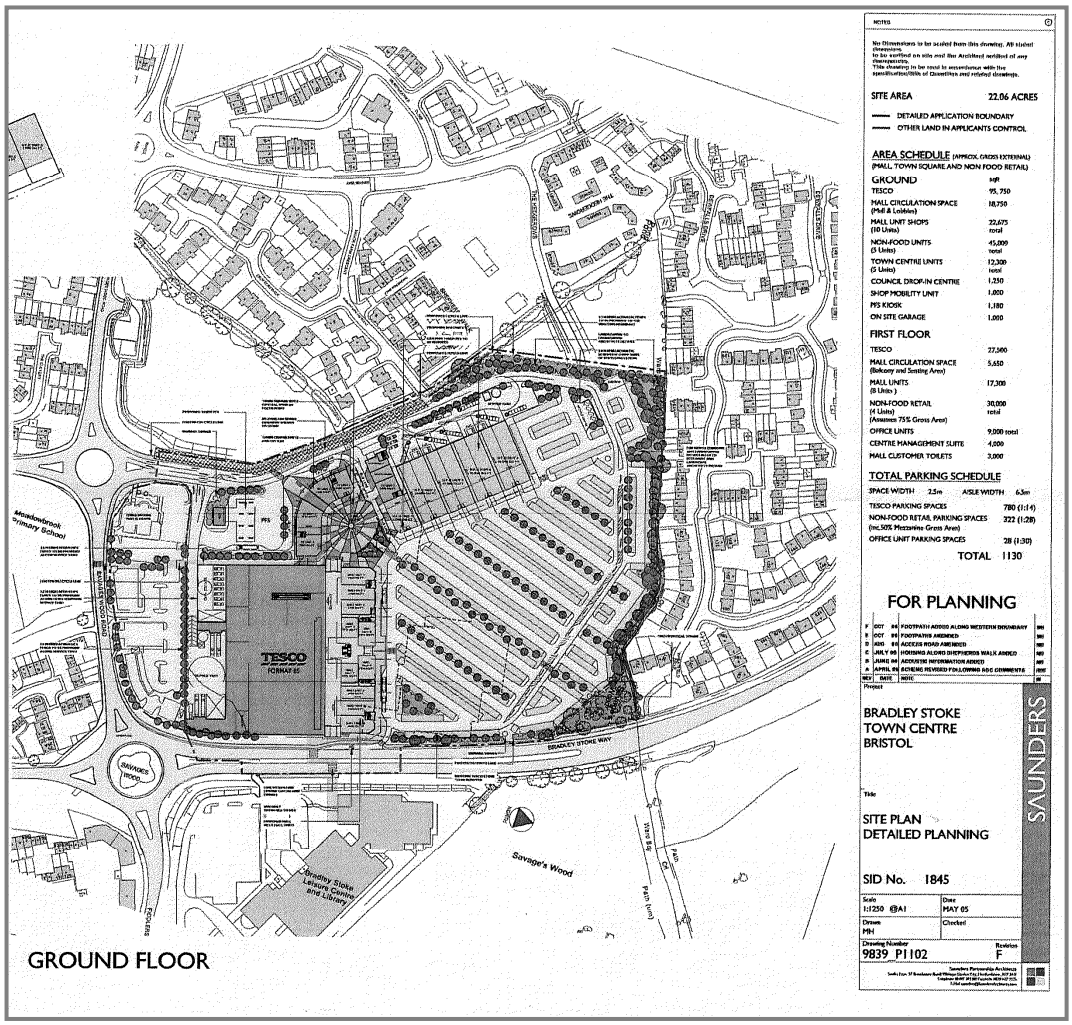
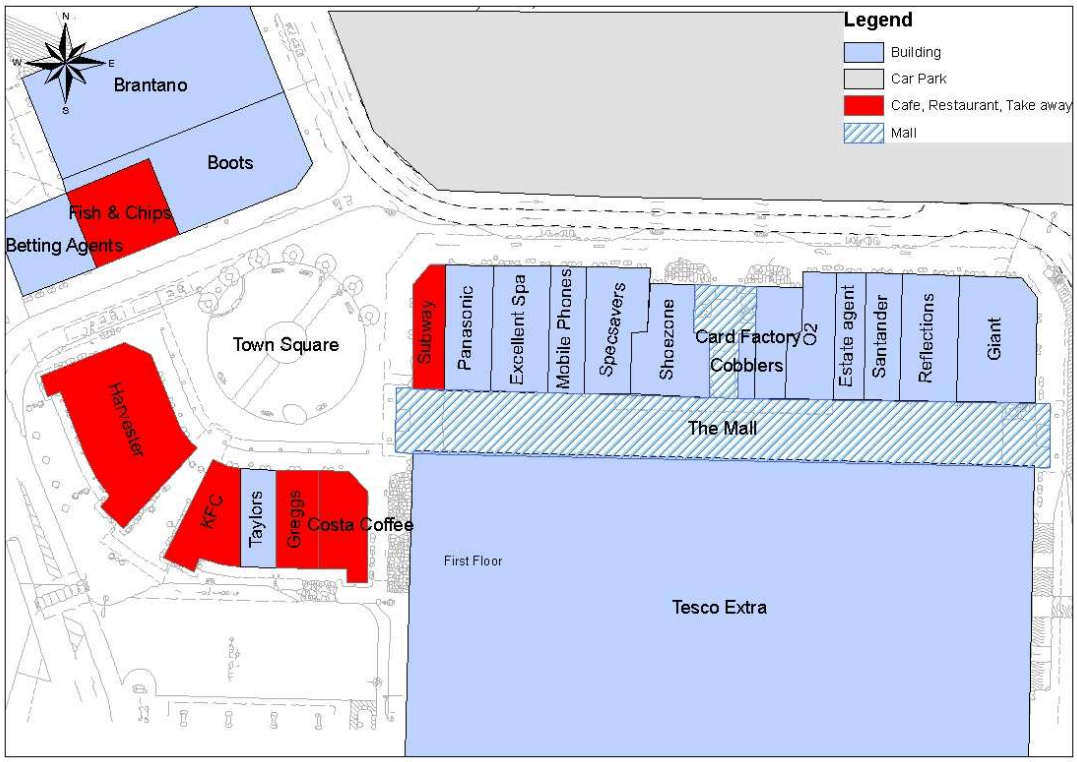


Figure 9-2: Revised and approved layout of Bradley Stoke town centre

The map below gives an overview of the site and the types of facilities that were present at Bradley Stoke town centre during the observation. The site is flat and the 'town centre square' is situated just outside the entrance to the mall and surrounded by several facilities, including food and drink establishments. The 'square' measures around 40m in diameter. Observations were undertaken on the outside square and on the inside mall space. As will be discussed further below, the type of facilities and constellation around the square appear to have an impact on the location and density of social interaction.



Map 9-2: Bradley Stoke town centre facilities

When the town centre finally opened, this was enthusiastically endorsed by the Town Council:

> 'A significant event… is the long awaited construction of the town centre. Tesco are to be congratulated on their efforts to provide a generally acceptable centrepiece to the town that has been so long awaited… **It is hoped that the town square … will be the scene of many activities by all sorts of community groups and traders during the year. It should be a hub for Bradley Stoke and its population** of 20-odd thousand people' (Bradley Stoke Town Council, 2008).

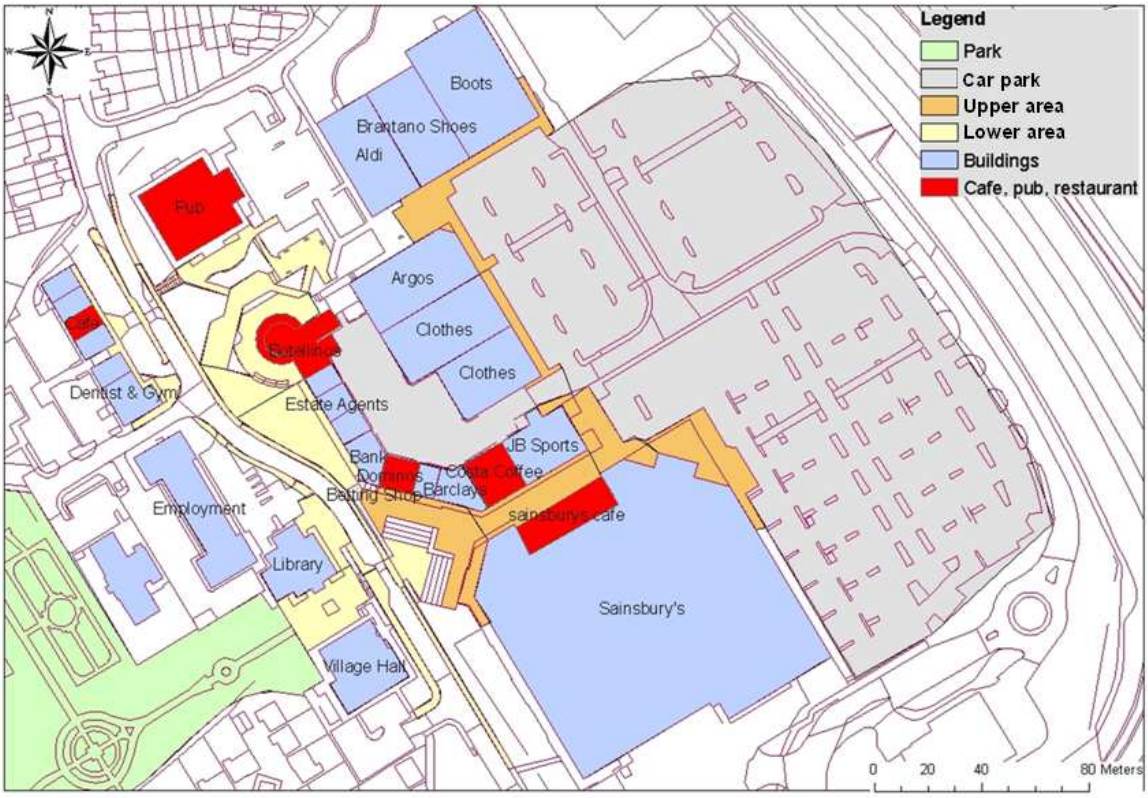
As will be demonstrated in this chapter, the attitude of the Town Council appears to have an impact on how the space is used. The public realm surrounding the facilities on this site is very much seen and used as a civic space by the community to hold events and exhibitions and a number of temporary stalls, decorations and functions, which is discussed later in the chapter.

The second site, **Emerson Green town centre** was first identified as a district centre in the mid 1970s when the area was first developed for housing. A supermarket was built in 1996 and extended in 2004. The rest of the site received planning permission in 1996. Initially Emerson Green was planned as a district centre, which was not to detract from neighbouring town centres such as Staple Hill, Kingswood and Downend which are much older and of the 'linear high street' type (see map below). However, in the South Gloucestershire Local Plan approved in 2006, Emerson Green is described as a new major town centre, on a par with Kingswood and Staple Hill.

Map 9-3: Emerson Green Centre and surrounding town centres

The overall floor-space of the site is around 21,000 m2 including the Sainsbury's supermarket of 10,438 m2 and again constitutes a mix of uses with shops, food stores, library and community centre/village hall. It also has a comparable amount of car parking spaces to the town centre in Bradley Stoke. The 1996 development was undertaken by a single developer and has a similar visual appearance throughout, whereas the Sainsbury's supermarket is visually different as will be discussed in more detail in Section 9.4.2.1. Interestingly the supermarket was extended in 2004 and 2007 (PK07/3381/F) and some urban design features of that extension which had potential for social interaction, were removed in 2009 (PK09/0596) as will be discussed in more detail in Section 9.4.1.1. below. The map below shows the entire site and the facilities provided in the town centre, with facilities that provide food and drink highlighted in red.

The site has a considerable change in level (2-3 metres in places) between the units facing the main car park and the smaller units along the south west sides. Stairs connect both areas and to identify the two areas they are highlighted in dark orange showing the **upper pedestrian area** and light orange showing the **lower pedestrian areas** which they are referred to as henceforth. Observations were undertaken at the upper level, the lower level and the intersection between the two levels as it was not possible to oversee each entire pedestrian area.



Map 9-4: Emerson Green town centre

With regard to a civic/open square, maps from the 1996 consent show the area at the bottom of the stairs (opposite the village hall and library (see right image) and the triangle with benches (see left image) as '**Village squares'**, see map overleaf.

Image 9-1: Emerson Green 'Village Square' (left) and 'Square' (right) as shown in Figure 9-3.

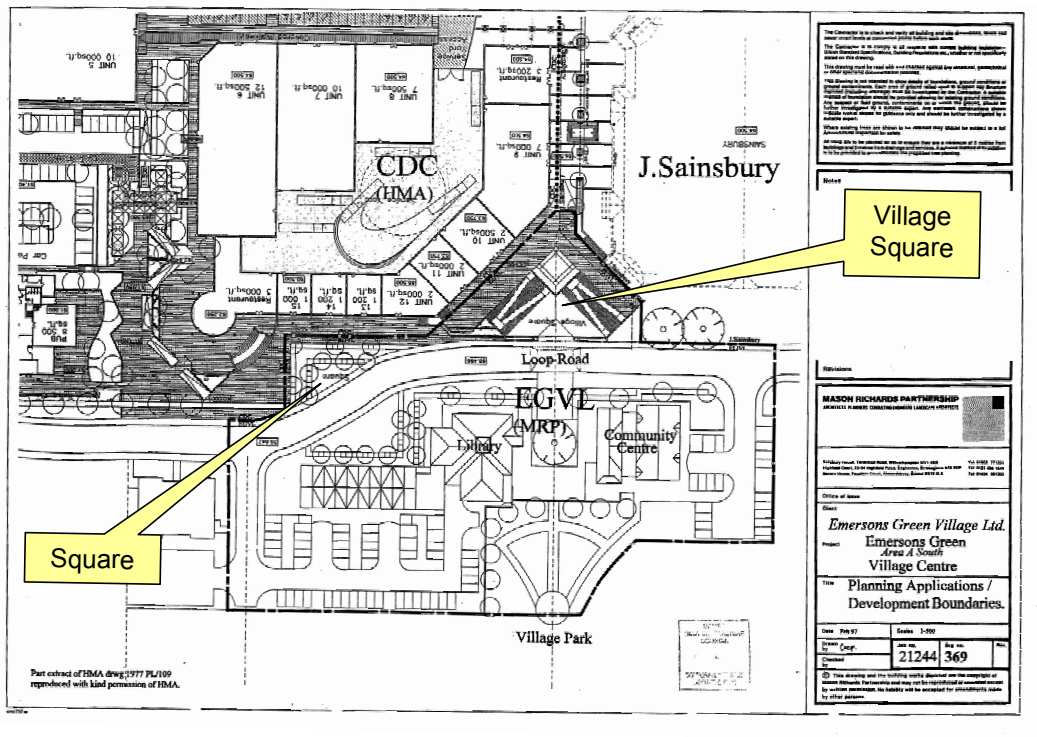


Figure 9-3: Location of 'village squares' at the Emerson Green town centre

There are differences with regard to the political bodies governing both sites. The Bradley Stoke town centre is governed by Bradley Stoke Town Council, whereas Emerson Green town centre is governed by 'Mangotsfield *Rural Parish* Council'. Whilst the offices of the Parish Council are situated within the town centre, the name suggests a different understanding of who the Council represents and a weaker association with Emerson Green as their main centre. From the many site visits undertaken before and during observation, it appeared that there were fewer temporary events and activities held at Emerson Green town centre than at Bradley Stoke town centre.

9.3 SOCIAL INTERACTION AT THE TWO TOWN CENTRES

Before analysing the influence that urban design features might have on the location, frequency and duration of social interaction, the results from the observations in both town centres are reported below. As set out in Section 5.5.3.1, the observations recorded the following information:

- Format of activity (sitting, standing, walking),
- Type of activity (talk, greet, phone/text, wait, eat, smoke),
- Location of observed behaviour,
- Estimated duration of the activity, and
- Information about the person (gender, age group, group format i.e. single, couple, family, friends etc).

The *format of activity* was grouped into **stationary** (sitting or standing) and **non-stationary** (walking) behaviour. The vast majority of recorded behaviour was stationary, as people moving through the space (pedestrian count) were not recorded. However, people who visibly greeted other people whilst walking, were included in the observations as engaging in social behaviour.

The different *types of activity* were grouped into **social interaction** (talk, eat together, greet), and **non-social activities** (wait, eat alone, smoke, phone/text etc.) irrespective of the *format of the activity*. Whilst it could be argued that phoning or texting constitutes social interaction, it fell outside the definition of social interaction for this research (see Chapter 3) which required both people to be present in the same space. Also, people who were interacting with friends/family they had arrived with were not recorded. Only people who met/bumped into someone on site and then interacted with them were recorded. For the remainder of this chapter, the group of activity types, categorised as **social interaction**, is the 'outcome' variables against which urban design features are tested apart from sitting features (only used seated social interaction), territorial features (only used standing social and non-social behaviour) and waiting/access points (distinguished between talk & stand and walk & greet) where a separation into different activity types/formats was found to enhance the analysis.

9.3.1 Frequency of Social Interaction

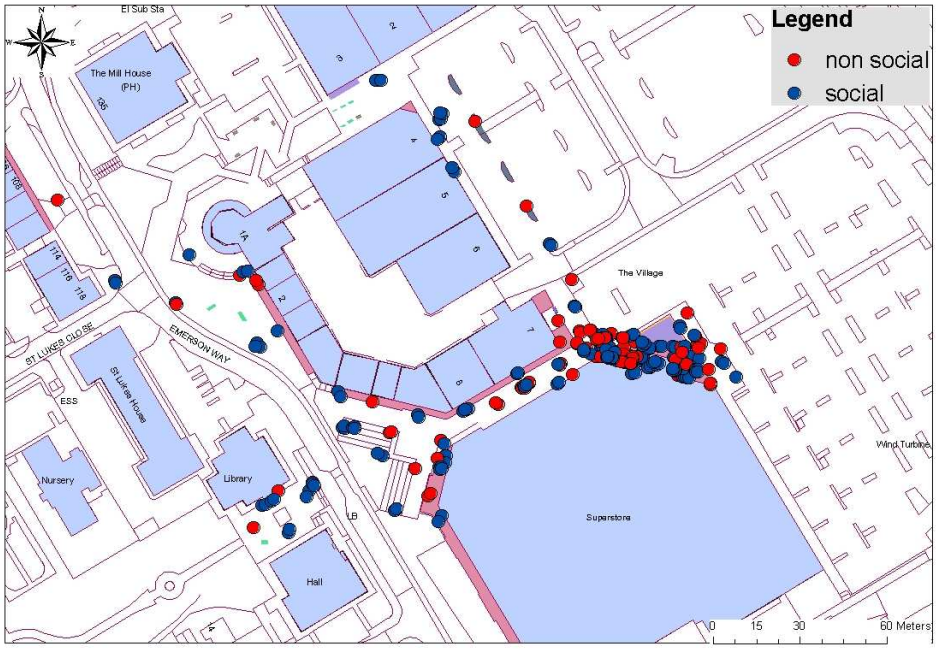
Observation of social interaction levels at **Emerson Green** recorded 165 instances of social interaction out of a total of 260 recorded activities. At **Bradley Stoke**, a much higher number of 270 social interactions were recorded, with the total number of recorded activities being 481 (see Table 9.1). This corresponds to field notes made during observation that Bradley Stoke town centre felt a much busier space than Emerson Green. With regard to the proportion of social interaction, however, the data indicates that whilst more people spent time at Bradley Stoke town centre engaging in stationary activities (so called optional activities by Gehl, 2001) than on the Emerson Green site, these activities were not necessarily more social activities (ibid).

	Non-social	Social	Total
Emerson Green Town Centre	95 (36%)	165 (63%)	260 (100%)
Bradley Stoke Town Centre	211 (43%)	270 (56%)	481 (100%)

Table 9-1: Frequency of recorded observations

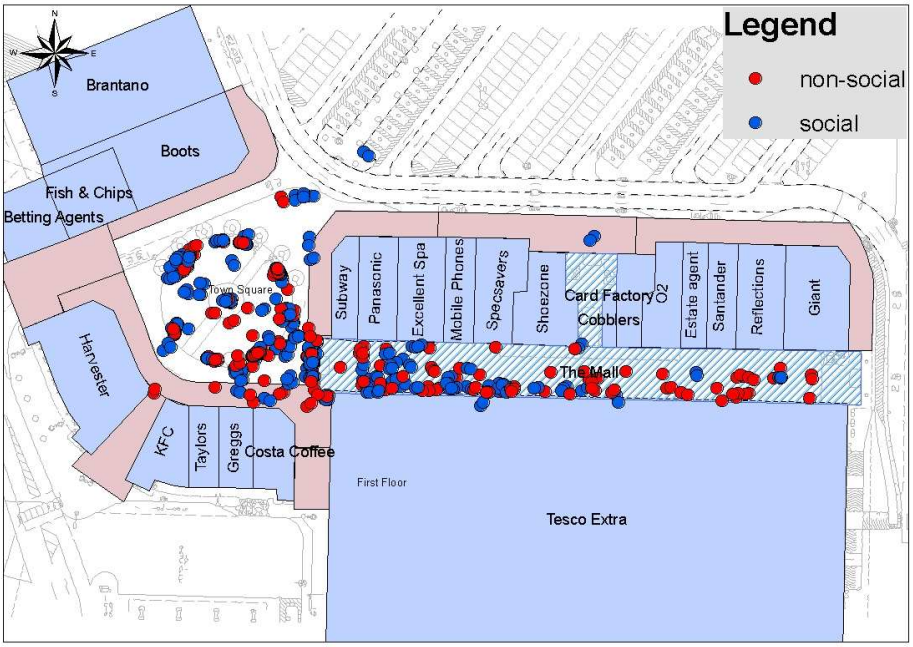
9.3.2 Location of Social Interaction

Map 9-5 shows the location of social interactions and non-social activities at the Emerson Green town centre. It is clear that the majority of both activities were concentrated in quite small areas close to the main entrance of the Sainsbury's supermarket. This also corresponds with the main pedestrian flows recorded in field notes. The ensuing analysis will investigate whether, and which, urban design features influence the location and frequency of social interaction across this site.



Map 9-5: Social and non-social activities at Emerson Green

The map below shows the same activities recorded at Bradley Stoke town centre:



Map 9-6: Social and non-social activities at Bradley Stoke Town Centre

At this site, the majority of both activities are also quite concentrated, but it is also clear that particularly social activities were less often located on the eastern side (far end) of the mall. Again, this corresponds with field notes that described that the main pedestrian flows were between the car park and the main, western entrance of the mall or the northern entrance, with very few people accessing or exiting the mall from the eastern side where the dual carriageway and the leisure centre/library are located (see location map 9-1 above). Section 9.5.2 below discusses pedestrian routes and access points and their influence, if any, on social interaction locations.

9.3.3 Duration of Social Interaction

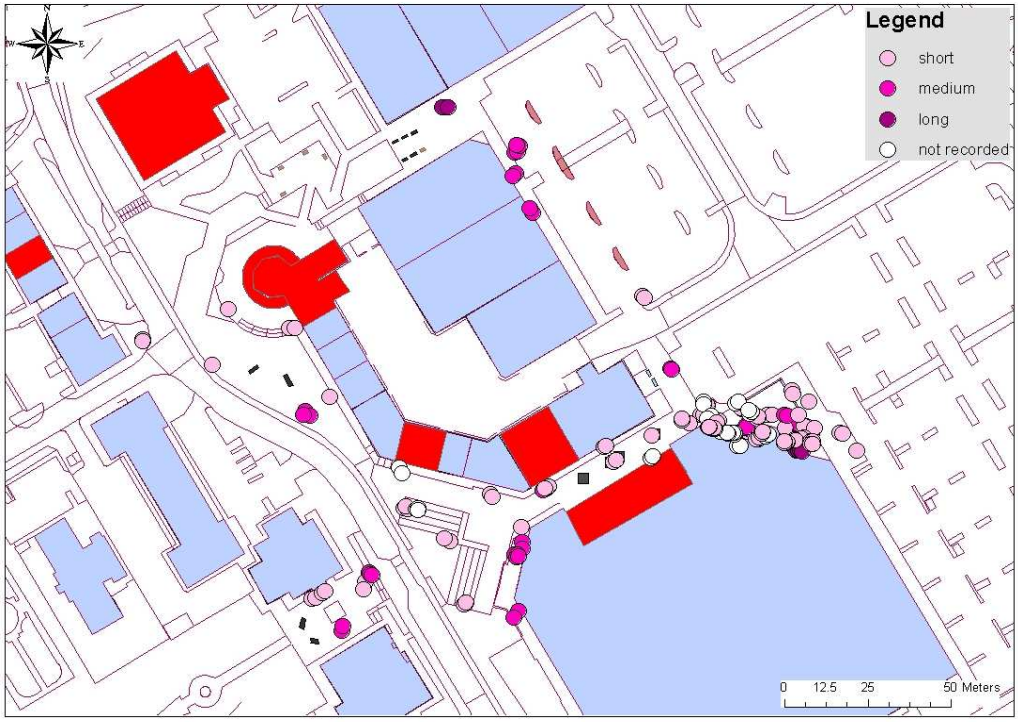
With regard to the estimated duration of social interactions and non-social activities, it should be noted that these estimates were made by the observer without continuously checking the time, hence they were rounded up or down and only give an approximate time. Given that the duration of activities were only estimated, they have been grouped into **short** (less than 5 minutes), **medium** (5 to 15 minutes) and **long** (over 15 minutes) durations which should reduce potential inaccuracies. Furthermore, around a third of durations were not recorded (due to times when the sites were very busy), hence any results from further analysis is treated very cautiously.

The majority of recorded activities on both sites were fairly short. Emerson Green had slightly more recorded instances of social interaction that lasted longer than those in Bradley Stoke. Comparing social and non-social activities, on both sites a higher percentage of recorded social interaction was conducted for a medium or long term than non-social activities (see table below). This is particularly apparent for the medium duration at Emerson Green, which shows that 26% of social interaction was of medium length, but only 8% of non-social behaviour. The chapter will explore below which urban design features, if any, might affect this observed difference in the duration of activities.

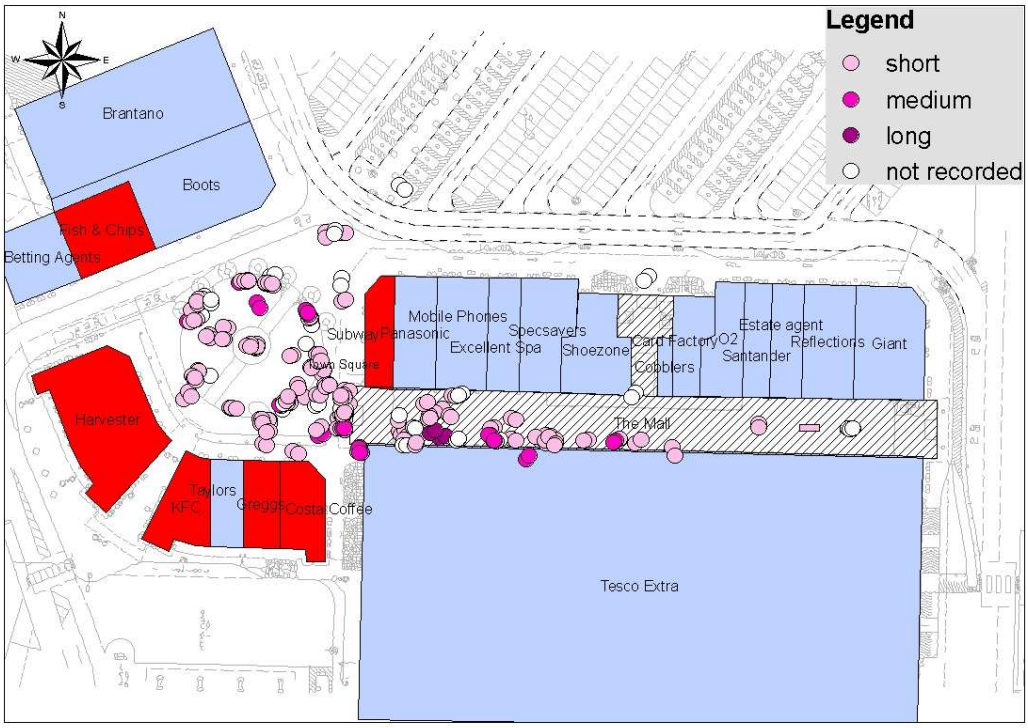
	Emerson Green			**Bradley Stoke town centre**		
	Non-social	Social	Total	Non-social	Social	Total
Short (<5 min)	60 (63%)	90 (54%)	150	117 (55%)	149 (55%)	266
Medium (5-15 min)	8 (8%)	43 (26%)	51	32 (15%)	53 (19%)	85
Long (>15 min)	0	6 (3.6%)	6	1 (0.5%)	3 (1.1%)	4
Not recorded	27 (28%)	26 (16%)	53	61 (29%)	65 (24%)	126

Table 9-2: Estimated duration and observed social interaction (Note, this is a significant, medium correlation on both sites with Cramer's v= .226 and .235)

With regard to the location of social interaction, no clear pattern emerges between the duration of observed social interaction and the location of that interaction. Very long conversations on both sites appear to occur somewhat more frequently in front of the entrances of shops and supermarkets, which will be discussed further in Section 9.5.2.1.



Map 9-7: Location of social interaction by duration of activity at Emerson Green



Map 9-8: Location of social interaction by duration of activity at Bradley Stoke

9.3.4 Attributes of People

Gender, age group and group format were also recorded and tested as to whether these had an independent impact on the location, duration and frequency of social interaction at the two town centres. With regard to *location of social interaction*, no discernable pattern emerged on the

maps for any of these attributes. Also, none of these attributes were associated with *duration* in Emerson Green. In Bradley Stoke however, age and group format were significantly, but weakly associated (Cramer's V = .195 and .187 respectively) with duration of activities. Over 99% of adults engaged in short and medium length social interaction, but more pensioners (10%) engaged in long social interaction. With regard to the group format, 100% of individuals and groups were recorded as engaging in short and medium social interaction, whereas 5% of couples and 2% of families also engaged in long social interaction at Bradley Stoke. *Frequency of social interactions*, was not significantly associated with gender or age on either site. However, group format (individual, couple, family, group), was found to have a significant association in Bradley Stoke (Cramer's v = .225) and Emerson Green (Cramer's V = .365), and logistic regression analyses highlighted on both sites that couples and groups were more likely to have been recorded as having social interaction than individuals, which is not surprising (see Bradley Stoke table below).

	B	WALD	SIG.	EXP(B)
Individual		23.359	.000	
Couple	.873	10.249	.001	2.395
Family	.255	1.056	.304	1.290
Group/Friends	1.223	17.705	.000	3.396
Constant	-.124	.866	.352	.883
Variable(s) entered on step 1: group_clean.				
Model predicts 59 % correctly Note R2 = .051(Cox & Snell), .068(Nagelkerke); Model x2 = 25.01; p=0.000				

Table 9-3: Logistic regression analysis of group format and recorded social interaction at Bradley Stoke

9.4 DESIGN FEATURES RETAINING PEOPLE LONGER AT OR AROUND A FACILITY

Urban design features that retain people longer at or around facilities and might thereby increase opportunities for social interaction (irrespective of a person's attributes such as gender, age and group format) were categorised into features relating to *comfort* and features relating to *curiosity* in the literature review in Chapter 4.

9.4.1 Comfort

Comfort relates to the user's need for seating, marking territory, eating and drinking, shelter from sun, wind and rain, and relaxation through greenery and an acceptable microclimate. The following sections analyse the different features in turn with regard to their existence at Bradley Stoke and Emerson Green and their influence on observed social interaction.

9.4.1.1 Sitting and Resting Features

The urban design literature has identified seating as the most important feature that retains people in public open space (Whyte, 1980) distinguishing between **primary** and **secondary**

seating (Gehl, 2001). Primary seating consists of actual benches and chairs, whereas secondary seating consists of steps, ledges, flower boxes etc at the appropriate height to afford sitting (ibid).

When analysing the provision of seating at Bradley Stoke and Emerson Green, the following was found: at Bradley Stoke there were six benches on the outside all on the central square, (see images 9-2 left) and two benches inside on the far side of the mall constituting a total of eight instances of **primary seating**. This was complemented by a number of chairs put outside by surrounding food businesses, such as the Harvester, KFC and Costa Coffee, which required customers to buy a product to use them. These were around the edge of the square (see images 9-2 centre). There was also a platform of raised steps on the square that was used as a form of secondary seating (images 9-2 right). Apart from those, due to the non-articulated walls, there were hardly any other opportunities for secondary seating across the entire site. This finding supports previous studies of malls which found that 'malls are primarily targeted for use by consumers. The owners do not want people to just hang around there, they want them to spend money and everything is designed explicitly or subtly to facilitate this' (Shaftoe, 2008, p.77). The location of seating at Bradley Stoke is shown in map 9-9 below.

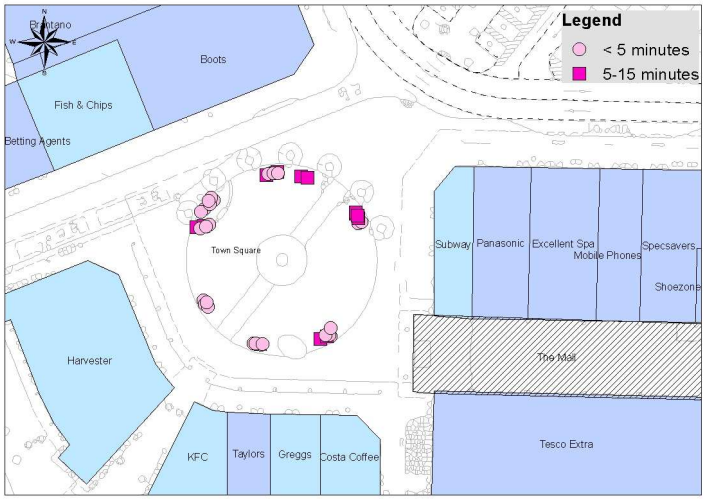
Images 9-2 :Searing at Bradley Stoke: primary, public seating (left), primary, private seating (centre), secondary, public seating in the form of steps (right)

Map 9-9: Location of public seating at Bradley Stoke, food facilities shown in red

When analysing the *frequency* of social interaction patterns at the **publicly available seating**, (excluding café seating surrounding the square) it was apparent that the *outdoor* benches had more recorded instances of social interaction than the *indoor* benches (see map 9-10 below). With regard to specific seats, the steps and the benches located closest to the main entrance had the largest number of instances of social interaction. This is not surprising as the steps provided a good viewing platform over the busiest area, but were at the same time a little withdrawn from the main pedestrian flow to allow for social interaction. Again, this supports findings in the literature where the most preferred seats are those offering an unobstructed view and located somewhat on the edge of an open space (Gehl, 2001; Holland *et al.*, 2007).

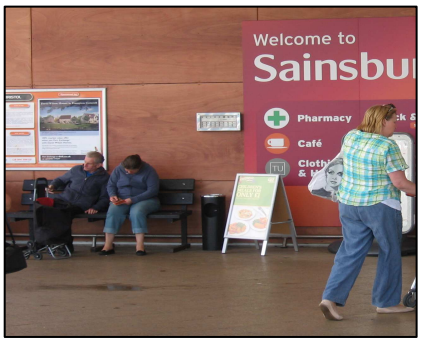
Map 9-10: Number of social interaction on seating space (benches and steps)

With regard to the *duration* of social interaction on primary and secondary seating at Bradley Stoke, unfortunately no duration estimate was recorded for the seating *indoors*. Around the town square, the benches further away from the main entrance area (to the north) were recorded as having more medium length social interaction. Again, this tallies with the finding that people like using seating located at the edge of a space with some distance to the main pedestrian flow.



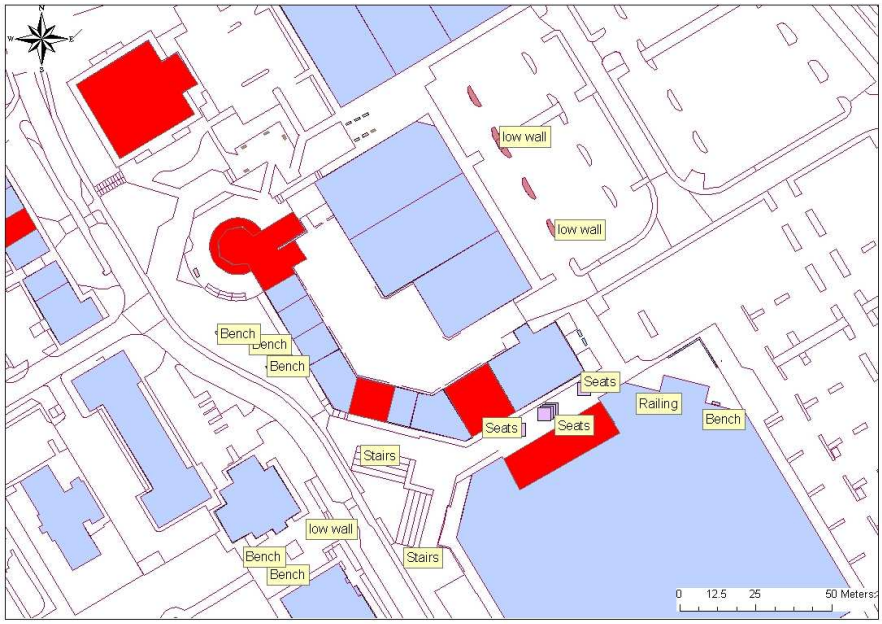
Map 9-11: Duration of seating at Bradley Stoke

At **Emerson Green**, there was one bench outside Sainsbury's (right image) and five granite cubes intended as seating on the upper level of the site, together with a few chairs outside Costa Coffee (left image) as well as six benches at the lower level together with a couple of outdoor chairs from the café and pub. The steps connecting the upper and lower levels of the site were also used for seating.



Images 9-3: Public seating at Emerson Green

The area between the northern side of the supermarket and the smaller units (Costa Coffee) etc. is referred to as '**the mall**' in planning officer reports. Plans approved for the latest extension of the Sainsbury's supermarket showed (in addition to the publicly available cube seats) outdoor seating in the mall area for the Sainsbury's café with the intention that doors to the café 'are opened during opening hours' (Stride Treglown, 2007). However, on the many occasions that the site has been visited during opening times of the cafe, the doors were always closed and no outdoor seating was provided. The plan below shows the location of the seating at Emerson Green. Compared to Bradley Stoke, the seating was much more widely distributed across the site (with seating over 150m apart), and not all of them located where the main pedestrian flow was, or where there was something interesting to look at, or in locations that could be seen when arriving at the site.



Map 9-12: Location of Seating at Emerson Green

Furthermore, some of the seating actively discouraged people to sit there as it was uncomfortable, due to its cold material and lack of back rest, located in the middle of a through-space (i.e. *the mall*), making the potential sitter feel exposed and also often cold as the space is often in the shade and functions as a wind tunnel (see left image 9-3). Hence, users of the facility made use of secondary seating opportunities, such as railings, low walls and steps in locations where they would have wished to sit. Indoor seating was only provided inside the Sainsbury's café and the Costa coffee and people thus needed to be customers to use those seats. Whilst the bench just outside Sainsbury's entrance was sheltered from rain and sun by the canopy over the area, it was not sheltered from wind or outside temperatures.

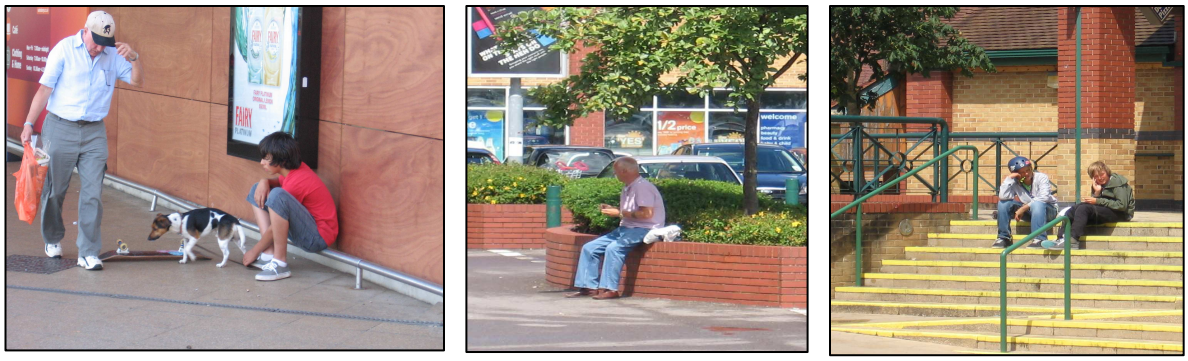
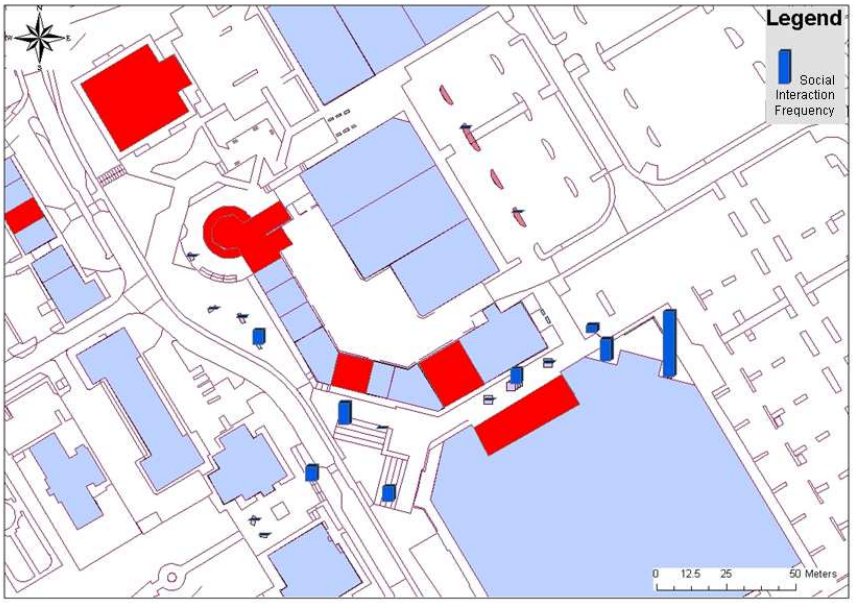


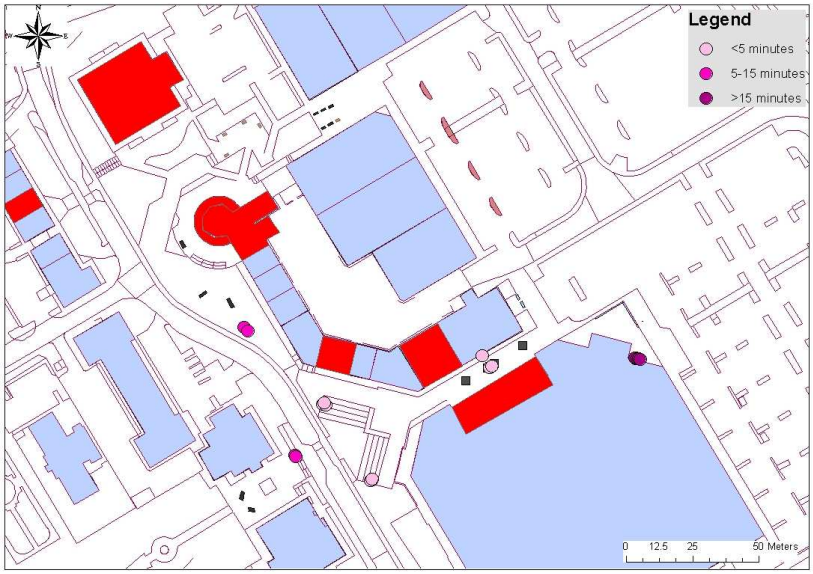
Image 9-4: Flexible seating at Emerson Green

When analysing the frequency of social interaction at the primary and secondary seating at Emerson Green, the overall number of people engaging in social interaction was, not surprisingly, lower than in Bradley Stoke (apart from the bench just outside the Sainsbury's entrance) with some seating (four benches on the lower side and two of the cubes along the mall) with no observed instances of social interaction. The railings and bench outside Sainsbury's were located in the main pedestrian flow and the steps provided a good vantage point to observe others. Again this is not surprising given that previous studies highlighted the importance of good locations for benches along the edge of spaces, with something to look at and the sitter's back protected (Gehl, 2001, Whyte, 1980, Holland *et al*., 2007).



Map 9-13:Number of social interactions on seating space at Emerson Green

With regard to the *duration* of social interaction at seating, the bench just outside Sainsbury's had the longest recorded instances, probably due to it being located so close to the main pedestrian flow. Field notes taken during observation noted that the bench was almost always occupied and people were often having conversations with other people who were just arriving or leaving.



Map 9-14:Duration of seated Social Interaction at Emerson Green

In conclusion, both sites were places for consumption, where the developer's main interest was not concerned with providing ample, well-located or well-designed seating. At Bradley Stoke, there was more and better used seating than at Emerson Green. On the other hand, people do appropriate design features for their own use if affordances allow this (Gibson, 1977). Hence, features such as railings and steps on the Emerson Green site were used for seating and socialising instead, allowing people to remain in their choice of space.

9.4.1.2 Features to Mark Personal Space

Apart from sitting, it is claimed that other urban design features such as bollards, walls, columns, bins, plant boxes etc., are often appropriated by people to **mark their territory** and use as an anchor for stationary behaviour either physically (leaning against) or symbolically (standing near, looking at) (Pushkarev and Zupan, 1975, Mehta, 2009, Stilitz, 1969). Preiser (1972) found that such features had noticeable radii of attraction in which specific behaviour took place. To test this assertion, a number of upright/vertical design features were selected including:

- Trees and shrubs,
- Walls and fences,
- Bollards,
- Columns,
- Bicycle racks,
- Advertising stands,
- Bins,
- Steps and benches,
- Public art, and
- Trolley storage areas.

During observation, this relationship between standing behaviour and upright urban design features was recorded on a number of occasions, see images 9-5 below, particularly when people were waiting by themselves.

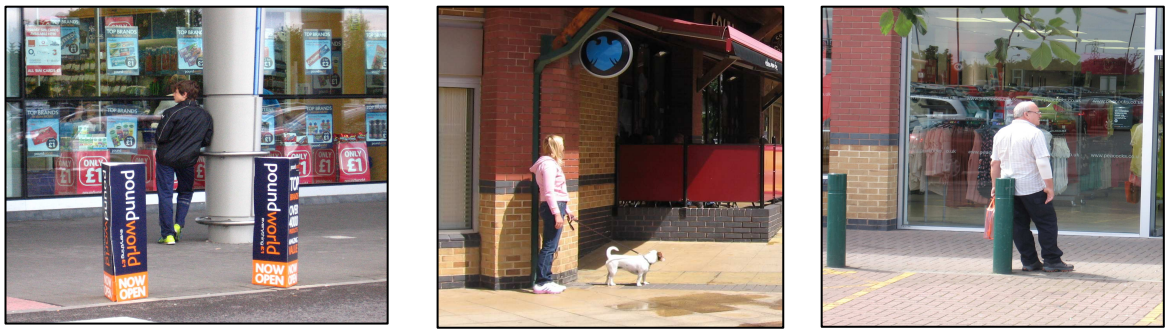
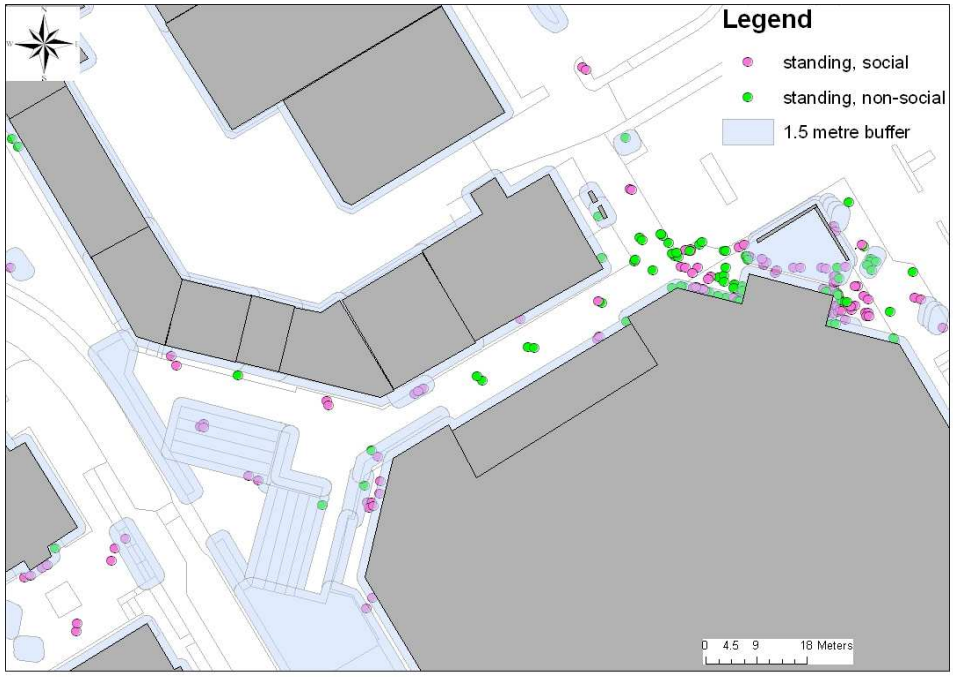


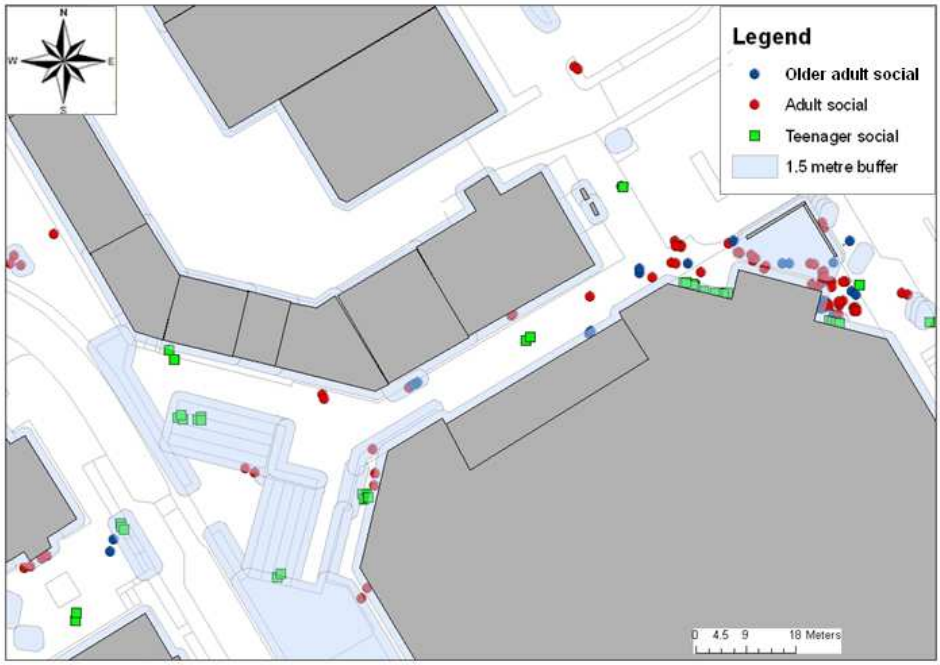
Image 9-5: People standing close to features to mark their territory

The maps below show a buffer of 1.5 metres around those features to demonstrate to what extent standing behaviour took place around these features (including walls). It is important to remember that positions of people were estimated by the observer. This was easy to do when people stood or leaned next to an object; however, when they stopped in the middle of the space, the accuracy of the point lies probably within half a metre either way, hence a buffer of 1.5 metres was used to allow for some margin of error. At Emerson Green, the map 9-15 below shows that a considerable number of people stood near specific features. Distinguishing between social and non-social behaviour, no clear patterns emerges.



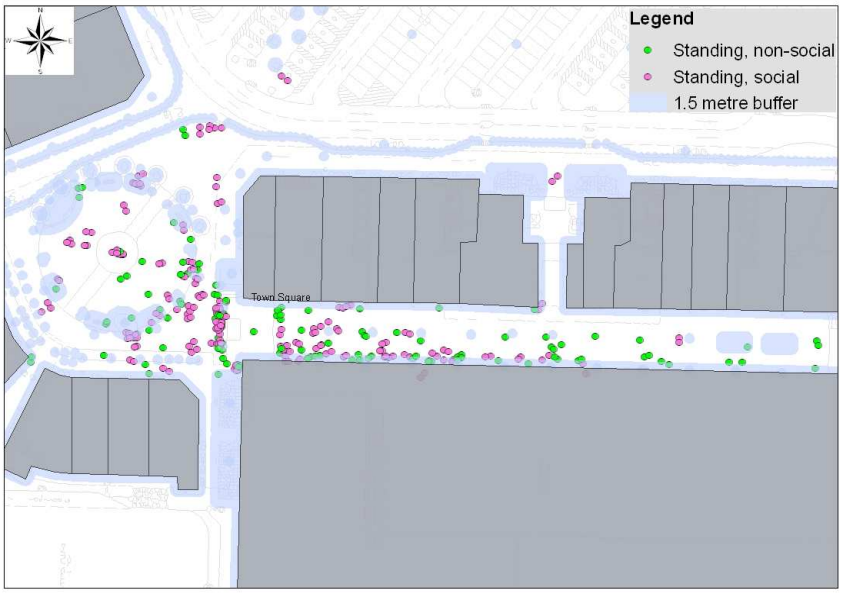
Map 9-15: Standing behaviour and territorial features at Emerson Green

However, when distinguishing between different age groups, it is apparent from the map below, that teenagers (shown as green squares in the map 9-16 below) tend to mark their territory more than other age groups, with very few instances of social interaction being recorded in 'open space'



Map 9-16: Location of social interaction by age group and territorial features at Emerson Green

At Bradley Stoke, the pattern is less clear, see map 9-17 below. There was also not a sufficient number of teenagers to produce a map with the different age groups. The images 9-6 below show that social interaction at Bradley Stoke also occurred in the vicinity of urban design features, but the map shows that this was not sufficient in numbers to explain the location of the majority of either social or non-social standing behaviour at Bradley Stoke.



Map 9-17: Standing behaviour and territorial features at

Images 9-6: Social interaction close to urban design features at Bradley Stoke

9.4.1.3 Permanent and Temporary Food and Drink Outlets

Providing food and drink, particularly together with opportunities for seating (indoor or outdoors), has been found to increase not only the length of stay of people in public spaces, but also to enhance levels of social interaction between people (Mehta, 2009, Whyte, 1980). Facilities themselves, in the form of cafes, restaurants and bars can act as facilitators for people staying longer in the area after or before undertaking their main purpose (e.g. shopping or leisure). At **Bradley Stoke** all the café/restaurant/take away food places were centrally located around the town square. There are six different premises: the Harvester, Simpson's Fish and Chip shop, Subways, Costa Coffee, KFC and Greggs. Numerous people were observed using these facilities before or after visiting other destinations (shops, supermarket, hairdresser). In addition, as most of these facilities provided outdoor seating and their clientele could be observed on arrival/departure to the site, several people were observed stopping to talk to people sitting at the café and talking across the demarcation. This was supplemented with people using the 'free of charge' seats on the square to eat and drink and socialise. Hence, the food outlets with their seats and the public realm with its complementary seating provided an area of activity where people could eat, drink and socialise.

At **Emerson Green** the number of food outlets is similar to the Bradley Stoke town centre site, with six units consisting of an independent café, a pub, Botellino's restaurant, Costa coffee and the Sainsbury's café. However, as shown on map 9.4 above, they are widely distributed across the site with three facilities each per different pedestrian level and only two visible from the car park site. Only the pub, Costa coffee and independent café have a few chairs outdoors which allowed for the same behaviour between passersby and people sitting at the café as observed at Bradley Stoke town centre. Conversely, the Sainsbury's café was on every visit very busy but was inaudible from the outside (due to the lack of doors opening into the *mall space*) and only accessible through the Sainsbury's main entrance. Hence, whilst the food facilities themselves increased

people's stay inside the facility at Emerson Green, this did not encourage people in the surrounding public realm to remain there for longer. A temporary ice-cream van was observed on two occasions which attracted some customers but, again, as there were few seating opportunities, people tended to talk to each other while in the queue for the ice-cream, but would disperse for consumption. Overall, only 13 people at Emerson Green were recorded eating, with nine people sitting and eating and another four standing and eating on the site in the surrounding public realm.

Consuming food or drink, either sitting on the 'public seats' or standing, was recorded together with whether the activity was combined with socialising and how long it lasted. For Bradley Stoke, within the group of people eating there was a significant relationship (Chi-square = .030) between the duration and nature of activity (social or not) with a medium strength of correlation (Cramer's V = .344). As can be seen from the table below, in Bradley Stoke, fewer people who were eating engaged in social than non-social behaviour, whereas in Emerson Green the number was about equal (although the overall numbers of people eating was much lower). In Emerson Green, the relationship between duration and social behaviour was also significant (Chi-square =0.047) with a strong correlation (Cramer's V=.715). From the table below, it is suggested that eating food does not increase the duration nor the frequency of social behaviour.

Eating Food	**Bradley Stoke**		**Emerson Green**	
Duration	Non-social	Social	Non-social	Social
Short	12	16	1	4
Medium	11	2	1	2
Long	0	0	0	0
Not recorded	12	6	4	0
Total	**35**	**24**	**6**	**6**

Table 9-4: People eating food by duration and whether engaged in social behaviour

9.4.1.4 Microclimate

In order for people to remain longer in outdoor spaces, comfortable microclimatic conditions such as temperature, sunlight and shade have been found to be important components (Cooper Marcus and Francis, 1990, Mehta and Bossom, 2010, Zacharias *et al.*, 2001). The same is relevant for indoor spaces, hence commercial facilities use an extensive range of climatic controls to achieve a constant and acceptable microclimate (Sommer, 1998). With regard to shade and wind, both sites have tall buildings (8-10m high), which throw long shadows (images 9-7 below), making some areas of the public realm potentially less acceptable to use during the day unless very warm. Furthermore, at Emerson Green 'the mall' area between Sainsbury and Costa coffee (images 9-7, left) functions as a wind tunnel, which makes perceived temperatures colder.

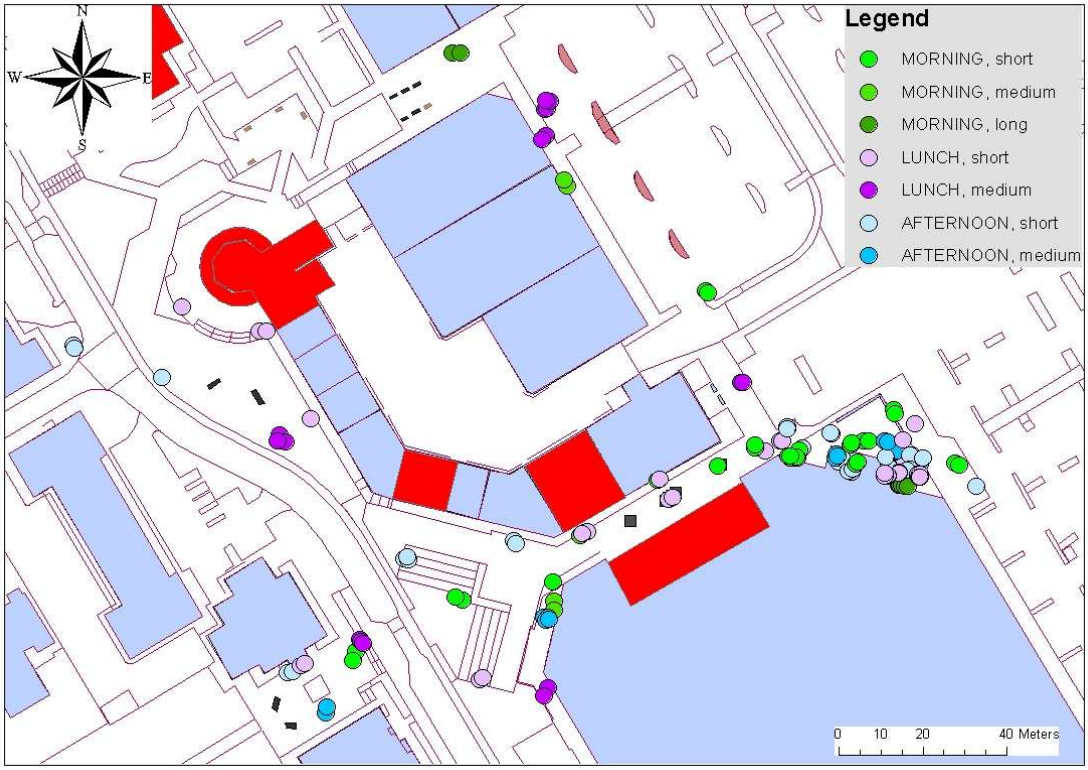

Images 9-7: Substantial shading of the public realm at Emerson Green (left) and Bradley Stoke (right)

Considering the *frequency* of social interactions over the course of a day, the table below shows that at Emerson Green, most people were recorded in stationary behaviour in the afternoon and during lunch time and this was also the time when there were most recorded instances of social interaction. The same holds true for Bradley Stoke. Evenings were not recorded at Emerson Green, as most shops closed at 6pm when the site was practically deserted.

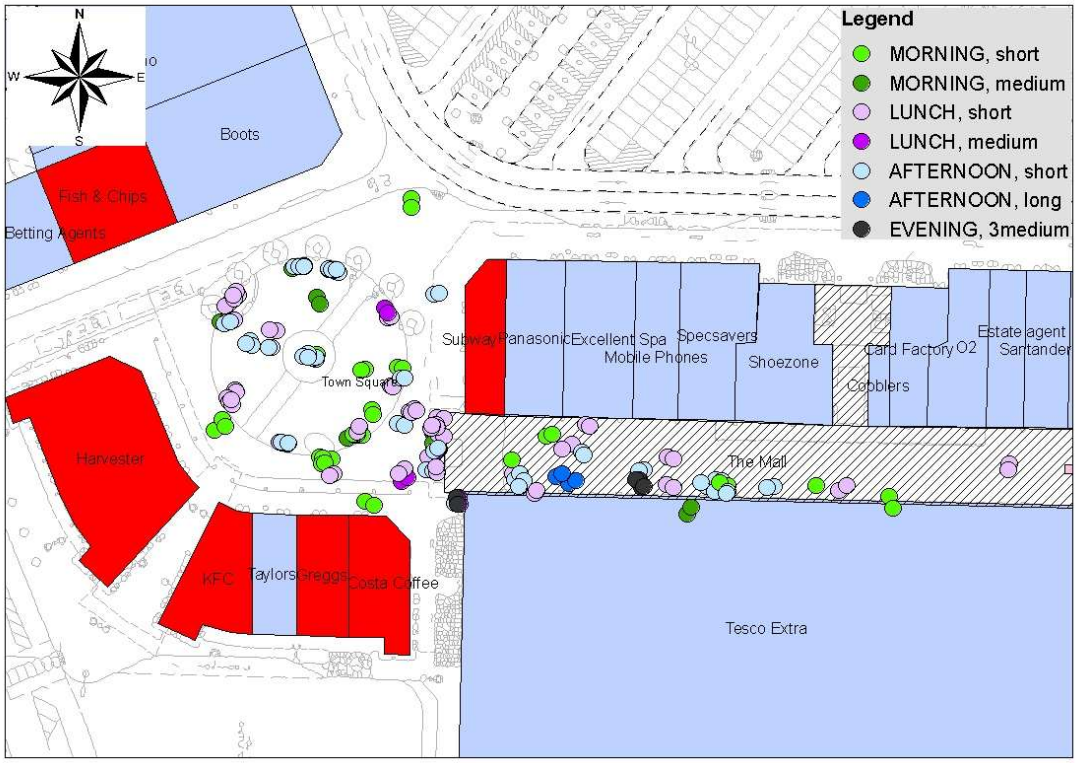
	Emerson Green			**Bradley Stoke town centre**		
	Non-social	social	Total	Non-social	social	Total
Morning (10-11)	22	44	66	55	67	122
Lunch (13-14)	40	56	96	71	96	167
Afternoon (16-17)	33	65	98	59	76	135
Evening (18-19)				14	17	31

Table 9-5: Time of Day and recorded Social Interaction

Considering the *location* of social interaction across the day, the maps below show recorded social interaction by time of day and duration. At Emerson Green, there is no clear pattern. If microclimate had a major impact on the location then one would have expected to see more instances during the morning on the eastern side and upper levels and the mall, and more interaction on the lower levels and western side during the afternoon following the path of the sun. Such a pattern is not discernable. The same can be observed for Bradley Stoke. Inside the covered mall no such impact was of course anticipated. Across the town square, there were slightly more instances of social interaction in the north-west part of the square during the afternoon, but there were also people still engaging in social interaction in areas which were in shade by the afternoon. With regard to the *duration* of the social interaction, there was also no discernable pattern (see maps 9-18 and 9-19 below). Field notes stated that if people bumped into other people, they stopped and chatted in situ regardless of whether the area was in shade or not.



Map 9-18: Time and Duration of social interaction at Emerson Green

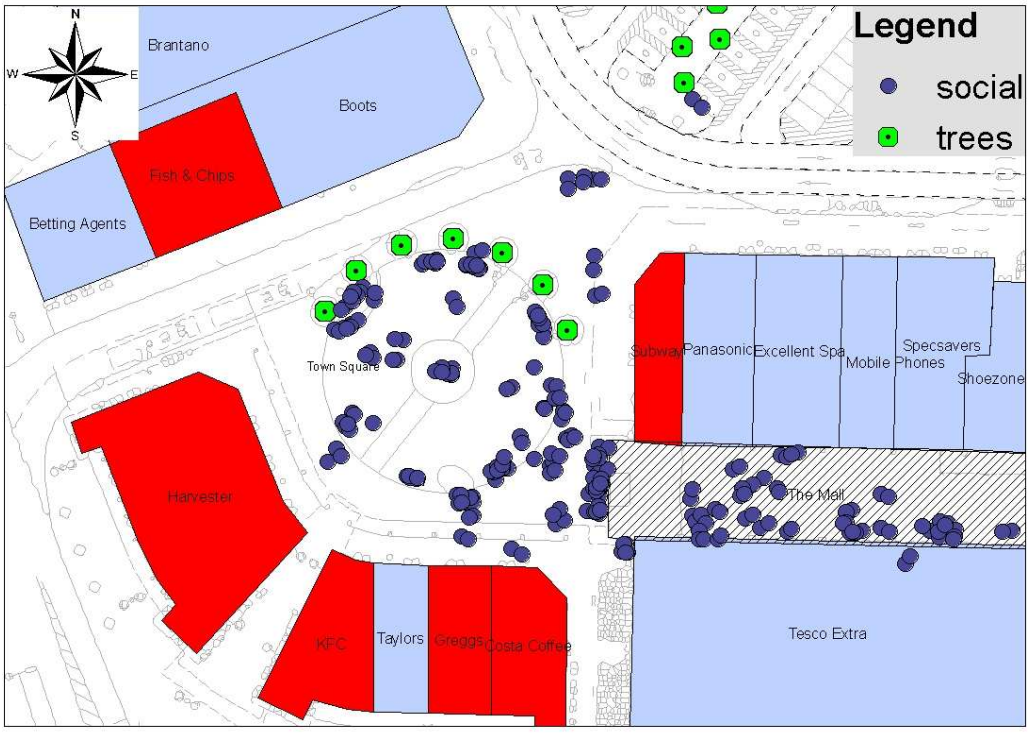


Map 9-19: Time and Duration of Social Interaction at Bradley Stoke

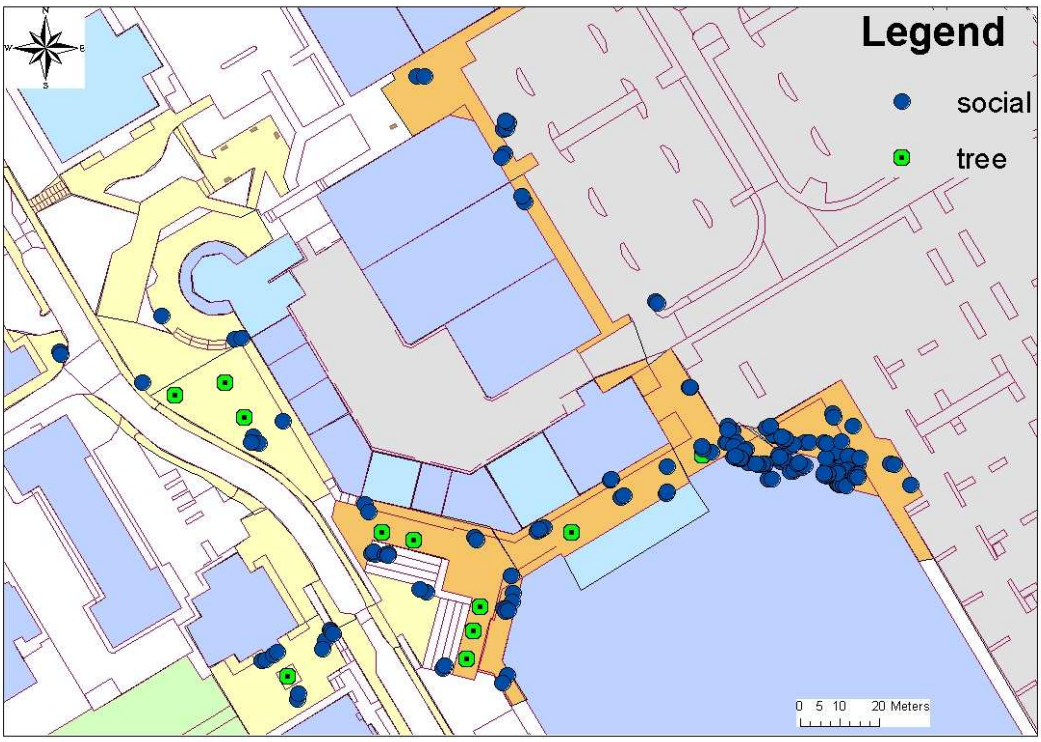
9.4.1.5 Greenery

Greenery has been found to have a positive impact on the preference of spaces and has also been found to aid relaxation and social interaction within spaces (Sullivan *et al*., 2004, Kuo *et al.*, 1998, Kaplan and Kaplan, 1989). Whilst both sites have some 'structural planting' e.g. trees and shrubbery within the surrounding public realm, particularly due to their young age they are visually dwarfed by surrounding buildings and low in numbers. Hence, the overall perception of the sites at the time of observation was not particularly green, but appeared to be urban and hard surfaced (see images below). Correspondingly, no pattern between the location or duration of social interaction and trees on the sites were found (maps 9-20 and 9-21). At Bradley Stoke the apparent proximity to trees was due to the benches being situated close to the trees (right image below).

Images 9-8: Trees at Emerson Green (left and centre) and Bradley Stoke (right)



Map 9-20: Location of tress and social interaction at Bradley Stoke



Map 9-21:Location of trees and social interaction at Emerson Green

9.4.2 Curiosity

In addition to feeling comfortable, the other main enticement for people remaining in spaces for longer is *curiosity* (Carr *et al.*, 1992b). With regard to facilities and their surrounding public realm, the three main groups of urban design features providing and maintaining *curiosity* relate to the visual appearance of the buildings and surroundings, the variety of goods, uses and facades to stimulate interest/interaction and multi-sensory focal points which are discussed in turn (Francis, 2003; Cooper-Marcus and Francis, 1990; Mehta and Bossom,2010; Lynch, 1960; Alexander, 1977).

9.4.2.1 Visual Appearance

Whilst the perception of an environment as beautiful or aesthetically pleasing is highly dependent on an individual's culture, mood and preference (Carmona *et al.*, 2003), certain key aspects of buildings and spaces have been analysed in the environmental psychology literature and have been found to affect most people's positive perception of places/buildings through **complexity and order**. Whilst users appreciate a certain amount of order or legibility of places at first sight to make sense of a space, they also require a level of complexity or mystery to encourage further exploration (Kaplan and Kaplan, 1982, Rapoport, 1977, Lynch, 1960 and Cullen, 1961).

Considering the buildings at Bradley Stoke first, it is interesting to note the intention of the designers when building the site. The design statement undertaken on behalf of Tesco plc at Bradley Stoke town centre states that:

> 'The Tesco store itself would be a **high quality, contemporary modern design** with large areas of glazing **that would provide a 'light and airy' feel** to the development. The extensive areas of glazing would ensure the building **provided 'active' frontages** to at least the north, west and east elevations. … The town square units would be at a lower height than the Tesco store/mall building and contained under a flattish/very shallow pitched roof. The **variation in rood types and heights would help to provide interest** in the scheme'(Planning Officer Report, 2006, p.12-13).

The planning officer's report shows that the intention was to design buildings which would stimulate 'interest' by a level of variation and complexity, whilst remaining legible to the users. Whether or not people find the buildings at Bradley Stoke interesting, complex or aesthetically pleasing could have only been ascertained by asking users directly, which was not undertaken for this research as it was outside its scope. From observations, people arrived at Bradley Stoke town centre and went straight to a certain destination (shop or service) or to meet friends/relatives. When people stopped it was either to take their mobile phone out, to eat or drink something, to check the supermarket bill, to wait for someone or because they had bumped into someone they knew. No user was ever observed stopping to look at/admire the buildings. This might also be the case as many users appeared to be familiar with the site and/or because the buildings were very legible and clearly signed, hence even on a first visit wayfinding was made easy. Overall at Bradley Stoke, the function or destinations appeared to be more influential on why people visited the space than the aesthetics of the buildings. Whilst Bradley Stoke functions as a town centre to serve around 20,000 people with a corresponding amount of floor space in retail and services, the buildings look very different from an organically grown town centre serving a similar catchment (images 9-9, right) which might be visited for aesthetic reasons alone. It is suggested that the different building form of the town centre is due to the different timeframe of the development of the centre (a few months rather than centuries), the size and format of the retail units and the single land ownership and developer implementing the scheme.


Images 9-9: The new town centre in Bradley Stoke (left); a traditional town centre in Great Yarmouth (right)

Hence, the Bradley Stoke town centre resembles more a suburban shopping mall, than a traditional town centre, which has been implemented in different locations across the country with very little variation in building style, resulting in the so called rise of the 'Tesco Towns' (Minton, 2012) (see images 9-10 below for comparison).

Images 9-10: Tesco extension to town centre in Shepton Mallet (left), town centre in Bradley Stoke (right)

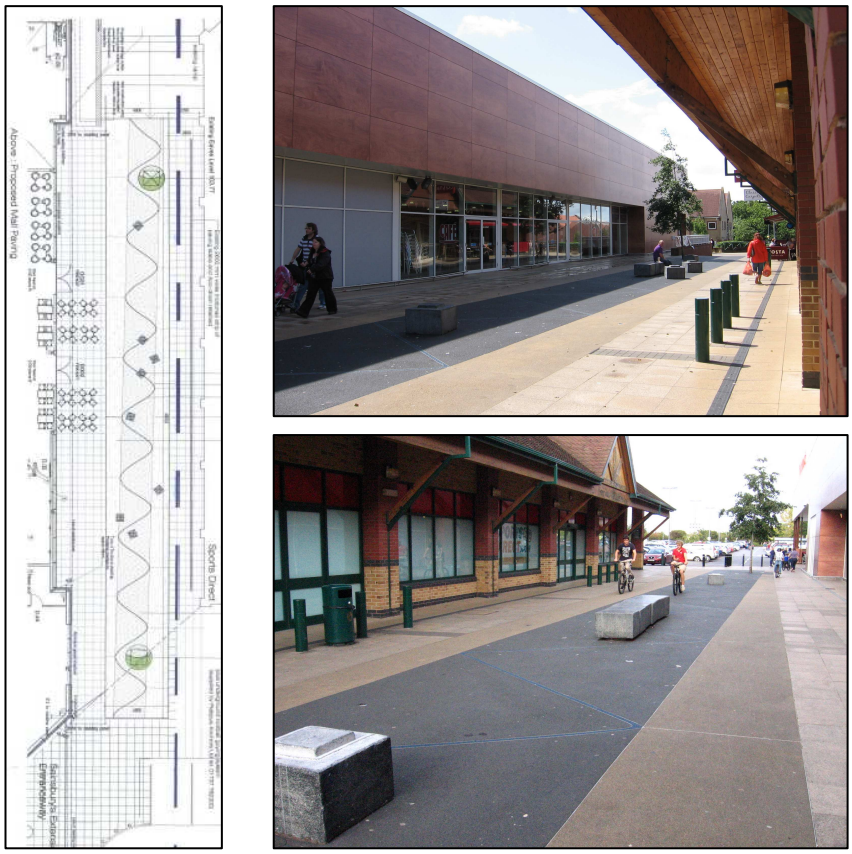
With regard to the *open space surrounding the buildings* it appears to be too small to provide much complexity through the creation of sub-spaces. The sub-spaces are the public seating within the public area and the seating provided by commercial facilities surrounding the area. With regard to legibility and mystery, the place is very easy to understand as everything can be taken in 'at first sight'. Bradley Stoke town centre gives the overall impression that the facilities are important and the size and position of the signs make very clear where everything is, enhancing its legibility. However, this has exactly the effect described by Cullen (1961), that these spaces in themselves are rather dull (see image 9-9 below).

Image 9-11: Open Space without mystery or discovery at Bradley Stoke town centre.

At **Emerson Green,** the legibility of the site is more difficult due to the change in level and the fact that one has to move through the site to see everything (starting from the car park), which should increase its mystery and appeal (Cullen, 1961). The buildings themselves are also more varied with different brick colours and roof types. Although some of the units are quite large, an attempt has been made to provide a human scale by having more detailed facades with columns, different coloured ledges etc., which could make this a more complex and interesting space with regard to its buildings (see images below).

Images 9-12: Different detailing of buildings at Emerson Green

With regard to the surrounding public space, 'the mall space' between Sainsbury's and Costa Coffee was subject to a detailed design scheme which was implemented as approved (see images below), but the end result appears to be another space without much complexity or curiosity.



Images 9-13: Public realm design scheme (left) and implementation (right); view from Sainsbury's end with Sainsbury's Café along the left side of the mall (above), view back towards Sainsbury's (below)

Overall, as in Bradley Stoke, people were observed moving directly to their destination from the car park in Emerson Green without lingering in the public realm, unless they were waiting to meet other people or bumped into them. It appears that although designers have made some effort with the architectural design of the buildings and site, this is not sufficient to make it an attraction in itself. Both sites have primarily a **function as a destination** to make use of the facilities present, not as spaces to linger without purpose, despite the provision of spaces such as the town square at Bradley Stoke.

There are examples of new-built town centres (albeit serving much larger catchment areas) that have been praised for achieving functionality and legibility as well as being architectural attractions in themselves (see images 9-14 below). Whilst highlighted in some architectural circles as successful schemes, they have also been criticised, in that 'there is nothing about Cabot Circus which is rooted in the surrounding environment, reminding shoppers that they are actually in Bristol. Instead, these are consumer hubs …that resemble nothing more than airport departure lounges'(Minton, 2009, p.15).


Images 9-14: Examples of flagship new town centres: Cabot Circus in Bristol (left);The Oracle in Reading (right)

As the above examples of praised new-built town centres serve much larger catchment areas providing a 'regional shopping experience', it is probably not surprising that these flagship projects spent considerably more time and care on the architectural and urban design aesthetics as they compete with other major city centres for customers (e.g. Cabot Circus in Bristol city centre competes with The Mall at Cribbs Causeway, Cardiff city centre and Reading city centre to name a few). Conversely, both Bradley Stoke and Emerson Green are located in near monopoly positions for the catchment they serve (e.g. there is only one large supermarket in Bradley Stoke). Hence, as observed, people use these sites primarily for their function as a service centre and/or to socially interact with other people, irrespective of their architectural aesthetics.

9.4.2.2 Variety

The literature suggests that there are three ways to increase *variety* with regard to facilities. Firstly, changing the variety of goods and displays inside stores and using temporary stalls, markets and other events (Mehta and Bossom, 2010). Secondly, providing a variety of land uses to encourage active engagement with the surrounding public realm and users (Cooper Marcus and Francis, 1990; McCormack, 1983). Thirdly, providing variety in the articulation of building facades to provide opportunities for interacting with buildings, such as 'edges with balconies, bays, porches, awnings, colonnades or other projections that provide a more comfortable threshold in inclement weather, prolonging activities and enabling uses to overlap into the street' (Llewelyn Davies, 2000, p.90). The latter two aspects have been incorporated into the active frontage grading system by Llewelyn Davies (2000), which has been used to analyse the two sites.

Variety of Goods, Stalls and Events

The **Bradley Stoke** site makes extensive use of temporary features, both on the *outside square* with changing displays of decorations, community and political events (images 9 –15, left and centre) and *inside the mall* with changing temporary stalls used by commercial businesses (images 9-15, right) as well as impromptu stands by voluntary groups.


Images 9-15: Variety of temporary stalls and events at Bradley Stoke

The entire site hence very much functions as a civic space/town square for the residents, although it is a privately owned space. In fact, on every observation visit, stalls and decorations had changed, which could be termed the 'soft changing' of an otherwise fixed built environment, adding continuous diversity and interest whilst maintaining the large structures of the built environment. This, in turn, might explain the larger numbers of people visiting the site and engaging in stationary behaviour at Bradley Stoke compared to Emerson Green. Whilst not every stall *inside the mall* constituted a primary location for social interaction, a number of them certainly were. For example, on one observation day, the local dogs and cats home had positioned themselves with two stalls at either entrance to the mall, each displaying a cage full of kittens to raise people's awareness of looking after pets. The stands constituted a huge magnet for children and adults and led to many social interactions by triangulation between onlookers.

In contrast, on the many visits to **Emerson Green**, the only observable change was the location of an ice-cream van. Whether this is due to the management of the site, or the location of the 'dedicated' village square away from the activity is not clear. The overall feel of Emerson Green was that the only changing features were the goods in the shop.

Active Frontages

Llewelyn Davies (2000) developed a grading system of active frontage with 5 categories, Grade A being the 'most active' and Grade E being the least active.

The most active frontage (Grade A) would contain the following features:	**The least active frontage (Grade E) would contain the following features:**
▪ More than 15 premises every 100m ▪ A large range of functions/land uses ▪ More than 25 doors and windows every 100m ▪ No blind/blank facades and few passive ones ▪ Much depth and relief in the building surface ▪ High quality material and refined details	▪ One or two premises every 100m ▪ No range of functions/land uses ▪ Predominantly blind/blank or passive facades ▪ Flat building surfaces ▪ No details and nothing to look at

When analysing Bradley Stoke town centre, the planning officer's report recommending planning permission stated that 'the scheme has been designed to avoid any dead frontages and encourage pedestrian activity in all areas' (Planning Officer's Report, 2006). Whilst this has certainly been achieved around the town square, it is less obvious on the mall side facing the car park, which has a long 'dead frontage' constituting the back of the shops facing the indoor mall (see image 9-16). Using the grading above, there are between 6 and 11 units per 100m across the site. Whilst the inside of the mall has Tesco on one side, the 13 shops on the opposite site (see map 9.6) provide a range of different uses/functions (such as comparison and convenience shopping, food, services etc.). The facades around the town square and on the inside of the mall are not blank and the design (as discussed above) has attempted, with the use of columns, signs and roofscapes, to produce some detailing. Overall, the site was rated as Grade B.

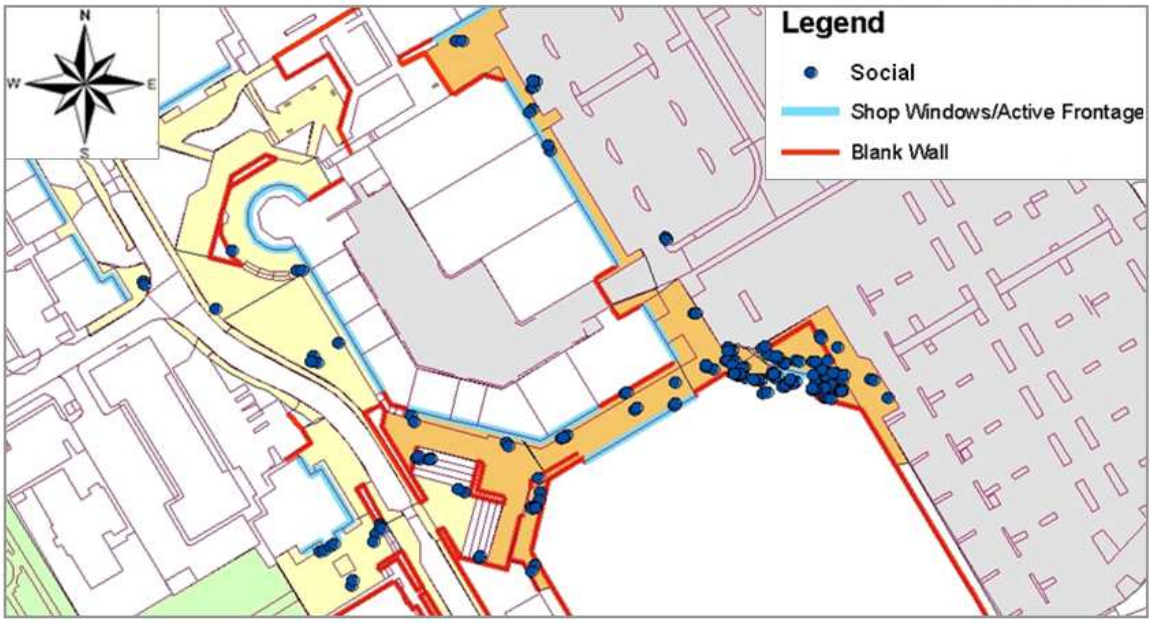
Image 9-16: Images of blank frontages at Bradley Stoke

When analysing Emerson Green, the units facing the car park have no more than three premises per 100m, whereas the side facing the road has a finer grain of about eight premises per 100m). The car park facing units have predominantly flat surfaces (see centre image below) and the units facing the road have a walkway with columns providing shelter (right image) and visually more articulated facades, however recesses in both frontages for the windows are so slim that people can not sit or interact with them (left image). When grading the site it makes sense to split this into two distinct parts: the upper residential part facing the car park was graded D-E, and the lower residential areas facing the road was graded Grade C.

Image 9-17: Examples of flat building surfaces (left and centre) and building facades with more depth and relief (right) at Emerson Green

When considering the *location of social interaction* however, it is not clear whether there is a direct effect between the length of active frontage (see map below) and social interaction. Whilst a number of instances on both sites occur in proximity to active frontages, this is also where the access points are located. Their impact is analysed in Section 9.5.2.1

Map 9-22: Active frontage and location of social interaction at Bradley Stoke



Map 9-23: Active Frontage and Social Interaction at Emerson Green

9.4.2.3 Multi-sensory Focal Points

Several authors have stressed the importance of a visual focal point in the public realm to maintain curiosity and attract people to remain longer in areas and also to provide a potential for triangulation where onlookers can socially interact by seeing/being seen or interacting with the focal point feature (Cooper Marcus and Francis, 1990; Gehl, 2001; Whyte, 1980).

At Bradley Stoke two attempts have been made to incorporate such design into the public realm surrounding the facilities. The first is a 'public art' item, constituting old gates (image right) and the second is a 'children's play' area, which allows children to move a ring over some metal poles (image left). Initially 'the applicants have proposed a spire like feature for the centre of the square to aid legibility and to provide a clear landmark for Bradley Stoke. Details of this spire would be subject to a condition on any approval'(Planning Officer's Report, 2006). However, this spire appears not to have been built. During all observations, only about five children were observed to play around the town square and out of those, three children played with the steps or the flower containers rather than the 'designed' play items. No stationary or social interaction was observed close to the 'gates'.

Image 9-18: Focal Points at Bradley Stoke: The children's play area (left) and the gates (right)

At Emerson Green, there are currently no focal points at all. Permission was granted for two pieces of public art in 2010 (PK10/0549/R3F), one outside the library, one outside the entrance area of Sainsbury's, neither of which had been installed at the time of the observations.

9.5 DESIGN FEATURES AFFECTING VISIBILITY AND MOVEMENT

9.5.1 Visual Permeability

Visual permeability relates to how far and what people can see – categorised into sightlines (an uninterrupted line of vision), transparency of shops (already discussed above) and central gathering/waiting points.

9.5.1.1 Sightlines

Seeing other people and being able to establish eye contact has been found to be a necessary prerequisite to initiate social interaction (Argyle and Dean, 1965). In the context of facilities, this can be achieved by having unobstructed sightlines (Bentley *et al.*, 1985), bidirectional pedestrian flow (Preiser, 1973) and intersections of pedestrians routes (Bitgood and Dukes, 2005). The maximum distance for seeing facial expressions is 20-25 metres, whilst the maximum distance to see events is 70-100 metres (Gehl, 2001). Hence, the two sites have been analysed with regard to the length of sightlines across the sites and the type of obstacles reducing visibility.

On the Bradley Stoke site, there are very few visual barriers. The town square can be seen and people there heard immediately when approaching from the car park (see image 9-19 on the left). Due to the double glass access points on either end of the mall, it is not possible to look inside but, once in the inside space, the entire length of the mall can be viewed (right image 9-19). In addition, when inside the mall, it is possible to view the activities going on outside on the square. This was intended by the design:

> 'The rear of the mall units which face the car park will have a substantial central glazed section **so a view of the town square can be obtained through the units**, creating a permeability to the building and adding movement and visual appeal when viewed from both inside and out. The mall will be extremely light and airy and will flood the front of the store with light and provide a strong visual reference from within it' (DPP, 2005, p.79).

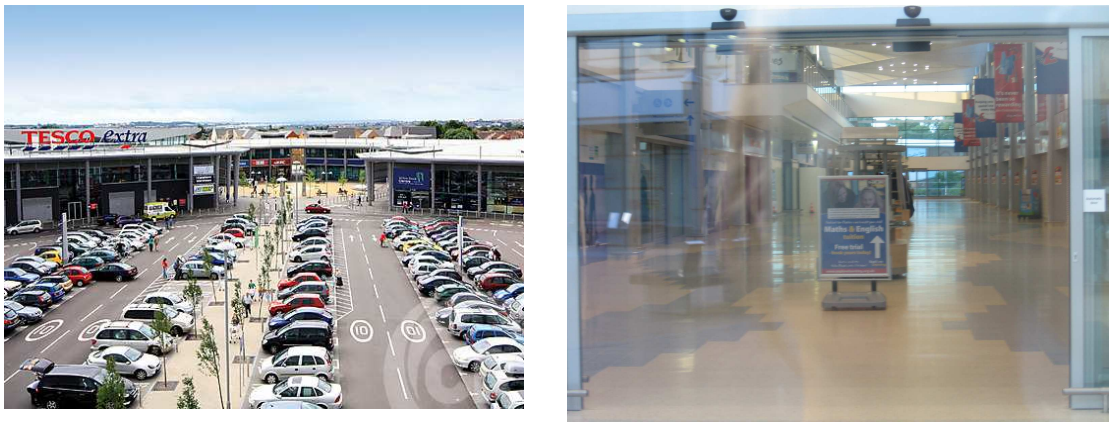
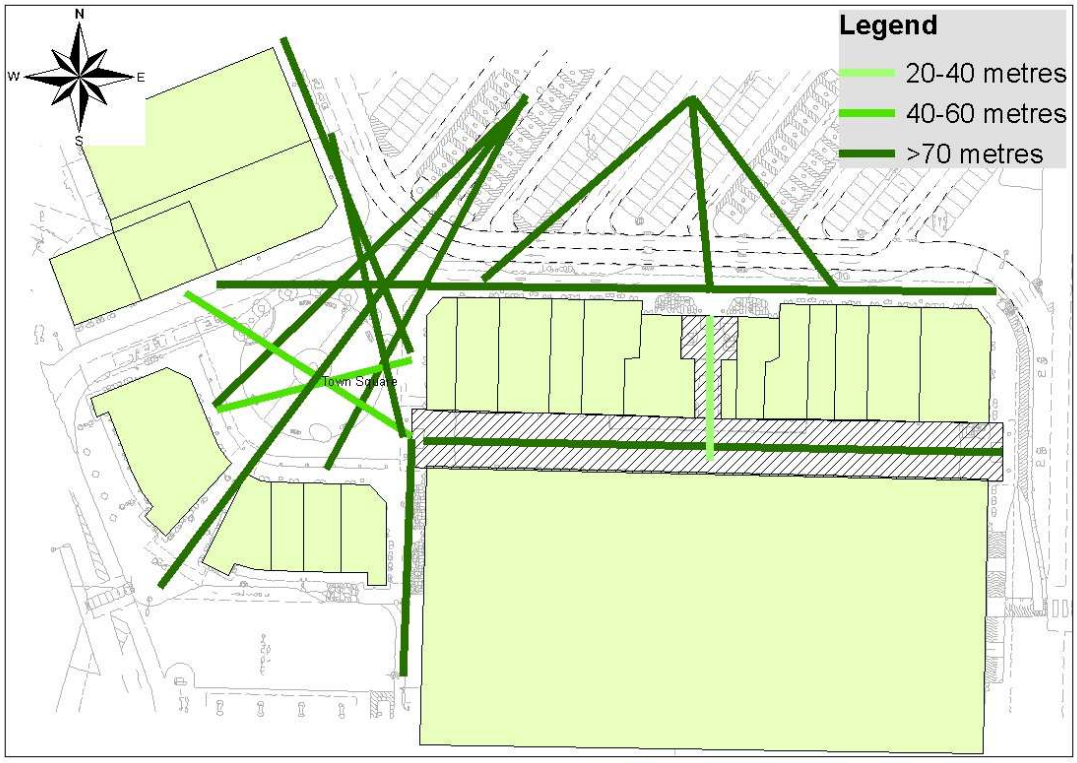


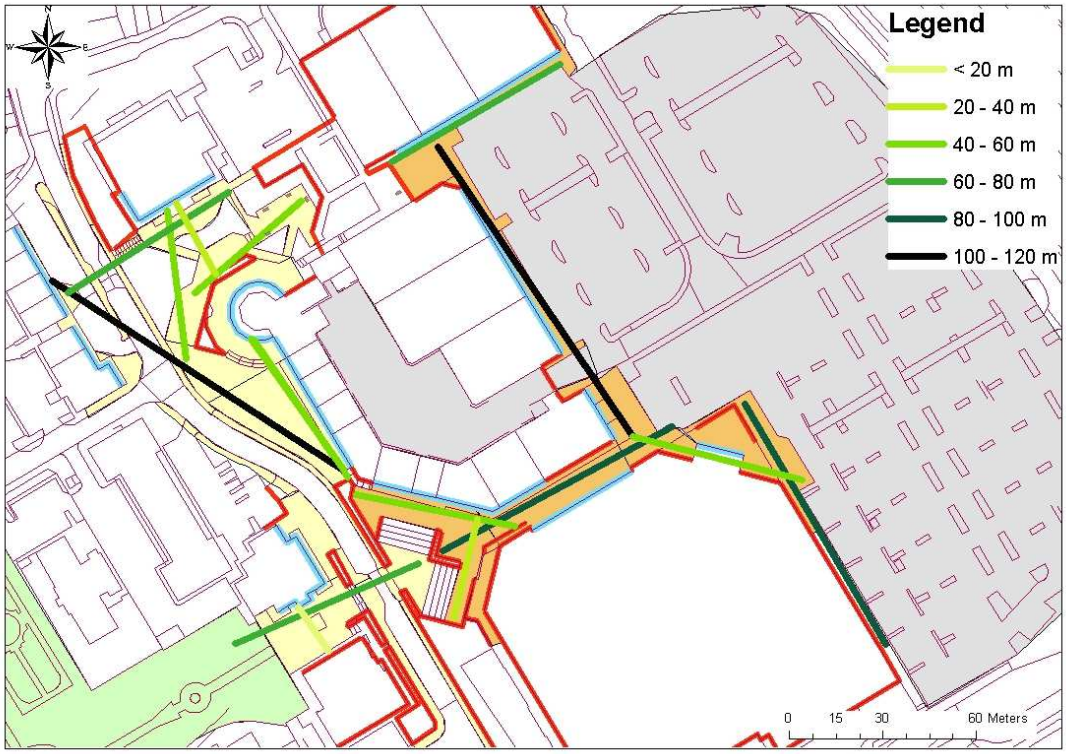
Image 9-19: View across car park to square (left) and across length of mall (right).

Overall, Bradley Stoke has very long sightlines with few barriers (see map 9-24 below). An example of how this can improve social interaction occurred during observation, where two couples with toddlers accessed the mall from opposing ends of the mall. As soon as the toddlers were close enough to recognise each other (given the flat surface and no obstructions this was quite a distance) they ran towards each other. This was followed by the parents of the toddlers having a medium length conversation.



Map 9-24: Length of sightlines at Bradley Stoke

At **Emerson Green**, the biggest obstacle to views are the buildings/urban form. In addition, there is the substantial change in level across the site separating the upper (shown in orange) and lower pedestrian areas (shown in pale yellow) through stairs (see map below) resulting in shorter sightlines (see map below).



Map 9-25: Length of sightlines across Emerson Green

As these are also surrounded by high walls it is impossible for people on the lower level to see people above (see images 9-20 below).

Image 9-20: The wall separating lower and upper pedestrian space at Emerson Green

Generally, the lower levels have shorter sightlines. The upper level contains the large car parking area and the main entrances of Sainsbury's and the bulk of shop units. The furthest one can park away from the frontage in Emerson Green is just 100m. Hence, the frontage along the big retail units is immediately visible, assisted by large signage/advertising. This is the 'front' of the

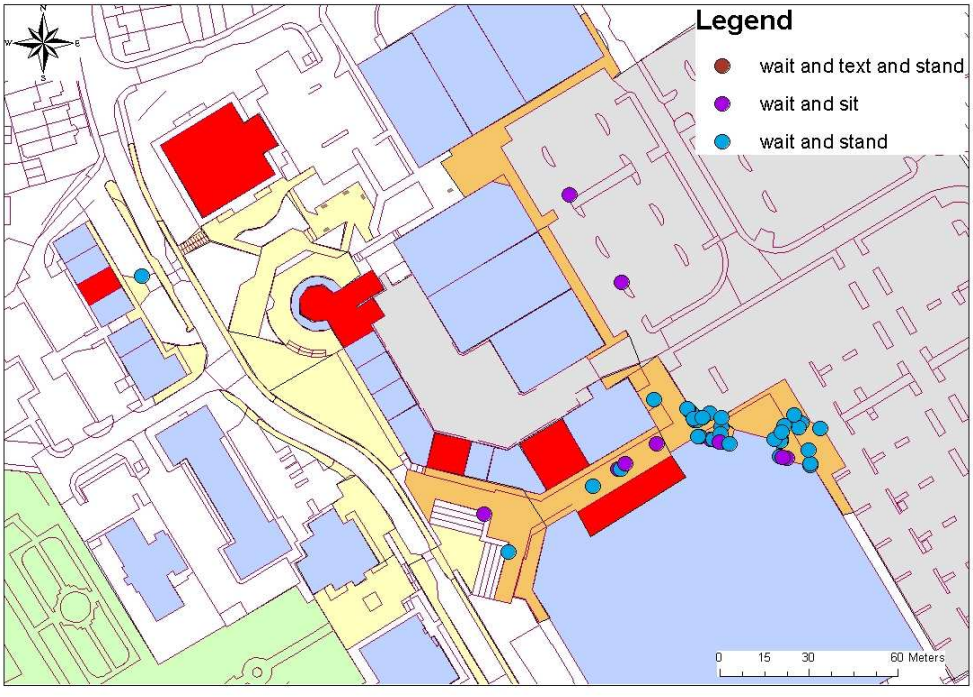
development for most users. The corridor between the front and the back of the site (the mall space) can only be seen when standing in front of it. Hence, most of the interaction and general pedestrian footfall happens at the upper level of the site (shown in Map 9.23 above) along the main entrances of the large units and the supermarket where the longest sightlines are.

9.5.1.2 Transparency of Frontages

As discussed above, transparency of shops can stimulate interest and retain people longer in spaces. It can also relate to seeing someone familiar inside or outside a facility (Mehta, 2009). Hence, visual permeability does not only relate to lines across inside or outside space, but also across the interface of outdoor and indoor space. Whilst on both sites, large areas of show windows and glazed sections enable people to see others, observable social interaction would be in the form of greeting someone separated through glass. This was not observed often enough on either site to further analyse a pattern.

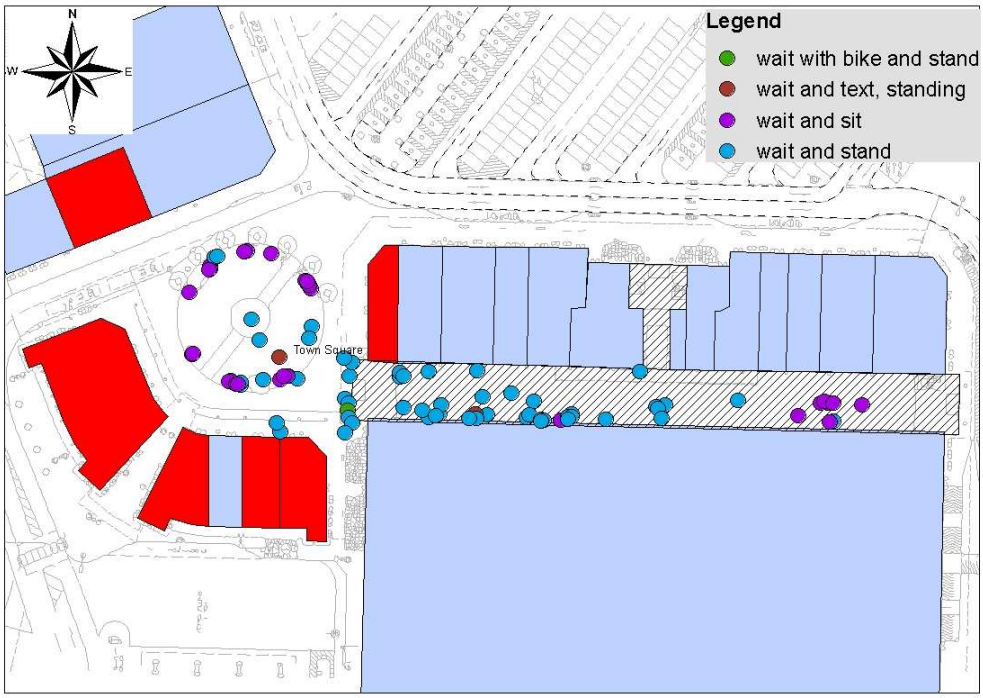
9.5.1.3 Central Waiting Points

The focal points discussed in section 9.4.2.3. can function not only as a point of interest and interaction, but also as a landmark to help wayfinding (called legibility) around sites (Lynch, 1960) and as natural *waiting points* (Alexander, 1977). As stated above, there is no designed focal point at Emerson Green. Hence, people tended to stand and wait just outside the entrance area of Sainsbury's as this was the busiest section of the site or they sat and waited on primary or secondary seating (see map below).



Map 9-26: Location of people waiting at Emerson Green

The same was observed for Bradley Stoke. Whilst people made use of the seating outside and inside to wait, when they stood and waited, this was observed in a number of random locations, often close to the main pedestrian flow close to the entrance of the mall (see map below).



Map 9-27: Locations of people waiting at Bradley Stoke

9.5.2 Physical Permeability

Physical Permeability has been defined as the 'degree to which an area has a variety of pleasant, convenient and safe routes through it' (DETR/CABE, 2000, p.91). With regard to facilities, this relates to the design and location of access points for each facility and the physical routes created inside and outside facilities and their surrounding public realm.

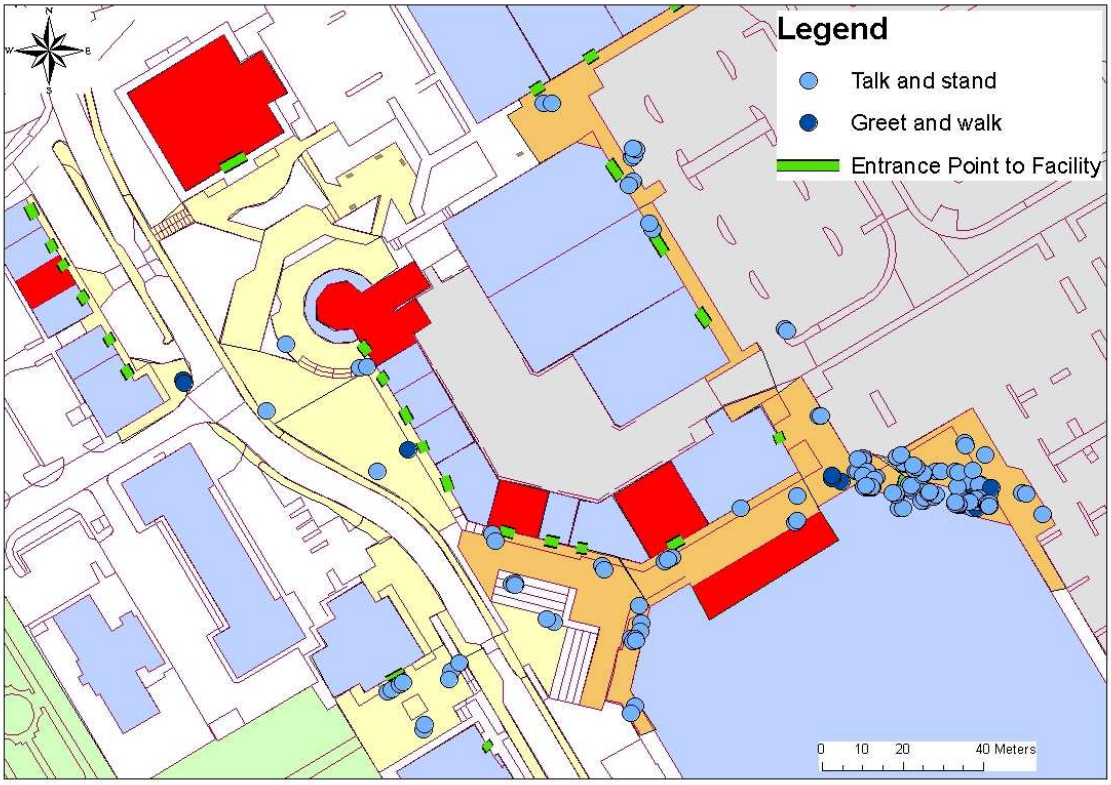
9.5.2.1 Access Points of Facilities

Access points determine where, how and when a facility can be accessed. Whilst several access points to a facility allow for many choices to enter and leave (e.g. parks), commercial premises tend to have one main entrance for reasons such as keeping the delivery area separate from the entrance area, using the entrance area to display goods, advertise, provide a reception and to allow easier surveillance of customers (e.g. supermarkets).

At Emerson Green, the vast majority of access points are identical in their format with a flat surface entrance door or sliding door providing one main entrance to each individual store (see images below).

Images 9-21: Single entrances with flat doors at Emerson Green

From the map below it is clear that many instances of social interaction where people stand or greet others happens close to the access points of facilities.



Map 9-28: Access points and non-seat based social interaction at Emerson Green

The only unusual design is the Sainsbury's access, which leads to the supermarket, the café and the learning centre and consists of a glass box externally attached to the building. This forces pedestrians to enter the store either from the left or the right, thereby channelling pedestrian flows parallel to the building and slowing down the pedestrian flow considerably, as people have to turn with their shopping trolleys when entering or leaving the store. This also means that it

effectively obstructs sight lines into the store as users can only see other people who are in the 'entrance box' at the same time (see images below).

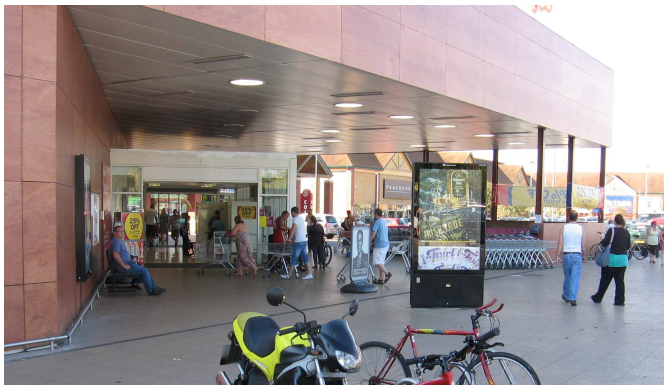
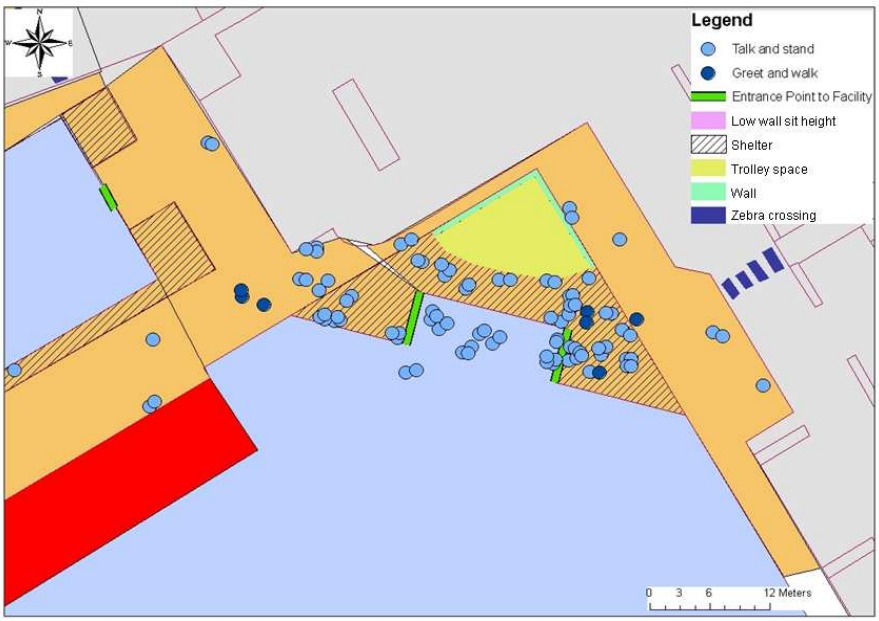


Image 9-22: Sainsbury's 'Entrance box' at Emerson green

The wider area around the entrance box is sheltered by a large triangle which would have been an optimal space to provide seating opportunities and/or turn it into a square. Instead, it is used for the storage of shopping trolleys and provides one dedicated bench. However, this form of access means that any person wishing to use the three facilities slows down while using this entrance. As discussed in Chapter 4, the speed of pedestrian flow and the volume of pedestrians along a particular route have been found to have an effect on the probability of social interaction (Preiser, 1973; Sommer, 1998). Slower pedestrian speeds have been found to encourage social interaction (Sommer, 1998). Furthermore, people enter and leave the store at this same point, so there is bidirectional pedestrian flow. Bidirectional pedestrian flow and intersections of pedestrian routes have also been found to be particularly social spaces (Llewelyn Davies, 2000). Combined with the fact that Sainsbury's is one of the primary destinations at Emerson Green, the location and design of the access points explains the increased frequency of social interaction in this particular location well (see zoomed in map 9-28 below)

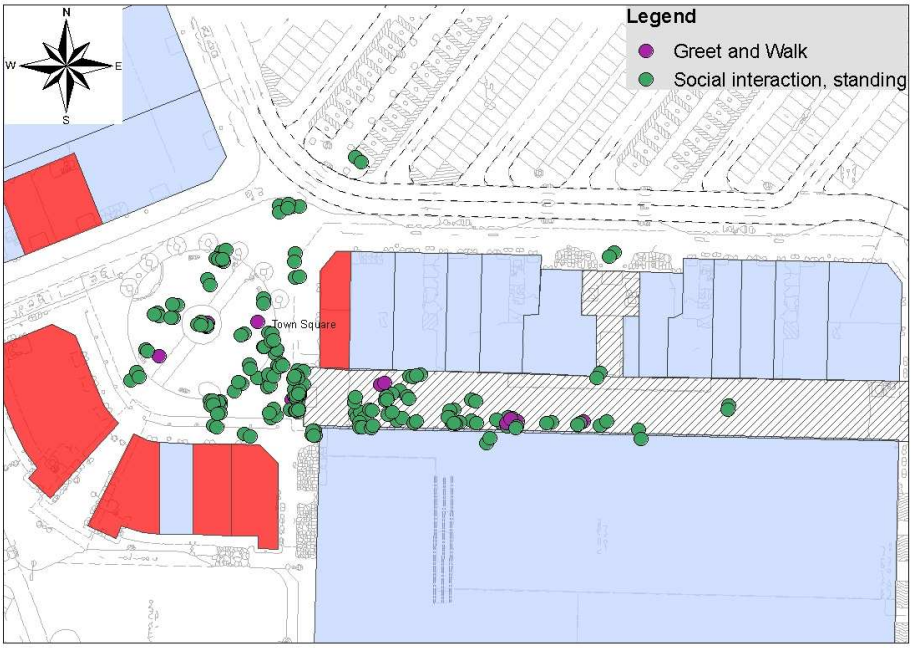


Map 9-29: Sainsbury's entrance area at Emerson Green and SI

At **Bradley Stoke**, the town square shops are all accessed through one entrance each, with a sliding or 'handle' door. The mall has three access points (the east and west entrance being over 100m apart) with sliding glass doors. Most people were seen to approach the town square and then turn to the left to access the western end of the mall. In doing so, they slowed down before the entrance of the mall, picking up shopping trolleys etc. Many people also exited the mall through the western entrance creating bidirectional pedestrian traffic. Inside the mall, the shops have again one access point each. The entrance area of the Tesco supermarket however, is designed without any barriers along the entire length of the store (see image below). The area where people usually enter the store is located at the western end of the mall and the check-out areas are situated along the rest of the length of the mall. Hence people can access and exit along almost any point of the entire 100m long mall without slowing down or dealing with oncoming pedestrian traffic.

Image 9-23: Access arrangement for Tesco at Bradley Stoke

When analysing how this affects the frequency and location of (non seated) social interaction, the following can be observed:



Map 9-30: Non-seated social interaction at Bradley Stoke

Most frequent instances of (non-seated) social interaction was observed around the entrance to the mall and along the 'entrance area' of the Tesco supermarket. This supports previous findings

that shared access points provide greater potential for social interaction (Sommer, 1998). Considering the entire length of the mall, the ability to enter and exit the supermarket at any point does not appear to increase opportunities for social interaction at the eastern end of the mall, as people are neither slowed down, nor facing oncoming pedestrians. Hence, this design of a long access point appears to be detrimental to providing opportunities for social interaction.

9.5.2.2 Function and Character of Routes

As set out in Chapter 4, the volume of pedestrians relates to favouring a particular route between location and destination over alternatives, if they exist. Urban design features affecting the preference for routes can relate to two main aspects: the *function* of the route (Hillier and Hanson, 1984; Gaerling *et al.*, 1986) and the *character, ambience and feel* of the route (Gehl and Gemzoe, 2000; White 1999). The **function** of the route relates to whether the route is a direct and short connection between desirable destinations (Bitgood and Dukes, 2005; Preiser, 1972) the number of other routes it is intersected with (level of integration) (Hillier and Hanson, 1984) and its visibility - whether it aids wayfinding (Gaerling *et al.*, 1986). The **character** of the route is affected by, surrounding uses (Alexander, 1977), changes in level (Gehl, 2001), smells and sounds (White, 1999), traffic levels (Appleyard, 1981) and feeling safe due to unobstructed views along the route (Nasar and Fisher, 1993).

As already set out above, the main locations where social interaction happened frequently on both sites were located around the **access points to the main destinations**. Both sites are designed to provide multiple, direct links from the car park to the main destinations in a 'flat' structure (Hillier, 1996), rather than constraining the routes by buildings etc. they are marked through surface changes to identify them as pedestrian walking spaces.

The Emerson Green site used to provide two different routes from the upper to the lower pedestrian areas, but the second route is currently a site for the construction of another building. The mall at the Bradley Stoke site has three entrance points and therefore a choice of routes to access Tesco. However, as already discussed before, the character, noise, activities and ambience of the town square is such that most people choose the route from the car park via the town square to the western entrance point of the mall.

The maps showing frequencies and location of social interaction and sightlines have demonstrated that the *character of the routes* on these sites appear to be of **less importance** compared to their *function*. With regard to the function, the most direct routes to the entrance

points of the main destinations determine where the main pedestrian flow is. In turn, areas with large pedestrian flow and bidirectional pedestrian traffic are the areas that have the highest frequency of (non-seated) social interaction.

9.6 SUMMARIES

The chapter provided a brief overview of the town centres, followed by reporting the frequency, location and duration of the social interaction recorded, including a brief section on whether this was affected by people's attributes. The latter demonstrated that people's attributes (such as gender, age and group format) did not have a strong influence on the location or frequency of social interaction at the observed town centres.

The chapter then addressed **Objective 5**, by analysing to what extent urban design features (grouped into features that retain people for longer in a space, e.g. comfort and curiosity and features that affect the movement of pedestrians, e.g. visual and physical permeability) had an influence on the location, frequency and duration of social interaction. This was tested using thematic maps, crosstabs and images. The table below gives a summary of the findings:

Design features relating to	Design features which affect:	the location of social interaction	the duration of social interaction	the frequency of social interaction
Comfort	Sitting and Resting Features	√	√	√
	Features to mark territory	√	√	X
	Food and Drink available	√	X	X
	Microclimate	X	X	X
	Greenery	N/A	N/A	N/A
Curiosity	Visual Appearance of Buildings	N/A	N/A	N/A
	Variety	√	X	√
	Focal points	N/A	N/A	N/A
Visual permeability	Sightlines	√	X	X
	Transparent frontages	X	X	X
	Central waiting points	N/A	N/A	N/A
Physical permeability	Access Points	√	√	√
	Function & Character of Routes	√	√	√

√ = influence observed; X = no influence observed; N/A – feature not existent/not prominent enough

Table 9-6: Design features affecting location, duration and frequency of social interaction at or around local facilities

In summary, features providing comfort to users were found to influence the location, duration and frequency of social interaction, apart from microclimate. Features providing and maintaining curiosity were mostly absent from the sites, apart from the variety of temporary stalls which

appeared to have a positive influence on the location and frequency of social interaction at Bradley Stoke. Visual permeability in the form of sightlines influenced the location of social interaction, whereas the influence from the length of active frontages was less clear. The most influential features, however, were those relating to the physical permeability of the site: routes and access points. The main pedestrian movements were determined by the shortest routes to the main destinations (*function* of route) and the presence of other people, i.e. people following the main pedestrian flow (*character* of the route). The access points of the main destinations constituted the most social locations and different access designs resulted in different frequencies and locations of social interaction depending on how far they slowed down pedestrian speeds and affected pedestrian directions.

Chapter Ten

Conclusions: Fostering Social Interaction at Local Facilities

10.1 INTRODUCTION

The purpose of the thesis was to investigate the role local facilities play as places of social interaction in the community. **Objective 1** was to identify the extent to which local facilities are used by the local population. The data collected for this research showed that over a third of all local facilities were used frequently (daily or weekly) by respondents and some facility types, such as supermarkets, district centres and corner shops were used frequently by the majority of respondents, thereby confirming the role local facilities play as important service providers (**Section 6.3**).

Objective 2 was to identify which factors relating to the facilities, the area they are located in or the individuals affect the use of local facilities. With regard to facility factors, due to data limitations, only factors influencing the most frequently used facilities could be established but not how these same factors affected non-frequent use. This had implications in that the different factor groups could not be analysed in one large model, hence the findings are based on an assessment of bivariate relationships only. The findings revealed that the type of the facility was important in that supermarkets were by far the most frequently used local facility. Quality and affordability considerations did not play a large role in choosing the local facility, more important was the fact that it was conveniently located close by, which meant that all frequently used facilities were within a mile of the user's home and half of those within ½ mile (**Section 7.2**). Considering the social aspect of facilities (rather than their utilitarian purpose) places of worship and cafes/pubs/restaurants were predominantly chosen to meet others. No clear profile with regard to the spatial arrangement of these facilities could be found in the dataset. With regard to the wider area the facilities were located in, subjective perceptions about crime levels, provision of public footpaths and ease of walking around were found to be positively associated with the frequent use of a number of local facilities. Having a social network in the area and perceiving others in the area a being similar to oneself were also positively associated with the frequent use of several local facilities (**Section 7.3**). With regard to personal characteristics of the users, their age, employment status, household composition and residence length were all associated with the level of use of local facilities (**Section 7.4**). The results highlight the fact that facilities don't operate in a vacuum, but that the wider area has an affect on their use. Furthermore, different user groups use different types of local facilities and, whilst families with children make substantial and frequent use of local facilities, it was found that other groups, particularly single households and people without children use local facilities less.

With regard to the claimed potential of local facilities to act as a place for social interaction, **Objective 3** was to identify the extent to which social interaction occurs between residents at local facilities. The data collected for this research showed that between a third and half of all frequently used local facilities were places where respondents engaged frequently in social interaction. Again, there were considerable differences between facility types, with over two thirds of all frequently used places of worship, schools, children's play areas and parks/open spaces constituting places where respondents frequently engaged in social interaction (**Section 6.4**).

Objective 4 was to identify which factors (relating to the facility, the area they are located in and the individual user) affect social interaction at local facilities. The ensuing analysis found that some facility types (such as schools) were always places of frequent social interaction irrespective of location, design or user profiles. For other facility types, the frequency of its use, the mix of facilities and the perception of the facility constituting a 'third place' were all found to have an influence on the frequency of social interaction at the facility (**Section 8.2**). With regard to the wider area the facility was located in, the analysis showed that the presence of a social network, perceived similarity with other residents, attachment to the area, length of residence and density all had an influence on levels of social interaction at those facilities (**Section 8.3**). With regard to personal characteristics of the users, their life-cycle stage, social class and employment status influenced levels of social interaction at local facilities highlighting the issue that **each** facility with its design and location not only caters for a **number** of different users but that these are also different in terms of their interest and need for social interaction (**Section 8.4**).

Finally, **Objective 5** was to investigate which micro-scale urban design features influenced the type, location, frequency and duration of social interaction at local facilities using the district centres which contained a range of local facilities as case study areas. The data collected demonstrated that features providing comfort to users were found to influence the location, duration and frequency of social interaction, (apart from microclimate) (**Section 9.4**) and that visual permeability in the form of sightlines influenced the location of social interaction (**Section 9.5.1**). The most influential features, however, were those relating to the physical permeability of the site: routes and access points. The main pedestrian movements were determined by the shortest routes to the main destinations (*function* of route) and the presence of other people, i.e. people following the main pedestrian flow (*character* of the route). The access points of the main destinations constituted the most social locations and different access designs resulted in different frequencies and locations of social interaction depending on how far they slowed down pedestrian speeds and affected pedestrian directions (**Section 9.5.2**).

The remainder of this chapter presents the contribution to knowledge made by this research, followed by a discussion of the limitations of the research, which precedes a longer discussion of the wider implications of the findings for policy and practice. The potential for future research is discussed before the overall conclusion.

10.2 CONTRIBUTION TO KNOWLEDGE

UK Government policy has claimed for some time that the presence of local facilities can foster social interaction and thereby help to build communities, suggesting that local facilities are not just needed as service providers for the local community but may also perform an important social function (ODPM 2005a; NPPF, 2012). Whilst local facilities have mainly been analysed with regard to their accessibility (Barton *et al.*, 2003, Winter and Farthing, 1997), social interaction has been analysed across neighbourhoods (Riger and Lavrakas, 1981; Raman, 2010) but not at facilities. Empirical evidence about the links between local facilities, their use and social interaction has so far been lacking. This research goes some way to provide empirical evidence, thereby contributing to a growing body of literature empirically investigating the premise that the built environment can facilitate particular behaviours (Barker, 1968; Burton, 2000; Dempsey, 2006; Festinger *et al.*, 1950; Fleming *et al.*, 1985; Lindsay, 2010; Mehta, 2009; Rogers and Sukolratanametee, 2009). Previous studies concerned with facility use lack the breadth and depth of the analysis presented here and do not combine stated behaviour of residents with observation of actual behaviour. This research considered a large range of different local facilities which were analysed as a group of local facilities as well as individual facility types and combined two data collection methods to glean information on perceived and actual behaviour. It reviewed the literature to define key concepts and identified a range of factors that might have an effect on social interaction at local facilities. This included macro-scale factors related to the facility, the neighbourhood and its users as well as micro-scale urban design features, reviewing and combining relevant literature from urban design and environmental psychology as well as sociology, housing, transport and planning. It then operationalised these concepts into indicators, and used site surveys to measure the relevant facility and micro-scale urban design features. Furthermore, this research used behavioural mapping techniques to analyse observed behaviour at local facilities in combination with basic statistical methods. This approach could be applied elsewhere. As well as contributing to theoretical debates and providing an adaptive methodology, the thesis also provides findings which could have implications for policy and practice. These are discussed in Section 10.4. below.

10.3 LIMITATIONS OF RESEARCH

The sample size (n=167) and the format did not allow more sophisticated analysis in Chapter 7 beyond the testing of basic bivariate relationships. Ideally, the analysis in Chapter 7 would have mirrored the analysis in Chapter 8, concluding with a large regression model comparing the relative importance of the different facility, area and individual characteristics on the frequent use of local facilites.

The relationships outlined in previous chapters were statistically significant but the size of the sample (n=167) and the low response rate make it difficult to generalise the findings beyond the sample population. The samples were located within one city in England which again makes inferences about other places or other people difficult. A number of findings were supported by previous studies and it is thus possible to discuss wider implications, but this should be done with caution.

As discussed in Chapter 5, a number of smaller models were undertaken using binary logistic regression instead of the more widely used linear regression. This method is more frequently used in psychology research than in built environment research. In comparison to linear regression (as discussed in Chapter 4 and 7), logistic regression does not have an equivalent effect size measure R^2, which explains variance of the different models (Tabachnik and Fiddell, 2007), hence it is less easy to compare different models with regard to their effect size. However, given the data format, it is felt that this was a wholly appropriate method to use.

Another consideration is that a cross-sectional approach was taken for data collection which does not allow the inference of causal relationships or certainty about the direction of a relationship. Whilst inferences can be made based on sound reasoning, the real pattern of causal direction can often be the opposite of what was anticipated (Bryman, 2004). A longitudinal approach would have been preferable but given the time constraints of a PhD project this was not considered feasible.

Whilst the research measured a range of factors relating to the facility, area and personal characteristics, it is acknowledged that other variables not included in this research might have also contributed to the outcome variables of use and social interaction measured in this research.

Data on some urban design features, such as curiosity provided through visual attractiveness of buildings and the public realm, would have benefitted from being measured qualitatively, for

example by interviewing people using the town centres at the time of the observation, however this was outside the scope of this research.

Finally, observations were undertaken in very busy locations with an increased likelihood that the researcher might have missed short occurrences of social interaction despite her best efforts. This limitation was taken into account in the analysis.

10.4 IMPLICATIONS OF FINDINGS FOR POLICY AND PRACTICE

A number of findings from this research are relevant to policy and practice in the areas of planning, housing, urban design and social exclusion. Implications of the findings for policy are discussed in reference to relevant empirical studies. The following sections set out to what extent local facilities, with their primary role as service providers, can also constitute settings for social interaction and thereby contribute towards the creation of communities. The sections below discuss aspects relating to the facilities themselves, the areas they are located in and the users where appropriate.

10.4.1 Local Facilities as Service Providers

10.4.1.1 Adequate and Accessible Local Facilities

Government policy advises local planning authorities to promote mixed use development (DETR, 2000; ODPM, 2003a) to contribute to the creation of *socially inclusive* communities with *good access* to *key services* for *all members* of the community (ODPM, 2005a). What the government believes to be *key services* for all members of the community has not been made clear (ODPM, 2001; 2005; DCLG, 2006). This research found that a large number of local facilities were used: whilst some facilities (such as supermarkets) were used by **all** members of the community, other facilities were predominantly used by **specific groups** such as people with children (schools, children's play areas, libraries, green spaces/parks, newsagents) or older/retired people (post office, newsagents, bus stops). This suggests that providing key services to *all members* of the community requires a broad range of *different facility types* to cater for different sub-groups within the population. Whilst public services (e.g. sports facilities, schools) can be provided in accordance with need (ODPM, 2001; ODPM, 2005b), private facilities (e.g. supermarkets and newsagents) are provided in accordance with market forces (Penn *et al.*, 2009) which might not always cater for all members of a community.

As different residents use different facility types, some are also disproportionately affected by inadequate provision of a particular type. For example, the recent closure of many post offices

(White *et al.*, 1997) raises questions of intra-generational equity and hence social sustainability (UNDP, 1997), given that older/retired people make more use of these facilities. Furthermore, service provision should remain flexible over time as the population profile changes, providing facilities that can adapt different users and need (= *facilities for life*). With regard to public services, the government has recently launched the Neighbourhood Community Budget Initiative to provide a channel for people to state which public services they wish to see in their area and discuss options for alternative provision (DCLG, 2011). Whilst recent legislation provides an opportunity for communities to buy existing facilities threatened by closure (*Localism Act*, 2011), with regard to the *provision* of private facilities, the emphasis remains on provision driven by the market.

Provision of facilities through the market has recently been characterised by increased scale, uniformity and centralisation (Fainstein, 2005). The centralisation of facilities raises another issue of facility provision, that of *accessibility*. The importance of providing accessible facilities within walking distance of peoples' homes aims to achieve the twin objectives of reducing car use and increasing social inclusion (DETR 1998; Urban Task Force/DETR, 1999; Social Exclusion Unit 2003; ODPM, 2003b; NPPF, 2012). Maximum distances to facilities have been suggested (Barton *et al.*, 2003; Urban Task Force/DETR, 1999) but there is no consensus of how easily accessible a particular facility should be. This research found that the vast majority of frequently used facilities were situated within 1 mile of the user's home and that more than half of the users walked to these facilities, supporting findings from previous studies (Foley, 1950). Whilst this is encouraging, the findings also support previous studies demonstrating that recommended distances to facilities can be inappropriate for less mobile users, such as older people (Burton and Mitchell, 2006) or people with children, the poor and the disabled (Gordon *et al.*, 2000; Bowling *et al.*, 2006). Furthermore, some of these less mobile groups have been found to be particularly dependent on facilities in their neighbourhood due to the lack of alternative transport choice (Lang, 1994; Gordon *et al.*, 2000). Whilst government guidance stresses the role of local planning authorities and development plans to designate centres and encourage development that is located accessibly (ODPM, 2005a and b), this depends on an application being made by the private or public sector. Outside the UK, local planning authorities are given more financial powers to encourage commercial facilities to locate in areas that are designated for service provision (e.g. Germany). Whilst the aim of providing accessible, key services to all members of the community is clearly promoted in policy and theory, more research is needed into how this provision can best be achieved and how the government's current emphasis on decentralisation of power to local communities (*Localism Act*, 2011) might be used as a tool for improved facility provision.

10.4.1.2 Neighbourhoods and Facility Use

Physical neighbourhood features, such as dwelling density and walkability of neighbourhoods have been promoted to increase local facility use (Aldous, 1992; Calthorpe, 1993; Urban Task Force/DETR, 1999). Density was not found to influence the use of any of the facility types apart from nurseries in this study, (the variety of densities across the areas ranged from <20 persons per hectare to >80 persons per ha), whilst the perceived walkability of an area only influenced the use of a few facilities, including parks/green spaces, supermarkets and bus stops. Social neighbourhood features, however, such as perceived homogeneity and social ties in an area, were found to positively influence people's use of a wider range of local facilities. Whilst the planning/design of neighbourhoods has received much attention (DETR/CABE, 2000; Urban Task Force/DETR, 1999), the social make up of neighbourhoods and the impact this has on local facility use has been less widely researched. Studies that have investigated mixed-tenure, heterogeneous communities have been inconclusive, with some studies claiming that heterogeneous communities use the same facilities (Casey *et al.*, 2007), whilst others found that in areas with strong perceived differences (income/class) between owners and renters, each group used their different facilities with neighbourhoods failing to provide spaces where the community could come together (Atkinson and Kintrea, 2000). This research provides further evidence that perceived homogeneity is linked to higher local facility use, thereby questioning the ability of local facilities in heterogeneous communities to provide services to everyone, irrespective of their quality or design.

In conclusion, what these findings suggest is that in addition to providing adequate and accessible local facilities for different residents, perceived homogeneity and social ties between residents also have a bearing on whether local facilities are used. To what extent local facilities can support the 'creation' of new communities, is discussed in the following sections.

10.4.2 Local facilities as settings for Social Interaction

Given the many individual and collective benefits associated with social interaction in neighbourhoods (Pickett and Pearl, 2001; Dines and Cattell, 2006; Ishii-Kuntz, 1990), policy makers have promoted social interaction between residents in neighbourhoods (DETR, 2000; NPPF, 2012). The process by which this is to be achieved is through the frequent use of local facilities, thereby creating a setting for 'repetitive chance encounters' between residents (Achimore, 1993). However, whether there is a clear link between frequent use and social interaction remains debated (Casey *et al.*, 2007). This research found that whilst this link holds true when considering all local facilities together, the situation is less clear when testing individual facility types. No relationship was found between the frequency of using supermarkets,

parks/open spaces, district centres and libraries and frequent social interaction, whilst a significant relationship was found between using restaurants/cafes/pubs frequently and having frequent social interaction at these facility types, thereby questioning the assumptions that frequent use will necessarily result in frequent social interaction, irrespective of facility type.

10.4.2.1 'Social' Facility Types

As stated above, policy guidance promoting the provision of local facilities as places where the local community can come together does not specify the type of local facility and/or whether any type of facility can act as a 'social hub' (NPPF, 2012). Research into this matter has found that schools are places of frequent social interaction (Jupp, 1999; Silverman *et al*., 2005). Other facility types identified as 'social hubs' were markets (Watson, 2009), supermarkets (Piacentini *et al*., 2001), shopping malls (Feinberg *et al.*, 1989), corner-shops (Jacobs, 1961) and cafés and restaurants (Mehta and Bossom, 2010), termed 'third places' by Oldenburg (1999). These research findings support studies showing that schools, play areas, leisure centres and places of worship were found to constitute places of frequent social interaction. Supermarkets on the other hand (the most frequently used facility across the community) were found to be places of limited social interaction. The findings show that users with children frequently engage in social interaction at children focused facilities. Whilst this may bring together a community of residents 'with children' (Weller and Bruegel, 2009), this community only constitutes about 20% of the UK population.

Older people and those not in full-time employment depend more on local networks for social support than other segments of the population (CLG, 2009; Gordon *et al.*, 2000; Skjaeveland and Garling, 1997). Hence, having facilities that provide opportunities for social interaction for the majority of the residential population appear to be important. There are potentially three ways of achieving this:

1. Facilities that are places of frequent social interaction could be mixed with places that are less social. The research tested this concept and found that groups of facilities that included a 'third place' were indeed more likely to be places of frequent social interaction.

2. Places that are social hubs for certain groups could be mixed with facilities that are social hubs for different groups, thereby increasing social interaction across the community. For example one of the case study areas contains a building housing the library, leisure centre

and a café and was mentioned by a number of residents as an important place for social interaction in the community.

3. Attempts could be made to increase social interaction at facilities that are frequently used by the majority of the local population, but are currently not functioning as social hubs. Supermarkets would be an ideal facility where social interaction could be increased, as they are frequented by a large section of the community. Previous research has highlighted that *some* supermarkets do constitute important social hubs (Dempsey *et al*., 2012; Barton *et al.*, 2007) whilst others do not. To what extent this can be influenced by the design of these facilities is discussed in the next section.

10.4.2.2 Design of Local Facilities

Following the Portas review (2011), the design of shared and public spaces along high streets has found renewed interest with the objective of making these spaces focal points for social interaction by all members of the community and thereby increasing sales for town centre facilities (DCLG, July 2012). Urban designers have long claimed that design of public space can increase opportunities for social interaction (Gehl, 2001; Whythe, 1980) and that features relating to comfort and curiosity can increase people's use and length of stay in public places (Cooper Marcus and Francis, 1990; Shaftoe, 2008). Visual and physical permeability have also been highlighted as important design features for users to see others (and bump into them), increasing the opportunity for social interaction (Sommer, 1998; Llewelyn Davies, 2000). It is important to remember that the primary purpose of a facility is not to encourage social interaction but to provide a service (e.g. education), or sell products (e.g. supermarket), hence its internal layout is primarily designed with that main purpose in mind. However, as set out above, educational facilities and some leisure facilities do constitute places of frequent social interaction in addition to providing a service/product. The research findings suggest that there are urban design elements associated with high levels of social interaction at or around facilities, supporting previous studies and claims set out in government guidance (DCLG, 2012). Features increasing the length of stay around facilities, such as sitting and resting features, features to mark a person's territory, food and drink and a variety of temporary events were all found to be associated with higher levels of social interaction. Urban design features that showed the clearest association with the location and frequency of social interaction were the location and design of access points to facilities and the available routes to them. Given that these are 'destination driven' places, this was not surprising.

Whilst the findings suggest that design can support opportunities for social interaction at or around local facilities, the question remains whether government reports and policy can convince facility providers that social interaction at their facilities benefits them financially and are therefore willing to invest in the design of their surrounding public realm to make them more social places. The Portas review (2011) and subsequent government guidance based on its recommendations (DCLG, July 2012) might constitute a first and important step in that direction.

10.4.2.3 Neighbourhoods and Social Interaction at Local Facilities

Compact, high density neighbourhoods which provide opportunities for residents to walk to local facilities are considered to provide more opportunities for social interactions as a result of more people being in the street (Churchman, 1999; CPRE, 2006). A well connected, walkable neighbourhood has indeed been found to increase social interaction en-route to local facilities (Casey *et al.*, 2007), however, this could not be tested in this research as all residents agreed that it was easy to walk around their neighbourhood. Higher densities have also been found to increase social interaction in neighbourhoods (Bramley *et al*., 2009) and this research found that this was also true for social interaction at local facilities. Previous research has shown that higher densities can have a positive impact on how many people a resident knows in their neighbourhood (Raman, 2010). It is therefore possible that an accompanying higher density of facilities increases social interaction at local facilities in those areas, with more opportunities for people to bump into each other.

The social environment of a neighbourhood also had an influence on social interaction at local facilities. Levels of crime (perceived or actual) and levels of deprivation had no association with social interaction levels at local facilities, contrary to previous findings (Newman, 1971). This is not to say that crime and deprivation levels are not associated with social interaction levels in neighbourhoods or at local facilities, but the selected study areas did not show sufficient diversity in crime levels for significant associations to emerge.

Previous research has shown that a person's social network (Riger and Lavrakas, 1981), perceived homogeneity (Hunter, 1975; Snow *et al*., 1981) and length of residence (Bramley *et al.*, 2009) can all influence a person's propensity to socially interact with others in a neighbourhood. This was supported by this research suggesting that social interaction levels at local facilities were more frequent for residents who were familiar with the neighbourhood and its residents (length of residence, aware of visible segregation, social ties in neighbourhood) and the extent to which they felt similar to others in the area. In order for people to remain long-term residents in the same neighbourhood and familiarise themselves with their surroundings and its residents,

developments with a variety of dwelling types and sizes have been advocated to cater for the housing needs of residents at different life cycle stages (DCLG, 2006). At the same time, providing a large variety of housing types and tenures is likely to reduce homogeneity of the population (Burton, 2000), which has been found to have a negative impact on social interaction and the development of social networks (Talen, 1999; Musterd, 2008). Whilst mixed-tenure and tenure blind housing developments have been promoted to improve social inclusion (Tunstall and Fenton, 2006), studies have found mixed results as to whether heterogeneous communities socially interact (Atkinson and Kintrea, 2000; Casey *et al.*, 2007) and to what extent this can be influenced by design (Jupp, 1999; Roberts, 2007) or is due to the level of heterogeneity (Camina and Wood, 2009). Although British society has seen a substantial rise in (income) inequality over the last decades (Wilkinson and Pickett, 2010) with gated communities increasing at a similar pace (Minton, 2009), new government guidance has reduced the emphasis on mixed tenure developments (NPPF, 2012).

10.5 POTENTIAL FOR FURTHER RESEARCH

There is real potential to extend this research. It would be useful to repeat the study at a larger scale across more widely differing neighbourhoods to be able to compare different neighbourhood factors, such as the influence of crime, deprivation, traffic levels etc. which were not very pronounced in this research due to the lack of variance. A longitudinal research design could be used to better understand to what extent local facilities increase social interaction levels and whether the social mix of an area is affected by facility use or is affecting facility use over time.

The collection of qualitative data at the same time as undertaking observations (for example through on-site interviews) would improve an understanding of resident's perception about their town centres and the features stimulating curiosity (e.g. levels of greenery, visual attractiveness of buildings and street furniture). Urban design features could be investigated across a larger number of sites, for example comparing traditional high streets and their urban design features with more recent town centres, to get a better understanding of the different design options of these design features and their influence on social behaviour.

The findings also raised the issue of how to provide improved urban design features to increase opportunities for social interaction and whether this is the responsibility of the private or public sector. The recent rise in so called 'town-centre, open air malls' has been criticised for producing safe, sanitised, homogenised and therefore dull places (Minton, 2010). On the other hand, many

traditional high streets tend to be characterised by disjointed public realm design due to the multitude of owners and responsibilities. Future research could investigate the feasibility of a joint-up approach for the design of the public realm including user's and providers. This could also be done as comparative study with international case studies, comparing different approaches to town centre management and the involvement of the local community in the design of street furniture and public art.

Future research could compare traditional high streets with new-built town centres to investigate social interaction levels and the influence of the grain/density, and whether this is due to the grain/density of different facilities or due to urban design features.

With regard to facility provision, the findings highlighted that the increased centralisation of facilities following market demand might become problematic in achieving accessible facilities. To what extent local government or local communities can produce *incentives* for dispersed facility provision could be analysed in future research, particularly given the centralised decision making powers supported by the current government. Again, a comparative, international study would be of interest.

Finally, centralisation of services, in particular the closure of post offices in rural areas has led to some research about its impact on older people (White *et al.*, 1997). In suburban areas, due to better access to buses, the issue of inaccessible small shops and services is rarely discussed but there may be similarly difficult implications for older people or those with reduced mobility. Qualitative research could highlight the main concerns such users have and what coping strategies they use.

10.6 THE DUAL ROLE OF LOCAL FACILITIES

In conclusion, this thesis lends cautionary support for the on-going promotion of the mixed-use principle (ODPM, 2005a) with regard to providing adequate and accessible facilities for the residents they are intended to serve. Residents do make use of local facilities and this is predominantly the case because they are local. As different user groups use different facility types it is important to secure the provision of *facilities-for-life*, catering for all generations, classes and income levels. Despite the rise in car ownership, internet shopping and the centralisation of retail into huge malls, local facilities still have an important role to play in the hierarchy of service provision.

This research also supports the assertion that local facilities can make a contribution towards the building of communities (NPPF, 2012) through constituting places of frequent social interaction. However, this only extends to **certain** facility types and **certain** residents. If perceived homogeneity of an area is an antecedent of social interaction, this raises wider issues of segregation and gated communities, implications of recent increases in income inequality in Britain (Wilkinson and Pickett, 2010) and resulting reduction in trust amongst members of the public (ibid.). The prevalent policy rhetoric describes British communities as 'not what they used to be' using terms such as 'broken' society, 'problem families' and 'no go areas'. The current government is trying to reinvigorate public spaces as places 'where people can come together who might not otherwise come together' (NPPF, 2012, p.17). Given the rise of spatial segregation and gated communities, there is a serious question whether people from different walks of life **want** to come into contact with others they don't know or whether they are 'voting with their feet' by moving to homogenous residential areas. Policy guidance that is based on examples from the continent (Urban Renaissance) fails to mention that British society is much more unequal than other European countries with resulting high levels of distrust and fear of crime (Wilkinson and Pickett, 2010). The research shows that the government's attempt to solve wider social and economic problems predominantly through the built environment, is severely limited and points to the need of a more joint-up policy approach of which local facilities play a small but significant part.

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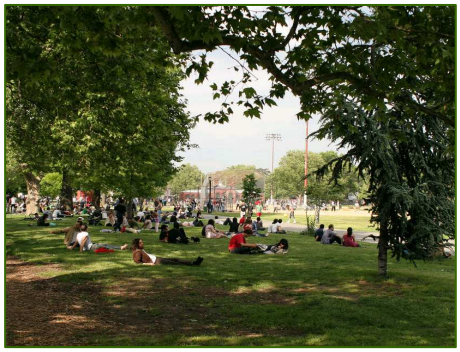
Appendix 1

Questionnaire

Your local facilities: places to meet people?

Is it important to you to have local facilities such as a newsagent, shop, park, school and sports centre that you can walk to? Do you meet friends and neighbours there? Are the facilities of a good quality?
Even if you use only some facilities in your local area, your answers will help me to understand which facilities are important to the local community and how their design can support social interaction.

You can also fill this questionnaire in online at
http://www.brookes.ac.uk/schools/be/about/architecture/social-interaction
using the password and personal code written on the questionnaire covering letter.



First a few questions about the area around your home

1. Do you agree or disagree with the following statements about the area within 10 minutes walking distance from your home. *Please circle just one of the numbers 1-5 for each statement.*

	Agree Strongly	Agree	Neither Agree/ Disagree	Disagree	Strongly Disagree
I enjoy living in this area	1	2	3	4	5
I would like to stay for several years	1	2	3	4	5
There is a lot of traffic in this area	1	2	3	4	5
I think I am similar to other people in this area	1	2	3	4	5
I know in which houses/flats council tenants live	1	2	3	4	5
There is a lot of crime in this area	1	2	3	4	5
I feel safe walking in this area after dark	1	2	3	4	5
There is a large network of footpaths around here	1	2	3	4	5
It's easy to walk from one part of this area to another	1	2	3	4	5

Now looking at facilities close to home

2. Do you have any of the following facilities within **10 min walking distance** of your home? *Please tick the appropriate box*

	Yes	No	Don't know
Bus stop	☐	☐	☐
Newsagent	☐	☐	☐
Green space	☐	☐	☐
Post office	☐	☐	☐
Take away	☐	☐	☐
Children's play area	☐	☐	☐
Primary school	☐	☐	☐
Hairdresser/barber/beauty salon	☐	☐	☐
Café/restaurant/pub	☐	☐	☐
Corner shop/food store	☐	☐	☐
Nursery	☐	☐	☐

3. Do you feel there are any facilities missing within **10min walking distance** from your home? *Please specify*

☐ No

☐ Yes, _____

_____

4a. Did you use any of the **available** facilities during the last year and how often? *Please tick the appropriate box*

4b. If you chose **never** in the preceding question, what would you say are the main reasons? *Please tick all that apply*

	Daily	Weekly	Monthly	Less than monthly	Never	Bad quality	Too expensive	Other users	Bad equipment	Not interested	I have no children	Other, please specify
Bus stop	☐	☐	☐	☐	☐			☐				☐
Newsagent	☐	☐	☐	☐	☐	☐	☐	☐				☐
Green space	☐	☐	☐	☐	☐	☐		☐	☐	☐		☐
Post office	☐	☐	☐	☐	☐	☐	☐	☐				☐
Take away	☐	☐	☐	☐	☐	☐	☐	☐		☐		☐
Children's play area	☐	☐	☐	☐	☐	☐		☐	☐		☐	☐
Primary school	☐	☐	☐	☐	☐	☐		☐			☐	☐
Hairdresser/barber/	☐	☐	☐	☐	☐	☐	☐	☐		☐		☐
Café/restaurant/pub	☐	☐	☐	☐	☐	☐	☐	☐		☐		☐
Corner shop/food store	☐	☐	☐	☐	☐	☐	☐	☐				☐
Nursery	☐	☐	☐	☐	☐	☐	☐	☐			☐	☐

Now thinking of facilities further away

5. Do you have any of the following facilities within **5min drive time** from your home? *Please tick the appropriate box*

	Yes	No	Don't know
Supermarket	☐	☐	☐
Leisure centre	☐	☐	☐
Secondary school	☐	☐	☐
Park/large green space	☐	☐	☐
Library	☐	☐	☐
Children's play area	☐	☐	☐
District centre with range of shops	☐	☐	☐
Place of Worship	☐	☐	☐
Café/restaurant/pub	☐	☐	☐
Community centre	☐	☐	☐

6. Do you feel there are any facilities missing within **5 min drive time** from your home? *Please specify*

☐ No

☐ Yes, _____

_____

7a. Did you use any of the **available** facilities during the last year and how often? *Please tick the appropriate box*

7b. If you chose **never** in the preceding question, what would you say are the main reasons? *Please tick all that apply*

	Daily	Weekly	Monthly	Less than monthly	Never	Poor quality	Too expensive	Other Users	Poor equipment	Not interested	I have no children	Other, please specify
Supermarket	☐	☐	☐	☐	☐	☐	☐	☐				☐
Leisure centre	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐
Secondary school	☐	☐	☐	☐	☐	☐	☐	☐			☐	☐
Park/Large Green space	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐
Library	☐	☐	☐	☐	☐	☐	☐	☐		☐		☐
Children's Play Area	☐	☐	☐	☐	☐			☐	☐		☐	☐
District centre with range of shops	☐	☐	☐	☐	☐	☐	☐	☐				☐
Place of Worship	☐	☐	☐	☐	☐	☐		☐		☐		☐
Café/restaurant/pub	☐	☐	☐	☐	☐	☐	☐	☐		☐		☐
Community centre	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐

Now thinking about the 3 facilities you used most often during the last year

8. Which 3 facilities (i.e. supermarket, play area) did you use most often during the last year?

Facility A_____

Facility B_____

Facility C_____

9. What are the names of these 3 facilities (i.e Tesco, Stanbridge Primary School etc)

Facility A_____

Facility B_____

Facility C_____

10. What are the main reasons for choosing these? *Please tick all that apply*

	Facility A	Facility B	Facility C
Close to work	☐	☐	☐
Employed at the facility	☐	☐	☐
Close to home	☐	☐	☐
Close to other facilities	☐	☐	☐
Cheap	☐	☐	☐
Good Quality	☐	☐	☐
Good Reputation	☐	☐	☐
Meet other people	☐	☐	☐
Seek peace and quiet	☐	☐	☐
Other, please specify			

11. Which mode of transport do you normally use to go to these 3 facilities? *Please tick one for each facility*

	Car	Motor Bike	Taxi	Bus	Bicycle	Walk
Facility A	☐	☐	☐	☐	☐	☐
Facility B	☐	☐	☐	☐	☐	☐
Facility C	☐	☐	☐	☐	☐	☐

Other, please specify _____

12a. Are the facilities within **5 min drive time** of your home?

	Yes	No
Facility A	☐	☐
Facility B	☐	☐
Facility C	☐	☐

12b. Are the facilities within **10 min walking distance** of your home?

	Yes	No
Facility A	☐	☐
Facility B	☐	☐
Facility C	☐	☐

Now turning to meeting people at these 3 facilities

Again, thinking about the 3 facilities you use most often :

13a. When you use the facility, how often do you **see** other users of the facility that you have seen before? *Please tick one for each facility*

	Every time	Most times	Some times	Rarely	never
Facility A	☐	☐	☐	☐	☐
Facility B	☐	☐	☐	☐	☐
Facility C	☐	☐	☐	☐	☐

13b. If you answered 'never' what would you say are the main reasons?

Main reasons

14a. When you use the facility, how often do you **say hello in passing** to other users? *Please tick one for each facility*

	Every time	Most times	Some times	Rarely	never
Facility A	☐	☐	☐	☐	☐
Facility B	☐	☐	☐	☐	☐
Facility C	☐	☐	☐	☐	☐

14b. If you answered 'never' what would you say are the main reasons?

Main reasons

15a. When you use the facility, how often do you **stop to have a chat** with other users of the facility? *Please tick one for each facility*

	Every time	Most times	Some times	Rarely	never
Facility A	☐	☐	☐	☐	☐
Facility B	☐	☐	☐	☐	☐
Facility C	☐	☐	☐	☐	☐

15b. If you answered 'never' what would you say are the main reasons?

Main reasons

16. Have you met friends **initially** through these facilities or at them? *Please tick for each facility*

	Yes	No
Facility A	☐	☐
Facility B	☐	☐
Facility C	☐	☐

17. Have you met neighbours **initially** through these facilities or at them? *Please tick for each facility*

	Yes	No
Facility A	☐	☐
Facility B	☐	☐
Facility C	☐	☐

18. Do you ever **plan** to meet up with people at these facilities? *Please tick for each facility*

	Yes	No
Facility A	☐	☐
Facility B	☐	☐
Facility C	☐	☐

19. How important would you say are these facilities for you to socialise with people you know? *Please tick one for each facility*

	Very important	Fairly important	Slightly important	No too important	Not at all important
Facility A	☐	☐	☐	☐	☐
Facility B	☐	☐	☐	☐	☐
Facility C	☐	☐	☐	☐	☐

20. In **which part** of each facility would you say you most often bump into/recognise people you know? *Please tick one for each facility*

	Car Park	Entrance Area/gate	Inside facility	Don't know
Facility A	☐	☐	☐	☐
Facility B	☐	☐	☐	☐
Facility C	☐	☐	☐	☐

Personal and household information

21. Did you know anybody who lived in **this area** (within 10 min walking distance of your home) before you moved here? *Please tick all that apply*

- ☐ Family
- ☐ Friends
- ☐ Acquaintances
- ☐ Work Colleagues

22. Do you know anyone in this area now? *Please tick all that apply*

- ☐ Family
- ☐ Friends
- ☐ Acquaintances
- ☐ Immediate Neighbours

23. How many neighbours roughly do you know:

By sight _____ To say hello to_____

To chat to_____

24. How often do you visit people from this area at their home ? *Please tick one*

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Less than monthly
- ☐ Never

25. How often do people from this area visit your home? *Please tick one*

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Less than monthly
- ☐ Never

27. Do you agree or disagree with the following statements? *Please tick.*	Agree	Disagree	
I prefer to spend my leisure time alone or relaxing in a tranquil family atmosphere			
I rapidly get involved in social life at a new workplace			
I feel that most people would try to take advantage of you if they get a chance			
I enjoy having a large circle of acquaintances			
I get pleasure from solitary walks			
After socializing I feel the need to get away and be alone			
The more people I talk to, the better I feel			
Often I prefer to read a book or watch TV than go to a party			
I spend my leisure time actively socializing with people			
Generally, I feel that most people can be trusted			

28. How long have you lived in this area?

_____years _____ months

29. Which of the following best describes your current accommodation situation?

Tenant
- ☐ private rented
- ☐ social rented

Owner
- ☐ with mortgage
- ☐ owned outright
- ☐ shared ownership

30. Which of the following best describes your current household composition?

one person household
- ☐ professional
- ☐ pensioner
- ☐ other

One family only

Married or cohabiting couple household
- ☐ no children
- ☐ with dependant children
- ☐ all children non-dependant

Lone parent household
- ☐ with dependant children
- ☐ all children non-dependant

other household
- ☐ all student (shared)
- ☐ all professionals (shared)
- ☐ other

31. How many children live in your household?

0-4 years_____ 5-11 years_____ 12-18 years_____

32. Are you: ☐ male ☐ female?

33. What age group are you in?

☐18-24 ☐25-29 ☐30-44 ☐45-59 ☐60-74 ☐75-89

☐ 90 and over

34. Which of the following best describe your current situation?

- ☐ Full-time employed
- ☐ Part-time employed
- ☐ Self-employed
- ☐ Looking after home/family
- ☐ Full-time Student
- ☐ Unemployed
- ☐ Retired
- ☐ Permanently sick or disabled
- ☐ other_____
- ☐ I would prefer not to say

35. What work do you or did you do?

36. Which of these groups would you say you belong to

☐ White British ☐White European ☐White Other ☐Black

☐ Asian ☐Mixed ☐Other ☐I would prefer not to say

If there is anything else you would like to say about your local facilities and social interaction at them, please use the space below

_____

_____

Thank you very much for your time and help in completing this questionnaire!

I will be spending the next few months analysing this questionnaire and am very happy to send you a summary report of the findings as soon as it is available.

PLEASE TICK THIS BOX

☐

If you would like to receive a summary report of my findings

Sometimes it is not possible to write down all the comments you might have. If you would like to be contacted again to discuss some of your answers in more detail via phone or in person with the researcher please tick the box below.

PLEASE TICK THIS BOX

☐

If you would be happy to be contacted for further discussions.

Personal information used will be processed under the terms of the Data Protection Act. Any information will be used exclusively for the purposes of the research programme and will not be passed to others or used for any other purpose. All information will be published in aggregated form so that individuals cannot be identified. The data will be held securely and disposed of when its purpose for collection is over.

If you have any queries about this questionnaire, please contact
Susanne Dahm, Department of Architecture, Oxford Brookes University
Email: sdahm@brookes.ac.uk Tel: 01865 483689

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Appendix 2

Mix, Spatial Arrangement and Visibility of Most frequently used facilities

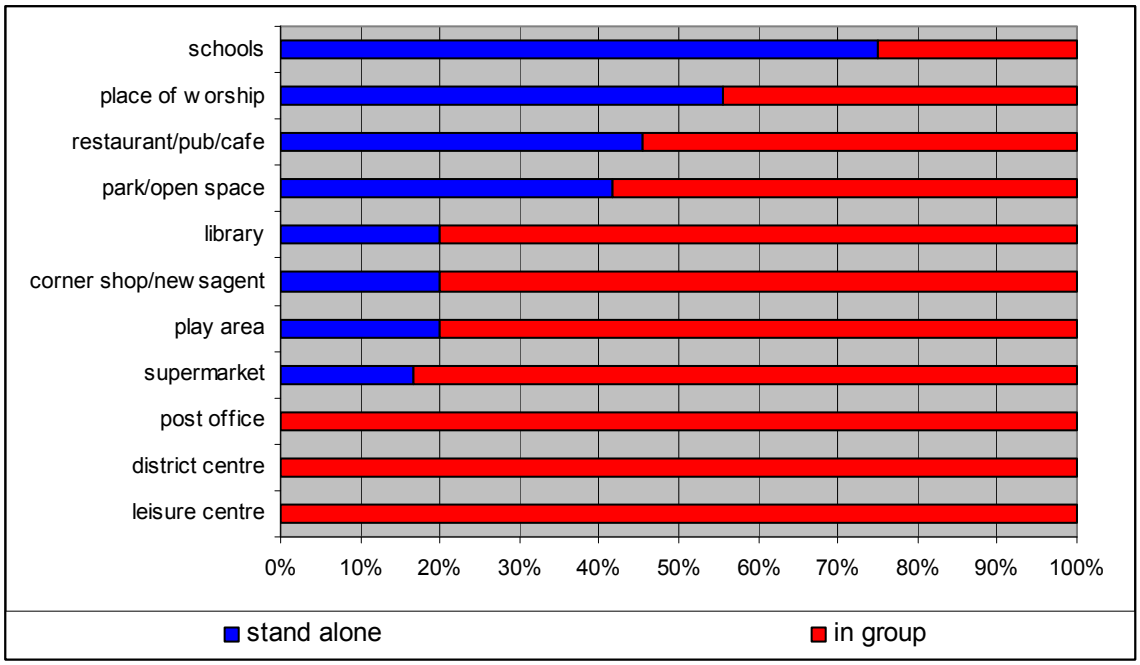

Figure 1: Facility Type by Format

Note: The relationship between the type of facility and its format is significantly correlated with a medium strength of association (Cramer's V= .515).

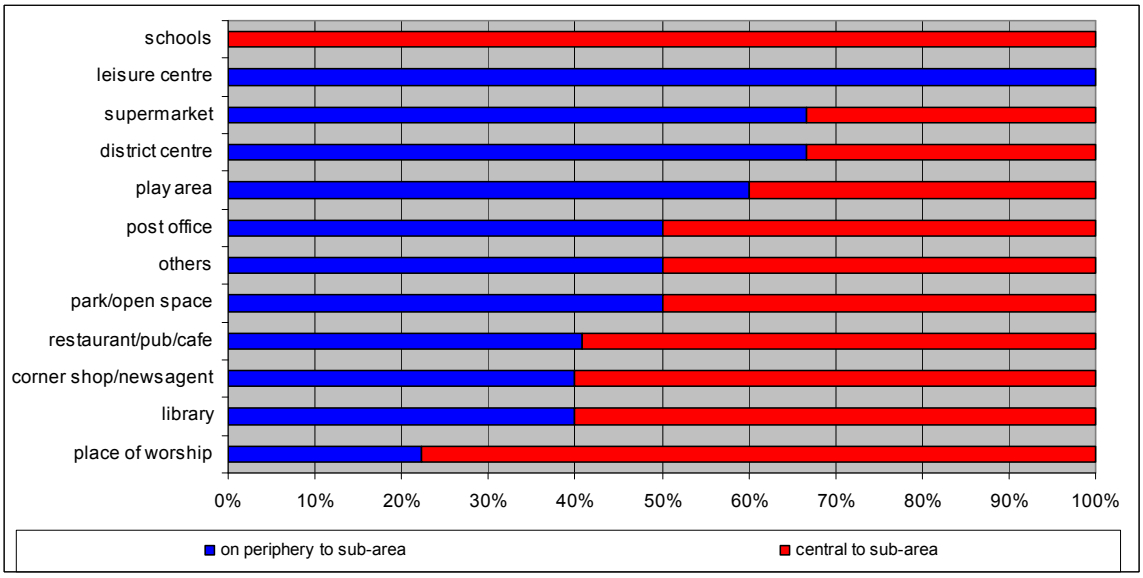

Figure 2: Location of facilities by type - Cramer's V= .459 sig

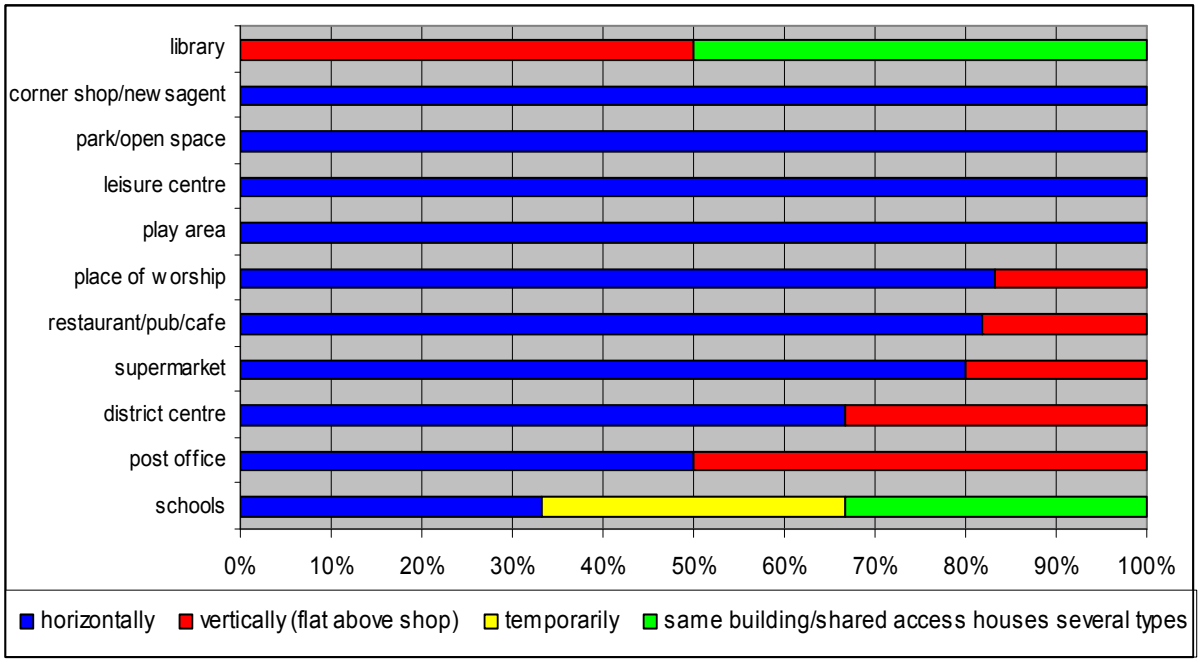

Figure 3: Mixing Types - Cramer's .574

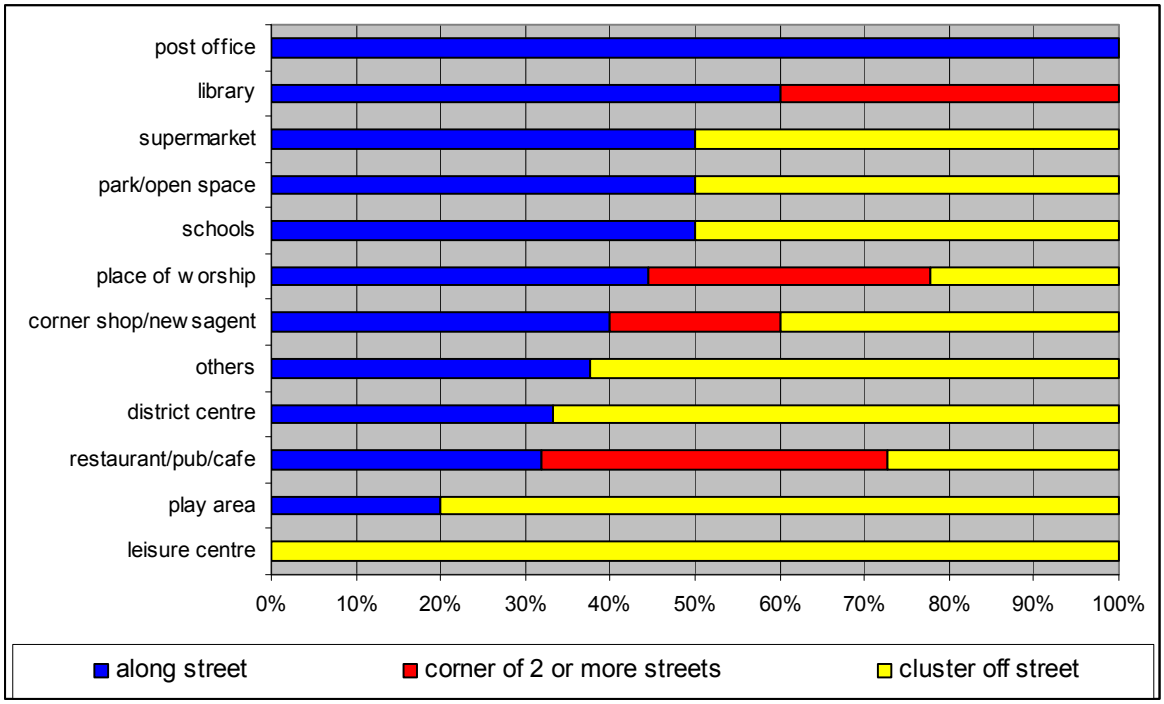

Figure 4: Urban Form by Facility Type – Cramer's V = .468

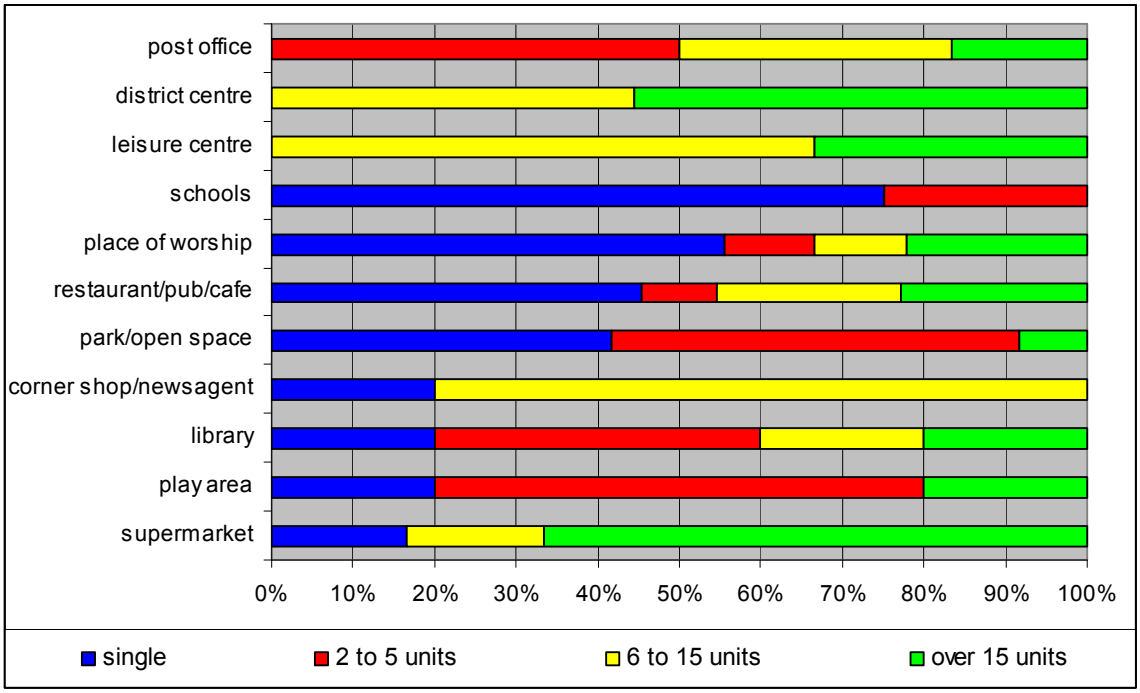

Figure 5: Facility type by number of units within a group

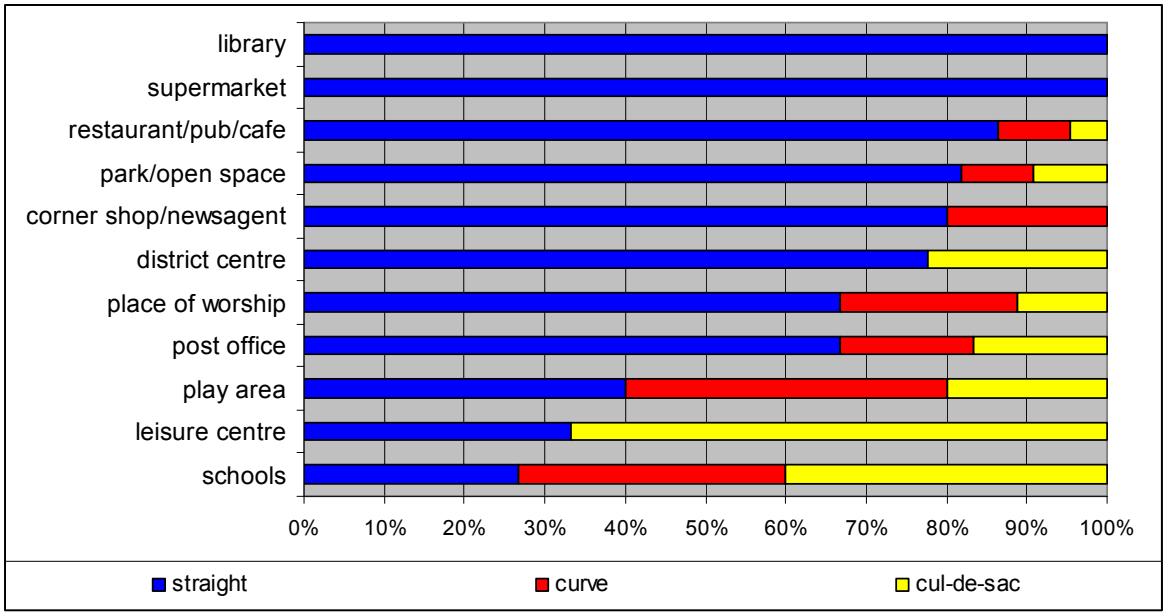

Figure 6: Street Shape Cramer's V = .418

Appendix 3

Individual Facility Type Logistic regression Tables

	B	S.E.	Wald	df	Sig.	Exp(B)
disagree			4.865	3	.182	
Agree strongly I know where council tenants live	1.368	.682	4.025	1	.045	3.927
agree	-.201	.444	.205	1	.651	.818
neither agree/nor disagree	.136	.545	.062	1	.803	1.145
Agree			6.525	3	.089	
Agree strongly I am similar to others in the area	-.108	.650	.028	1	.868	.898
neither agree/nor disagree	-.971	.426	5.208	1	.022	.379
disagree	-.913	.578	2.500	1	.114	.401
Constant	.055	.289	.036	1	.850	1.056
Model predicts 61.5% correctly						
Note R^2 = 0.08 (Cox and Snell); 0.11(Nagelkerke); Model x2 = 13; p=<0.05						

Table 1: Social mix of area and local green space

	B	S.E.	Wald	df	Sig.	Exp(B)
Agree I am similar to others in the area			2.549	2	.280	
neither agree/nor disagree	-1.560	1.071	2.120	1	.145	.210
disagree	-.854	1.094	.608	1	.435	.426
disagree			5.086	2	.079	
Agree I know where council tenants live	1.350	.636	4.502	1	.034	3.858
neither agree/nor disagree	.084	1.165	.005	1	.943	1.087
Constant	-2.484	.547	20.621	1	.000	.083
Model predicts 89.5% correctly						
Note R^2 = 0.07 (Cox and Snell); 0.14(Nagelkerke); Model x2 = 10; p=<0.05						

Table 2: Social mix of area and takeaways

	B	S.E.	Wald	df	Sig.	Exp(B)
Agree I am similar to others in the area			6.683	2	.035	
neither agree/nor disagree	-1.051	.421	6.235	1	.013	.350
disagree	-.633	.528	1.436	1	.231	.531
disagree			.576	2	.750	
Agree I know where council tenants live	.284	.381	.556	1	.456	1.329
neither agree/nor disagree	.180	.545	.109	1	.741	1.198
Constant	.023	.278	.007	1	.934	1.023
Model predicts 59.9% correctly						
Note R^2 = 0.05 (Cox and Snell); 0.07(Nagelkerke); Model x2 = 8; p=<0.05						

Table 3: Social mix of area and parks

	B	S.E.	Wald	df	Sig.	Exp(B)
Agree I am similar to others in the area			4.098	2	.129	
neither agree/nor disagree	-.692	.547	1.599	1	.206	.501
disagree	-1.818	1.061	2.934	1	.087	.162
disagree			3.979	2	.137	
Agree I know where council tenants live	.508	.443	1.316	1	.251	1.662
neither agree/nor disagree	-1.482	1.073	1.910	1	.167	.227
Constant	-1.212	.333	13.234	1	.000	.298
Model predicts 80.9% correctly						
Note R^2 = 0.07 (Cox and Snell); 0.11(Nagelkerke); Model x2 = 11; p=<0.05						

Table 4: Social mix of area and children's play areas

	B	S.E.	Wald	df	Sig.	Exp(B)
Agree I am similar to others in the area			.007	2	.997	
neither agree/nor disagree	-.044	.535	.007	1	.935	.957
disagree	-1.515	818.04	.000	1	.998	.000
disagree			2.693	2	.260	
Agree I know where council tenants live	.745	.505	2.180	1	.140	2.107
neither agree/nor disagree	-.198	.831	.056	1	.812	.821
Constant	-1.865	.403	21.441	1	.000	.155
Model predicts 85.4% correctly						
Note R^2 = 0.06 (Cox and Snell); 0.11(Nagelkerke); Model x2 = 9; p=<0.05						

Table 5: Social mix of area and local cafés/restaurants/ pubs

	B	S.E.	Wald	df	Sig.	Exp(B)
Yes family	.788	.503	2.454	1	.117	2.198
No friends	-.954	.480	3.947	1	.047	.385
No acquaintances	.824	.464	3.148	1	.076	2.280
No immediate Neighbours	.611	.615	.987	1	.321	1.843
Yes visit daily/weekly	-.248	.478	.268	1	.605	.781
Less than 20 neighbours known	-.961	.424	5.142	1	.023	.382
Constant	.817	.373	4.795	1	.029	2.264
Model predicts 69.8% correctly						
Note R^2 = 0.12 (Cox and Snell); 0.16(Nagelkerke); Model x2 = 16; p=<0.05						

Table 6: Social network and newsagent facility use

	B	S.E.	Wald	df	Sig.	Exp(B)
Agree strongly, it is easy to walk			3.196	2	.202	
Disagree it is easy to walk	-.515	1.176	.192	1	.661	.597
Agree it is easy to walk	.946	.648	2.133	1	.144	2.576
Agree strongly, there are many footpaths in this area			7.329	2	.026	
Disagree there are many footpaths in this area	-.959	.879	1.192	1	.275	.383

	B	S.E.	Wald	df	Sig.	Exp(B)
Agree there are many footpaths in this area	-1.727	.648	7.107	1	.008	.178
Constant	-.923	.317	8.465	1	.004	.397
Model predicts 78.0% correctly						
Note R^2 = 0.06 (Cox and Snell); 0.09(Nagelkerke); Model x2 = 10; p=<0.05						

Table 7: Walkability of area and bus stops

	B	S.E.	Wald	df	Sig.	Exp(B)
Agree strongly, it is easy to walk			4.927	2	.085	
Disagree it is easy to walk	-1.711	.781	4.796	1	.029	.181
Agree it is easy to walk	-.628	.484	1.685	1	.194	.533
Agree strongly, there are many footpaths in this area			3.685	2	.158	
Disagree there are many footpaths in this area	-1.364	.757	3.250	1	.071	.256
Agree there are many footpaths in this area	-.744	.492	2.290	1	.130	.475
Constant	1.276	.332	14.759	1	.000	3.583
Model predicts 64.2% correctly						
Note R^2 = 0.12 (Cox and Snell); 0.16(Nagelkerke); Model x2 = 20; p=<0.05						

Table 8: Walkability of area and local green spaces

	B	S.E.	Wald	df	Sig.	Exp(B)
Agree strongly, it is easy to walk			.856	2	.652	
Disagree it is easy to walk	.858	1.009	.723	1	.395	2.358
Agree it is easy to walk	.028	.728	.001	1	.969	1.028
Agree strongly, there are many footpaths in this area			5.705	2	.058	
Disagree there are many footpaths in this area	-1.775	1.238	2.056	1	.152	.169
Agree there are many footpaths in this area	-1.699	.739	5.286	1	.021	.183
Constant	-1.237	.344	12.920	1	.000	.290
Model predicts 88.2% correctly						
Note R^2 = 0.06 (Cox and Snell); 0.12(Nagelkerke); Model x2 = 11; p=<0.05						

Table 9: Walkability of area and supermarkets

	B	S.E.	Wald	df	Sig.	Exp(B)
Male	.761	.432	3.108	1	.078	2.141
Non white British	-.518	.834	.386	1	.534	.595
<30-44			9.506	3	.023	
45-59	-.183	.616	.088	1	.766	.833
60-74	1.244	.516	5.799	1	.016	3.469
>75	1.215	.745	2.657	1	.103	3.370
Constant	-2.161	.430	25.243	1	.000	.115
Model predicts 80.1% correctly (0% for frequent use and 100% for not frequent use) Note R2 = 0.089 (Cox & Snell), 0.142 (Nagelkerke) Model x2(1) = 14.6; p=<0.05						

Table 10: Age and use of bus stops

	B	S.E.	Wald	df	Sig.	Exp(B)
Male	.129	.372	.120	1	.729	1.138
Non white British	-.259	.617	.176	1	.675	.772
<30-44			7.608	3	.055	
45-59	.109	.424	.067	1	.796	1.116
60-74	.908	.468	3.763	1	.052	2.480
>75	2.250	1.083	4.312	1	.038	9.485
Constant	.108	.316	.116	1	.733	1.114
Model predicts 62.9% correctly (9.4% for frequent use and 94.4% for not frequent use) Note R2 = 0.073 (Cox & Snell), 0.099 (Nagelkerke) Model x2(1) = 10.7; p=<0.05						

Table 11: Age and use of newsagents

	B	S.E.	Wald	df	Sig.	Exp(B)
Male	.170	.418	.165	1	.685	1.185
Non white British	.355	.706	.253	1	.615	1.426
<30-44			23.478	3	.000	
45-59	.227	.572	.157	1	.692	1.254
60-74	2.019	.524	14.865	1	.000	7.529
>75	2.411	.732	10.861	1	.001	11.150
Constant	-1.829	.431	17.972	1	.000	.161
Model predicts 74.8% correctly (78.9% for not frequent use and 65.9% for frequent use) Note R2 = 0.178 (Cox & Snell), 0.249 (Nagelkerke) Model x2(1) = 27.1; p=<0.05						

Table 12: Age and use of post offices

	B	S.E.	Wald	df	Sig.	Exp(B)
Male	*.875*	*.468*	*3.492*	*1*	*.062*	*2.398*
Non white British	1.545	.688	5.050	1	.025	4.689
<30-44			4.227	3	.238	
45-59	.687	.616	1.244	1	.265	1.987
60-74	.951	.633	2.255	1	.133	2.588
>75	*1.667*	*.873*	*3.648*	*1*	*.056*	*5.295*
Constant	-2.780	.537	26.822	1	.000	.062
Model predicts 81.9% correctly (98.3% for not frequent use and 4% for frequent use) Note R2 = 0.088 (Cox & Snell), 0.146 (Nagelkerke) Model x2(1) = 13.2; p=<0.05						

Table 13: Ethnicity and use of place of worship

	B	S.E.	Wald	df	Sig.	Exp(B)
Male	-.048	.495	.009	1	.923	.953
Non white British	-.796	.845	.886	1	.347	.451
<30-44			16.959	2	.000	
45-59	-1.695	.594	8.134	1	.004	.184
60-74	-2.648	.777	11.624	1	.001	.071
>75	-.466	.311	2.243	1	.134	.628
Constant	-.048	.495	.009	1	.923	.953
Model predicts 81.6% correctly Note R2 = 0.14 (Cox & Snell), 0.23 (Nagelkerke) Modelx2(1) = 23.5; p=<0.05						

Table 14: Age and use of children's play areas

	B	S.E.	Wald	df	Sig.	Exp(B)
Male	-.510	.486	1.099	1	.294	.600
Non white British	-.717	.823	.759	1	.384	.488
<30-44			13.502	2	.001	
45-59	-1.092	.494	4.893	1	.027	.336
60-74	-3.362	1.047	10.309	1	.001	.035
>75	-.305	.302	1.020	1	.313	.737
Constant	-.510	.486	1.099	1	.294	.600
Model predicts 80% correctly (100% for not frequent use and 0% for frequent use) Note R2 = 0.162 (Cox & Snell), 0.257 (Nagelkerke) Model x2(1) = 27.4; p=<0.05						

Table 15: Age and use of primary schools

	B	S.E.	Wald	df	Sig.	Exp(B)
Male	.602	.563	1.143	1	.285	1.826
Non white British	-.880	1.091	.651	1	.420	.415
<30-44			9.063	2	.011	
45-59	1.191	.600	3.938	1	.047	3.291
60-74	-1.637	1.122	2.128	1	.145	.195
>75	-2.515	.525	22.945	1	.000	.081
Constant	.602	.563	1.143	1	.285	1.826
Model predicts 89.3% correctly (100% for not frequent use and 0% for frequent use) Note R2 = 0.089 (Cox & Snell), 0.180 (Nagelkerke) Model x2(1) = 13.9; p=<0.05						

Table 16: Age and use of secondary schools

	B	S.E.	Wald	df	Sig.	Exp(B)
Male	-.061	.478	.016	1	.898	.941
Non white British	-1.808	1.108	2.663	1	.103	.164
<30-44			8.158	2	.017	
45-59	-1.221	.592	4.253	1	.039	.295
60-74	-1.339	.526	6.484	1	.011	.262
>75	-.167	.337	.246	1	.620	.846
Constant	-.061	.478	.016	1	.898	.941
Model predicts 73.3% correctly (100% for not frequent use and 0% for frequent use) Note R2 = 0.96 (Cox & Snell), 0.140 (Nagelkerke) Model x2(1) = 11.76; p=<0.05						

Table 17: Age and use of leisure centres

	B	S.E.	Wald	df	Sig.	Exp(B)
Yes, children	.055	.540	.011	1	.918	1.057
full-time			12.729	4	.013	
Part & self employed	.106	.630	.028	1	.866	1.112
home/family	.239	1.190	.040	1	.841	1.270
retired	1.598	.555	8.283	1	.004	4.941
all others unemp. & sick	2.075	.761	7.438	1	.006	7.963
Constant	-2.086	.468	19.860	1	.000	.124
Model predicts 78.9% correctly (99.2% for not frequent use and 2.9% for frequent use) Note R^2 = 0.099 (Cox & Snell), 0.153 (Nagelkerke) Model $x^2(1)$ = 16.75; p=<0.05						

Table 18: Employment status and use of bus stops

	B	S.E.	Wald	df	Sig.	Exp(B)
Yes, children	.132	.408	.104	1	.747	1.141
full-time			15.152	3	.002	
Part & self employed	.803	.452	3.153	1	.076	2.231
home/family	1.593	.486	10.756	1	.001	4.917
retired	2.081	.806	6.668	1	.010	8.015
Constant	-.269	.318	.719	1	.396	.764
Model predicts 67.6% correctly (57.4% for not frequent use and 73.4% for frequent use)						
Note R2 = 0.110 (Cox & Snell), 0.151 (Nagelkerke) Model x2(1) = 17.29; p=<0.05						

Table 19: Employment status and use of newsagents

	B	S.E.	Wald	df	Sig.	Exp(B)
Yes, children	-.216	.454	.226	1	.634	.806
full-time			11.592	3	.009	
Part & self employed	.734	.511	2.066	1	.151	2.084
home/family	1.649	.496	11.036	1	.001	5.201
retired	.286	.747	.147	1	.702	1.331
Constant	-1.393	.393	12.538	1	.000	.248
Model predicts 70.6% correctly (81.3% for not frequent use and 48.9% for frequent use)						
Note R2 = 0.104 (Cox & Snell), 0.145 (Nagelkerke) Model x2(1) = 15.76; p=<0.05						

Table 20: Employment status and use of a post office

	B	S.E.	Wald	df	Sig.	Exp(B)
Yes, children	.740	.380	3.795	1	.051	2.096
full-time			4.966	3	.174	
Part & self employed	.712	.436	2.669	1	.102	2.038
home/family	.413	.433	.911	1	.340	1.511
retired	-.478	.565	.715	1	.398	.620
Constant	-.283	.302	.879	1	.348	.753
Model predicts 59.6% correctly (41.7% for not frequent use and 74.2% for frequent use)						
Note R2 = 0.057 (Cox & Snell), 0.076 (Nagelkerke) Model x2(1) = 9.413 (p=0.052); p=<0.05						

Table 21: Having children status and use of local green space

	B	S.E.	Wald	df	Sig.	Exp(B)
Yes, children	2.594	.640	16.431	1	.000	13.378
full-time			2.386	3	.496	
Part & self employed	.792	.537	2.173	1	.140	2.209
home/family	-.029	.925	.001	1	.975	.972
retired	.346	.736	.221	1	.638	1.414
Constant	-3.318	.655	25.682	1	.000	.036
Model predicts 82.2% correctly (91.4% for not frequent use and 41.4% for frequent use)						
Note R2 = 0.209 (Cox & Snell), 0.339 (Nagelkerke) Model x2(1) = 36.78; p=<0.05						

Table 22: Having children and use of children's play areas

	B	S.E.	Wald	df	Sig.	Exp(B)
full-time			.044	2	.978	
Part & self employed	.126	.596	.044	1	.833	1.134
All others	-18.534	4905.872	.000	1	.997	.000
Yes, children	3.051	1.062	8.252	1	.004	21.126
Constant	-3.931	1.029	14.604	1	.000	.020
Model predicts 89.7% correctly (100% for not frequent use and 0% for frequent use) Note R2 = 0.191 (Cox & Snell), 0.393 (Nagelkerke) Model x2(1) = 32.8; p=<0.05						

Table 23: Having children status and use of secondary schools

	B	S.E.	Wald	df	Sig.	Exp(B)
Yes, children	1.171	.563	4.323	1	.038	3.224
full-time			3.690	3	.297	
Part & self employed	-.985	.720	1.871	1	.171	.374
home/family	.436	.648	.454	1	.501	1.547
retired	.465	.702	.438	1	.508	1.591
Constant	-2.307	.503	21.028	1	.000	.100
Model predicts 85.8% correctly (100% for not frequent use and 0% for frequent use) Note R2 = 0.047 (Cox & Snell), 0.083 (Nagelkerke) Model x2(1) = 7.38; p=<0.05						

Table 24: Having children status and use of libraries

	B	S.E.	Wald	df	Sig.	Exp(B)
married with children			4.682	3	.197	
one person household	-.729	.513	2.014	1	.156	.483
married no children	.256	.576	.197	1	.657	1.292
single parent with dependant children	-1.135	.731	2.409	1	.121	.321
Class 1 & 2			3.640	4	.457	
Class 3	.336	.666	.255	1	.614	1.400
Class 4	-.092	.495	.035	1	.852	.912
Class 5	.698	.846	.681	1	.409	2.011
Class 6-10	1.542	.958	2.591	1	.107	4.672
rented	-2.178	.778	7.845	1	.005	.113
Constant	1.093	.379	8.298	1	.004	2.982

Table 25: Tenure and use of district centres

	B	S.E.	Wald	df	Sig.	Exp(B)
married with children			8.789	3	.032	
one person household	-.749	.504	2.211	1	.137	.473
married no children	.303	.564	.289	1	.591	1.354
single parent with dependant children	-2.228	.891	6.244	1	.012	.108
Class 1 & 2			2.163	4	.706	
Class 3	-.223	.603	.136	1	.712	.800
Class 4	-.313	.525	.355	1	.551	.731
Class 5	.278	.751	.137	1	.712	1.320
Class 6-10	.898	.870	1.066	1	.302	2.455
rented	-1.330	.808	2.708	1	.100	.265
Constant	.991	.385	6.623	1	.010	2.693
Model predicts 81.7% correctly (99.1% for not frequent use and 4.2% for frequent use) Note R^2 = 0.082 (Cox & Snell), 0.133 (Nagelkerke) Model $x^2(1)$ = 11.186; p=<0.05						

Table 26: Household composition, social class and tenure on use of newsagent

	B	S.E.	Wald	df	Sig.	Exp(B)
married with children			8.599	3	.035	
one person household	-1.741	1.092	2.540	1	.111	.175
married no children	.948	.546	3.019	1	.082	2.581
single parent with dependant children	1.224	.776	2.491	1	.114	3.402
Class 1 & 2			10.221	4	.037	
Class 3	1.418	.652	4.732	1	.030	4.130
Class 4	.050	.684	.005	1	.941	1.052
Class 5	-.459	1.138	.163	1	.686	.632
Class 6-10	1.754	.726	5.831	1	.016	5.777
rented	-.534	.953	.314	1	.575	.586
Constant	-1.950	.469	17.324	1	.000	.142
Model predicts 78.6% correctly (95.2% for not frequent use and 14.8% for frequent use) Note R2 = 0.162 (Cox & Snell), 0.253 (Nagelkerke) Model x2(1) = 23.1 ; p=<0.05						

Table 27: Household composition, social class and tenure on use of cafés,restaurants,pubs

	B	S.E.	Wald	df	Sig.	Exp(B)
married with children			11.109	3	.011	
one person household	-2.427	1.065	5.192	1	.023	.088
married no children	-2.467	1.059	5.427	1	.020	.085
single parent with dependant children	.434	.718	.365	1	.546	1.543
Class 1 & 2			1.170	4	.883	
Class 3	.314	.720	.190	1	.663	1.369
Class 4	.122	.614	.040	1	.842	1.130
Class 5	-.994	1.135	.767	1	.381	.370
Class 6-10	.016	.796	.000	1	.984	1.016
rented	-.025	.905	.001	1	.978	.976
Constant	-.877	.391	5.045	1	.025	.416
Model predicts 80.9% correctly (100% for not frequent use and 0% for frequent use) Note R2 = 0.141 (Cox & Snell), 0.226 (Nagelkerke) Model x2(1) = 19.8; p=<0.05						

Table 28: Household composition, social class and tenure on use of children's play areas

	B	S.E.	Wald	df	Sig.	Exp(B)
married with children			5.590	3	.133	
one person household	.488	.640	.583	1	.445	1.630
married no children	1.296	.570	5.172	1	.023	3.654
single parent with dependant children	-.183	1.145	.025	1	.873	.833
Class 1 & 2			6.037	4	.196	
Class 3	-.204	.750	.074	1	.786	.816
Class 4	-.607	.719	.712	1	.399	.545
Class 5	1.354	.718	3.559	1	.059	3.874
Class 6-10	.486	.772	.396	1	.529	1.625
rented	.302	.865	.122	1	.727	1.353
Constant	-2.038	.477	18.251	1	.000	.130
Model predicts 81.7% correctly (99.1% for not frequent use and 4.2% for frequent use)						
Note R^2 = 0.082 (Cox & Snell), 0.133 (Nagelkerke) Model $x^2(1)$ = 11.186; p=<0.05						

Table 29: Household composition, social class and tenure on use of buses

	B	S.E.	Wald	df	Sig.	Exp(B)
Class 1 & 2			5.969	4	.201	
Class 3	-.159	.578	.076	1	.783	.853
Class 4	-.328	.517	.402	1	.526	.721
Class 5	-.250	.700	.128	1	.720	.778
Class 6-10	**1.819**	**.856**	**4.521**	**1**	**.033**	**6.167**
married with children			6.312	3	.097	
one person household	-1.094	.585	3.495	1	.062	.335
married no children	.300	.488	.378	1	.539	1.350
single parent with dependant children	.826	.797	1.072	1	.300	2.283
rented	-.461	.760	.369	1	.544	.630
Constant	-.269	.359	.562	1	.454	.764
Model predicts 64.5% correctly (84.5% for not frequent use and 36% for frequent use)						
Note R2 = 0.129 (Cox & Snell), 0.173 (Nagelkerke) Model x2(1) = 16.7; p=<0.05						

Table 30: Household composition, social class and tenure on use of takeaways

	B	S.E.	Wald	df	Sig.	Exp(B)
>20 years			7.738	3	.052	
<5	1.153	.617	3.492	1	.062	3.167
5-10	1.153	.666	2.999	1	.083	3.167
11-20	1.540	.563	7.485	1	.006	4.667
Constant	-1.846	.439	17.655	1	.000	.158
Model predicts 71.4% correctly						
Note R^2 = 0.07 (Cox and Snell); 0.1(Nagelkerke); Model x2 = 8; p=<0.05						

Table 31:Length of residence and use of leisure centres

	B	S.E.	Wald	df	Sig.	Exp(B)
>20 years			10.595	3	.014	
<5	-1.266	.520	5.924	1	.015	.282
5-10	-1.473	.506	8.480	1	.004	.229
11-20	-.573	.473	1.465	1	.226	.564
Constant	1.266	.341	13.744	1	.000	3.545
Model predicts 65.3% correctly						
Note R^2 = 0.07 (Cox and Snell); 0.1(Nagelkerke); Model x2 = 11.75; p=<0.05						

Table 32:Length of residence and use of newsagents

	B	S.E.	Wald	df	Sig.	Exp(B)
>20 years			15.650	3	.001	
<5	.022	.943	.001	1	.981	1.022
5-10	2.219	.699	10.084	1	.001	9.200
11-20	1.903	.677	7.914	1	.005	6.708
Constant	-2.730	.596	20.990	1	.000	.065
Model predicts 80.5% correctly						
Note R^2 = 0.12 (Cox and Snell); 0.19(Nagelkerke); Model x2 = 21; p=<0.05						

Table 33:Length of residence and use of post offices

	B	S.E.	Wald	df	Sig.	Exp(B)
>20 years						
<5	1.457	.733	3.947	1	.047	4.293
5-10	1.792	.714	6.299	1	.012	6.000
11-20	1.477	.695	4.512	1	.034	4.381
Constant	-2.730	.596	20.990	1	.000	.065
Model predicts 81.6% correctly						
Note R^2 = 0.05 (Cox and Snell); 0.08(Nagelkerke); Model x2 = 8.75; p=<0.05						

Table 34:Length of residence and use of children's play areas

	B	S.E.	Wald	df	Sig.	Exp(B)
>20 years			15.650	3	.001	
<5	.022	.943	.001	1	.981	1.022
5-10	2.219	.699	10.084	1	.001	9.200
11-20	1.903	.677	7.914	1	.005	6.708
Constant	-2.730	.596	20.990	1	.000	.065
Model predicts 80.5% correctly						
Note R^2 = 0.12 (Cox and Snell); 0.19(Nagelkerke); Model x2 = 20; p=<0.05						

Table 35:Length of residence and use of primary schools