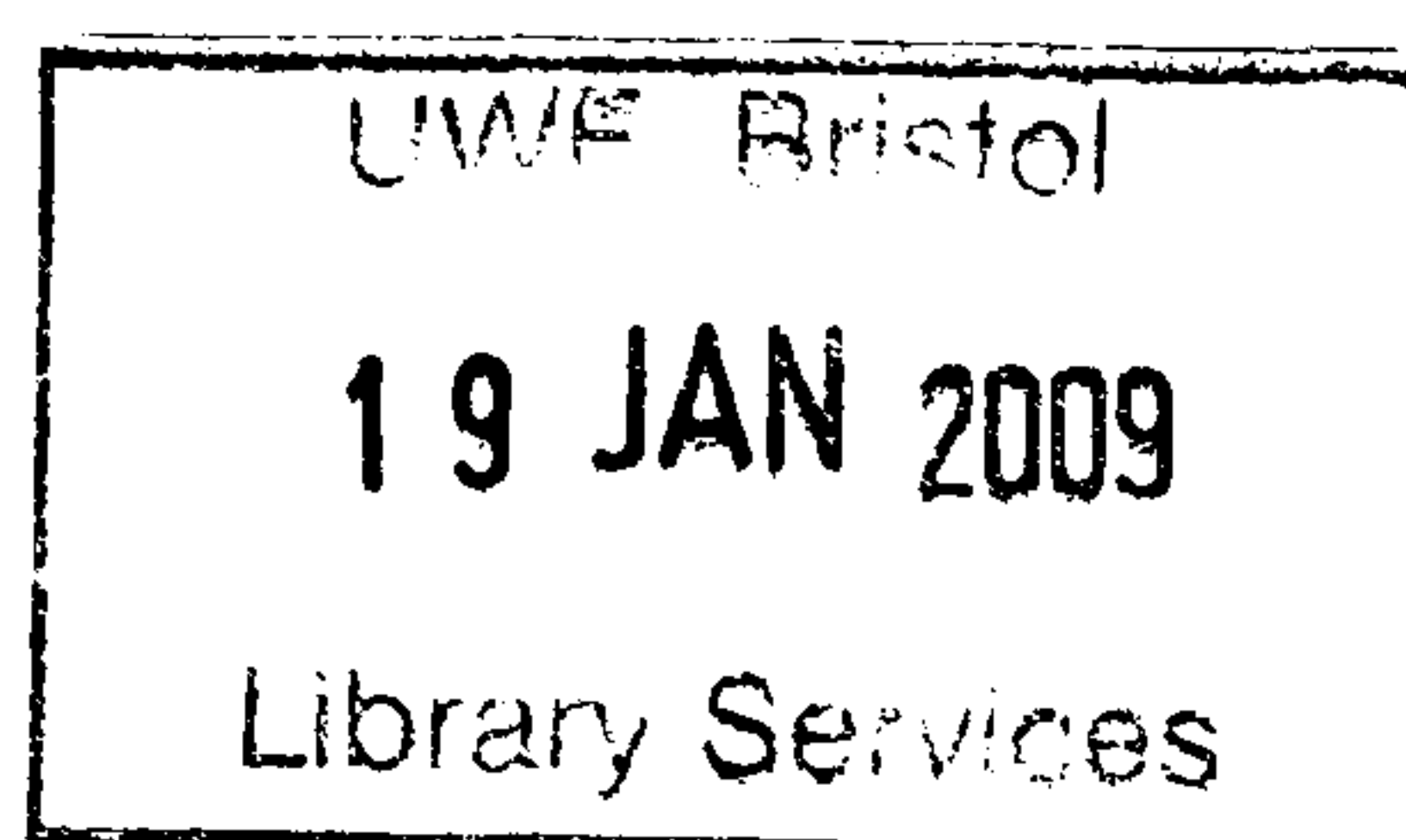


Residential Relocation and Travel Behaviour Change

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ABSTRACT

With greater policy emphasis now given to travel demand management, the need for research into understanding travel behaviour, and identifying opportunities to effect travel behaviour change has grown significantly. A key impediment to behaviour change can be the lack of conscious consideration by an individual of the travel choices they make, i.e. habit. Breaking or weakening habits by bringing consideration of travel options back into an individual's consciousness is therefore an important precursor to behaviour change, although this can be difficult to achieve through many behaviour change interventions.

A rise in the level of consciousness of behaviour can occur when an individual faces a key life event, or a change of circumstances, such as would occur with moving home. A home move is a key event of particular interest for potentially weakened travel habits, as it can drastically change the travel situation of the household. The home location to a large extent determines journey time to work, amenities, schools and the public transport options available to the household. Therefore the decision of where to live will often have long term consequences for travel behaviour, in addition to the move having the potential to affect travel habits in the short-term. It might therefore be possible for travel behaviour change interventions to 'take advantage' of weakened habits associated with a home move in order to promote more desired methods of travel.

This suggestion had however not been empirically examined prior to the start of this research. Research was therefore deemed necessary to better understand the implications of residential relocation for travel and travel habits. This was in order that should the above suggestion prove accurate, any interventions to be implemented would have a more thorough grounding in knowledge and understanding of the situation, and thus a better chance of success. This thesis therefore sets out to examine the travel implications of residential relocation.

An initial qualitative phase of exploratory in-depth interviews conducted with recent movers in the city of Bristol, England, highlights the importance of how travel is *thought about* during the search and selection processes, to how the move affects household travel. Three types of post-move changes to travel behaviour are identified; deliberate, anticipated and unexpected.

This leads to the development of the ‘Residential Relocation Timeline’ (RRT), a conceptual framework of eight stages during the moving process at which consideration of travel issues may occur.

The second part of the research (a postal survey) further examines and develops this framework. Given the diverse nature of relocation experiences at the individual level, five different ‘travel-consideration-types’ are identified. These provide a more generic interpretation of differences in the timing of travel considerations undertaken during the process of a move.

It is revealed that 12% of the moving households in the study never considered travel during the course of their move (86% did consider travel at some point), and overall 57% of respondents experienced a change to the pre-move main mode used for at least one regular household journey. 50.6% of respondents considered travel after the move had taken place (with 7.6% considering travel only at this time), and therefore are likely to have experienced ‘unexpected’ or ‘unplanned’ changes to their household travel. 49% of the sample consider travel prior to the selection of the property, and therefore are likely to have ‘anticipated’ the travel outcomes. 75.5% do report considering travel issues such as proximity to work and shops during the search for their new home (whether this consideration is planning for change, or planning for as little change as possible). Finally, for 34.2% of the survey respondents travel issues were involved in prompting the move, and therefore some change to travel is likely to have been sought.

It is concluded that the study does find evidence for travel behaviour change and travel habit weakening associated with a home move, and that therefore residential relocation appears to be an ideal time to target travel behaviour change interventions. It is suggested however that interventions are most likely to be effective if targeted to households in the process of determining their search criteria, or at least prior to final selection of the property. Many households appear to wish to reduce their travel upon moving, but are thwarted by lack of availability of suitable property and the complicated decisions involved in property search and selection. Interventions at such times if carefully designed therefore have the potential to be both effective and appreciated by recipients – a situation that is highly desirable for behaviour change campaigns.

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Chapter 1: Introduction and Chapter Overview

1.1 Overview

This thesis details research examining travel behaviour change in the context of residential relocation, or moving home. The chapter first introduces the ‘problem’ being addressed by the research before providing an overview of the chapters to follow within the thesis.

1.2 The need for travel behaviour change

Travel behaviour change is vital both in the UK and globally as levels of car use continue to rise. High levels of car use present many problems environmentally, economically and socially. In terms of pollution, *passenger* car use generates roughly 40 percent of UK Carbon monoxide emissions and 13 percent of UK Carbon dioxide emissions (DfT, 2006, Tables 3.8 and 3.9), contributing greatly to global warming. Economically increasing levels of congestion reportedly cost the UK £20 billion each year¹ (CBI, 2004), and society’s increasing reliance on the private car creates many problems for those households without access to a car, contributing strongly to social exclusion (Kenyon, Rafferty and Lyons, 2003). The urgent need to attempt to reduce car travel to protect the environment and work towards a sustainable future is therefore recognised (CEC, 1992).

Policy aims of reducing levels of car use face a number of substantial challenges. Historically the ‘predict and provide’ policies which were prevalent in the UK up to the 1990s, and which favoured road building and the private car have left the legacy of an extremely car dependent society (Goodwin 1995; 1997). Such policies have contributed to extensive urban sprawl and erosion of the public transport system to the extent that the only viable means to access many areas is by the private car. Additionally, complex modern lifestyles have developed utilising

¹ The DfT (2004a) questions this estimate, noting that the £20 billion figure is based on the value of the difference between actual travel speeds and free flow speeds, and that in practice it is not realistic to expect all traffic to flow freely at all times.

the private car to the extent that accessing a wide range of dispersed activities is the norm. Such lifestyles would be difficult to maintain without the private car as alternative modes are more limited in levels of flexibility and freedom.

In order to address these issues, policy focus in the UK has switched from ‘predict and provide’ to one of demand management. This aims towards achieving a more rational and effective use of the transport system, by changing the extent and nature of travel in terms of when, where, how and how much people travel. Travel demand management (TDM) is defined in its broadest sense by Meyer (1999, p576) as “any action or set of actions aimed at influencing people’s travel behaviour in such a way that alternative mobility options are presented and/or congestion is reduced”. It is clear that such an approach requires an extensive understanding of travel behaviour and its motivations and influences in order to be effective. In particular TDM takes place in the context of governments, certainly in the UK, adhering closely to the principle of freedom of choice, (Lyons, 2004), hence TDM tends to focus on explicitly or implicitly influencing choice, rather than restricting or dictating it. Therefore again understanding travel behaviour becomes crucial.

Travel behaviour constitutes the day to day choices of activities, destinations, journey frequencies, travel modes, time of travel and routes. These choices have been shown to be affected by numerous factors including demographics (Lu and Pas, 1999); household income (Dieleman, Dijst and Burghouwt, 2002), lifestyle choices (Salomon, 1983; Krizek and Waddell, 2003), attitudes (Gärling, Gillhom and Gärling, 1998; Kitamura et al, 1997; Nillson and Kuller, 2000), and family composition (Dieleman et al, 2002). All these factors and more contribute to the huge variations in the amount of travel undertaken by individuals and households. Much of travel behaviour is characterised by the same repeated ‘choices’ being made everyday, for example the commute to work. For many individuals the same mode is used, frequently at the same time of day and along the same route. Thus a key feature of travel behaviour is the generally limited variation in an individual’s day to day choices².

Any of the travel choices outlined in the previous paragraph may be influenced in order to reduce the negative impacts of the travel. Examples of TDM policy aims include the promotion of mode switch away from car use, encouraging the use of closer facilities.

² Despite this consensus research does suggest that daily travel can in fact vary (Kenyon and Lyons, 2003; Stradling, Meadows and Beatty, 1999; Bonsall et al, 1984), and also that many individuals in fact use a variety of travel modes (Stradling, 2003). This issue will be further discussed further in Chapter 2.

encouraging trip chaining, reducing frequency of trips or encouraging travel at less congested times of day. Methods employed to achieve these aims vary, however provision of information is a vital policy tool to raise awareness of and facilitate the use of alternative modes (Lyons, 2006). The development of the Transport-Direct website highlights the recognised importance of improved and easily accessible information.

In addition to this there is a need for persuasive messages to highlight the benefits of both alternative modes and reduced travel, in order to encourage mode switch or other behaviour change. These can be approached through a variety of mass media campaigns, or alternatively individualised marketing can provide more personalised tools facilitating change (Brög 2003; Taylor and Ampt, 2003). Additional TDM measures include improvements to public transport and walking or cycling facilities (eg implementation of cycle lanes and improvements to service frequency), cost alterations (eg road pricing and taxes), and reducing distances between destinations through land-use planning (eg compact development and mixed use development). All these policies differ in effectiveness, cost, time scale, technical feasibility, public acceptance, political feasibility and success levels. As noted by Vlek and Michon (1992), the more coercive strategies may have negative side-effects out-weighing the expected benefit; whereas the less coercive may be less effective.

The effectiveness of TDM policies is dependent on numerous criteria. Firstly it is recognised that for many households or journeys few alternative options exist, therefore limited impact can be made. Stradling (2003) notes that it is important to distinguish between car dependent people, car dependent places and car dependent journeys. Additionally Goodwin (1995) outlines four levels of car dependency ranging from severely limited journey alternatives available, to a good variety of alternative journey options available. Further to this, despite the presence of alternatives, individuals may not wish to use them due perhaps to strong preferences for car use and enjoyment of driving. Therefore not all households are *able* to easily respond to behaviour change interventions even if they would like to do so, and further households do not *wish* to change.

It is however an additional barrier to behaviour change which claims the focus of the current research. As previously mentioned, travel behaviour is frequently characterised by the same repeated 'choices' being made everyday or every week. For much of daily travel this frequent repetition of the same behaviour leads to the development of ingrained habits, which then become difficult to change due to the automatic and largely unconscious nature of the behavioural choices (Verplanken et al, 1997). In particular, evidence suggests that where a

habit is present, any new information pertaining to this habitual behaviour such as changes to timetables or to relative journey costs will be largely ignored (Verplanken et al, 1997; Aarts et al, 1997). This therefore potentially renders many standard behaviour change interventions ineffective in the presence of habits, due to their reliance on information provision and persuasion techniques. Policies that are not based solely on information provision, such as improvements to bus services, are also reliant on the transfer of information in order to publicise these improvements to those not already using the services. Habits therefore present a significant challenge to many TDM measures, challenges that must be overcome if behaviour change towards a more sustainable transport system is to be achieved.

The processes of habit formation as described above will be outlined in more detail in Chapter 2 of the thesis, and as will also be detailed in the chapter, habits must first break or be weakened in order for behaviour change to occur (Dahlstrand and Biel, 1997). This requires an increase in the level of consciousness of the habitual behaviour or a change to the situational context of the behaviour (Ouellette and Wood, 1998). More personalised approaches and individual marketing techniques often have some success. However these personalised methods are extremely resource intensive and are thus limited in the scale of their application. Research focus instead turns to the potential of certain situations where habits may already be weakened, and thus the barrier to behaviour change already removed.

Panel data examination reveals substantial amounts of travel behaviour change occurring in the population each year (Dargay and Hanly, 2003; 2004). It is therefore clear that overall travel behaviour is not as unchanging as examination of the limited variability in day to day patterns would lead us to believe. This leads to the conclusion that as travel behaviour clearly does change, it is possible for travel behaviour to be changed (Cairns et al, 2004). As will be discovered in Chapter 2, recent evidence points to the importance of key life events in influencing habitual travel behaviour. Life events including gaining or losing a driving licence, moving home, and starting a new job have been demonstrated to be associated with travel behaviour change, and in particular mode switch (van der Waerden, Timmermans, and Borgers, 2003; Klöckner, 2003). It therefore seems that habits are likely to be weakened at such times, and it is suggested that these events ‘trigger a process of reconsidering current behaviour’ (van der Waerden et al, 2003, p2). It is therefore possible that there exists the potential for greater change to occur surrounding such key events than the level currently evidenced, and that they provide a unique opportunity to target and promote travel behaviour change without the barrier to change of habits present. The greater susceptibility of people to change during such change events has previously been suggested (Jones and Sloman, 2003).

As this is a relatively new field, little is understood about precisely how such key events influence travel behaviour. The limited research into the topic to date has tended to focus on examining the impacts of a number of key events throughout the life-course, therefore detailed examination of the effects of specific key events on travel behaviour is lacking. In particular the majority of the research to date has focussed on outcomes rather than process. This focus has resulted in the absence of any understanding or guidance as to the most effective behaviour change policies to apply to such situations, or the most appropriate timing of their application relevant to specific events. It is additionally difficult to estimate the likely effectiveness of any policies applied to such occasions. Thus it is clear that numerous gaps exist in the literature and state of knowledge. These gaps require addressing before it will be possible for the most effective measures to be designed for attempting to change behaviour at these times of potentially weakened habit. It is precisely some of these gaps which the thesis aims to address.

In order to gain the level of detail required to provide guidance to interventions, examination of a single key event would be necessary. The likely impacts of a job move for example would vary significantly from the impacts of a marriage on travel. In this instance the key life event of residential relocation is selected for three key reasons. Firstly it is a relatively frequent event compared to gaining a driving licence or getting married. Roughly 10 percent of the UK population move home each year (Böheim and Taylor, 1999), and relocation typically occurs more than once to any given individual therefore providing more than one potential opportunity to target a given individual. Secondly the residential location of a household clearly affects the travel options available to that household in terms of proximity to public transport facilities and the spatial distribution of activity centres such as food shopping, work and leisure destinations relative to the home. Change in residential location is likely to create changes in many of these dimensions. Finally, a reason for moving house could be in order to reduce commute or other journey times, or to have better access to alternative means of travel. In such situations the move would have been *designed* around changing travel behaviour. Therefore the key event of residential relocation provides an interesting range of potential influences on household travel behaviour. The overall aim of the research is therefore to establish: *to what extent, and how does the process of moving home act as a prompt for an individual to review and potentially change their travel for different journey purposes?*

A brief overview of the structure of the thesis which examines this question will now be provided, before discussion of the literature review commences in the following chapter.

Chapter 2: Habits, Key Events and Residential Relocation

The second chapter of the thesis, as has already been alluded to, examines in more detail the concept of habit and how habits constitute such a substantial barrier to behaviour change. Much research into travel behaviour discusses habit but does not deal with the concept at any level of depth, an incidence which creates the perception of a straightforward and simple concept. That this is not the case will be highlighted at various points throughout the chapter. Insights are sought from the literature regarding how habitual behaviours may be overcome, with the raising in consciousness of behaviour, and a change in the situational context of the behaviour highlighted as two potential routes (Ouellette and Wood, 1998). The concept of key life events is then introduced as covering situations where both these criteria may be met, and thus potential times of weakened habit. The limited research into the influence of key events on habitual travel behaviour is discussed in detail before focus centres on the potential for travel behaviour change surrounding the particular key life event of residential relocation.

Literature relevant to the travel related effects of residential relocation is then inspected. This includes discussion of findings from panel data and additionally research examining the influence of urban form on travel behaviour. Impacts on commute distance and time, car ownership and mode choice are discussed. If successful behaviour change interventions are to be targeted to households undergoing residential relocation it is important that as much information as possible regarding the interrelationships between housing choices and travel choices at such times is obtained.

Chapter 3: Housing choice and travel choices

An outcome of the initial data collection phase of the research (to be discussed in Chapters 5 and 6) is the importance of thoughts and decisions regarding travel behaviour during the prompt, search and selection phases of the move in determining how that move affects household travel behaviour. Accordingly the literature regarding the role of travel considerations in residential choice gains a higher importance than originally anticipated, requiring a whole chapter for adequate coverage. The literature regarding residential choice is vast therefore the chapter does not attempt to cover all aspects, but instead focuses on providing a brief outline of the main theories. Firstly theories of prompts for home moves are examined, followed by search and selection processes and the chapter finally focuses on research into the factors involved in residential choice. Throughout, a focus on the role of *travel* considerations in the process is retained, in particular during discussion of the myriad influences on residential choice. A general conclusion is that the influences of travel

considerations tend to be far less important than issues associated with the house itself or the neighbourhood. Despite this, the influence of travel choices on residential location are likely to vary greatly between households, particularly between those with a desire to use public transport and those who have no such desire.

Chapter 4: Research aims and overall approach

The fourth chapter draws conclusions as to the state of knowledge regarding the influence of residential relocation on travel behaviour, and the potential for promoting further behaviour change at this time. A study which has begun to attempt behaviour change at such a juncture is introduced. The main conclusion reached within the chapter is that not enough understanding of the specific influences in the situation exists in order to most effectively design successful interventions promoting further change. It is additionally concluded that gaining such an understanding would in any case be valuable in advancing the state of knowledge of the interrelationships between housing and travel choices. These conclusions lead to discussion of the research aims and also discussion of any guidance available from the literature regarding the examination of these aims.

The eventual research route taken involves two stages of data collection, therefore for clarity the overall research approach is also introduced in Chapter 4. This includes exploration of potential research routes to examine the outlined aims, reasoning behind the eventual selection of an initial exploratory qualitative phase (which was to be followed by a survey examining a wider range of experiences), and likely challenges to be faced as highlighted by existing literature. Finally information regarding the study context, the city of Bristol, South West England is provided.

Chapter 5: Interview methodology

The design and implementation of the first stage of data collection is detailed and justified in Chapter 5. This is the completion of in-depth qualitative interviews designed to explore the travel related experiences of recently moved owner-occupier households in Bristol. In particular, difficulties encountered with participant recruitment and the solutions employed are outlined. Despite these difficulties, participants reporting a wide variety of moving experiences are recruited, and detail is provided of these 13 individuals representing 11 recently moved households in Bristol.

Chapter 6: Interview Results

The interview data was initially examined utilising data driven thematic analysis. However the majority of the initial themes identified merged to form a conceptual framework which was to prove instrumental in guiding the remainder of the research. The Residential Relocation Timeline (RRT) is a series of eight stages covering the process of moving home from prompt to after a period of living in the home. At each of these stages travel issues may or may not be considered. The development of this framework utilising participant experiences is detailed in the chapter. In addition to this, the chapter presents evidence for weakening of travel habits during the moving process and includes a limited discussion of participant understandings of the concept of habit.

Chapter 7: Survey Methodology

Based on the findings from the completed interviews, the most valuable course for the second part of the research is determined to be an examination of the RRT framework over a broader range of moving experiences than could be obtained from eleven interviews. The chapter therefore details the design and implementation of a larger scale postal survey of recent movers which was selected as the most appropriate methodology. Again some time is devoted to detailing solutions to overcoming the recruitment difficulties experienced. Also the careful considerations employed in the design of the survey instrument are detailed. Both the pilot and main survey were eventually distributed by the Land Registry, with a return of 229 useable replies to the main survey constituting a response rate of 20 percent.

Chapter 8: Survey Results 1: Travel considerations during a move

This chapter focuses on a detailed examination of consideration of travel issues during the moving process. Firstly the relative influence of travel issues in relation to housing and neighbourhood issues is examined, and the presence or absence of travel considerations throughout the moving process is discussed. The chapter then turns to examine in detail the types of consideration of travel at each of the RRT stages. Finally typologies are developed based on the reported timings of travel consideration throughout the RRT. Cluster analysis is utilised to develop five clusters, membership of which is then compared to household demographics, details of the move, and household attitudes. Based on these results initial profiles of five ‘TC-types’ (travel consideration types) of moving household are developed.

Chapter 9: Survey results 2: Travel outcomes following a move

The second chapter examining findings from the survey focuses on the travel *outcomes* of the move. Alterations in main mode used and average journey times following the moves are examined for five ‘routine’ journey purposes. Additionally alterations in overall distance travelled by the household and availability of travel options and satisfaction are also examined. These changes are all compared to variables associated with the move in order to identify any relationships present. Finally the travel outcomes of the move are linked to the typologies developed in the previous chapter to extend the five TC-type profiles to include travel outcomes of the move.

Chapter 10: Conclusions

The final chapter in the thesis assesses what has been found during the research in relation to the original study objectives as outlined in Chapter 4. Findings are related to the literature and policy implications are discussed, including a final assessment of the opportunity provided by residential relocation for travel behaviour change. This includes suggestions for interventions to best take advantage of this opportunity. Lessons learnt from the research methodologies undertaken and future research opportunities discussed. The thesis concludes that the interrelationships between housing and travel choices are very complicated, but nevertheless a residential relocation appears to be an ideal time to target travel behaviour change interventions.

Chapter 2: Habits, Key Events and Residential Relocation

2.1 Overview

This chapter examines in detail the specific barrier to travel behaviour change that is the influence of past behaviour or habit. The concept of habit is detailed, combined with guidance from the literature regarding how habitual behaviours may be changed. Two potential routes are highlighted (Ouellette and Wood, 1998), the raising in consciousness of the behaviour, or a change in the behavioural context¹. The concept of key life events is discussed as representing times where both these criteria may be met, and such events are thus introduced as times of weakened habit. The particular key life event of residential relocation is discussed as likely to be the most influential regarding habitual travel behaviours, and research examining this potential relationship is additionally examined.

2.2 Introduction

The introductory chapter has outlined how habits frequently present a particular barrier to travel behaviour change that is difficult to overcome, and that behaviour change is required in order to address increasing levels of car use and the problems this causes. In order to understand how best to address this issue, a thorough knowledge of habits, their development and processes as currently understood in the literature is important. Mode choice is frequently used as an example of habitual behaviour within the psychology literature examining habits (e.g. Bamberg and Schmidt, 2001; Bamberg, 2000; Schlich and Axhausen, 2003; Matthies, Kuhn and Klöckner, 2002; Garvill, Marell and Nordlund, 2003; Aarts and Dijksterhuis, 2000; Verplanken, Aarts and van Knippenburg, 1997; Fujii and Gärling, 2003) and the concept of habit is often referred to in travel behaviour research literature (Kenyon and Lyons, 2003; Goodwin, 1995). However within this travel literature it is rarely dealt with at any detailed

¹ It is likely that the a change in situational context would cause a raising in consciousness, however they are discussed as two separate routes by Ouellette and Wood, (1998).

level of conceptualisation. It is likely that this may be due to the complex nature of the habit concept, where extensive difficulties and complexities are revealed only with deeper examination of what at the surface level appears to be a straightforward concept. This chapter attempts to address this lack of discussion by presenting detailed information regarding the habit concept, culminating in extensive discussion of potential routes through which habitual behaviour may be overcome. The concept of key life events as times of weakened habit is introduced, with particular emphasis placed on the key life event of residential relocation.

2.3 What is a habit?

To understand the concept of habit in detail it is necessary to first examine the notion of cognitive capacity and limitations in human decision making. The human brain possesses limited capacity for processing all the information, tasks and decisions that are required of it in daily life. In order to maintain optimal function it is necessary that the cognitive effort employed to carry out many behaviours is reduced. This can be achieved through a reduction in the level of attention and conscious thought employed. Numerous cognitive processes exist to facilitate this task, three examples of which are outlined below.

2.3.1 Monitoring of actions

Simple actions that are frequently performed, such as walking or climbing stairs, require little or no effort to perform once they have been learned, and can be reduced in attention and cognitive effort to the point of becoming automatic and unconscious (Schneider and Shiffrin, 1977). Automatic behaviour is carried out without conscious thought or monitoring, ie non-deliberately in response to a cue. A fully unconscious behaviour is carried out without either attention or awareness. Climbing the stairs is generally an automatic but not unconscious behaviour; upon reaching the stairs (the cue) it is not necessary to think about how to climb, but an individual would generally be aware that they were doing so.

2.3.2 Selective attention

The brain is constantly bombarded with information in the form of visual, audio and other cues. Processing all this information would be impossible due to limited processing capacity, therefore selective attention is employed. Only certain information deemed by the brain to be relevant to the current situation is given attention and processed, the remainder being ignored. Thus it is possible to spot friends in a crowded pub for example, or listen to and join in the conversation once they have been found despite the existence of additional proximate conversations and noise.

2.3.3 Decision making heuristics

To weigh up all the pros and cons of a particular course of action (as suggested in utility maximisation theory) would require substantial effort which the brain will again try to limit. Instead, numerous cognitive ‘tricks’ or heuristics - methods used by the brain to reduce the cognitive load - are likely to be used (Tversky and Kahneman, 1974). Decisions might be based solely on one attribute of the various options, or on a subset of the relevant attributes. Alternatively minimum requirements could be set with the first option that meets these requirements being selected, even if it does not represent the optimum choice. For example, in considering options for a particular trip, an individual may select the first travel option that comes to their attention which costs less than £30 and is no longer than an hour in duration. In this way, once a *satisfactory* option has been found there is no need to consider further options as this would entail unnecessary cognitive effort.

Probably the most frequently employed method to reduce cognitive effort in decision-making is to rely on previous experience. Where the situation has been encountered before, the brain is likely to depend on memory of decisions made previously, and their outcomes, rather than revisiting and again comparing all the available options. If there is a behaviour in memory which achieved the currently required goal, and is also currently feasible, then it is likely that this behaviour would be carried out. Each time this behaviour is repeated, the more enforced it becomes, and therefore in turn even more likely to be repeated on a subsequent occasion, and with less decision-making effort associated. It is in this way that automaticity (unconscious response) and habits can develop for often repeated behaviours, such as the habitual use of the car for commute journeys.

The ‘cognitive short-cuts’ and heuristics, examples of which have been outlined above, are usually helpful aspects of the brain that are very effective at improving efficiency of functioning. They can however be fooled and work against intended behaviour as will be seen shortly (see Eiser, 1986 for more details). For further information on specific types of heuristics see Eysenck and Keane (2000), Tversky and Kahneman (1974) or Schneider and Schiffrin (1977).

2.4 Properties of habits

A habit may be defined as “a learned sequence of acts that become automatic responses to specific situations, which may be functional in obtaining certain goals or end states”. (Triandis, 1977, 1980). It is likely that a habitual behaviour (e.g. travel by car to work) was originally based on a consciously considered and positive decision (‘a good way to travel to work will be by car’), which was acted upon and found to be successful (‘I got to work on time’). This is repeated subsequently until such a point where every time the individual decides to travel to work from home (the goal is activated), the car is automatically used without any conscious decision-making taking place or consideration of alternative options. It is suggested that the main factor influencing habit strength is frequency of past behaviour (Ouellette and Wood, 1998).

The necessity of a goal distinguishes habit from other involuntary behaviours such as ticks and reflexes (Verplanken et al, 1997). For a habitual commute mode choice, the goal is likely to be ‘to get to work’. It is unlikely that the individual would spontaneously start driving without the presence of such a goal. In order for a habit to develop and strengthen, both the goal and the situational context must remain constant (Ouellette and Wood, 1998); for example, needing to travel to work, from home, and having access to a car. Specific habits relating to commute mode for example can however become generalised to any required destination (Verplanken and Aarts, 1999), nevertheless the goal of reaching a destination remains necessary. In habit development the individual would initially intentionally use the car for their commute journey, but this intention would be gradually replaced by habit. A reciprocal relationship between habit and intention is suggested (Triandis, 1977; Eagly and Chaiken, 1993). When habit is strong, intention is a weak determinant of behaviour, and vice versa. However, as previously stated, the goal remains.

An additional key component of habitual behaviour is a certain level of automaticity. Automatic behaviour is characterised by being a quick response, requiring little attention (effort), conscious thought, or intention and is also non volitional (Eysenck and Keane, 2000; Schneider and Schiffman, 1977). Debate exists as to the level of automaticity required to constitute a habit. Many argue that only complete automaticity constitutes a habit (Ronis, Yates and Kirscht, 1989). However, Ouellette and Wood (1998) disagree and argue that driving is an example of a habitual behaviour that is automatic but can also be volitional and intentional with a degree of awareness². This debate raises a number of questions that will be returned to throughout the thesis³, and particularly has implications for the measurement of habits as will be discussed shortly. It may prove useful for the application of the concept in everyday situations to interpret habit as a variable including weaker and stronger habits rather than something in a binary state (i.e. either habitual or not habitual). Stronger habits would have lower levels of consciousness and higher automaticity.

Such discourse serves as a reminder that the classification of many people's daily travel as habitual is not as straight forward as it would at first appear. Kenyon and Lyons (2003) have argued, based on qualitative evidence, that travel behaviour in relation to mode choice does exhibit automaticity. They observed that, whilst individuals may make use of a number of different modes in their daily lives, for a given journey purpose such as commuting, individuals tend to have a *primary* and *default* mode choice. The former represents the automatic, or habitual, modal choice for the majority of journeys, the latter being considered when travel by the primary mode is ruled out – for example when the traveller would be drinking alcohol and unable to drive, or if the car were being serviced.

2.5 Why are habits barriers to behaviour change?

A habitual behaviour (if arising from an originally rational decision) will remain rational unless the situation changes in a way that is not detected (Gärling and Axhausen, 2003). Habits constitute useful behavioural short-cuts from which there is frequently no need or desire to change. It is only once the habit is deemed undesirable (either by the individual or externally, eg Government), that change is sought.

² This debate will be returned to in the conclusions chapter.

³ For example, if habits are not necessarily automatic, then what distinguishes habit from routine?

Habits form in order to avoid unnecessary cognitive effort. Once a habitual behaviour is in place, consideration of alternatives to that behaviour would constitute significant ‘unnecessary’ cognitive effort. Such consideration is therefore avoided and any information regarding these alternatives is ignored through ‘selective attention’. This often results in the individual not processing and not becoming aware of any changes in the relative attractiveness of alternatives to the habitual behaviour⁴. This reduced attention to new information has been demonstrated experimentally (Gärling, Fujii and Boe, 2001; Aarts and Dijksterhuis, 2000; Verplanken et al, 1997; Aarts et al, 1997).

This aspect of habitual behaviour in particular has a severe impact on the effectiveness of behaviour change interventions. Additionally, soft measure behaviour change interventions tend to consist largely of information provision, and this is simply not processed by those individuals with strong habits. Nor are improvements to a public transportation system likely to be noted. This combined with the (relatively) automatic nature of habitual behaviours; that they are frequently difficult to change even if the individual desires and intends to do so, forms the main difficulty in overcoming habitual behaviours. As previously mentioned in Section 2.4 it is possible that a habit established in a specific situation might be generalised to other situations including similar cues (e.g. *any* journey from home). General habits are more difficult to break because the cue situations that trigger the habit occur more frequently (Verplanken and Aarts, 1999), presenting a particular problem for reducing extensive car use.

Dahlstrand and Biel (1997) suggest that a habit must first be broken (unfrozen), or severely weakened before behaviour change can take place. A variety of suggestions exist as to how this can be achieved. Prior to examination of these suggestions, it is however first necessary to discuss how such change might be demonstrated, namely, how habits might be measured.

⁴ To illustrate this point: an individual with a strong car use habit for travelling to work may not realise that the introduction of a new train service, coupled with increasing congestion, would mean that a train journey to work would actually be quicker and less stressful. In this way, habitual behaviours can become less rational if the situation changes.

implied by the term, or in particular the level of specificity intended differs between the ‘everyday’ usage of the term, and the ‘scientific’ term used within research. This presents a challenge to any research intending to examine habits, particularly qualitative, as it is important to ensure that the same thing is understood by interviewer and interviewee for any topics under discussion⁵. This issue further presents a challenge to research into habits as a whole, as the implications and outcomes of such research are generally applicable to the general public, and it must be ensured that no confusion arises from any misunderstandings of terminology in the application as well as the generation of any research.

It is therefore clear that despite recent developments, no entirely satisfactory method of measuring habits exists. This is one of the greatest difficulties with the habit concept, how to research a concept that cannot be satisfactorily measured. Any solutions to this are inextricably linked to the precise definitions of habitual behaviour employed as previously discussed in Section 2.4. It is an issue that will be raised throughout the thesis. Providing evidence for any effects upon travel habits, other than actual changes in behaviour, clearly presents a potential issue. Frequency of past behaviour remains the most effective means of predicting future behaviour and is commonly taken to equate to habit within the literature, however unsatisfactorily.

2.7 Breaking habits – changing behaviour

Ouellette and Wood (1998) suggest two routes by which habits may be unfrozen or broken. They suggest that both changes to the situational context and increasing the conscious deliberation of the behaviour might weaken or break habits. Both of these routes will now be briefly examined.

⁵ This presents a potentially more serious challenge than the use of unknown terminology in interviews, the need for clarification of which would be obvious. It may be assumed that such a ‘simple’ term as habit is fully understood to mean the same thing by all parties involved (both interviewer and interviewee might make such an assumption). Even academics from different disciplines appear to use different understandings of the term.

2.7.1 Changing the context of behaviour

Habits form where situations are constant. For habitual mode choice for a given journey purpose this requires the same start and end points, the chosen mode to remain available, and possibly the same time of day. Alteration to the context under which the habit was formed could, if a significant enough alteration (Matthies et al, 2002), potentially break habits. The situational context could include the individual's internal goals such as getting to work, or external factors such as changes to the structure of the situation, perhaps structural or financial alterations to the transport network for the case of travel habits. These changes would have to be psychologically relevant to the individual in order to have an effect (Fujii and Kitamura, 2003), i.e. changes to aspects that are perceived as relevant and important.

Studies examining the effects of context changes on travel behaviour include examination of the impacts of free bus passes (Bamberg and Schmidt, 2001; and Fujii and Kitamura, 2003); and road closures (Fujii and Gärling, 2003). In each of these examples, public transport use was found to increase and this increase was found to be sustained a month and a year respectively after the intervention. Thus there is evidence that a temporary contextual change can have long-term effects on behaviour. In these examples this may be accounted for by the experience and familiarity with public transport used gained during the trial, thereby reducing the mental effort of doing so on future occasions. Alternatively, public transport use may have positively altered previous (mis)perceptions or attitudes concerning the public transport in question.

2.7.2 Increasing the conscious deliberation of behaviour

Increasing the level of conscious deliberation of a behaviour by definition reduces the habitual nature, or at least habit strength of that behaviour (Ouellette and Wood, 1998). A technique frequently employed in behaviour change campaigns that might achieve increased conscious deliberation is the *implementation intention* (Gollwitzer, 1999). Recipients are encouraged to make a (usually written) statement of their intent to try a particular behaviour in a specific situation, therefore increasing the conscious deliberation involved. Research has shown the potential effectiveness of this technique. Bamberg, (2000) found a significant increase in the probability of trying public transport among students who had formed an implementation intention compared to those who had not. Additionally, Matthies et al (2006) utilised a free

bus pass in addition to encouraging a commitment to using public transport with small but significant results in terms of behaviour change.

A number of other methods for increasing consciousness and deliberation of behaviour have been attempted, including increasing the accountability for decisions made (Aarts et al, 1998) and forced consideration of alternative modes for planned journeys in a week (Garvil et al, 2003). Both these studies found a reduction in habitual response (car use), even after the intervention had ceased. Other methods deriving from more practically oriented work are also likely to increase the consciousness of behaviour. Individual marketing campaigns generally highlight the individual's current behaviour, before suggestions are provided of how change might be achieved (eg Brög, 2003). Such focussed attention on the individual's behaviour must increase awareness and therefore weaken habit.

It does appear that altering the context and increasing deliberation as suggested by Ouellette and Wood (1998) has success in breaking habits. However a significant issue with more widespread implementation of the outlined techniques is the cost (both financial and temporal). The interventions involved require a great degree of tailoring to the individuals being targeted and thus can be time and resource intensive exercises. It is therefore important to consider if there are ways to change habitual behaviours that could be less resource intensive. This will be the focus of the remainder of the chapter.

2.8 The role of key events

Recent research has examined the role of key life events in influencing travel behaviour (van der Waerden, Borgers and Timmermans, 2003; Klöckner, 2004; Harms, 2003; Lanzendorf, 2003). It is suggested that there are many events that occur over the course of a person's life that will 'trigger a process of reconsidering current behaviour' (van der Waerden et al, 2003, p2). Such events include getting married, having children, and gaining or losing a driving licence. Having children for example might add new required travel destinations such as nursery, and make the use of certain modes more difficult. Losing a driving license would necessitate either a reduction in travel or the use of alternative modes of travel to the car.

If a key event is defined as 'triggering a process of reconsidering' (van der Waerden et al, 2003, p2) this indicates that there are naturally occurring events that increase the

consciousness and deliberation of potentially habitual behaviours, and hence weaken and perhaps break habits (Ouellette and Wood, 1998). Many of the key events outlined also alter the situational context (such as losing a driving licence removing a travel option), and are thus affecting both of the suggested routes for breaking habitual behaviours (Ouellette and Wood, 1998). It therefore seems that there may be many naturally occurring key life situations where habits are weakened. If advantage could be taken of such situations then this suggests that the difficult task of breaking or unfreezing habits (Dahlstrand and Biel, 1997)) prior to promoting new desirable behaviours, might in fact not be necessary. The as yet limited literature to support this suggestion will now be examined.

In a qualitative study of new members of a car-sharing club Harms, (2003) found that 85 percent of respondents who had been car owners prior to joining the club reported significant changes in their personal life when being asked about their motivation to join the group. This was more frequently reported than other considerations such as lower costs and reduced environmental impact. A quantitative follow up (Harms 2003), found that routine (or habit) strength was weakest when people's behavioural context had recently changed. This was measured using the response frequency method outlined in Section 2.6. Results for information seeking among the study participants (which does not occur with the presence of strong habits) were however less clear.

Klöckner (2004) found using the same measurement technique that travel mode choice habit was significantly weaker for those individuals reporting having experienced a life event in the previous year, compared to those who had not. Additional support for habit weakening following a key event is provided by Bamberg, Rolle and Weber, (2003). In a study examining public transport use of new residents in Stuttgart, both the experimental (moved and free bus pass) and control (moved but no pass) groups demonstrated substantial travel mode change. The participants also receiving an intervention (a free bus pass) reported substantially more behaviour change than those not receiving the pass. This suggests that habits were sufficiently weakened following a home move that an intervention at this point was particularly successful, but habits were also weakened enough for behaviour to additionally change without such an intervention. Finally a key finding of the European INPHORMM project was that people are more susceptible to change at change events (Jones and Sloman, 2003).

There is therefore evidence to support the suggestion that key events such as a change in job or residential relocation can weaken travel habits. This indicates that they are indeed likely

present good opportunities for targeting behaviour change interventions as the barrier to change of habit does not require unfreezing at such points. The occurrence of key events throughout the life-course will now be examined before a closer examination of which specific key events are likely to be most influential on travel behaviour, and which are the most appropriate for potential interventions.

2.8.1 Studying key events

Key events occur throughout the lifespan, with specific events and their timing depending on the individual concerned. Klöckner (2004) gained data on both key events affecting travel mode choice and the ages at which these events were experienced. This was in order to demonstrate different types of experiences of key events through the life-course. Participants were clustered according to levels of car use throughout the life course, with three clusters of respondents produced: those starting with low car use and increasing over time, those starting with high car use and decreasing, and those constantly maintaining low car use. These increases and decreases in levels of car use as a percentage of journeys made were associated with the experience of various key events. This work is limited in terms of producing externally comparable clusters due to the small sample size, however the importance of considering how different key events can occur at different timings for various households, is illustrated. The significance in terms of impact of the key event will be different for different households.

Many key life events such as residential relocation or change in workplace are the result of long-term decisions. The importance of recognising the role of long-term decisions in influencing everyday smaller decisions (such as travel), and the paucity of research in this area has been stressed (Krizek 2003; Lanzendorf, 2003). Lanzendorf (2003) proposes the use of mobility biographies to record an individual's travel behaviour throughout the lifespan, with emphasis on three domains of influence. This is based on Salomon's (1983) life domains: lifestyle, accessibility and mobility. A mobility biography essentially constitutes collecting almost a 'life history' in terms of travel behaviour and related life variables in order to examine the influence of certain variables over time. This is clearly likely to be a useful technique in the study of key events affecting travel. It is postulated within the mobility biography framework that any larger scale, or long-term decisions in the lifestyle or accessibility domains can have long-term implications for future (habitual) travel behaviours of the mobility domain and any travel decisions made at this transitional time. For example,

the decision not to purchase a car (mobility domain) may preclude the choice of car as a mode for any trips. The choice of a residential location (accessibility domain) that is not connected to the work location by public transport prevents the use of a train or bus to travel to work. This is a particularly useful technique to highlight that there are likely to be many key events occurring throughout the course of an individual's life, and therefore many potential opportunities to take advantage of weakened habits. However these are likely to vary in terms of the appropriateness for applying interventions⁶.

2.8.2 Which key events have the most potential for influencing travel behaviour?

The effects of various life events on travel mode choice have been examined by two separate studies. Klöckner (2004) requested participants to note down up to ten life events that had influenced their mode choice over the course of their life, before they were presented with a list of 18 life events for more detailed examination. Van der Waerden and Timmermans (2003, as cited in van der Waerden et al, 2003) presented participants with a list of over 90 key events and critical incidents for participants to indicate whether the event had been experienced and whether it had generated travel mode switch. Both studies recorded similar key events as being the most influential on travel mode choice. The event most influential on the largest proportion of respondents from both studies was getting a drivers license. Getting a car, change in work or studying situation, and moving home or town were the next most significant events, but varied in order for each study.

For events such as gaining a drivers license, or getting a car the explanation for reported mode switch is clear. A decision to make a new mode available has been implemented and therefore it is likely that this new mode will be used. Such events are unlikely to be ideal for successfully targeting car use reduction interventions, although it may be beneficial to attempt to minimise the inevitable increase in car use through intervention at such times. Alternative events are likely to prove more fruitful in terms of potential influence. Alterations to home, study or job location might also alter mode availability, as well as journey distance and

⁶ A particular issue with this field of research is the necessity of collecting data retrospectively, and relying on participant recall. This limitation would be a particular issue for the subconscious behaviours of interest to the current research.

possibly the required frequency of trips in the case of work or study change. Each of these aspects would impact on both the situational context and the consciousness of behaviour, and therefore be likely to impact upon any travel habits. Each is therefore worthy of study. However, one of these key events would have an impact upon the majority of travel undertaken by a household, whereas changes to work and study locations would impact only upon the commute.

Residential relocation has a far broader potential sphere of influence than any of the other key events listed, and interventions targeted here would have a more extensive reach. Evidence for reduced habit strength following a residential relocation has been provided (Bamberg et al, 2003; Klöckner, 2004). A residential relocation can alter the spatial distribution of activity centres such as food shopping, work and leisure destinations relative to the home, and also choice set of travel options. For example, there could be changes in proximity to rail and bus stations, parking availability, or the attractiveness of walking or cycling around the area. Additionally a reason for moving house could be to reduce commute or other journey times or to have better access to alternative means of travel, in which case the move would have been designed around changing travel behaviour. Finally residential relocation is an event that the majority of the population are likely to be involved in at one point in their lives, for many people fairly frequently. Therefore any implications of any findings have the potential to be applicable to a large number of people. Thus a residential relocation is a key event that could have especially significant and interesting consequences for household travel behaviour. Accordingly it is therefore worthy of further examination in the context of promotion of travel behaviour change. In order to successfully change a situation and be aware of likely implications of that change it is necessary to first understand the situation and its influences. Therefore research into the effects of residential relocation on travel behaviour from a summary of the literature is valuable to examine.

2.9 Residential Relocation and travel behaviour

2.9.1 Evidence for travel behaviour change associated with relocation

The Bamberg study previously outlined in Section 2.8 (Bamberg, Rolle and Weber, 2003) provides substantial evidence for travel mode switch following a residential relocation. Increases in public transport use as a percentage of all journeys made were found in both the

control (no bus pass – increase from 18.9 to 24.4 percent) and experimental group (increase from 19 percent to 46.8 percent). Unfortunately the focus of this study was the effects of the bus pass, not the recent move. No non-movers were studied to allow for comparison, therefore it is difficult to assess how much of the reported mode change was related to the relocation, and how much to additional influences. However the substantial amounts of change recorded⁷ indicates a certain level of influence.

Further evidence exists for the occurrence of behaviour change surrounding a home move. In particular examination of panel data has demonstrated substantial changes to travel behaviour associated with a home move. Dargay and Hanly (2004) examine data from the British Household Panel Survey (BHPS), an annual survey of over 2500 households each year since 1991. They find much higher levels of change in commute time, commute mode and vehicle ownership reported by households that have also reported a change of address that year.

In terms of commute time it was found that roughly 30 percent of households that had moved home in a given year also increased their commute by 5 minutes or more. A similar amount reduced their commute travel time by 5 minutes or more. This can be compared to the figures of roughly 20 percent of households that had not moved home or changed job experiencing such changes in their commute time (Dargay and Hanly, 2004). Similar percentages of change are reported for commute distances of residents of an area of Switzerland (Arend and Gotardi, 1994, as cited in Scheiner, 2006). Thus two studies both demonstrate that roughly 60 percent of households who change residence experience changes to their commute distance or time. Both studies show slightly higher percentages increasing rather than decreasing their commutes. This again tallies with figures showing general increases in commute distance over time (DfT, 2005a: Table 3.2).

In terms of commute mode switch Dargay and Hanly (2004) found that 28 percent of those household's within the BHPS that had moved home had switched commute mode, compared to 14 percent of those households who hadn't moved, with a 17.6 percent change in commute mode overall in the sample. The level of change in commute mode was even higher for those households that had changed workplace – 33 percent of these reported a change in commute mode. However, a change in workplace is more likely to only affect commute journeys (notwithstanding trip chaining), whereas a change in residence will affect the majority of

⁷ It is noted that public transport in the city of Stuttgart is extremely good, which is likely to have contributed to these substantial results (Bamberg et al, 2003).

households journeys, therefore residential relocation remains of greater interest in terms of overall potential for behaviour change.

Evidence for changes to general mode use rather than merely commute is also provided, this time from Germany. The StadtLeben project, (2002, as cited in Scheiner, 2006) found that of all households moving within 3 neighbourhoods in Cologne between 1989 and 2001, only half used a certain travel mode equally as often as before the move. The most change reported was to public transport use, with a decrease overall. Additionally, the studies by Klöckner, (2004) van der Waerden et al, (2003) and Bamberg (2003) discussed previously in Section 2.8 have added to the small body of evidence demonstrating travel mode switch associated with a home move, albeit researching at a much smaller scale.

Finally in terms of vehicle ownership Dargay and Hanly (2004) also found that 12.2 percent of households that had moved home reduced their car ownership levels, while 15 percent increased their level. This is compared to a 7 percent decrease and 7 percent increase for non-movers/no employment change, and 10.6 percent decrease and 15 percent increase for employment change. Therefore over 25 percent of households who moved home also changed car ownership levels, whereas only 14 percent of non-movers did. This suggests a clear link between residential location decisions and vehicle ownership decisions.

It is therefore clear that evidence exists for associating changes in travel behaviour with residential relocation. However, the main study approach discussed so far (examination of panel data) provides little insight into the processes occurring to bring about such an association. This knowledge is necessary if intentions to influence these processes are to be most successfully achieved. However, as shall be seen, such knowledge within the literature is limited.

2.9.2 Understanding how relocation affects travel behaviour

Van der Waerden et al (2003) explore to a limited extent the specific effects of key events on different aspects of travel behaviour, including the effects of residential relocation on travel options. They find that for 30 percent of their sample the home move increased the availability of other modes, for 5 percent there was a decrease in the availability of alternatives, for 15 percent a change only in the composition of alternatives and for 50 percent no difference to before the move. The effect on attitudes towards modes was minimal. This therefore suggests

that mode switch is indeed likely to be greatly related to changes in availability of options caused by the home move, as postulated earlier. Additionally the study examines the effects of the move on the characteristics of mode alternatives, finding that costs, time and comfort of mode choices were more affected by the move than safety and reliability issues. Unfortunately this study has only a limited number of participants discussing residential relocation (32) due to the overall research design focussing on a variety of key events. However, this appears to be the only study to date attempting to understand precisely how key events and residential relocation impact on travel behaviour. Nevertheless, further research into residential location and relocation can provide further potential insights.

Research has alternatively examined the links of recent movers to their previous place of residence. Newly resident suburbanites in Germany have been found to retain strong links to the central city, as demonstrated by their trip destinations (Holz-Rau, 2000, as cited in Scheiner, 2006). The strength of this link was shown to decrease with duration of residence in suburbia. Similarly a study of trip destination choices for residents of a single neighbourhood, again in Germany found links to the previous locations of residence (Scheiner, 2000, as cited in Scheiner, 2006). Formerly East Berliners completed activities in East Berlin, whereas the formerly West Berliners completed activities in the west. However StadtLeben, (2002, as cited in Scheiner, 2006) found in a study of inner city moves that only private matters and private visits were linked to the former location. These studies suggest that recent movers are possibly likely to increase their journey distances in order to retain contact with the previous location. These findings are obviously only applicable to moves within a certain distance range, or within the same city, however this covers a substantial proportion of moves. For very short distance moves such an effect would not be measurable, and for longer distance moves retaining many activities in the old residential location is unlikely to be practical. This therefore suggests that travel changes may in part be accounted for by ties to former place of residence that will reduce in strength over time.

2.9.2.1 Residential location

Additional potential insight comes from research examining the effects of actual residential *location* on travel behaviour. This frequently constitutes examination of neighbourhood type and comparisons between central urban versus suburban locations (eg Krizek, 2003; Holz-Rau, 2000). High correlations between urban form type and style of travel behaviour have been observed for some time (e.g. Cervero and Radisch, 1996; Crane, 2000). Those living in higher density, mixed-use developments tend to use more public transport and travel less by

car in both distance and percentage of trips (Cervero and Radisch, 1996; Headicar and Curtis, 1994; Stead and Bannister, 2001; Schwanen and Mokhtarian 2005; Krizek, 2003; Steiner, 1994). This relationship was initially assumed to demonstrate the influence of urban form on travel behaviour, and therefore moves between different location types would account for many differences in travel behaviour. Krizek, (2003b) finds that households relocating to neighbourhoods with higher neighbourhood accessibility and higher regional accessibility (a traditionally designed neighbourhood to a more modern one) decrease both their total distance travelled and their number of trips per tour. Holz-Rau, (2000) finds the corresponding opposite pattern for households moving from the inner city to suburbia.

Recent research however argues that the high correlations previously recorded are in fact likely to be an artefact of residential self-selection (Krizek, 2003; Krizek and Waddell, 2003; Molin and Timmermans 2003; Kitamura et al, 1997; Bagley and Mokhtarian, 2002), where the households pre-existing travel preferences in terms of their attitudes and lifestyles, have determined their location choice. According to this theory it would be these preferences which the residential relocation has allowed to become demonstrated and that were likely to have affected the residential choice therefore accounting for changes in travel behaviour.

The body of evidence however does not suggest that residential location and urban form has no influence on travel behaviour. Schwanen and Mokhtarian (2005) compared the travel behaviour of four groups of participant: Urban residents expressing preferences for urban living; urban residents expressing preferences for suburban living; suburban residents expressing preferences for suburban living; and suburban residents expressing preferences for urban living. It was found that mismatched urban residents (those with a preference for suburban living) had travel behaviour similar to that of the suburban residents. However mismatched suburban residents (those with a preference for urban living) did not have travel similar to urban residents. The suburban environment does not allow for an urban style of travelling (shorter distances, fewer journeys completed by car). Therefore travel preferences were influencing the behaviour of the mismatched urban residents, but for the mismatched suburban residents the residential environment (fewer public transport options and greater dispersion of amenities) precluded the completion of preferred behaviour.

The relative roles of both urban form and residential selection on travel behaviour are hotly debated and require disentangling (Krizek, 2003). The relationship is likely to be a complex one (Krizek, 2003; Crane, 2000). The extensive debate regarding the relative roles of both urban form and residential selection on travel behaviour has most implications for land-use

policies such as compact city developments that were introduced based on the assumption that such developments could change travel behaviour. However regardless of whether such policies can promote behaviour change, these policies are nevertheless extremely beneficial in their provision of increased opportunity for those households who would prefer to live in higher accessibility areas with reduced need for travel.

2.9.3 Summary and conclusions of section

Clear evidence for an association of travel behaviour change with residential relocation has been provided in the form of changes to commute times, vehicle ownership, and modes used surrounding residential relocation. However the process of how these travel aspects are affected by a home move is less clear. Alterations between neighbourhood types (eg compact city centre to suburban) are likely to affect all three travel choices, largely due to alterations to mode availability and distances between amenities. However such changes cannot account for all travel behaviour change according to the results of van der Waerden et al, (2003). Journey distance increases may also be partially accounted for by ties to former place of residence.

The literature outlined above appears to be the extent of evidence and insight available within published literature to date on the influence of moving home on travel behaviour. Thus available knowledge of the topic is limited. Indeed a number of authors acknowledge the paucity of research and understanding in this field (Krizek, 2003; Lanzendorf, 2003; van der Waerden et al, 2003). The literature as discussed is therefore unlikely to provide sufficient guidance to the design of any behaviour change strategies. However, there is a further aspect which has not been thoroughly explored in the chapter. It is likely that there are many interrelationships between housing and travel choices, and the current chapter has only examined one side of the relationship, the influence of location and relocation on travel behaviour. In order to gain a full understanding of the situation it is also likely to be valuable to gain information regarding the effects of travel choices on residential choice, as this equally has the potential to affect post move household travel behaviour⁸. The potential effects of such relationships have been hinted at by the research demonstrating the role of residential

⁸ The specific importance of additionally examining this relationship in detail was particularly highlighted by the results of the first stage of data collection, a series of exploratory, in-depth interviews.

preferences as opposed to urban form on travel behaviour. This information is potentially equally as important and will therefore be examined in the following chapter.

2.10 Summary and conclusions

This chapter has discussed theory behind why habits present such a significant barrier to behaviour change in some detail, to highlight some of the many complexities associated with the habit concept. Current methods for weakening habits in order to promote behaviour change have been highlighted as highly resource intensive in nature. Therefore the potential of an alternative suggestion of focussing interventions to key life situations where habits are already weakened has been examined. Empirical evidence for the effect of key events on travel mode choice in particular has been highlighted, with the possibility that this may be extended to effects on travel behaviour in general. A number of key events have been discussed, with the conclusion reached that residential relocation (or moving home) presents the most promising ‘window of opportunity’ to affect travel behaviour.

Given this conclusion it is therefore necessary to gain as much information as possible regarding the effects of moving home on travel behaviour. It is necessary that factors influencing a situation are as fully understood as possible before attempts are made to change that situation. The chapter has attempted this by examining the literature relating to the effects of moving home on travel behaviour. However, despite the evidence for an association between travel behaviour change and moving home, only limited guidance as to likely processes involved is available. This is however only one side of the relationship and examination of the alternative side, the influence of travel choices on housing choice may be equally important. Therefore the following chapter examines this literature with the intention of providing further understanding of the interrelationships between housing and travel choices and therefore guidance as to the most effective design of potential intervention strategies.

Chapter 3: Housing Choice and Travel Choices

3.1 Overview

This chapter examines the influence of travel choices and considerations on residential choice in order to further the understanding of how residential relocation may affect travel behaviour. The role of travel issues during the prompt for a move, the search and the final property selection are examined. The chapter finds that travel considerations can be involved in all these stages of a move, but particularly during property selection these influences are generally found to be far less influential than considerations associated with the house and neighbourhood. Despite this the influence of travel choices on residential location are likely to vary greatly between the specific travel criteria under examination, and to vary between households. In particular differences are likely to be observed between those households with a desire to use public transport and those who have no such desire. The chapter concludes that much of the research focuses on outcomes and relative influence of various factors rather than any understanding of the *process* of how these factors are involved in residential choice.

3.2 Introduction

In the previous chapter the potential influence of key events such as moving home in both changing the situational context of any habitual behaviour and also raising the consciousness of behaviour was established. The ‘window of opportunity’ of weakened habits for influencing potentially habitual travel behaviours provided by a home move has been highlighted, and research examining the current impacts of residential relocation on travel behaviour explored. It is however additionally deemed important to gain an understanding of the other side to this relationship prior to any attempts at taking advantage of this window of opportunity. Accordingly the current chapter attempts to address this query by examining relevant literature focussing on residential relocation and the impacts of travel choices on residential relocation and residential choice. A thorough review of the literature on residential relocation is not intended as the literature is too vast and useful reviews have already been completed (see Dieleman, 2001; Mulder, 1996; Boyle, Halfacree and Robinson, 1998). The

chapter does however intend to give a brief overview of the main theories that have some applicability to the influence of travel choices on moving home decisions.

It is necessary to note that this body of literature frequently refers to the influence of accessibility criteria on moving home decisions, rather than the influence of travel criteria (eg Molin and Timmermans, 2003). The two are clearly heavily related, and in many instances are likely to have been used interchangeably in the context of residential choice. However it is necessary for attention to be drawn to a few differences in their correct usage. Accessibility is concerned with means of accessing services and destinations such as shops and employment, where the service rather than means of obtaining it is of key concern. Travel issues would include such concerns but also specifically relates to more detail regarding mode preferences and viable distances. For example, off-street parking considerations for a potential new home is clearly a travel issue, but not necessarily an accessibility related one in the context of residential choice, as the absence of an off-street parking space is unlikely to greatly hinder the access of any services.

Before starting the discussion a quotation is presented which neatly illustrates the challenges faced in attempts to discern the sections of the literature on residential relocation that were relevant to the study. It refers to the wide number of disciplines with an interest in studying residential mobility, including geographers, economists, psychologists, planners, sociologists and more. “The division of labour in the study of housing choice, efficient as it may be, obviously has some drawbacks. In a field so large and covering so many sub-fields, people could easily lose track of each others specialisations. They might even fail to understand each other’s work they express themselves so differently that it seems as if they are speaking in different languages. This renders it difficult for researchers from different traditions to judge the value of each others work and place it in perspective,” Mulder (1996, p210).

3.3 Residential Mobility

The process of residential relocation is frequently separated into a series of stages (Brown and Moore, 1970; Clark, 1986; Speare, Goldstein and Frey, 1975). The number of stages included varies between studies, but generally ranges from one stage focussing on the eventual residential selection (e.g. Davies and Pickles, 1991; Clark, Deurloo and Dieleman, 1994), to three or more where the process is separated into the decision to move, the search and selection process and a final decision of whether or not to move (e.g. Hooimeijer and Oskamp,

1996). Travel related choices may have influence during any of these stages and therefore the chapter includes discussion of all three. Despite recognising that the decision to move, search for and choose an alternative dwelling should be considered integral parts of a single process rather than separate stages (Dieleman, 2001), the stages nevertheless provide a useful and logical structure for discussion. This begins with the initial decision to move, or prompt for the move.

3.3.1 The decision to move home

Many reasons exist as to why a household could wish to move home, some of which will be travel related. The concept of place utility was developed by Wolpert (1965) as a measure of how suited the current residence and its location are to the needs of the household. Where place utility is low and the needs and desires of the household are poorly matched to the accommodation, residential stress (Brown and Moore, 1970), or low residential satisfaction (Speare, 1974; Landale and Guest, 1985) is likely to occur. Residential stress may be caused by factors internal to the household, such as changes in space requirements, income level, or job location. Alternatively factors external to the household can cause stress, such as deterioration of the quality of the neighbourhood or alterations in the cost of travel.

Three levels of urgency of move are identified (Clark and Onaka, 1983; Goetgeluk and Hooimeijer, 2002). The level of urgency affects the processes of both search and selection of a property due to its impact on the amount of time available. Forced moves occur where a household has no choice but to move and must find a replacement property immediately. Examples include exceptional circumstances such as a fire or repossession, or where renters are evicted. Secondly there are Induced moves, where a home move is necessary to accommodate other household decisions and choices, such as accepting a job in a distant location, getting married, or needing space for a new child. Such induced moves could also be considered relatively urgent in nature and are frequently driven by employment or lifecycle (Clark and Onaka, 1983); two ‘triggers’ for a move which will be examined in more detail shortly. Finally there are adjustment moves.

This is the least urgent type of move, where the concept of residential stress is most useful as the search trigger may be less obvious. A move is desirable to improve the housing situation, such as moving to a neighbourhood with high(er) social status, or to a larger property etc. These adjustment moves have been found in a review of 18 studies to constitute a much larger

proportion of moves than induced (or forced) moves (Clark and Onaka, 1983). This conforms with the finding that housing related criteria are generally found to make up the greatest proportion of reason for moves (Clark and Onaka, 1983; van der Vlist, Gorter, Nijkamp, Rietveld, 2002).

In a study of Dutch households van der Vlist et al (2002) found housing related causes to be the most important reason for the last move of 50 percent of the sample. Household and family reasons constituted 38 percent, with labour and occupation 8 percent, and finally commuting reasons prompting 5 percent of the sample. Home moves reportedly due to housing related reasons are unlikely to involve travel reasons so will not be examined any further in the chapter, however moves due to labour and occupation, and commuting reasons clearly are related to travel. Additionally moves related to household and family reasons are associated with stage in the life-course, which can equally be influential in terms of travel behaviour. Examination of both job moves and life-course events constitute a sizeable proportion of research into the topic and will now be examined in more detail.

3.3.1.1 Job move and proximity to workplace

Excepting retired households, full-time teleworkers and homeworkers, it is necessary that the home is a commutable distance from the workplace (what constitutes a commutable distance is defined according to the individual and their circumstances). Changing jobs over a long distance can naturally necessitate a residential move (Clark and Dieleman, 1996, as cited in Dieleman 2001). Job moves are therefore frequently associated with triggering longer distance moves (Clark and van Lierop, 1986; Phe and Wakely 2000; Waddell, 2000; Dieleman, 2001).

However with jobs moves over a medium distance the household must decide whether to accept a long commute, or to relocate (van Ommeren, Rietveld and Nijkamp, 1999; van Ommeren, van der Vlist and Nijkamp, 2006). The Government's 2004 White Paper on Transport states that 'more people remain in the same place even if they change jobs rather than move nearer where they work', (DfT, 2004b, p21). This highlights that many factors in addition to commute considerations are likely to be involved. A long commute may initially be accepted for a variety of reasons including family ties and attachment to home. However there is evidence to suggest that those households living farther away from the workplace have an increased likelihood of moving (Clark, Huang and Withers, 2003; van Ommeren 1996; van Ommeren et al, 1999), and an increased likelihood of reducing commute distance and time upon moving (Clark et al, 2003; Dargay and Hanly, 2003). Therefore the stress of a

long commute may initially be accepted by some households, but is likely to build up to unacceptable levels over time. High commute distance has equally been found to increase job mobility rates as well as house mobility (van der Vlist et al, 2002; van Ommeren, 1996).

Further research suggests that job moves do not have to occur over a long distance in order to trigger residential relocation. Clark and Davies Withers (1999) produced evidence from the United States demonstrating that households that had changed jobs within the local housing market region were 2.4 times more likely to move home than a household that had not changed job. An explanation to account for this includes increased choice due to increased income and a desire to minimise commute time. Job related reasons account for 11 percent of the main reasons for moving according to the Survey of English Housing (DCLG, 2006a, Table S227), and are clearly therefore an important trigger for residential relocation, regardless of distance.

3.3.1.2 Life-course

The concept of a household's changing needs due to progression throughout the lifecycle is well established and understood (Rossi, 1955; Clark and Onaka, 1983; Speare et al, 1975; Mulder and Wagner, 1993). The concept has been extended to take account of the huge variety of lifestyles and choices that can be made, thus a life-course rather than life-cycle is more appropriate (Boyle, Halfacree and Robinson, 1998). According to a review by Mulder, (1996); "events in different life course trajectories cause different types of moves in terms of distance, direction and destination." Those households wanting to settle and have children early will most likely have a very different property selection and 'house course' than a very career orientated single person. They are equally likely to have very different travel patterns.

The majority of needs arising from changes within the household (life-course) bring about moves mainly within the daily activity space and are therefore short distance moves. 20 percent of moves are under 1 mile (DCLG, 2006b¹). Such moves of themselves are likely to have little impact on household travel given the short distances involved, however travel requirements and needs are equally likely to change with life-course stages. Life-course triggers for a home move might include moving out of home for university, moving in with a partner, marriage, space requirements for new children, empty-nest, downsizing and finally

¹ Source: DCLG Survey of Housing in England, 2005/05, Table S230.

retirement, divorce and separation (Boyle et al, 1998; Mulder, 1996). Many of these events would also affect travel, with the birth of children potentially increasing proportion of journeys completed by car, or retirement removing the requirement of a daily commute. These factors would again in turn be likely to influence the housing location choice (as will be discussed shortly). The interrelationships between such factors frequently make it difficult to discern the relative involvement of each (Lanzendorf, 2003).

3.3.1.3 Factors influencing likelihood of moving

In addition to triggers for a move, research has also demonstrated a number of trends in mobility data that constitute valuable knowledge regarding the likely moving population. It is commonly found that renters move home far more frequently than home-owners (Clark and Davies Withers, 1999; Böheim and Taylor, 1999; Dieleman and Mulder, 2002; Courgeau, 1985), as do younger households (Clark and Davies Withers, 1999). Additionally households in larger properties and households with a detached home have been shown to move less frequently, presumably due to higher existing levels of residential satisfaction (Kim, Pagliara and Preston, 2005). Dual-earner households are also more closely bound to the place of residence than a single income household (Clark and Davies Withers, 1999; Waddell, 1996), which can be accounted for due to the increased difficulties in finding properties with ideal commutes for two workplaces, and therefore reduced incentive to move. It has also been shown that households headed by males are less likely to move (Kim et al, 2005). Finally dissatisfaction with the current house due to lower accessibility and the poor level of neighbourhood amenities has been shown to motivate residential mobility, (Kim et al, 2005).

3.3.2 Summary of the decision to search

It is clear that the decision to search for a new property can be influenced by travel concerns. Particular triggers for residential search include a job move (regardless of distance) and numerous additional life course events such as planning for children. Additionally households may move due to the build up of stress and dissatisfaction of the difference between the housing situation and that which could be achieved. The demonstration of the involvement of travel related prompts for a move is an important acknowledgement, as if these factors are prompting a move then it is likely that their involvement will be maintained in later move decision making. Moving households are more likely to be younger households and undergoing changes in the life-course. It is important to remember that such life-course

changes could also independently of the move affect travel choices, for example having children requiring increased levels of car use.

An important addition to this discussion is to note that a household may be prompted to consider moving home, but then not do so for a variety of reasons. Adjustments could be made with the current home or to the household's needs therefore removing the need to move (Brown and Moore, 1970). Alternatively financial constraints or lack of availability of appropriate housing may prevent a move. Böheim and Taylor, (1999) find that of the 44 percent of households in the 1990s BHPS who indicated a desire to move home each year, only 10 percent had done so by the following wave. The perceived benefits of the move have to outweigh the considerable cost (in time, energy and money) of search and moving in order for a move to take place. The chapter now moves to examine the next steps taken by a household that maintains their intention to move home. Firstly theory of the processes of search and selection is briefly overviewed before research examining the factors influencing residential choice is discussed. Specific emphasis on travel related factors remains.

3.4 Search and Selection processes

3.4.1 Search

The process of residential search is far less researched than the decision to move or factors influencing residential location selection. It is however important to briefly consider as the search process and level of awareness and knowledge will determine the information available upon which a choice will be made (Brown and Moore, 1970). At any given time in any given location a number of properties will be available for sale and rent. The number and type of these properties depends on the local housing market of the area in question (Dieleman, 2001), and clearly varies over time as new properties become available and others are sold. Information gathering about residential opportunities is extremely different to any other commodity search due to the intervening role of estate agents. Despite alternative means of gaining information about property availability, such as 'for sale' signs, newspaper adverts, internet searches etc; to gain access to these properties it is generally necessary to go through estate agents. The exception to this has been the development of internet self-sale sites (eg. www.mypropertyforsale.co.uk), however these have yet to take-off in any significant way.

Palm and Danis (2002) found that the internet appears to have had very little impact on the search processes recorded in the 1970s except that those who search using the internet visit a larger number of properties in person than those who do not use the internet. This limited impact may change with the development of software and websites specifically designed to aid location decision making. For example, the German ‘Mobiplan’ which provides information on the personal, social and environmental effects of long range decisions (Kreitz et al, 2002). Improved location information provided by tools such as this creates the potential for influencing household locational choices (Beckmann, 2003, as cited in Scheiner, 2006). It seems that no such tool is yet available in the UK; however websites such as TransportDirect provide detailed journey information between two postcodes, therefore the majority of the information necessary to set up such a system is clearly available. Despite this the actual influence of these sites on the residential search process is not yet known.

The search process is likely to be different for households that are familiar with the areas they are searching compared to those that aren’t. Households with a certain degree of familiarity with the area need only focus on the properties themselves as information regarding facilities, travel options etc will largely already be known. Many moves are over very short distances (20 percent in the Survey of English Housing, (DCLG, 2006a, Table S230) are under 1 mile), as previously mentioned. These moves are less likely to have been prompted by travel related issues due to the short distance, excepting of course where walking is the preferred mode. Households with low levels of familiarity would likely need to focus on finding information about particular neighbourhoods in addition to individual properties.

3.4.2 Selection

The search process is intrinsically linked to the process of selection, as search can only end once a selection has been made (even if that selection is to remain in the current home). The household must make a decision from the *choice set* of the available properties within budget that the household is aware of, of which home to select or to remain where they are. This process is far from straightforward and the key challenges will briefly be outlined in this section. These include the sheer number of attributes potentially involved in property selection, the all too frequent necessity of compromise and constrained choice, and that decision making generally involves a household rather than an individual decision maker.

Each potential new home is made up of numerous individual attributes from the size of the garden to the availability of a dining room. Hunt, McMillan and Abraham, (1994) provide a list of 52 factors found by various studies to influence residential location choice including: number of rooms, proximity to shops, size of garden, style of property, and parking. Therefore choosing between so many is not a simple task and a decision based on utility maximisation would be too complex with the involvement of so many factors. Decisions are therefore likely to be satisficing, based on a number of possible decision heuristics such as focussing on only a limited number of important attributes (choice simplification), or calculating additive attractiveness (c.f. Montgomery 1993; Gärling and Friman, 2002).

Within the research property attributes are frequently grouped into the three main categories outlined below (Hunt et al, 1994; Clark and Onaka, 1983). This separation facilitates both research and modelling but is also likely to facilitate actual decision making for some households as way of simplifying choice:

- Housing attributes: e.g. number of rooms, size of rooms, garden, garage, off-street parking, quality of décor.
- Neighbourhood attributes: e.g. noise levels, lively, crime, social ties, feel, density.
- Accessibility attributes: e.g. proximity to work, shops, schools other amenities, city centre, motorways, train stations, bus routes, and cycle routes.

The current focus on travel behaviour clearly suggests that ‘accessibility’ related attributes are likely to be of most interest to the research. However it is not that clear cut as ‘accessibility’ differs slightly from ‘travel’, as explained in the chapter introduction. A fourth category of *household* attributes such as number of members, age of members, lifestyle choices is often included as an additional explanatory variable in much of the research (Hunt et al 1994). These distinctions facilitate examination of the numerous influences on property selection.

A substantial amount of literature examines the relative importance of various attributes on housing choice, enough to constitute an almost separate research field. The amount of literature is possibly at the cost of detailed examination of the influence of these attributes on residential choice as a process. The following section will examine in detail some of this

literature as it relates to travel and accessibility criteria, however prior to this it is beneficial to highlight two further factors complicating the process of residential selection.

3.4.2.2 Household rather than individual decision making

The house selection task is further complicated by the fact that a residential relocation affects all household members and it is therefore frequently not just one individual making decisions (Seavers, 1999; Molin, Oppewal and Timmermans, 1999). Seavers (1999) argues that all decision makers should be accounted for, rather than as has been the trend, focus only on the head of the household who is assumed to act on behalf of all members. Different members are likely to have different travel requirements, particularly in two worker households. Jones (1979) argues that much household decision making, particularly that related to travel behaviour, is made at the household level. However despite these findings, research has shown that outcomes and priorities do not seem to change if all decision makers are taken into account (Molin et al, 1999).

3.4.2.3 Constrained choice and compromise

The final complicating dimension to property selection is one with substantial impacts, particularly in the current UK situation of high housing demand and high property prices. Rarely is a property available that meets all the requirements of the household. Both physical availability and budget limitations lead the majority of housing selections to be constrained choices requiring trade-offs and compromises. Commonly the ‘right house’ is not in the ‘right location’ or might, for example, have everything desired apart from parking availability. Decisions regarding priorities must be made, a point that will be frequently raised in the following section. It has been found that a willingness to substitute the most preferred dwelling for a less preferred alternative is partly determined by the urgency of the move (Goetgeluk and Hooimeijer, 2002). Those households moving for (relatively) urgent reasons, as discussed previously in Section 3.3.1 under prompts for the move, such as a job move, or divorce for example, would be much more likely to accept a less desirable property than those moving for reasons related to the property itself. Households moving for house related reasons can take the time to wait for the correct property to become available. Interestingly those households accepting initially less-preferred properties have been shown to become quite satisfied with their choice over time, (Gärling and Friman, 2002). This can partly be attributed to adaptation and adjustment. “Understanding relocation behaviour therefore requires insight into the way people trade off their housing preferences when they are faced with a lack of

accessible opportunities” (Goetgeluk and Hooimeijer, 2002, p3). The chapter having summarised research relating to both the decision to search, and the search and selection processes; the following section attempts to examine precisely this: the role of travel factors in influencing residential choice.

3.5 Researching residential choice and factors influencing it

As introduced in the previous section, any property choice is made up of a vast number of attributes which may or may not affect a particular household’s selection process. A substantial body of research examining the relative influence of various attributes on residential choice has developed, including examination of travel and accessibility related attributes. The chapter has so far examined the role of transport considerations in *prompting* a home move. The influence of accessibility or travel criteria in the selection of a property has been much more extensively examined in the literature, however with less clear outcomes obtained as shall shortly be seen.

As discussed in the chapter introduction, numerous research disciplines tackle this topic resulting in a variety of differing approaches. This presents a significant challenge for any newcomer to the field to easily gain a clear understanding of the state of knowledge (Mulder, 1996). Different approaches include examination at various scales (global market to individual property level), varying foci (from the housing market to more sociological approaches), varying data collection techniques (revealed and stated preferences, aggregate versus disaggregate levels), and the employment of a variety of modelling techniques. The majority of these approaches tend to focus on establishing the relative importance of various factors in residential choice, rather than an understanding of processes involved. It is possible that processes differ depending on the attributes concerned. Nevertheless findings are valuable to examine as many of these different approaches have some relevance to travel considerations, although some more so than others.

Discussion in the chapter so far has focussed mainly on individual (or individual household) level decision making as being the most applicable when considering both housing and travel choices and the ultimate potential for behaviour change. This remains largely the case for the following discussion on residential choice and factors influencing it. However aggregate level research also provides information relevant to the role of travel impacts on housing choice. Prior to examining findings regarding detail of the influence of specific travel criteria on

residential choice, such as accessibility to work and access to public transport; it is first valuable to examine some of the research in the context of methodology employed, as the different approaches result in very different types of data and associated issues. Following discussion of methodologies and findings of the varying approaches to studying residential choice, the section will draw together conclusions as to the state of knowledge of the role of travel considerations in moving house decisions.

3.5.1 Methodological Approaches

In this section three types of methodological approach to studying residential choice are introduced: aggregate level revealed preferences; stated preferences; and finally individual level revealed preferences. The section includes only limited discussion of research findings where these relate specifically to accessibility to work and public transport, as these will be more fully discussed in the following section.

3.5.1.1 Aggregate level research into revealed preferences

Revealed preference is the study of actual decisions made by households, as noted by the specific homes they have chosen to live in. At an aggregate level this involves examination of existing housing and household pairings, with the assumption that a household's current location is a reflection of its choices, needs and preferences at that moment (Mulder, 1996). It is taken for granted that when a property no longer matches the household's needs and preferences, that they would move. House prices, for example, can be used to examine how properties vary in attractiveness, and the characteristics that correlate with higher and lower levels of attractiveness can then be identified. This approach has been used to study location elements including proximity to CBD (central business district) and commercial land uses (Kockelman, 1997), proximity to schooling (Gibbons and Machin, 2003) and proximity to public transport (Gibbons and Machin, 2004; Heneberry 1998; Cervero and Duncan, 2002; RICS, 2002).

The earliest studies into residential location choice can be considered revealed preference examinations. Accessibility was a key consideration in these early economic models which focussed on distance from the workplace and city centre in an access–space trade off (Alonso, 1964; Muth, 1969). However according to Tillemans, Etteman and van Wee (2005), the early models tended to neglect non-monetary travel costs such as travel time and therefore provided

an overestimation of the impact of travel costs on location decisions. Additionally, these models were based on the importance of the CBD, which no longer provides a suitable proxy for today's complicated and polycentric city structures. Subsequent studies have found a lesser influence of accessibility. Weisbrod, Ben-Akiva and Lerman, (1980) found that while transport attributes in the form of commute travel time by car and bus did impact upon residential preferences; household and housing cost factors were greatly more influential. Despite the apparent lower importance of accessibility issues than originally assumed, the influence of accessibility criteria on housing value continues to be reported, as will be examined in more detail in the following section (Kockelman, 1997; Gibbons and Machin, 2004).

Aggregate examination of housing choice is the most common type of research into residential choice (Mulder, 1996). However, the assumption that all household's preferences are matched in their actual situation is clearly flawed when aspects such as the cost of moving and availability of properties are raised. Preferences and needs change over time but a household may not have the ability, or the inclination to move due to inertia.

Three further difficulties exist with extending findings formed at the aggregate level to individual household preferences (as is of interest to the current research). Firstly, positive correlations are present between many housing attributes, making separation of the involvement of different factors difficult. For example property size tends to increase with increasing distance from the centre, therefore relationships might be found with either variable, but it would remain unclear which was the main influence. Additionally, zoning of areas is frequently applied in aggregate level research. Precision is therefore lost and results are largely dependent on the assumptions behind the zoning borders (eg Freedman and Kern, 1997). The final key issue with the revealed choice approach relates to the constrained nature of choices as previously discussed in Section 3.4.2.3; that rarely will a household find a property that matches all of its preferences. Actual housing choice is likely to be a compromise rather than a reflection of true preferences, and this study approach cannot isolate the relative roles of preferences and constraints (Cadwallader, 1989).

The findings of this research approach are therefore clearly limited in their applicability to understanding the role of travel considerations in residential choice. It should however be noted that the purpose of the majority of this research is the prediction of choice within the property market, and the factors that affect it. Therefore the needs and preferences of individual households are less of an issue. It is particularly useful for housing policy to know

what choices are actually likely to be made in the housing market, even if the detail is hidden, and a particular strength of the method is in examining trends. It is possible for this approach to have greater applicability to individual preferences if such research is focussed upon recent movers, where a clearer link between preferences and actuality is more likely, for example, Weisbrod et al, (1980) and Bina, Kockelman and Suescun, (2006). Nevertheless, the aggregate level revealed choice approach is necessary to consider for the current research purposes as accessibility or travel criteria are frequently included in examinations. The body of research provides information on the actualities of the housing situation, and therefore has a high degree of validity. However more individual level research is more specifically appropriate to the current topic of understanding process, and this will now be examined.

3.5.1.2 Stated Preference

An alternative approach to studying housing choice focuses solely on a household's preferences. In its simplest form a stated preference survey would involve an individual rating the importance level of various housing attributes. This however would have little use for examining the trade-offs necessary in a real life situation and many more sophisticated techniques have been developed. Commonly participants are requested to select from hypothetical houses where the attribute information provided for each 'property' and the different levels of these attributes have been specifically selected based on the specific aims of the research in question. Examination of the trade-offs between the included attributes is then possible, allowing for the 'importance' of each attribute to the overall choice to be determined. An additional technique also allowing examination of trade-offs between various attributes is decision plan nets (Goetgeluk and Hooimeijer, 2002; Floor, van Kempen and de Vorch, 1996). This examines which housing attributes might be subject to substitution, and which attributes would cause rejection of the dwelling if they were not satisfactory. Thus a slightly greater focus on the *process* surrounding consideration of various attributes is possible, but again 'importance' of attributes is the key focus.

Stated preference is an extensively utilised technique in studies of housing choice (e.g. Earnhart, 2002, Kim, Pagliara and Preston, 2005; Hunt et al, 1994; Molin and Timmermans, 2003; Gayda and Boon 1998). The attributes frequently found to be the most influential on housing choice are the cost, number of rooms and tenure (Hunt et al, 1994; Molin and Timmermans, 2003). Repeatedly these are found to be important, as are all attributes relating to the house itself. Various accessibility attributes have been examined including travel times to work (Kim et al, 2005; Hunt et al, 1994; Borgers and Timmermans, 1993) travel costs to

work (Kim et al, 2005), travel time to shops (Hunt et al, 1994), travel costs to shops (Kim et al, 2005) and proximity to rail stations/ public transport (Hunt et al, 2005; Borgers and Timmermans, 1993). However the result in terms of the influence found of these travel related factors varies greatly. For example, in a review of their stated preference research over the previous ten years Molin and Timmermans (2003) conclude from six studies that accessibility considerations are significantly less important than housing attributes and attributes related to the neighbourhood. This is a finding concurred with by further studies (Bina et al, 2006). Conversely, both Kim et al (2005) and Tillema, et al, (2005) find that travel costs greatly influenced both the decision to move and the location choice.

The influence in housing choice attributed to accessibility criteria is to a certain extent largely dependent on the additional criteria measured in the study. The Kim et al, (2005) study found travel costs to work and shops, and travel time to work to greatly influence both the decision to move and residential location choice compared to neighbourhood attributes such as population density and school quality. Studies finding accessibility to be of minimal influence (eg Molin and Timmermans, 2003; Weisbrod et al, 1980) tend to include housing variables such as number of rooms etc, as well as neighbourhood and accessibility issues. It is likely that in comparison to housing costs and household factors (size etc), travel issues will have limited influence, whereas in comparison to neighbourhood density for example, the influence appears likely to be more pronounced.

The stated preference approach is also not without additional difficulties. The vulnerability of research to non-commitment bias is an issue as respondents are not committed to behave in the way they say they will (Kim et al, 2005). Also if the hypothetical situations appear too unrealistic the choice behaviour is additionally likely to be unrealistic (Kim et al, 2005). Stated preference approaches measure ‘pure preferences’ and are useful for policy predictions to be made, but less good in terms of predicting actual behaviour (Mulder, 1996). This is again largely due to the constrained nature of housing choice not allowing preferences to be fully realised (Gärling and Friman, 2002). Mulder, (1996, p220) suggests that research into residential preferences has its own merits – for instance in predicting choice in future situations. *“But when the aim is to understand mobility behaviour, an indispensable further step is to confront preferences with actual choice.”*

The stated and revealed preference methods outlined in the previous section have provided much insight into factors influencing housing choice, but they both present a methodological drawback related to the presence of significant constraints in housing choice. Revealed preferences do not allow examination of the relative roles of preferences and constraints, whereas stated preference is unlikely to represent an accurate predictor of actual housing choice precisely due to the presence of such constraints. In attempts to rectify this situation comparisons of both revealed and stated preference data for particular locations have been made (Earnhart, 2000). However, Mulder (1996 – see above comment) suggests that where the aim is to understand behaviour, a necessary step for stated preference studies is to confront preferences (or intentions) with actual choice. This ‘true’ longitudinal research has also been attempted, however these types of studies are also often fraught with methodological difficulties. Not all households that intend to move at a certain point in time will actually move home, and even fewer will move within a specific time period as would be required for panel data research. Goetgeluk and Hooimeijer, (2002) found that from a sample of ‘searchers who considered themselves likely to accept a suitable vacancy if one becomes available’ only 50 percent had moved after one year. This greatly contributed to the result that only 25 percent of housing choices made a year after the collection of preferences would have been predicted based upon those preferences recorded. Preference data can also quickly become out of date due to exogenous changes in the housing market. This was another factor contributing to the poor rate of prediction for Goetgeluk and Hooimeijer, (2002). Nevertheless, if difficulties such as these can be overcome, the information to be gathered has the potential to be extremely valuable.

An alternative approach which can combine collection of data regarding housing preferences, and the actual housing situation, is to survey households that have recently moved home about their experiences. This approach was instigated by Rossi (1955) in the successful attempt to encourage research that focussed on the individual, or individual households rather than the solely aggregate approaches that existed at the time. This type of retrospective research can take the form of both quantitative (Champion and Fisher, 2004; Bina et al, 2006) but also qualitative work (Coolen and Hoekstra, 2001; Jarvis, 2003; Seavers, 1999). However again it also is not without difficulties. The largest challenge facing this type of research is the reliability of participant recall. The retrospective nature of the research renders this issue inevitable, but of particular concern is that recall of preferences and intentions may be more complicated than recall of events and facts (van der Vaart, 1996; as cited in Mulder 1996).

Despite these difficulties this type of research remains popular due to the relative ease of completion, and because comparison between preferences and actuality is enabled. Very little of this type of research to date however examines travel or accessibility considerations (for exceptions see Bina et al, 2006). Research findings of all methodological types discussed so far suggest that travel considerations are generally of less importance than housing or neighbourhood considerations (eg Molin and Timmermans, 2003; Weisbrod et al, 1980). It is therefore not surprising that such issues become neglected in research which by its nature will have a tendency to focus on those attributes of most importance to the participants. Nevertheless the possibility remains for this methodological approach to emphasise travel issues in order that this data might be collected.

3.5.2 The influence of travel considerations in residential choice

Having highlighted the main approaches to data collection in research examining residential choice, it remains to summarise the travel related findings of these studies. This will include a detailed examination of the likely impacts of two specific travel criteria on residential choice, that of proximity to workplace and accessibility to public transport facilities. Prior to this it is necessary to address the contradictory results presented in the previous section, where some studies find accessibility or travel criteria to be important (Kockelman 1997; Kim et al, 2005; Tillema et al, 2005), and others do not (Weisbrod et al, 1980; Molin and Timmermans, 2003; Waddell, 1996).

A possible explanation which may account for some of these differences is tenure. The importance of accessibility criteria has been shown to differ between owner occupiers and private renters (Timmermans and van Noortwijk, 1995). Accessibility has been found to have slightly more importance for households in the rental sector than owner occupiers. This has previously been accounted for by the dominance of low income households in rented property. However it may alternatively be due to rented property not requiring consideration of ‘investment’ and ‘the future’ thus allowing more room for consideration of travel issues. Accessibility criteria nevertheless remain less important than housing and neighbourhood criteria for both private renters and owner occupiers.

An additionally important issue to discuss when dealing with contradictory findings is the international nature of the literature. Studies are drawn from all corners of the globe, with associated differences in societal structures, cultures and norms and transport systems. It may

be that this variation contributes to differences in the importance given to travel during property selection. Much of the research discussed in this chapter is drawn from the Netherlands, with its high level of provision of social and rented housing, as compared to the UK and United States (where much of the remaining literature originates). This would relate again to the differences in housing tenure outlined in the previous paragraph. The public transport system is also generally far superior in the Netherlands than in the UK, which might account for less of a need to consider travel – as most destinations are relatively easily accessible. However differences in study findings according to country of origin are not readily observable. The variation between countries could however lead to questions as to the appropriateness of comparing such different systems. Nevertheless, the particular preferences of owner occupiers, or more particularly the processes of search and selection in different countries, is unlikely to be substantially different. Households wherever they are looking to buy will need to consider access to workplace and amenities and would also be likely to consider market values for investment.

Despite the overall limited importance of travel issues found, accessibility to a variety of services remains a necessity for the majority of households. Households require access to workplaces, shops, leisure facilities and friends and family in order to function satisfactorily. The remainder of this section will examine in detail research relating to the influence of accessibility to work (cost, time, distance etc) and influence of accessibility to public transport (bus or train facilities within x minutes walk) on residential choice. These are the two main travel related criteria that have been examined in the research. Likely future trends in the specific influence of these attributes will additionally be discussed.

3.5.2.1 Accessibility to work

A household must obtain an income and therefore its members are constrained to live in a location from which it is possible to access employment. This access can be achieved remotely through technology and teleworking, however more frequently it is achieved through travel, or a commute. Commute behaviour, as with any travel behaviour can be separated into choices regarding destination, frequency, distance, time and mode. The home location relative to the workplace determines many aspects of these choices, particularly the commute distance (assuming the workplace location is fixed). However many additional aspects of the commute are affected by home location, including likely journey times and travel mode viability. It is therefore logical that such issues would be considered during residential choice. Mode viability and mode preferences will be discussed separately in Section 3.5.2.2. Therefore this

section focuses on discussion of consideration of commute journey frequency, distance and time in residential choice.

Research demonstrating the limited influence of proximity to workplace in residential choice has already been discussed (eg Weisbrod, 1980; Hunt et al, 1994). Research using various panel surveys (Clark et al, 2003- Puget Sound; Dargay and Hanly, 2004 – BHPS) has demonstrated that both one and two worker households with a large separation between workplace and residence are more likely to decrease their commute distance and time on moving home. Clark et al (2003, p218) therefore argue that “households are acutely aware of the trade-off between distance to work and residential location²”.

Getis, (1969, as cited in Clark et al, 2003) suggests an ‘indifference zone’ within which commuters are relatively indifferent to access to work. This would be formed by the maximum acceptable commute time, (or ideal commute time if these were wildly differing). Moves considered within this ‘zone’ would therefore require limited consideration of travel to work, and it is additionally thought that moves over short distances can generally ignore workplace location (Dieleman, 2001). Given the relatively high proportion of moves occurring within the same local authority district (Böheim and Taylor, 1999) it is likely that this accounts for much of the apparently low importance of workplace accessibility in housing choice, when compared to household attributes (eg Weisbrod, 1980, Hunt et al, 1994).

Such explanations for limited importance of proximity to work do not however provide the whole picture. Over recent years both the average commute distance, and average commute journey time in the UK have been steadily increasing. Between 1994 and 2004 the one way mean commute time in the UK increased by 10 percent from 23.6 minutes to 25.9 minutes (DfT, 2005b: Table 1.8) and the average distance travelled to work increased from 7.5 miles one-way in 1989/91 to 8.5 miles one-way in 2002/2003. (DfT, 2005a: Table 3.2). This suggests a declining role of the importance of proximity to workplace in residential location choice which may be important to examine. It appears that a number of different trends may be contributing to this decline, and these will now be examined.

² It is necessary to acknowledge that the work location may not be known at the time of property selection or there may additionally be multiple worksites.

The typical commute pattern in the UK remains a commute to the same workplace five days a week (Lyons and Chatterjee, 2007). The National Travel Survey in 2002/2003 found that this applied to 77 percent of persons (DfT 2005a; Table 3.6). However, increasingly the option to telework either full or part time is available to households as technologies improve and working patterns change (ONS, 2006; Lyons, Haddad and Jones, 2006). This reduction in the required frequency of commute journeys is likely to increase the acceptable commute journey distance or travel time. Therefore the working pattern of the household is one factor likely to affect how much influence proximity to work has on the housing choice.

Increasing levels of two-worker households in the UK are also likely to have an impact. The increased difficulties of finding residential locations with commutes suitable for both partners often results in members of such households maintaining longer commutes. Findings vary concerning the detail of how two worker households resolve the location issue. van Wee, Holwerda, van Baren, (2002) found that workers 1 and 2 seem to be treated equally when residential location is selected, whereas other studies have shown that workplace for the mother of a two-worker family is far more important than that of the father (Molin, Oppewal and Timmermans, 1999). This is presumed to be due to greater childcare responsibilities falling to the mother, resulting in increased need to reduce commute time. For two-worker households proximity to workplaces may remain an important consideration in selection of a property. This may be particularly true due to the potential difficulties of achieving a suitable solution. It is however less likely that such households will be able to locate near to all workplaces, despite considering it important.

With increasing job uncertainty, levels of home ownership and multiple worker households, ties to the residence are becoming stronger (Scheiner, 2006). Increasing inclination to keep the existing place of residence is reflected in ever higher numbers of long-distance commuters (Kalter 1994, as cited in Scheiner 2006; Green, Shackleton and Hogarth, 1999), and in evidence that a workplace may be chosen in relation to the home location rather than necessarily vice versa (Clark et al 2003). This trend of ties to the residence as opposed to workplace is only likely to increase with improved technologies allowing greater freedom in choice of workplace (teleworking). This is in turn likely to reduce the influence of accessibility to workplace in residential location decisions, as the viable distance between home and workplace is increased for those information workers whose jobs allow them to work from home, as commuting is required less frequently.

There is however one potentially significant factor working against this trend that appears to so far have received little attention in the context of residential choice. This is the increasing levels of congestion on the roads. Congestion increases journey times and therefore reduces acceptable commute distances, potentially increasing the priority necessary to be given to proximity to workplace, for those households needing to be in a specific location for work. As stated, the potential extent of this influence has not yet been examined. However it gives rise to the possibility of two trends working in opposite directions with regards to the influence of proximity to workplace on residential location choice. Proximity to workplace is still clearly an important consideration in residential location choice, and remains included in the majority of housing choice models (e.g. Clark et al, 2003; Lerman, 1977; Anas, 1980; 1981; Clark and van Lierop, 1986; Waddell, 2002; Rouwendal and Meijer, 2001; Molin et al, 1999; Kockelman, 1997). Nevertheless, it is not the all important determining factor that it was once thought to be, and future trends are unclear.

3.5.2.2 Access to public transport and mode preferences

The second travel related criteria to be examined more closely is the role of in particular access to rail (as this has been most commonly researched), and less specifically mode preferences in general. The majority of household journeys are completed to and from the home. Therefore excluding the private car, the mode alternatives available to a household for the majority of journeys are dependent on the residential location. Public transport use depends on appropriate public transport facilities being nearby, and walking and cycling requires distances to destinations such as work and shops to be appropriately restricted.

Research findings regarding the influence of proximity to public transport in residential choices are however also conflicting. Increased house prices in proximity to rail stations has been demonstrated, (Gibbons and Machin, 2004; Cervero and Duncan, 2002) thereby suggesting that access to rail stations is desirable. The effect is particularly strong in London, where higher levels of public transport use are common. However elsewhere there is a small but significant effect. Additionally van Wee et al, (2002) find a strong influence of accessibility to public transport (rail, light rail, and bus) in a study of Dutch housing choice. Other studies report no influence of public transport availability – although these are frequently measured in terms of density of location (city vs suburbia), eg (Weisbrod, 1980; Timmermans and van Noortwijk 1995).

Hunt et al, (1994) argue that there are two types of household when choosing a residential location. Those that use public transport and believe that public transport influences the quality of the residential location, and secondly those who do not use public transport and consider it insignificant to the attractiveness of a location. Rivera and Tigalao, (2005) argue that studies finding access to public transport to be unimportant are formed of the second type of household. Research into mode use preferences extends these findings (van Wee et al, 2002). Pickup and Town (1983) argue that people with an explicit preference to travelling by public transport do not consider living in a residential location far away from public transport nodal points. This seems logical as to consider living somewhere without public transport would preclude the option of travelling in the way that is desired.

Combining the above arguments would suggest that there are in fact three levels of public transport preference: Those for whom public transport access is a necessity or high preference; those for whom access to public transport would increase the attractiveness of a property, but for whom it is not crucial; and those for whom access to public transport makes little difference to the attractiveness of a property.

The road network provides access to far more properties than rail or bus networks. Accessibility of locations by public transport is highly variable, whereas access by car is not. A preference for public transport use will therefore have a significant restriction on residential choice, whereas a preference for car use will not (van Wee et al, 2002). It has been found that the influence of mode preferences on residential choice is stronger for one and two person households, people over the age of 45, and households not owning a car, (van Wee et al, 2002).

It therefore appears that the influence of access to public transport in residential choice is likely to depend on the household's mode preferences. For non public transport users and those not wishing to use public transport, little impact on residential choice is likely. However for those households explicitly wishing to use public transport the influence is likely to be substantial.

3.5.2.3 Additional travel related considerations

In addition to research examining the effect of proximity to workplace and public transport, limited research has also examined the influence of access to other amenities including schools³ (Molin, Oppewal and Timmermans, 1999; Gibbons and Machin, 2003), and shops (Hunt et al, 1994; Schellekens and Timmerman, 1997). Hunt et al, (1994), find that accessibility to work and accessibility to shops are separate, suggesting that studies which combine accessibility attributes into one accessibility measure may not be comparable. More recent studies have indeed tended to separate out these variables, focussing on specific accessibility attributes rather than a single accessibility measure.

In terms of relative importance of travel related criteria, Molin et al (1999) found by means of group stated preference surveys, that child's travel time was the most important travel related criteria, followed by mother's workplace. Access to father's workplace was significantly less important, and proximity to public transport options of only minor importance. It was presumed that the school escort journeys of the mother influenced these priorities. Proximity to schools in terms of catchment area is more frequently studied in residential choice (Gibbons and Machin, 2003), and this could account for the higher priority of child's travel time found. However, it may additionally be an important travel consideration for other studies.

3.5.2.4 Summary of the influence of travel criteria on residential choice

This section has demonstrated that despite numerous studies suggesting that travel issues have minimal influence on residential choice, it is clear that travel considerations do remain an important, if not always explicit, consideration in residential choice. Naturally the level of influence depends on the specific households circumstances. A household that is free to telework and has no desire to use public transport is likely to report a limited influence of accessibility issues in residential location choice, compared to a car-less household with members commuting daily by bus. Additionally, such issues are likely to be more important for renters rather than households looking to buy their home, and moves over a short distance are unlikely to require extensive consideration of travel. However as to any further explanations, despite extensive research examining the 'importance' of travel issues, little information is available regarding how, when and for whom travel issues influence the search and selection process. The precise nature of the influence is little understood.

Travel considerations generally remain significantly less influential than factors such as cost, tenure and number of rooms. The following quote neatly summarises the situation: “as long as people have the opportunity to afford flexible means of transport, the impact of accessibility on their residential choice behaviour (in the absence of interventions) is relatively limited” (Molin and Timmermans, 2003).

3.6 Summary of the influence of travel related choices on residential location

This chapter has examined how travel and accessibility considerations are involved throughout the residential move process in order to improve understanding of the situation and the potential effectiveness of targeting travel behaviour change strategies to recent movers. A brief outline of theory regarding ‘how people move’, and how property might be selected has been provided. It has been shown that travel considerations can be involved in all stages of a move; from a job move or the desire to reduce commute length or other journey distance prompting the decision to move home, to travel priorities such as mode preferences or travel time limitations influencing the search area and final selection of the home.

The involvement of travel considerations throughout a move is likely to influence the travel impacts of that move. For example, it would be hoped that a household whose main trigger to move home was to be nearer work, would eventually reduce their commute distance due to the restrictions on search area instigated by these preferences. However, it has also been shown that in residential choice at least, such travel or accessibility considerations tend to be less important and influential than those relating to housing, household or neighbourhood criteria.

The highly constrained nature of residential choice, particularly in the UK has been stressed. For the majority of households it is necessary for trade-offs between desirable criteria to be made when selecting a new home. It might therefore be surmised that, given their generally lower importance, accessibility and travel criteria are the first to be compromised. The necessity for the majority of households to consider travel to a certain degree when making a property selection seems logical. Except perhaps for very short distance moves, such

³ This can obviously be affected by catchment area.

consideration would be necessary to ensure that for example commute journey distances remain viable. Research findings however suggest this may not be the case. It has been suggested that some, particularly car using households do not even consider accessibility as remotely important, presumably as long as the house is within their selected limits or 'indifference zone'. Conversely for other households accessibility is a key priority, particularly for those intending to use public transport, or to walk and cycle.

The current repeated aggregated findings that accessibility issues have a significant influence on residential choice, just a far smaller one than the other attributes is not hugely informative. Aside from this the specific role of accessibility considerations in housing choice is little understood despite extensive research into the topic. This suggests the importance of further examination of how individuals consider travel issues during a residential relocation.

Finally it is necessary to remember that despite theorising about behaviour and influences on housing choice, selecting a home is an intensely personal thing. Colloquial evidence, as highlighted by property television programmes, suggests the importance of the 'it just feels right' phenomenon, where a household cannot verbalise why they select a particular property other than 'it just feels right'. Naturally if the property did not meet certain 'rational' criteria then it would be unlikely to have been viewed, but nevertheless it is important not to forget the potential importance of this 'non-rational' element when detailing property selection.

Chapter 4: Research Aims and Overall Study Approach

4.1 Overview

The barrier to travel behaviour change presented by habits and the potential for key events, particularly residential relocation, to aid in overcoming this barrier have been outlined in the previous chapters. Further to this, literature relevant to examining both the impacts of residential relocation on travel behaviour and the role of travel choices in influencing residential selection has been discussed, in an effort to begin to understand the interrelationships between the two. The current chapter examines what has been learnt from this literature specifically related to how travel behaviour might be affected during residential relocation. It concludes that further research is necessary in order to improve understanding of the influence of residential relocation on travel behaviour. A specific research gap and research aims are identified and an outline of the overall research approach designed to address these aims is introduced, including detail of the study context.

4.2 What is known about the relationship between travel choices, housing choices and travel behaviour?

It is clear from the literature reviewed so far in this thesis that residential relocation is related to travel behaviour change. High levels of change in mode use, change in travel distances and changes to vehicle ownership have been demonstrated in households that have recently moved, without the presence of any additional behaviour change interventions. Only limited data exists, however most studies seem to report a figure in the region of 30 percent of households reporting specific changes to travel behaviour following residential relocation. This figure is however by no means assured as research has not examined to what extent those households experiencing mode change are the same households reporting changes to journey times and vehicle ownership. Additionally life events such as employment change and birth of children are also likely to be occurring in association with residential relocation, and these will have additional impacts on travel behaviour. Nevertheless a link between housing change

and travel change has arguably been established. It is therefore suggested that as travel *does* change surrounding residential relocation, then travel *can be* changed (Cairns et al, 2004).

The precise nature of the link between residential relocation and travel behaviour is however less well established. *When* during the moving process travel behaviour is affected, and what factors increase the likelihood of change is less well understood. Despite this, some suggestions can be obtained from the literature examined.

As regards to the timing of impacts of a residential relocation on travel behaviour, it is clear that for many moves travel related variables such as a job move or desire to reduce commute journey or journey to other amenities, will in fact have prompted the move. In such situations it is clear that the most active process affecting travel behaviour is likely to be a pre-existing need or desire for travel behaviour change that is eventually achieved through the residential relocation. The travel behaviour change would occur in the individual's head prior to even the search for the new home. Thus it is not the residential relocation prompting travel behaviour change, but vice versa. However for situations where travel has not prompted the move little information regarding timings is available and the question remains as to the timings and processes involved.

Availability of travel modes (as also linked to residential location type – urban, suburban etc) has also been highlighted as a key factor involved. If a mode is not available then it cannot be used, even in spite of 'successful' persuasive messages to do so. Therefore changes in mode availability are likely to account for a substantial amount of behaviour change. In the van der Waerden et al (2003) study discussed in Chapter 2, 50 percent of respondents that had moved home reported a change in either composition or number of modes available. However 75 percent of the respondents reporting on a home move experienced mode switch. This suggests that other factors must also be involved in generating mode switch, however it is necessary to remain aware of the very small sample size (n=31).

The extent to which households consider availability of modes when choosing their new home however remains unclear. Chapter 3 established that accessibility considerations are unlikely to take priority over housing and neighbourhood criteria, this therefore suggests that where compromises arise travel criteria are the most likely to be compromised. Exceptions to this are likely in situations where the move has been prompted by a travel situation (such as a desire to reduce an existing long commute), or where specific preferences for availability of public transport exist (Hunt et al, 1994). "As long as people have the opportunity to afford flexible

means of transport, the impact of accessibility on their residential choice behaviour is relatively limited” (Molin and Timmermans, 2003). This suggests that for a substantial proportion of moves the travel situation and mode availability (or residential location) is likely to be determined by ‘accident’, or as a result of other household choices rather than deliberately. For many urban residents such ‘accidental choices’ are frequently likely to provide a good array of accessibility options, but this is by no means guaranteed unless such criteria are prioritised. Despite the information regarding relative preferences, it remains unclear to what extent these issues are considered or not at all. Thus numerous questions remain regarding how and when residential relocation affects travel behaviour.

4.2.1 Targeting recent movers

Prior to identification of the specific gap in research that will be targeted, it is beneficial to mention a particular research project which has, subsequent to the start of the current research, begun to target recent home movers with specific travel behaviour change interventions.

The Travel Smart programme in Australia (Taylor and Ampt, 2003; Ampt, 2003) is a form of individualised marketing promoting travel behaviour change, with a number of specialised techniques employed. Recently trials have begun in targeting their individualised marketing programmes at *recently moved* households with the hope that such households should be more susceptible to change (Ampt, Stopher and Wundke, 2006). The specific programmes implemented in this circumstance (Ampt et al, 2006) are facilitative rather than prescriptive. I.e. ‘what changes to your car use will make your life better’, rather than ‘how can we get more people to use buses’. Participants are interviewed either face to face or by telephone and asked to think about the way they travel, and any aspects that currently frustrate them. A ‘tool’ that might help the problem is then developed during conversation between the householder and researcher/conversationalist, and a voluntary commitment to try the tool/suggestion is obtained. Such tools might include journey plans, a kilometre monitor, local activities guides and specific information on time and money savings or improving fitness and independence.

To date only limited results are available, but they do suggest the interventions are proving effective. However, no ‘non-moved’ comparison groups are available within the study. The paper discusses difficulties surrounding the acquisition of an appropriate control group for the effectiveness of the interventions (those who moved but did not receive interventions) and difficulties in locating a population recently moved or about to move home. However the

issue of a control group for examining the effectiveness of targeting movers is unfortunately not discussed. Comparison to previous Travel Smart programmes is also not possible as the intervention approach taken has also changed. It is likely that the new facilitative approach is likely to be far more effective than a prescriptive approach which could incur defence mechanisms from participants unwilling to be forced to change. Therefore it seems that the additional effect of targeting recent movers is unfortunately unlikely to be identifiable from this particular study. Nevertheless, this study seems to again indicate that a residential relocation is indeed a good point to target travel behaviour change interventions. Such studies would clearly benefit from an improved understanding of the myriad influences of residential relocation on travel behaviour, which as discussed above, is lacking. In particular knowledge regarding the most appropriate times to intervene would appear to be valuable as the aforementioned study focuses only on post-move interventions.

4.3 Research gap

The studies examined so far in the thesis indicate that a residential relocation is indeed likely to be a good point to target travel behaviour change interventions. It is unfortunate that the few existing studies with interventions targeted at recent movers (Bamberg et al, 2003; Ampt et al, 2006) did not include control groups able to provide clear evidence for the success of this targeting method. Such information would have been invaluable to gauge the level of impact on eventual change that was specifically provided by the targeting of recent movers.

It is however additionally clear that the summary of the literature examining interrelationships between housing choices and travel choices has raised more questions than have been answered. Too little is known about the interrelationships between housing choices and travel choices for the design of any such intervention to be accurately informed. Residential relocation is often a long drawn out process, there is no indication of when during the move behaviour change occurs, or who might be most susceptible to influence, or when travel issues are at their most influential. There is also no information regarding how much time following a move there may be to intervene before new habits are set. Research to date has largely focussed only on the outcomes of residential relocation, such as mode change, rather than attempts to understand the processes leading to these outcomes.

Research that can better understand the consequences for travel of residential relocation should be salient to transport policy and in particular to the development of travel demand

management strategies. The potential for longer-term choices such as residential location choice and shorter term decisions such as daily travel behaviour to be mutually influencing to one another, has been stressed (Krizek, 2003).

It is therefore concluded that further detailed knowledge of residential choices and travel choices at the individual household level, and in particular the effects of moving home on travel behaviour would be valuable. It is important to understand how, why and when households consider travel issues during a move and new property selection (including trade-offs), or perhaps more importantly, understand why they do not if this is the case. As has been argued throughout the thesis so far, it is suggested that this understanding is not currently available within the literature. Addressing this knowledge gap is deemed crucial prior to any attempt at altering the impacts of residential relocation on travel behaviour. It is only with improved understanding that the most appropriate methods for targeting behaviour change in the situation can be implemented.

4.3.1 Guidance from the literature on addressing the research gap

Despite the shortcomings of the existing literature identified so far, some useful guidance to future research in the topic is provided. Specific lessons and challenges will now be identified.

4.3.1.1 Identification of the influence of potentially masked travel issues

Firstly the repeated finding that travel considerations are generally less important than those relating to housing or neighbourhood is particularly valuable. It suggests that a general focus on factors influencing residential choice would be unlikely to shed much insight into the role of travel issues. Instead, it would be necessary to specifically focus on travel related attributes in order that detailed information about these is not masked by the other factors that have already been established as more important.

4.3.1.2 Measurement of habits

Secondly difficulties associated with the measurement of habits have been highlighted. As discussed in Chapter 2, measurement of habits presents a significant conceptual challenge, and therefore no entirely satisfactory measure exists. This presents issues for establishing that

habits are indeed weakened during a residential relocation, as recording both current and particularly pre-move levels of habit is unlikely to be straightforward. A measure of past behaviour is the most widely accepted proxy. Any progress on this topic, and associated complexities with the habit concept as outlined briefly in Chapter 2, would also be valuable. These issues will be discussed throughout the thesis, most notably in Chapter 10.

4.3.1.3 Cause and effect

An additional challenge highlighted in the literature is the potential difficulties in distinguishing between cause and effect in the topic (Lanzendorf, 2003; Krizek, 2003). In the example of a family moving to suburbia with their first child, and beginning to make more use of the car numerous potential explanations exist. This increase in car use could be due to effects of the relocation itself providing both the opportunity for consideration of travel and a change in context likely to weaken any travel habits. Alternatively it may relate to the constraints presented by the new location (suburbia, designed for cars with greater dispersion of activities), or perhaps the fact that the child is at an age where using the car is far more convenient than other modes and more escort journeys are called for. Additionally it could have been a desire to be able to travel more easily by car more that prompted the move in the first place. Thus the cause and effect in such situations is difficult to establish. “Evidently the decisions are interrelated and important to disentangle for a better understanding of what causes an important share of car travel” (Lanzendorf 2003, p12). This suggests the need for employing qualitative research methods (initially) since they are more capable of establishing causality (Clifton and Handy, 2001).

4.4 Research Aims

The conclusions drawn from the literature as to the state of knowledge regarding interrelationships between travel and housing choices, and the gap as identified in this literature lead to the following specific research aims:

- 1. To identify whether there is evidence to suggest that travel habits are weakened during a residential relocation.*

2. *To examine what can be learnt about the impacts of residential relocation on routine travel behaviour, including the processes behind any impacts.*
3. *To assess (based on an improved understanding of the situation) the potential for and provide suggestions as to how travel behaviour changes (or could be changed) during residential relocation.*

These aims are encapsulated by the following research question:

To what extent, and how does the process of moving home act as a prompt for an individual to review and potentially change their travel for different key journey purposes?

4.5 Introduction to the research

4.5.1 Overall Study Approach

The chapter now provides an introduction to the research approach taken in order to address the aims as outlined above. The research is undertaken in two stages, hence the value of a separate introduction to the overall approach. The additional emphasis of examining the role of travel considerations in influencing residential choice was not a key focus until after the findings of part one of the research. Hence the initial part of the research focuses on examining the impacts of residential relocation on travel behaviour. Detail regarding the research setting is additionally provided at the end of the section.

4.5.1.1 Approaches considered

In designing research to address the aims outlined above, the appropriateness of conducting a panel study was considered. The study emphasis on behaviour prior to and following a specific event would in principal lend itself to data collection at two points in time. Thus, provided any external factors could be identified, any difference in travel could be attributed to the home move. Such an approach would have the potential to overcome two key challenges identified in the previous section: the particular difficulty of discerning cause and effect in relation to travel and relocation; and any requirement for measuring previous habits.

This idea was however discarded largely due to the likelihood of extensive practical difficulties with participant recruitment, as outlined below.

Panel membership is notoriously difficult to recruit for and maintain. The research under discussion would have the additional difficulty of maintaining contact with participants through a change of address. A difficulty further compounded by the fact that by no means all households searching for a new home will move within a given time period, necessitating the initial recruitment of a large number of households to allow for this. (Of the 44 percent of households in the BHPS reporting an intention to move home, only 10 percent had done so by the following year, (Böheim and Taylor, 1999)). The final disincentive in recruiting for a panel study was that moving house is often extremely stressful, and therefore participants may have less time or inclination than usual to participate in research (especially immediately pre and post move).

4.5.1.2 Approach taken

It was decided instead to focus on the experiences of recently moved households, in the manner discussed in Section 3.5.1.3 of Chapter 3. This approach required contacting participants only once, after time has elapsed to allow settling into the new home. It also had the benefit of allowing post move travel over a longer time period to be examined, as the time taken for post move travel behaviour to ‘settle’ is unknown.

In the UK roughly 10 percent of the population move home each year (Böheim and Taylor, 1999). 10 percent of the population therefore have the potential to be participants and participant recruitment was not anticipated to present a particular problem¹. This retrospective approach would however rely on participant recall of their previous behaviour and decisions which presented a potential issue as recall can not always be relied upon. The importance of an event such as choosing and moving into a new home is however likely to be highly salient (Sudman, 2003), and therefore easy to recall (Mathiowetz and Duncan, 1988). Nevertheless it would be important to minimise the ‘time since move’ in order to reduce elapsed time since the events requiring recall.

¹ In the event this anticipation was proved to be incorrect, as will be discussed in Chapters 5 and 7. Ampt et al (2006) additionally discuss difficulties with accessing recently moved households, however this paper was written subsequent to the completion of the research being described.

Given the limited availability of literature examining the specific topic it was appropriate to adopt an exploratory approach. A survey was considered at this stage, but it was decided that insufficient information regarding the factors and processes involved was available to appropriately guide a survey design. Therefore in-depth interviews with recent movers were selected. Detailed discussion of the methodological considerations involved in the completion of interviews is provided in Chapter 5. As previously stated these interviews specifically intended to examine the experiences of moving home and any impacts on travel behaviour.

As is the nature of exploratory research, the direction of any subsequent research was to be informed by the outcomes of the exploratory interviews. One further stage of research was completed. The results from the exploratory interviews (see Chapter 6) pointed to a research framework that would be appropriate to examine over the experiences of a wider range of participants, therefore a postal survey was completed as the second part of the research (see Chapter 7). In the remainder of the thesis the methodology and results from the exploratory interviews are discussed prior to the introduction of the second part of the research, the postal survey. Prior to this discussion it remains only for the introduction to detail the decisions taken regarding the research setting and context.

4.5.2 The research setting

A research focus on the experiences of urban residents (at least urban since the move) was deemed to be important as the potential opportunity for using alternative modes of transport to the car is much greater in urban areas. Rural areas are often characterised by poor or no public transport facilities and distances between services may be greater. It is acknowledged that this may be the case for some parts of urban areas too, but in the main there are more opportunities in urban areas. Additionally, a household choosing to live in a rural area would likely have strong motivations for not choosing an urban area, and so be unlikely to be swayed by travel considerations and the possibility for use of alternative modes. Such households would be interesting to study, but for the current purposes the interest was to understand the experiences of those households that had travel options to consider and had not eliminated the option of transport alternatives to the car by their choice of a rural location. If there are no travel

alternatives available then movers are unable to alter their mode choice and are unlikely to consider doing so.

4.5.2.2 Study location: Bristol, UK

The city of Bristol, South West England was chosen as the location for both parts of the research. Reasons for the selection of urban residents have been outlined above. A focus on a single city was decided upon to again minimise potential variance in the experiences of recent movers for this exploratory research. Bristol was selected due to both its specific transport difficulties which will be outlined shortly, and its convenience to the researcher for travel to interviews and build-up of contacts.

Bristol has a population of 398,300 and an area of 110km² (Census, 2001- 2005 estimates, BCC, 2005). It is therefore a relatively large city, but it also has a distinct edge unlike some conurbations in the UK. It has a slightly higher than average percentage of one-person households (33 percent compare to an average of 30 percent for England and Wales, Census 2001). And also a relatively high proportion of the population qualified to degree level or higher (24.5 percent compared to 19.8 percent, Census, 2001).

In terms of travel, Bristol suffers particularly from high levels of congestion. It has only limited local rail services and an extensive bus network of questionable quality. Recent plans for a tram service were unfortunately never completed due to disagreements over the proposed route, a problem compounded by the involvement of two separate councils as substantial parts of particularly north Bristol are not located in 'the city of Bristol' but are part of South Gloucestershire.

Bristol has a higher rate of car ownership than the UK national average and also increasing rates of car use for work, leisure and shopping trips. 45 percent of journeys under 2km are made by car (BCC, 2005). Levels of public transport use in the city were increasing between 2000 and 2003, but 2004 saw a drop in bus passenger journeys, reversing the previous trends (BCC, 2005). The bus service has undergone a number of substantial price rises in recent years leading to protests and campaigns such as 'reclaim the buses' (see BBC, 2006). However a recent survey suggests that overall 52 percent of passengers are satisfied with overall bus service (BCC, 2005). In 2001 13.5 percent of work journeys in Bristol were completed by public transport compared to 14 percent and England and Wales, but in 2004 the figure was 12 percent for Bristol, suggesting decreasing public transport use.

Bristol does however have a relatively high proportion of journeys completed by walk or bicycle, 20.2 percent of work journeys compared to 12.8 percent in England and Wales as a whole (ONS, 2001). City cycling levels have increased by nearly 40 percent since 2000. That the city is the home of Sustrans and is relatively well served by cycle routes with 32 miles of national Cycle Network and 44 miles of other routes in the city may or may not affect this.

Bristol therefore provides an interesting example of a city with specific transport problems that are variously likely to be experienced by other cities. It creates the impression of the availability of a public transport network, which may be influencing the residential choices of households. However as will be seen throughout the study findings, the quality of public transport in the city is not high and therefore it could be argued that a *false* impression of public transport availability is created. The following chapters will now detail the research carried out.

Chapter 5: Part 1 Methodology: In-depth Interviews

5.1 Overview

This chapter outlines and justifies the approach taken in the first phase of the research; the completion of in-depth qualitative interviews with recent movers in Bristol. The research aims to examine what can be learnt about the impacts of residential relocation on travel behaviour and habits. The research design, interview schedule and practical difficulties encountered during the research, particularly with participant recruitment are discussed. Ethics and safety issues are also highlighted before discussion of the respondents interviewed and analysis techniques employed.

5.2 Research Design

The overall aim of the research has been discussed in the previous chapter. This is to examine the experiences of recent movers in the city of Bristol, UK, to learn about the travel implications of their moves¹. In particular it is intended to assess whether there is evidence to suggest that travel habits are weakened during a residential relocation.

The overall research design has also been outlined in the previous chapter. The initial phase of the research was determined as the completion of qualitative in-depth interviews. Of the two main alternatives a panel study presented extensive practical recruitment difficulties for too little potential gain; and based on the literature review, it was felt that not enough was known about the relationships between moving and travel choices to allow for the design of an effective survey on the topic, at least in the first instance.

¹ As discussed in Chapter 4, the additional emphasis of the research on the influence of travel considerations in residential choice was not a key focus until its importance was highlighted by the interview findings.

The selection of qualitative in-depth interviews presented two further benefits: firstly regarding the issue of recall. The study emphasis on the changes to household travel surrounding a recent move requires information regarding household travel behaviour prior to the move. The data of interest has occurred in the (however recent) past and therefore data collection is reliant on participant memory. Gärling and Axhausen (2003) also remind us of the greater difficulty faced in attempts to remember non-deliberate choices; potentially serious issue for a study examining largely habitual behaviours. To overcome these issues, methods for improving accuracy of recall are important. In a face-to-face study it is possible for rapport to build up between the interviewer and participant (Dex, 2003). A flowing conversation may prompt associated memories more readily than a series of questions, and therefore may be of benefit to aid recall. A face-to-face technique is therefore preferred in the interests of gaining as accurate an account as possible.

A second benefit of the selection of qualitative in-depth interviews is the ability to focus on both process and causality (Clifton and Handy, 2001; Røe, 2000). Previous research has examined travel behaviour change following a home move, with some exploration of the reasons linked to any changes (e.g. van der Waerden et al, 2003). However, research to date has not considered the *processes* that precede any observed changes in travel behaviour. It is possible that this could be achieved through gaining experiential accounts from recent movers.

Finally, an open interview structure allows the participant to focus on the issues found to be of most importance. This is particularly important in an exploratory piece of research, in order to avoid the neglect of unexpected, but potentially influential issues. Therefore an open interview structure was felt important to inform thinking on some of the important issues and key processes occurring. Within this vein it was decided that the research should focus on depth of insight and analysis as a more appropriate focus than generalisability at this stage of the research. The number of participants involved was restricted accordingly.

5.3 Participant Recruitment and data collection

5.3.1 Target participants

The previous chapter detailed the selection of residents of the city of Bristol, South-West England as potential participants. This was in order to limit the potential external variations of

moving decisions and circumstances of participants for this exploratory research. In addition to this it was also decided to restrict participants to *homeowners* that had purchased their property in the previous 12 months.

5.3.1.1 Homeowners

Research has shown there to be many differences in housing preferences and priorities between renters and owner-occupiers (McHugh, Gober, and Reid, 1990; Mulder, 1996). Any attempt to include owners, renters and other tenancy arrangements in exploratory research would be likely to add further complications, rather than provide for greater understanding and clarity. Both the main tenancy arrangements would have been valuable to study, particularly as differences might be related to different life stages. However owner-occupiers were selected as the focus as this is the most common way to live in the UK, with 71 percent of the population of England owning their own home in 2005 (DCLG, 2006b).

5.3.1.2 Time since move

It was decided that participants should have moved home within the previous 12 months. Seavers (1999) has successfully researched home movers within this time period, and considers it a suitable time limit; the significant upheaval of a move is likely to be remembered for some time. For the current research this time period was considered sufficiently short for participants to be able to remember past (pre-move) travel behaviour, but also long enough to extend the pool of potential participants wide enough to give a good chance of getting an appropriate sample. It would also be long enough and to have allowed new travel behaviours to become established. Additionally it was a concern not to approach participants too soon after moving, due to the stressful nature of this time.

5.3.1.3 Individual versus Household

Following discussion in Chapter 3, Section 3.4.2.2 regarding the importance of all household members in influencing the moving home decision (Seavers, 1999; Jones, 1979) it was decided to attempt to recruit all household members over the age of 14 for a group interview. This would present numerous benefits: a greater likelihood of accuracy in accounts due to corroboration; and different perspectives on the move situation. However it was also decided that recruitment of all household members would not be *necessary*, particularly given research

findings that outcomes and priorities don't seem to change if all decision makers are taken account of (Molin, Oppewal and Timmermans, 1999). Therefore one household member representative would be acceptable, but more members desirable.

5.3.1.4 Summary of target participants

Excluding these restrictions, the study sought to gain the experiences of a wide variety of situations and moving circumstances. Given the exploratory nature of the study it was important to ensure that participants were not all representatives of similar situations, (such as all single person households, or all moved very short distances), and would thus present a potentially biased view of the situation.

In summary the target participants for the research were therefore members of a range of households that owned their own home in the city of Bristol, and that had purchased and moved to their property within the previous 12 months.

5.3.2 Recruitment

The identification of a rich source of potential households from which a variety of moving situations could be chosen for closer examination was a desirable and anticipated outcome of any recruitment drive. However, as shall be seen, unanticipated difficulties in participant recruitment rendered both this, and the desire to involve all household members in an interview, untenable.

5.3.2.1 Estate agents

It was originally envisaged that estate agents would have provided a means to recruit participants for the research. The intention was to request estate agents to send out letters to their recent customers (purchasers) requesting their help and participation in an interview. It was intended to include some brief questions regarding demographic and circumstantial detail in order that this information would assist in identifying a suitable diversity of interviewees. It was acknowledged that estate agents would not be able to provide addresses of their recent customers due to restrictions of the Data Protection Act (1998), but that they should be able to distribute a letter themselves, perhaps with an outgoing mail-shot to these customers. This

recruitment method had been successfully 'piloted' in an undergraduate dissertation at Southampton University (Meyers, 2000). However, this method did not prove successful for the current study in Bristol as will be detailed below.

Initial contact with estate agents in Bristol was made in person, and the individuals approached were receptive to helping with the research. However, when steps were taken to progress matters and more detail about the requirements became clear, managers cited the Data Protection Act (1998) as guiding against such activities, and could not be persuaded otherwise². The Data Protection Act (1998) guards against the use of details collected for one purpose being used for an alternative purpose without permission. This is however permissible if it can be established that the alternative purpose is in the public interest. While it can be argued that the purpose of the research was in the public interest³, it is a view that can be seen as subjective rather than objective. There seems a tendency in general for erring on the side of caution when it comes to such legislative wording, especially concerning the Data Protection Act (1998).

A complication for the case in point is that the Data Protection Act (1998) also advises that once details are no longer required, they should be destroyed. Once a house is purchased and the moving process has been satisfactorily completed, in theory the estate agent's business with that customer is concluded, and their contact details should no longer be kept. In practise it is likely that details are in fact kept for some time, (this could provide another explanation against the reluctance to help). It is not altogether clear why this approach to recruitment had worked previously but not on this occasion. It is considered likely to be a combination of different estate agents making different decisions and being more aware of and taking more seriously the Data Protection Act (1998). The experiences perhaps highlight the (growing)

² The issue was further complicated by the fact that the majority of estate agents in Bristol, even the chain agents, are in fact separate franchises and do not have a centralised records system. Only one estate agent is actually centralised. Therefore it transpired that numerous agents would have had to be individually visited and persuaded to help in order to accrue enough addresses to recruit participants (as by no means all letters sent out would receive favourable replies). Therefore following initial difficulties the approach was not pursued to the level of head-office. It is possible that had the Bristol situation been different this route may have been pursued to a favourable outcome.

³ See Appendix 5 for a letter outlining the public interest of the research.

difficulties being faced by researchers in general associated with the Data Protection Act (1998). Nevertheless, an estate agents' approach to recruitment was abandoned⁴.

5.3.2.2 Alternative recruitment options

The option of placing a poster in estate agents shops requesting participation was offered, but it was felt that this would have little value as the majority of people visiting an estate agent are looking to move, rather than have recently moved. Door-to-door leafleting or a blanket survey to an area was considered but decided to be too time and resource consuming for the amount of likely responses. On average 1 in 10 households move home each year (Böheim and Taylor, 1999). When reducing this by the proportion of eligible households likely to respond positively to requests for participation, the potential success rate is minimal. The targeting of specific workplaces was also considered, but rejected due to the likelihood of restricted diversity in participant experiences regarding the commute (as the destination would be the same for all participants). The commute is the likely most habitual journey and is therefore of particular interest to the study. Such a focus would have risked producing results that would not provide insight to experiences over the city of Bristol, or UK as a whole.

5.3.2.3 New build area

A further possibility was to focus the study on an area of newly built housing, as all the residents of such an area would clearly have recently moved. This would have resulted in recruitment of a sample with greater homogeneity than desired; nevertheless, areas of newly built housing within Bristol were examined as possibilities. It was discovered that large proportions of these new developments were housing association properties (social housing) rather than privately owned as required for the study. Many of the residents would therefore not have selected their new homes in the manner of interest to the study. On visiting these new developments it was discovered that the majority of the completed housing was social housing, with the private properties yet to be built, therefore this idea was also abandoned.

⁴ See footnote 2.

It was eventually decided to send a press release detailing the research to the local media (see a copy as Appendix 1). This method provided less control over the likely respondents, and did not enable the collection of preliminary details allowing selection of participants based upon recording a variety of situations, (as originally intended with the estate agents recruitment method). It also depended on potential participants having enough interest in the topic to firstly read an article about it, and secondly motivate themselves to volunteer. This risks potential bias among the interview participants towards those with a high interest in transport issues. Unfortunately this is a common issue facing research based on volunteers and could not be avoided in the current situation. Nevertheless it is necessary to remain aware of this potential issue during the analysis of results.

The press release lead to the inclusion of the study in at least two local papers, and also a brief local radio interview (see a copy of the articles as Appendix 2). The study was also included on the university website and in the university bulletin. Through these articles only six participants were recruited directly. A further four initial volunteers did not eventually participate due to timing difficulties and a waning of interest in participating when followed up. This limited response was disappointing. However a response to such a request would generally require high levels of motivation on the part of the respondents. Further participants were recruited through acquaintances and snowballing. These techniques actually provide the benefit of potentially reducing the bias towards an interest in transport issues within the sample. The prompt to participate in such circumstances is due to ‘encouragement’ from friends rather than a specific interest in the topic. Details of the participants recruited will be provided in Section 5.6

5.4 Topic guide design

It has been established that interviews were to be completed with recent movers who responded to either an article in the local Bristol media or to requests from friends. The aim of the research was to learn about key processes based on the travel related experiences of participants’ moves. The importance for this exploratory research to allow the emergence of any issues important to participants but perhaps not raised within the literature review, has already been highlighted. The topic guide was therefore designed to be broad ranging and relatively free, as opposed to detailing a more specific interview-schedule. It was however

also recognised that a number of details would be required from each participant. This would allow comparisons could be made, and participants' contexts understood. For these reasons a semi-structured topic-guide was designed, with general topic areas offered for discussion (eg, tell me about x....), and a check list of required details that were later asked about if not mentioned during the responses. Such detail included for example, the length or mode choice of a particular journey, or probing for the role of life-stage or transport in a given decision. A copy of the topic guide can be seen as Appendix 3.

Topics for discussion were selected to attempt to cover the whole range of potential influences on moving and travel behaviour. The topic guide was designed with reference to the Lanzendorf (2003) life domains framework as discussed in Chapter 2, Section 2.8.1. It was ensured that each of the domains that might influence travel behaviour (lifestyle, accessibility, and mobility) were covered by the interview. This involved prompting for details on each level where only one or two levels of life domain had been provided for a given topic. The main topic areas included in the guide will now be outlined. These include details of the household and home move in order to set the context of the move; travel details both before and after moving to assess the impacts of the move; and discussion of the extent to which household travel behaviour was and is routine and habitual.

5.4.1.1 Move details

The participant's main reasons for moving home, and their 'search and selection story' were a vital area of discussion. This set the context for the participant's choices as the reasons behind a move are likely to impact the whole process, including the priority given to transport during that move⁵. The literature highlights many factors such as life-stage and a job move which would be likely to have different impacts on both a move and associated household travel. Participant life stage detail, if not mentioned, was prompted for, as was detail of any issues relating to travel involved in the move itself.

⁵ A further note that the particular emphasis of examining the role of travel considerations in influencing residential choice was not a *key* focus until *after* the findings of this part of the research.

Detail of household travel both before and after moving was important in order to assess any changes occurring, and the impacts of the move on daily travel. Detail of interest included mode, frequency, and journey length of daily travel for various journey purposes such as work, food shopping, the school run, and leisure. Participants were also asked what effect, if any the move had had on their travel behaviour. This was in order to obtain the participant's own perceptions of the issue in addition to the inferences possible from the travel details provided. The determination of whether non-move related issues had influenced household travel behaviour over the course of the move was also important in order to ascertain the specific role of the move in any changes observed. Participant knowledge of local public transport associated with the new home area, and how such knowledge was acquired was also of interest. Finally, generally nearer the end of the interview, participant opinions regarding potential opportunities for further travel change surrounding the move were discussed. Barriers that had prevented a change in travel and the potential for interventions to help or encourage future travel change were discussed in order to gain participants opinions and insight into how their situation could be improved.

Given the key interest of the research in examining the potential for the key event of moving house to weaken travel habits (see Chapter 2), it was important to attempt to assess the extent to which habits had existed prior to the move, and whether these had been weakened or broken by the recent move. This aim presented a significant challenge: not only are there numerous conceptual and practical difficulties with measuring habits, (as outlined in Chapter 2, Section 2.6 - essentially that it is difficult to satisfactorily measure a process that is automatic and unconscious, particularly through self-report); but also the habits of interest were past rather than current habits which severely compounded the issue. This resulted in the necessity of relying on participant memory of supposedly unconscious behaviour (somewhat of a contradiction). A pilot interview however confirmed that participants were able to discuss the habitual (or otherwise) nature of their previous behaviour.

A number of approaches to assess level of habit were employed during the interviews. Frequency of past behaviour is one of the most widely accepted indicators of habit, and detail of journey frequency was obtained as discussed under travel behaviour in the previous section. Given the qualitative nature of the study, a precise 'measure' was beneficial rather than necessary, as a strong idea of the extent of habit could be gained from participants own

accounts of their behaviour. In the initial stages of the interview participants were deliberately questioned only about their travel ‘routines’. As discussed in Chapter 2, the concept of habit can be deceptively complex and ambiguous. It was felt that ‘routine’ provided less ambiguity as to definition and was therefore less open to interpretation and a less complicated term to discuss. This decision enabled observation of whether or not the participant chose to introduce the term ‘habit’ to the discussion of their own choice.

It was however additionally necessary to discuss ‘habits’, and if it had not already been introduced by the participant the term was introduced mid-way through the interview. It was also important to gain an idea of what the participant understood by the term ‘habit’. This would avoid any confusion during the interview discussions due to differences in understanding and interpretations of terminology. Participants were therefore asked how they would define a ‘habit’ and also a ‘routine’.

Following this Verplanken and Orbell’s (2003) self-report habit measure was implemented⁶. Participants were requested to complete the scale twice, once for current main travel mode to work and once for travel to work prior to moving. The measure consists of ten Likert scale statements, such as: ‘I feel x is part of me’, or ‘I frequently do x’, (where ‘x’ is to be replaced with the habit of interest, such as car driving). This was implemented largely as a prompt for discussion of travel habits, to ensure that all dimensions of habit (frequency, lack of thought etc) were covered. The accuracy of the measure to address *past* habits is particularly unclear. Participants were finally asked directly if they felt that their travel had been habitual prior to moving home.

5.4.1.4 Household details

Details about the participant’s household were also necessary to obtain. If they were not clear from earlier discussion, detail of aspects such as household composition, car ownership, bike ownership, and house price were also requested.

⁶ A copy of the full scale can be seen in the interview topic guide in Appendix 3.

The topics as outlined above were felt to cover the aims of the research, but also to provide enough freedom to allow unanticipated aspects to be raised by participants. The emphasis in the interview was on learning from participants' experiences before and during the course of moving (and hence any behavioural intentions) rather than only of their choice outcomes beyond the move. At the end of the interview participants were asked to raise any important issues regarding their move or travel behaviour that they felt had not been covered.

5.5 Data collection

5.5.1 Safety and ethics

The safety of the interviewer was paramount at all times. The resources were not available for the interviewer to be accompanied, so the researcher carried a mobile phone and the 'buddy' system was implemented. A pre-arranged contact or 'buddy' is informed as the interviewer both arrives and departs from each interview so that the interviewer's whereabouts is known throughout (Craig, 2000). Participants are made aware of this system in order to deter any potential undesirable behaviour. It was also possible within the timescale of the research for interviews to be carried out in the summer. This improved the safety of evening interviews with them being conducted in daylight. Other options such as telephone interviews had been considered, but were felt to lose much of the rapport between the interviewer and interviewee, which was a key requirement of improving participant recall during the interview (Dex, 2003).

The nature of the interviews was unlikely to be of a sensitive nature or cause potential stress to participants, but they were informed that they had the right to withdraw at any stage and that the data collected would be anonymised in reporting.

5.5.2 The interview

Through the combination of a press release and snowballing from acquaintances, individuals representing eleven households agreed to participate in an interview. All participants met the

basic requirements of having purchased a house in or around Bristol to which they had recently moved. Interviews were conducted in the participants own home, their workplace, or in a room booked on the university site, as was convenient to the participant, and were of approximately one hour's duration. All topics in the interview topic-guide (see Appendix 3) were covered, although not necessarily in the order presented. Maintaining a good flow of conversation was deemed to be of more importance than a strict adherence to the topic-guide, so the order was often altered in the interests of conversation. All interviews were audio recorded using either a laptop with a microphone and *Audacity* software, or a digital audio recorder. They were then transcribed by the researcher, using *Express Scribe* software, which is freely available on the internet⁷.

All interviews bar one were conducted with one household member only. Nearly half of the interviewees were in single person households (which slightly reduces the range of experiences recorded). However for the remainder attempts had been made to involve as many of the household members as possible, the importance of taking the household as a unit of analysis, particularly with decision-making, has already been discussed (Jones, 1979; Seavers, 1999). It often proved too difficult to arrange a time and place suitable for all household members to participate. The most convenient time to be interviewed was frequently at work in the lunch break, therefore additional household members were not available.

The exception to this was the one family in the study, who were interviewed together, mother, father and daughter. It was very useful to witness the debates among the household over what was done and reasons why. It gave the opportunity of more factual aspects to be recalled by three memories, and therefore if one made a mistake, another could correct, providing greater accuracy of details recalled. It was therefore unfortunate that it was not possible to interview more households together. The recruitment difficulties have already been discussed and it was acknowledged that necessitating all adult household members to participate would further limit participation in the study. Nevertheless, the participants recruited provided an interesting range of circumstances which will now be summarised before presenting and examining findings from the interviews in detail in Chapter 6.

⁷ See reference list for details of both software packages.

5.6 The Interview Participants

The study participants provided extremely interesting and varied accounts of their experiences relating to moving house and travel behaviour. A summary of each participant households’ ‘moving story’ is included as Appendix 4 and participants’ details are summarised in Table 5.1.

Table 5.1: Characteristics of study participants

Participant	Age	Sex	Household composition	Car owner	Distance of move (miles)	Time since move at time of interview (months)
1	25	F	Single	Y	<1	2
2	30	F	Single	Y	12	9
3	38	F	Single	Y	2	10
4	27	F	Couple	Y	11	11
5	28	M	Single	N	22	1
6	26	F	Couple	N	2.5	2.5
7	58	M	Couple	Y	3	10
8	25	F	Couple	N	95	0.5
9	27	F	Single	Y	4	8
10	32	M	Couple	Y	14	6
11	45	MFF	Family	Y	365	8

It can be seen from the table that the study participants were mainly part of a couple or from single households. It is unfortunate that more families could not be persuaded to participate. However given the recruitment difficulties outlined earlier this proved difficult to avoid, and households with children are generally less likely to have spare time to volunteer. Additionally the majority of participants were in their mid-twenties or early thirties. Younger households have higher rates of residential mobility (Clark and Davies Withers, 1999), so this may go some way to explaining the deficit in older participants.

With this small sample the aim was not to gain a representative picture of the home-moving population, but rather to gain key insights into the sorts of experiences relating to travel choices and underlying behavioural processes. As will be seen in the following chapter it can be argued that the sample recruited achieved these aims.

Despite concerns over recall, it transpired that participants were confidently able to remember their behaviour and decision making up to 12 months ago. (There can of course be no objective test of the accuracy of this recall). Moves many years previously were often referred to in vivid detail. This is likely to be because the behaviours under question are particularly

memorable, albeit for different reasons. Daily travel is carried out everyday for many years, and is therefore likely to be remembered due to its frequent repetition. On the other hand purchasing a house is not often a decision taken lightly, and such momentous decisions are likely to be highly salient, and therefore also well recalled (Sudman, 2003). From Table 5.1 it can be seen that there is variation among participants in the time elapsed since the move occurred. This presents the possibility of comparing the different accounts of post-move travel and examining how quickly new habits might develop.

Despite potential limitations associated with the restricted recruitment of the sample of interviews secured, a rich variety of moving circumstances, experiences, and influences on travel behaviour was obtained. Differing motivations for the move, distances of move, familiarity with Bristol, and levels of car ownership (for example) were reported by participants. Not all of this detail can be illustrated in a table, therefore detail of the ‘moving storylines’ for each participant household are included as Appendix 4.

The interview transcripts were analysed according to principles of Thematic analysis (c.f. Braun and Clark, 2006). The transcripts were read and re-read to develop themes, and sections then coded according to their content with the help of *Nvivo* software. The intention was for codes to be grouped together into a number of themes which would form the basis of analysis and discussion of the results. This however proved to be an evolving process, as the initial themes were flexible and eventually facilitated the development of a single conceptual framework. It is this framework rather than a series of themes which constitutes the majority of the results from the interviews to be presented in the following chapter.

5.7 Chapter summary

This chapter has detailed the methodological considerations and steps implemented in a piece of exploratory research aiming to improve understanding of the relationships between residential relocation and travel behaviour. In-depth qualitative interviews were conducted with members of 11 recently moved households in Bristol, that were recruited through a combination of a press release to the local media and snowballing. Despite the many challenges faced, particularly in determining an appropriate recruitment technique, the participant experiences obtained appear to be both varying and insightful. Analysis of these accounts will now be examined in the following chapter.

Chapter 6: Part 1 Results: In-depth Interviews

6.1 Overview

This chapter outlines the findings from 11 in-depth interviews carried out with recently moved households in Bristol, UK. Participants' opinions regarding the level of habit in their travel behaviour and changes to their mode use following the move are discussed. Despite the completion of data driven thematic analysis, discussion centres on the finding that the travel outcomes of participant's moves are inextricably linked to their 'consideration of travel issues' during the search and selection of the new property. Specifically differences between deliberate, anticipated and unexpected changes to travel are highlighted. Participant experiences are utilised to develop a conceptual framework of travel considerations throughout the process of moving home. This eight stage process is entitled the Residential Relocation Timeline (RRT).

6.2 Introduction

As highlighted in the previous chapter, the main findings to be presented from the interview results centre around the explicit concept of 'consideration of travel issues' and the development of an eight stage framework over which this consideration could occur during a move. Further 'themes' such as 'planning, organisation and flexibility' and 'availability of mode options' were developed during the analysis, but will not be discussed separately as they are largely incorporated into discussion of the framework. The first section of the chapter however briefly examines some interesting findings regarding the participants' views of habits, which naturally formed a specific theme of the analysis. This is followed by examination of the extent of travel mode change occurring within the sample, leading to the discussion of consideration of travel issues.

6.3 Travel Habits

As detailed in Chapter 5 (Section 5.4.1.3) travel habits formed much of the interview discussion as the intention was to establish whether or not participants felt their travel was habitual both prior to and post move. This was in order to assess the level of changes to *habitual* behaviour surrounding the move. During the interviews, discussion largely (at least initially) focussed on travel ‘routines’ as this term was felt to be less ambiguous and more straightforward than ‘habit’, which could be interpreted in a number of ways (see Chapter 2). Habits however were eventually discussed and it was deemed necessary to establish from interview participants what they understood from the two terms ‘habit’ and ‘routine’ in order to clarify any subsequent discussion. The resulting comments raised a number of interesting points regarding notions of habits which will briefly be introduced before discussion returns to the level of habit in participants’ travel behaviour.

Perceived differences between habits and routines proved especially insightful. Participants felt that the main difference between habit and routine was the level of consciousness required. Habits were perceived to be more unconscious and difficult to change than routines. Additional suggestions of differences included that routines were also linked to time, and represented pressure from an external force, whereas habits were more internal, human, and personal; in that a machine could have a routine, but not a habit. Responses however varied greatly, suggesting that the distinction between habits and routines is not that clear-cut. Participant 3 provided the following description of a habit which is both detailed and typical of additional participants’ definitions:

“I think it’s something you just do routinely,.... it’s kind of automatic, you don’t have to consciously think about what you’re doing, you just.... you know, you’re doing it before you realise what you did.”

[Participant 3]

Subsequent to this discussion of definitions, Verplanken and Orbell’s (2003) self-report habit measure¹ was introduced as a framework for discussion regarding travel habits pre and post move. This was in order to ensure that discussion of all dimensions of habit (frequency, lack of thought, etc) were included. The majority of interview participants felt that their travel,

¹ See a copy within the interview topic guide, Appendix 3.

particularly the commute, was habitual. For example, Participants 2 and 3 stressed the lack of thought involved in their 'decisions' to drive to work:

"If I was to think about it, I mean I could like, like I could be cycling to work at the moment. But it's just habit. I just go and get into the car and.... First thing in the morning..... you know"

[Participant 3]

"I mean you know, certainly taking the car and driving away and coming to work, I do it without thinking about it, and I do it frequently. Yes. And that's er..... It doesn't change, my behaviour"

[Participant 2]

The most habitual was Participant 1. For her, alternative modes to the private car, other than taxis when socialising, were never used. She had no desire to use other modes and by her own admission her travel was extremely habitual:

"Because I always use my car, and I don't think about it."

[Participant 1]

The least habitual was Participant 4 who did not feel that her travel post move travel was habitual as she continued to try a variety of modes (she had however used only one mode pre-move). To her, habit was a negative thing. This highlights the potential emotional dimensions of habits and routines:

"I hate routine. I think I find routine very frightening. But that's only myself. I suspect many people like their routine."

[Participant 4]

Conversely other participants demonstrated the positive dimensions of habits; that the correct habit could be a beneficial thing to have:

"I also want to start cycling cos I need to get fitter, so... I'd like to think that that becomes my habit."

[Participant 2]

These findings regarding both positive and negative views of routine or habitual behaviour begin to suggest that to a certain extent the level of habit could be linked to personality variables. The interviews have uncovered various dimensions of interest regarding the habit concept. These include associations between positive and negative emotions, and differences between habits and routines. These dimensions require both further discussion and examination. However, given limited space and the specific aims of the research (see Chapter 4), discussion returns to focus on travel behaviour change in the context of habits, rather than the habit concept itself. The habit *concept* will be revisited in the final chapter of the thesis. In line with the original research aims this section has however established that the majority of study participants felt their travel to be habitual, and that therefore any travel behaviour change reported surrounding the move is indeed a change to *habitual* behaviour. The extent of travel behaviour change and habit weakening among the participants will now be examined.

6.4 Mode change since the move

In order to most effectively examine travel behaviour change surrounding the participants' moves, it was decided to focus on mode choice alone as this is the dimension of travel behaviour most clearly linked with habits. In addition to this a particular focus on commute mode was selected, as the commute is generally the most regular and repetitive journey, and therefore the most likely to be or become habitual. It also remains the journey type most associated with peak period urban congestion and hence of interest to transport planners and policymakers. Any changes to the commute mode choices of the interview participants from before to after moving are therefore of particular interest to the study.

Table 6.1 highlights participant commute mode usage both before and after residential relocation. Both usual main mode used and any additional modes regularly used are included. The numbers in the table refer to participant ID numbers as allocated in the previous chapter (see Table 5.1). The table highlights that two participants (6 and 10) have more than one main usual commute mode: Participant 6 generally takes a lift to work from her partner, but then walks home as they finish at different times; while Participant 10 prefers to cycle (post-move) or use the train (pre-move), but regularly has too many papers to carry to enable easy use of either of these modes, and therefore drives. Many participants reported a usual main mode but occasionally use an alternative. For example Participant 3 usually drives to work but occasionally works from home. Kenyon and Lyons (2003) suggest that the majority of individuals generally have a primary and a default mode choice, and that both of these can be

considered habitual as the default is *automatically* used whenever the primary mode becomes unavailable for whatever reason. Therefore the use of two modes does not preclude the involvement of habit.

Table 6.1: Participants commute mode choice before and after moving (numbers refer participant IDs as allocated in Table 5.1)

Previous mode	Mode at time of interview						
	car	car lift	walk	cycle	bus	train	no travel
car	1, 2, 3, 7, 9, 10		2	9			
car lift	11	7		11			
walk	4	6	6		4	4	
cycle							
bus							
train				10	5, 8, 10		
no travel	2				8		3
Shaded cells = no mode change; bold = usual means of travel; <i>italic</i> = occasional alternative means of travel							

Six changes to ‘usual’ means of travel and nine ‘alternative’ mode changes occurred among the 11 study participants. It is helpful to recall that this occurred in the absence of any intervention to promote travel alternatives or encourage behaviour change. Such a substantial incidence of change lends support to the hypothesis that moving house is likely to induce travel behaviour change². Given that the majority of the participants reported that their travel behaviour, in particular the commute, had indeed been habitual prior to moving (as discussed in Section 6.3); this also provides support for the suggestion of travel habit weakening associated with a home move. It is not possible for habitual behaviour to change to this extent without the habit first breaking/ weakening.

² Participants had been asked to mention any other factors they felt may have influenced their travel behaviour over the time period of their move. Only Participant 10 identified such an external cause. This related to the ‘natural’ variation in his commute travel patterns between university term time and university holidays. He had moved to Bristol from a nearby city and had not changed employer. Prior to the move it had been term time, and post move it was the holidays (at the time of interview) so he had greater flexibility regarding the frequency and time of day of his travel to work (and had not yet experienced post-move, term-time commuting). This was taken into account in the remaining discussion with him, and also during the analysis of this interview.

It can also be seen from Table 6.1 that mode change tends to occur to those using public transport and slow modes (walking and cycling) prior to the move. Those commuting as car drivers tended to continue doing so after the move. This may be linked to the fact that public transport users are reliant on services being available (and providing suitable levels of service) and walkers and cyclists are reliant on distances being appropriate, whereas car drivers are not. The availability and feasibility of mode options is likely to alter having moved home, which will be a contributory factor in any mode switch. Car use is typically less reliant on ‘availability’ and level of service (this relates only to the quality of the road network, its management and the levels of traffic), and is also not substantially restricted by distance of journey.

6.4.1.1 Types of mode change

Analysis of participant discussion of these mode changes revealed three ‘types’ of mode change within the sample: Deliberate, anticipated and unexpected. For example, Participant 10 had moved (with his partner) largely in order to facilitate cycling to work:

It seemed sensible to move to Bristol so he could walk to work and then I could cycle to work, cos cycling to Bristol from Bath was just too long.

[Participant 10]

This is an example of *deliberate* change to travel as the move was designed around this desired travel change. Alternatively, Participant 4 had realised that moving away from the city centre would necessitate a change from her usual mode of walking. This was however a necessary evil of getting on the property ladder, and therefore an *anticipated* (but not deliberate) change in mode. Finally *unexpected* changes to travel also occurred, for example Participant 9 discovered a cycle path near her new house and was thus prompted to cycle to work on occasion; or Participant 6 who prior to moving expected to continue walking to work, but having moved in with a partner who drove to town, regularly found herself getting a lift.

The recognition of these differences in the *types* of changes to travel behaviour surrounding a home move was crucial in terms of the direction taken for the remaining analysis. It led to the identification of a key influence on the process of travel behaviour change, as associated with a home move, which will be further detailed in the following section.

6.5 Consideration of travel and habit weakening

6.5.1 Planning for travel changes

The key factor differentiating between the three types of mode changes identified in the previous section was surmised to be the *level of planning* for travel during the move process itself, the search and selection of the property. Deliberate changes were highly planned, anticipated marginally planned, and unexpected changes not planned at all prior to the move. This process of *planning* can in turn be linked to the habit concept.

The occurrence of planning for change (a decidedly conscious behaviour) implies the absence of strong habit surrounding those behaviours for which a change was planned, as a habit is by definition a non-considered behaviour. That this habit weakening, or breaking occurs is evidenced by the eventual change in behaviour achieved (examples of which were outlined in Section 6.4). The process behind habit breaking and travel behaviour change surrounding a move therefore involves *planning* for that change (be it ‘deliberate’ or ‘anticipated’ change), as prompted by the decision to move home³. This clearly involves a ‘raising in consciousness’ of the habitual behaviour (Ouellette and Wood, 1998), which in fact occurs triggered by the *anticipation* of a ‘change in situational context’. These are the two key elements involved in breaking habits, as identified by Ouellette and Wood, (1998). The ‘unexpected’ changes to travel are slightly different as they involve no planning and result from the relocation itself. They are therefore an example of the ‘change in situational context’ breaking habitual behaviour (Ouellette and Wood, 1998).

6.5.2 Considering travel changes

Participant experiences also highlight that not all ‘planning’ for behaviour change results in eventual change. For example, Participant 7 wished to move where he could walk to the shops and city centre, however enforced trade-offs in property selection eventually meant this was not possible, and he eventually continued to drive. A further example is provided by Participant 3, who considered cycling to work:

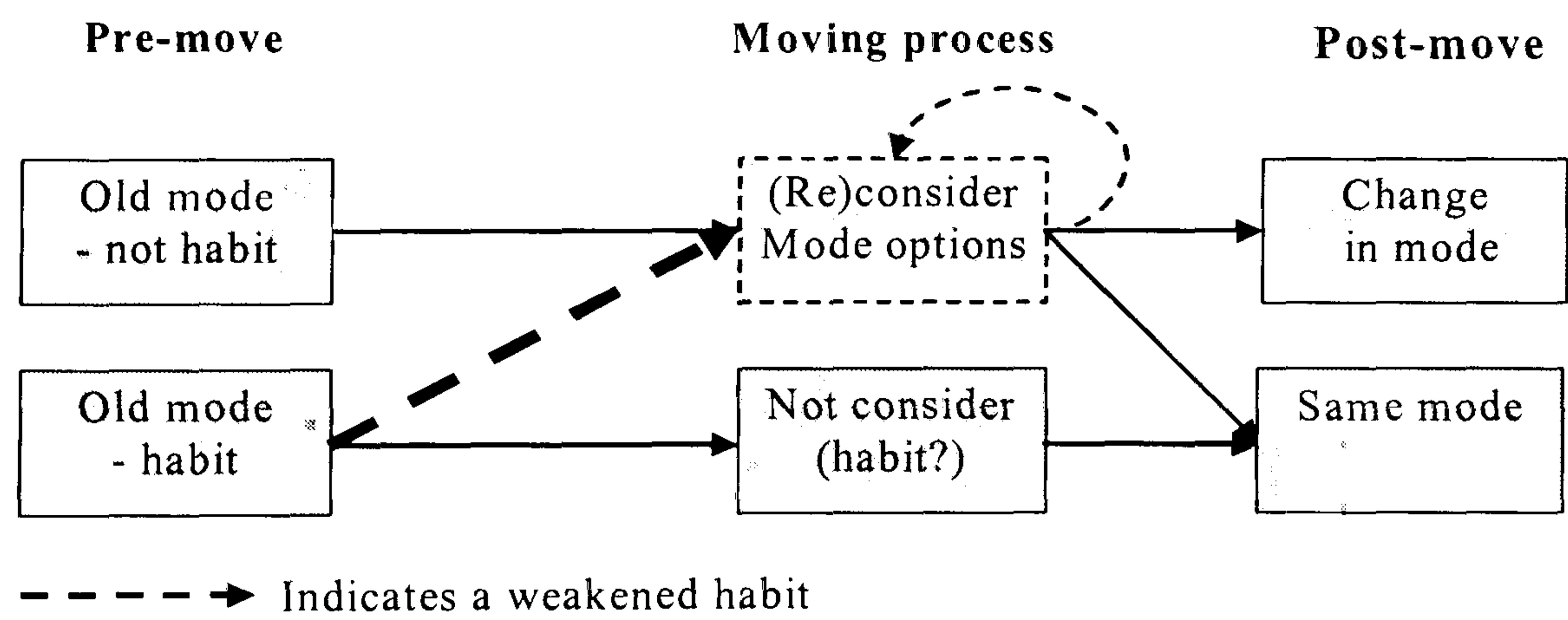
“If I was moving over this way, in theory I can cycle to work. My idea was that I’d get back into cycling.(it) hasn’t particularly happened yet.”

[Participant 3]

As can be seen in Table 6.1, Participant 3 continued to drive to work after her move, occasionally also working from home as she had done prior to the move. Nevertheless, ‘planning’ or more appropriately in this case ‘consideration’ of change has occurred and therefore this travel habit has been weakened despite no eventual behaviour change⁴. This therefore suggests that travel habits surrounding a move are likely to have been weakened to a greater extent than would be evidenced by the amount of behaviour change recorded.

‘Consideration’ of travel change is a more appropriate term to utilise than ‘planning’ as it covers a wide range of conscious thoughts regarding travel (all of which, by their very definition would constitute habit weakening), including situations where travel is not necessarily specifically planned for, as in the above example of Participant 3. It can also incorporate ‘unexpected’ changes to travel as these would still require some *consideration* in order to occur. Consideration of travel change therefore provides evidence of weakened habit, and is a key precursor to any travel behaviour change.

Figure 6.1: Consideration of alternative mode options and actual mode change prompted by a house move.



³ Unless of course it was the decision to change travel that prompted the home move, as has already been discussed, and will be discussed further.

⁴ As highlighted in Section 6.3participants, including Participant 3, did generally feel that their pre-move travel had been habitual, therefore it is possible to interpret this as habit weakening rather than simply absence of habit.

Figure 6.1 illustrates the process of residential relocation prompting travel consideration and ultimately travel mode change. Pre-move, travel behaviour might be habitual or non-habitual. If it is non-habitual then mode choice is likely to be considered over the course of a move. This may or may not result in a change of mode, as the pre-move mode may again be chosen. Habitual mode choices might on the other hand remain largely unconscious and non-considered, in which case no mode change would occur. This can be altered by the moving process prompting consideration of previously habitual mode choices, thus breaking or weakening habits. This is indicated by the dashed line in Figure 6.1. The dotted feedback loop illustrates how mode intentions can alter over the course of a move. This new consideration also may or may not result in a change of mode – this depends on the specific circumstances involved.

Where travel mode has been considered, lack of behaviour change following this conscious deliberation is likely to reflect a positive and informed re-selection of the same mode. Lack of behaviour change therefore cannot be judged as an ‘unsuccessful’ outcome in terms of travel behaviour. Explanations reasons for lack of behaviour change despite its consideration also include ‘laziness’; the explanation provided by Participant 3 for not completing her previously outlined intention to cycle to work. Nevertheless, the act of consideration of alternative modes implies that these decisions are consciously chosen and habit is not influencing the choice. Significantly this also suggests that any behaviour change interventions implemented at such times will have greater potential for success. They would not face the ‘barrier to change’ of habits. The extent of consideration of travel changes reported by the interview participants begins to suggest that a residential relocation may indeed be a potentially effective time to target behaviour change interventions. It is possible, for example, that given additional assistance, Participant 3 could have been encouraged to achieve her aim of cycling to work following her move.

‘Consideration of travel issues’ is therefore established as a concept of key interest to the research. The emergence of this important finding has been facilitated by a research approach focussing on processes rather than outcome alone. For example, the mode choice outcomes for Participant 3 suggest the move had no influence on her travel behaviour (see Table 6.1), which the earlier quotation demonstrates is not the case. This key change to a previous status quo, of huge interest to promotion of behaviour change would have been missed by focus on outcomes alone. Given the importance of this conclusion to the remainder of the research it is important to examine ‘consideration of travel’ more thoroughly before the concept is developed further in Section 6.6.

Consideration of travel change during the moving process has been established as a key part of the process linking residential relocation to travel behaviour change. The occurrence of consideration of travel change alone can be argued to provide evidence for the ‘absence’ of strong travel habits, as by definition habits are non-considered behaviours. The term ‘absence’ is used in reference to the fact that not *all* pre-move travel is necessarily habitual (although most of it is assumed to be – eg Verplanken et al, 1994), therefore to use ‘broken’ or ‘weakened’ habit in a general context would not be strictly correct⁵ unless the presence of habit prior to the ‘consideration of change’ had been established. Nevertheless it has indeed been established that the interview participants felt their pre-move travel to be habitual and it is therefore appropriate to discuss weakened habits in relation to their experiences. Regardless of how it is described, ‘consideration of change’ provides evidence that no strong barrier to behaviour change (formed by habits) is present, which is the key feature of interest in the promotion of behaviour change.

Thus far examples of travel consideration have focussed on consideration of (mode) *change* implying weakened habit (for the participants). It is additionally likely that many households would consider travel issues when selecting a new home, in order to *avoid* changing their travel behaviour. Participant 1’s prioritisation of parking availability for a new home in order to ensure easy use of her car is an example. Such consideration is clearly not likely to lead to behaviour change (habit breaking). However, the behaviour is still raised in consciousness and therefore it can be argued that habit is also weakened (Ouellette and Wood, 1998), albeit not as strongly weakened as consideration of alternative travel behaviours would imply. It is therefore argued that *any* reported consideration of travel behaviour (not necessarily consideration of change) involves a level of habit weakening.

Despite this argument, ten out of the eleven study participants did discuss consideration of *alternative* modes for at least one journey purpose, suggesting that moving home *does* prompt *reconsideration* of travel mode choice(s). However it must additionally be noted that the interview sample were largely ‘self-selected’, i.e. they were all volunteers, and there is

⁵ The term ‘absence’ can also be questioned due to ambiguities over the precise definition of what constitutes habitual behaviour. However discussing the ‘absence of *strong* habits’ covers for this issue, as will be discussed further in Chapter 10.

therefore the potential for bias towards greater interest in travel issues, and thus greater consideration of alternative travel options.

6.5.2.2 Habit development

It is important to stress that no attempt is made to suggest that following a home move travel habits are weakened for any period of time, or that all travel habits will be affected. The time taken for new habits to develop is unknown, but according to participants is unlikely to be long. Participant 5 felt his 'routine' had become habitual in "*about two days*", and Participant 8 provides the following example of how quickly after a move new travel habits can develop:

"Every morning for some reason I get the 70 (bus) rather than the 99 (bus). I don't know why cos the 99s actually closer. But I do kind of just walk, walk out of my flat and then walk towards that bus stop, for no apparent reason. So I suppose, that's, that's turning into habit and I'm only Only had to do it a few, well I suppose a handful of times. And I started doing it."

[Participant 8]

From participant experiences it would seem that two factors appear to potentially heighten the speed of habit development. Firstly where little behaviour change has occurred, such as for Participant 9 whose habitual routine developed "*from day one really*" as she had not changed mode, despite considering the bus. The second situation is where the new 'routine' had been extensively planned prior to moving, as for Participant 5: "*Ooh about two days, but I knew it was gonna be the routine*". It is therefore suggested that habits are likely only to be temporarily weakened surrounding a move, and a question remains over just how long they may be weakened for.

6.5.3 Summary of habits and mode change

Thus far it has been established that the majority of interview participants felt that their travel behaviour was to a certain extent habitual, and a large proportion also experienced mode change following their move. A focus on three different 'types' of mode switch following a move (deliberate, anticipated and unexpected) has given rise to the importance of 'consideration of travel issues' in weakening habitual travel behaviour. This notion has been

examined thoroughly in the section, in order to clarify any potential ambiguities in what is to remain a key concept throughout the research.

6.6 The Residential Relocation Timeline of travel consideration

Analysis of the interviews has provided yet further development of the concept of ‘travel considerations’ involved in travel behaviour change surrounding a home move. In line with the ‘types’ of mode change identified in Section 6.4.1.1 it was realised that consideration of travel issues could occur at different stages of the moving process, with varying potential outcomes. A conceptual framework has been developed accordingly which will be detailed in this final section of the chapter.

The conceptual framework has been entitled the Residential Relocation Timeline, or RRT. This is a series of 8 stages during the moving process at which travel issues might be considered. It is stressed that these stages are *possibilities* of where consideration might occur. Travel could be considered at all, none or some of the stages. The Stages are outlined in Figure 6.2, and will be introduced in more detail shortly. It will be argued that the *timing* of consideration of travel issues during the move, (as identified from these Stages), is highly significant, as it is likely to influence both the travel outcomes and *potential* travel outcomes of a move.

The RRT stages are closely related to those of Brown and Moore (1970) in that the move is separated into prompt, search and selection. However, in the RRT far more detailed stages are discussed, and the stages continue after the selection and the actual relocation has occurred. Unlike those of Brown and Moore (1979).

Figure 6.2: The Residential Relocation Timeline – a conceptual timeline of points at which travel behaviour could be considered during the house move process.

RRT Stage	Stage of move	Explanation (for the example of travel mode choice)
Stage 1: The prompt for the move	Prompt	A house move is prompted by desire to change travel mode, for example a desire to be able to cycle into work.
Stage 2: The selection of search criteria	Search	Travel mode is considered at the start of the search process, for example a desire to have access to a bus into town.
Stage 3: The selection of areas to search	Search	Travel mode is considered when selecting areas in which to search for property – for example areas with a train station
Stage 4: Whilst viewing properties	Search	Travel mode is considered during the search process, eg the realisation upon viewing that the area would not be suitable for walking in.
Stage 5: Prior to final selection	Selection	Mode choice options are considered immediately prior to purchase, eg a confirmation that required destinations will be accessible from the property.
Stage 6: Prior to move (after offer accepted)	Selection	Mode choice is thought about after the purchase but prior to the move, in terms of planning future travel from the new home.
Stage 7: Post Move	Post move	Mode choice options are considered having moved in, for example considering the most appropriate mode for grocery shopping from the new home.
Stage 8: After some time in the home	Post move	Mode choice is reconsidered after a period of being in the new home, for example frustration with unexpected levels of congestion.

It is necessary to note that the initial RRT framework as developed from these interviews contained only seven stages. The value of separating Stage 2 of the original RRT into two separate stages was highlighted by the pilot work for the subsequent survey research, to be detailed in the following chapters⁶. The RRT is introduced here with its final stage numberings in order to avoid later confusion.

Following the RRT summary presented in Figure 6.2, each of the Stages will now be detailed in turn utilising participant examples to highlight key features of the stage. The majority of

⁶ See Chapter 7, Section 7.6.1.1.2 for more detailed discussion regarding this decision. See Stanbridge, Lyons and Farthing (2004) for an outline of the original seven stages.

these examples will continue to focus on mode choice as this is the travel behaviour most clearly linked to habits, however additional travel behaviours will also be discussed where appropriate. The discussion begins with Stage 1, the prompt for the move.

Stage 1: Travel as a prompt for a move

The first Stage at which travel may be considered along the RRT occurs at the very start of the moving process. Travel issues may in fact prompt the initial decision to search for a new property, as discussed in Chapter 3. Only one of the participant households considered mode choice as a prompt for the move:

“The expense of getting the train...financially it was an issue. I wanted to go back to cycling again. ...so. If anything, probably transport was the biggest factor in making us move cos we actually quite liked the house ... Just the wrong place for work.”

[Participant 10]

Consideration of mode choice as a prompt for a move implies that attaining availability of alternative mode options will be a high priority during the search and selection processes. Ensuring the new house is near a bus stop if bus is the desired mode, or moving near enough to cycle to work, as was Participant 10’s intention. It seems likely that if mode choice or other travel consideration was a primary determinant of moving home, such criteria would not become compromised; the eventual new property would enable the desired mode(s) to be used. This was indeed the case for Participant 10, who as can be seen in Table 6.1, cycled to work at the time of interview. The *priority* given to having alternative mode options available at any stage in the process plays a significant role in the outcome for mode choice, as shall be seen in discussion of later stages.

Stage 2: Selection of search criteria

The second (and third) stage of a move at which travel may be considered is during the development of the household’s search criteria. Consideration of travel issues at Stage 2 of the RRT reflects the households’ decision making regarding desired travel behaviours (particular destinations, modes etc) and how these could be achieved, by implementing particular search criteria. For example:

“a safe area 30 minutes walk, or 40 minutes walk from the centre of the city was crucial to me.”

[Participant 6]

This travel consideration would occur in conjunction with identifying all search priorities for a new property, for example, number of rooms, style of building, type of area and price. In the selection of actual search criteria, the household must distinguish between various, often conflicting priorities. For example, Participant 4 would ideally have continued living in the urban centre, where she was able to walk everywhere. However, buying in the centre would not have been possible due to the expense:

“at least 4 people in the office, if not more, everyday cycle, or walk. But then they don’t own their house so... We had to make a choice somewhere, I couldn’t afford a house in Bristol so, we need to make a compromise sometimes, and that’s the choice we took really.”

[Participant 4]

Thus the higher priority of buying a home meant that a desired travel behaviour (walking to work), although briefly considered, did not eventually form part of the search criteria.

A similar early compromise was made by Participant 5, although for different reasons. For him a desire to walk to work was also an ideal, and as he did not work in the centre this would have been financially feasible. However, this was discounted as an option due to his general dislike of the residential areas surrounding his workplace:

“Cos I don’t like any of the areas round university. They’re horrible. You know, I’m quite up for quality of life and the quality of life, apart from work, around this area’s not what I’d like. It’s, you know, none of my friends live round here. And, there’s no, probably no quite good pubs or anything, cinemas etcetera. And I think very much it’s kind of the place where you really need a car. Um... in order to be able to do anything. And I just didn’t even consider living here really, for more than about a split second.”

[Participant 5]

Thus compromises are already occurring before the search process has actually begun. Such unattainable ideals may nevertheless be significant insofar as providing insights into an

individual's propensity to change travel behaviour and achieve their aims if provided with additional help and interventions.

Participants did not only report *compromising* their travel ideals, many travel related search criteria were also discussed. Participant 5, having eliminated the possibility of walking to work, decided to focus on commuting by bus, only searching in areas within a 15-minute walk of a bus route to his work. Thus his property search was designed around his intended mode:

"I very specifically targeted houses that were on the 99 or number 70 route."

[Participant 5]

Other participants also considered their travel, and in particular mode options at this point on the RRT, and designed their property search around this:

"Because I, I don't drive, then I had to be kind of on a bus, well yeah, really had to be on a bus route, or in cycling distance to work."

[Participant 8]

"We were only looking in [a central area of Bristol], because we wanted to be in the city, for two reasons I suppose. One, to use the city, but also for accessibility purposes, being able to walk to quite a lot of things."

[Participant 7]

Thus consideration of travel issues in the selection of search criteria appears to have a potentially significant impact on the eventual housing choice. Priorities for bus use were frequently mentioned, which corroborates with the findings of Hunt et al, (1994) that for those households wishing to use public transport this would have a significant influence on the property selection, as discussed in Chapter 3. There is however no suggestion that all households would consider their mode options at this stage: that so many of the study participants did could possibly be a reflection of the voluntary nature of the recruitment method. They may have been motivated to respond and participate by some existing interest in transport issues, and therefore be likely to consider their own mode choice at the earliest opportunity. Only further research will determine if this is the case or not.

Stage 3: Selection of areas to search

As mentioned previously, the third stage of the RRT was an addition subsequent to the analysis of the interview participants' experiences. The selection of areas in which to search was initially considered as part of the search criteria, and has therefore been discussed under the previous stage. However in later chapters it will be considered separately. For the majority of interview participants clear preferences regarding the criteria to be met in terms of area were observed, and therefore discussion of search criteria generally included discussion of areas selected. For many participants of the survey pilot study this did not appear to be the case, as will be discussed in more detail in Section 7.6.1.1.2.

Stage 4: Whilst viewing properties

The fourth point of consideration on the RRT is also part of the search process, but occurs during, as opposed to at the beginning, of the search. Consideration of travel issues is prompted by some experience of the search process itself, possibly altering some originally held priorities or search criteria, transport related or otherwise. For study participants this was mostly connected to a realisation of the levels of traffic on the route from the more affordable residential areas of the city to their workplace. Both Participants 2 and 3 worked in the north of Bristol, however the area south of the centre is generally more affordable. For Participant 2 it was the *visits* to prospective properties in the south of Bristol that prompted her reconsideration of how far she was prepared to commute to work, thereby increasing the priority she gave to proximity to workplace:

“The reason why I didn’t buy in the south of Bristol was because of the very poor traffic conditions in Bristol. Just going there and visiting the house was already a nightmare, so that really put me off.”

[Participant 2]

Participant 3 describes how a similar realisation and priority modification actually lead to the consideration of alternative travel modes as has previously been mentioned:

“at first I started looking south of the river, because I thought it'd be cheaper. I'd be driving and I realised I'd be stuck in that traffic. If I was moving over this way [north Bristol], in theory I can cycle to work. I felt if I moved south of the river I would be really reliant on the traffic and my car, did I really want to be doing that?”

[Participant 3]

Neither Participant 2 nor 3 had considered their travel prior to this stage – as can be seen they both initially intended to drive, so had no specific need to (Hunt et al, 1994; van Wee et al, 2002). However consideration of travel at Stage 4 had significant implications for their moving experiences. Additional examples of issues which could be raised by the search process and prompt consideration of travel issues at Stage 4 include the unreliability of a particular train service, or the inability to find a house that meets all the required search criteria.

6.6.1.1 Summary of the search process

It is clear that different study participants considered travel issues as prompting their move; in the selection of their search criteria; and reconsidered travel issues as prompted by the actual process of viewing potential properties. For some participants this involved the creation of specific decisions and plans as to how they intended to travel from a new home; for example plans to commute by bus. As will now be seen, for some participants these plans or intentions were seen through into action, and for others they were altered at later stages of the move, during the selection and actual move stages.

Stage 5: Prior to placing an offer

The fifth stage of the RRT, is part of the property selection stage of moving home – occurring at the point when a property is seriously considered as a potential new home, but prior to any purchase decision. Availability and viability of an individual's required travel options associated with the potential new home may be considered, and there is the potential for the property to be rejected if the requirements are not met.

Having ruled out the possibility of walking at Stage 2 (due to the greater search priority of *purchasing* a home), Participant 4 had a general desire for a variety of travel options to be

available. Such a general aim could not guide the *search* process, but could influence the final selection of a property.

“I remember at the beginning when we still didn’t put the offer on or anything. We went from the house, we drove from the house to the train station. Cos I didn’t know the area, I asked (my partner) to do that to show me how easy it is.”

[Participant 4]

For some participants, consideration at Stage 5 was just to confirm earlier decisions or availability of options, as above. However, this was the first, and only stage of travel consideration for study Participant 1. For her it was not to consider alternative modes, but to check that her current mode could be maintained if she bought the property.

“I would say that definitely a parking issue came up. When I was looking at flats across more congested areas of Bristol, parking was a problem. And in this particular flat it wasn’t.”

[Participant 1]

As previously mentioned in Section 6.3 this participant was a strongly habitual car user, and as discussed in Section 6.5 this example of some mode consideration reflects only a mildly weakened (rather than potentially broken) habit due to the raising in consciousness of the behaviour required to consider parking.

Consideration at Stage 5 also provides the opportunity for previously prioritised travel modes to become compromised. At Stages 2, 3 and 4 Participant 7 restricted his search to a central location as he wished to be able to walk to destinations. However, following many problems with the actual purchasing of a property, including ‘gazumping’ on two occasions, he was shown by his estate agent a property that met many of his criteria, but was on the edge of the city. Travel priorities were considered before making any decisions:

“(we were used to) being able to walk to quite a lot of things, ... and coming to this (house) we realised we wouldn’t be able to do that.”

[Participant 7]

Eventually this house was purchased and as *anticipated* he was not able to walk to everyday destinations. To what extent such compromise and change to priorities generally occurs cannot be determined from the small sample of this study. Nevertheless this example aptly illustrates how much the final property selection (and resultant travel mode options) can deviate from a person's original intentions. Stage 5 is a key point in the selection (or rejection) of the property – where the availability of mode options, and therefore the choice set of those that can be used, is finally determined.

Stage 6: Prior to move but post selection

Provided the property is not rejected at Stage 5, the final property selection has been made and the property is purchased⁷. From this point forward the majority of mode options available to the household are determined as the property location determines the proximity to bus and train, and amenities within walking and cycling distance. Only vehicle ownership decisions (including motorcycles and car sharing schemes) remain as an option to change future travel options. Nevertheless, consideration of travel issues may occur prior to the actual move. Consideration left until this stage would imply that mode options are not of particular concern to the individual, but that the individual likes to plan ahead and assess how various journeys could be made. In particular, consideration of travel for non-commute journeys may become more prevalent, (as opposed to commute journeys which had entailed the majority of travel considerations during the property search). For example, Participant 5 stated realising that he would be able to walk to shops (once he had moved house) as he would be living in a central location.

Stage 7: Post move

Until the move has taken place it is not possible to see if the travel intentions exhibited at earlier RRT stages will actually lead to the corresponding travel outcomes. For many participants, previous decisions were indeed carried through to action at this stage. Participant 10 did manage to cycle to work after his move, and Participant 5 did get the bus to work as

⁷ Clearly the process is rarely so straightforward – surveys, mortgages, gazumping, vendor's change of mind, etc. are all issues that remain to be faced. Nevertheless, such issues do not constitute travel considerations so are therefore of limited concern to the current study.

planned. In such situations no consideration at Stage 7 is necessary (at least for that journey purpose).

Discussion has already highlighted how travel decisions can change throughout the search and selection stages. They are also liable to change as the household moves home, as for various reasons alterations may occur once the move has taken place. Study participants' experiences of this appear to have been prompted largely by the addition of car as an option for a given journey purpose. Participant 6 designed her house search and move around a desire to be able to walk to work, shops, and leisure destinations. This was an important priority for her as has been shown under discussion of Stage 2. However, as previously discussed in Section 6.4.1.1 she 'unexpectedly' now tends to receive a lift to work each day with her partner (although walks home).

"Having moved to here into a household where there is a car, I'm more likely to rely on it in instances where I know from past experience that I don't need it."

[Participant 6]

She had not planned for or anticipated this change, it just happened once they moved in together.

"I knew I wanted to be in a place where I could walk to work. Just as I always have done. And that, I knew in the back of my mind that (my partner) would be moving in and he had a car, but, I didn't really, take that into consideration."

[Participant 6]

Apart from Participant 6, (and Participant 7 as detailed under Stage 5), other study participants did end up using modes for commute journeys that they had considered (either deliberately planned for, or anticipated) at earlier stages. Even the most habitual car user in the study (Participant 1), considered travel enough to check at an earlier stage that parking would not be a problem. Thus it is suggested that commute travel mode is in general considered prior to the selection process, and is extremely unlikely not to be considered until after the move.

The same however is not true for other journey purposes. As mentioned briefly under Stage 6, other journey purposes generally appear to be given more consideration at the later stages of the timeline (Stages 6, 7, and 8). The key distinction between commute and non-commute journeys may be the specificity of the destination. For the majority of leisure or shopping

destinations it is the activity that is important, not the place, so for example any shop, or any exercise class may be visited (notwithstanding difference in relative attractiveness of the activities available at different destinations). Thus plans on how to reach such activities do not need to be made so early along the RRT, and indeed may not necessarily be considered until after the move, on an ad hoc basis. Despite this, certain specialised leisure activities may in fact have definite locations and would perhaps be considered in a similar way to commute journeys.

Stage 8: After some time in the new home

The final stage of the RRT is where travel behaviour is *reconsidered* after a period of being in the new property. This may be prompted by any number of additional key events, a job move, starting a new hobby, purchasing a new vehicle, etc. However, to conclude the RRT stages, the case of Participant 4 provides examples as to how this may also merely be a reflection of time needed to settle into a ‘routine’ post move.

Participant 4 moved from the centre of Bristol, where she had walked everywhere, to the edge of the city in order that she could afford to get on the property ladder. A number of different modes were tested to access her work in the centre. She owns a car, but was discouraged from driving to work due to lack of parking close to her work and the traffic. She tried the train for a few months and then decided she didn’t really like it, so switched to the bus. Thus her main mode at the time of interview (11 months after relocating) was bus, and the others, which she still used occasionally, were alternative modes (see Table 6.1). This switch appears to be for no other reason than she had yet to settle into a routine since moving that she was happy with. She does however recognise that she is extremely fortunate to have such a variety of modes available to her, particularly since they were not all specifically planned for in the search for a property.

6.6.1.2 Summary of RRT framework

The section has outlined how travel considerations may vary with different stages of the moving process, and how priorities can change at any time, including after the move has taken place. As stressed in the introduction to the RRT, it is by no means suggested that travel would be considered at all, or even any stages in the framework. The RRT merely outlines the possibilities. The interview participants upon whose experiences the RRT has been developed encompassed a variety and range of circumstances surrounding their move and travel

choices⁸. That the RRT has been able to adequately reflect all their experiences suggests the framework is robust. It outlines a potentially insightful process which intuitively all home movers must go through. It is however based on a very limited number of participant experiences which raises questions as to its general applicability that will be further discussed in Section 6.7. Prior to the chapter drawing final conclusions from the interview findings outlined, it firstly remains to introduce discussion of a specific factor which appears from the interview participants' experiences to be influential in determining the level and timing of travel consideration during a move.

6.6.2 Car ownership and travel consideration

The previous section detailed each of the stages of the Residential Relocation Timeline. In terms of what information can be gleaned regarding detail of travel considerations throughout a move, whether or not the household has access to a car appears to constitute an important factor influencing when along the RRT travel is considered.

Those households without access to a car all included travel criteria among their search criteria, whereas those with access to a car did not necessarily do so. Travelling without a car requires that public transport services are available or distances are suitable for walking and cycling. Therefore these issues are necessarily considered in property search and selection. Travelling by car does not require this level of planning as most destinations are accessible by car.

This can be related to the discussion in Chapter 3 (Section 3.5.2.2) regarding the influence of travel mode preferences on moving decisions. Based upon research recognising two types of households with regards to the influence of public transport in property selection (Hunt et al, 1994; van Wee et al, 2002), it was suggested that in fact three types exist: Those for whom public transport access is a necessity; those for whom access to public transport would increase the attractiveness of a property, but for whom it is not crucial; and those for whom access to public transport makes little difference to the attractiveness of a property. Participant 1 is an example of the third type, and it would appear that car ownership may provide the distinction between whether the remaining participants fall under type one or type two.

⁸ See summaries of the participants' 'moving stories' as Appendix 4

The emphasis on car ownership is not to imply that those households who own a car do not wish to use alternative modes; those that do are also likely to plan for these alternatives. However the case of Participant 7's eventual decision to purchase on the edge of the city (where extensive car use would be necessary); despite strong initial motivations for a central property to allow access to amenities on foot; demonstrates the key difference between households with access to a car and those without. Regardless of travel preferences, car ownership implies that any travel preferences (modes or distances) may relatively easily be compromised.

Conversely, Participant 6, who did not own a car, highlights how her high prioritisation of the ability to walk to town would not have allowed such a compromise:

"the location to me was maybe the first priority, because however beautiful a flat was, I wouldn't have bought a flat that was more than an hours walk into town"

[Participant 6]

It would of course possible for the majority of households without access to a car to acquire one should they feel the need to do so, however this is unlikely to be a simple decision due to expense and the initial reasons behind lack of car ownership⁹. Thus car ownership appears to have a significant influence on both the timing at which consideration occurs in the relocation process, and the importance given to maintaining availability of alternative mode options in the face of other competing priorities.

6.7 Summary and Conclusions

This chapter has presented findings based upon 11 in-depth interviews with recently moved households in Bristol, England, regarding the travel related experiences of the home move. Changes to travel mode following the move have been examined (including three different

⁹ Car ownership is currently the norm, particularly in Bristol. Specific motivations are likely to be required for a household that can afford to purchase a home (and therefore presumably a car), not to own a car. Such motivations could include a desire to remain 'environmentally friendly', (Participant 6), a strong dislike of driving and congestion (Participant 5), or health related restrictions on driving (Participant 8).

types of change), and participant perceptions of ‘habit’ briefly discussed. However the main focus of discussion has been the development of the Residential Relocation Timeline (RRT), a conceptual framework of eight stages during the process of moving home at which travel issues might be considered, with varying outcomes for post-move household travel. The concept of ‘travel consideration’ has additionally been detailed.

The development of such a framework was not the initial intention of the research, which merely aimed to explore the travel related experiences of moving home. It would seem that the restricted number of interviews conducted was significant in allowing the researcher to obtain a high level of familiarity with each of the interview participants’ experiences. This contributed greatly to the ability to recognise an overall framework during the initial examination for themes within the data. A strong focus of the interviews in understanding the experiences and processes involved rather than merely the travel outcomes was also clearly influential.

As discussed in Section 6.6.1.2, the RRT appears to be robust due to its ability to adequately reflect the wide range of moving circumstances and travel choices experienced by the participants. The intuitiveness of the process of 8 stages additionally provides support for its general applicability. Nevertheless it is based upon a very limited number of participant experiences, raising questions as to the applicability of the framework to the vast range of moving experiences likely to exist across a wider moving population. It also does not allow for a more extensive assessment and understanding of how the population of home movers maps onto the framework.

Questions raised by the framework development include: For whom and in what circumstances are the stages of consideration relevant? When during the move does most consideration of travel occur? What contributes to initial travel intentions, and the manifestation of such intentions as choice outcomes? What hinders the implementation of intentions, or causes intentions to change? There is also a need to develop further understanding of the factors that are influencing consideration at the various stages of the RRT. Research into such questions should allow better insight into understanding the processes involved in interrelationships between travel and housing choices.

The finding within the chapter that some people change travel modes for particular journey purposes following a home move is perhaps not surprising, although this study joins precious few others in confirming this. What is of greater significance in relation to understanding

travel behaviour and changing behaviour, is the recognition that people are consciously considering the issue of mode choice at one or more points during the course of the moving process. Any travel habits are clearly weakened at such times. Given that the majority of the interview participants felt that their mode choice prior to moving was habitual, this 'consideration' and travel mode change reported provides evidence for linking weakened habits with residential relocation. It is therefore clear that the exploratory interviews outlined in this and the previous chapter have provided both support for the suggestion that residential relocation might be an appropriate occasion at which to focus travel behaviour change interventions, and yielded a potentially insightful framework that has raised numerous questions for further research. These questions will be addressed further in the following chapter.

Chapter 7: Part 2 Methodology: Postal Survey

7.1 Overview

This chapter details the design and implementation of a postal survey of recent movers in Bristol, South-West England. Significant challenges were faced in the design of both the survey instrument and the method of distribution. Accordingly the chapter devotes some time to detailing these challenges and their solutions before reporting details of the households recruited and the response rate achieved.

7.2 Research Design

7.2.1 General focus

The previous chapter has outlined the outcomes of a series of in-depth exploratory interviews examining the hitherto under-researched area of the travel impacts of residential relocation. As per the original objectives of the research, any further research steps were to be guided by the outcomes of this first exploratory examination. Two main directions emerged as possibilities to inform the design of the second part of the research. Firstly the interviews had raised novel issues regarding the concept of habit and what habit ‘means to people’. Turning the research focus to further examine these issues was considered. Secondly a conceptual timeline of ‘consideration of travel issues’ during the move (the RRT) had emerged from the interview participants accounts of their experiences. The concept was felt to be robust and had the potential to provide the framework for improved understanding of how a home move and travel behaviour change might be associated. It was therefore decided that further development and examination of the RRT framework presented the most fruitful route to take. This was due to both the original study aims of examining travel behaviour, and also in terms of potential practical applications of the research. The *potential* for the research findings to have a direct benefit (however small) in improving the transport situation in the UK was an important motivator for the researcher. A summary of the conclusions regarding the habit concept, as based on the interview data, is included in the Chapter 10.

With the focus of the second part of the research confirmed as development of the RRT concept, a number of research possibilities remained. These largely entailed either the continuation of in-depth qualitative work, or a switch to more quantitative approaches. Both paths had merit; however, many varied and different circumstances surrounding a home move exist. It was felt that largely due to this, referencing the experiences of a limited number of participants qualitatively might not provide a sufficiently effective representation of the experiences of the moving population as a whole. As has been outlined in the previous chapters, the in-depth interviews only obtained the experiences of one family, and mainly younger households. It was not possible to know whether the interview participant's experiences were 'normal' or extremely atypical as no reference points existed. The RRT itself however was felt to be fairly robust as the stages are in fact intuitive ones, some or all of which every household must go through in order to move home. Whether each stage is distinguishable from the next for a given household is the factor most likely to differ between households, and the extent to which this applies would only become apparent through examination of a larger number of household moves. A clear aim of the research was therefore to gain the experiences of a wide range of participants.

Additionally, for the research findings to have policy relevance, being able to offer some degree of generalisation in reporting was considered necessary, but not readily achievable through a continuation of an in-depth qualitative approach. It was considered that further in-depth research would be most valuable once a broader, generalised depiction of the area of study had been established. This would allow the pursuit of further depth of understanding to be set within the broader picture. However this is beyond the scope of the current research.

It was therefore decided to examine the RRT further by means of a survey of recent movers. A survey would be able to target a much wider range and larger number of respondents within the time and resource constraints for the current research (only one full-time researcher). This is however generally at the cost of depth. Surveys are useful where the target population is clearly defined so that its members can be unequivocally identified, and where it is likely that the majority of respondents will know the information asked of them (Czaja and Blair, 1996). The current research meets all these criteria as shall be discussed shortly. However it is important to firstly identify the specific aims of the research in order that the appropriate survey methods are selected.

7.2.2 Survey general aims

In order to fully take advantage of the opportunity to develop further understanding of the RRT framework and the involvement of travel considerations in moving home, the survey would require examination of three key areas.

- a. An examination of the specific travel considerations undertaken at different stages of the RRT by a wide range of households. This would include an assessment of the *extent* to which travel is considered (or not) at each of the stages, in order to assess the potential levels of habit weakening; and an assessment of possible ‘patterns’ in the timing of travel considerations undertaken by different households during the move¹.
- b. An assessment of the involvement (or otherwise) of the factors which have the potential to influence the household’s experience of travel considerations and the RRT, as examined above. Possible examples include the initial prompt and search criteria of the move, and the number of workers in the household.
- c. Collection of information regarding household travel behaviour, and any changes occurring to both the travel situation and household travel behaviour over the course of the move. For example changes to travel modes, journey times and mode availability.

These three topic areas would provide the basis for a thorough examination of the RRT framework, and associated understanding of the travel implications of a move. Clearly however most insight is to be gained from cross-examination of findings within each of these topic areas. Thus the specific aims of the survey are:

1. *To determine any ‘patterns’ in the consideration of travel at various stages of a move, and examine the relationship between these and household factors such as presence of children, attitudes, affordability, level of car ownership, distance of move, and prompt for move.*

¹ For example, some households considering travel only at the early stages of the RRT, and others considering travel only at the later stages.

This would allow the potential identification of different ‘types’ of households as regards timing of travel consideration. It could allow identification of some of the factors influencing a household’s propensity to consider travel issues, and also could allow identification of those household ‘types’ that are most likely to be susceptible to change, and those that are unlikely to be susceptible.

2. *To examine how transport consideration during the move, and the general circumstances surrounding the move are related to post move travel impacts such as changes to travel and eventual travel mode choice.*

This will relate what has been learnt from the first topic outlined above, as regards travel considerations during the move, to the travel impacts of the move, providing insight as to the interrelationships between housing and travel choices.

A final specific aim of the survey relates to the overall study objective of providing an assessment of the potential for behaviour change interventions to be targeted to recent movers.

3. *To determine at which of the RRT stages most consideration of travel issues occurs.*

This is to allow identification of the stage at which travel habits are likely to be at their weakest, and therefore theoretically most susceptible to change from intervention.

With the study aims clearly defined it remains to consider how these aims should be achieved in practice.

7.3 Participant recruitment

7.3.1 Target participants

It was decided that the target population for the research should remain households that had purchased and moved to a home in the city of Bristol within the previous 12 months. Recruitment of participants who would have some experience of considering moving and buying a home was necessary, and continuing to restrict the sample to Bristol would facilitate ease of comparison between Parts 1 and 2 of the research if required. Additionally Bristol

provided a good case study for travel issues as outlined in Chapter 4, Section 4.5.2.2. It was nevertheless necessary to learn from the difficulties encountered in recruiting the participants for Part 1. Such difficulties were likely to be compounded in the search for larger numbers of participants. The previous press release solution was not likely to yield a sufficient number of participants. Finding a new solution to this was a particular challenge to the research.

7.3.2 Potential targeting methods and survey types

A number of survey types (mail, internet, face-to-face), with slightly varying specific target populations were considered in order that the most practicable combination could be selected. Ideally a precise target population would be identified based solely on the research aims, and the means to target them subsequently identified. In practice, given the previously encountered difficulties, the ability to follow such an ideal was not anticipated, and the potential of various combinations was assessed. The main options considered included a blanket survey to a specific geographical location; a web-based survey; use of electoral role data, and finally use of data provided by the Land Registry. These recruitment options will now be detailed prior to discussion of the eventual recruitment method (and survey type) selected.

7.3.2.1 Non-specific targeting

The blanket distribution of a postal survey to a specific geographic location, and therefore not specifically targeting recent movers was considered. It was felt that a high proportion of a general sample of homeowners could, at any given time, be located at some point on the RRT, from considering moving in the future, to having moved recently. Moving can often be a long drawn out process and Stage 8, the final stage of the timeline in particular might last some considerable time, perhaps even until a new move is planned. This was however decided against, as designing a questionnaire relevant for households at so many different stages of a move would render it overly complicated, long and difficult for participants to understand. Such a design would be likely to require a face-to-face interview survey format to enable the appropriate parts of the questionnaire for each household to be selected. This would present excessive work for one individual to complete within a given time period of the study, and therefore involve the recruitment of additional researchers. This recruitment method was therefore rejected as it would have been excessively resource intensive, with little extra benefit to be gained from the potential resource outlay. It was decided that identifying a

method to target those households that had recently moved home and could therefore discuss all stages of the RRT in retrospect was of utmost importance.

Non specific targeting of mail outs or visits, but specific targeting of the questionnaire (ie targeting all homes in an area, but requesting only those households who have purchased their homes in the last year to participate) was also considered. 1 in 10 households move each year in the UK (ONS, 2006a) therefore this technique should theoretically locate eligible participants in 10 percent of homes targeted (notwithstanding that this is an average). However, when response rates that could be expected from eligible recipients of an unanticipated postal survey are taken into account, the likelihood of finding a large number of participants falls dramatically. This was therefore rejected as a highly inefficient means of targeting participants.

7.3.2.2 Internet survey

The possibility of using the internet to target recent movers was also considered. Web surveys are particularly beneficial as the data are stored as the participant completes, removing the need for time consuming data entry. They can be useful for targeting a wide range of people. However it is necessary to remember that those households without access to the internet would not be included in such research, thus introducing the risk of bias among respondents.

It might have been possible to advertise for participants on community websites within Bristol or on property websites. It was however quickly decided that it would be difficult to raise enough awareness of an online survey to achieve enough responses from a single city to permit confidence in any findings. It would be impossible to do this via the internet alone, as there was no particular site that new homeowners were especially likely to view, particularly within the geographical restrictions of Bristol. Again, a press release could not be relied up to raise enough awareness as it had not previously achieved a large response. If an internet survey were required in this circumstance, realistically it would be required to mail the information to prospective participants in order that enough awareness could be raised. If mailing was to be used it would be more appropriate to mail the survey directly, as this would eliminate the need for the web, reducing costs and importantly reducing bias by not excluding those households without access to the internet from participating. Additionally, the internet is best for shorter surveys with closed answer questions (Dillman, 2000), and it was anticipated that gaining information on both the move and household travel behaviour would require a survey of some length.

One option for targeting recent movers was to obtain both the current and the previous years' electoral role data for the city of Bristol and compare the names for each address both years, selecting those that did not match (ie the residents had changed). It was confirmed with the electoral role that these data would be available to purchase in electronic form, and it was hoped that there may be some way to make the comparisons electronically. This was however by no means assured, and it may have been necessary to search for resident changes by eye. This would have been a very time consuming and monotonous process.

A particular discouragement was that this method would only target movers, not necessarily homeowners, therefore a larger number of addresses would need to be obtained to recruit a substantive sample of the target audience. This method may have proved successful, however given the extensive work/time required to obtain a number of addresses, alternative methods continued to be explored.

The existence of websites such as 'nethouseprices.com' that show house sale prices for the whole of the UK, along with their date of sale was highlighted by an estate agent contact who was being questioned as to the feasibility of gaining estate agents cooperation through approaching head offices. (Again the Data Protection Act (1998) emerged as the main obstacle to further pursuing estate agents). It was established that these websites contained the addresses of properties sold over any given time period, with date of sale, and the websites could be searched by postcode. They therefore contained the required address information. These websites were examined, and it was made clear that to use their information for any mailings was against the terms of use of the site, and an offence. Eventually it was established that the Land Registry were the owners of the source data on the sites.

The Land Registry had not previously been approached due to uncertainties regarding the precise data they possessed, services they provided and the level of co-operation that could be expected from such a large and complex organisation. However, the websites showed clear evidence that precisely the data that was required was available, and that it would be possible to specifically target residential property in the city of Bristol that had changed ownership over a specified time period. This approach was therefore pursued.

7.3.3 Recruitment approach and survey type

The Land Registry was approached with a request for providing addresses for the study. A letter of support highlighting the importance of the research from the Department for Transport² was dispatched, and probably contributed to a swift agreement to help (see a copy as Appendix 5). The letter stressed how the research aimed to improve understanding of how individuals' home choices affected their travel choices. It was working towards helping those individuals who wished to reduce their levels of car use to achieve their aims, and was therefore in the public interest³.

As it had been established that the research was in the public interest, the Land Registry agreed they were able to help provide the addresses that were required, provided their time and expenses were recompensed. The addresses would be provided with two restrictions. These influenced the type of survey available to the study. Firstly the addresses necessary to distribute the survey would not be provided directly to the researcher; any distribution would have to go through the Land Registry in London. Secondly, each address could only be used once in order to avoid excessive disturbance for the recipients.

These restrictions pointed to a postal survey as the main possibility for the research. Any initial contact with potential participants would necessarily be via the mail. Any attempts to arrange non-postal means of data collection (e.g. internet or face-to-face) would therefore require potential participants to complete more than one step of 'involvement' in the research (ie respond to an initial contact letter and then participate in a face-to-face survey, or locate the appropriate website). This would be likely to discourage some potential respondents from participating, thus working against the key aim of the survey to gain the views of as wide a range of participants as possible. A postal survey could theoretically be completed immediately upon its receipt, with no further involvement required on the part of the respondent (other than remembering to post it).

² The Department of Transport were co-sponsors of the research.

³ A similar approach might have been applied to estate agent head offices. However given that the majority of estate agents in Bristol are franchises rather than a single company it would have remained at the discretion of numerous individual managers as to whether they were willing to assist. Additionally, even if this route was successful in achieving cooperation, the various franchises did not possess a central customer address list, so either extensive compilation would have been required, or the research would have had to focus on specific areas rather than the city as a whole.

A postal survey was in any case the preferred survey type due to the ability to efficiently collect large amounts of data over a relatively short period of time (Robson, 2002), and therefore target a wide range of participants. These restrictions were therefore not overly constraining. It was however unfortunate that no chance for providing reminders to potential participants would be available, as these are an almost essential part of achieving good rates of response to postal surveys (Fowler, 2002). This was however accepted due to the difficulties in discovering alternative recruitment techniques as outlined. Part 2 of the research was therefore established as a postal survey to be distributed to the owners of recently bought properties in the city of Bristol, UK.

Unlike the house price websites initially discovered, the Land Registry did not possess the data in the required format to easily produce addresses of recent purchasers in the city of Bristol. It was therefore necessary for a special search query to be run at some financial cost to the study. It was elected to additionally request the *names* of homeowners at a comparatively minimal extra cost. This was to encourage the recipients to at least open the envelope containing the questionnaire. A set of address labels for residential properties in Bristol that were registered as having a change of ownership between July 2004 and April 2005 were therefore produced by the Land Registry. 2500 addresses were requested to allow enough for a pilot, the 2000 anticipated mail out, and some spare in case of any changes. Accordingly it was finally assured that it would be possible for the research to specifically target residential properties in the city of Bristol that had changed ownership over a specified time period.

7.4 Survey content design

7.4.1 Overall issues to consider

A considerable challenge was faced in limiting the survey from covering the amount of data that was desirable, to that which was necessary. A copy of the final questionnaire can be seen as Appendix 7, and detail and justification for much of its content will be provided in this section. The questionnaire in Appendix 7 differs quite substantially in terms of format when compared to the initial pilot survey developed (see Appendix 6), however the content was changed very little. Throughout the questionnaire design careful consideration was given to question layout and format. This is a potentially key influence on likely response rates and participant recall (Dillman, 2000; Fowler, 2002), as will be detailed in Section 7.5.1.2. The

focus of this section however is on the survey content. The questionnaire was designed to cover the three key areas outlined under the survey aims section, and provide a few additional details. Each of these will now be examined in turn.

7.4.2 Travel consideration over the RRT

Despite the RRT's focus on travel, detail of *any* considerations involved at each stage of the RRT would have been beneficial to obtain. This would allow an assessment of both the relative importance, and influences on travel consideration over the RRT. However it has been highlighted in Chapter 4 (Section 4.3.1) that detail regarding the involvement of travel issues in a move risks becoming masked, due to its generally lower priority. It was also felt that the inclusion of all factors involved in a move would involve extensive work for the participants, and likely provide overly complicated and difficult to interpret results. It therefore it remained important to focus examination of consideration over the RRT on travel issues alone.

The first detail required was whether or not the respondent felt that travel issues had been considered by any members of the household at each of the RRT stages. It was the intention to examine differences between those households that considered travel issues at different times during the RRT. For example, those perhaps considering travel early in the process but not later, and those considering travel later but not earlier. A search for distinguishable 'patterns' of timing of consideration of travel issues over the RRT was anticipated.

The decision was taken not utilise the term 'consideration' of travel issues in the questionnaire as it was felt to be too ambiguous as to the level of thought required to constitute 'consideration'. The previous chapter detailed how *any* travel consideration was of interest to the study in terms of potential habit weakening (see Section 6.5.2.1). Therefore 'consideration' was replaced with travel "on your mind", as this was felt to more accurately convey all possible thoughts regarding travel issues.

Specific detail of the travel issues that were 'on the mind' of the participant (or their household) at each stage of the RRT was desirable to gather in order examine for differences in travel considerations between the stages, and to provide insight as to how travel considerations may alter over the course of a move.

An idea of the *level* of consideration given to travel issues at each stage of the move was also beneficial, in order to aid identification of the stage at which travel habits might be at their weakest. The term to what ‘extent’ travel was ‘on the mind’ at each stage was carefully chosen in order to avoid the use of alternative ambiguous terminology. For example, ‘how much’ could be interpreted as how many times, or how important, and ‘how important’ implies importance in relation to something else, an implication which it was wished to avoid. Participant opinion of the stage at which travel had been most ‘on their mind’ was additionally beneficial to the research to extend understanding of the RRT framework.

Finally in terms of the RRT, given the huge variety of moving circumstances that exist, it was important to provide the opportunity to examine if the RRT was indeed applicable to all instances of residential relocation. Participants were therefore required to indicate on a scale of 1 to 5 how well they felt the stages as outlined fitted their experiences, and space was provided for comments. These comments would prove valuable in establishing in which situations the RRT was more applicable than others. This section of the questionnaire was crucial to the study objectives. Its design and presentation proved an interesting challenge, as will be detailed in Section 7.6.1.1.1.

7.4.3 Factors of potential influence on travel consideration over the course of a move

An almost exhaustive list of factors have the *potential* to influence a households’ consideration of travel issues during the process of moving home. Selection of those to include within the survey was based upon a number of issues: guidance from the interview findings and literature where appropriate, but also through knowledge of property search from the experience of searching for a place to live. Those factors addressed by the survey, and justification for their inclusion will now be presented.

7.4.3.1 Details of the moving situation

The moving circumstances of the household are clearly likely to influence travel consideration throughout a move. Factors such as the initial prompt behind the move, the search criteria involved, any compromises made, the distance of move, the time elapsed since the move, and previous familiarity with the area moved to would all contribute to different circumstances

and were therefore important to include. However a few of the additional factors included require further explanation.

It was considered that differences in the need for travel consideration were likely to be dependent on whether the household had a specific desire to live in a certain area of the city, or was conducting a more general search. Consideration of a number of different areas would involve different levels of travel consideration (assuming travel was considered at all) than consideration of properties within a single area. Specifically, if a household searches only one area, then the associated travel issues are unlikely to change. Many of the RRT stages would likely be the same, even possibly occur together. It was therefore important to acknowledge this possibility, and the questionnaire requested detail of the number of different areas searched for a new property (1, 2-3, 3+).

In a similar vein, whether or not the household experienced difficulties in locating a property that met their search criteria would be likely to influence to processes of search and selection, including consideration of travel criteria. If difficulties were faced this would likely result in a different experience of the RRT than for a straightforward selection. Participants were therefore asked to rate (on a scale of 1-5) their ease of finding suitable properties in terms of both availability and affordability. In addition to this, detail was also requested regarding any search criteria that may have been compromised during the property selection (open response).

Finally with regards to the circumstances of the move, it was decided to include a single question to attempt to assess the relative influence of accessibility, housing and neighbourhood criteria at the first 5 stages of the RRT. This was to examine whether those rating accessibility issues higher would experience the RRT differently and/or result in different travel outcomes. It additionally provided the opportunity to test whether the RRT framework could provide any more insight regarding the relative importance of these three dimensions (other than simply housing is important and travel is not) – something that no recent studies into the topic have achieved. For each of the first five RRT stages participants were asked to distribute 10 points between the three categories of criteria (accessibility, house and neighbourhood) as to how much, relatively, each influenced their decision at each of the stages. The question was also intended to allow some comparison of the research findings to the many studies that have looked at the relative importance of accessibility, neighbourhood and house in residential relocation (eg Molin and Timmermans, 2003 – see Chapter 3).

In both the interview results and Chapter 3 the potential influence of various modal preferences on housing choice were highlighted. In particular the interview results pointed to the influence of vehicle ownership on the housing search process. Where no cars are available housing choice is likely to be extremely affected by transport considerations, as more extensive planning is generally required for non-car journeys. This would clearly affect travel considerations over the RRT. Therefore the number of vehicles available to the household (and also any alterations to vehicle ownership over the course of the move) was requested.

It was also felt that given the importance of car ownership on the search process, as identified by the interviews, attitudes towards car use might also be expected to be influential on travel considerations. It was therefore decided to incorporate within the questionnaire a slightly modified version of a segmentation measure which divides car users into one of four ‘attitude profiles’ (Anable, 2005; Stradling, 2005; see Appendix 10 for more detail of this measure)⁴. This would not only divide participants into die-hard drivers, car-complacents, malcontent motorists, and aspiring environmentalists, but it would also provide information regarding whether participants enjoyed driving, were happy to use public transport or cycle, or felt that alternatives to the car were not available to them. It was felt that these attitudes might influence, or be associated with how travel was thought about during the moving process⁵.

⁴ *Die-hard drivers* enjoy driving and do not want to stop; *car complacents* are happy with driving and see no reason why they should cut down; *malcontent motorists* do not enjoy driving but feel they have no alternative; and *aspiring environmentalists* are actively trying to cut down on their car use, but are still car users. See Appendix 10 for more detail.

⁵ With hindsight it would have been more appropriate to include a measure of specific *mode preferences*. As discussed in Chapter 3 preferences for modes alternative to the car are likely to affect the search process as they require planning in order to ensure feasibility from the property selected. The importance of this issue was unfortunately not noticed until after the survey design was complete. It was only the findings from the interviews which highlighted the importance of conducting a more thorough literature search into housing choice, as reported in Chapter 5. However, the inclusion of a disproportionate number of interview participants without access to a car for a time masked that the underlying issue for travel consideration was in fact not car ownership but strong preferences (or need) for public transport/ walk-able distances. This was extremely unfortunate, and highlights the risks involved in the recruitment of volunteers, where interest in the issues discussed is liable to be biased (non-car owners are likely to have a greater interest in travel issues than car owners, therefore more likely to volunteer in the study). Nevertheless, the attitudes to car use segmentation measure does

Finally in terms of factors likely to influence travel considerations over the course of the move, detail regarding the participant and their household demographics was important to include. The household size, presence of children, gender, age, and education level were all potentially influential. Additionally the location of the property within Bristol (both current and pre-move post-codes), and the cost of the property were of potential importance. Collection of this type of information would also provide the opportunity for comparison of the recruited sample to population statistics for the area, to assess the possible level of representativeness.

7.4.4 Travel behaviour change

The third focus of the survey was to examine any changes in travel behaviour from prior to post-move, in order that these could be examined in association with the recorded RRT travel considerations. For such comparisons it would be important to take account of all household members' travel, as all household members have the potential to influence and be influenced by a residential relocation. Neglect of one member might result in a key process being missed.

Travel behaviour change could occur to, among other aspects, mode choice, distance travelled, journey time, destinations, journey frequency, and vehicle ownership. Despite the focus of the research remaining on travel mode choice, (due to the closer association of habits to this dimension of travel behaviour); the intention was to include a measure of all these dimensions. The limited number of interview participants had shed little light as to the dimensions most likely to be affected by residential relocation, or to affect the relocation process. The exception to this, as has been previously discussed in Section 6.6.2, is vehicle ownership. A number of interview participants had discussed considering alterations to their vehicle ownership when considering moving home, and it was therefore appropriate to examine this further.

include many of these issues and remains beneficial to the research, particularly as an indicator of whether the householder is keen to be able to reduce their levels of car use, or not.

Many of the previously listed travel dimensions are likely to differ depending on the journey purpose. To provide a context for any changes found, six key journey purposes covering journeys routinely conducted by all household members were therefore selected for examination. These journey purposes were: the journey to work for *each* adult in the household ('adult 1'(the respondent), and 'adult 2'), grocery shopping, journeys to the city centre, the school run, and a regular leisure trip⁶. These were selected as likely to be the most routine and frequently carried out journey purposes and thus most relevant to the study's aims of examining potentially habitual travel behaviour.

It was decided to restrict data collection to the *main* mode used (singular) for each of these journey purposes, (both currently and prior to the move), and the associated 'typical' journey times. A question was also included to determine whether the main destination for each of the outlined journey purposes altered from that of the pre-move journey. This was in order to take account of possible changes in destination that could influence travel in addition to changes in home – particularly changes to workplace.

Journey time was selected over journey distance as it was not possible to collect detail of both due to space limitations. Journey time is generally more important to an individual than the actual distance travelled (Wachs, Taylor, Levine and Ong, 1993). It would likely therefore be of greater influence in residential relocation decisions and also be easier on recall than journey distance. It is recognised that 'typical' journey times may vary considerably, and that journeys may be multi-modal. However limiting data collection to *main* mode and *typical* journey time was necessary in order to facilitate interpretation of whether a mode switch or change in journey had time occurred. Such restrictions would also facilitate comparison between data for different journey purposes and between participants. Additional space was however provided for participants to detail any other modes used, their frequency of use and any variations in journey times, should they wish to do so. This potentially would allow the opportunity to assess whether the respondent used a variety of modes for their journeys or was potentially more strongly habitual.

⁶ It was recognised that leisure trips were likely to incorporate numerous different journeys, however as raised by the experiences of Interview Participant 5, a household's members may have a specific leisure pursuit requiring a specific destination which might influence their housing location choice. Participant 5 required access from any property he considered to matches for the cricket team he played for. The intention was to include the opportunity for such details to be provided by survey participants.

A measure was also included of the impacts of the move on overall household travel distance in order to assess whether the move was likely to have ‘improved’ the households situation (in terms of reduced travel and levels of car use – TDM policy aims) or had ‘worsened’ the situation. This was restricted to a 5 point scale ranging from ‘significant increase’ to ‘significant decrease’ due to space constraints.

A previously discussed in Section, a move is likely to alter the travel modes available to the household, and it was wished to obtain detail of what (if any) changes had occurred, and how these might be related to travel considerations of the RRT. To request this information from participants would clearly result in a record of the participants’ perceptions of the situation rather than a necessarily objective measure. However it can be argued that for mode options availability, whether or not a given mode is *perceived* to be available to the individual is likely to be a more significant determinant of use than actual ‘objective’ transport availability⁷. This therefore remained of particular interest to the research. However due to space limitations it was only possible to obtain a record of whether the household considered the number of options to have increased, decreased, remained the same, or changed in content but not number. Participants were also asked how satisfied they were with their current travel options availability, and why. This was to allow insight to whether any compromises or plans that had been made during the move, or lack of them, had influenced levels of satisfaction with available travel options.

The final detail necessary for examining the travel impacts of a move was to ascertain whether any other events had influenced household travel behaviour either during or since the move. It was important to establish whether any changes in travel behaviour recorded were caused by an identifiable alternative trigger, or could be attributed to association with the recent home move.

⁷ Information regarding participants’ pre and post move postcodes was also obtained. Therefore the possibility of gaining a ‘non-objective’ assessment existed if it was deemed vital to the research. This would however require substantial effort for limited apparent gain.

7.4.5 Additional content

7.4.5.1 Habit and routine

In addition to the three key topic areas of interest as outlined in Section 7.2.2, it remained important to the original study aims to attempt to retain a level of measurement of habit within the participants' travel behaviour. In order to establish the role of key events (the home move) in weakening or breaking habitual behaviours, it remained important to attempt to determine the presence of travel habits prior to and following the move, despite the difficulties and potential futility involved in such measurement. To gauge habit, a limited number of statements based on Verplanken and Orbell's (2003) self report scale were included. These included statements such as 'prior to moving my journey to work was habitual', or 'before a move was planned, alternatives for my journey to work were never considered', which were presented with a 5 point agree/disagree scale. It was ensured that the statements referred to specific journey purposes, as general statements would be ambiguous, open to many varied interpretations and therefore not easy to respond to. Only a limited number were included, in acknowledgement of the fact that they were unlikely to provide unquestionable evidence for the presence of habit prior to the participants' move. This is due to theoretical questions over the ability of self-report of supposedly unconscious behaviour, particularly previous behaviours. Nevertheless they remained beneficial as provision of some idea of the situation.

It was also desirable to gain an idea of the amount of time taken post move for new habits to become established. This would provide information regarding the time available for interventions to target weakened habits post-move. The term 'routine' was again employed as it is less open to different interpretation than the term habit, therefore permitting a greater comparison between participant responses.

7.4.5.2 Contact details

A final requirement of the survey would be to obtain participant contact details in order to provide the option of follow up study should further information be required. Provision of such detail would additionally be necessary if participants wished to be entered into the prize draw included as an incentive to participate in the survey.

7.5 Survey design considerations

7.5.1 Questionnaire design

A strong questionnaire design is the most important factor in achieving both a good survey response rate and meaningful results. Having established the content that was necessary to the research, the main aim of the questionnaire design was to produce an effective postal survey that was capable of meeting the previously outlined aims, was not too long, and was sensitively designed in order to aid recall. This was a second significant challenge faced by the research, and a number of issues required addressing.

7.5.1.1 Recall of retrospective data

A particular potential issue which demands addressing, particularly given the selection of a postal survey, is the reliability of responses and accuracy of recall. Much of the information required for the survey was, as with the interviews in Part 1, retrospective in nature, and therefore reliant on participant recall. In a postal survey there would be no 'conversation' to prompt recall of specific instances (Dex, 2003). However, the greater time available to participants in responding would (in theory at least) allow household records to be checked (Czaja and Blair, 1996), allowing for improved accuracy where necessary.

Research has suggested that the saliency of events has a strong impact on accuracy of recall (Mathiowetz and Duncan, 1988). The more salient the event, the less error in recall reported. Sudman (2003) highlights three key dimensions of events resulting in increasing saliency: the increased uniqueness of the event; increased social and economic costs of the event; and the continuation of consequences following the event. These all increase levels of saliency. Purchasing a home scores highly on all of these criteria and is therefore a highly salient event and likely to be remembered. This is evidenced by some of the participants of Part 1 of the research providing vivid accounts of not only their most recent move, but also moving experiences that occurred many years previously, as comparison to the current stories they were describing. It was therefore felt that eliciting such experiences through a questionnaire approach would not introduce undue problems of recall accuracy, especially if the questionnaire was sensitively designed with the need to aid/prompt recall in mind. (Ensuring accuracy is also an issue in non-retrospective surveys, as accuracy of response often proves impossible to check, for example when obtaining reported opinions).

Survey questions should be clear, non ambiguous, non-complicated, understandable, and as short as possible (Dillman, 2000). Examples of the careful consideration of the terminology employed in the survey have already been discussed under survey content. Ambiguous and overly technical terms and language were to be avoided throughout. Wherever possible, tick box answer style questions were used – these provide less response burden to the participant, are easy for data entry, more straightforward to analyse, and should be the default for any mail survey (Fowler, 2002). Open answer questions were not to be excluded as they could provide both explanations and detail of the few situations where the range of possible answers was likely to be too extensive to be covered by the provision of tick-box options. Open answer questions were supplemented by tick-box options wherever possible, often to reduce the daunting appearance of blank space. Finally, wherever possible the questionnaire also included polite and friendly comments as suggested by Fowler (2002) to improve response rates. For example, participants were wished good luck for the prize draw.

Section 7.6.1.1.1 provides a detailed account of the design of the RRT section of the survey which highlights the careful consideration required to achieve appropriate measures and satisfactory questionnaire design.

The survey was targeted only to those households with non-complex structures – a maximum of two adults, plus any children. This was a concession to the requirement to gather data regarding the travel situation of all household members. The needs of all members of a household theoretically have the opportunity to influence housing search and selection, and all are equally likely to feel the impacts of a move on their travel situation. It is therefore important to consider all household members in the collection of data on residential choice.

Catering for all household types in this way would lead to a requirement for overly complicated questionnaire design and analysis. The majority of households in England are made up of couples, families or single people (DCLG, 2006b), therefore only households with up to two adults over 18 (plus any children) were requested to participate in the study. Households with extended families and ‘grown-up’ children remaining in the parental home were therefore excluded along with other ‘non-simple’ households. This is unlikely to have substantial implications for the research findings, largely because the proportion of

households excluded on this basis was likely to be small. Nevertheless, this exclusion will require acknowledgement in any discussion of results.

In order to establish that the households receiving the questionnaire were indeed eligible to complete it, screening questions were included on the front page. It was felt important to include these as questions to answer rather than simply instructions on who was eligible, in order to ensure that they were read and understood. Three questions established that the recipient (or a member of their household) owned the house that they lived in; that they had moved there within the past 12 months; and that the number of adults in the house was no more than two. If they did not meet these three criteria they were informed their responses were not required⁸.

The questionnaire was designed for completion by one adult member of the household on behalf of any other household members. While involvement of all household members is desirable (see discussion in Chapter 3, Section 3.4.2.2 and Chapter 5, Section 5.3.1.3); particularly given the request for information regarding all household members' travel behaviour; to demand it from a postal questionnaire would be impractical and likely to reduce response rates. Early considerations of providing separate sections for each household member to complete were discarded as being overly complicated, creating more work for participants and adding undesirable length to the survey. As previously mentioned, postal surveys allow for time for the checking of information prior to completion (Czaja and Blair, 1996). This would theoretically include the opportunity for information to be checked with additional household members if their views were determined as important by the questionnaire recipient.

The targeting of specific household members to ensure randomness in completion (Czaja and Blair, 1996 - adult with nearest birthday, males only, etc) was also considered but decided against. As each target household should only have up to two adult members, the maximum number of potential completers was two (assuming teenage children would not complete). and picking one over the other, particularly when single adult households were also to be included,

⁸ It would, with hindsight, have been beneficial to request such participants to complete a few demographic details in order to allow for detail of ineligible respondents to be collected, and as an assessment of the extent to which non-response was due to ineligibility rather than dis-inclination to participate. A number of otherwise blank surveys with one of these ineligibility questions ticked were returned, and therefore it is likely that such a request would have received some response.

was felt to be unnecessarily complicated. As a result it was left to the household to decide who would complete the questionnaire (though questions were included to identify the household structure and the place of the respondent within that structure).

7.5.2 Response rates and response bias

As with any research, substantial consideration needed to be given to issues of response rates and particularly response bias. The careful design of the survey questionnaire has been detailed. However, the experiences of a wide variety of moving households was desired, and it was particularly acknowledged that responses were likely to be more forthcoming from households with a specific interest in their travel behaviour. This would introduce potential bias to the responses which must be considered in the interpretation of results.

7.5.2.1 Questionnaire layout

In addition to the previously outlined careful design of questions it was ensured that the questionnaire was also printed in large, clear type font, and had plenty of blank space so as not to appear overcrowded (Fowler, 2002; Czaja and Blair, 1996). Additionally it was printed on cream paper as research suggests that black ink on cream paper is far easier to read than black ink on white paper, especially for individuals with dyslexia.

7.5.2.2 Incentives

It was also decided that an incentive should be included to encourage a higher response rate. This was particularly important in order to address non-response bias, by encouraging those without a particular interest in the topic of travel impacts of a home move, or without a strong sense of public duty (Bonsall, 2002), to complete the questionnaire. A prize draw of £250 was selected as having the ‘wow factor’ of a large sum of money and relatively simple to implement. Prize draws also avoid the ‘negative inference’ that can be associated with individual payments, where the potential participant assumes that the task must be unpleasant since they are being paid to complete it (Bonsall, 2002).

7.5.2.3 Reminders

A methodological limitation arose due to the Land Registry's refusal to utilise each address more than once. It was not possible to send reminders to prospective survey participants in order to improve response rates. While an unavoidable constraint, this was nonetheless extremely unfortunate as reminders are an excellent, almost vital, part of mail survey research in terms of increasing response rates (Fowler, 2002), and therefore hopefully reducing response bias.

7.5.2.4 Cover Letter

The involvement of the Land Registry did however provide the opportunity for the survey to be distributed accompanied by a letter from the Land Registry chief executive in support of the research⁹. Support from a legitimate authority encourages trust and the perceived importance of the survey, which is a further key factor for improving response rates (Fowler, 2002). The covering letter explained why the recipient had been sent the questionnaire, stressed the importance of the study, the level of confidentiality associated with the research and highlighted the £250 incentive. It also necessarily highlighted the lack of obligation to participate, and that recipients would not be contacted again if they did not wish to participate. The ability to stress the minimal disruption to recipients was a key condition of the Land Registry's involvement in the study, and may have contributed to some households' decision not to participate. It could equally however have encouraged others to participate. A telephone contact number for the researcher in case of enquiries was included on both the letter and the questionnaire.

7.5.2.5 Envelope appearance

Finally, questionnaires were placed in white envelopes, as research suggests that white envelopes can produce better response rates than brown (Fowler, 2002). These were addressed to named home-owners which should also have encouraged a greater response than a distribution of envelopes 'to the home-owner'.

⁹ See Appendix 8 for a copy.

7.6 Survey Procedure

7.6.1 Pilot study

A pilot study was conducted to test the effectiveness of both the questionnaire, and the distribution method. It would also provide an idea of the likely response rates that could be expected.

Two hundred white envelopes containing the pilot questionnaire (see Appendix 6), cover letter and a business reply envelope were placed in a box and mailed to the Land Registry offices in London. The Land Registry was instructed to select and attach 200 random addresses from the 2500 labels already produced, and then mail the envelopes. Recipients were not informed that it was a pilot survey, and they were equally eligible for the £250 prize incentive as the main survey participants.

Thirty seven eligible replies were received, a return rate of 18.5 percent. Response rates will be discussed in more detail in Section 7.7.1. No noticeable biases in terms of income levels, areas of Bristol, or attitudes towards car use and travel were observed. This indicated that the questionnaire was effective for gaining an adequate number of responses to a long survey (16 pages!) that arrived with no prior warning.

7.6.1.1 Changes to the questionnaire

Despite the adequate response rate, participant comments on the returned questionnaires prompted the decision to make some changes to the questionnaire that would hopefully provide both improved response rates and quality of responses. In particular it was decided to address the format of the RRT section. This in turn affected the structure of the whole questionnaire, permitting it to be shortened from 16 to 12 pages¹⁰; (provided that some not centrally important, but otherwise desirable questions were removed). Removed questions included detail of whether any *specific travel intentions* had been abandoned during the course of the search, the *convenience* of various transport modes from the new home, and an

¹⁰ Booklet printing requires the number of pages to be a multiple of four in order to avoid inclusion of blank pages.

assessment of household life-stage. Other than the removal of these variables, survey *content* remained the same, but the *format* of the question presentation was altered. (See Appendix 6 and Appendix 7 for copies of both questionnaires). The most significant changes made will now be discussed, and they also serve as examples of the level of detail given to questionnaire design.

7.6.1.1.1 RRT section design

To explain the eight RRT stages, keep it interesting, simple, understandable and most importantly short, was a significant challenge. For the pilot survey the stages were designed as per the design principles outlined in Section 7.5.1.2, preference of tick boxes over open answer responses. This meant that for each stage a table of modes and journey purposes were presented, with tick boxes for indicating those which were considered at each stage (see a copy of the pilot survey as Appendix 6). A small open answer space was also presented for any additional information participants wished to provide. The pilot questionnaire also attempted to ‘set the scene’ for each RRT stage, by structuring the questionnaire so that questions relevant to a particular stage, immediately preceded questions regarding detail of considerations at that stage. For example, a question on search criteria for the new home was asked immediately prior to the question about travel considerations at Stage 2, definition of search criteria. The aim of this was to focus participant’s minds to the correct point in time of their move as an aid to recall.

Pilot respondents however reported finding the repeated tick box format boring and repetitive – the types of considerations reported often did not vary much between stages, so participants found completing a tick box section for each stage laborious. Importantly, when attempting to interpret this section of the pilot surveys, it was found difficult to gain any meaning from the tick box answers, and any open responses were increasingly relied upon. Accordingly, it was decided to change the format to that which can be seen in Appendix 7, and in making these changes it was also established that the scene setting technique used in the pilot would take up a disproportionate amount of time and space, so was abandoned.

Another difficulty that pilot participants seemed to find is that despite instructions to examine all the stages prior to completion, not surprisingly it appears many didn’t, and quite a few questionnaires contained ‘actually this should have been the next stage’s response’ type comments. This prompted the decision to include a simple outline of the stages with ‘did you consider any travel issues at this stage, yes, no or don’t remember’ for each stage – so that

participants would have some awareness of all the stages prior to completing the detail for them. This was in question format to ensure the information was read.

For the final survey the main response space for each stage was an open answer space. Some research suggests that open ended questions can in fact produce better recall than closed answer (Sudman and Bradburn, 1973). A series of tick boxes were included to help prevent repetition of answers and make the questions appear less daunting (eg 'tick if same as previous stage', or 'didn't consider at this stage'). Additionally research shows that the use of a logical and natural sequence in the order of questions improves recall accuracy (Dex, 2003), and the RRT framework lent itself to this. Finally, how much detail to provide for the instructions to the overall RRT section was a key issue. A separate instruction sheet explaining the RRT and some other key terminology was considered, but not pursued as it was felt having an extra sheet to read would be off-putting to potential participants and generally not read. Eventually it was decided that the instructions should be brief, with the minimum detail possible as can be seen in the final questionnaire (Appendix 7). The instructions to the question asked participants to think about specific travel issues they had thought about at each stage (eg journey purposes, modes, times and distances), stressing that this question was a crucial part of the questionnaire.

7.6.1.1.2 *Addition of an extra stage*

The most significant alteration made to the study on the basis of the pilot survey was the addition of an extra stage to the RRT. As described in Chapter 6, the stage 'selection of areas in which to search' was added as the third stage. This decision was prompted by a number of the pilot respondents (n=5) reporting that they mainly considered travel when *selecting areas* in which to search, rather than specifically the other stages, and the stages as set out did not allow for this. The number of respondents making such comments prompted the need for reconsideration of the RRT stages.

During the development of the original RRT framework, interview participants had frequently discussed considering travel when selecting areas in which to search, however this was considered at the time to constitute part of the households' search criteria, and such considerations were incorporated into Stage 2. With hindsight prompted by the comments of pilot participants, it is clear that selection of a specific area may indeed be a specific search criterion if the household has a specific desire to live in a particular area. However, frequently the selection of areas in which to search for a property is likely to be based on a reflection of

where the households additional search criteria can best be met. Thus it would constitute a separate stage in the process. It was therefore felt to be most appropriate to incorporate this additional stage into the RRT framework.

7.6.2 Main Survey

Following these changes it was decided not to complete a second round of piloting due to severe time constraints. Time constraints occurred both in terms of the overall research framework, but also in terms of the already printed address labels of households having moved home since July 2004 (see Appendix 9). The questionnaire was instead tested on numerous colleagues, acquaintances and recently moved neighbours to ensure its clarity and appropriateness to the situation under study. As will be discussed in the following chapter, only one question would likely have been slightly altered had further piloting been undertaken. No alterations to the distribution method had been made, so no re-testing of this was required.

7.6.2.1 Distribution

For the main survey distribution a Land Registry employee travelled to UWE with the remaining address labels to oversee the labelling and distribution. Any leftover address labels were removed by the Land Registry employee to be destroyed. In this way the survey as described above and shown in Appendix 7 was distributed to 2000 households within the city of Bristol, who had registered purchasing their property with the Land Registry since July 2004.

7.7 Survey Returns

A total of 229 eligible¹¹ and useable questionnaires were returned. Upon their receipt each one was numbered, and the number of questionnaires received each day was recorded to enable a view of the response rate pattern.

The numerical data were entered into SPSS, and the qualitative data was entered into Excel with the aid of three temporary staff members. Name and address details were stored separately from the response data to ensure anonymity (the majority of respondents did elect to provide this personal data – possibly due to the reminder that it was required for entry into the prize draw). Every tenth survey entered was checked for accuracy by the main researcher, and any errors recorded.

7.7.1 Response rates

Czaja, and Blair, (1996, p35) define response rate as ‘the number of eligible sample members who complete a questionnaire divided by the total number of eligible sample members.’ Not all of the 2000 envelopes and questionnaires would have been received by households eligible to respond to the survey. Firstly a number of surveys were returned with ‘addressee not known’. Additionally the property might be rented out by its recent purchaser, and also only households with two or fewer adults (plus any children) were eligible. Finally, to be eligible the household had to have purchased the property within the last 12 months. Due largely to delays between requests for production of the address labels and completion of the final survey (see Appendix 9 for more detail), it was estimated that a large proportion of the questionnaires would have in fact been received by households that had moved over 12 months ago and were therefore ineligible to participate. Given these influences on the eligibility of the households receiving questionnaires, the response of 229 was estimated to represent a response rate of 20 percent (see Appendix 9 for calculations and further detail).

¹¹ 23 ineligible completed responses were also received but not included in the study. These were largely ineligible due to a time period of over 12 months having elapsed since the move had taken place.

According to text books (eg Czaja and Blair, 1996), response rates of below 40 percent should be discarded. In particular, the use of survey reminders to increase response rates is strongly advocated (Czaja and Blair, 1996; Robson, 2002; Fowler, 2002). This is accepted as good practice, however the Land Registry would not permit reminders to be sent as this posed too much inconvenience to recipients, therefore it was not possible in the current situation for reminders to be sent.

In reality such high response rates of above 40 percent are difficult to obtain, and much lower response rates are the norm. For example Kim et al, (2005) report a self-completion questionnaire with a response rate of 26.7 percent; Gayda (1998) reports 19.2 percent; and Bina et al, (2006) report findings based on a response rate of 21.7 percent. Krosnick (1999, p3) argues that having a low response rate does not necessarily mean that a survey suffers from a large amount of non-response error. The example of a study by Visser et al (1996) is presented, where a postal survey with a low response rate (30 percent) was far more accurate at forecasting election results than a telephone survey with a response rate of 60 percent. Examples of studies where improving the response rates did not alter the substantive conclusions of a study are also presented (eg Traugott et al, 1987).

“Clearly, the prevailing wisdom that high response rates are necessary for sample representativeness is being challenged. It is important to recognise the inherent limitations of non-probability sampling methods and to draw conclusions about populations of difference between populations tentatively when non-probability sampling methods are used. But when probability sampling methods are used, it is no longer sensible to presume that lower response rates necessarily signal lower representativeness,” (Krosnick, 1999, p4).

The response rate of 20 percent for the current study is therefore accepted as strong, particularly given the length of the questionnaire involved (see Appendix 7) and the absence of reminders.

7.7.2 The survey respondents

To conclude this chapter the study sample produced from the methodology outlined will now be introduced. Participants’ details will be presented alongside relevant data regarding the UK

population moving into owner-occupied housing in 2005, from the 2005 Survey of English Housing (SEH) (DCLG, 2006a). Additionally data from the UK 2001 census for both England and Wales and for Bristol will be provided, particularly where the relevant data is not available from the SEH. This allows comparison between Bristol and England (and Wales), demonstrating areas where Bristol may be peculiar compared to the rest of the country. Naturally however the census data is for the whole population of the relevant areas, including both rural and urban areas, and not just owner-occupiers. There is no intention within the study to extrapolate specific findings to a national level as the main aim is to understand processes involved, hence assessing the representativeness of the sample is not crucial. Nevertheless, it is valuable to check that the sample are not extensively different from the population of movers into owner-occupied properties, and the population of Bristol where appropriate, and that a specific subgroup has not accidentally been targeted. If such a group had been unintentionally targeted then any findings from the research might be applicable to only that group. Table 7-2 to Table 7-4 show household composition, distance of move, car ownership levels, main commute mode, and reasons behind the move, as compared to the aforementioned statistics.

Table 7-1: Age of survey respondents

Age	% survey sample	% Owner Occupiers in England moved in last year (2005)¹²
16-24	2.7	8
25-34	47.8	36
35-44	31.4	27
45-64	15.9	21
55-74	2.2	4
75+	0	2

¹² Source: DCLG (2006a), Survey of English Housing 2005, Table S244, age of household reference person.

Table 7-2: Household types of survey respondents compare to data for Bristol and the UK as a whole.

Household type	% survey respondents	Owner occupiers moved within last year (2005) ¹³ %	% 2001 census Bristol	England and Wales source 2001 census key statistics %
Couple (no dependent children)	45.0	41	21.6	30
Couple (dependent children)	17.5	27	17.4	20.8
Lone Parent	3.5	5	10.4	9.6
Single (Male)	14.4	12		
Single (Female)	19.2	11		
Single Total	(34.1)	(23)	33%	30
Other multi-person household	----	4	9.8	6.7
Total	100	100		

Table 7-3: Distance of move of survey participant households

Distance categories	% of sample ¹⁴	% of Owner Occupiers in England moved in 3 years previous to 2006 ¹⁵
Less than 1 mile	19.3	17
1-10 miles	54.4 <i>1-3 miles = 37.7</i> <i>4-10 miles = 18</i>	52 <i>1-2 miles = 16</i> <i>2-5 miles = 21</i> <i>5-10 miles = 15</i>
10-50 miles	11.6	18
Over 50 miles	12.7	11

¹³ Source: DCLG (2006a), Survey of English Housing 2005, Table S246.

¹⁴ Newly composed households where members had moved different distance categories are not included.

¹⁵ Source: DCLG (2006a) Survey of English Housing 2005 06, Table S230.

Table 7-4: Reason for move

Reason for move	Percentage of total responses	Main reason for move – Owner Occupiers in England ¹⁶
Wanted larger house or flat	14.1	21
Wanted smaller house or flat	2.2	7
Divorce or separation	3	6
Marriage or cohabitation	5.4	5
Other personal reasons	7.2	7
To move to a better area	10.4	18
Change of job / nearer to job	9.6	8
Wanted to buy	19.5	14
Other reasons	27.9	14

Table 7-5: Car ownership levels

Number of cars/vans	Survey percentage	Bristol (source, 2001 census, key statistics)	England and Wales (source, 2001 census, key statistics)
0	3.5	28.8	26.8
1	60.5	46.6	43.8
2 or more	35.9	24.6	29.4

Table 7-6: Main modes used for commute (percentages)

Main mode used	Survey Sample Current Commute	Survey Sample Pre-move commute	Bristol census 2001	England and Wales Census 2001
Car	61.2	60.9	54.6	61.1
Public transport	9.0	13.4	14.7	16.0
Walk	10.5	13.7	16.8	11.1
Cycle	14.9	9.6	5.0	3.1
Other	4.5	2.4	8.9	8.7

It can be seen from the tables that a strong variety of households (within the specified maximum two adults plus children) and moving situations have been recorded, (in particular different distance of move). Responses were also received from all postcode areas covering the city of Bristol, (both central and suburbs¹⁷), and the majority of respondents had moved

¹⁶ Source: DCLG (2006a) Survey of English Housing 2005 Table S225.

¹⁷ Based on an examination of postcode areas 13.6 percent of the survey sample were from centre, 55.6 percent inner city, 30.6 percent suburbs. (Postcodes BS1,2 and 6 are city centre, BS 3,4,5,7,8,9 are

between 6 and 12 months prior to receiving the questionnaire. More recent movers were not to be expected due to the recruitment difficulties outlined in Appendix 9¹⁸, and any respondents that had been in their current home for over 12 months were removed from the sample as they had not been requested to participate.

It can also be seen from these tables that the households recruited to participate in the survey are broadly comparable to the population of moving owner-occupiers, and the city of Bristol population where appropriate. For example, it can be seen that the rank order in the age categories is identical. A few differences are observable, such as household composition and main commute mode; although expectations of a perfect match would be unreasonable, for these differences are readily accounted for as will now be discussed.

Table 7-2 highlights that single person households, particularly females, are overrepresented when compared to the sample of UK movers into owner-occupation as a whole. Couples with dependent children are under-represented. It is unfortunate that more families were not recruited as they are likely to face particular travel challenges that others are not, including consideration of access to schools. However it is not altogether surprising as households with children are likely to have less free time available to complete a survey. An additional explanation is the increased likelihood that families would want to move to non-urban areas and therefore not covered within a survey of a city. These differences must nevertheless be taken into account when considering the potential wider implications of any findings.

In terms of reasons behind, or prompts for the move, direct comparison between the data sources is more difficult. The SEH collected data on main reason only, whereas the RRT survey requested as many influences as had been involved in the prompt. This was due to a desire to obtain information regarding whether or not travel had been at all involved. Prompts for the move will be discussed more fully in the following chapter, however it can be seen from Table 7-4 that 'a job move' or wanting 'to be nearer work' appear marginally higher within the survey sample than the SEH data. It is possible that a slight effect from the travel emphasis of the survey encouraged more of those with travel related prompts to participate in the survey, however the effect appears to be minimal, if present at all.

inner city and above that classed as suburbs - or not within the city of Bristol and therefore not targeted with surveys).

¹⁸ A few of the included respondents had moved more recently than this, it is presumed that these respondents perhaps purchased a property to renovate prior to moving in.

It can also be seen from Table 7-4 that 42 percent of the survey sample (19 percent of total responses) selected 'to get on the property ladder' as a prompt for moving. This at first seems to suggest that an exceptionally high proportion of the survey sample were first time buyers. However, examination of SEH housing data regarding previous tenancy (DCLG, 2006a, Table 216) demonstrates that 38 percent¹⁹ of households having moved into owner occupied housing in 2005/2006 were not living in owner-occupied accommodation prior to their move. This suggests that the 42 percent of the survey sample moving in order to get onto the property ladder²⁰ is not substantially different from the 38 percent of the movers within the SEH who became owner occupiers upon their recent move, (and the 14 percent for which this was the main reason behind the move).

Finally in terms of travel, it is clear from Table 7-5 that the study sample has a far higher level of car ownership than the Bristol average. This however this is not surprising given the deliberate sample bias towards owner occupier households, who are more likely to be able to afford cars. It can be seen from Table 7-6 that particularly for post-move commute the study sample is clearly biased towards cyclists over walkers and public transport commuters. The census figures shown are however for 2001, and according to the indicators of the Quality of Life in Bristol Report (BCC, 2005), cycling in Bristol has risen 40 percent between 2001 and 2004. This trend is likely to have continued, and therefore the proportion of cyclists among the survey sample is unlikely to be as comparatively high as the figures in the table would suggest.

This section has demonstrated that the survey sample does not appear to differ in any key way to the moving population of England and the population of Bristol as a whole. This gives confidence that any conclusions to be drawn from the analysis may have wider implications than just for the study sample. It is also valuable to be able to gain an idea of where the experiences of the study participants 'fit' into the wider population picture. An assessment of the generalisability of the sample also allows for an assessment of the success of the survey instrument and recruitment technique, and how useful this method might be to future research.

¹⁹ According to the 2005 Survey of English housing, (DCLG, 2006a, Table S216), of 686 thousand owner occupied households in the UK that moved in the previous 12 months; 82 thousand were new households; 426 thousand were previous owner-occupied; 11 thousand were previously social renters; and 167 thousand were previously private renters. Therefore 38 percent (260/686) were potentially first time buyers, or could have moved to get on the property ladder.

²⁰ Previous tenancy data was not collected in the study survey due to space limitations.

The main aim of the methodology was however to gain information regarding a wide variety of experiences. It appears from the mix of household types and moving details outlined in this section that this has been achieved.

7.7.3 Summary of Chapter

It appears that the careful design of the survey instrument and distribution as detailed in this chapter have achieved their aims of gaining responses from a good mix of recently moved households living in Bristol, with a wide range of moving experiences. Further detail of these experiences will be outlined in the analysis chapters to follow.

Chapter 8: Travel Considerations During the Moving Process

8.1 Overview

This chapter presents the first section of the analysis of the postal survey of recent movers in Bristol, design of which has been detailed in the previous chapter. The aims of this survey were to examine the RRT framework developed in Chapter 6 over a broader range of participants, and to further understanding of the influences of a home move on household travel behaviour. The chapter focuses on both the *occurrence* and *timing* of consideration of travel issues during the moving process, with travel considerations occurring at each stage of the RRT framework examined in detail. Typologies of moving households are then developed based on the timing of consideration of travel issues during the move. These are further examined for relationships with details relating to the households and additional factors associated with the move, in order to create detailed profiles of the different typologies.

8.2 Introduction

Chapter 6 established ‘consideration of travel issues’ as a central concept to the research. This was determined to be an important precursor to travel behaviour change, and therefore a key part of the process to examine in attempts to understand the influence of moving home on travel behaviour. It is of particular potential benefit for understanding how travel outcomes might be altered in future, as it signifies the absence of strong travel habits (see Section 6.5 for more detail). To facilitate the examination of consideration of travel issues as a process, the conceptual framework of the Residential Relocation Timeline (RRT) (see Figure 8.1 in Section 8.4 for a reminder) was developed. This chapter focuses on the processes of search and selection of the new home, and consideration of travel issues throughout. Extending these findings to the actual travel outcomes of the move will be the focus of the following chapter.

Firstly the chapter considers the involvement of travel issues in the prompts and search criteria of participants’ moves. This provides some context as to the *relative* involvement of travel criteria within participants’ moves, for the later detailed discussion of travel consideration over the RRT. Following this, the extent of participants’ consideration of travel issues over the moving process as a whole is examined, focussing on what proportion of the sample reported

considering travel issues at *any* point during their move. The chapter then turns to examine in detail each of the RRT stages in turn, using both quantitative and qualitative data from the survey responses. The types of travel considerations reported and the proportions of the sample considering at each stage are discussed. In this way variation in travel considerations throughout the move as a process are identified. Finally a series of household travel consideration ‘types’ is developed based on the *timing* of consideration of travel issues during the moving process. These are further examined for relationships with details relating to the households and additional factors associated with the move, in order to create typology profiles of the different ‘TC-types’. Discussion now begins at the start of the moving process, the initial prompt for the move.

8.3 Travel prompts and search criteria

Prior to commencing discussion of the extent and types of specific travel considerations over the RRT, as is a key focus of the survey identified in Chapter 7; it is beneficial to briefly examine the range of prompts and search criteria reported by the study participants. This provides some context for the later discussion, by providing an indicator of the *relative* involvement of travel considerations compared to factors such as housing and neighbourhood considerations over the participants’ moves. Chapter 3 detailed how despite a lack of clarity within the research regarding the relative influence of these three factors; it is generally found that travel issues are less influential than either housing or neighbourhood criteria. It was the intention to assess whether this was the case for the study sample.

8.3.1 Travel prompts

The travel prompts of the survey sample have already been introduced in the previous chapter, where they were compared to the ‘main reason for move’ according to the Survey of English Housing (SEH). They were found in general to be similar despite differences in the specific details and prompts recorded. However, more detailed prompts were collected in the study survey which can now be examined. Participants of the RRT survey were requested to select from a list of 18 possible prompts, including ‘other’, as many factors as had been involved in their decision to move home. The prompt options provided and their respective response frequencies can be seen in Table 8-1. Subsequent to the data collection the response options have been categorised into house, neighbourhood, life-cycle, and travel factors for presentation in Table 8-1; in order to facilitate comparison of the relative involvement of travel related factors against other factors.

Table 8-1: The prompts of participants' moves

Reason for Move	n	Percent of sample selecting this option ¹	Reason for Move	n	Percent of sample selecting this option ¹
Housing related prompts			Lifecycle related prompts		
To get on property ladder	97	42.5	Moving in with partner	22	9.6
Bigger house wanted	70	30.7	Job move ²	18	7.9
Smaller house wanted	11	4.8	New children	15	6.6
Total	178	72.5	Separation from partner	15	6.6
Neighbourhood related prompts			Planning for children	13	5.7
To move to a nicer area	52	22.8	Retirement	6	2.6
Total	52	22.8	Marriage	5	2.2
Travel related prompts			Death of partner	2	0.9
To be nearer work	29	12.7	Total	78	38.4
To be nearer family	22	9.6	Other prompts		
To be nearer a school	16	7	Other	51	22.4
Total	67	26.4	For investment	38	16.7
			Increased income	16	7
Total number of prompts reported	498	99.6	Total	105	39.7

It can be seen from Table 8-1 that a total of 67 travel related prompts were reported by the 229 participants. This corresponds to 60 individual participants (26.4 percent of the sample) reporting a travel related factor involved in prompting their move, as participants were able to report more than one travel factor³. Examples of participants' travel related prompts for a move (as recorded in the RRT section of the survey) include: *"Journey was taking too long for work, too far from Bristol at night, taxis expensive. Looking to be close to city and shopping"*.

¹ The total percentages in this column are not a total of the figures above, they represent the percentage of the sample selecting that criteria type, eg 72.5% of the sample reported at least one housing related prompt.

² A job move is included under lifestyle related prompts as it is a desire for different employment and career progression which is likely to be most influential in such situations. It is however noted that where a job move prompts a home move this is also very much travel related as it is likely to be the need to travel to the new job prompting a home move. This is however not always the case as research has shown job moves over short distances also increasing propensity for residential move (Clark and Davies Withers, 1999). Of the 29 participants reporting that they moved to be nearer work, only 4 also selected a job move as a prompt, therefore it can be assumed that for the remaining 25 participant households (10.9% of the sample), job location(s) remained the same and a desire to be nearer work prompted the move.

³ 54 participants reported 1 travel related prompt, 5 participants reported 2, and 1 participant reported 3.

And, *“As I am getting older I wished to be near to town, hospitals etc., in case at some stage I can no longer drive”*. Thus it is clear that for some households travel issues form a significant part of the prompt for moving. The clear travel emphasis of the survey, and the potential associated increase in saliency of participants’ travel issues must be noted. However the various proportions of the prompts were not greatly different to the ‘reasons for move’ as collected by the 2005 SEH, as demonstrated in Table 7.4 in the previous chapter, therefore this is unlikely to have had a significant impact.

It is additionally clear from Table 8-1 that almost three times as many participants reported the involvement of housing related criteria in prompting their move than reported travel criteria. These prompts were mainly focussed on finding a bigger home or getting on the property ladder. *“The primary reason to move was the size of house and financial reasons.”* These results replicate for the study participants the situation generally reported within the literature (Chapter 3), that travel considerations are clearly influential in home moves, but nowhere near as influential as factors associated with the home itself.

8.3.2 Search criteria

In addition to information relating to prompts for the move, study participants were also requested to list up to five of their most important search criteria when searching for their new home (Q6a in Appendix 7). Responses were coded into 96 separate search criteria, which for ease of use were further coded into twenty, more general criteria⁴, as can be seen in Table 8-2. Finally the search criteria were again categorised according to their relation to house, neighbourhood, travel, and other criteria (see Appendix 10 for discussion of the coding decisions taken here).

⁴ It was necessary for the ‘general’ categories to be either quite broad or very narrow, and broad was selected as providing most meaning. For example, responses included ‘size of rooms’, ‘number of rooms’ and ‘size’. It is not clear whether ‘size’ means size of rooms, or size of house (eg number of rooms) therefore it is necessary to either keep all three separate, or combine all three. Distinction into size of house and number of rooms is not possible. To highlight this, examples are provided of some of the more detailed categories in the final column of Table 8-2.

Table 8-2: Search criteria of respondents⁵

General Criteria	Count	Examples of specific criteria included
Housing		
Property size	139	Number of rooms, house size, size of rooms
Property Finances	102	Price, affordability
Outside space	86	Garden, space for pet
Property type	46	House not flat, semi-detached, older
House other	38	Specific room details, view
State of repair	27	
Future development	9	Room for development
Home ownership	3	
House Total	452	
Neighbourhood		
Location/ Area	103	Location, area, nice/good area
Location other	61	Noise level of area, not on main road
Neighbourhood Total	163	
Travel		
Amenities in Proximity	64	Shops, schools, general amenities
Travel to work	45	
Parking	42	Garage, driveway, off-street
Proximity to friends and family	23	
Access to PT/ cycle routes	19	Bus routes, train station, cycle routes
Proximity to centre	19	
Transport links	13	Proximity to motorway, airport
Travel other	5	To reduce car use, ease of access
Proximity to other	2	River, docks
Travel Total	232	
Other	7	
Total	853	853 criteria (224 respondents)

It can be seen from Table 8-2 that the most commonly mentioned criteria is the property size (including number and size of rooms), followed by the location of the property and property costs. The most commonly mentioned travel criterion is a variable indicating a general proximity of amenities such as shops and schools, which ranks 5th, after outdoor space or garden. Further travel search criteria are considered, such as journey to work and proximity to city centre, but by considerably fewer respondents than focussed on the housing attributes of size, cost and outdoor space, and the area of the property.

It is clear that the general trend within the literature of housing criteria as the most influential criterion type (see Chapter 3) is again repeated. Many participant comments from the RRT

⁵ See Appendix 10 for reasoning behind the classification of various criteria, particularly ‘parking’, ‘location/area’, and ‘amenities in proximity’.

open responses reflect this: *“The main criteria for the property were that it was bigger and had a garden. Travel was not a criteria as it would be dealt with wherever I moved”*. *“The house was more important than travel. Living in a city you expect to be able to travel to and from destinations. I have a car, bike and can walk”*. However more travel orientated examples of search criteria were also provided, e.g. *“Wanted somewhere on a route to work with good public transport access.”* Further detail of the specific travel considerations reported during a move will be discussed in Section 8.5 of this chapter.

Despite the lower relative importance of travel related search criteria, 50 percent of the survey sample mention at least one travel issue in their search criteria⁶. Therefore travel issues are not only involved in prompting the moves of a quarter of the survey sample, but are also considered in the top five search criteria by at least half of the study sample. They are therefore clearly important even if not as important as housing criteria.

8.3.2.1 Summary of section

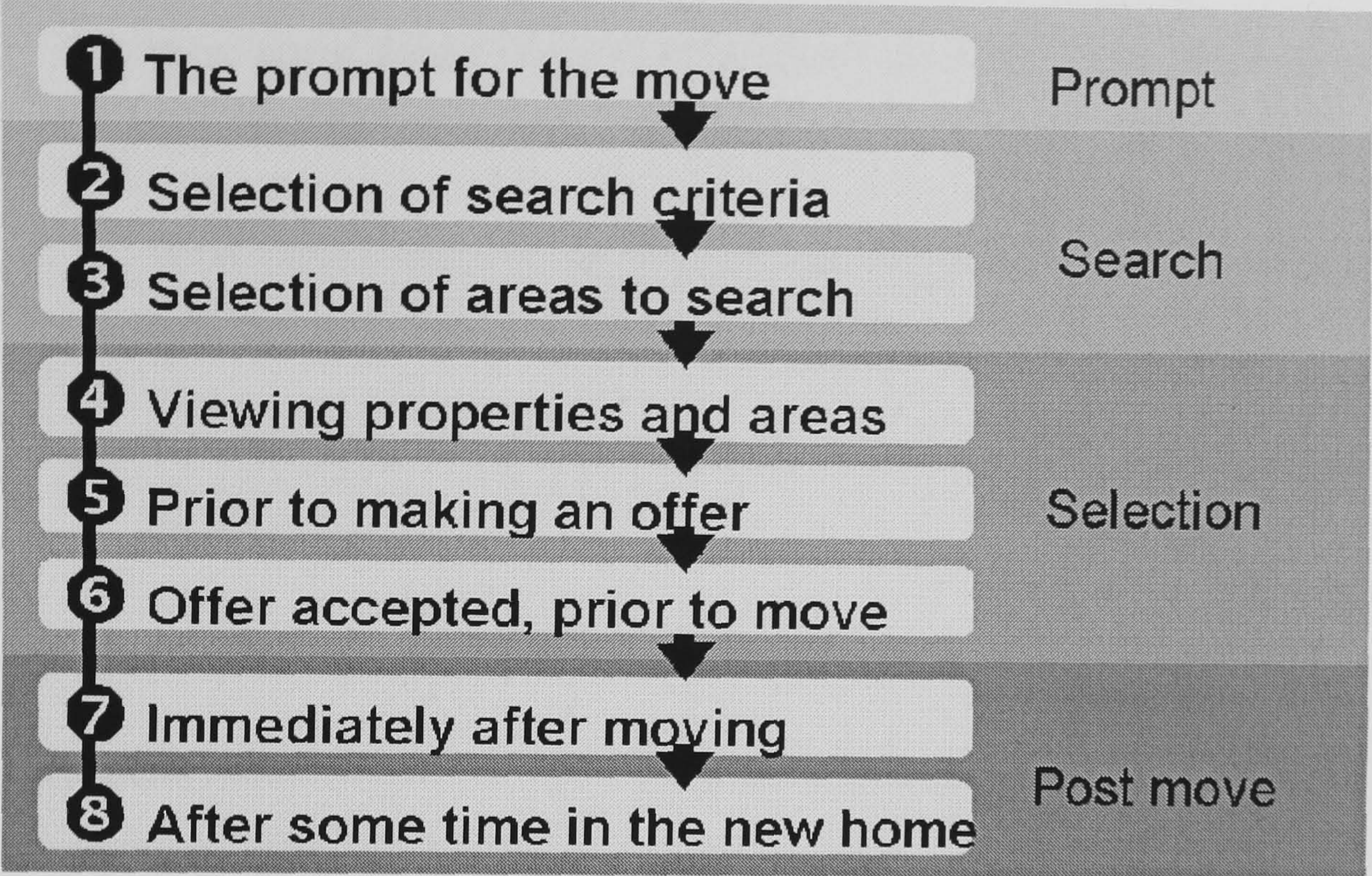
This section has clearly demonstrated that travel issues appear to have substantially less involvement than housing criteria in the initial prompt and search criteria of a move (and therefore presumably the remainder of the move in the majority of situations). Thus the existing situation generally reported in the literature is replicated. Having set the context by a brief examination of the relative involvement of travel issues, the chapter now turns the focus to consideration of travel issues over the course of move alone, as examined utilising the RRT framework.

8.4 To what extent are travel issues considered during the process of moving home?

A key aim of the research is to establish the extent to which participant households considered travel issues during the process of their move. Chapter 6 detailed how the occurrence of consideration of travel issues necessarily implies the absence of strong travel habits and a potential ‘window of opportunity’ for influencing travel behaviour. It is therefore possible to assess the proportion of the sample that are (theoretically) potentially susceptible to travel behaviour change strategies from examination of their reported travel consideration (or lack of it) over the RRT (Residential Relocation Timeline – see Figure 8.1).

⁶ 34 percent of those with travel related search criteria had also mentioned a travel prompt.

Figure 8.1: The Residential Relocation Timeline - conceptual timeline of points at which travel behaviour could be considered during the house move process.



Prior to presentation of these results the section firstly provides detail of the process of determining from the survey data whether each participant could be said to have considered travel issues, or not, for each of the eight RRT stages. This serves as a reminder of what specifically has been recorded when ‘consideration of travel issues’ is discussed in the following analysis. This is followed by examination of those survey respondents who reported some consideration of travel issues over the stages, as compared to those not considering at all during the move. Potential explanations for lack of consideration of travel issues are examined. Finally the ‘consideration patterns’ reported in the timing of travel consideration over the course of participants’ move are outlined before the section findings are summarised.

8.4.1 Determining whether or not travel was ‘considered’

As detailed in Chapter 7, the survey included a number of questions referring to consideration of travel issues over the RRT. The term ‘consideration’ was not explicitly utilised as it was felt to be too ambiguous and open to interpretation for the purposes of a survey (see Chapter 7 for more information on this issue). The analysis and discussion however now reverts to the term ‘consideration’, but it remains valuable to note that wherever mentioned this refers to responses to a number of questions specifically referring to ‘travel on the mind’, as outlined

below. In order to determine level of consideration at each stage of the RRT, the following information was requested from each participant⁷:

1. Were travel issues on your mind at this stage? (*Yes/ No, if no move to next stage*).
(*repeated for all stages*)
2. What travel issues did you think about at this stage? (*open response, plus tick boxes to indicate repetition of previous answers*) (*repeated for all stages*)
3. To what extent were travel issues on your mind at this stage? (*rating 1-3*)⁸ (*repeated for all stages*)
4. At which stage was travel most on your mind?

Participant responses to the first three questions were compared, and only those whose responses consistently indicated the occurrence of consideration were designated as having considered travel at a particular stage. In this way the inclusion of potentially arbitrary participant responses was avoided, where perhaps fatigue or a disinclination to select ‘don’t know’ would lead to inconsistencies in response.

This process leads to a consideration variable with three possible values: definitely considered, definitely did not consider, and incongruous response. The majority of the analysis to follow in this chapter focuses only on those respondents who ‘definitely considered’, and the other two values are effectively ignored. However, in order to facilitate the search for potential typologies of travel consideration using cluster analysis (see Section

⁷ See the copy of the questionnaire in Appendix 7 for the precise presentation and wording of these questions.

⁸ The question “*To what extent were travel issues on your mind at this stage? (rating 1-3)*” was only intended for completion by those participants reporting that travel issues had been considered at the stage in question. Unfortunately some participants who did not consider travel issues at the stages in question also responded. Therefore the scale is not entirely valid as ‘1’ will have been interpreted as both ‘no consideration’ and ‘a little consideration’ by different respondents. It was therefore only possible to separate responses into high and low consideration from the scale, and it is this that was used in the process to be discussed in Section 8.4.1. With hindsight it would have been clearer to include a scale of 0 to 3. This is the one improvement that would have been made had the questionnaire been piloted for a second time. However, given the huge variation in responses to be described in Section 8.4.3, it is likely that even if this data had been successfully collected it would have remained necessary to reduce the data to ‘considered versus not considered’, as detailed in this section, in order for patterns to emerge, as discussed in Section 8.6.1.

8.7.1), it was necessary to reduce variability in the data. To achieve this without losing cases which contained an incongruous response, it was necessary to reduce these three values into two. Therefore those respondents who reported not considering, and those whose responses were inconsistent were designated as ‘not having definitely considered’. This provided two values for each stage ‘definitely considered’ and ‘not definitely considered’. As previously stressed – the majority of the analysis in the chapter (excepting that in the following section) focuses only on occurrence of consideration, rather than absence of it, therefore this is of only limited impact. Where non-considerers are the focus, this is explicitly stated, and the incongruous respondents removed from analysis.

8.4.2 At how many of the RRT stages was travel considered?

The *number* of stages at which each of the participants reported considering travel issues is shown in Table 8-3. Consideration at many stages does not necessarily provide an indicator that travel issues were a high priority, but provides an indication of the prevalence of travel considerations throughout the move. It can be seen that there is a great range in the number of stages at which participants considered travel, with 7 percent considering at all 8 stages and the modal number being consideration at 3 stages, with 17.5 percent.

Table 8-3: The number of RRT stages at which travel was considered

Number of Stages	Considered Frequency	Considered Percent
0 (no travel consideration)	33	14.4
1	14	6.1
2	29	12.7
3	40	17.5
4	36	15.7
5	33	14.4
6	14	6.1
7	15	6.6
8	15	6.6
Total considering travel	(196)	(85.6)
Total	229	100.0

Most significantly, Table 8-3 highlights that 86 percent of the study sample reported considering travel issues during at least one of the RRT stages of the move. Comparison of this to the 50 percent of the sample that included travel related search criteria or the 26.4 percent that indicated travel related prompts highlights that a substantially higher proportion

of the study sample does give some consideration to travel issues than would be indicated by analysis of top search criteria and prompts alone. This provides clear support for the decision to focus the main part of the research on travel issues in isolation. It highlights that travel issues may indeed be considered but that this detail would likely be masked by more important and better understood criteria such as price and number of bedrooms.

This finding additionally suggests (according to the arguments previously outlined in Chapter 6) that 86 percent of the sample do not demonstrate strong travel habits at some point during their move. It is further possible to assert that this largely provides evidence of *weakened* travel habits, as 71 percent of the respondents either agreed or strongly agreed with the statement ‘prior to moving my travel to work was habitual’. While this simple measure does not provide unquestionable ‘proof’ of pre-move travel habit, (and therefore presence of habit *weakening*); given the difficulties in measuring habit reported throughout the thesis, it is likely to be as appropriate an indicator as is possible for a retrospective study. It is therefore argued that the majority of travel ‘consideration’ recorded within the study implies travel habit weakening.

Two slight cautions are advisable here; firstly that in assessing the ‘extent’ of consideration of travel issues during the move it is necessary to remember that the *strength* of consideration may vary. At one extreme travel issues may be taken for granted in an assumption that the situation in the new property would be satisfactory, or consideration could entail, for example, a cursory assessment of parking availability and distance to work. At the other extreme it might involve a more detailed examination of different travel options based upon time, price or other generalised cost elements. Therefore the degree to which travel habits are weakened/absent is undetermined. Nevertheless, as argued in Chapter 6 (Section 6.5.2.1) *any* consideration of travel represents conscious thought as to travel, and therefore the absence of *strong* travel habit.

The second caution is due to the nature of the survey questionnaire and its obvious travel focus. Respondent bias might occur in terms of increased saliency of travel issues, or from a desire to please the researchers. No research however can be entirely free from bias, and as not all participants did report travel consideration this cannot have had a substantial effect. These participants not reporting consideration of travel issues will now be examined as a population of interest to assess likely explanations for the absence of travel consideration during the process of moving home.

In addition to highlighting the extent of consideration of travel issues during the process of moving, Table 8-3 also highlights that 33 participants reported considering travel issues at no stage of their move. For 6 of these 33 participants the responses contained some incongruence (see previous discussion in Section 8.4.1 on definitely considering or not). Therefore only 27 study participants (11.8 percent of the sample) can be said to have definitely reported never considering travel during their move.

Potential explanations for this absence of travel consideration are important to obtain in the interests of generating a fuller understanding of the processes and factors involved in consideration of travel issues over the course of a move. These can be examined from the open responses. Two popular explanations were provided. Firstly that the move had been over a very short distance, so no new consideration of travel issues was necessary, e.g.:

Because our new house is only .25 mile away from our old one and travel to and from work from both houses was/is straightforward

[Participant 66]

Indeed 52 percent of the non-considerers had moved less than 1 mile.

Secondly, eight of the non considering participants explicitly mentioned that they travelled by car and so it was not necessary to plan for travel by this mode, e.g.:

We both drive so did not think about travel. Public transport is not used because it is too expensive and unreliable.

[Participant 178]

"All areas looking at were close and I use car to commute."

[Participant 115]

Additional explanations for lack of travel consideration included a focus on other priorities such as a nice house or good school, e.g.:

Travel distance was not a consideration due to it being more important to get the right house rather than the right area / distance to work.

[Participant 41]

Alternative explanations included that the work location was either distant or varied, so planning for commute travel (the journey most likely to require planning in relation to a home move – see Chapter 3) wasn't necessary as it would have little consequence for the journey:

I work in London (when I do work) so it means taxis and trains. So either I don't have a car or I refuse to let where I work dictate where I live. Cars, garages, drives are the least important thing to me.

[Participant 164]

Therefore a variety of reasons have been provided by the survey participants as to why travel issues might not be considered during a home move. It is however finally important to note that travel might not be 'considered' because it is taken for granted that the new home situation will be satisfactory, and presumably require little change from the pre-move travel situation. (Anticipating a change would necessarily involve consideration of travel – or travel being 'on your mind'). If this assumption of no change to travel required proved incorrect, the implications for the household are potentially large and stressful (desired destinations may prove difficult to reach). Such circumstances would require post-move consideration of travel (Stages 7 and/or 8 of the RRT), and therefore any participant households in this situation would not have registered as non-considerers in Table 8-3. This situation will be discussed further following the development of typologies of moving households in Section 8.7. Nevertheless, it would seem that for the survey participant households *not* considering travel issues at any point of their move, such difficulties were not faced.

8.4.3 Summary of extent of consideration over the move

The survey has thus provided evidence that a high proportion of movers within the sample, (86 percent) appear to demonstrate the absence of strong travel habits at some point during the course of the move. This is a much high level than would be evident from examination of move prompts and search criteria alone. Additionally it has provided explanations as to the situations in which travel is less likely to be considered (and habit not weakened) – a valuable insight for the potential future promotion of behaviour change interventions associated with a move. Detail of the *types* and *timings* of consideration occurring will be the focus of the remaining sections of the chapter.

8.5 Detail of travel consideration at each of the RRT stages

Having established the *extent* of consideration of travel issues throughout the move, focus now turns to examine variation in consideration at each *stage* of the RRT. Both ‘amount’ of travel consideration at each Stage, and detail of the specific travel considerations reported by participants will be discussed. Table 8-4 shows for each of the 8 RRT stages both the percentage of respondents who reported considering travel at that stage (first column), and the percentage of respondents indicating that this was the stage at which travel issues were ‘most on their mind’ (second column).

Table 8-4: Overview of consideration at all stages

RRT Stage	% Respondents confirming ‘yes travel issues were on my mind at this stage’	% of respondents indicating ‘travel issues were ‘ <u>most</u> on my mind’ at this stage’
Never	-	11.8
Stage 1: The prompt for the move	34.2	15.9
Stage 2: Selection of search criteria	64.8	9.5
Stage 3: Selection of areas to search	82.1	29.5
Stage 4: Whilst viewing properties	65.3	9.1
Stage 5: Prior to final selection	53.1	3.6
Stage 6: Prior to move, post selection	28.1	1.4
Stage 7: Post Move	42.3	6.8
Stage 8: After some time	43.9	12.3
<i>Number of responses</i>	<i>811</i>	<i>220</i>

It can be seen from Table 8-4 that Stage 3 (selection of areas to search) clearly stands out as the stage where both the highest proportion of respondents have travel on their mind (or the largest proportion consider travel issues), and the highest proportion have travel *most* on their mind (*most* considered travel issues)⁹. As discussed in Section 8.4.2.1, 12 percent never considered travel. Stage 6 (after having an offer accepted) is noticeably the stage where least consideration occurs, perhaps because it is less easily distinguishable from the following stage. Finally Stage 8, after being in the home for some time, has the third highest amount of consideration overall. This was unexpected, as it occurs some time after the change of circumstances has taken place. Detail of the types of travel considerations reported by survey participants at this stage will be examined to highlight potential explanations. Examination of the detailed travel considerations reported at all stages is intended to provide an improved

⁹ The implications of this finding will be discussed in Chapter 10.

understanding of how such considerations might vary throughout the moving process. Not all respondents provided detailed comments in the survey, but the majority included comments for at least one stage, with many commenting on every stage of the RRT.

8.5.1 Consideration at Stage 1: The prompt for the move.

The prompt for the move has already been discussed in Section 8.3.1, therefore only limited discussion is required here. Typical travel related issues considered in prompting a move included a desire to improve access to employment¹⁰ and other important destinations such as friends, family and hospitals: *“We wanted somewhere to live where we would be easily accessible to work and city centre by either public transport or using own car. Previous place didn't really fulfil these criteria. Ideally we wanted to be able to walk and cycle everywhere.”*

Reductions in journey distance, costs and time were not the only foci of travel considerations at this stage. Reduction of journey stress including (dis)comfort, and overcrowding was also frequently mentioned. These desires often included a change of mode, particularly in favour of cycling as highlighted in the above example. Nine additional participants volunteered that a desire to start cycling was at least part of the prompt for them to move.

For nearly half (46.5 percent) of those participants reporting considering at this stage, (nearly 16 percent of the sample overall), it was the stage at which travel issues were most on their mind. Therefore where travel is involved in a prompt for a move this is frequently of high relevance to the household, which is logical if the travel situation has been important enough to the household to help prompt it to move.

8.5.2 Consideration at Stage 2: Search criteria

As with Stage 1, the search criteria of a move have been examined in Section 8.3.2, therefore again only limited further comments will be provided. Double the number of participants reported consideration of travel issues within their search criteria as considered travel at Stage 1. Despite high proportions of the sample considering travel as part of the search criteria, a far lower proportion of those considering at Stage 2 reported travel *most* on their mind at this stage than for Stage 1. It is likely this is associated with higher amounts of consideration of travel at the subsequent stages, in particular Stage 3, and other search criteria taking priority

¹⁰ 33 participants specifically referred to the commute in prompting their move.

(as previously discussed in Section 8.3). Despite this, examples were provided at Stage 2 of households prioritising travel over other issues: *“We wanted to be close to the cycle path so that we could cycle to work and not be reliant on bus/car, also handy for the local train station. Thus restricted area we were prepared to look at.”* Therefore travel is clearly not the least important search criteria for all households.

Participant comments at Stage 2 additionally highlighted that travel considerations within the household’s search criteria are largely concerned with mode choices and preferences, in particular for modes alternative to the car. Of the 104 written comments at Stage 2, 89 related to consideration of travel issues in some way (as opposed to explanations for not considering). 77 of these referred to mode choices including car parking and bike storage. 18 of the comments related to one specific non-car mode, and 41 related to consideration of a variety of modes, with the remainder largely detailing parking. Many participants therefore clearly considered a variety of modes in their property search and had a general desire to have a number of travel options available. E.g.: *“Needed to be within walking or cycling distance from work/shops/friends and have access to public transport for longer journeys. Also wanted safe and on street parking.”*

The fewer comments regarding consideration of car use for journeys at this stage, (excepting parking), is likely to be linked to a general reduced need for planning for car journeys (as discussed in Chapters 3 and 6). Thus consideration at Stage 2 is largely concerned with planning for use of alternative modes to the car (be it for specific modes or a general desire for a variety of options) and for storage of vehicles (bicycles and cars).

8.5.3 Consideration at Stage 3: Selecting areas to search

Stage 3, selection of areas to search, is where both the largest proportion of participants considered travel issues (82 percent) and the substantially largest proportion of the sample reported travel issues as *most* on their mind (29.5 percent). It is clearly the stage at which most consideration of travel issues occurs overall. The importance of this stage highlights the wisdom of both completing a pilot survey, and implementing the changes suggested by participant responses, as this stage was not a part of the original RRT framework, but was incorporated as part of the previous stage (search criteria)¹¹. Nevertheless, the extent of travel consideration reported at this stage may to a certain extent have been predicted. The nature of ‘area selection’ almost by definition (although by no means necessarily) involves

¹¹ See Sections 6.6 and 7.6.1.1.2 for discussion of this alteration.

consideration of proximity to various important destinations, such as workplace. Detail of reported travel considerations at this stage however remain important to examine.

Open responses describing consideration at Stage 3 highlight that it is indeed characterised by concerns of accessing destinations. Ease of reaching places of employment (e.g. *"We wanted to be within a commutable distance to work"*), childminders (e.g. *"Had to be near childminder and work"*), and shops and amenities (e.g. *"Wanted to be in walking distance of my gym and shops"*) etc. Over two-thirds (66 percent) of the open responses at Stage 3 consisted of distance or travel time to particular amenities: not surprising given the geographic focus of the stage. Consideration of these issues was not confined to Stage 3 but was most strongly associated with it, particularly the emphasis on distance.

Mode preferences and mode alternatives continued to be considered at Stage 3, largely associated with the different journey distances feasible in a reasonable time by different modes (walk vs car vs cycle), but also availability of public transport services: *"we had to ensure distance travelled to school was walkable for a teenager"*, *"looked at areas on bus route"*, or *"I began to think about travel distance to work, how far the property was from work and possible routes, congestion etc., possibility of cycling to work"*. As with Stage 2, some of these comments referred to strict mode preferences while others were possibilities, aspirations and ideas for ensuring a variety of options available.

Affordability emerged as a key factor affecting level of consideration given to travel issues when selecting areas. *"Looked at all areas from Stroud to South Bristol considering what I can afford in each area"*, *"Limited to what I could afford so travel wasn't considered."* Additionally, commute distance and patterns also appeared to have an influence, (as previously discussed in Section 8.4.2.1 - the examination of non consideration of travel): *"Adult 1 commutes to Swindon so Travel time dependant on areas and primary routes but minor as any Bristol location affected a 50min commute by only +/- 10 mins"*.

Finally, a few participants extended their focus on potential journey times at Stage 3 to take detailed notice of the levels of congestion in specific areas: *"Had to consider volume of traffic in area."* and *"consideration was given to the journey time to work and the queues that would be likely on the roads to work. Travel to work by car within 30 mins in rush hour"*. As shall be seen under discussion of consideration at Stages 7 and 8, many further participants did not consider the potential levels of congestion – and report regrets on this issue. This therefore highlights the different levels of detail relating to travel that may be considered by different households.

The majority of the study participants did report considering travel issues to a certain extent when selecting areas in which to search for property. Thus travel is clearly an issue considered and prioritised early on in the process, even if for a large proportion of households it is not a *highly* prioritised issue (see Section 8.3).

8.5.4 Consideration at Stage 4: Viewing properties

By Stage 4, viewing properties, some participants were beginning to report that no further consideration of travel issues was necessary as specific search and area criteria to provide for their intended travel had been implemented: *“I knew from the areas that I'd selected that any house would now hit my criteria for being able to use my bike or buses easily.”* Or: *“Once I had a rough idea where I may be moving to I had already processed issue of travel in my head.”*

It is likely that this high initial prioritisation of travel criteria, with strict selection of search criteria and areas to search, accounts for part of the reduction in number of participant households considering travel from this stage onwards (only 65.3 percent at Stage 4).

Conversely for a few households it was not until the viewing process began that travel issues were considered. The following is the first instance of travel consideration made by Participant no.222: *“Considered journey to/from place of work for both adult 1 and 2, using both cars. Also considered distance to nearest shops/supermarket and local parks (by foot). Essentially, didn't want to travel to/from work for longer than 45 mins.”*

It is likely that this household did not focus on a specific area/s to search, but rather viewed disparate properties, checking the travel situation of each one in turn; the property itself being of greater importance¹². This suggestion is corroborated in that this participant reported having searched more than three different areas for a property.

In addition to these types of consideration, many of those households that had previously considered travel continued to do so at Stage 4. *“Whenever viewing a property, we did take into consideration its distance from the nearest bus stop.”* A particular issue which was apparent throughout the stages but of particular relevance at Stage 4 was parking: *“I discounted one house because of the great difficulty in parking any where near it especially at night or with shopping”*. Parking was a popular search priority (see Table 8-2) and a particular

¹² A possible explanation for this lack of earlier consideration was considered to be unfamiliarity with the area, however upon checking this the participant was in fact very familiar with the area.

challenge reported by a number of participants as many properties in Bristol do not have easy parking availability. Changes to vehicle ownership were also considered: *"Thinking about additional car as previously walked to work/ school but would not be possible in areas looked at."*

Mode alternatives at Stage 4 were often considered in the form of 'back-up plans': *"Considered future need to use the bus and was glad to know there was a bus route passing my house (albeit 1 hourly) although my previous house had a 10 minute service. However mainly used car."* Or: *"location with easy access to cycle path as potential alternative to driving to city centre."* Such comments highlight the importance of having a range of travel modes available to certain households, as was first suggested by the interview participants. For other households travel issues clearly remained of lower importance as their area selection had not been so strict. *"If we had seen a property we liked in an area which would have led to difficulties in getting to work, this would have had a major negative mark against it, but compromises need to be made in every house move."*

Finally for Stage 4, as with interview Participants 2 and 3, (described in Chapter 6), there was further evidence that considering travel issues when viewing properties can alter decisions made at previous stages: *"I initially wanted to commute by train. After viewing several areas within walking distance from Temple Meads [Bristol's main train station], decided against it due to 1: cost of rail travel 2: types of property near Temple Meads. 3: unreliability and inflexibility of public transport."* This illustrates the importance of viewings to allow familiarisation with the area, and how although for many households priorities remain constant throughout the move and stages of the RRT, for some households alterations do occur from one stage to the next.

Stage 4 of the RRT therefore comprises of households that are at many differing points in their consideration of travel issues. Some have completed consideration and therefore made *deliberate*¹³ plans; some are just starting to consider; some still not considering; and yet others continue previous consideration. It is however the stage 'most considered' for only 9.1 percent of the sample, so a stage of lesser, but by no means no importance to understanding the process of travel implications of moving home.

¹³ A reference to the three types of changes to travel behaviour following a home move, as identified in Chapter 6: Deliberate, anticipated, and unexpected. It is recognised that these distinctions apply equally to *any* travel outcomes of a move, and are not just applicable to 'changes'. I.e the continuation of cycling to work could be *deliberately* planned for.

8.5.5 Consideration at Stage 5: Prior to making an offer

The most common written comment provided for Stage 5 was that which had begun to be made at Stage 4; that no further consideration of travel issues was necessary at this point, as it had already been taken into account. However approximately half (53 percent) of the survey sample did report considering travel issues prior to making an offer on a property, although it was the most considered stage for only 3.6 percent of participants.

For some participants further checks of the travel options and mode alternatives available were completed prior to making an: *“Walked around the area to ascertain any previously unnoticed cycle/walking routes”*. Some participants were even prompted to consider mode switch at this stage *“Garage on the property and cost of transport ie. Running the car compared to getting bus.”* or *“When saw properties so close to work, I began to consider that I could walk to work and we could sell one of our cars.”*

Confirmation that required destinations would be accessible from the potential property was reported by a number of households, e.g.; *“Adult 1 needs to use car or bus fro commute. Adult 2 could use car or walk”* *“Thought about ease of movement both to get to work and closeness to motorway.”* The precaution of trying out proposed travel methods before making an offer on the property was also reported: *“We walked the journey and timed it from home to school to ensure the journey was walkable and safe before finalising our decision”*; *“We did a dummy run from the house to my work to check it was workable.”* This is a hugely sensible step to take for households for whom the travel situation is important. A step which as shall be seen in following stages, a number of other participant households may have wished they had taken.

Finally, certain households considered prior to making an offer (Stage 5) that compromises had to be made to their travel preferences: *“We couldn't find a property we liked in the area most convenient for travel to Bath, so compromised our travel needs for the property we wanted”*. Conversely there were also reports of good public transport accessibility swinging the balance in favour of the selected property. *“Being very close to Parson Street Station was a big factor for this house.”* *“Obviously, when finding the right house the location of the nearest bus stop wasn't a massive priority, but it certainly helped us to come to the decision that the house we wanted to make an offer on was the right one.”* Thus again, extensive variance in the level of detail of consideration given to travel issues is apparent. However it is clear that for many households, post-move travel is clearly thoroughly planned for prior to selection of property and completion of a move.

8.5.6 Consideration at Stage 6: Offer accepted but prior to moving

It is clear from Table 8-4 that Stage 6 (after having an offer accepted, but prior to moving) is where least consideration of travel issues occurs (only 28 percent of the sample consider here, with only 1.4 percent indicating most consideration). Nevertheless, potentially important travel considerations were reported.

As with Stages 4 and 5 further participants continued to report that travel had already been planned prior to Stage 6 and therefore no further consideration was deemed necessary. *“Had already thought and sorted prior to making an offer!”* The prevalence of exclamation marks etcetera in such comments indicates that many participants felt it was obvious that one would have organised household travel prior to finalising selection of a particular property. However continued reports of travel consideration at Stage 6 by other participants, to be discussed below, indicate that for some other households this was indeed not the case, and that travel had not been thoroughly planned as part of the property search and selection. This finding again highlights key differences in the way different households view their travel and housing choices.

Those considering travel issues at Stage 6 generally took the opportunity to seek public transport information; *“Enquired more about all bus routes in locality eg to/from work, station, etc for adult 1.”* Or to plan particular routes to work and to other destinations, e.g. *“I began to think about possible cycle routes to work and other areas of Bristol that I use”* or *“looked at map and worked out possible route to work - realised would have to get up 5 minutes earlier each morning”*. Route planning appeared to be the main travel consideration at this stage rather than mode and distance as considered at previous stages. However additionally changes to vehicle ownership were also considered immediately prior to moving: *“Identifying new travel routes to work as we sold our cars to share one”*, or conversely *“purchased second car”*. Additionally: *“Due to location of house, decided that a new bicycle was needed due to the nature of part of the journey that I'd be taking to work by bike (i.e. steep hill, poor road surface)”*. It is therefore clear that Stage 6, offer accepted but prior to moving, allows for detailed planning of future travel to be completed, including specific routes and consideration of vehicles, by those motivated/organised enough to do so. It therefore remains an important stage for understanding the overall process of travel considerations during a move, despite lower overall levels of consideration occurring here.

8.5.7 Consideration at Stage 7: After moving

By Stage 7 the household has finally moved into their new home. Even for households that had planned travel prior to the move, it might be expected that travel would be considered at this stage in terms of testing new routes and finding the best travel times etc. However, participants reported that where plans made prior to the physical move had worked out, this was not felt to be necessary: *"Because I anticipated cycling and nothing has changed"*. Additionally consideration of travel issues was also reported as unnecessary where households had experienced very little change to their situation, perhaps due to an extremely short distance of move: *"Cycling from new property only required minor adjustment to daily routine (slightly further and more challenging route). Drive to work required little planning."* These explanations perhaps account for the fact that less than half of the study sample reported consideration of travel issues upon moving into their new home, particularly given the high proportion of moves over a very short distance (see Table 7.3 in previous chapter).

Many participants who did consider travel upon moving into the new home reported similar considerations to those discussed under Stage 6; finding out more detail about cycle routes, public transport options etc and experimenting with different routes, timings and travel options: *"Actually determining specific routes and most timely ways to get to work and return home."* *"Had to consider best routes. Looked at bus options/ taxi/ night bus."* *"I quickly found out about how to get onto the cycle track from my home"*. *"Getting used to routes and heavy traffic times - when to avoid if possible."*

On occasion the process of reaching the 'current' travel situation was also outlined, particularly where travel modes had been changed: *"At first, I used a mixture of public transport and the car as the car made me feel more confident about reaching work on time. Now, I have mastered the bus timetables!"*

The process of reaching a satisfactory travel situation often involved facing challenges resulting from the household's new location: *"Cycle routes, bus routes and congestion spots for daily commute. Frustrating that not easy to get to Temple Meads directly (without having to change in city centre."* Or: *"Thinking about how to travel to get grocery shopping - this is very difficult to do without a car in Bristol as most supermarkets are in outlying areas."* Numerous such challenges were reported, however these continued to be reported at Stage 8 'after some time in the new home' and therefore all such comments will be discussed further under the following stage.

Not all experiences and comments regarding the post-move travel situation were negative however. Other participants reported being extremely pleased with their new situation: *"I*

found that the area that I've moved to suits my travel requirements better than I had expected.” Or: *“Realised how convenient train station was and also what a good place for cycling the area is so we took up cycling again. Still undecided about selling one car”.* *“Discovered virtually car free route to Temple meads station!”* Thus it is clear that not all ‘good’ travel situations require extensive planning.

It therefore seems that at Stage 7, for some households specific testing of routes and the best times to conduct journeys is likely to occur; while for other households, post-move consideration involves realisation of the implications of the choices that have been made, which can be either positive or negative realisations.

8.5.8 Consideration at Stage 8: After living in the home for some time

The final stage of the RRT is Stage 8, after the respondents have been living in their new home ‘for some time’¹⁴. 44 percent of the participants considered travel at Stage 8 but it was the stage at which travel was *most* on the mind of 12 percent of the survey respondents: for a quarter of those considering at this stage it was the most important stage. Only Stages 1 and 3 had higher proportions which highlights the significance of Stage 8 in terms of consideration of travel issues ‘during’ a move process.

At Stage 8 some time has elapsed in the new home and therefore it was expected that additional key events, not necessarily related to the house move, would constitute the majority of travel considerations at this stage. Reports of such external changes were indeed provided eg: *“Now daughter at 6th form college (not her previous school) so bus service can now be used - although this service is expensive and very unreliable.”* *“My car has just been written off! And it's great not to have to worry about getting to work/shops etc”;* *“my wife got a new job and needed to investigate ways of travelling to work.”* Changes subsequent to the move prompting travel consideration included changes to employment, work location and other destinations and also vehicle write-offs, fuel price increases, and road-works.

However, a substantial proportion of the travel considerations reported at Stage 8 included no such additional changes experienced. Instead the focus was on reporting the positive and negative experiences of the new residential situation, similar to many of the comments

¹⁴ Clearly the definition of ‘some time’ could vary greatly between participants, and this is of potential concern, however the terminology was carefully chose to allow the stage to cover a wide range of travel related circumstances following the move.

reported at Stage 7. It is likely that some households will realise the difficulties immediately, and for others a gradual build up of realisation and possible stress is more likely. Nevertheless, the post move travel challenges and difficulties reported by participants at Stages 7 and 8 will now be examined together.

8.5.8.1 Difficulties/ challenges presented by the post-move travel situation

It is likely that the extent of comments across the survey sample regarding difficulties faced accounts for the higher than expected levels of consideration of travel issues at Stage 8 – 29 participants reported such difficulties at Stage 8 alone. It is valuable to firstly note that the difficulties to be outlined were reported in response to the question ‘what travel issues were on your mind some time after moving into your home?’ Specific difficulties and challenges were not requested at any point in the survey. This highlights that post-move challenges to household travel are clearly an emotive and not uncommon occurrence (at least within the survey sample).

The difficulties reported can be separated into three main themes:

- Difficulties with *availability* of public transport and (suitable) cycling and walking routes.

E.g. *“Problems due to lack of safety if cycling or walking from Easton (BS5) to St Paul’s (BS2) and beyond as no alternative except St Paul’s underpass or bridge over M32 to St Werburghs - both very unpleasant.”*

“Infrequency of bus route on Bank holidays/ Sunday running”

- Unexpected levels of congestion.

“Adult 1- realised journey to work was affected badly by school run traffic so had to leave 30 minutes earlier to avoid traffic.”

“Realised I have to be careful to avoid rush hour”.

- Dissatisfaction with the actual public transport services provided.

“Local bus services began to become a worry, as unreliable”.

“Due to price, poor service, lateness, infrequency, and state of buses, person one has decided to cycle to work”.

“The public transport (BUS) didn't conform to timetable, was too expensive and over crowded”.

These three themes differ in the extent to which it would have been possible to ‘anticipate’ the difficulties prior to selection of the new home.

Availability of public transport and other ‘services’ should have been easy to check through readily available information such as websites, as should cycling routes. Therefore households bemoaning a lack of services might wish to consider such issues more thoroughly in future moves. *“Only wished I had also thought about parking - which is a minor problem”.*

It would have additionally been possible to check the levels of congestion in an area prior to property selection. As reported under Stage 3, some participants did consider this in their selection of areas to search, even trying out routes prior to confirmation of selection (Stage 5). Clearly however, many further participants had not taken such a step: *“found the level of traffic much higher than anticipated, stopped taking bus and began to walk (financial impetus also). Found walk too lengthy and bought bicycle”.* Or *“Travel distances ok - but time limit to do journey not as estimated due to heavy volume of traffic.”*; *“Realised didn't actually drive routes to work from new house before moving in rush hour. Busier than expected”.* To complete journey trials during rush hour would not have added a substantial amount of effort. This is clearly only likely to be employed by those households for whom travel is a relatively high priority – for many other households any knowledge of high traffic levels may have been ignored in favour of different priorities.

The reliability and costs of public transport services are however less easy to accurately predict¹⁵. It is reasonable to assume that a service should run (approximately) as advertised. However, the sheer number of unprompted comments reporting difficulties with the bus service¹⁶ (cost, reliability, etc) strongly suggests that this is not the case, and the bus service in Bristol leaves something to be desired. Repeated trials of the service to assess reliability prior to property selection would of course be possible, but perhaps excessive and should be

¹⁵ Public transport costs in Bristol, particularly bus prices have risen considerably over the period of study.

¹⁶ 15 participants specifically complained about their bus services, and a number of them had been prompted to switch away from bus use despite intending this to be their main mode of travel.

unnecessary. Nevertheless, this is *not* something which could have been improved with greater consideration of travel issues in residential selection¹⁷.

At Stage 8 in particular mode switch was often reported as a solution to the problems faced. Of the 12 respondents complaining about buses, 8 of them had switched to use car (two of these had only tried buses rather than been regular users), 4 were walking or cycling and the remaining three remained on the buses. In response to congestion, cycling was the most popular response (therefore in terms of TDM the higher than anticipated levels of congestion appear to be having a positive effect on some participants' mode choice): *"I began to cycle to work in the centre to avoid traffic"*

8.5.8.2 Positive outcomes of travel consideration (and also the lack of it)

For some participants, experiencing the difficulties as outlined above lead to them reporting that travel would form a greater priority for future moves: *"When thinking about possible future moves, would move to other side of Bristol to be closer to motorways and avoid poor transport routes of south Bristol."* *"Would move to where there is better parking. But I enjoy how close the property is to the shops."* *"Journey to adult 1 work had got longer - would like to live nearer to work next time."* The experiences of stressful travel situations seemed to increase the likelihood that travel would constitute a priority in any future moves, which could be considered a 'positive' outcome. At least this is what was reported. Given other constraints it may or may not be possible *"Realised how I hadn't really thought about travel issues deeply enough but that financial considerations (i.e. a house I could afford) had taken priority."*

Finally, as with Stage 7, not all comments at Stage 8 were negative, or lessons learnt from negative experiences. A few participants instead reported considering how happy they were with the level of consideration they had given to travel throughout their move. *"I am very thankful I made the decision to live close to city centre. Traffic in Bristol is very congested. I*

¹⁷ In addition to this the situation raises a further point. There does seem to be a proportion of movers in the study who, with no outside persuasion, are willing to consider using the bus following a home move (only 5 of the 15 bus complainants commuted by bus prior to moving). This is particularly encouraging given the suggestion that non public transport users tend to perceive public transport as worse than it is. In the current situation 10 non public transport users had actually perceived it as potentially better, or at least good enough to try. It is however unfortunate that the poor level of service has lead in many cases to a switch back to car use (or other alternatives): *"Bus very expensive on a daily basis and unpleasant to travel on. Therefore bought own car."*

travel from [area close to centre] to city centre for work. It takes a lot of strain off me as I absolutely LOATHE driving” (respondent’s emphasis). “*Wishing I lived closer to my work so I could pop home lunchtimes... but overall pleased... certainly a winner that my children can walk to school. We can walk to city centre now!!*” “*Happy where I live and closeness to all that I need!*” “*Enjoying reduced time travel and fuel costs.*” Such comments serve to highlight the benefits that substantial consideration of travel issues during the moving process can bring.

Travel consideration at Stage 8 - having been in the new property for some time, therefore appears to largely involve additional changes to circumstances prompting reconsideration of travel, and reflections on the current household travel situation as the extent of the problems is realised over time – in particular the solutions eventually implemented for this, such as mode switch.

8.5.9 Summary of travel consideration at the RRT stages

It seems clear from the detailed examination above that the types of travel considerations undertaken and prioritised vary at different stages of the move. A desire to reduce travel distances or journey stress can prompt a decision to search for a new home. The formation of search criteria tends to centre on *mode* preferences where travel is involved, particularly non-car modes due to the increased need for planning to ensure such mode availability. In the selection of areas to search journey *distance* considerations become more prevalent, in particular distance to workplace and perhaps consideration of proximity to amenities such as shops and schools.

Depending on the extent of consideration and *planning* at these earlier stages, no further travel consideration may be necessary, as strict criteria based on mode and distance preferences might have been implemented in the selection of areas to search. However travel considerations may continue when viewing properties, particularly in relation to availability of back-up journey plans, parking issues, or even the reconsideration of earlier travel criteria becoming necessary.

Prior to confirming a decision to place an offer on a property, a final check may be made to ensure that any specific required destinations would indeed be accessible from the property, however the precise details of this would depend on the households priorities. Planning of specific routes and journey times may then occur, either after the offer has been accepted or perhaps not until after the move itself has taken place. The remainder of travel issues considered (after the move has taken place) largely involve finding solutions to the challenges

faced in the new home location, reporting on enjoyment of the new situation, or may be due to subsequent changes to the household's situation and travel needs.

Thus far in the chapter it is clear that travel choices can often be the subject of significant attention at a relatively early stage in the residential relocation process. It is clear that travel issues are on the mind of many participants, whether such issues are prioritised or not. These considerations do not solely dictate where someone ends up living but have the potential to be a significant contributory factor. The travel outcomes of the move will be the focus of the following chapter. The current chapter continues its examination of travel *consideration* during the process of the move.

8.6 Differences between households in the timing of consideration of travel issues

The detailed discussion of types of travel considerations at each of the RRT stages has in addition to highlighting differences *between stages*, also highlighted differences in consideration between *households*. An example of a particular distinction is those households reporting that consideration of travel was complete around Stage 4, and those not starting to consider travel until this stage.

For example, Participant 59 reports at Stage 2: *"I considered travel (on foot, by bus, and by car/taxi) in relation to friends, work, shopping etc when determining my search criteria."* And then at Stage 4 reports not considering travel: *"Because I only viewed properties within a narrowly defined search area."*

Alternatively Participant 183 doesn't consider early in the process, reporting at Stage 3 that she was: *"Limited to what I could afford so travel wasn't considered."* However work accessibility was confirmed prior to placing an offer at Stage 5: *"Thought about ease of movement both to get to work and closeness to motorway,"* although planning the specific details of travel was left until moving in, Stage 7: *"Finding out about bus routes and different travel routes to work."*

In addition to these two almost 'opposite' travel consideration 'patterns', many further experiences are likely. The final sections of the chapter focus on examining differences between *households* in terms of how travel issues are considered during a move. This begins with an examination of the 'consideration patterns' produced by participants reports of consideration, (or not), at each of the RRT stages.

8.6.1 Consideration ‘patterns’ throughout the RRT stages

The consideration of travel, or not, of participants at each of the 8 RRT stages can be represented as an 8 digit binary number, with ‘1’ representing ‘considered’ and ‘0’ representing ‘not definitely considered’ (see Section 8.4.1 for an explanation of ‘not definitely considered’). For example ‘11110000’ indicates consideration at Stages 1-4 but not at 5-8. Where two participants have identical pattern configurations travel considerations have been reported at the same stages of the RRT. A frequency table of the configurations, or ‘patterns’ produced by participant responses is presented in Appendix 12 (due to its large size). Very few configurations are repeated at any substantial level. The configuration with the highest frequency is ‘00000000’, representing no consideration at any stage, with 14.4 percent of the response. Only three further configurations contain above 5 percent of the response. These are ‘11111111’ (consideration at all stages), and ‘01111000’ and ‘01100000’ which represent consideration only at the planning stages of the move, but not as the prompt.

A total of 83 different configurations of consideration patterns were recorded from the study participants¹⁸. This highlights the huge variation in participant responses and participant consideration of travel issues during their move (as well as, potentially the sensitivity of responses to the survey design). In particular this variety clearly demonstrates the importance of examining the experiences of a larger number of respondents, as undertaken in this second part of the research, rather than focussing solely on further in-depth work. The variation also suggests the need to briefly examine whether the RRT framework was found to be equally applicable to all these different experiences of travel consideration, and presumably associated differences related to the overall move process.

8.6.2 Perceived fit of the RRT framework

It is important to examine whether the notion of a timeline and stages was perceived to fit the diverse range of moving experiences collected by the postal survey, particularly given its development based on only a limited number of households’ experiences. Overall, 81 percent of the survey respondents reported that the stages fitted their experiences at least moderately well (rated 3 or above out of 5), with 46 percent of respondents indicating the stages fitted well or very well (4 or 5). This is felt to be an acceptable level of fit.

¹⁸ With the inclusion of three categories (definitely considered, definitely did not consider, and incongruous/ambiguous response) this number rose to 142.

It is additionally important to examine any potential reasons behind those reporting a reduced level of fit; in order to improve understanding of the implications of employing the RRT. A number of variables which the interview research had indicated as having a possible influence on the moving process were compared with the 'fit' rating to search for any association. Firstly whether or not travel had been considered at all during the move was examined and demonstrated a significant relationship with the fit of the RRT ($\chi^2 = 29.642$, $df=2$, $p=0.000$). It is clear from the cross-tabulation¹⁹ that where consideration had not occurred, the RRT was not perceived to fit well.

Occurrence of mode change, household size, distance of move, and familiarity with the area revealed no significant χ^2 association. A significant relationship/correlation however was found between the 'fit' rating and the number of different areas searched for a property. Spearman's Rho returned a correlation of 0.22 ($p=0.004$), indicating a weak, but significant relationship that searching more areas lead to a better fit of the RRT²⁰. As one participant (number of areas searched = one, RRT rated 2) explains:

"We wanted a place in the same area we already lived in so we knew the transport issues already and they weren't, consequently, at the front of our minds, so the stages were too detailed for me to relate to".

This comment refers to both distance of move (*same area already lived in*) and familiarity with area (*knew transport issues already*) however neither of these factors returned a significant χ^2 relationship for the sample as a whole. It is the comment "*the stages were too detailed for me to relate to*" that provides the most insight. It suggests that those households viewing only one, or a limited number of areas do not experience all the stages included in the RRT as distinct. If only one area is searched, then the majority of travel implications are likely to apply for all potential properties, thus such issues require less consideration than would be the case if numerous areas were searched. Many of the stages are therefore likely to be combined, and the RRT is perceived as fitting the experience less well.

This finding does not call into question the general applicability of the RRT framework, or the inclusion of such households within the analysis. Difficulties with level of detail are not disagreements with the actual process outlined. It is however useful to be aware when attempting to improve understanding of the process, that households searching few areas may experience many stages simultaneously. Nevertheless, the RRT constitutes a useful

¹⁹ See Appendix 14.

²⁰ The opposite conclusion of RRT fit rating affecting number of areas searched is illogical.

framework, applicable to the majority of moving households and the huge diversity of experiences entailed. It is therefore an appropriate framework to employ in the search for specific ‘types’ of moving households.

8.7 Typologies of movers according to timing of travel consideration during the moving process

Given the huge variation in both extent and types of travel consideration during a move, as evidenced by the results presented thus far, it would be of particular benefit to establish specific typologies of movers. Typologies present a generalised ‘type’ or ‘category’ of (in this case) households; simplifying the complexities in the data, and allowing for examination of trends and relationships between variables. An improved understanding of travel considerations throughout the moving process could be greatly facilitated through their employment. Additionally they should provide for ease of presentation and application of any important findings.

Accordingly, a search for specific ‘clusters’ of participant households, depending on similarities in the reported timings of travel consideration during the move process, is conducted utilising cluster analysis. The clusters established are then developed into profiled Travel-Consideration types (TC-types) through examination of associations between cluster membership and various study variables relating to the households’ moving circumstances.

8.7.1 Cluster analysis

A hierarchical cluster analysis was performed on participants’ indication of whether or not travel issues were considered at each of the stages (as previously discussed in Section 8.6.1). The purpose of cluster analysis is to produce groups (clusters) where the variability in scores between clusters is greater than variability within a cluster. Each participant, or case had eight binary responses to be utilised for clustering (one for each of the eight RRT stages; considered or didn’t definitely consider, as discussed in Sections 8.4.1 and 8.6.1). See Appendix 12 for the table of the binary response patterns.

The ‘average linkage between groups’ method was used on the ‘simple matching’ distances of the data. This begins with combining the two cases (respondents) with the most similar scores to form a cluster, and continues with each step combining the two cases (respondents) or clusters (groups) with the most similar average scores until all the cases are in a single cluster.

The process is frequently illustrated using a dendrogram or tree diagram, where a shorter length of branch indicates greater similarity between cases and clusters that were joined together (see Cramer (2003), or Everitt (1996) for more information). Due to its large size the dendrogram of the travel consideration data is included in the appendix only (Appendix 14). Within Appendix 14 it is highlighted that at a number of places in the dendrogram, the branch joining two clusters together is relatively long, thus indicating that the two clusters joined at that point were dissimilar in some way. This implies that they had therefore been ‘forced together’ by the clustering procedure, and were likely to represent separate clusters.

The dendrogram also highlights five participants with response profiles entirely dissimilar to any other response profiles (or each other). Given that the aim of this section of the research was to examine general typologies rather than encompass all details, these five participants were removed as outliers. An additional rule was applied that a cluster should consist of at least 10 subjects: fewer than this in a single cluster would have limited meaning. With the outliers removed, subjective inspection of the branch lengths in the dendrogram revealed a 3, 5 or 7 cluster solution. Two of the clusters in the 7 cluster solution contained less than 10 cases and therefore were not considered meaningful clusters. Three clusters was considered an oversimplification of the diversity of residential relocation experiences already highlighted by the research and therefore too restrictive. 5 clusters therefore seemed the optimal solution within the data. This was confirmed with inspection of the response frequency tables for ‘percent of cluster members considered at this stage’ for solutions of 3,4,5,6,7, and 8 clusters (of which Table 8-5, below, is an example for the 5 cluster solution) to determine which one provided the clearest distinctions in the data.

Table 8-5: Cluster membership/ TC-type, and percentage of respondents in each cluster considering travel at each stage.

Cluster / TC-type	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	n
1: Minimal Considerers	5	24	33	0	5	3	6	6	66
2: Maximal Considerers	60	68	88	96	94	70	96	78	50
3: Prompted early planners	100	75	90	65	0	0	30	30	20
4: Post move considerers	6	35	59	6	0	24	82	100	17
5: Non-prompted early planners	14	76	94	93	70	16	13	21	71

Table 8-5 shows the percentage of respondents in each of the 5 produced clusters that considered travel at each stage of the RRT. This data was utilised to interpret the make-up of each cluster, as will be described below, from which the clusters were given the TC-type (travel consideration type) labels shown.

Travel Consideration Type 1 – Minimal considerers (n=66): Cluster 1 is identified from Table 8-5 above as ‘Minimal-considerers’, since cluster members reported very little consideration of travel at any of the stages. Any consideration that did occur was predominantly at Stages 2 and 3, where the largest proportion of participants reported travel consideration. 33 members of cluster 1 did not consider travel at any stage during their move, therefore this cluster is strongly linked to the earlier discussion of non-considerers of travel, as they all fall within this cluster.

Travel Consideration Type 2 - Maximal Considerers (n=50): Cluster 2 is labelled ‘Maximal-considerers’ due to the high percentage of members reporting consideration of travel at each of the stages. 15 members of this cluster reporting considering travel at every stage of the RRT, and 5 at every stage but Stage 8 (travel consideration subsequent to the move).

Travel Consideration Type 3 - Prompted early planners (n=20): Cluster 3 is labelled ‘Prompted-early-planners’, as the majority of cluster members reported consideration at stages 1 through 4, but very little afterwards – consideration was focussed in the early stages of the move. It would seem likely that as per earlier examples discussed in the chapter, travel considerations have prompted the move and are continued until Stage 5, by which time future travel is planned and minimal further consideration is undertaken.

Travel Consideration Type 4 - Post move considerers (n=17): Cluster 4 members highlighted the majority of their travel consideration at Stages 7 and 8, after the physical move, so are labelled ‘post move considerers’. Limited consideration occurred at earlier stages prior to the home move itself. It might be assumed that these households, (as discussed in Section 8.4.2.1) assumed no changes to travel would be necessary post-move; hence limited travel consideration: but then perhaps faced specific, unexpected challenges post-move.

Travel Consideration Type 5 – Non-prompted early planners (n=71): The final cluster’s profile appears similar to cluster 3, with limited further consideration after Stage 5. However the key difference is that very few members of cluster 5 reported consideration at Stage 1, the prompt for the move, and they are therefore labelled ‘Non-prompted-early-planners’

It therefore does seem that the cluster analysis has provided clearly identifiable ‘types’ of travel consideration. It remains to assess whether differences in travel consideration over the course of a move (according to the TC-types) does in fact provide meaningful groupings of different experiences associated with a move.

8.7.2 Factors associated with ‘travel consideration type’

A further key aim of the research is to examine the additional factors associated with a move that might be related to levels and timing of consideration of travel issues. The travel-consideration-types outlined above are therefore tested for associations with variables from the survey, particularly focussing on details of participant households and their move situations. The variables tested for relationships with travel consideration type (timing of travel consideration) are discussed under three headings: those relating to the household composition; those relating to details of the move; and those relating to the households’ pre-move travel. These will be used to develop typologies of moving households. However, firstly it is necessary to clarify a few details regarding the statistical tests completed, and their presentation in the chapter.

8.7.2.1 Chi² tests of association, and summary tables

Chi² tests were utilised in all relationships shortly to be discussed as this is the appropriate test for examining associations between two categorical variables. A frequency table of the two variables under examination is produced, and the observed frequencies (the study data) are compared to the expected frequencies (those that would be statistically expected in each box of the table were there no relationship between the two variables under examination). If the observed values are significantly different from the expected values then it may be concluded that there is a relationship between the two variables under study. The nature of this relationship may be observed from the frequency tables.

A probability level of at least 0.05 is the generally accepted standard to select as determining a significant relationship (Coolican, 1994). However given the exploratory nature of the current research, relationships that are significant at the 0.1 level are also discussed as indicators of potential interest for further examination. Additionally, situations where over 20 percent of the expected values in a Chi² table are below 5 are generally considered less reliable, with an increased possibility of Type 1 errors (Cochran, 1954 – as cited in Coolican, 1994). However recent authors have stressed that in practise this is of less concern, providing that the sample size is greater than 20 (Coolican, 1994). Nevertheless, it is worth noting that for good practice

in Chi² tests, all expected values should be above 5. Therefore tests conducted within the thesis where over 20 percent of the expected values are below 5 will be acknowledged.

A significant number of these tests are conducted both in this and the following chapter. The detailed Chi² cross-tabulations and statistics for all the significant relationships are therefore included in the Appendices, with summary tables are provided in the text. The descriptions within these summary tables (eg Table 8-6) refer to observed trends within the cross-tabulated data. They refer specifically to a comparison of the ‘observed’ (actual) frequencies and the frequencies that would be statistically ‘expected’ if there were no relationship between the variables under examination, (as calculated during the Chi² tests). Terms such as ‘more likely’, refer to ‘more likely than expected in a general population’, rather than necessarily that the highest proportion of members of specific a TC-type had reported a certain circumstance²¹.

Finally, discussion of causality based on this analysis of the survey is frequently possible due to both the additional inclusion of qualitative data²², and the logical time order of events (ie TC-type could not logically be a predictor of household size). It is however recognised that no true causality can be strictly determined due to the cross-sectional nature of much of the data collected.

8.7.2.2 Household demographics

Firstly details of the household were examined to assess whether travel consideration type could be related to household details. No relationship was found with the age of respondent, sex of respondent, household composition, number of household members (the number of adults had been restricted to two), presence of children in the household, or education level. This therefore suggests that factors relating to the household itself have little or no influence

²¹ For example, 14 of the Maximal-considerers reported ‘to be nearer work’ as a prompt for their move, and 35 reported it was not, therefore clearly more of the Maximal-considerers were not prompted to move by a desire to be nearer work, than were. However, very few participant households overall were prompted to move by a desire to be nearer work (n=28). Therefore, that 14 of the Maximal-considerers reported ‘to be nearer work’ as a prompt for their move suggests a strong association between Maximal-considerers and ‘prompt to be nearer work’, which would accordingly be noted in the table (see Table 8-6,).

²² Clifton and Handy, (2001) suggest that qualitative data may be used to determine causality. Participants are able to explicitly express why certain events occurred with the freedom of open response.

over the timing at which consideration is given to travel issues during a move, at least for the current survey sample. This is potentially unfortunate due to the ease of use of such data for specific targeting of messages or interventions. It is however not entirely surprising given the lack of clear distinctions in travel preferences (and therefore need for travel consideration) according to such data, (albeit that men are generally shown to favour buses less than women). This is particularly true when the range of individuals that are likely to make up any one household (and are thus recorded within the details examined), are taken into account. Given the potential implications of these findings, the Chi² tables, despite not being significant, are included in Appendix 14.

8.7.2.3 Move details

The general move situation, and factors associated with it, would be more likely to affect the timing of travel consideration in the move process (and therefore travel consideration type). For example, the lack of necessity to consider travel issues for moves over a very short distance has already been discussed in Section 8.4.2.1. Accordingly, the moving variables as detailed in Section 7.4.3.1 of the previous chapter were tested for association with TC-type.

A significant Chi² relationship was found with distance of move, familiarity with the area moved to, the number of areas searched, whether or not availability of property constrained the households' choice, the overall rating given to the influence of accessibility considerations on the search and selection²³, and whether or not to be nearer work was a prompt for the move. The detailed cross-tabulations and statistics are provided in Appendix 14.2, with a summary provided in Table 8-6, below.

²³ The rating of the influence of accessibility considerations is measured in relation to neighbourhood and housing criteria. See Q12 in Appendix 7.

Table 8-6: Summary of the significant relationships (Chi² p<0.05) found between travel consideration type and variables related to the home move²⁴.

	TC-type (Travel Consideration type)				
Factor of the moving situation	Minimal Considerers	Maximal Considerers	Prompted Early Planners	Post Move Considerers	Non-prompted early planners
Distance of move ⁱ	More likely to have moved under 3 miles, particularly less than 1.	More likely to have moved above 4 miles	More likely to have moved over 10 miles.	Over 1 mile	More likely to have moved between 0-3 miles
Level of familiarity with area moved to ⁱ	More likely to have been very familiar	More likely a little or moderately familiar	Most likely quite familiar, but also not at all familiar	More likely to have been little or moderately familiar	No discernable familiarity level
Was to be near work a prompt for the move?	Unlikely to have moved to be nearer work	More likely to have moved to be nearer work	More likely to have moved to be nearer work	Unlikely to have moved to be nearer work	Unlikely to have moved to be nearer work
Influence of accessibility criteria on ⁱ house choice (score out of 10)	More likely 0-2 (none above 5) (lower)	More likely 3+ (higher)	No clear differences	More likely 0-2 (none above 5) (lower)	More likely 3+ (higher)
Was travel to work a top 5 search criteria?	More likely no	More likely yes	More likely yes	More likely no	More likely yes
Was parking a top 5 search criteria?	More likely yes	More likely no	More likely no	More likely no	More likely yes
Number of areas viewed	More likely to have viewed only one area	More likely to have viewed more than 3 areas	No observed differences	More likely to have viewed more than 3 areas	More likely to have viewed 2-3 areas
Availability of suitable property	Less likely to have found any difficulties	Very likely to have found difficulties	No clear differences	No clear differences	No clear differences

²⁴ The descriptions within the table refer to a comparison of the ‘observed’ and statistically ‘expected’ frequencies within the cross-tabulated data, as presented in Appendix 15.2. Terms such as ‘more likely’, refer to ‘more likely than expected in a general population’, rather than that the highest proportion of members of specific a TC-type had reported a certain circumstance. See Section 8.7.2.1 for further details.

ⁱ indicates variables with over 20% of expected values under 5 (see Section 8.7.2).

Stage most consideredⁱ	Clearly likely to have most considered at no stage	More likely to have most considered at Stages 1 and 5	Clearly more likely to have most considered at Stage 1	Clearly more likely to have most considered at Stages 7 & 8	More likely to have most considered at Stages 3,4, & 5
How well did the RRT fit situation?ⁱ	Clearly most likely to find the RRT fit 'not at all', or 'a little'	Clearly more likely 'quite well'. None in 'not at all' or 'a little'	More likely to find the RRT fit in a little or moderately	Slightly more likely to select 'moderately'	Most likely to find the RRT fit 'very well'

Out of all the factors shown in Table 8-6, the distance of move provides the clearest variation between the 5 TC-types. Of the 44 households moving less than 1 mile, 48 percent were in the Minimal-considerers type and 41 percent in the Non-prompted-early-planners. 75 percent of the Minimal-considerers had moved less than 3 miles and 33 percent less than one mile. This corroborates the earlier discussion regarding non-consideration of travel issues for moves over a very short distance. Those moving longer distances tended towards membership of Maximal-considerers and Prompted-early-planners and thus were likely to have had travel considerations prompting the move (as these two TC-types tend to report consideration at Stage 1). As can also be seen in Table 8-6, one specific prompt did indeed return a significant relationship with TC-type; those households moving in order to be nearer work tended towards membership of Maximal-considerers (50 percent) and Prompted-early-planners (25 percent)²⁵. These TC-types also (therefore) tended to include travel work within their search criteria, as did the Non-prompted-early-planners. However, whether a *job move* had been involved in prompting the move did not return a significant relationship with TC-type ($p=0.114$).

Overall for the search and selection process the Maximal considerers and Non-prompted-early-planners are more likely to report a greater influence of accessibility criteria (in relation to neighbourhood and house criteria) than the other TC-types. However no additional search criteria²⁶ returned a significant relationship with TC-type, suggesting that no specific non-travel criteria are likely to influence consideration of travel over a move.

²⁵ Half of the remaining 25% were members of the non-prompted early planners cluster. It is clearly not a perfect relationship, as there are the remaining 12.5% of participants that reported wishing to be nearer work as part of the prompt for the move, but are then part of the minimal considerers, or post-move considerers clusters (not to mention that the 12.5% in non-prompted early planners is also a little incongruous, but less so than the other 2).

²⁶ As outlined in Section 8.3.2.

Previous familiarity with the area moved to is, as would be expected, correlated to distance of move (Spearman's $Rho = -0.403$, $p=0.00$), and therefore demonstrates a similar pattern of relationship with TC-type. Members of households moving a shorter distance are likely to be more familiar with an area. However, the correlation is not a perfect one, in particular households (mainly among the Maximal-considerers) may have moved some distance but still be familiar with the area, perhaps due to previous experiences of living there. Post-move-considerers tended to only be a little familiar with the area to which they moved. This intuitively makes sense, and could partly explain the absence of early consideration of travel issues. To consider travel issues in an unfamiliar area would entail a thorough information search and amount of effort. Clearly travel was not a priority during the move for the Post-move-considerers otherwise such an information search would likely have been carried out.

Finally in relation to the move, both the number of areas in which properties were viewed, and whether or not availability of property constrained the household's choice, also returned a significant relationship with TC-type. Maximal-considerers tend to have searched for properties in more than three separate areas, and Post-move-considerers and Non-prompted-early-planners tend to have searched two or three. Minimal-considerers tend to have only searched one area. As discussion in Section 8.6.2, if only one area is searched travel issues would only need to be considered once, (if at all - as it is already known that the majority of Minimal-considerers moves were over a short distance, and so therefore they would be already likely to know the travel implications of the area). Search of more than one area would be more likely to result in greater consideration of travel issues. This may additionally be linked to greater perceived constraints of property availability – greater constraints of availability would require a search of more areas and greater travel consideration, hence more likely to become Maximal-considerers. This further links to the fit rating of the RRT, where Maximal-considerers and Prompted-early-planners perceive the greatest fit of the RRT.

It therefore seems clear that many aspects of the move process itself are related to TC-type and the timing of consideration of travel issues during the move. The further the move, the more likely travel issues are to be more extensively considered (or to have prompted the move in the first place). Additionally a greater number of areas searched appears more likely to require travel consideration throughout the move. The section now turns to examine some travel related variables with TC-type.

8.7.2.4 Household pre-move travel and travel attitudes

The travel outcomes of the participants' moves are to be discussed in the following chapter. Nevertheless, a household's pre-move travel, vehicle ownership, and their preferences with

regards to travel modes and distances were identified in Chapter 7 as likely to influence how travel issues are considered throughout the moving process, and are therefore important to examine in relation to TC-type. Only 8 of the study sample did not own a car, therefore it was not possible to examine differences between TC-types based on vehicle ownership.

Significant relationships were however found with pre-move commute mode, pre-move commute time, and a measure of attitudes towards car use. The focus of the analysis on commute travel is due to the commute frequently being the most regular and significant journey completed, and therefore likely to be most influential on how a household considers travel.

The measure of attitudes towards car use is based on that developed by Stradling (2005; and Dudleston et al, 2005 and Anable, 2005), as briefly discussed in Chapter 7. Four attitude clusters²⁷ are produced (for car drivers) based upon responses to approximately 10 Likert style attitude statements. This measure, and the clustering of the (car drivers among) the survey respondents into the four attitude segments is detailed in Appendix 11. Given that car use requires lower levels of planning than other modes, it was felt that those groups wanting to reduce their car use might have prioritised travel issues higher during the move²⁸.

In addition to these, TC-type was examined with whether or not participants had made a conscious decision to change their behaviour. Deciding to change travel would likely require extensive consideration of travel issues during a move. However the relationship was not found to be significant ($p=0.14$). This may be explained due to the fact that consciously deciding to make *no* changes to travel would equally require considerable planning and travel consideration over the course of a move, as deciding to alter travel²⁹.

²⁷ *Die-hard drivers* who enjoy driving and do not want to stop; *car complacents* who are happy with driving and see no reason why they should cut down; *malcontent motorists* who do not enjoy driving but feel they have no alternative; and *aspiring environmentalists* who are actively trying to cut down on their car use, but nevertheless remain car users.

²⁸ It must be noted that these measures are for attitudes at the time of survey, rather than pre-move. To attempt to measure past attitudes would be as difficult as measuring past habits. It is therefore necessary to recognise that attitudes may have changed since before the move – as will be discussed in the following chapter.

²⁹ With hindsight the question would have been more effective if designed to take account of this: to establish whether a conscious decision was taken to change travel, a conscious decision was taken NOT to change travel, or no conscious decisions regarding future travel were made.

Table 8-7: Summary of significant Chi² relationships found between travel consideration type and variables related to the pre-move household travel and attitudes to car use³⁰.

	TC-type (Travel Consideration Type)				
Variable	Minimal Considerers	Maximal Considerers	Prompted Early Planners	Post Move Considerers	Non-Prompted Early Planners
Pre-move Commute mode (both adults)ⁱ	Highly likely to have been a single car user. Also some 2 car commuters	Most likely to have been two cars commuters, Also some car and walk or cycle in combination	No clear relationship. Least likely type to have been 2 car-users. Slightly more single walker/cyclists	No clear relationship but slightly more likely to have been walkers/ cyclists and PT	Very unlikely to have been single car users, more likely to have been walkers and cyclists. Also car-PT and 2 car users
Pre-move commute time (both adults)ⁱ	Very likely to have been one commuter under 30 mins. No 2 commuters over 30 mins.	Likely to have been 2 commuters above 30mins, unlikely to have been single below 30 mins	More likely to have been over 30 mins, whether a single or couple	Most likely to have been 2 commuters both under 30 mins	Most likely to have been 2 commuters under 30 mins, unlikely to have been single over 30 mins
Attitudes to car use segments	Clearly more likely to be diehard drivers and complacent car users	More likely to be malcontent motorists and aspiring environmentalists	Slightly more likely to be malcontent motorists, but little other difference observed	Slightly more likely to be malcontent motorists and die-hard drivers	Very likely to be aspiring environmentalists, unlikely to be car complacents and diehard drivers

Again the detailed tables of the significant Chi² relationships tested in this section are included in Appendix 14, with Table 8-7 providing a summary above. It is necessary to note that the Chi² results for pre-move commute mode (for both adults combined) despite returning a significant p value had a high proportion of cells with expected values less than 5. This therefore places the reliability of the relationship in question. It was however decided not to combine categories to reduce this proportion as there appears to be substantial differences between some mode categories that might logically be combined (eg differences between single commuter households commuting by car and two-car-commuter³¹ households). The

³⁰ The descriptions within the table refer to a comparison of the ‘observed’ and statistically ‘expected’ frequencies within the cross-tabulated data, as presented in Appendix 15.3. Terms such as ‘more likely’, refer to ‘more likely than expected in a general population’, rather than that the highest proportion of members of specific a TC-type had reported a certain circumstance.

ⁱ indicates variables with over 20% of expected values under 5 (See section 8.7.2).

³¹ This refers to a dual-income household where both adults report car as the main commute mode.

table in Appendix 14 and the summary below are therefore included as an illustration rather than as evidence for a relationship.

In terms of pre-move mode use, Table 8-7 (and Appendix 14.3) highlight that single car commute households tended to become Minimal-considerers, whereas households with two car commuters tended to become Maximal-considerers or Non-prompted-early-planners. Walkers and cyclists, and those households with 2 commuters one travelling by public transport, the other by car also tended to become Non-prompted-early-planners. As previously identified in Chapter 3, modes alternative to the car are likely to require planning in order to be retained post move³² – hence early consideration of travel during the move, and membership of Non-prompted-early-planners TC-type. The prevalence of single car commuter households as Minimal-considerers agrees with this statement. However when two individual's journeys require planning for, this presents a much more complicated situation (Sermons and Koppelman, 2001) which must require more extensive consideration of travel issues. Thus there are interdependencies to consider within a household and it appears valuable to have collected data on all household members travel.

Turning to pre-move commute time the Maximal-considerers and Prompted-early-planners tended to have longer commutes, both for single and double commuter households. This indicates that those households with longer commutes are more likely to give consideration to travel issues, in particular it seems likely to have prompted the move as these are the two TC-types to include consideration at Stage 1, (the prompt for the move). This again corroborates findings discussed in Chapter 3 (eg Clark et al, 2003; Clark and Davies Withers, 1999), that long commutes are less likely to be sustainable. The shortest pre-move commutes were from the Minimal considerers, who as previously mentioned under commute mode were most likely to be single car commuter households. This suggests that those with shorter existing commutes had a tendency to think less about travel than other households (they also tended to move shorter distances).

Finally with regards to attitudes towards car use it would seem that the associations observed corroborate the interpretations of the TC-types suggested thus far. Roughly half of both the die-hard drivers and complacent car users (those segments with no desire to reduce car use) were Minimal-considerers, whereas the highest proportions of aspiring environmentalists and malcontent motorists (42 percent and 32 percent respectively) were Non-prompted-early-planners (and also Maximal-considerers). Thus those households that *enjoy* car use (die-hard and complacents) have tended not to consider travel issues during their recent move (again

³² As travel is not considered at Stage 1 for this TC-type, it is unlikely that a change in mode is sought.

highlighting that car use involves less planning): and those households that would like to reduce their car use (but generally feel unable – malcontent motorists) have given greater levels of consideration to travel issues during their move. It is additionally possible that difficulties with travel either in selection or post-move might prompt a household/individual to feel unable to control their level of car use and therefore become malcontent motorists (as the attitude measure was taken post-move).

8.7.3 Travel consideration ‘Types’

The previous section has outlined numerous variables representing moving circumstances, and household travel behaviour and travel preferences relating to the timing of consideration of travel issues during the move, (as determined by the five TC-types). The relationships detailed so far can further be utilised to develop detailed profiles for each of the TC-types.

Travel Consideration Type 1 – Minimal considerers (n=66)

Minimal-considerers give hardly any consideration to travel issues during their move, if at all. They are likely to have moved a very short distance and (therefore?) be very familiar with the area to which they move. They are also likely to commute by car (at least prior to the move), with single-car-commuter households particularly likely to be Minimal-considerers. The attitude profiles, where Minimal-considerers are more likely to be diehard drivers or complacent car users, reflect this. They are also likely to have little difficulty in finding suitable properties available. Additionally, the associations highlighted previously regarding absence of consideration (such as multiple or distant workplaces, see Section 8.4.2.1), are applicable to this TC-type as it contains all those households never considering travel during their move. For many Minimal-considerers the 8 RRT stages are too detailed to relate to, therefore the RRT fits the experiences of Minimal-considerers least well of all the TC-types.

Travel Consideration Type 2 - Maximal Considerers (n=50)

Maximal-considerers consider travel issues at (pretty much) every stage of the RRT and it is relatively influential in the search and selection of the new home. They tend to have moved further, at least over 4 miles (only one Maximal-considerer had moved less than 1 mile) and be moderately familiar with the area moved to. They also tend to have experienced difficulties relating to the availability of suitable properties. Higher-end pre-move commute times (30-60 minutes) are likely to contribute to a prompt for the move being a desire to be nearer work (Approximately a third of Maximal-considerers moved to be nearer work). Travel issues are

most thought about during the prompt for the move. Attitudes to car use clearly indicate a desire to change travel within Maximal-considerers, whether through malcontent with their motoring or aspirations for environmentalism. Households tend to have two adult commuters, with one commuting by car and the other using a variety of modes including car, public transport or walking.

Travel Consideration Type 3 - Prompted early planners (n=20)

For Prompted-early-planners travel considerations have prompted the move and are continued until RRT Stage 5, by which time future travel is planned and minimal further consideration is undertaken. They are likely to have a longer pre-move commute (over 60 minutes) which as with Maximal-considerers is likely to contribute to a desire to be nearer work as a prompt for the move. This TC-type is less clear cut than the others regarding distance of move, familiarity with area, pre-move commute mode and attitudes to car use, although slightly more malcontent motorists are included.

Travel Consideration Type 4 - Post move considerers (n=17)

For the Post-move-considerers the majority of travel consideration occurs at Stages 7 and 8, after the physical move has taken place. It would appear that this TC-type may be more susceptible to the physical change in context needed to prompt consideration of travel, rather than attempting to plan for their new situation. It may be that this is due to unexpected travel difficulties faced post-move. Post-move-considerers tend to have moved moderately far, at least over 1 mile, and be a little or moderately familiar with the area moved to. Commute journey (pre-move) tends to be in the 16-30 minutes range, with a higher proportion of walkers than might statistically be expected. Attitudes to car use are fairly evenly spread, with slightly higher levels of both malcontent motorists and diehard drivers.

Travel Consideration Type 5 – Non-prompted early planners (n=71)

Members of the Non-prompted-early-planners tend to consider and plan for travel considerations early and not later in the moving process, but such considerations have not prompted the move. As with Maximal-considerers, accessibility considerations are relatively influential in the search and selection of the new property. The search also tends to take place over more than one area. Cycling and walking are popular pre-move commute modes within this TC-type, with few single commuters commuting by car. Three of the five single adult households in the study without a driving license were Non-prompted-early-planners. Pre-move, the commute journey is most likely to be between 16-30 minutes and in terms of

attitudes to car use Non-prompted-early-planners have more malcontent motorists and aspiring environmentalists. Moves tend to be shorter, less than 3 miles but with no observable trend in familiarity levels. Nevertheless, this cluster represents the largest proportion of the study sample.

8.7.3.1 Summary of the typologies

It is clear from the above typologies that it is possible to develop meaningful types of moving households based on the timing of travel consideration throughout a move. Given the huge range of moving circumstances that exist this is a hugely beneficial finding, extremely useful for furthering understanding of the factors influencing travel considerations during the moving process. As previously stressed in Section 8.7.1, causal relationships cannot strictly be determined from the (frequently cross-sectional) data. However the inverse relationships for many of the observed relationships are illogical. Additional qualitative data has been collected within the survey which can be (and has been) used for clarification of certain relationships. The trends have therefore been interpreted as *potential* causal influences where applicable.

Strong similarities are evident in the moving and pre-move-travel details of in particular Maximal-considerers and Prompted-early-planners. For both, travel is involved in the prompt for the move, and longer pre-move commute journeys are demonstrated. The Non-prompted-early-planners also demonstrate strong similarities with both these TC-types, as households within all three use alternative modes to the car (or wish to do so), and they have a tendency toward malcontent motorists and aspiring environmentalists. The main difference in terms of travel consideration between these and the remaining two TC-types is consideration of travel issues during the search and selection phases of the move (or rather absence of it). Maximal and both the Early-planner types consider travel during the property search and selection, whereas the remaining Minimal and Post-move considerers do not. Similarities in travel behaviour and moving circumstances are also evident between Minimal-considerers and Post-move-considerers. These ‘similarity pairings’ suggest that whether or not travel is considered during the search and selection phase is closely related to the moving circumstances. It seems to be particularly influential in terms of determining different experiences of the move.

The typologies provide a potentially useful tool for examination of the relationships between home choices and travel choices. Further development to incorporate any trends in the travel outcomes of the move of these TC-types will be undertaken in the following chapter. It is however necessary to remember that profiles such as these are useful largely as a tool to aid understanding of general trends. Over reliance on such simplifications should be avoided as humans and households are all different and do not fit neatly into such classifications. It can

be seen from Table 8-5 that cluster membership is not neatly split according to the travel consideration timing outlined. Many incongruent responses are in addition found throughout the analysis reported. This is however to be expected, as humans, and particularly households, are all different.

It is finally important to note that membership of a particular TC-type is likely to be transitory, as travel preferences and home priorities change over time. Households would likely fall under different TC-types for different home moves over their life-course. These issues will be discussed further in Chapter 10. Nevertheless, the typologies are extremely useful for allowing insight into some general trends and relationships that occur between travel consideration and residential choice.

8.8 Chapter Summary

This chapter has examined the occurrence of travel considerations throughout the process of moving home. It has established that travel considerations are for the majority of the study sample, the least important type of criteria to consider when compared to house and neighbourhood issues. Nevertheless, 86 percent of the sample considered travel issues at some point during the course of their move, which suggests that travel issues remain important to the majority of householders despite their lower overall influence. It additionally suggests that travel habits are likely to be weakened for this large proportion of the sample.

Differences in both type and extent of travel considerations at various stages of the move have been examined; with Stage 3 (selection of areas to search) identified as the stage where most consideration of travel issues occurs. Examination of differences in the timing of travel consideration during the move, between households, has culminated in the development of five Travel-Consideration Types. Associations between these TC-types and the circumstances of the move (distance, prompts etc) has revealed that moves over a longer distance; with travel involved in the prompt for the move where pre-move commute journeys were longer; and where households use alternative modes to the car (or wish to do so); are more likely to consider travel during the search and selection stages of a move. These findings will be extended to consider the *travel outcomes* of the participants' moves in the following chapter.

Chapter 9: Travel Outcomes of the Move

9.1 Overview

This chapter examines the travel impacts of moving home for 229 survey respondent households that had moved home in the previous year. The specific outcomes examined are mode switch and journey time for a variety of regular journey purposes (in particular whether levels of car use increased or decreased); impact on overall household miles travelled; and impact of the move on availability of travel mode options. Each of these variables is examined for change from pre to post move, and compared to details of household composition and moving circumstances in order to search for relationships and possible explanations for any change, (or lack of it). Finally travel outcomes are examined in detail in relation to the five Travel-Consideration-Types as developed in the previous chapter. It is concluded that the travel outcomes of the move are indeed related to these typologies, with different trends in terms of travel change and types of change observed among members of different TC-types.

9.2 Introduction to Results

Having established in the previous chapter the extent and types of consideration of travel issues during the participants' moving process, attention now turns to examine the travel outcomes of the move. A key original objective of the research is to examine what can be learnt about the impacts of residential relocation on routine travel behaviour, therefore changes to mode use, journey times and distances, and mode availability are examined in turn. These variables allow an examination of the extent of evidence for broken habits, the direction of any change in terms of reductions or increases in levels of car use, and levels of participant satisfaction (or otherwise) regarding any changes to their travel behaviour.

Travel consideration, as examined in the previous chapter, is unlikely to constitute the only influence on travel outcomes of a move. Accordingly, associations between travel outcomes and a number of study variables associated with a household and their move are examined, including attitudes to car use, distance of the move, and prompts for the move; in addition to the TC-types developed in the previous chapter. Also of interest is whether any changes were intentional or not. Where appropriate, examples of participant open answer responses will be employed to illustrate the points made and to shed further insight into explanations for relationships observed. In this way examination of how moving home can affect household

travel is facilitated. The chapter concludes with an extension of the Travel-Consideration-Types developed in the previous chapter to include detail of travel outcomes. It begins with participant mode choice.

9.3 Mode choice

9.3.1 Introduction

As detailed in Chapter 7, information regarding participant’s *main* mode use both at the time of study and prior to moving was obtained for six key journey purposes: both adults commute to work, the school run, grocery shopping, travel to city centre and repeated leisure journeys. These six journey purposes were selected as being the most frequently undertaken journeys, and therefore the most likely candidates to be potentially habitual in nature, and of interest to the study¹. The data is shown in Table 9-1 to Table 9-6, with Table 9-1 providing an overall summary of mode usage/switch for all the journey purposes combined, and Table 9-2 illustrating mode usage/switch for all *commute* journeys in the sample (including both adults for any two-commuter households within the survey sample). The final two columns of Table 9-1 to Table 9-6 highlight the amount of change within the sample.

¹ Main mode was selected as the data to record as providing ease of comparison between participant households and journey purposes, however it was recognised that journeys can be multi-modal (Kenyon and Lyons, 2003; Stradling, 2003). In acknowledgement of this, space was additionally provided for participants to report on any additional modes and journey details. However very few participants took this opportunity. A lack of response here could not confidently be taken as evidence for lack of use of alternative modes as participants may simply have been disinclined to provide the extra detail. Due to this and the low response the data was not analysed. With hindsight it would have been of greater benefit to ask more specifically if any alternative modes were *ever* used for the given journey purposes, or perhaps the frequency of them.

[illegible][illegible][illegible]

(The following text is extremely faint and largely illegible due to low contrast and blurring. It appears to be a list or index of items, possibly related to the "Bibliography" section mentioned in the header.)

Case No.	Case Name	Case Type	Case Status	Case Description	Case Details	Case Notes	Case Comments	Case Actions	Case Results	Case Conclusions
1	Case 1	Case 1 Type	Case 1 Status	Case 1 Description	Case 1 Details	Case 1 Notes	Case 1 Comments	Case 1 Actions	Case 1 Results	Case 1 Conclusions
2	Case 2	Case 2 Type	Case 2 Status	Case 2 Description	Case 2 Details	Case 2 Notes	Case 2 Comments	Case 2 Actions	Case 2 Results	Case 2 Conclusions
3	Case 3	Case 3 Type	Case 3 Status	Case 3 Description	Case 3 Details	Case 3 Notes	Case 3 Comments	Case 3 Actions	Case 3 Results	Case 3 Conclusions
4	Case 4	Case 4 Type	Case 4 Status	Case 4 Description	Case 4 Details	Case 4 Notes	Case 4 Comments	Case 4 Actions	Case 4 Results	Case 4 Conclusions
5	Case 5	Case 5 Type	Case 5 Status	Case 5 Description	Case 5 Details	Case 5 Notes	Case 5 Comments	Case 5 Actions	Case 5 Results	Case 5 Conclusions
6	Case 6	Case 6 Type	Case 6 Status	Case 6 Description	Case 6 Details	Case 6 Notes	Case 6 Comments	Case 6 Actions	Case 6 Results	Case 6 Conclusions
7	Case 7	Case 7 Type	Case 7 Status	Case 7 Description	Case 7 Details	Case 7 Notes	Case 7 Comments	Case 7 Actions	Case 7 Results	Case 7 Conclusions
8	Case 8	Case 8 Type	Case 8 Status	Case 8 Description	Case 8 Details	Case 8 Notes	Case 8 Comments	Case 8 Actions	Case 8 Results	Case 8 Conclusions
9	Case 9	Case 9 Type	Case 9 Status	Case 9 Description	Case 9 Details	Case 9 Notes	Case 9 Comments	Case 9 Actions	Case 9 Results	Case 9 Conclusions
10	Case 10	Case 10 Type	Case 10 Status	Case 10 Description	Case 10 Details	Case 10 Notes	Case 10 Comments	Case 10 Actions	Case 10 Results	Case 10 Conclusions

Table 9-4: Mode switch for grocery shopping from pre to post-move

	Current mode to shops					Total previous mode	Number changed mode	% changed mode
Previous mode to shops	car	public transport	walk	cycle	Other (NOT including n/a)			
car	135	1	15	0	0	151	16	10.60
public transport	18	0	16	1	0	35	35	100.00
walk	0	0	0	2	0	2	2	100.00
cycle	2	0	3	0	0	5	5	100.00
Other (NOT including n/a)	2	0	0	0	0	2	2	100.00
Total current mode	157	1	34	3	0	195	60	30.77

Table 9-5: Mode switch to city centre from pre to post-move

	Current mode to city centre					Total previous mode	Number changed mode	% changed mode
Previous mode to city centre	car	public transport	walk	cycle	Other (NOT including n/a)			
car	77	14	13	0	0	104	27	25.96
public transport	8	26	6	0	1	41	15	36.59
walk	9	6	15	0	0	30	15	50.00
cycle	2	1	2	8	0	13	5	38.46
Other (NOT including n/a)	1	0	0	0	0	1	1	100.00
Total current mode	97	47	36	8	1	189	63	33.33

Table 9-6: Mode switch for leisure journeys from pre to post-move

	Current mode for leisure					Total previous mode	Number changed mode	% changed mode
Previous mode for leisure	car	public transport	walk	cycle	Other (NOT including n/a)			
car	118	2	9	5	0	134	16	11.94
public transport	7	4	3	0	0	14	10	71.43
walk	6	4	14	2	0	26	12	46.15
cycle	1	0	0	1	0	2	1	50.00
Other (NOT including n/a)	2	0	0	0	2	4	2	50.00
Total current mode	134	10	26	8	2	180	41	22.78

It is firstly valuable to provide an overview of the current travel situation of the participant households, and also the changes in *aggregate* levels of mode use of the sample, in order to provide an idea of the overall picture of travel outcomes following a move. It can be seen from the ‘total’ row of the tables (particularly Table 9-1), that by far the majority of the study sample’s journeys are completed by car as the main mode³, with walk as the second most popular (albeit with less than a quarter of the number of journey purposes completed mainly by car). This high level of car use is to be expected given the popularity of the private car. The sample’s main commute mode choices have already been compared to figures for Bristol and England (see Chapter 7), which has illustrated the comparability of the data.

In terms of *changes* in levels of mode use, the overall level of car use among the sample is very similar both prior to and post move. For example, only 7 fewer households travelled to the city centre by car following the move, and this is the journey purpose demonstrating the largest difference in number of car users pre to post-move. The proportions of journeys completed mainly by walking, cycle and public transport have however altered. The number of journeys overall completed mainly by public transport decreasing (by 34 percent), apparently at the expense of walking and cycling, which have increased. The previous chapter has detailed the level of disgruntlement with the bus services in Bristol among the survey sample (there is little in the way of local trains etc), and this is clearly likely to have contributed to mode switch away from bus use, eg “*Due to price, poor service, lateness, infrequency, and state of buses, person one has decided to cycle to work.*” Such switches may frequently be the result of post-move experiences (rather than occur immediately following the move⁴).

Cycling is the main mode used for the lowest number of the participants’ journeys overall. It has however demonstrated the highest aggregate increase from pre to post-move in terms of the proportion of the sample cycling to work following their move (see Table 9-2). “*Realised*

³ Journeys to the city centre and taking children to school have far lower proportions of car use as the main mode compared to other journey purposes. School journeys are generally shorter distance, and parking availability and costs in the city centre can be a discouragement to driving. Nevertheless, car use remains substantially the most popular main mode for all journey purposes.

⁴ It could be up to a year since the home move for the current participants. Therefore additional events (job moves etc) not necessarily linked to the move could have occurred subsequently and affected mode use (either creating new mode change, or perhaps masking a mode change by a return to the original mode).

what a good place for cycling the area is so we took up cycling again.” As previously detailed in Chapter 7, cycling for commute among the sample is higher than England and Bristol averages. These figures are consistent with reports of large increases in cycling levels for commuting in the city (Bristol City Council, 2005). The aggregate figures in Table 9-2 suggest that this increase in cycling is largely at the expense of public transport and walking rather than commuting by car.

It is clear that mode switch is occurring within the study sample, and given current Government aims of reducing the negative impacts of travel it is encouraging to observe the increases in walking and cycling. It is however unfortunate that this appears to be largely at the expense of public transport use rather than car use. Nevertheless, examination of the aggregate picture is not sufficient to provide an improved understanding of the circumstances leading to such change.

9.3.2 Mode Switch

Aggregate level mode switch following a home move, as discussed in the previous section, is important to examine in terms of the overall picture. However, in terms of understanding processes and the involvement of various factors in influencing particular outcomes, change at the individual level is of greater consequence. This is especially true for assessing the potential for encouraging greater behaviour change. Chatterjee (2001) reminds us that when highlighting travel change it is important to take account of churn in order that a reflection of the true picture may be obtained. By way of example, Table 9-1, overall journeys, shows that prior to moving, 622 journeys were completed by car as the main mode. At the time of survey 616 journeys were completed by car, an unsubstantial change of 6 car journeys overall. In fact when the mode switch detail (body of the table) is examined, as highlighted by the final two columns of Table 9-1 (and Table 9-2 to Table 9-6), it can be seen that 107 journeys have been switched away from car use. This more substantial amount of change has been masked by 101 other journeys that have been switched to car use. It is therefore clear that a substantial amount of switch in car use has in fact occurred in the study population over the course of the move.

The percentage of households reporting mode change within each journey purpose is highlighted in the bottom right corner of Table 9-1 to Table 9-6. Excluding school journeys, which may be biased due to the relatively small number of participant households undertaking this journey, it can be seen that each of the journey purposes contained roughly similar percentages of mode change. Journeys to the city centre had changed the most, and grocery shopping journeys contained the least amount of mode switch. These tables provide evidence

of substantial mode change – almost 30 percent of all participant journey purposes were changed in main mode following a home move. Set against a backdrop of the apparent day-to-day unchanging nature of much of travel behaviour, this level of change provides substantial evidence for the effects of moving home in influencing travel behaviour⁵.

These mode changes however, might have occurred for a variety of reasons, including many of the additional key events listed in Chapter 2 such as getting drivers licence or moving job, as it has been noted that it could be up to a year between the household's move and the collection of survey data. It would therefore be expected that some mode switch would be recorded in any sample of households over a period of time. Therefore in order to firmly associate the observed mode change with a home move, comparison of some of the reported figures to a non-moved population is necessary.

The British Household Panel Survey (BHPS) is a yearly panel which includes collection of data on main mode used for travel to work. In their analysis of this data, Dargay and Hanly (2004) found that each year between 1991 and 2001, roughly 17.6 percent of commuters changed their main commute mode. Comparison of this figure to the 26.9 percent of commute journeys from the study sample changed in main mode (as highlighted in Table 9-2, reveals that almost 10 percent more journeys changed mode in the sample who had all moved home compared to the 'normal' sample. The 'normal' sample would additionally include households that had moved home as well as others that experienced alternative key events during the year, and is therefore likely to mask the real level of difference between recently moved and non-moved households. Nevertheless, the substantial difference observed provides *clear evidence* for linking at least commute travel mode change with a residential relocation.

9.3.2.1 Mode switch and evidence for habit weakening

As outlined in Chapters 2 and 6, mode choice for regular journey purposes is generally considered habitual in nature (albeit whilst acknowledging that many individuals are multi-model – Stradling, 2003; Kenyon and Lyons, 2003). Therefore mode switch cannot take place without any existing travel habits first weakening and breaking. The previous chapter has

⁵ It is of course possible that this alteration in main mode used could simply be an alteration in relative *amounts* of mode use, i.e. a less frequently used 'default' mode (Kenyon and Lyons 2003) switching frequency to become the main mode. Thus only limited change would have occurred, which would not constitute the substantial change that use of an entirely different mode would entail. However this is unlikely to have been a substantial effect on the results as very few participants reported alternative modes used.

already discussed how 71.3 percent of the respondents agreed or strongly agreed that their pre-move journey to work was habitual. Therefore the finding that 10 percent more of the study participants changed commute travel mode than in a ‘normal’ population, can equally be taken as evidence specifically linking the weakening of travel habits to residential relocation, as habits cannot be present if the behaviour is changing⁶.

Regardless of the initial presence of habits, the evidence for the absence of habit in situations where mode switch occurs is clear. This is of significant interest as evidence that habits are not strongly effective at some point of the process of moving home, and therefore behaviour should be susceptible to further change at this time.

Table 9-7: Number of journey purposes for which a main mode change was reported. (Frequency of participants)

Number of journey purposes for which main mode change reported	Frequency	Percent of sample	Presence of mode switch
0	99	43.2	No Change 43%
1	50	21.8	Some change 57%
2	52	22.7	
3	20	8.7	
4	7	3.1	
5	1	0.4	
Total	229	100.0	

The level of mode change for commute journeys has already been examined, with 26.9 percent of the sample having changed mode and therefore clearly not experiencing habitual commute mode choice over the course of the move. It is shown in Table 9-7 that when all six of the recorded routine journey purposes are taken into account, 57 percent of households experienced mode change for at least one of the routine journey purposes. Therefore (members of) 57 percent of households clearly experienced a certain level of habit weakening. No detail is however collected on the frequency of each journey, so this is merely an

⁶ The link between moving home and habit weakening based on this evidence however must be taken cautiously. As detailed in Chapter 7 it is not possible to confidently ascertain the presence of habits prior to the move from the simple measurements outlined. Nevertheless, the measure is a useful indicator, and does not disagree with the generally held view that mode choice for regular journeys may be considered habitual in nature (Verplanken and Aarts 1999; Verplanken et al 1994; Matthies et al, 2002; Gärling, 1998; Thøgersen, 2006).

indication of the amount of behaviour change within the sample, rather than a precise demonstration. It is finally valuable to note that, as discussed in Chapter 6, the actual level of habit weakening is likely to be higher than that evidenced by mode change, as not all habit weakening will ultimately lead to behaviour change

9.3.2.2 Are those participants who experienced a main mode switch different from those who didn't?

In order to examine the factors that might be associated with mode switch following a home move, presence or absence of mode switch in a household (according to the figures previously discussed in Table 9-7) was compared to a number of variables in the study by means of Chi² tests. The variables included household details and detail of the moving circumstances (as detailed in Section 7).

As with the Chi² examinations in the previous chapter, the detailed cross-tabulations of the data and statistics found to be significant at the 0.1 level are provided in the appendix (Appendix 15) while Table 9-8 provides a summary of these relationships. The 0.1 level is included due to the exploratory nature of the research, as an indicator that the relationship might be worth further examination in future, rather than as evidence of a relationship found, therefore any relationships that are not significant at the 0.05 level are indicated in the table. See Section 8.7.2.1 for further detail on these tests and their presentation in the chapter, the summaries of the data provided are described in relation to the statistically expected values.

Table 9-8: Comparison of presence of mode change with additional details relating to the move and household. All variables included in the table are significant at the 0.05 level, unless indicated ‘*’, in which case they are significant only at the 0.1 level.

Variable	Description of relationship with presence or absence of mode change, (as compared to Chi ² ‘expected values’). ⁷
Distance of move	Under 3 miles less likely than expected to have changed mode. Over 3 miles, more likely to have changed mode.
Familiarity with area moved to	‘Not at all’ to moderate familiarity, more likely to have changed mode. ‘Quite well’ to ‘very well’ less likely to have changed mode.
Number of areas in which properties were viewed	More than 3 areas viewed, more likely to have changed. Only 1 area viewed, less likely.*
Inclusion of any travel related factor in prompting the move?	Those with travel prompts far more likely to have changed, and those without less likely.
Was to be nearer work a prompt?	Those moving to be nearer work were more likely to have changed mode.
Was to be nearer school a prompt?	Those who moved to be nearer school were more likely to have experienced mode change.
Were any of the top 5 listed search criteria travel related?	More likely to have changed mode if travel issues were listed as search criteria.
Had the household made a conscious decision to change travel?	More likely than ‘expected’ to have changed mode if made a conscious decision to do so.
RRT stage at which travel issues were most considered	Stages 1,3,5,8 more likely than expected to have changed. Stage 4 less likely than expected to have changed mode. The rest no difference to expected.
RRT Travel Consideration Type	Maximal, post and prompted planners more likely to have changed. Minimal less likely and Non prompted planners no different to expected.*
Attitudes to car use segments ⁸	Malcontent motorists and Aspiring Environmentalists more likely to have changed. Diehard drivers and complacent car users less so.

It can be seen from Table 9-8 that the likelihood of mode switch increases with a conscious decision to change travel during the move, and if travel issues, particularly a desire to be nearer work or school, are involved in the prompt for the move. In such situations the

⁷ See Appendix 15 for detailed cross-tabulations of the data upon which these summaries are based.

ⁱ indicates variables with over 25% of expected values under 5 (see Section 8.7.2.1).

⁸ For more detail on this variable please see Appendix 11.

households clearly desire change and therefore act to facilitate it over the course of the move, as evidenced by the following participant example, where post-move both household members cycled to work, a mode switch from car use prior to the move for one of them: “*We both wanted to move to an area where we had the option of cycling to work.*”

The distance of the move and familiarity with area are also both related to presence of mode switch, with increased distance of move, and reduced familiarity associated with increasing likelihood of a switch. A move of over 3 miles is likely to create a greater change to the relative positions of home and other destinations than a shorter distance move and therefore a change to the feasible modes for those journeys is likely, thus accounting for higher rates of mode change with longer distance moves.

Regarding the search process, a search of more than three areas is associated with an increased likelihood of mode switch. Where only one area is searched it is likely that for many households this is the area already inhabited, as the majority of moves are over a very short distance (Böheim and Taylor, 1999). The area is searched for a larger or more suitable property. In such situations mode switch would be unlikely, thus accounting for the observed trend.

Greatest consideration of travel at RRT stages 1,3,5 and 8 is also associated with greater likelihood of mode switch. Travel consideration at Stages 1 and 8 (the prompt and post-move) is, as outlined in the previous chapter, likely to be created by either a desire or need for travel change. Explanations for the remaining RRT stage relationships however are less clear. Greater likelihood of mode change is also associated with attitudes in favour of reducing levels of car use, which is what would have been expected. (It is however equally possible that these attitudes may have in fact been prompted by undesired mode change following the move).

The TC-types introduced in the previous chapter were also examined for association, with the relationship only significant at the 0.1 level. This shows that Minimal-considerers are less likely to have changed mode, which is likely to be accounted for by the tendency for short distances moves and limited alteration to circumstances from this TC-type. Maximal, Post-move, and Prompted-early-planners are *more* likely to have changed travel mode than statistically expected. Both the Maximal-considerers and Prompted-early-planners tended to consider travel as a prompt for moving, and this can therefore account for the change in mode as travel changes are intended due to prompting a move. Post-move consideration of travel issues is likely to be necessitated by difficulties in continuing with the previous travel routines in the new housing situation, thus accounting for the relationship of increased mode switch within this TC-type.

No significant relationship has been found with presence of mode change and variables associated with the household (eg size and level of education); property cost; various prompts for the move (a job move, to get on the property ladder, to be nearer family, and moving in with a partner); and finally whether or not any subsequent events influencing travel behaviour had been reported. It therefore seems that the occurrence of mode switch is largely related to variables associated with a *decision* to change travel behaviour – travel considerations prompting a move and the household making a conscious decision to change travel. This suggests that a considerable proportion of the participants' mode change is therefore 'deliberate'⁹, and results from decisions taken prior to the selection of the property.

Mode switch is also however associated with later travel considerations (Post-move-considerers and households whose main travel consideration occurred at RRT Stage 8), and such changes are likely to have been 'unexpected' prior to the move (as otherwise they would have been considered earlier). A clear link with the numerous travel difficulties reported by participants, as outlined in Section 8.5.8.1 can be made. This suggests that the two of the three 'types' of travel behaviour change identified in Chapter 6 are clearly identifiable from the presence of mode switch within the survey sample. ('Anticipated' changes are more difficult to identify from the data collected regarding consideration of travel issues or not, as consideration regarding these travel changes might occur at any stage from 3 to 6. It is however extremely likely that they are included among the sample.)

9.3.3 Level of car use

It is not only the presence or absence of mode switch that is of interest to the research. Both in terms of greater understanding of the impact of home moves on travel behaviour, and in particular with regard to the implications for policy aimed at achieving car use reduction, the *detail* of any mode switch occurring is important. In particular is the switch in a positive direction (reducing car use) or a negative one (increasing it)? Equally, in terms of understanding opportunities for promoting low levels of car use, an examination of those households with no mode change, but maintaining low levels of car use following a move (continuing to use alternative modes), or conversely those remaining high car users is additionally important.

⁹ See discussion in Chapter 6 on deliberate, anticipated and unexpected changes to travel behaviour.

Level of car use was assessed utilising reported main mode used for the six previously outlined key journey purposes. The proportion of reported¹⁰ journey purposes for which car was the main mode used prior to the move was compared to the proportion of reported journey purposes for which car was the main mode used following the move. Difference in proportion rather than difference in number of journeys for which car was the main mode was utilised in order to allow comparison between different household types. For example, a single person household would not have any second adult commuters or children to school journeys, therefore a comparison of absolute numbers would not be appropriate. The sample was split initially into three categories (increase in car use, decrease in car use, and no change). The no change group was then separated into two categories, more than 50 percent of journey purposes having car as main mode, and less than 50 percent of journey purposes for which car was the main mode. In this way participants were classified into the four categories outlined below.

- Those who remain relatively lower car users (n=35).
- Those who remain relatively higher car users (n=67)
- Those who increased the proportion of journey purposes undertaken mainly by car (n=61)
- Those who reduced the proportion of journey purposes undertaken mainly by car. (n=65)

It can be seen from the sizes of these four groups that similar numbers of households remained high, increased or decreased their car use, but approximately 50 percent less remained low car users. This suggests that it may be more difficult to maintain low car use following a move as less households achieve this. Potential explanations include lifestyle pressures and a desire to increase level of car use, or difficulties in location choice. It is possible that those households reducing car use had a stronger motivation to achieve a reduction following a move (than those already having lower levels of car use) due to dissatisfaction with their existing high car use situation.

Again, examination of variables associated with alterations in levels of car use is valuable to learn from in terms of any future attempts to influence the situation. Table 9-9 below provides a summary of the variables found to have significant relationships with level of car use (at

¹⁰ Those for which a main mode was indicated.

least at the 0.1 level), and again the cross-tabulations of the significant relationships are included in Appendix 15.2.

It can be seen from the table that those taking a conscious decision to change travel during the move are more likely to *reduce* the proportion of journeys for which car is the main mode used, as is highlighted by the following comment for the opposite situation, where no conscious decision to change travel was reported. *“Having moved further out of Bristol than before I had to now plan where to park for work and nursery etc. The reality of always needing the car became more highlighted.”* Those not taking a conscious decision to change travel are far less likely than statistically expected to decrease levels of car use (most likely to remain high users), and those taking a conscious decision to change travel behaviour are no more likely than statistically expected to have increased their level of car use. This suggests that those increasing levels of car use do not generally appear to consciously intend to do so, and therefore highlights the probable lack of deliberation involved in increasing levels of car use, against the deliberation which appears necessary to achieve a reduction. This suggests the need to encourage consideration of travel during property selection if levels of car use are not to be increased. The association between reduced levels of car use and a prompt to be nearer work can equally be accounted for by the prompt as an indicator of intention to change travel.

A further specific moving prompt is also shown to be related to change in level of car use. Households that moved to get on the property ladder are far more likely than statistically expected to be in the ‘remained low car users’ category. A number of possible explanations can account for this. It might be expected that as first time buyers tend to have reduced buying power, they would be restricted in their choice of location and therefore end up with more car dependent areas due to increased prices in more accessible areas, as occurred for the following participant: *“First time buyers can not afford to be 'picky' - if price right.”* However having just made the financial commitment of a property, finances are likely to be tight and therefore mobility more restricted, possibly accounting for lower levels of car use. Another possibility is that the high costs of purchasing leads households to be very aware of the costs of travel and thus determined not to increase it in their location choice.

Table 9-9: Comparison of change in level of car use¹¹ with additional details relating to the move and household. All variables included in the table are significant at the 0.05 level, unless indicated ‘*’, in which case they are significant only at the 0.1 level.

Variable	Description of relationship with change in level of car use, as compared to Chi ² ‘expected values’ ¹² .
Distance of move	Those moving over 100 miles were more likely to have increased and least likely to remain high. 10-99 miles likely to have decreased. 4-9 likely to increase and remain high. 0-3 least likely to reduce, most likely to remain low or high.
Inclusion of any travel related issue in prompting the move?	Those with travel prompts were more likely than expected to have decreased level of car use. Those without travel prompts were most likely to stay the same; low or high.
Was to be nearer work a prompt for the move?	Those moving to be nearer work were most likely to have reduced car use, those not most likely to have remained high, but also likely to have increased and remained low.
Was to get on the property ladder a prompt for the move?	Those moving to get on the property ladder were most likely to have remained low car users. Those not, most likely to have increased, decreased or remained high.
Had the household made a conscious decision to change travel?	Those who didn’t make a conscious decision were more likely than expected to stay the same (high and low) or increase. Those who did were more likely to reduce.
RRT stage at which travel was most considered ⁱ	Stage 1 most likely to decrease. Stage 8 most likely to increase. Stages 3 and 4 most likely to stay the same low, and stage 5 and 7 only slightly more likely to remain same high.
RRT Travel Consideration Type	Maximals and Prompted-planners more likely than expected to have changed (increase or decrease), Minimals most likely to have remained high, Non-prompted-planners most likely to have remained low, and Post-move slightly more likely to have increased.
Attitudes to car use segments	Malcontent motorists and complacent car users were most likely to have increased or remained high. Diehard drivers most likely to have remained high. Aspiring environmentalists were most likely to decrease or stay the same low.

Both the TC-type and most considered stage are also significant with change in level of car use at the 0.05 level. Maximal-considerers and Prompted-early-planners are the most likely to have reduced their car use, which can again be linked to the involvement of travel

¹¹ Change in the proportion of journey purposes for which car was reported as main mode - values are ‘increase’, ‘decrease’, ‘remain high’, and ‘remain low’.

¹² See Appendix 15 for detailed statistics and cross-tabulations of the data upon which these summaries are based. The descriptions here refer to the observed study variables as compared to the values that would have been statistically expected were there no relationship between the variables.

ⁱ indicates variables with over 20% of expected values under 5 (see Section 8.7.1).

considerations in the prompt of the move for these TC-types. However many households increasing their levels of car use also come from these TC-types, as well as from the Post-move-considerers, who largely increased. Non-prompted-early-planners are most likely to remain low level users, which again highlights that planning for travel is necessary in the retention of low levels of car use, as this TC-type does appear to plan for travel. Minimal-considerers are likely to have retained high levels of car use, a situation it would seem they are happy with: *“We both drive so did not think about travel. Public transport is not used because it is too expensive and unreliable.”* TC-type and level of car use will be discussed in more detail in the final section of this chapter.

In terms of most considered stages, those most considering travel at RRT Stage 1, the prompt are most likely to reduce car use, and Stage 8 most likely to increase. This yet again suggests that reduction of car use requires planning and early consideration (the prompt for the move). While where travel is mostly considered after the move (Stage 8), and therefore not planned, or perhaps as a result of ‘unexpected’ difficulties (see Section 8.5.8.1) the most likely result is an *increase* in levels of car use.

Finally in terms of attitudes towards car use, as would be expected, those either decreasing or retaining low car use were most likely to be the aspiring environmentalists. It was however the malcontent motorists that were relatively most likely to increase the amount of journeys for which car was the main mode – an increase which appears to confirm previous suggestions the it is the post-move travel situation which has lead such households to become disgruntled with their levels of car use but feel unable to do much about it (characteristics of malcontent motorists). Both the diehard drivers and complacent car users are most likely to have remained high car users – the diehard drivers are particularly unlikely to have increased their levels of car use (possibly as car use was already at ‘maximum’ levels).

Numerous variables have therefore been shown to be related to the level of car use post move. Those households likely to have remained low or decreased the amount of car journeys will have considered travel early on in the process, particularly if it was involved in a prompt for the move. It does seem that where deliberate decisions are taken regarding travel (such as prompting the move or deciding to alter travel), reductions in car use tend to be promoted rather than increases. This most notably points to the suggestion that households generally do not seem to desire to increase their levels of car use, and therefore any help that could be offered to assist in reducing levels of car use might be welcome.

9.3.4 Summary of mode choice

Thus far the chapter has highlighted that participants' mode choices have undergone substantial change following their home move, and the presence of mode switch can in turn be taken as evidence that travel habits are likely to be weakened surrounding a home move. A substantial proportion of this change can be associated with the home move itself rather than additional factors. The need to examine disaggregated data in order to reveal the extent of these changes has been stressed as change can be masked at an aggregate level, due to the occurrence of changes in both directions. The sections have highlighted that mode switch, and in particular whether this switch increased or decreased levels of car use appears to be largely related to distinctions between deliberate and unexpected changes (consideration of travel in the early stages versus the latter stages of the RRT). Deliberate changes appear more likely to lead to reductions in levels of car use, and unexpected changes more likely to increase. Additionally the retention of low levels of car use also appears to also require planning at the early (although not prompt) stages of the move. Therefore as suggested by the interview results, planning for change appears to be a key influential factor in determining travel outcomes for mode choice at least, and highly beneficial to examine in the context of travel considerations.

9.4 Journey time and distance

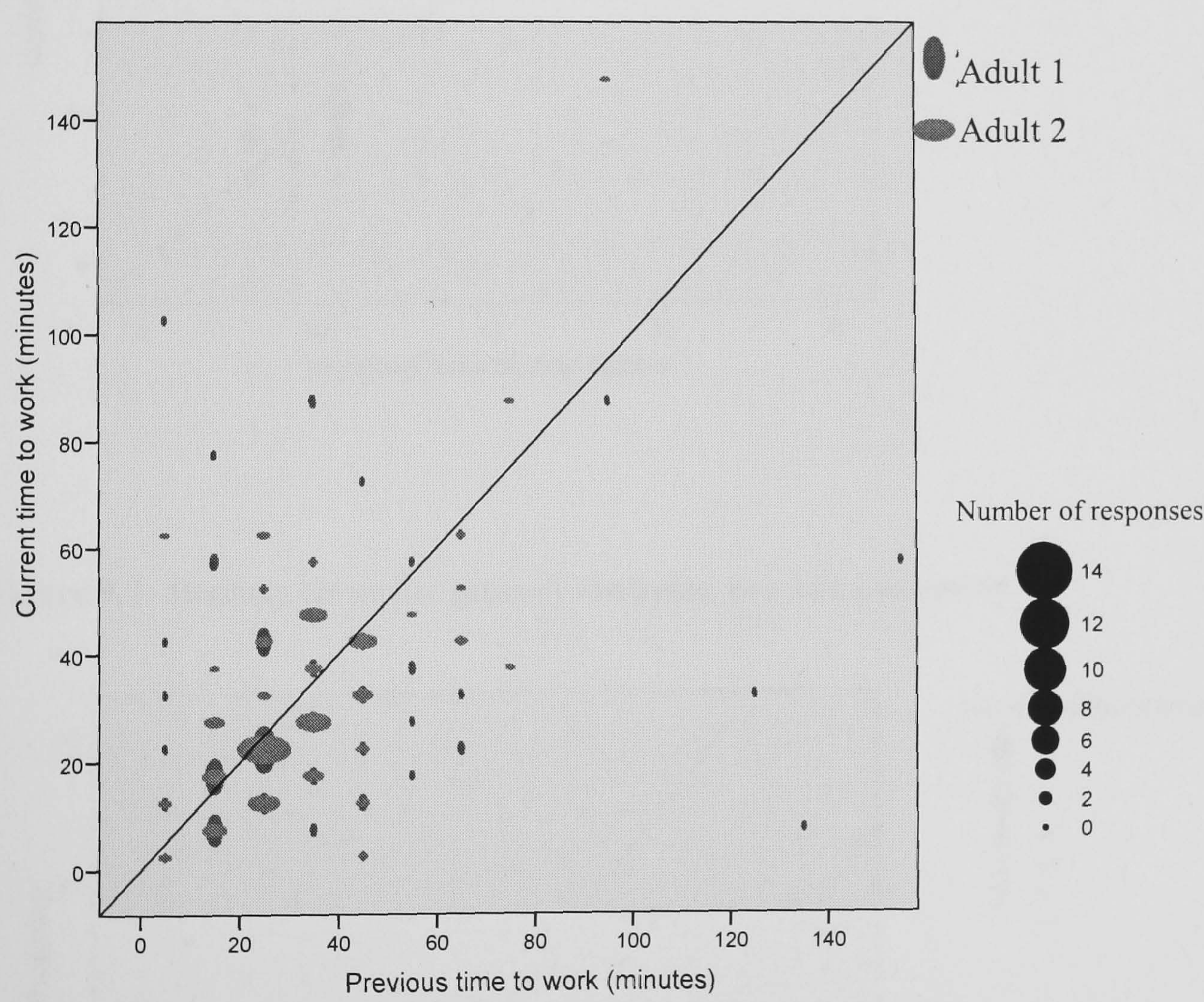
Mode choice is not the only travel outcome of interest when examining behaviour change associated with moving home. It was felt important for the survey to examine not only travel mode change, but other potential changes to travel behaviour. In this way a better understanding of the range of impacts of a residential relocation on travel behaviour might be obtained. To this end, as well as mode switch the survey also gained information on journey times for each of the previously outlined journey purposes; a measure of impact of the house move on overall distance travelled by the household; a measure of the impact of the move on the availability of alternative travel modes; and a measure of household satisfaction with the modes available to them post-move. This section will focus on journey time and distance, with impacts of the move on availability of mode options discussed in the following section.

9.4.1.1 Typical journey times

Figure 9.1 to Figure 9.3 are scatter plots providing a visual representation of the participants' reported 'typical' journey times for commute, journeys to the city centre and journeys for

grocery shopping, both prior to and post-move. The central line of the plots indicates no time change, with plots to the right of this line indicating participants with reduced journey times, and plots to the left indicating participants having increased. The greater the distance the plot from this central line, the greater the increase or decrease in journey time experienced. Thus it is possible to assess at a glance both the range of responses, whether increase or decrease has mostly occurred, and whether increase (or decrease) is most associated with longer or shorter pre-move journey times.

Figure 9.1: Commute time pre and post move for any commuting adults in the households surveyed.¹³



¹³ In the commute plot three further respondents whose previous travel time was over 200 minutes have been removed from the figure to reduce the axis range and provide clearer presentation of the remaining results. All these respondent's current travel time to work remained above 120 minutes.

Figure 9.2: Journey times to the city centre pre and post move.

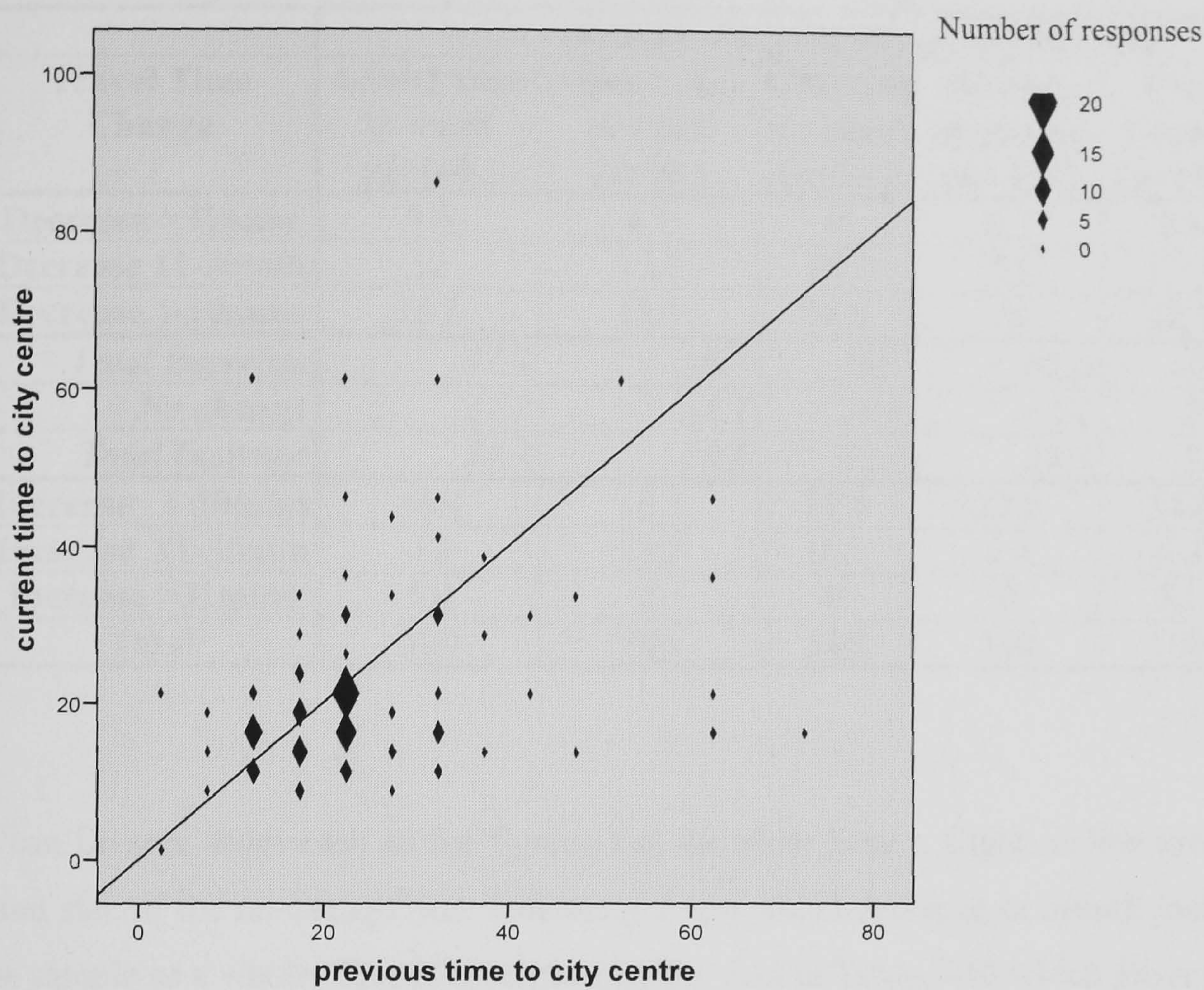


Figure 9.3: Journey times for grocery shopping pre and post move.

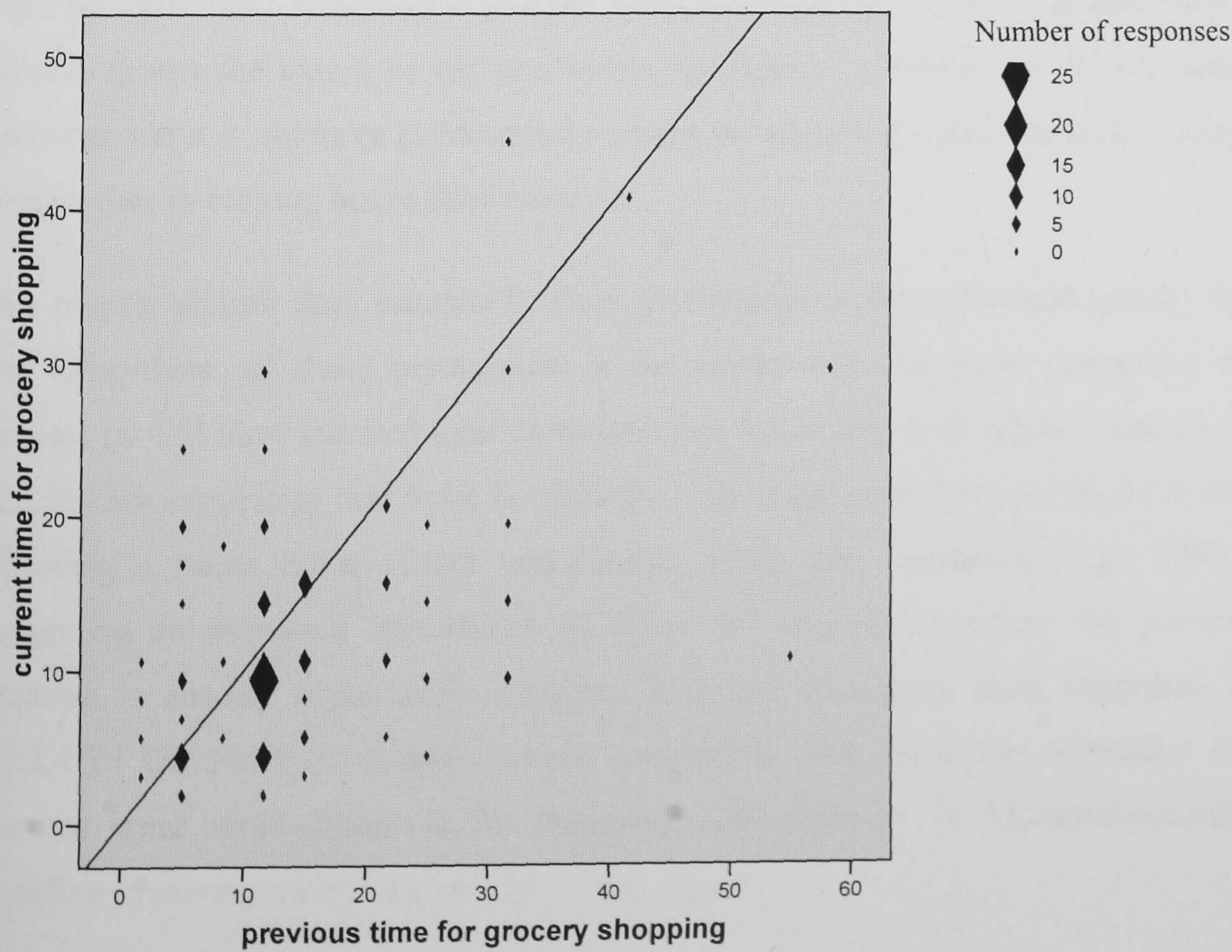


Table 9-10: Journey time changes from pre to post-move for all journey purposes. (Percentage of respondents)

Travel Time Change	Journey Purpose (% of respondents)						Total
	Adult1 time to work (n=166)	Adult2 time to work (n=98)	Children to school (n=28)	Grocery Shopping (n= 140)	City Centre (n=141)	Leisure (n=108)	
Decrease >31mins	9.6	4.1	0	0.7	2.8	2.8	
Decrease 11-30min	12	15.3	10.7	7.9	11.3	12	
Decrease 1-10mins	16.3	13.3	28.6	30	22.7	17.6	
<i>Total Decrease</i>	37.9	32.7	39.3	38.6	36.8	32.4	217.7
<i>No change</i>	27.7	36.7	28.6	37.1	29.8	38	197.9
<i>Total Increase</i>	34.3	30.5	32.1	24.3	33.3	29.6	184.1
Increase 1-10mins	16.9	16.3	21.4	17.9	24.8	19.4	
Increase 11-30min	12	12.2	10.7	6.4	6.4	8.3	
Increase >31mins	5.4	2	0	0	2.1	1.9	
Total	100	100	100	100	100	100	

It can be seen from each of the figures that the plots have a slight incline towards the right hand side of the no change line, indicating a very slight decrease in overall journey times for the sample as a whole. This is confirmed by the data in Table 9-10 which provides a summary of the overall changes for all the journey purposes recorded. From Table 9-10 it can be seen that overall for the sample there is little difference between whether journeys increased, decreased or remained the same, with slightly more households reporting typical journey times reduced, and slightly more journeys having remained unchanged than increased. The slight bias towards a reduction in journey times is encouraging in terms of reduction of car use policies (given the extent of car use within the sample identified in the previous section). However that it is not more pronounced perhaps yet again highlights the lack of importance of travel issues in moving house decisions.

This overall picture does potentially mask differences at the individual journey level. With four exceptions, all those participants in the survey with pre-move commutes of over 40 minutes (n=56) have reduced their commute time (including both adults 1 and 2). This holds with studies suggesting that those households with longer commutes are likely to reduce them following a home move (Clark and Onaka, 1983; van Ommeren et al, 1999), perhaps suggesting an increased importance of travel for households where the pre-move travel situation is already presumably stressful. This has previously been suggested in Section 8.7.2.4 of the previous chapter, where households with pre-move commutes of over 30 minutes were more likely to be Prompted-early-planners or Maximal-considerers, and therefore involving travel as a prompt for the move.

It was not possible to record detail of both time and distance due to space constraints in the questionnaire and journey time was selected as being the most influential on behaviour (Wachs et al, 1993). However, a simple measure of impacts of the move on overall household distance travelled was also taken in recognition of the non-perfect correlations between distance and behaviour (Chatterjee and Lyons, 2007). The responses are shown in Table 9-11, and it can be seen that for almost equal proportions of the sample the move increased as decreased overall household travel distance. The amount by which travel distance increased or decreased was not recorded (other than ‘significantly’ or not) and therefore it is not possible to make any statements regarding the impacts of the move on overall distance travelled. However it is clear that for the largest proportion of households no change in overall household distance travelled was recorded. This differs to the previous data regarding journey times, where more increased or decreased than remained the same.

Table 9-11: Effect of the move on the number of miles travelled by the household

Household mileage.....	Frequency	Percent	
significantly decreased	29	12.7	27.5
decreased	34	14.8	
no change	99	43.2	43.2
increased	49	21.4	29.3
significantly increased	18	7.9	
Total	229	100.0	

9.4.2 Comparison of time and distance to additional study variables

In order to allow examination of possible associations between change in journey time and factors associated with the move or the household, it was decided to focus on changes to commute time only. Destinations such as supermarkets and gyms may relatively easily be changed if desired, however for the majority of workers the workplace is fixed over the course of the move (excepting of course where a job move prompted the residential move). Therefore whether the household has increased or decreased their commute journey following the move is especially of interest – particularly as it is generally the most frequently repeated journey and therefore likely to have the most impact in terms of congestion and environment. It was only possible to compare whether overall household commute time had ‘increased’, ‘decreased’, ‘not changed’, or ‘one adult had increased and the other decreased’, as inclusion

of more detailed categories (eg very short and very long commutes) for Chi² examination was not possible with the amount of data collected.

Table 9-12 provides a summary of the significant Chi² relationships tested between the move and household details listed in column one and changes to both household commute time and overall household distance travelled. The detailed cross-tabulations of the data, including the Chi² statistics are included in Appendix 15.3 and Appendix 15.4.

Table 9-12: Comparison of commute journey time alterations and changes in overall distance travelled with move and household details. All variables included in the table are significant at the 0.05 level, unless indicated ‘*’, in which case they are significant only at the 0.1 level.

Variable	Description of relationship with changes to household commute journey times ¹⁴ , as compared to Chi ² ‘expected values’ ¹⁵ .	Description of relationship with change in overall household distance travelled, as compared to Chi ² ‘expected values’ (options as in Table 9-11)
Household Composition ⁱ	Single person households were more likely to decrease or experience no change to commute journey times, whereas couples were more likely to increase, or have 1 increase and 1 decrease ¹⁶ .	-
Distance of move ⁱ	Moves of less than a mile tended to have not changed, and moves 1-3 miles tended towards increase (or ind/dec). Moves over 4 miles tended towards more decrease.	Moves of less than a mile tended to have not changed, and 1-3 miles tended towards increase. Further moves were likely to have changed, but with a variety of increase and decrease.
Familiarity with area ⁱ	Those very familiar tended towards no change, those moderately familiar toward decrease, or 1inc1dec, and those less familiar tended towards an increase.	-
Number of areas in which property was viewed	-	Only one area, little change. More than 2, more increase or decrease.
Inclusion of any travel related	Those households for whom travel issues had prompted the move	If travel was a prompt for the move then more likely to either increase

¹⁴ Options include whether overall household commute time had increased, decreased, not changed, or one adult had increased and the other decreased.

¹⁵ See Appendix 15 for detailed cross-tabulations of the data upon which these summaries are based.

ⁱ indicates variables with over 20% of expected values under 5 (see Section 8.7.1).

¹⁶ There is a possibility that this relationship is significant due to one of the commute time categories (1 journey increase, the other decrease) not applying to single person households.

issue in prompting the move?	tended towards a decrease, and those whom it hadn't tended towards no change.	(normally or significantly) or significantly decrease. If it wasn't then no change.
Was to be nearer work a prompt for the move?	If moved to be nearer work then decrease. If not then no change or increase. (1 of each even)	If to be nearer work a prompt, significant decrease in miles. i
Did a job move prompt the residential move? ⁱ	-	Prompt increases likelihood of change (increase or decrease)
Was to be nearer family a prompt for the move? ⁱ	-	Prompt increases likelihood of change (increase or decrease)
Had a conscious decision to change travel been made?	*Same as distance, with even more increase in the non-conscious decs.	Sig 0.009 20.349, df=8, cv=0.218. Strongly agree – likely reduce (and a little increase). Disagree, likely no change and a little increase.
RRT stage at which travel was most considered ⁱ	Stage 1 decrease. Stages 4,7,8 increase. No change, stage 3 and none. 1 incl dec stages 2 and 8.	Sig but lots of cells under 5. Stages 3 and 4 no change. Stage 1 decrease. Stage 2, increase and decreases observed, stage 7 and 8 increase.
RRT Travel Consideration Type ⁱ	No change, clusters 1 and 5. Decrease cluster 3. Increase clusters 2 and 4. 1 incl dec fairly even.	Clusters 2 and 4 most likely to have significantly increased and increased. Cluster 1 most likely to not change. Cluster 5 even on everything. Cluster 3 most likely to decrease, with a bit of 2 and 4 too.

Many of the associations illustrated in Table 9-12 are similar to those previously discussed under change in level of car use, and therefore will not be discussed in detail here. Reduction in commute time and household miles travelled is again associated with variables indicating a conscious, deliberate consideration of travel issues (prompt to be nearer work, Prompted-early-planners TC-type, most consideration at RRT Stage 1). Increases are more associated with non-planned travel consideration (eg most consideration at RRT stages 7 and 8). Maximal-considerers however experienced both decrease and increases to travel times, possibly due to difficulties experienced in achieving the desired new property situation. This possibility will be discussed further in the final section of the chapter.

In terms of details of the move, distance of move was again related to the travel outcome; with those moving less than a mile unsurprisingly experiencing little change to their overall distance travelled or commute journey time. Those moving 1-3 miles experienced an increase in both. This is likely to be because a move of 1-3 miles is not far enough to alter many locations visited but far enough to increase the distance from them. In terms of commute those moving 4-99 miles showed slightly more decrease than would be expected statistically and for

journey distance overall a slight increase was observed, however a substantial amount of overall decrease was also recorded within this group. With this distance of move old destinations visited are generally changed.

A final addition to previous findings is that the overall distance travelled is related to number of areas searched, with those searching only one area experiencing little change in distance travelled compared to those searching more areas. This suggests, that the household had not moved far and intended to remain in the same area, and therefore only searching in that area.

It is clear that numerous relationships exist between details of the move experience and journey time and distance. Before moving to discuss in detail the travel outcomes of the RRT clusters, there are two more travel outcomes of a move worth examining.

9.5 Satisfaction with, and availability of, mode options

A final indicator of travel impacts of a move is the availability of travel or mode options from the home. A change in home location has the possibility of drastically changing the availability of travel mode options. The travel options available to a household will be a significant influence in determining which modes of travel the household is likely use. It is the perception of mode availability rather than the actuality which is generally important in determining mode use, as modes that are perceived as unavailable or difficult to access from the current home are extremely unlikely to be utilised, regardless of their actual 'objective' availability. Nevertheless, 'objective' availability remains important in determining the set of possible options.

Examination of changes to mode availability within the survey was restricted to information on whether the move had increased the number, decreased the number, made no difference, or altered the options available to the household, without altering the amount. In addition to the perceived availability of travel options from the home, satisfaction with the level of options available is also of interest. Inclusion of this variable allows examination of whether extensive consideration and planning for travel issues is associated with higher levels of satisfaction, and therefore presumably more content households. Increasing or retaining high satisfaction levels is an important outcome to achieve following any potential intervention. It is therefore important to examine whether any further study variables are related to satisfaction with availability of travel options in order that any future interventions may be most beneficial to households. Table 9-13 shows both the study participants' levels of satisfaction and the availability of transport options from the new home.

Table 9-13: Comparison of alteration in availability of transport options and satisfaction levels with them¹⁷.

	Affect on transport options available					
Satisfaction Level	more options available	less options available	different options but same amount	no change in amount of options	Total n	% Total
Low satisfaction	10	21	12	30	73	32.3
Medium satisfaction	17	4	11	31	63	27.9
High satisfaction	40	4	11	35	90	39.8
Total n	67	29	34	96	226	
% Total	29.6	12.8	15.0	42.4		100

It can be seen that in terms of satisfaction levels, slightly more of the participants are highly satisfied with the availability of travel options from their new home, than only moderately or poorly satisfied. It can also be seen that where the availability of options increased, participants were more likely to be highly satisfied, and where they decreased more likely to have low satisfaction levels. This is not surprising given the generally higher value placed on the increased choice provided by having a variety of modes available, as initially suggested by the interview participants, and repeated within the survey responses. E.g.:, *“House had to be close to public transport especially buses, but also trains. Preferably in walking distance of work to eliminate daily car usage and all transport costs”*. In particular it provides for alternatives if the main mode to be used is not available; e.g. *“Thought about how far to bus stops - could I get to local shops if car broke down?”*

In terms of perceived availability of options it can be seen that for the highest proportion of the study sample mode availability remained unchanged, but for twice as many households the move increased rather than decreased the perceived amount of travel options available. This appears encouraging for policies aiming to reduce levels of car use, to observe that the majority of households in the study either maintain or improve their perceived availability of mode alternatives upon moving home and are therefore presented with greater travel choice. (Even if a mode option ultimately proves to be an unattractive one, such as many participants reported experiences of bus services, it is nevertheless a choice that can be implemented if necessary).

¹⁷ Chi² =36.297, df=6, p=0.000.

However, two additional explanations are possible. It is likely that as a household moves and considers travel from their new home they are more likely to discover any new or improved transport options than a household that has been in situ for some time and potentially strongly habitual. The increase might therefore be due to perceptions of availability rather than necessarily the objective situation. Nevertheless, as stated in the introduction to this section, it is perceptions which are heavily influential on actual behaviour. Additionally sample bias may have had a role. The households with an interest in the travel implications of their move would be more likely to have increased their mode options availability for the reasons outlined in the previous paragraph, and also would be those most likely to have responded to the survey.

Both alterations to availability of travel options, and satisfaction with the level of availability are again examined for relationships with additional study variables. An overview of findings is presented in Table 9-14 with the detailed Chi² tables supporting the findings included in the appendices (Appendix 15.5 and Appendix 15.6).

Table 9-14: Comparison of alteration in availability of mode options and satisfaction with mode availability, with details of participants’ moves and households. All variables included in the table are significant at the 0.05 level, unless indicated ‘*’, in which case they are significant only at the 0.1 level.

	Description of relationship with changes to mode options available to the household, as compared to Chi ² ‘expected values’ ¹⁸
Distance of move	Less than a mile were far more likely than statistically expected to have no change. 1-3 most likely different or no change. 10-99 by far most likely to have more. Over 100 miles most likely to have less options available.
Familiarity with area moved to	Very familiar by far most likely to have not changed. Most likely to have increased options availability were moderate or a little familiarity.
Was travel a prompt for the move?	*Those prompted more likely than expected to have more options available, or a change in options.
Was to be nearer work a prompt for the move?	Those moving to be nearer work were most likely to have more options available. Those not were more likely than expected to have less options available, or no change.
Did a job move prompt the home move?	If yes, more likely than expected to have less options available, or a change in options. If no, most likely to have no change.
Number of areas in which property was viewed	If 1 area viewed, far more likely than expected to have had no change. 2-3 areas, most likely to have more or no change, 3+, very likely to have changed, mostly increase or decrease.

¹⁸ See Appendix 15 for detailed statistics and cross-tabulations of the data upon which these summaries are based.

ⁱ indicates variables with over 20% of expected values under 5 (see Section 8.7.1).

Had the household made a conscious decision to change travel?	If agree that a conscious decision was made, then far more likely than expected to have increased available options. If disagree most likely to have had no change.
RRT stage at which travel was most considered ⁱ	Stage 1 more likely to have more options. Stage 3 most likely to have less or no change. Stage 7 most likely decrease. Stage 8 more likely than expected a change in amount.
RRT Travel Consideration Type	Minimals more likely than statistically expected to have not changed. Maximals most likely to have increased but also likely to differ. Post-move most likely to have increased or decreased. Non-prompteds more likely than expected no change.
	Satisfaction with options availability
Had the household made a conscious decision to change travel?	Those making a conscious decision were far more likely to be highly satisfied. Those not making a conscious, more likely to be moderately satisfied, and those neither agreeing or disagreeing with statement most likely to have low satisfaction.
Number of areas in which property was viewed	*Fewer areas viewed higher levels of satisfaction
RRT stage at which travel was most considered ⁱ	More likely than expected to have high satisfaction were those considering most at Stages 1,2,4, & 5. Those with low satisfaction considered most at Stages 3, 7 & 8.

As with discussion of moving details related to journey time and distance, many of the trends observed with changes to mode availability are similar to those for changes to levels of car use, and therefore will not be discussed in detail. Travel related prompts for a move, greater distance of move, a conscious decision to change travel and earlier greatest consideration of travel issues are all associated with increases in availability of mode options, explanations for which are similar to those provided in the section on change in level of car use.

Earlier planned considerations of travel, and a conscious decision to change travel behaviour are also associated with higher levels of satisfaction with options availability, which is not surprising as an increase in mode availability would most likely result in higher satisfaction levels. Higher satisfaction was also associated with fewer areas searched. This can be largely accounted for by participants specifically selecting one area mainly according to its travel criteria: *“We wanted to stay in the area, as it was convenient for work/city centre etc. And liked the atmosphere - shops and pubs etc”*. A search over a number of areas may indicate difficulties in locating a suitable property thus also accounting for the lower levels of satisfaction reported.

Those considering travel most at RRT stages 7 and 8 reported the lowest levels of satisfaction of mode availability and consideration most at these stages is also associated with higher than statistically expected levels of decrease (Stage 7) or a change only in the composition of available options (Stage 8). This suggests that leaving the majority of consideration of travel

issues until after the move has taken place is not only likely to lead to a reduction in the travel options available to the household, but also satisfaction levels with the situation. This is presumably because once the move has taken place there is little that can be done to alter the availability of travel options, short of moving again (or purchasing a car or bike perhaps), so consideration at this stage is too late to affect availability of travel options.

In terms of a conscious decision to change travel behaviour the relationship is not that straightforward. For those households consciously deciding to change their travel as they moved, availability of travel options was most likely to increase and satisfaction levels with them were likely to be high. Those not making a conscious decision to change were unlikely to change but were still moderately satisfied with their options. Those households reporting only moderate levels of a conscious decision to change are likely to have experienced some change (increase, decrease, or composition alteration) but experience low satisfaction with the options available. This suggests that unless a definite conscious decision to change is made (if change is desired) then ultimately satisfaction levels with the situation are likely to be low. This indicates that strong determination may be required to achieve satisfactory improvements to the availability of travel options, which may be a key finding of the research.

The general trend (apart from Stage 2¹⁹ necessarily, which will be discussed in more detail in the following section) is the earlier the ‘most consideration’ of travel issues occurs, the higher the level of satisfaction (and greater likelihood of increasing availability). This finding is crucial as it implies that not only might interventions to increase consideration of travel issues during a house move be beneficial in terms of encouraging positive behaviour change, but they would also be beneficial and perhaps welcomed by home movers. Interventions encouraging earlier detailed consideration of travel issue would have the potential to increase post move satisfaction levels with transport availability. Public acceptability of any policy is key in determining the success of its implementation (Jakobsson, Fujii and Garling 2000; Vlek and Michon, 1992), therefore this finding, suggesting the potential direct benefit to the public of interventions suggested is a key finding in terms of policy implications.

¹⁹ It is not contradictory for Stage 2 considerers to experience both high and low satisfaction with options availability. This merely reflects the dichotomies of consideration at this stage.

9.5.1 Summary of travel behaviour change

The chapter so far has highlighted the changes to participants travel modes, journey times, journey distances, and availability of mode options following a home move. Substantial change has been recorded, which for mode use in particular has been used to demonstrate evidence for habit breaking associated with a home move, as it has been shown that more commute mode change occurred in the moved study sample than a ‘normal’ sample.

Both ‘improvements’ to a household’s travel situation (reductions in car use, journey times and distances, and increases in mode availability and satisfaction), and ‘deterioration’ have been observed in almost equal measures, with ‘improvements’ slightly more prevalent. This variation suggests that there is no clearly observable specific impact of residential relocation on travel behaviour, and that a range of outcomes occur. It is instead valuable to again turn to the processes behind any travel outcomes. The occurrence of travel behaviour change has been shown to be related in general to the distance of move, familiarity with the area, and number of areas viewed during the search. Thus far it has been suggested that a conscious decision to change travel behaviour, and earlier consideration of travel issues are more likely to result in ‘improvements’ to the situation. However, a greater examination of the TC-types developed in the previous chapter is likely to be of value to shed light on the processes involved.

9.6 Travel outcomes and RRT Travel Consideration Types

This final section of the chapter turns to examine in more detail whether a clear link can be established between timing/pattern of travel issues consideration during a move, and particular travel outcomes. This is examined through a more detailed assessment of the TC-types developed in the previous chapter. Summaries of all the travel outcome relationships examined so far will be combined with additional travel outcome data in order to further develop the typology profiles of each of the five TC-types.

9.6.1 Additional travel outcomes

The previous sections have focussed on *changes* in travel behaviour. However also of interest in order to fully develop the TC-type profiles is to examine actual travel outcomes for each, such as particular mode choices, or journey times associated with particular TC-types. In order to address this, prior to the general examination of RRT travel consideration types with

travel outcomes, a few remaining travel outcome variables not yet compared to TC-types will be introduced. Two of these variables focus specifically on the post-move commute journey due to limited space for discussing all journey purposes: namely commute mode choice and commute journey time. The third variable is a measure of time taken post move prior to habit development. This is an important indicator of how much time available post move there may be to provide effective interventions before any habits weakened by the move become strengthened.

9.6.1.1 Commute mode and time

Pre-move commute mode and time of members of each TC-type were discussed in the previous chapter, both demonstrating a significant Chi² relationship with TC-type. This result was observed whilst noting that a large number of cells in the tables had expected values less than 5 therefore limiting the confidence in this result. A similar situation is found for post move commute mode (see Table 9-15 below), however post-move commute *time* did not return a significant Chi² relationship with TC-type (p=0.255). Therefore the data is not presented in the chapter.

It can be seen from Table 9-15 that post-move, Minimal-considerers have a high proportion of single car commuters. This is similar to the pre-move commute mode – which is not surprising given this TC-type experienced minimal change in modes used and travel overall. Post-move, Non-prompted-early-planners have twice as many walkers and cyclists as would have been statistically expected. The remaining TC-types however are fairly mixed in mode – especially Maximal-considerers. Taking this combined with the lack of significant relationship between post-move commute time, and TC-type, it seems that TC-type is more related to pre-move travel and travel change than post-move travel. This suggests that the pre-move travel situation may be likely to influence the types of consideration given to travel issues during a relocation, and has more impact upon the timing of travel consideration than travel consideration ultimately has on eventual mode choices and journey times.

Table 9-15: RRT travel consideration type and current household commute modes including both adult household members in the survey sample. Expected values are included to facilitate examination of the trends present²⁰.

RRT Type	Post-move main commute modes for all commuters in the household.									
	2 car users	single car user	2 walkers or cyclists	1 walker/cyclist	2 public transport	1 public transport	car-pt	car-walk/cycle	pt-walk/cycle	Total
Minimal Considerers <i>Expected</i>	14 <i>14.2</i>	30 <i>16.5</i>	3 <i>4.1</i>	5 <i>7.8</i>	0 <i>.6</i>	1 <i>1.4</i>	3 <i>5.2</i>	1 <i>6.7</i>	0 <i>.6</i>	57
Maximal Considerers <i>Expected</i>	12 <i>11.2</i>	8 <i>13.0</i>	1 <i>3.2</i>	4 <i>6.2</i>	2 <i>.5</i>	1 <i>1.1</i>	8 <i>4.1</i>	9 <i>5.3</i>	0 <i>.5</i>	45
Prompted Early planners <i>Expected</i>	2 <i>3.5</i>	5 <i>4.1</i>	2 <i>1.0</i>	2 <i>1.9</i>	0 <i>.1</i>	0 <i>.4</i>	0 <i>1.3</i>	3 <i>1.6</i>	0 <i>.1</i>	14
Post Move Considerers <i>Expected</i>	3 <i>4.2</i>	4 <i>4.9</i>	0 <i>1.2</i>	2 <i>2.3</i>	0 <i>.2</i>	1 <i>.4</i>	3 <i>1.6</i>	3 <i>2.0</i>	1 <i>.2</i>	17
Non-prompted early planners <i>Expected</i>	18 <i>15.9</i>	10 <i>18.5</i>	8 <i>4.5</i>	14 <i>8.8</i>	0 <i>.6</i>	2 <i>1.6</i>	4 <i>5.8</i>	7 <i>7.5</i>	1 <i>.6</i>	64
Total	49	57	14	27	2	5	18	23	2	197

9.6.1.2 Habit development

It was demonstrated in the previous chapter that the majority of the study sample considered travel during at least one stage of the RRT, and therefore can be argued to have had weakened travel habits. It is important to gain an idea of the amount of time post move before new habits are developed. This provides an idea of the time available post move for interventions to have an influence without having to first overcome habits. Again routine was the term employed as providing less ambiguity. Table 9-16 shows the time taken following the move before participants felt that they were in a routine for four of the previously outlined journey purposes. General leisure travel and journeys to the city centre were not included due to space constraints as they were felt to have lower potential for routine.



²⁰ Chi² = 60.624, df=32, p=0.002 (31 cells – 68.9% expected value less than 5).

Table 9-16: Time taken post-move before journeys were felt to be habitual (count and percentage).

		Not in a routine	Instantly	A week	2 weeks	A month	A few months	n/a	Total
A1 journey to work	Count	15	129	33	19	11	8	14	229
	%	7.0	60.0	15.3	8.8	5.1	3.7	0	100
A2 journey to work	Count	3	78	21	13	7	5	86	213
	%	2.4	61.4	16.5	10.2	5.5	3.9	0	100
Children to School	Count	5	27	8	6	2	1	159	208
	%	10.2	55.1	16.3	12.2	4.1	2.0	0	100
Grocery Shopping	Count	22	125	24	19	8	10	2	210
	%	10.6	60.1	11.5	9.1	3.8	4.8	0	100
Total	Count	45	359	86	57	28	24	-	599
	%	7.5	59.9	14.4	9.5	4.7	4.0	-	

It can be seen that the majority of the sample (roughly 60 percent for each journey purpose) reported that they instantly settled into a routine for the various journey purposes. This suggests that there is not very much time at all following a move in which habits remain weakened, highlighting the need for swift action or pre-move intervention. Habit development for commute mode choice has also been compared to TC-type, a summary of which can be seen in Table 9-17 in the following section. It can be seen from this that habit develops *slightly* more quickly for Minimal-considerers and Prompted-early-planners, and marginally slower for Post-move and Maximal-considerers. This will be discussed further within the final typology profiles to be detailed shortly.

9.6.2 All travel outcomes and RRT Travel Consideration Type

Table 9-17 provides a summary of all the travel related outcome variables of the move found to be significantly related (at least as the 0.10 probability level) with TC-type. This allows for an overview of the post-move travel outcomes for each TC-type. It is clear from the table that participants’ travel outcomes following the move are indeed related to the timing of consideration of travel issues during the move, as represented by the TC-types. Significant Chi² relationships have been found with at least one aspect of all the dimensions of travel behaviour previously discussed (mode use, mode switch, journey times, travel options availability), excepting satisfaction with travel options available (p=0.298 – see Appendix 15.6 for this data).

Table 9-17: Summary of the general trends in travel outcomes and travel changes reported by members of each RRT Travel-Consideration-type. All variables included in the table are significant at the 0.05 level, unless indicated ‘*’, in which case they are significant only at the 0.1 level.

Type of Travel Change	1: Minimal Considerers	2: Maximal Considerers	3: Prompted Early Planners	4: Post-move Considerers	5: Non-prompted Early Planners
Presence of mode change *	Unlikely to change mode	Very likely to change mode	Likely to change mode	Neither likely or unlikely to change mode	Unlikely to change mode
Change in mode used to city centre	Unlikely to change	Very likely to change	Likely to change	Neither	Unlikely to change
Change in level of car use ¹	Most likely to retain high (not increase) levels of car use	Most likely to reduce levels of car use	Most likely to reduce levels of car use	Slightly more likely to increase levels of car use	Most likely to retain low (not decrease) levels of car use
Change to number of miles travelled by household ⁱ	Unlikely to change	Very likely to change, either decrease or (more likely) increase	Most likely to decrease	Very likely to change, some decrease but mostly increase	Unlikely to change
Change to combined commute times ⁱ	Unlikely to change	Most likely to increase, or have one worker increase, the other decrease	Most likely to decrease	Most likely to increase ² or have one worker increase, the other decrease	Unlikely to change
Change in availability of mode options	Most likely to remain unchanged, unlikely to increase	Very likely to increase, unlikely not to have changed	Neither likely or unlikely to change	Very likely to change, either increase or decrease	Most likely to remain unchanged
Current household commute mode(s) ⁱ	High tendency toward (largely single) car drivers	Lots of mixed mode households	varied	varied	Mostly cyclists and walkers
Post-move commute time	Shorter	Longer	Longer	Shorter	Shorter
Time for commute habit development ⁱ	Instantly or up to a week	Over a week, and likely over 2 weeks	Slightly more in instantly	Over a week, and likely over 2 weeks	Either not in a ‘routine’, or instantly

¹ In terms of the proportion of recorded journey purposes completed by car as main mode.

ⁱ indicates variables with over 20% of expected values under 5 (see Section 8.7.1).

² A particularly large increase in commute time likely – over 10minutes.

For each of the TC-types Table 9-17 highlights that regardless of the travel outcomes examined, similar levels of change are apparent. Both Minimal-considerers and Non-Prompted-early-planners tend to have experienced very little change in any of the travel outcomes; whereas members of the remaining three TC-types do tend to have experienced change. The specific changes experienced by these TC-types varies, particularly for mode choice and mode options availability; however Prompted-early-planners tended towards a decrease in levels of car use, commute time and overall household distance travelled, while Post-move-considerers tended slightly towards an increase. Maximal-considerers experienced more of a mixture of increase and decrease in journey time and distance, but an overall decrease in levels of car use.

The explanation for higher levels of travel change within the Prompted-early-planners is clear. For this TC-type travel issues were involved in prompting the move, and thus a change to travel would have been a desired outcome of the move⁵⁵. Such change would have been planned for during the search and selection stages of the move. This would naturally be intended to ‘improve’ the household’s travel situation in some way, thus accounting for the tendency towards reduced journey times and distances, and increased availability of mode options for this TC-type.

Maximal-considerers also reported the involvement of travel issues in prompting a move and would also therefore have desired travel change. This TC-type however reported a mixture of both ‘improvements’ and ‘deterioration’ in the household travel situation, which highlights a slight difference in travel outcomes to the Prompted-early-planners. The main difference between the Maximal-considerers and Prompted-early-planners is post-move consideration of travel issues, at RRT Stages 7 and 8. Section 8.5.8 of the previous chapter detailed how post-move travel considerations, in particular at Stage 8, occur largely either through subsequent key events affecting travel, or through difficulties faced in achieving a suitable travel situation post-move. Both these situations are likely to result in a change to any travel behaviour that

⁵⁵ It is necessary to remember that not all decisions to *change* travel behaviour will necessarily have *prompted* the move. It is also possible that a decision to move can prompt a decision to change travel behaviour. However from the survey sample it would appear that this rarely happens. This may be accounted for by a relatively high frequency of situations where a number of factors combine to ‘build a large enough case’ to justify considering moving. As such, travel consideration initially prompted by additional factors would also be reported as involved in the prompt for the move. This possibility requires further examination.

was planned prior to the move, thus accounting for the ‘mixture’ and more ‘unexpected’ travel outcomes. Thus Maximal-considerers may largely have been Prompted-early-planners, except that difficulties were faced achieving their travel aims, or subsequent influences affecting household travel were experienced. The absence of travel consideration post-move for the Prompted-early-planners suggests that no such difficulties were faced, and plans were likely to have been implemented.

A similar situation is also apparent between the Minimal-considerers and the Post-move-considerers. Minimal-considerers hardly consider travel at all, and Post-move-considerers largely only consider once the move has occurred. It would therefore appear that had the Post-move-considerers not faced difficulties or subsequent prompts to consider travel (the types of consideration occurring at RRT Stages 7 and 8, as detailed above), they might have been Minimal-considerers. From the lack of pre-move travel consideration it can be inferred that no change in travel was desired for either group. It can also be inferred that it would have been ‘assumed’, pre-move, that no change to travel would be necessary following the move; or at least that the travel outcomes of the move were of limited importance to the household. As previously discussed in Section 8.7.2.3, many Minimal-considerers in particular moved very short distances and travelled largely by car, (single workers commuting by car were particularly prevalent). These are factors which are likely to have affected both an assumption that no change would be necessary, and the result that this assumption ultimately proved correct. It may be such factors which account for the different travel outcomes of the two groups. The situation of the Post-move-considerers is less clear due to their smaller population. Nevertheless, the apparent pre-move assumption of no change necessary proves incorrect, risking increases to travel.

Finally, the Non-prompted-early-planners formed a substantial proportion of the survey sample (31 percent). Despite extensive consideration of travel throughout the search and selection stages of the move, this TC-type tended to experience very little travel change. The only difference in travel consideration between this TC-type and the Prompted-early-planners discussed previously, is whether or not travel was considered as a prompt for the move (as highlighted by their TC-type labels!). This, combined with the lack of post-move travel consideration, (which implies that pre-move travel intentions were achieved), crucially suggests that the Non-prompted-early-planners were planning NOT to change their travel situation throughout the search and selection of their new home⁵⁶. If specific travel outcomes

⁵⁶ It is likely that the absence of a significant relationship between TC-type and ‘conscious decision to change ($p=0.140$) reflects the absence of ‘conscious decision not to change’ in the survey question. It

are required from a new home, regardless of whether these differ or not from the pre-move situation, planning and consideration of them is likely to be necessary. In particular, the retention of travel modes popular with this TC-type (largely walking and cycling), and maintaining shorter travel distances would likely require planning in order to remain feasible.

It therefore seems from these summaries that there are three key stages during the process of moving at which travel considerations are particularly likely to influence the *travel outcomes* of the move. These are: whether or not a desire for change prompted the move; whether specific travel outcomes are planned for during the search and selection (including planning for both change and no change to the existing travel situation); and finally whether the pre-move travel intentions ultimately prove feasible (through either difficulties in their implementation or subsequent alterations to the households situation: any changes occurring to travel behaviour at this late stage are likely to be ‘unexpected’ and unlikely to be highly satisfactory situations⁵⁷). In addition to this, the role of compromise in final property selection must not be neglected. Therefore whether the final property meets the travel intentions is added as a fourth point of influence.

Table 9-18 highlights a simplified summary of the travel consideration experiences of the different TC-types, as based on pre-search intentions, whether these intentions were fulfilled, and whether behaviour is likely to change. This is useful for assessing differences between TC-types at a glance. It is however important to stress that this table presents a gross oversimplification of the possible courses of travel consideration and implications during a move.

The table suggests that one TC-type grouping appears to be missing from the study sample: households planning not to change their travel, whose experiences didn’t work as planned. It is likely that members of this Type within the sample (should they exist) have been included

appears from TC-type interpretations that this is likely to be equally important in terms of consideration.

⁵⁷ Satisfaction with mode availability did not itself return a significant relationship with TC-type although it can be seen from Appendix 15 that the cross-tabulations, albeit not significant, are in the correct direction to support this suggestion, with Maximal and Post-move-considerers demonstrating lower than statistically expected levels of satisfaction. The stage at which travel was most considered did however return a significant relationship, and households considering travel most at Stages 7 and 8 were very unlikely to be highly satisfied with their availability of travel mode options.

within the Maximal-considerers, as the only difference would be travel involved in the prompt for the move. It is however likely that this is a small group, as having experience of the preferred modes due to their current usage would increase the probability that the household would have a realistic assessment of the requirements, and workability of the modes. It would be expected that any such household would have experienced a certain level of change in their travel behaviour, despite not wishing to do so. Further separation of Maximal-considerers by examining for this grouping would be of little benefit due to very few likely differences between the two – (as apparent from their lack of initial distinction).

Table 9-18: Summary of Travel consideration types

TC-type	Pre-search intentions	Planning for travel during search and selection?	Intentions achieved post-move?	Likely travel outcomes, and satisfaction levels with them	n
Prompted-Early-Planner	Desire to change	Yes (consideration Stages 1,2,3,4,5)	Yes	Desired travel changes are achieved and high satisfaction likely	n=20
Maximal-Considerers	Desire to change	Yes (Consideration Stages 1,2,3,4,5)	No (Consideration Stages 7&8)	Desired changes may not be achieved	n=50
Non-prompted-early-planners	Desire to remain unchanged	Yes (Consideration Stages 2,3,4,5)	Yes	Desire to remain unchanged is achieved, high satisfaction likely	n=71
Minimal-considerers	No desire to change	No	Yes	Pre-move assumptions of no change required prove correct	n=66
Post-move-considerers	No desire to change	No	No (Consideration Stages 7&8)	Pre-move assumptions of no travel change prove incorrect	n=17

9.6.2.1 Summary

It is particularly encouraging to see that the initial cluster analysis based upon timing of travel consideration has produced such meaningful groupings in terms of both travel consideration and travel outcomes. These ‘types’ are invaluable to aid understanding of the relationships between housing choices and travel choices. They highlight a variety of ‘moving courses’ that can be taken with regards planning for travel. It is likely that each differs with respect to its amenability to promotion of reduced travel – this will be discussed further in Chapter 10. It however remains necessary to again stress that these are merely typologies. The TC-type members within the study sample do not all demonstrate precisely the characteristics to be outlined shortly within the final profile descriptions. It would be more surprising should they do so, as individuals are all different, and groups of people (such as households) even more so. Nevertheless inter-group variation does appear to be greater than intra-group variation and

thus the typologies remain appropriate for discussion of various associations between travel consideration, choices and travel outcomes of moving home. Accordingly, the data in Table 9-17 will be utilised to extend the TC-type profiles developed in the previous chapter.

9.6.3 Typology Profiles of the TC-types

Profile of Travel Consideration type 1 – Minimal-considerers (n=66)

Minimal-considerers give either hardly any consideration to travel issues during the course of their move, or none at all. Very little change to travel behaviour is experienced in terms of mode use, mode availability and distance of travel, and the private car predominates as the commute mode of choice. Single-commuter households commuting by car are particularly likely to be Minimal-considerers. The attitude profiles, where Minimal-considerers are more likely to be diehard drivers or complacent car users reflect this mode preference for car use.

The lack of both travel change and travel consideration indicates a certain level of satisfaction with the pre-move travel situation, as there is apparently no desire to change it. This is confirmed by the tendency for short distance moves, as dissatisfaction with the travel situation would have been evident by a desire to move further away. Preference for car use (a mode which does not require much planning for feasibility to be retained) and short distance of moves combine with the presence of multiple or distant workplaces, (implying that careful selection of a location would have little impact on overall commute distance) to contribute towards a lack of necessity for travel consideration in the search and selection of a new home. Multiple and distant workplaces imply that careful selection of a location would have little impact on overall commute distance. The lack of travel consideration at *any* stage additionally indicates that no difficulties are encountered in continuing with the status quo as regards travel following the move (otherwise travel would necessarily be considered post-move).

Minimal-considerers tend to report instant development of travel habits post-move. which is not surprising given the limited travel behaviour change experienced. Both of these factors suggest little weakening of travel habits, or raising in consciousness of habitual behaviour during the move. These households are therefore likely to be the least susceptible to external influence encouraging travel behaviour change. Not only is there limited weakening of habits, but also the attitudes suggests no inclination to reduce car use (although the car-complacents could possibly be persuaded). Many Minimal-considerers additionally have good reasons for lack of consideration of travel issues: multiple workplaces and/or very short distance of move, so there is likely to be minimal room for influence. Nevertheless, there remains a possibility,

as half of the Minimal-considerers did consider travel issues at least at 1 stage. Given the higher levels of car use by this TC-type, this possibility may be valuable to further examine.

Profile of Travel Consideration Type 4 – Post-move-considerers (n=17)

Post-move-considerers tend to leave consideration of travel issues until after the physical move has taken place (Stages 7 and 8 of the RRT). Therefore it would appear that this TC-type is prompted to consider travel by the actual change in situation. It is the ‘physical change in context’ which (may) weaken travel habits, rather than the anticipation of a move. Post-move travel behaviour is likely to have changed from pre-move behaviour, with a variety of alterations occurring, tending towards an increase in both distance and time overall.

As with the Minimal-considerers, travel consideration does not take place during the search and selection of the property. It can therefore be inferred that the travel situation is not of great priority to the household and also that it is assumed that no post-move travel change will be necessary. It is however necessary to note that Post-move considerers tend to have moved slightly further than the Minimal-considerers, (at least over 1 mile), therefore the explanations for lack of travel consideration may be slightly different. The occurrence of consideration of travel following the move, and the tendency of this TC-type towards travel change highlights that the assumption of no change necessary proves incorrect for the Post-move-considerers.

It appears that post-move travel consideration is prompted by difficulties in the continuation of the pre-move routine. It is therefore the need to change travel behaviour which prompts travel consideration, and thus account for the greater likelihood of travel change. Examples of such considerations by Post-move-considerers include: *“Decided to travel to work by bike as the time in car was taking a long time and costing more money (with petrol prices rising).”* And *“Realised I have to be careful to avoid rush hour”*. That this change for the TC-type overall veers towards an increase rather than decrease in journey times/ distances and car use, is likely to be explained by the lack of planning for travel.

The potential for promoting positive travel behaviour change for households with this pattern of travel consideration is not clear. The limited number of participant households falling within this Type presents difficulties in generalisation. Nevertheless, it does appear that travel is not planned for during the selection of a property, therefore if this group could be encouraged to consider travel issues earlier in the moving process, the difficulties ahead may be anticipated and avoided. The observed increases in levels of travel might be reduced. As with Minimal-considerers, 81 percent of the TC-type do consider travel at one point pre-

move, therefore there remains the potential for interventions to find slightly weakened travel habits.

Profile of Travel Consideration Type 3 – Prompted-early-planners (n=20)

Prompted-early-planners are at least partly prompted to move by some aspect of travel (although this is not necessarily the main prompt for the move). A desire for travel change is indicated, otherwise such a prompt would not have occurred. For Prompted-early-planners, travel consideration then tends to continue at each stage up until Stage 5, property selection. It appears that by this stage the majority of future travel is planned and minimal further consideration of travel is undertaken.

Prompted-early-planners are more likely to have a pre-move commute of over 60 minutes. This presumably contributes to the common desire within the group to be nearer work as a prompt for the move. Travel behaviour tends to have changed within this TC-type, tending towards a decrease in levels of car use, miles travelled and commute time. The lack of travel consideration following the physical move suggests that pre-move plans have been successfully executed.

It therefore appears that the combination of a desire for reduced travel prompting the move, and little difficulties faced in achieving that, produce both the Prompted-early-planners consideration profile and a tendency for a reduction in household travel. In terms of the potential for interventions it is likely that this TC-type would be most receptive to suggestions of ways to reduce their car travel as this matches their apparent existing viewpoint. It is however possible that for households within this TC-type there would be no room for further improvement as all that is possible has been achieved. Nevertheless, this is unlikely due to the many compromises necessary to locate a suitable property, and the post-move challenges that may easily be faced. Therefore Prompted-early-planners are likely to be most receptive to interventions, albeit with likely restricted potential for further behaviour improvements.

Profile of Travel Consideration Type 2 - Maximal Considerers (n=50)

Maximal-considerers consider travel issues at (pretty much) every stage of the RRT. Most travel consideration occurs at the prompt for the move, with approximately one third of Maximal-considerers having moved in order to be nearer work. An over-representation of higher-end pre-move commute journey times (30-60 minutes) is likely to contribute to this desire to be nearer work. Attitudes to car use clearly indicate a desire to change, whether through malcontent with motoring or aspirations for environmentalism. Extensive change in

travel behaviour is indeed evidenced by this TC-type, however the direction of this change, whether an increase or reduction in journey times and car use, is very mixed.

As with the Post-move-considerers, consideration of travel following the move suggests unexpected changes to travel behaviour. However travel is considered during the selection of the property for Maximal considerers. The need for consideration of travel issues at all stages (resulting in membership of Maximal-considerers) may be determined through difficulties encountered in finding a desirable or acceptable property. The likely necessitation of compromises resulting from such difficulties would explain the variance in travel outcomes, with some households compromising other factors to achieve their travel aims (therefore generally reducing travel) and others compromising travel criteria (thus increasing levels of travel). This suggestion is corroborated by examination of responses to the agree/disagree statement 'We couldn't find a home that met all of our criteria' for this TC-type. Maximal Considerers agree with this statement far more than members of other TC-types (see Section 8.7.2.3).

The higher proportion of two commuter households within this Type (one generally commuting by car and the other an alternative mode following the move) would increase the difficulty of finding suitable commutes for both adults. Also restricted budget may play a role as this Type tends to have purchased less expensive property. Finally Maximal-considerers tend to have moved further, at least over 4 miles, (only one household had moved less than 1 mile), which again may add to the level of travel consideration required.

An additional approach to consideration of travel issues which results in Maximal-consideration of travel is provided by Participant 125 (a single full time worker). Travel issues were considered not as a necessity but rather as a 'nice to have'. The maximum acceptable commute journey was 40 minutes by car, however a 10 minute cycle and walking distance to town would have been ideal. As this was not a core priority it was not specifically planned for early on (as in Prompted-early-planners), but continued to be considered throughout, while searching numerous stages. This resulted in a commute cycle of 35 minutes.

It is clear that many different moving circumstances and travel considerations can result in consideration at the majority of stages and Maximal-consideration. It is likely that this TC-type would receive the most benefit from interventions encouraging reduced car use and more effectively planned travel. The extent of post-move consideration suggests difficulties experienced, many of which perhaps could have been avoided with greater pre-move/selection knowledge of travel situations of particular areas. Given the level of travel consideration by this TC-type, any interventions are unlikely to face any strong habits preventing attendance to

their messages and influence. As with Prompted-early-planners, it is possible that many members of this TC-type have achieved the best possible situation given their particular household circumstances. However with this TC-type in particular, any guidance is likely to be appreciated in the difficult decision of where to locate, and important factors to consider when selecting a property.

Profile of Travel Consideration Type 5 – Non-prompted-early-planners (n=71)

Non-prompted-early-planners tend to consider and plan for travel issues only in the search stages of the move, and not later in the moving process. Travel considerations however have not prompted the move. The lack of travel behaviour change experienced by this TC-type, combined with lack of travel involvement in the prompt for the move seems to suggest that these households are planning NOT to change their travel. They are happy with their pre-move travel situation to the extent that they wish to maintain their current travel patterns. E.g. *“Wanted somewhere close enough to partners work so that he could continue to walk and I to drive to my school.”* Or, *“We wanted to still be able to cycle into work.”*

Non-prompted-early-planners tend towards low travel times (commute time is most likely to be between 16-30 minutes) and have a high proportion of walkers and cyclists, which is likely to account for their desire not to change as these modes match with the attitudes to car use of the TC-type, (a higher proportion of malcontent motorists and aspiring environmentalists). An exception is that this type also contains a high proportion of households with two adults commuting by car (both before and after moving). Their inclusion as Non-prompted-early-planners is likely to be accounted for by the challenges involved in organising two commutes which would be likely to require some consideration and planning.

The existing travel patterns and attitudes demonstrated by Non-prompted-early-planners have two potential implications for interventions. Either they have already reduced travel by car as much as possible, or they still have room for improvement and are precisely the people willing to reduce levels of car use that should be targeted to encourage others to follow suit. Even though members of this TC-type appear largely not to think about alternative modes, habit is still weakened as behaviour is raised in consciousness due to the requirement of re-planning for it, therefore interventions should still have a greater effect than on a non-moved household.

9.7 Chapter summary

This chapter has demonstrated the impacts upon household travel behaviour that can follow a residential relocation. A substantial amount of change in modes, distances and times travelled, and availability of transport options has been demonstrated within the study sample. Differences between those households that have ‘improved’ their household travel (in terms of likely environmental impacts – reduced journey distances and levels of car use) as opposed to those whose travel situation has ‘deteriorated’ have also been examined. Knowledge of differences between influences on these two groups is useful in terms of policy and generating understanding of the relative influences on these two groups.

The amounts and types of change have been linked to a number of (possibly) explanatory variables including the distance of the move and most significantly, the timing of consideration of travel issues during the move; as provided by the ‘TC-types’ from the previous chapter. It has been demonstrated in both chapters how these TC-type profiles are a useful tool for improving understanding of the involvement of travel in the home move process, and travel outcomes of this process. These typologies may prove instructive in seeking to better understand how to develop and target initiatives intended to (further) encourage consideration of travel issues and thus in turn encourage (positive) changes in travel behaviour itself.

In terms of the potential for utilising these TC-types for targeting behaviour change interventions, one major disadvantage must be noted. It is only possible to determine membership of each of these groups retrospectively. It is not possible to predict prior to a move which households are likely to consider travel and which are not. No associations between TC-type and household demographics were found, and only limited detail of pre-move travel. As noted in the previous chapter, the TC-type of a household may also change from one move to the next. As will be discussed in the final chapter, this is not a huge difficulty as interventions do not necessarily require specific targeting. The typologies provide insight into the range of necessary approaches to take, and most specifically they are extremely valuable for guiding understanding of the range of likely responses to such interventions.

Chapter 10: Conclusions

10.1 Overview

The final chapter of the thesis summarises the research findings and discusses them in relation to the original research objectives, existing literature, and policy context. This includes an assessment of the evidence provided for associating weakening of travel habits with residential relocation; an assessment of the processes involved in the interrelationships between housing choice and travel choices; and discussion of the practical applications of the research, in terms of the potential for promotion of travel behaviour change associated with residential relocation. Four key stages of a move in terms of influence on post-move travel behaviour are discussed, and the provision of advice and search tips to prospective movers is considered. The research process undergone, methodologies employed, and possibilities for future research are reflected upon, before the final conclusions of the research are drawn.

10.2 Introduction

The thesis has outlined research undertaken to improve understanding of the interrelationships between travel and housing choices, and to examine whether residential relocation is likely to provide a suitable occasion to target travel behaviour change interventions. This research has involved initial exploratory in-depth interviews followed by a broader scale survey. Both have involved representatives of recently moved households from the city of Bristol, UK. Outcomes from this methodological approach (detailed in earlier chapters) range from the development of a conceptual timeline, (the Residential Relocation Timeline (RRT) - a series of eight stages during the course of a move at which travel issues may be considered; to the production of typologies of moving households, based upon the timing at which travel issues are considered during the moving process, (as determined from the RRT framework). Travel habits and habit weakening have been considered throughout.

The overall aim of this thesis has been to examine how, and to what extent, the process of moving home acts as a prompt for an individual to review and potentially change their travel for various routine journey purposes. This overall aim was broken down into three individual objectives which are (as outlined in Chapter 4): 1: An assessment of whether there is evidence to support the suggestion that weakened travel habits can be associated with instances of

residential relocation; 2: An assessment of the impacts of moving home on household travel behaviour, including any processes involved; 3: An assessment of the potential for travel behaviour change strategies to be successfully targeted to households in the process of moving home. Each of these will now be examined in some detail to assess the extent to which the study has met its initial objectives

10.3 Objective 1: Is there evidence to support the suggestion that travel habits are weakened during a residential relocation?

As discussed in Chapter 2, much of travel behaviour, in particular mode choice, is habitual in nature, thus presenting a substantial challenge to attempts to encourage travel behaviour change. Where habits are present, individuals are less likely to pay attention to the situation surrounding the habitual behaviour (Verplanken et al, 1997); this includes any information pertaining to it. Therefore, where the situation changes, perhaps with the addition of an alternative option for the behaviour, or a change in the relative costs of options, this may go unnoticed. This lack of attention to information extends to messages promoting behaviour change, thus presenting a challenge to the promotion of reduced levels of car use.

There has been some suggestion within the literature promoting travel behaviour change, that individuals are more likely to be susceptible to change at times of key events such as moving home (Ampt, 2004; Jones and Sloman, 2003). This suggestion had however received only limited empirical attention. The current research proposed that weakened habits were indeed likely, due to the key event raising the level of consciousness of the behaviour (Ouellette and Wood, 1998). Thus it was the intention to assess whether or not this was the case with the key event of residential relocation. This event provides both the key dimensions required for breaking habits identified by Ouellette and Wood, (1998); a change in situational context and a likely raising in consciousness of travel behaviour.

Two separate research findings are relevant to habit weakening, and will therefore be discussed in this section. These are ‘mode change’ and ‘consideration of travel issues’. Discussion will initially focus on evidence provided for the ‘absence’ of travel habit yielded by the study, rather than evidence for habit weakening. This is due to the many (largely conceptual) difficulties inherent in *confidently* establishing the presence of habits, (as discussed throughout the thesis – see Chapter 2 for more detail). The measurement of previous habits presents even greater (conceptual) challenges, and therefore despite relevant data recorded within the study (71 percent agreed with the statement ‘prior to moving my travel to

work was habitual’); the presence of travel habits within the survey sample *prior* to the moves cannot be assured. It is therefore more accurate to discuss the ‘absence’ of habits rather than habit weakening. The extent to which absence of habit can be taken to equate to habit weakening will be discussed further following discussion of the evidence for ‘absence’ of habits.

10.3.1 Mode change as evidence for absence of habits

The most irrefutable evidence for ‘absence’ of travel habit over residential relocation occurs in the form of travel mode change. If the main mode used for a given journey has changed over the course of the move, it is clear that habit could not have been affecting this travel mode choice. 57 percent of the surveyed households had changed main mode for at least one regular journey purpose. Therefore this is evidence that for 57 percent of the surveyed households, habit was not influencing mode choice (or was ‘absent’) for at least one regular journey at some point during the RRT.

It is necessary to acknowledge that despite the generally perceived habitual nature of travel mode choice, it does not follow that individuals are uni-modal travellers (Stradling 2003; Kenyon and Lyons, 2003). This raises the issue that the changes in main mode recorded within the current research may constitute an alteration in relative frequency of mode use, rather than actual mode *switch*. It is questionable whether such a situation would be providing clear evidence of absence of habit. However, the survey instrument also included space for provision of detail regarding alternative modes used for the journeys reported. Very few alternatives were reported, therefore it is possible to say that alteration in relative frequency of dual modes usage is unlikely to have substantially occurred within the sample¹. This therefore does not detract to any great extent from the 57 percent of households surveyed reporting change in main mode used and thus providing evidence for absence of habit.

A clearer association of the *level* of mode change (and therefore absence of habits) that can be linked specifically with residential relocation has also been provided. Comparison of the level of commute mode change among the survey participants to that of a ‘general’ population, revealed that 10 percent more of the survey participants changed commute mode following

¹ There is the possibility that the lack of additional modes reported could have been due to participant fatigue. The amount of journey information required by the survey was substantial, and additional mode use information was not requested specifically for each journey purpose individually, but as two questions for all journey purposes (one for pre-move the other for post-move travel).

their move than in the ‘general’ BHPS sample (Dargay and Hanly, 2004)². Therefore this is clear evidence that greater mode change occurs surrounding a home move than among a general population.

10.3.2 Travel consideration as evidence for absence of habits

An alternative form of evidence for associating habit weakening (or absence) with residential relocation has also been found during the course of the research. ‘Consideration of travel issues’ during the move has formed a particular focus of the research, with 86 percent of the recently moved survey sample reporting consideration of travel issues at some point during the course of their move. By its very definition consideration implies conscious thought, thus indicating the absence of (by definition unconscious) habits at the point of consideration.

Travel consideration cannot however be unquestionably interpreted as a complete absence of travel habits. There are many different dimensions to an individual’s travel behaviour (and a household’s), thus any number of ‘separate habits’ may be involved. To be strictly accurate, consideration therefore only implies absence of habit for at least *one* of these ‘dimensions’ of travel behaviour; for example consideration of journeys to school but not shopping.

In addition to this, no comparison to travel consideration of non-moving households has been made. Therefore evidence has not been provided that this level of consideration of travel would not have occurred without the move. It is difficult to see how this comparison could be made in practise though. Given theoretical views regarding travel habits (shortly to be discussed); and the property related considerations reported; it is extremely unlikely that travel consideration would have occurred to this extent without the move.

10.3.2.1 Are habits unconscious?

A further complication regarding whether consideration of travel issues provides evidence for absence of habit and habit weakening arises from further conceptual difficulties with the habit concept. In particular, discrepancies between the *theory* regarding habits, and its *practical application* present confusion. These issues, whilst recognised from the start of the research, have so far largely been circumvented throughout the thesis in order to avoid confusing the arguments presented.

² The BHPS sample includes both movers as well as non-movers, so therefore this comparison does not illustrate the full potential difference between moved households and non-moved households.

Strictly speaking habitual behaviour is defined as that which is triggered automatically and unconsciously (Ronis et al, 1989). With such a definition, any evidence of conscious consideration (as outlined in the previous paragraphs) indicates absence of habit. However such a strict definition is likely to cover very few real life behaviours. Smoking and drug use are often described as habitual, but these behaviours are complicated through biological addiction. Reflexes are also distinct from habits as they do not have a goal.

Behaviour that is truly automatic and unconscious would be impossible to record and observe outside of laboratory conditions and it would cover so few behaviours that it would be of severely limited practical interest. For the most frequently examined travel related habit (travel mode choice), it is likely that the individual is aware that they are getting in the car, and has a certain level of control over the choice (therefore the behaviour is not automatic). The 'habit' is evidenced in the lack of inclination to consider alternative mode options.

Therefore in practise, the majority of behaviour which is deemed 'habitual' is to a limited extent volitional and conscious. Indeed Ouellette and Wood, (1998) suggest that habits do not need to be unconscious³. In such situations 'consideration' of travel is less clear as evidence

³ The assertion that habits do not need to be unconscious (Ouellette and Wood, 1998), as detailed previously, raises the question of what then is the difference between a habit and a routine? This question was raised during the interview research and has been discussed to a limited extent in Chapter 6. The conclusion was reached that certain differences do exist between the two concepts, for example habits are perceived as more personal, individual and humanised, whereas routines might be more externally imposed. These are however not dimensions of the concepts that receive much attention within the literature, and it would appear that further examination of these issues is required.

A question remains over the value of retaining and attempting to research a concept which, by its very definition, it is not possible to measure in practise: particularly when it appears that removal of the 'non-measurable' dimensions of the concept result largely in discussion of what could be termed 'routines'. This however is merely a discussion of label – the value of the underlying concept is not disputed. Issues regarding use of terminology are however particularly relevant for a subject area whose outcomes are to a large extent applicable to the general public (in the form of tips on how to break bad habits etc). The lay and scientific definitions/interpretations of the term habit clearly vary, particularly in their level of specificity. They do not however differ enough to avoid confusion as to interpretations of terminology. The key point is that confusion over terminology between lay and science is a potentially critical issue for a field whose research findings are frequently directly applicable to the public. This issue therefore requires further research.

for absence of habit. Nevertheless, consideration remains an indication of ‘theoretical’ absence of habit; but perhaps only evidence of ‘weak’ habit in practise.

10.3.3 Summary of evidence for habit weakening

The research has clearly established the absence of travel habits evidenced by higher levels of mode switch surrounding a move than in a ‘normal’ population. It has also established that the majority of households are likely to have (at least) only weak habits at some point during the course of a move as they are prompted to consider their travel situation. Regardless of the pre-move situation in terms of habits, are likely to be receptive and susceptible to information provision. It can be concluded from this evidence that interventions coincident with residential relocation may be less likely to encounter habit and thus have greater potential to bring about change.

The presence of pre-move travel habit, and therefore evidence for habit *weakening* has not been unquestionably established. However the majority of study participants reported considering their pre-move travel to have been habitual, and travel mode choice is frequently assumed to be habitual nature (Verplanken and Aarts 1999; Verplanken et al 1994; Matthies et al, 2002; Gärling, 1998; Thøgersen, 2006). Therefore it is possible to argue to case for the study demonstrating habit weakening.

Stronger evidence for weakened habits than that provided within the study is unlikely to be demonstrable without ‘true’ longitudinal research (collection of household data both prior to and then following the move). As detailed in Chapter 5, this approach was considered for the current research but rejected in favour of a retrospective approach (which has proved extremely insightful). It may be however that future research desiring to provide explicit evidence for weakened habits associated with residential relocation has most to learn from a longitudinal approach.

As a final extension it has further been highlighted that the majority of participant households considered travel at the earlier search and selection stages of the relocation process. This highlights that in terms of potential travel habits weakening it is the *raising in consciousness* of travel (Ouellette and Wood, 1998) prompted by the *decision* to move, rather than the *change in context* (ibid.) of the *physical move* which prompts consideration of travel (and potential habit weakening). This alters previous authors’ suggestions (Jones and Sloman, 2003) that a home move will prompt travel behaviour change due to the change in context. While any *effect* of a potentially weakened habit (such as travel mode consideration) is unlikely to be evidenced (if at all) until after the physical relocation has taken place, it is at

some point earlier in a *process* that it occurs in the mind of the individual. This is not to suggest that additional mode switches may not be prompted solely by the change in situational context (these also occur), but it remains the case that many of the possibly more important journeys are likely to have been reviewed in advance.

10.4 Objective 2: To examine what can be learnt about the impacts of residential relocation on routine travel behaviour, including the processes behind any impacts.

10.4.1 The travel impacts of a residential relocation

The literature review provided little insight as to the travel impacts of residential relocation. It was felt important that these should be understood prior to any attempts to alter these impacts. With regards to trends in travel outcomes following a home move, it is clear from the responses of the survey sample that recently moved households report numerous changes to their travel behaviour. In addition to the mode change highlighted in the previous section, alterations to journey times and travel distances have also been reported. Longer distance moves naturally tended towards greater levels of change (this agrees with the findings of Clark and Davies Wither (1999)); the services visited under such circumstances are additionally likely to change. Leisure journeys demonstrated the least amount of mode change overall, perhaps due to their tendency for completion by car.

Changes to travel appear slightly more likely to constitute ‘improvements’ to the household’s travel behaviour: (journey times and levels of car use are slightly more likely to reduce following a move; and availability of mode options is slightly more likely to increase). However the difference is only slight and household travel behaviour was also likely to ‘worsen’ following a move.

Further to these trends there is very little that is highlighted from the study findings regarding the specific *impacts* of moving home on routine travel behaviour. A great variety of moving home situations and travel outcomes exist and were recorded, therefore few specific trends (other than ‘change’) are apparent. This perhaps accounts for the lack of clarity within the literature. Much however has been learnt from the research about the processes of interrelationships between housing and travel choices, and this therefore forms the majority of discussion regarding objective 2.

10.4.2 Interrelationships between housing choices and travel choices

A key point emphasised by the research findings is that the relationship between moving home and travel outcomes is clearly not uni-directional. In order for the travel outcomes of a relocation to be understood, it is necessary to take account of how a household's travel preferences and considerations have in turn influenced the moving process and property selection. More accurately it is therefore the *interrelationships* between housing and travel choices that have been examined within the research, and that should remain the focus of any future research.

Within the research the concept of 'consideration of travel issues' has received much attention; not only evidence for habit weakening (as has been discussed under the first objective), but also as a specific manifestation of the interrelationships between housing and travel choices. The concept has formed the basis of examination of the *process* of the move (see Chapter 6 for an extended discussion). Through the development of the RRT (Residential Relocation Timeline), the research has identified eight different stages during the moving process at which this consideration of travel issues could occur. These range from the initial prompt, to sometime post move, each highlighting different issues regarding interrelationships of housing and travel.

The research has further extended these findings with the establishment of typologies of moving households. Five TC-types (Travel-Consideration-types) have been developed based upon the reported *timing* of consideration of travel issues during the move (as measured using the RRT). Profiles of each TC-type have been generated utilising further details of the participants' move and travel behaviour. Most significantly for addressing objective 2, examination of the differences and similarities in moving circumstances and travel considerations between each of the TC-types highlights four key 'stages' of a move at which travel considerations are likely to *influence* the post-move travel outcomes. They are therefore key stages to understand in terms of interrelationships between housing and travel choices. The stages are: the prompt for the move; during the search process; at the point of selection; and post-move⁴. The eight stages of the RRT, while of benefit to understanding the experience

⁴ Three of these four stages of the moving process identified as influencing travel behaviour outcomes are frequently researched within the housing literature. Chapter 3 briefly discussed the use of stages of a move in residential mobility research (eg Brown and Moore, 1970). Such research tends to focus on residential choice and therefore understandably does not continue examination once the household has moved into their new home. It may however seem that the four stages listed could have been identified

of moving home and the overall process, do not necessarily all have significant implications for the travel outcomes of the move. Each of these four stages will now be discussed to highlight what they demonstrate regarding the influence of moving home on travel behaviour (and vice versa).

10.4.2.1 Prompt to search

A move (or rather the decision to search for a new home) may be (at least partly) prompted by a desire to change travel behaviour. This situation has already been discussed in the thesis under RRT Stage 1 (and TC-types Prompted-early-planners and Maximal-considerers) however a summary here remains beneficial.

Where travel issues have prompted a move, it is highly likely that post-move travel behaviour will be different to pre-move travel in some way, as travel change has been a reason behind the move. It is in fact likely that the post-move travel situation would be an ‘improvement’ (in terms of reduced journey times and lower reported levels of car use), rather than ‘deterioration’, as rarely would households intend to increase the costs and time involved in extra travelling. This is notwithstanding that priorities may change over the course of the moving process, perhaps when faced with the need for compromise (as will be discussed under the remaining influential stages).

Where households consider travel issues in prompting the decision to search for a new home (34 percent of the survey participants), it cannot be said that the move (or anticipation of it) is prompting consideration of travel and weakening travel habits (as is argued for the remaining stages). Rather a pre-existing desire for change and therefore previously weakened travel

as the most influential at the outset of the research. It is to be remembered that the focus of the research has been on the process of a move rather than outcomes alone. Therefore the identification of 8 stages of the RRT has been valuable in terms of understanding the situations, even if not all stages are influential in determining travel outcomes. It is also rare that the prompt for the move, search criteria and property selection are considered as separate stages within the literature. More frequently these are combined into two ‘stages’ such as the reasons behind the prompt and factors influencing the new property choice, or even one stage; simply ‘the reason for the move’ (eg Davies and Pickles, 1991; Clark et al, 1994). This study therefore emphasises that if travel outcomes are of key interest, then each of these stages must be considered separately.

habits prompts the move⁵. Thus it would be incorrect to discuss the influence of the move (or anticipation of it) on weakening travel habits, and it might be argued that the move is not the key influence of interest in such situations. Nevertheless, the move facilitates any behaviour change, and a household beginning to search for a new home remains a useful identifier for locating households with potentially weakened travel habits and greater susceptibility to change, despite the alternative cause.

Possible travel related prompts for a move include a job move, a desire to reduce commute time, a desire to reduce travel costs, and a desire to get fitter and thus walk and cycle more. It is unlikely that many of these prompts would, in isolation, result in relocation; additional reasons for moving would be involved in the final prompt to search for a new home. The relative importance of these different prompts will affect the moving process. No overall relationships have however been found between individual non-travel prompts for the move and travel considerations or outcomes. Therefore the affect of additional prompts is unclear⁶.

To summarise the influence of this stage on travel outcomes of a move; if a move is prompted by travel related issues it is likely that travel will be considered in the selection of the property, and that post-move travel behaviour will be different to pre-move. Travel is slightly more likely to have ‘improved’ than ‘deteriorated’ following the move. This situation is however liable to change at any of the following stages of a move.

⁵ An exception to this is that the prompt for a move might be a build up of factors, eg a householder considering that a bit more room would be nicer, and ‘adding’ the ‘prompt’ of a desire to move nearer work as a way of ‘building the case’ for a decision to move. In such situations it is clearly a decision to move which has prompted the consideration of travel issues, even if the travel issues then become part of the final prompt for the move (or more accurately, search).

⁶ It must be remembered that no record was made of the *main* prompt for the move within the survey. All factors affecting the decision to move were recorded, as it was of greater importance to the study objectives to assess whether travel issues had been at all involved in the prompt. Identification of the more commonly researched ‘main’ prompt for the move would have been valuable to facilitate comparison to other research, however space within the survey questionnaire was limited. It would also have permitted the distinction of those households for whom travel was a substantial reason behind the move, from those for whom it was just an additional bonus to be able to improve the situation.

If travel has prompted the move, then it is extremely likely that the issues involved would be retained within the search criteria for the new property. Equally, the household's decision to move for other reasons may prompt a realisation that the travel situation might be improved⁷. It is further important to realise that a household might specifically wish NOT to change aspects of their travel behaviour, and therefore include this within the search criteria. This is equally as important as planning for *changes* to travel, for a household with specific travel requirements. In particular, travel by non-car modes such as cycling or public transport might require planning in order to ensure retained feasibility.

Both these situations (planning to change or not to change) cover a raising in consciousness of travel behaviour, but with differing likely outcomes. They involve *deliberate* planning for post-move travel (as discussed in Chapter 6)⁸. If travel issues are not considered during the search (and selection) criteria then it is likely that the household 'assumes' that no changes to travel will be required post-move. Alternatively it may simply be that the travel outcomes of the move are of little consequence to the household.

Consideration of travel within the search criteria (if achieved post-move), implies that pre-existing travel preferences are influencing the residential location (and its attendant travel implications), rather than the move influencing travel behaviour per se. In such situations the residential relocation allows existing travel preferences to be realised rather than the change in location directly affecting travel. Thus it would be incorrect for the travel outcomes following this type of move to be attributed directly to impacts of the relocation, as the relocation was a means of achieving existing aims. These preferences will however have been raised in consciousness by the decision to search for a new property. This situation again neatly highlights the potentially complicated interrelationships between travel and housing choices.

⁷ 66 of the survey participants considering travel at RRT Stage 2 had not considered at RRT Stage 1, and therefore travel issues had not prompted their move. It is therefore possible to say that for approximately half of those households considering at Stage 2, the decision to move home was the precursor to consideration of the household travel situation, as highlighted by the following participant Stage 2 example: "*Started to think we would like a property that was close to a major bus route into the city centre for ease of travelling to work (for both adults).*"

⁸ In addition to deliberate travel behaviour change, the achievement of non-change can equally be a *deliberate* travel outcome.

The research has importantly highlighted a relationship between higher levels of satisfaction with the travel alternatives available to the household, the earlier in the moving process at which travel issues were *most* considered. Those households giving most consideration to travel at the prompt or search stages tended to be more satisfied with their post-move travel situation. This is an important finding, immediately suggesting that encouragement of earlier consideration of travel issues for moving households might, if successful, improve satisfaction levels. This will be discussed further under the final objective; the applications of the research.

10.4.2.3 Property Selection (or rejection)

Travel consideration can also influence the potential travel outcomes of a move during the property selection. A final confirmation is made that the travel behaviour planned (or perhaps assumed) at the previous stages is in fact possible from the property under consideration. Consideration at this stage is the least clear in terms of its actual impact on travel outcomes. It might be assumed that a final check of travel prior to selection would increase the likelihood that the household would achieve its planned travel outcomes.

It appears however, that travel consideration immediately prior to property selection is more frequently associated with situations where more extensive travel consideration is *required*. For example, where the need for compromise is likely. If such challenges are not met, consideration of travel during the final property selection appears to be unnecessary. If travel consideration does occur at this stage, and it is discovered that the property does not fulfil all the criteria, two options are possible. The property is rejected, or compromises are made and these changes to travel plans are accepted and therefore *anticipated*.

Again specific responses when faced with this situation are likely to be individual to the household and moving circumstances. However the lower general importance of travel issues compared to house and neighbourhood attributes found within both the literature and the survey is likely to affect the frequency with which travel over other issues is compromised. That consideration of travel at the property selection appears largely concerned with potential compromise highlights the potential influence of consideration at this stage to the potential outcomes. The *priority* given to travel issues is required to be relatively high if they are not to face potential compromise.

10.4.2.4 Post-move (unexpected outcomes)

Travel considerations are also likely to affect the ‘actual’ travel outcomes of the move once the move has taken place (RRT Stages 7 and 8). It might be assumed that travel consideration

would be necessary as a household settles into the new home, particularly if travel had not previously been considered. However, from the survey sample experiences it appears, as with the previous stage, that consideration of travel following the move is largely only necessary if the ‘deliberate’, ‘anticipated’ or ‘assumed’⁹ post-move travel behaviour is not possible, proves unsatisfactory or a superior alternative is discovered.

Most commonly this involves facing the challenges presented by the new home’s travel situation, such as availability of bus routes, suitability of cycling routes, levels of congestion, and reliability of public transport. However it may occur for positive as well as negative reasons, and also due to subsequent key events (see Chapter 8). Post-move travel consideration therefore involves changes to any travel planned prior to the move. Any changes resulting from such post-move considerations would have been *unexpected* prior to the move taking place. This could include *planned* changes which *unexpectedly* do not occur, perhaps resulting in the pre-move travel situation being retained.

Specifically, any travel change (and associated habit weakening) which occurs at this stage, (and has not previously been considered), has been prompted by the change in physical situational context of the household’s travel situation. This differs to travel consideration at any of the other stages, as habit weakening there occurs in response to *anticipation* of a *change in situational context*. Therefore evidence for both routes to habit weakening have been found in the research.

It would appear that such changes to planned travel are more likely to result in a ‘deterioration’ of the household’s travel situation. This again highlights the benefits of thoroughly planning for travel earlier in the moving process.

10.4.2.5 The process(es) of interrelationships between housing and travel choices

The combination of how travel is considered at each of the four stages will alter the moving process and the ultimate travel outcomes of the move. Five specific ‘routes’ through the stages have been identified within the research (the same routes which aided identification of the key stages in the first instance – the five TC-types). The travel consideration ‘route’ (or TC-type) taken by a given household can change from move to move. Indeed, some survey participants

⁹ For 18.3 percent of the survey sample travel issues were not considered at RRT stages 1-5 (the search and selection of the property), and therefore the issue is solely one of the physical relocation impacting travel.

reported ‘learning from their experiences’ that earlier consideration of certain travel issues would be required for future moves, and therefore the TC-type at one move may in fact affect the likely TC-type at subsequent moves. These TC-types will be further discussed under objective 3, an assessment of the implications of the research findings.

The specific travel considerations involved at any stage are naturally dependent on the preferences of individual households. The RRT has however highlighted different types of travel considerations occurring at different stages, including mode preferences most closely associated with RRT Stage 2 (identification of search criteria), and journey distances with Stage 3 (selection of areas to search).

The particular importance of planning for travel behaviour during residential search highlights the importance of pre-existing (or newly developed) mode preferences in determining the travel impacts of a move. This would seem to add to the ‘pre-existing mode preference versus neighbourhood design debate’ in terms of accounting for the observed relationships between travel behaviour and neighbourhood style (as discussed in Chapter 3) in favour of mode preferences. It would appear that for the study sample at least, travel is largely planned (or even assumed) prior to the move.

It is of course necessary to recall the specific sample upon which the study findings have been based. These were households with no more than *two adults, buying* property in an *urban* area (specifically Bristol). The applicability of the findings to further populations should be considered.

It is likely that similar processes are undergone regardless of how many adults are in the home, only perhaps decisions would be even more complicated. No relationships have been found with household composition, as restricted (single person, couple, family, single parent family), therefore it is unlikely that additional adults would have a specific influence in any direction. It is however also important to note the limited number of families with children in the sample. Being in the catchment area for a good school is frequently a driver behind families housing choice – the current research may have missed this. Nevertheless this might reduce the priority of travel still further.

It is also likely that experiences in other cities would be similar, except that the specific public transport services available may differ. Property selection in rural areas (as regards travel considerations) is however likely to be substantially different. Public transport availability is generally more limited in such areas, and service availability is more restricted. Travel considerations for households searching rural areas are clearly likely to depend on the particular reasons for choosing to live in a rural area. Moving for a job in the area may result

in potentially similar considerations as reported in the study findings. However, if the move is for a lifestyle choice, and it is the intention to commute to the city, then such motivations are unlikely to be altered by encouragements to reduce travel, as the area decision has already been made.

In terms of renters the process is again likely to differ. Renters do not have to consider the future value of properties and decisions frequently related to shorter term plans. It is therefore possible that more consideration would be given to travel, or rather it would be more highly prioritised, as it is short term and the household can move again if necessary.

10.4.2.6 Summary

The main conclusion reached in Chapter 4 was that not enough understanding of the specific influences involved between residential relocation and travel choices existed in order to most effectively design successful interventions promoting further change. The thesis concludes that in fact detail of the specific influences is unimportant due to many varied circumstances occurring. However understanding the process of moving home remains important.

The research has highlighted that it is not possible to discuss how moving home affects household travel behaviour without recourse to the involvement of travel considerations in the moving process undergone (as discussed under objective 1). In particular how travel is *planned* for (or not) during the *choice of residential location* is equally, if not more important in contributing to the travel outcomes of the move than the simple occurrence of a change in residential location.

10.5 Objective 3: To assess (based on an improved understanding of the situation) the potential for, and provide suggestions as to how travel behaviour could be changed during residential relocation.

The final key objective of the research relates to the applicability of the study findings. Thus far the chapter has provided a clearer understanding of how the process of moving home affects travel behaviour, including the provision of evidence demonstrating weak travel habits surrounding a home move. Focus now turns to assess the potential for behaviour change interventions targeted to households that have moved or are considering moving home. Discussion firstly centres on the application to this time of certain types of interventions

already practised in the promotion of reduced car use. Following this the section turns to examine in detail the possibilities for influencing the processes of residential search and selection. The potential for behaviour change of both these routes is assessed.

10.5.1 Promoting the benefits of reduced levels of car use

The research has demonstrated that the majority of households in the study sample (86 percent) have at most only weak travel habits at some point during their move. This majority should therefore be more open to information regarding their travel behaviour and choices than households not considering moving, (as the majority of such households would likely be habitual in their travel choices¹⁰). The research has therefore provided evidence that any informational interventions are likely to be more effective when associated with a residential relocation. It is not necessary for the barrier to information use (and behaviour change) provided by habit to first be overcome at such times.

The promotion of behaviour change through the provision of information and persuasive messages is a popular soft measure employed in travel demand management (TDM), (eg Taylor and Ampt, 2003; Brög, 2003; Cairns et al, 2004). Such approaches range in scale from mass media campaigns (eg ‘wear a seatbelt’) to targeting individual households, communities and people (Taylor and Ampt, 2003; Brög, 2003). Due to their thorough documentation elsewhere in the literature (eg Cairns et al, 2004; Jones and Sloman, 2003), it is not necessary for this chapter to detail the possible approaches to the use of information provision in attempts to achieve travel behaviour change. It is however beneficial to highlight the precise messages that would be promoted, and the timing of their implementation.

The benefits of reduced levels of car use to society, the individual and their household should be promoted. This would be combined with practical tips of how a reduction in car use could be achieved; for example through the use of alternative modes or making use of more proximate facilities in order to reduce journey distances. The benefits highlighted would include cost savings, reduction of stress, time savings, health benefits from walking and cycling, and the possibility of additional activities such as reading if using public transport rather than driving. Alternatively the approach may be more incentivised in nature – for example providing a relocating household with discounted travel on public transport for a

¹⁰ Presuming of course that no alternative key events such as job moves were experienced at the time, and noting all the exceptions detailed in Section 9.3.2.1.

period following their relocation (comparable with the discount on purchases for recent movers that a major DIY chain currently offers its customers in the UK).

Such messages could be promoted at any stage of the moving process. This would include post-move, as the research has shown that travel habits for many households remained weakened throughout¹¹. The research has however highlighted that the greatest proportion of survey respondents gave most consideration to travel issues at RRT Stage 3 (selection of areas to search). Therefore in order to locate the greatest proportion of households with weakened habits, interventions should be targeted to when the households are selecting areas in which to search for property. Intervention prior to the actual property selection additionally has the benefit of occurring prior to fixing of the location and associated availability of travel options, and before new travel patterns have a chance to become ingrained¹². Precise targeting to Stage 3 is however likely to prove a challenge, as the stages would not be immediately obvious to an observer. Any stage of the RRT moving process is therefore sufficient. The research findings highlight that given the levels of travel habit weakening associated with residential relocation, techniques targeted to this ‘window of opportunity’ are likely to have greater impact than non-targeted approaches.

10.5.2 Facilitating consideration of travel issues in residential location decisions

The research findings suggest that a slightly differing approach to that outlined in the previous section is likely to prove more effective in terms of generating both behaviour change away from extensive car use, and high levels of household satisfaction with the post-move travel

¹¹ The success of post-move intervention programmes such as by Wundke and Ampt, (2004), and Bamberg et al, (2003) illustrate this possibility. RRT Stage 8 (after some time in the home) was actually the stage with the third greatest level of ‘most’ travel consideration. This finding allays concerns over the practicalities of potentially requiring interventions to be implemented almost immediately following a home move. This would be in order to best take advantage of weakened habits before new habits have a chance to develop (Stanbridge et al, 2004). The higher levels of travel consideration at Stage 8 than Stage 7 implies that interventions do not necessarily have to occur as soon as the household moves into their new home.

¹² This aligns with the findings of Ampt, (2006) which, as previously discussed, examines the effects of interventions on recently moved households. Results are not yet available.

situation. This is the promotion of greater consideration of and priority given to travel criteria during residential *selection*.

The research has highlighted varying degrees of travel consideration during residential selection. Some households (Minimal and Post-move-considerers) do not consider travel at all, whereas for others it is of substantial importance. However as has been highlighted throughout the research, travel issues nevertheless appear to remain the lowest overall priority for the majority of households, when compared to housing and neighbourhood issues. Consideration and prioritisation of travel also does not guarantee that the desired travel situation will be achieved from the new property – numerous difficulties may be faced including the need for compromises in selection, or neglect of key dimensions in decision making. Both considerers and non-considerers of travel could therefore benefit from tips and guidance on the potential travel impacts of moving home.

For greatest potential impact, those households already considering travel would require slightly different messages and tips to those not doing so. However, as has previously been highlighted in Section 9.7, it is difficult to assess prior to the property selection which households are likely to consider travel, and which are not. More specific targeting of messages is therefore unlikely to be possible. Thus a single intervention could be developed for all households searching for a new home, however its design should take account of the different ‘start positions’ of recipients. It is recommended that this should be a booklet of search tips for households looking to move home¹³.

For the benefit of those households not considering travel of importance in property selection, the booklet would firstly need to emphasise the extent to which the home location impacts upon daily travel behaviour, including mode availability, travel distances and costs. Judging from the response of survey sample this influence is more apparent to some households than others¹⁴. Following this the importance of considering these issues *early* in the search process should be stressed; with the potential benefits of giving *greater priority* to travel issues in the search and selection processes emphasised.

Examples of the points to be raised would include:

¹³ This would likely be targeted for distribution through estate agents, as will be discussed in more detail shortly.

¹⁴ Participant comments ranged from ‘why should I consider this??’ to ‘of course I considered this’.

1. Spending excessive amounts of time travelling is tiring, stressful and very expensive. When choosing a new home you have the opportunity to reassess these distances as the majority of your travel is dependent on where you live. The majority of us commute everyday, so any mistakes made here will be faced on a daily basis.
2. It is important to think about the sort of travel you would ideally like to have when forming your household search criteria, in order to increase the likelihood that this will be achieved. The earlier it is planned for the more likely it is to be achieved.
3. Making assumptions about how travel will be from a particular location can prove very costly (particularly in terms of time and stress). Many recently moved households surveyed found the congestion levels to be far higher than they anticipated, or found their intended cycle routes unpleasant. Therefore it is important to thoroughly check the travel situation *before* a final selection is made.
4. Walking and cycling are not subject to congestion, are relatively cheap (or free), and are good exercise.
5. If housing in a particular area is just out of budget, taking into account the likely travel cost savings if moving to the area is important when calculating budgets. Particularly for areas within walking or cycling distance to work.¹⁵

In addition to these tips it would be beneficial to provide a check-list of reminders of ALL the potential implications of residential location selection. Many survey respondents reported regretting overlooking such issues, in particular the level of congestion in the area.

Such tips would include:

6. If you intend to drive to work remember to check journey times IN RUSH HOUR (or at the time you will be completing them), as traffic in many areas of cities can extensively increase journey times.
7. If cycling or walking are of interest not only are distances necessary to consider, but also the safety and pleasantness of the route, particularly in the dark as it gets dark early in winter.

¹⁵ It might be possible to encourage mortgage lenders to accept this more often when agreeing terms and take this into account in affordability calculations – It would seem that many assume car ownership.

8. Is there an alternative method of reaching the workplace, for example if the car breaks down or the buses are on strike?
9. If you intend to travel by bus then remember to check the frequency of service, particularly at weekends.
10. Consider the ease of parking near the property.

Finally the booklet should include detail of how to access travel information for the region/locale.

Wherever possible the points made would best be illustrated through presentation of case examples (perhaps anonymised from the survey participants, or ‘made up’ if necessary). This would hopefully make the points more relevant and thus more meaningful to the recipients. The tips and advice as outlined should be of benefit both to those households considering travel, and those not doing so. However, prior to discussion of how such a booklet may be distributed and its potential influence on residential selection and ultimately travel behaviour, a further potential intervention is discussed.

10.5.2.1 Search tool(s)

A particular outcome of the research has been the recognition of the difficulties faced by many households in achieving their desired property solutions, especially with regards to travel outcomes. Property search and selection involves countless influencing attributes, rarely with all those desired available in one housing option. Decisions are therefore complicated and frequently likely to require some form of compromise. It is entirely possible that all the relevant travel issues (as outlined in the previous section), may be considered, and even prioritised, but a property with a satisfactory travel situation remain elusive. It is therefore perhaps of greater importance to provide tools to help households that are persuaded of the need to consider travel issues (whether due to persuasive interventions or not) to achieve their desired property solutions.

It is proposed that a ‘search tool’ could be developed to aid the complicated search and selection process. Once provided with a household’s required destinations and certain other constraints (price, modes preferred, etc) the tool could provide indications of suitable locations which best meet these requirements. It could possibly be developed to suggest suitable available properties, however that would add significant complications, particularly due to the high rate of property turnover in some areas. Recent advances in data availability and processing make this suggestion a more realistic possibility than might have been the case

previously. A similar tool (Mobiplan) has been developed in Germany (Kreitz et al, 2002), although it is difficult to see to what use this has been put.

In the UK, accessibility planning is now a key theme in shaping local authority transport planning and associated funding awards from Central Government. The proposed tool would be in line with this agenda, and in particular software developed to support accessibility planning, which is GIS-based, may readily lend itself to the creation of information for residential relocation advice. Experimental work drawing upon the UK Government's multi-modal door-to-door journey planner (Transport Direct) is also examining how isochrones of travel for a given postcode location in the UK can be produced. Therefore much of the data that would be required already exists. A further benefit of the proposed tool would be the potential for collection of data highlighting the travel and location needs of households. This would provide further information to forward the accessibility planning agenda.

A final alternative approach is suggested specifically in response to the many survey participants discovering that the transport information they had used in informing their decisions did not accurately reflect the actual situation from the property. In particular with regard to bus services regularly not conforming to the timetable and generally being found to be expensive and poor quality¹⁶, eg '*Bought a car because the bus was too expensive, unreliable and smelt!*' Such comments are clearly in response to the specific situation in Bristol, however, it is likely that similar problems would be faced in other areas. To address this issue (other than to improve service reliability) the suggestion is to encourage a bottom-up approach to information provision. Residents would be encouraged to provide details of their local services, perhaps to a searchable database. It might be hoped that ultimately such reports could encourage improvements to services.

This approach would not be without difficulties. Whether individuals would be motivated enough to provide the information would be questionable. As would the accuracy of any

¹⁶ As an aside, these comments are rather illuminating in relation to public transport. There has been a tendency to see endeavours to attract people to use buses being hampered by the problem of non-users having ill-informed perspectives of what public transport is like thus perceiving the experience of bus use to be worse than it is in practice. Yet these comments reported largely at RRT Stage 8 point towards a willingness amongst some people to try using public transport, only to find that their perceptions or expectations exceed the quality of service that they encounter in practice such that they revert to using other modes.

information they were likely to provide, as many personal biases could be introduced. Home-sellers might be more persuaded to provide the information, but would then be unlikely to present their property in a negative light. A suggestion might be to include a requirement for travel information within the new 'home information packs', however this suggestion is unlikely to be practical in the near future, if at all. Amongst other challenges there is the issue with the 'objective' provision of travel information that is not based on timetables. Nevertheless such a tool is worth considering as a potential remedy if the 'official' information continues to mismatch with the 'actual situation', thus causing dissatisfaction to households and in particular potential mode switch back to car.

10.5.3 Practicalities of the proposed interventions

Each of the interventions suggested in this chapter would require targeting specifically to households looking to move home. A plausible route to target such a population is through estate agents, as they are the main 'gatekeepers' of households looking to move home¹⁷. A booklet providing both the search tips outlined and promoting the search tools could be distributed through this route. The booklet could also provide messages encouraging reduced car use, as suggested in Section 10.5.1. It would however be important not to overemphasise the need for reduced car use (particularly mode switch), in order to avoid negative reactance¹⁸ (Vlek and Michon, 1992). Given the research finding that many households do wish to consider travel but face many difficulties, the booklet would be most effective presented as being 'here to help' rather than 'you need to change your behaviour'. Such a positive approach has a greater potential for success (Vlek and Michon, 1992). It is also unlikely that many households purchasing a home would conclude upon more extensive travel consideration, that greater levels of car use were desirable, and actively search for situations to

¹⁷ There is no reason to suggest that the difficulties faced attempting to recruit participants for the current study through estate agents (as outlined in Section 5.3.2¹⁷ and to be further discussed in Section 10.6.5) would again be faced for distribution of information. Participant recruitment would have required the estate agents to provide customer data to a third party, thus presenting difficulties regarding the Data Protection Act (1998). This would not be the case with the distribution of materials.

¹⁸ This is where individuals (car drivers in this case) feel threatened by the message and react by acting in the opposite manner or ignoring the message.

provide for this¹⁹. Therefore it is unnecessary to strongly discourage car use in the intervention but merely highlight the benefits of reduced travel and alternative modes

Finally in terms of distribution is necessary to also consider the internet. The search tips and information could be provided on a website with links from estate agents and other property sales websites. The search tool in particular might be most effective as a free, web-based tool with links to travel and other information sites.

10.5.4 Potential effects of the proposed interventions

In terms of the potential for influencing behaviour, although the five established TC-types cannot be utilised for targeting interventions²⁰, they are however beneficial for providing assessments of the likely impacts of any interventions (in addition to guiding their design). It must be noted that the interventions could, and indeed would frequently aim to, alter the TC-type of a household.

The TC-type most likely to benefit from the type of interventions previously outlined in Section 10.5 are the Maximal and Post-move considerers. These are the two groups facing the greatest need for travel consideration following relocation, and therefore the households experiencing the greatest unexpected and unintended changes to travel. The lack of planning and expectation of such changes increases the likelihood that such changes would involve ‘deterioration’ of household travel, and this could potentially be remedied with greater pre-selection travel consideration.

The Maximal-considerers are the TC-type likely to be most appreciative of any assistance in housing search as they generally appear to face challenges throughout the process – both in property selection and post-move. The Prompted-early-planners and Non-prompted-early-planners are additionally likely to be receptive to any assistance and information provision as their consideration of travel issues during property selection suggest that it is important to them. In particular the check lists of aspects often neglected by the study participants would be beneficial to these three TC-types, as would a search tool to facilitate their decision

¹⁹ Specifically given the greater costs in terms of fuel and time that this would involve, and the high levels of congestion in urban areas, to which this research specifically applies. Although an increase in car use may be desirable to reduce social exclusion of some poorer households, households that cannot afford to run a car are unlikely to be able to afford to buy their own home.

²⁰ It is not possible to identify the TC-type of a given household in time for action to be taken.

making. In terms of reductions in travel behaviour there is however a question over whether any properties could be found that are both ‘more suitable’ (in terms of travel reduction) and acceptable to the household (eg not a hugely undesirable location). This is the case for all three of these TC-types as there is by no means any guarantee that a ‘more optimal’ property solution exists – particularly as residential search is likely to be thorough. This is something that can only be tested through practical application. Nevertheless, the tool has the potential to reduce *some* of the stress associated with housing choice, and even a small number of households influenced has the potential for significant travel improvements.

Conversely the lack of consideration by Minimal and Post-move considerers suggests travel is of limited importance, and therefore require persuasive messages highlighting the importance of travel consideration for the search tips to be noted. This would hopefully avoid the unexpected changes (increases) experienced by Post-move considerers. The Minimal-considerers are slightly different in that they tend to move only short distances and search a single area. It would appear that many of the Minimal-considerers are simply looking for a bigger property within the area which they already live²¹. Little change to their travel has been necessary, which combined with lack of consideration suggests little change to their pre-move expectations. In terms of satisfaction levels little intervention is therefore required. They are therefore likely to prove more of a challenge for encouraging behaviour change. In the face of these obstacles it might therefore be wise to apply the advice Goodwin (1997) provides for attempts to tackle car dependence: to focus intervention efforts instead on those households that are likely to be more amenable to change, where a greater return on investment is possible. This TC-type however has relatively high levels of car use, and therefore it would be of interest to attempt to influence this. It remains possible that some could be encouraged to consider travel during their property search. This would hopefully reduce the proportion that otherwise would have become relatively unsatisfied Post-move-considerers, through the situation not meeting their expectations. It could also achieve some reductions in levels of car use assisted by the (limited) change in situational context.

10.5.5 Potential for reduced car travel and increase in satisfaction

As has been observed in both the literature review and the study results, travel related issues are generally less important to households than issues associated with the house or the neighbourhood. Naturally households buying a home are interested primarily in the building

²¹ This contributes to a poor fit of the RRT due to less distinct stages experienced.

in which they will be living and its immediate surrounding environment. Therefore the relative importance of travel is unlikely to be increased significantly. (It is possible that the situation would be different for renting households, and this is something that would be of value for future research to examine). However, buying a home is a decision with significant consequences; therefore the majority of households would be likely to use all available resources to help them make the best possible choice. This is particularly true if these resources explicitly aim to aid in the reduction of household stress through the achievement of post-move travel satisfaction.

In terms of the impact of these resources, where properties are available that meet the household's travel requirements, but do not compromise the households other key criteria (whatever they may be); then the effects of interventions on housing choice are likely to be positive. The household would choose a home in a better travel situation than might have been chosen without the interventions. A question therefore arises regarding for what proportion of households (if any) a home location exists which provides an 'optimal' travel situation, without compromising other key criteria (and specifically of interest, the proportion of households that wouldn't have chosen such a location without intervention). This can only be examined through development and trial of such systems as the search tool previously outlined in Section 10.5.2.1. Examination is only really possible on a case-by-case basis as different households (and their members) will have wildly varying search criteria, values, and priorities therefore it is impossible to predict. Relevant data could be collected through use of the tool. Property availability (or lack of it) also varies around the country. The influence of travel considerations on housing choice is however likely to be adversely affected by trends such as increases in two or more worker households, for whom an entirely satisfactory travel situation is unlikely to exist. Also increases in the frequency of employment changes reduce the need to consider access to a particular workplace as a long-term requirement when selecting a home, (Scheiner, 2006).

Research is necessary to further examine the choices households make when fully informed about the travel consequences of various moves. With a strong persuasive case made, certain households might be encouraged to compromise some other of their non-key criteria in favour of improved accessibility. However, this again is only possible to assess on an individual case basis. The following quote from a survey respondent (a Maximal-considerer) nevertheless underlines the potential of households becoming more fully informed of the implications of housing choices: *"If I had known the traffic problems/ road works/ jams, I would have re-assessed the areas to live in."*

10.6 Reflections on the research process

This final section (before the conclusions) of the chapter examines the completed research process. The choices made and methodologies employed are queried to highlight what lessons have been learnt in overcoming the research challenges faced.

10.6.1 Literature

The first challenge faced by the research project concerns the amalgamation of three extensive and separate bodies of literature (habit and psychology of habits; understanding travel choices and travel behaviour; and residential choice). Identifying the relevant literature regarding residential choice, of which the researcher had little familiarity prior to the start of the research, presented the most significant challenge. The quotation from Mulder (1996) presented on the first page of Chapter 3 highlights that even for specialists on the topic this literature is at times confusing. The first course of action was to avoid more than a cursory examination as it was initially not deemed to be central to the research. This however altered following analysis of the first, qualitative stage of the research, where the importance of this body of literature to the travel outcomes of a move became highlighted. It therefore became necessary to indeed attempt to identify the relevant parts of the literature, the results of which can be seen as Chapter 3. This proved extremely beneficial to the research, but it highlights some of the many challenges to be faced by interdisciplinary research.

10.6.2 Study approach: In-depth interviews (to be followed by a broader survey)

The approach taken in the study, in-depth interviews followed by a larger scale survey has allowed the collection of a rich variety of information, including both depth and breadth, and allowed a thorough examination of the research objectives. It has therefore definitely been a strong choice of approach. In terms of objective 1, providing evidence for an association between habit weakening and residential relocation, a two-stage longitudinal approach may have provided a clearer record of habit *weakening*. However this would have been at the cost of a detailed, qualitative and notably *exploratory* examination of moving experience as a whole, which resulted in the important insight that *interrelationships* were the key focus of interest rather than unidirectional relationships. Additionally any measurement of habits that could be used in any alternative approach would be, as has been frequently raised in the thesis, not without its questionability.

The main drawback of the research approach taken has been the extended time required to design and implement two separate research methodologies, specifically the achievement of two rounds of participant recruitment is time consuming. It was initially intended that only one participant recruitment method would require implementation (through estate agents), which would have made recruitment more straightforward. However, as has been detailed this proved not to be possible. It may prove possible for any similar research in future to utilise the Land Registry's data, again as a single recruitment method.

The commencement of the research with in-depth exploratory interviews with recent movers permitted a thorough retrospective reflection on the moving process as a whole. It is unlikely that the research would have developed as it did without this valuable phase of the research. Specifically the 'open' nature of the interviews allowed insight into the importance of pre-move travel considerations, and a recognition of three different types of travel change associated with a move – planned, anticipated and unexpected changes. Most notably, without these insights the RRT framework, would not have been developed. The qualitative section of the research was therefore crucial for the development of the key conceptual framework upon which the remainder of the research was based – the Residential Relocation Timeline. In addition to this the interviews also provided some potentially novel insight to the concepts of 'habits' and 'routines', as has been summarised in Section 6.3. Therefore the initial decision to complete qualitative interviews to gain a better understanding of the situation under study proved extremely valuable.

10.6.3 Research focus on the RRT framework

The decision to extend these findings by means of a postal survey, and to further develop the RRT framework have equally proved beneficial choices. The Residential Relocation Timeline, as developed from the interview participant experiences, appears an invaluable and insightful framework for improving understanding of the process of how moving home influences travel behaviour (and vice versa). The huge range of moving experiences reported by survey participants has highlighted its applicability throughout the range of moving experiences that may exist. The survey has permitted identification of the stage at which most consideration of travel occurs, facilitated identification of different types of travel consideration undertaken during a move, and allowed identification of the four key influential stages in terms of impacts upon travel outcomes. Despite the recognition that only four²² of the eight stages are key in

²² Some of these four are in fact two RRT stages combined.

terms of travel outcomes, (as detailed under Objective 2 in this chapter), all eight remain beneficial for providing insight to travel related experiences associated with moving home. The moving home typologies (TC-types) as developed based on this framework provide a useful tool for understanding the different processes as regards travel consideration that different households experience, and particularly in terms of assessing the likely impacts of possible interventions to households in the process of moving home.

10.6.4 Survey design

The detailed consideration of design of the survey questionnaire was necessary in order to produce a questionnaire that was understandable to recipients and would produce meaningful results. It was particularly necessary to most effectively convey the RRT framework which could be potentially confusing to participants. The considerable effort employed in the design of the survey questionnaire appears to have been worthwhile as it produced an effective instrument capable of gaining detailed information able to provide illustration of a complicated process.

Not all the questions included in the survey have been discussed in detail in the thesis. As is often the case with survey research, certain questions have proved less crucial to the central argument of the thesis. It is however considered that it was not possible to know until the responses were received whether the data would be necessary and useful. This is particularly true for exploratory research, as even having conducted preliminary qualitative data collection it is difficult to know in advance which elements will prove vital to the majority of respondents²³. The current study has begun to highlight which are the central issues and which are more peripheral and therefore future research will face this challenge to a lesser degree.

Naturally as the research progresses, and with hindsight a limited number of improvements to the survey would have been made. Firstly it would have been beneficial to include '0' in the scale of measurement for 'extent of consideration' at each stage, as detailed in Chapter 7, as this would have allowed for those not considering at that stage to complete the question, should they wish to do so. Secondly it would have been beneficial to record a single main prompt for the move in addition to the range of prompts recorded, as this would have allowed both an easier comparison to other studies, and an assessment of the extent to which travel had

²³ Given the huge range of moving experiences it can be argued that any pilot study (unless of substantial size and thus really a main survey) would not provide a sufficiently large sample to answer this query.

prompted the move. Thirdly it would have been valuable to include the option ‘planning NOT to change travel’ when gaining information regarding the conscious intentions of the household as regards their travel outcomes.

Finally, the potentially most significant omission was a record of the participant and their households’ mode preferences. This would have been beneficial for a number of reasons – firstly to allow assessment of the influence of mode preferences in determining travel consideration and travel outcomes. The potential influence of mode preferences has been highlighted in Chapter 3, however the potential significance of this was not realised until after the survey design was completed. Collection of detail on mode preferences was actually considered at one point in the survey design as of possible influence. But it was removed due to space constraints as its potential key importance was not recognised. At the time it was felt that mode preferences would need to apply to specific journey purposes – and cognitive dissonance would be likely to result in little difference to the reported main modes used, therefore proving of little value as a question. It was also recognised that preferences of respondent *households* as a whole would be of interest, and that many respondents would be likely to record only their own preferences. This might have been covered by the simple inclusion of a question asking whether the household intended to use public transport (vitaly important, sometime, and not at all),

It was only the findings from the interviews which highlighted the importance of conducting a more thorough literature search into housing choice, and the inclusion of a disproportionate number of interview participants without access to a car for a time masked that the underlying issue was in fact strong preferences (or need) for public transport/ walk-able distances, rather than lack of car ownership. This was extremely unfortunate, and highlights the risks involved in the recruitment of volunteers, where interest in the issues discussed is liable to be biased (non-car owners are likely to have a greater interest in travel issues than car owners, therefore more likely to volunteer in the study).

This would also have allowed greater insight into the mode preferences vs urban design debate, however the study has already managed to contribute in favour of mode preferences in this case.

10.6.5 Participant recruitment and the Data Protection Act

As noted in Chapters 5 and 7, significant difficulties were encountered in attempts to recruit a target population of recently moved households. Subsequent research in Australia (Ampt. 2006) also reports difficulties in targeting a similar population, detailing a comparison of a

variety of methods attempted, including: through utility companies, visitor and migration centres, a home sale website, the defence housing department, estate agents, universities, removal companies, and door-to-door visits in newly established areas. It is therefore clear from both this and the current research that the recruitment of recently moved households can present unexpected difficulties (unexpected due to the ‘common’ occurrence of households moving home).

At the start of the current research it had not been anticipated that such difficulties would be faced as it was assumed that estate agents would provide a suitable route to contact potential participants. However, after initially demonstrating willingness, the Data Protection Act (1998) was cited as advising against their participation. Proposals to demonstrate that the research would be ‘in the public interest’²⁴ (for such circumstances data distribution is permitted under the DPA), did not alter this situation. Admittedly this route was not fully pursued upon the discovery that the majority of estate agents in Bristol were franchises rather than a chain and therefore did not possess a centralised customer database. Therefore it may have been possible through more ‘official’ channels (such as approaching through the Department of Transport, rather than a research centre), and convincing the business that this was in fact within the law, to pursue the route to eventual success. However the experience highlights that estate agents (in Bristol) appear to not fully understand the DPA, are scared of it and thus tend to err on the side of caution. This is a positive outcome of the DPA for the general public and safety of data, however highlights an issue that may have wider implications for research in general. Many additional businesses and organisations are likely to be in similar positions, particularly smaller ones; therefore many conventional participant targeting methods may fail due to a lack of understanding of the DPA resulting in a general erring on the side of caution. This has particular potential to affect smaller research projects, rather than large scale national efforts which will have the resources and ‘authority’ to convince organisations to participate. Clearly larger organisations such as the Land Registry are more familiar with the Act, therefore this research project, in addition to those suggestions by Ampt (2006), has highlighted an alternative method for the procurement of addresses which may prove beneficial for future research.

²⁴ The research clearly was demonstrated to the Land Registry to be in the public interest

10.7 Final conclusions and future research

The research as outlined in this thesis has highlighted the substantial amount of travel behaviour change which follows residential relocation. Despite over three-quarters of the households whose experiences were examined moving less than ten miles, (and 57% less than 3 miles), 57% of respondents experienced an alteration to the main mode used for household journeys to work, shops, school run, city centre or regular leisure, and 39% of respondents experienced a change in commute time of over 10 minutes. The research has highlighted that in many cases this change is deliberate and perhaps a motivation for moving home, however in others it is accidental and a household could benefit from increased consideration of travel prior to property selection. Where the travel change is deliberate, a tendency towards reduction in levels of travel and car use is apparent, thus despite a focus on encouraging households to want to reduce their travel, for many this desire already exists and it remains only to facilitate necessary action. This however is not an easy task given the complications involved in finding and purchasing suitable property and limited availability of property. It is however concluded that where improvements are possible, any interventions (if not overly forceful) have a great potential for success, as they are generally likely to be working alongside the aims of households, as opposed to contradicting them.

A variety of interventions have been suggested as potentially successful, however these have not been tested, and further research to test the feasibility and actual impacts of such interventions, perhaps in the form of small pilot tests would be valuable in order to ascertain their suitability. In particular it is recognised that the study conclusions are based on data collected only within a single city (Bristol), therefore it is important to assess whether the findings could be replicated in other UK towns. It is felt that the findings are equally likely to apply to other UK cities due to their general nature, although their suitability to rural areas is less clear. Any pilots of interventions, or further study would be required to be of a reasonable size in order to take account of the huge diversity of residential relocation circumstances and priorities. In particular the search tool outlined in Section 10.5.2.1 first requires development before any tests as to its usefulness and effects on households choice can be made.

In addition to this, numerous further extensions of the findings of the current research would be valuable. The research has suggested that notwithstanding the diversity of residential relocation circumstances, home-mover characteristics and experiences, it seems possible to identify reasonably meaningful typologies of individual households and their associated relocation descriptors. Further in-depth research with households corresponding to each of the five TC-types would be valuable as confirmation that the interpretations provided in this

thesis could be agreed with, and to allow for a deeper examination into the reasons leading to the specific types of travel consideration completed during the move.

An interesting extension to the research would be to examine any differences in experiences and search processes of households seeking owner occupied property, and those searching for rented accommodation. It is likely that many differences exist as the priorities and implications of selecting a property to rent rather than to own are different. Renters do not have to consider future sale values, investment, and making sure the choice is the 'right' one as it is relatively easy for renters to move within a short space of time. Examination of such differences may highlight key processes about either, and extend the proposed housing selection intervention tools to additionally be applicable to renters. It may also potentially allow an assessment of the impact of UK housing policy favouring owner-occupation. This could also be achieved to a certain extent by comparison to other countries with different housing policies, such as the Netherlands where rented accommodation is more the norm. This is again a further possible avenue of future research into the topic.

It therefore remains only, by way of final conclusion, to provide a summary addressing the overall aim of the research. The research findings clearly suggest that the process of moving home is an ideal time for a household to review and potentially change their household travel. This review can take place at any point throughout a move, including at the very start, prompting a decision to move, or after the physical move has taken place. The 'window of opportunity' of weakened habit for encouraging travel change is open throughout the moving process. However greatest benefit in terms of reduced levels of car use, and perhaps also increased household satisfaction, is likely if interventions and tips are provided early rather than later in the moving process, and *crucially* manage to influence decisions regarding *property selection*.

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Appendices

RECENT HOMEBUYERS IN BRISTOL SOUGHT FOR UWE RESEARCH PROJECT

Issue date: 18/06/2004

Have you bought a house in Bristol recently? A researcher from the University of the West of England, Karen Stanbridge, is looking for people who have bought a home in Bristol in the past six months to take part in a study looking at the effects of residential relocation on travel habits.

The study is based in the Centre for Transport and Society at UWE's Faculty of the Built Environment.

Karen is looking to find out if moving house causes people to change their travel patterns or mode of transport. Karen said. "We are looking at potential ways of reducing car travel and the research aims to determine if giving people more information when they move house about public transport links and routes might encourage them to leave the car at home."

"Evidence suggests that people use their cars out of force of habit. Moving to a new location is an ideal time to redress old habits. The research will investigate recent movers attitudes towards travelling and if the move is a good time to take stock of transport issues. It will also explore if their travel has changed at all since moving house. By talking to people about their experiences we hope to be able to get an idea of what features are influencing travel behaviour during this time of potential change."

"At this stage we are looking for around 15 homeowners in Bristol who will be interviewed about their experiences," explained Karen. "Later stages will involve more participants."

"Participants will be interviewed on a single occasion, which should take no more than one hour, about their daily travel before and after moving. The interview could involve all or some of the household together, or just one member."

"Travel habits are easily developed, and difficult to break once formed. By gaining an understanding of how new habits are formed, we hope to be able to encourage the formation of new habits that are good for the environment and local community, and also reduce dependence on the car."

People can find out more by calling Karen on 0117 328 3667, or emailing karen2.stanbridge@uwe.ac.uk. If they would like to be part of the study they will be asked a few questions and Karen will arrange to come and see them at a convenient time.
-ENDS-

Editor's notes For a photograph of Karen Stanbridge please call the press office

For further information please contact.

Jane Kelly or Mary Price, Press Officers, **Bristol UWE**

Tel: 0117 328 2208, Fax 0117 328 2341

Email: jane.kelly@uwe.ac.uk or mary.price@uwe.ac.uk

Transport researcher seeks volunteers

Plea to recent house buyers

HOUSE buyers in Bristol are being invited to take part in a major research project into travel habits.

Researchers from the University of the West of England are looking for people who have bought a home in Bristol in the past six months to take part in a study looking at how moving house impacts on travel patterns and use of transport.

The study, led by researcher Karen Stanbridge of the Centre for Transport and Society at UWE's faculty of the built environment, will look at potential ways to reduce car travel.

And it will aim to determine if giving people more information about public transport links and routes when they move might encourage them to leave the car at home.

Ms Stanbridge said: "Evidence suggests that people use their cars out of force of habit.

"Moving to a new location is an ideal time to redress old habits.

"The research will investigate recent movers' attitudes towards travelling and if the move is a good time to take stock of transport issues.

"It will also explore if their travel has changed at all since moving house.

"By talking to people about their experiences we hope to be able to get an idea of what features are influencing travel behaviour during this time of potential change."

Researchers are initially looking for 15 homeowners in Bristol to be interviewed about their experiences but may seek more people to take part in the later stages of the study.

Ms Stanbridge said: "Participants will be



Study:
Researcher
Karen
Stanbridge

by IAN TURNER

interviewed on a single occasion, which should take no more than one hour, about their daily travel before and after moving. The interview could involve all or some of the household together, or just one member.

"Travel habits are easily developed, and difficult to break once formed. By gaining an understanding of how new habits are formed, we hope to be able to encourage the formation of new habits that are good for the environment and local community, and also reduce dependence on the car."

People interested in taking part in the study can find out more by contacting Karen Stanbridge on 3283667, or emailing karen2.stanbridge@uwe.ac.uk.

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UWE survey needs you

HAVE you bought a house in Bristol recently? If the answer is 'yes', then the University of the West of England would like to hear from you.

Karen Stanbridge is looking for people who have bought a home in the city within the past six months, to take part in a study looking at the effects of residential relocation on travel habits. She is trying to find out if moving house causes people to change their travel patterns or mode of transport. To find out more, email karen2.stanbridge@uwe.ac.uk.

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Residential Relocation and Travel Behaviour – Interview Topic guide

Remember

- Aims: Looking for an understanding of behaviours and decisions, the effects on daily travel of moving house. What they think the reasons are for any changes in travel.
- Stress Cause and Effect. Remember to put lots of whys in.
- Discuss routines until habits mentioned by me.
- Lifestyle domain, mobility domain, accessibility domain.

<ul style="list-style-type: none">• Life style domain – age and generation, household composition (life cycle), income, educational/ professional career, leisure activities and related attitudes
<ul style="list-style-type: none">• Accessibility Domain – spatial factors: change of the transport system, spatial factors such as residential relocation, higher education facilities. I think I would add here ‘distribution of activity centres’.
<ul style="list-style-type: none">• Mobility domain??? Car ownership, season ticket,

- **Introduction section –**
 - anonymous reporting, right to leave, what study is about etc , stress no rights and wrongs,
- **Details about current house –**
 - Household members, length of residence, distance from previous residence
 - Number of cars, drivers licenses, public transport season tickets.
 - Reasons for moving, role of travel in move decisions,
 - Local public transport awareness, how any information was found.
- **Daily Travel**
 - Descriptions of an average day – where go, how get there etc

The points below covered for all the below journey purposes.

- How often,
 - Mode – why – ever any others used? Would it be possible to use others? – why not?
 - How far / long takes,, where is work??
 - Is it the same every day/week / or different?
 - So do you think it is different in any way?
 - What do you think are the reasons for any/no differences?
- Journey to work: before and after (is it the same workplace)
- Food shopping (who goes, where, a particular location or varies, how was shop selected, tried others?)
- Kids to School
- Leisure (types of activities usually completed, eg visit friends/relatives, shopping, cinema, eating out, pub, etc

- **Routines and Habits**

- Considering your travel behaviour now, would you say that it was in any way routine? which aspects and why? If not, why not? how long would you say it took for this to develop? – from day 1, or longer? Carried over from before move. Do you think it is helpful to have a routine?
- Habit measure scale (see end) – discussion of responses
- What are habit and routine? – explanations, definitions.
- Do you consider that any of your travel behaviour is habitual?ie, done without really thinking about it too much? perhaps even unconscious?
- Discussion of travel habits generally
- Repeat scale for before move journey

Opportunities for changing behaviour

- What effect, if any, do you think that moving house had on your travel habits or routines? – why?
- Any other things that may have influenced travel over the same time period since your move? What? explanations.
- Can you think of anything that might have caused you, or encouraged you to change your behaviour more? Eg more public trans info, free bus tickets. Do you think that if you were given all the relevant information about public transport in the local area when you first moved house that it would have affected your travel behaviour in any way?
- Is there any aspect of your travel behaviour that you would like to change? If yes, what are the reasons/why that you haven't yet changed it?
- Can you think of any other occasions when your travel routines/ habits/ behaviour changed? Eg another move, job move, drivers license, babies, life stage, etc.

Car dependency – If they are indicating lots of car use

- Do you consider yourself dependent on the car??
- Would your routines have to change significantly if it wasn't there??
- Would this be acceptable to you?
- Imagine life without a car, how would you cope??
- What would your biggest problems be??

Reasons for moving and travel.

- We have been discussing any differences in your travel before and after your house move. Do you have anything to add about that now?
- Did you expect these changes before you moved?
- Had you planned / thought about travel when deciding to move? such as being near work, shops, schools, other places/activities etc, bus stops train stations, parking, motorways.
- What features were important to you, your priorities when searching for your new property? *Prompt – to be near a school, moving closer to work, needed more room, investment, nicer area, life stage... ..*Linked to reason for move in first place.
- What were your reasons for selecting this house in particular?
- *Location, price, just felt good, near amenities etc. Was there anything you felt it to be lacking, or in an ideal world that it would have had?*
- Would you say that the house itself, or its location were more important when you were making a house selection?
- any other comments or questions?

Final details

- Life stage Do you think you would classify your household as one of the following list. Do you think this has changed while you moved house / recently? Leaving the parental home, entering the labour market and changing jobs, cohabitation and marriage, having children, child launching, retirement and reaching old age.
- Participant Demographics, house price, etc

Habit measure scale is included on the following page.

Please think about your journey which you think is your most routine. Please indicate on a scale of 1-5, whether or not you agree (5) or disagree (1) with the following statements related to that journey. Explain scale a bit more eg 234. Suggest journey to work by a particular mode.

What is the journey?

	Behaviour x is something...	Disagree				Agree
1	I do frequently.	1	2	3	4	5
2	I do automatically.	1	2	3	4	5
3	I do without having to consciously remember.	1	2	3	4	5
4	that makes me feel weird if I do not do it.	1	2	3	4	5
5	I do without thinking.	1	2	3	4	5
6	that would require effort not to do it.	1	2	3	4	5
7	that belongs to my (daily, weekly, monthly) routine.	1	2	3	4	5
8	I start doing before I realize I'm doing it.	1	2	3	4	5
9	I would find hard not to do.	1	2	3	4	5
10	I have no need to think about doing.	1	2	3	4	5
11	that's typically "me".	1	2	3	4	5
12	I have been doing for a long time.	1	2	3	4	5

Repeated for same journey purpose pre-move.

INTERVIEW PARTICIPANT STORIES

Participant 1

Participant 1 is a single 25 year old woman who moved in order to get on the property ladder. She liked the area in which she was previously renting, so focussed the search on only this area resulting in a move of less than 1 mile. The area is a 'desirable' area in close proximity to the centre of Bristol. She now lives with a lodger to keep costs down. In terms of travel, this participant drives almost everywhere despite her close proximity to central Bristol. She works on the edge of the city.

Participant 2

Participant 2 is a 30 year old single female living alone. She had moved to Bristol from Edinburgh for work a year prior to the purchase of this property, but had decided to rent in Bristol before deciding where to purchase (she had owned a property in Edinburgh). She rented in a village outside of Bristol (she works on the north edge of Bristol), but decided to buy closer to the city, approximately x miles from the centre. She considered properties south of the river due to lower prices in that region but was put off by the traffic levels as she attempted to reach properties for viewings in the area. Her new property is fairly close to her workplace but she continues to drive as it is uphill and she often goes home for lunch.

Participant 3

Participant 2 is a 38 year old single female living alone. She has lived in Bristol most of her life, and was moving from a flat to a house in order to find more space and a garden. Her flat was in a fairly central location north of the centre. Upon deciding to move she viewed properties south of the centre due to lower prices in the area, but the journey from there to her workplace on the north edge of Bristol put her off, and she realised that less central properties to the north of the city were not much more expensive. They would not require her to be car dependent. Prior to moving she had cycled a lot, particularly to reach leisure activities, and she intend to cycle to work from her new home soon, however at the time of interview had continued to commute by car.

Participant 4

Participant 4 is a 27 year old woman who lives with a partner. Prior to the move the couple rented a flat in central Bristol, and could both walk to work. They now live in a commuter town on the edge of Bristol, and one drives to work (in a new location subsequent to the move), and the other uses a variety of options including driving, train and bus to reach her work in the centre of Bristol. Participant 4 reported strong enjoyment of being able to walk to work, however the reason for the move was a strong desire to get on the property ladder, which they could not afford to do within walking distance of the centre. Having ruled out the option of walking to work they instead opted for property with a garden and hence moved to an area distant from the centre due to affordability. This was also an area where the partner had been raised.

Participant 5

Participant 5 is a single 28 year old male who now lives with a lodger. Prior to moving he was living with his parents in order to save enough money for a deposit for a home. Having chosen not to own a car he briefly considered moving to within walking distance of his workplace but did not like any of the areas close by. He therefore switched his focus to bus routes, and selected an area fairly central to Bristol with good bus access to his workplace. An additional consideration in his residential location choice was access to a railway station to facilitate access to matches for the cricket team he regularly played for.

Participant 6

Participant 6 is a 26 year old woman who was buying a flat in order to move in with her partner. They had both previously lived in rented accommodation, her in a central location and him further out of town. A huge priority for this participant was that the property would be within 40 minutes walk of her workplace in the centre of Bristol as she enjoyed walking to work. This is something she was not prepared to compromise on as she did not own a car, and did not wish to do so, and also did not want the stress of using buses. Her partner however does have a car, and following the move she frequently ends up getting a lift to work, despite having achieved her goal of staying within walking distance. She does also walk however.

Participant 7

Participant 7 was a 58 year old senior manager who works on the edge of Bristol. He was renting in a central Bristol location following a divorce and wished to purchase a property in the same desirable location with his new partner. They both enjoyed being able to walk to the centre and all the amenities they required (other than work), and wished to retain this after their move. Their experience was somewhat different to the other participants, as after losing two properties in the location they were searching through ‘gazumping’, their estate agent showed them a property that met many of their requirements but was on the edge of town (also further from the workplace). This was the property they eventually purchased, and they now have to drive (or perhaps cycle) to reach most destinations. They do however now travel less for leisure as they have a large garden and this takes up most of their time.

Participant 8

Participant 8 was a 25 year old woman moving in with her fiancé. They had both previously been living (separately) with their parents in Oxford but were both familiar with Bristol having met at University here. They had made a conscious decision to look for work and move back to the city, however participant 8’s partner had not found a job in the city at the time of interview so was working elsewhere and had not yet move in (the interview took place less than a month after the move). Participant 8 is unable to drive due to a medical condition however her partner has a car. Nevertheless it was important for her to be able to access her workplace on the edge of Bristol by an alternative to driving. They had chosen a property on the bus routes and also within a 40 minute walk of her workplace.

Participant 9

Participant 9 is a single 27 year old woman who had lived in Bristol for a number of years. Her reason for moving was to get on the property ladder, and she searched in the only area of the city not too distant from the centre that she considered she could afford. Therefore there was little room to plan for travel. She largely drives to work, however has additionally discovered a good cycle path very close to her home, so intends to try cycling in future. She now lives with a lodger, as was her initial plan.

Participant 10

Participant 10 is a couple in their 30s who moved to Bath from London a few years ago as one got a job in Bristol, the other in Bath. They moved again to Bristol after deciding that they were not happy with the time and cost of their long commutes, after the partner employed in Bath changed jobs. They were very fond of Bath, less so of Bristol, and the only reason for the move was the commute issue. They selected a property in a fairly central area of Bristol so that one partner could walk to work in the centre, the other cycle to the outskirts (he had occasionally cycled to work from Bath – a distance of xx miles one way, so was a keen cyclist). They do own a car which also gets used, particularly when they have things to carry.

Participants 11-14

This was the only family to take part, and was also a group interview with all three family members (mother, father and 13 year old daughter) present. The family had moved from Scotland (Glasgow?) due to the fathers employment and had no previous knowledge of Bristol. They selected areas to search by asking their daughter to choose some schools she liked the look of, and picking locations within travelling distance and on bus routes for the schools. They moved to an area of suburbs to the south of the city. Initially the mother had tried commuting to her work in the centre by bus, but was severely disappointed that the bus system in no way compared to that in Edinburgh. She was increasingly using the car to get to work on time. The father now cycles to work most days, however also has to make a number of work trips, and on such occasions drives.

Business case for survey mail out: research on residential relocation and travel.

This research is part funded and supported by the UK Department for Transport, with Gillian Smith

Introduction

Current government policy on transport is centred upon reducing the extent of dependence upon the car through improving the availability, viability and attractiveness of alternatives. In addition to investment in and improvements to the transport system itself, there is a need to influence travel choices and behaviour such that the share of travel undertaken by alternatives to the car is increased. A key point made in the 1998 transport White Paper is that significant improvements to transport overall can be attained by each individual making only modest changes to their behaviour. However, achieving behaviour change in practice is proving far from easy.

There is a growing recognition that habit is a major inhibitor of behavioural change. Individuals settle into routines of travel behaviour in terms of the trips they make, the modes they use, the destinations they visit and so on, that become habitual and entrenched. This is a major barrier to positive effect being achieved from policies and initiatives geared to influence behaviour. An alternative line of approach to achieving behaviour change is therefore to target points at which habitual behaviours are likely to be weakened or subject to change. It was hypothesised that residential relocation represents one such juncture in people's lives.

Research to date

A series of qualitative in-depth interviews with recent movers was carried out with the aim of understanding the impacts of the relocation on participant's travel behaviour and hoping to identify opportunities for positive behaviour change.

It became apparent from these interviews that the impact of moving house on household travel behaviour was greatly dependent on the considerations and priorities given to travel issues prior to the move itself. Travel habits are perhaps changed as a process rather than a single instance of the move. The travel opportunities provided by the new home greatly restrict the modes of travel that are available, therefore the role of travel considerations in the property selection decision is crucial. Much research has looked at moving house decisions, but the role of travel issues remains unclear. It is found to be sometimes important

and other times not, however no suggestion of when this might be. Clarification of this would be desirable.

A particular result of note from the interviews was that considerations of travel issues were likely to take place at different stages during the moving process, with potentially varying effects on post move travel. Different stages would include during the selection stage, the search stage or as the initial prompt for the move, and seven separate 'points of consideration' were established. There was some indication that this could be related to such factors as level of car ownership, and research within this new framework has the potential to provide some understanding of the role of transport in relocation decisions and the impacts this has on post move travel behaviours, and opportunities for changing and habitual travel.

It is therefore proposed to conduct a survey to explore these issues further and examine whether the experiences of the interview participants can be expanded to a wider population. Such a survey is very much in the public interest for the following reasons:

- If successful improvements are to be made to the UK's transport systems and policies then greater understanding of traveller's choices and decision making is important.
- Much of an individual's travel is dependent on the opportunities for travel provided by their home location (eg proximity to bus, train, or amenities, and parking). Many individuals may wish to reduce their car use but are unable to due to lack of alternatives available. Therefore improving understanding of how residence location decisions are made, in relation to travel considerations and trade-offs with other priorities is important for understanding and improving the situations of those individuals who may wish to leave their car at home but are unable to do so.
- It is also important to determine which households are likely to place high priority on travel issues over other issues when searching for a home.

What would be required

This research requires the distribution of a survey to approximately 2,500 addresses that have been purchased during the previous twelve months. A mixture of lengths of time since the move within the year would be preferred, eg 500 very recent, 500 after a few months, 500 at approximately 11 months and so on.

The addresses should be within the city of Bristol, so this would be postcode areas BS1, to BS9, BS 13 and 14,15,16. Again a mixture of post codes and time since sale would be required.

My (Karen Stanbridge) contact number: 07930xxxxxx



University of the
West of England

Sharing your experiences of

Moving home and its consequences for your daily travel

**As a thank you for completing this questionnaire
we will enter you into a £250 prize draw**

To confirm that you are eligible to complete the questionnaire, firstly we would like to check the following: PLEASE CIRCLE THE APPROPRIATE ANSWER

Have you (or a member of your household) bought the home you currently live in? Yes No

Have you moved in to this home in the last 12 months? Yes No

Is the number of adults (18 years and over) living in your household two or less (not including lodgers)? Yes No

If you have answered '**Yes**' to all three previous questions then we would very much appreciate you completing the questionnaire and returning it to us. It is several pages long but has been designed to be easy to complete.

If you have answered 'No' to any of these questions then thank you for your time but we do not need you to complete the questionnaire.

If you have any queries, please contact Karen on 0117 328 2894 or email karen2.stanbridge@uwe.ac.uk

Please turn over

Your household and move

Q1: Please tell us who lives in your household, starting with yourself (do not include lodgers unless they had a significant role in helping you choose your current home).

Household Member	Age (years)	Sex	Has a driver's licence?	Occupation:
				(full time employed, part time employed, unemployed, retired, student, full time child care, other)
Yourself		m / f	y / n	
Adult 2		m / f	y / n	
Child 1		m / f	y / n	
Child 2		m / f	y / n	
Child 3		m / f		
Child 4		m / f		

Q2: How far was your previous home from your current one? PLEASE SELECT ONE.

a: Yourself:

☐ Less than 1 mile

☐ 4-9 miles

☐ 16-30miles

☐ 51- 100miles

☐ 1-3 miles

☐ 10-15 miles

☐ 31-50 miles

☐ 100+miles

b: Adult 2 (if applicable and if different to yourself)

☐ Less than 1 mile

☐ 4-9 miles

☐ 16-30miles

☐ 51- 100miles

☐ 1-3 miles

☐ 10-15 miles

☐ 31-50 miles

☐ 100+miles

Q3a: Have any of the following been associated in any way (before or after), with your moving home? PLEASE TICK ALL THAT APPLY

- ☐ New child(ren)

☐ Marriage

☐ Change of employment

☐ Death of a partner

☐ Moving in with a partner
- ☐ Separation

☐ Retirement

☐ Divorce

☐ Other

b: How was this associated with your move?

Q4a: Before you considered moving, how well did you or anyone in your household know the area you are now living in (roughly 1 mile around your current home)? PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all

12345

Very well

b: Please explain how you or your household knew the area (roughly 1 mile around), before you considered moving to your current home. (eg lived there previously, friends in the area, have lived in the surrounding area, etc.)

Q5a: How many cars and vans are available in your household? PLEASE TICK ONE.

0

☐

1

☐

2

☐

3

☐

4+

☐

b: Has household car/van availability or type, changed in any way with moving home (for example in terms of the number of vehicles or make/model of vehicles)?

Yes

☐

No

☐

c: If 'yes', how has car/van availability changed, and why?

Moving home and thoughts given to travel issues

This section splits the process of you moving home into 7 stages. These are:

- (1) The initial decision to consider moving home.
- (2) Preparing to look for a new home.
- (3) Viewing potential properties (before a preferred choice has been found).
- (4) Preferred property identified.
- (5) Offer accepted – location of new home now known.
- (6) Move to new home completed – settling in.
- (7) After having lived in the new home for a while.

For each of the above stages we would like to know about all the ways you seriously thought about travelling, even if you eventually did not travel in this way. Each stage will be asked about in turn in the following section.

The following seven stages may at first seem very similar. Please read each of the stages carefully before responding.

STAGE 1 - The initial decision to consider moving home

Q6a: What were the main reasons that prompted your household to think about moving home in the first instance? PLEASE TICK ALL THAT APPLY.

- | | | |
|---|--|---|
| <input type="checkbox"/> Job move | <input type="checkbox"/> To be nearer work | <input type="checkbox"/> For investment |
| <input type="checkbox"/> Moving in with a partner | <input type="checkbox"/> To be nearer a school | <input type="checkbox"/> To be nearer family |
| <input type="checkbox"/> Marriage | <input type="checkbox"/> To move to a nicer area | <input type="checkbox"/> Death of a partner |
| <input type="checkbox"/> Bigger house wanted | <input type="checkbox"/> Separation from partner | <input type="checkbox"/> Smaller house wanted |
| <input type="checkbox"/> To get on property ladder | <input type="checkbox"/> Increased income | <input type="checkbox"/> Retirement |
| <input type="checkbox"/> Other, please explain: _____ | | |

b: To what extent were travel issues thought about as A PROMPT for you to move? PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all 1 2 3 4 5 Significantly

c: What travel issues were involved as A PROMPT for your move?

PLEASE ANSWER FOR EACH APPLICABLE JOURNEY IN THE FOLLOWING TABLE.

Which journeys did you think about? PLEASE TICK ALL THAT APPLY		Mode(s) thought about PLEASE TICK ALL THAT APPLY				Journey time thought about PLEASE WRITE IN MINUTES	
		Car	Public transport	Walk/ Cycle	Not thought about mode	Intended time (mins approx.)	Not thought about time
None	<input type="checkbox"/>						
Work (yourself)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Work (adult 2)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Children to	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Grocery	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
City centre	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

d: What specific travel issues, if any, did you think about at this stage?

STAGE 2 - Preparing to look for a new home.

Q7a: What were your household’s most important criteria when originally searching for your new home? PLEASE WRITE IN UP TO 5.

1:	4:
2:	5:
3:	

b: To what extent were travel issues thought about when deciding your original search criteria for your new home? PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all 1 2 3 4 5 Significantly

c. What travel issues did you think about as part of your original search criteria? PLEASE ANSWER FOR EACH APPLICABLE JOURNEY IN THE FOLLOWING TABLE.

Which journeys did you think about? PLEASE TICK ALL THAT APPLY		Mode(s) thought about PLEASE TICK ALL THAT APPLY				Journey time thought about PLEASE WRITE IN MINUTES	
		Car	Public transport	Walk/ Cycle	Not thought about mode	Intended time (mins approx.)	Not thought about time
None	<input type="checkbox"/>						
Work (yourself)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Work (adult 2)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Children to school	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Grocery shopping	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
City centre	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

d: What specific travel issues, if any, did you think about at this stage?

Stage 3: Viewing potential properties (before a preferred choice has been found).

Q8a: To what extent were travel issues thought about as you viewed various potential properties? PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all 1 2 3 4 5 Significantly

b: What travel issues did you think about when you viewed various properties? PLEASE ANSWER FOR EACH APPLICABLE JOURNEY IN THE FOLLOWING TABLE.

Which journeys did you think about? PLEASE TICK ALL THAT APPLY		Mode(s) thought about PLEASE TICK ALL THAT APPLY				Journey time thought about PLEASE WRITE IN MINUTES	
		Car	Public transport	Walk/ Cycle	Not thought about mode	Intended time (mins approx.)	Not thought about time
None	<input type="checkbox"/>						
Work (yourself)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Work (adult 2)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Children to school	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Grocery shopping	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
City centre	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

c: What specific travel issues, if any, did you think about at this stage?

FOR THE FOLLOWING STAGES PLEASE REFER TO THE SELECTION AND OFFER ON YOUR CURRENT HOME ONLY.

Stage 4: Preferred property identified.

Q9a: To what extent were travel issues thought about in deciding to make an offer on your current home? PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all 1 2 3 4 5 Significantly

b: What travel issues did you think about in deciding to make an offer on your current home? PLEASE ANSWER FOR EACH APPLICABLE JOURNEY IN THE FOLLOWING TABLE.

Which journeys did you think about? PLEASE TICK ALL THAT APPLY		Mode(s) thought about PLEASE TICK ALL THAT APPLY				Journey time thought about PLEASE WRITE IN MINUTES	
		Car	Public transport	Walk/ Cycle	Not thought about mode	Intended time (mins approx.)	Not thought about time
None	<input type="checkbox"/>						
Work (yourself)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Work (adult 2)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Children to school	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Grocery shopping	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
City centre	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

c: What specific travel issues, if any, did you think about at this stage?

Stage 5: Offer accepted – location of new home now known.

Q10a: To what extent were travel issues thought about once your offer had been accepted for your potential new home? (So you knew where you would be moving to, but had not yet moved). PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all 1 2 3 4 5 Significantly

b: What travel issues did you think about once your offer had been accepted on your new home? PLEASE ANSWER FOR EACH APPLICABLE JOURNEY IN THE FOLLOWING TABLE.

Which journeys did you think about? PLEASE TICK ALL THAT APPLY		Mode(s) thought about PLEASE TICK ALL THAT APPLY				Journey time thought about PLEASE WRITE IN MINUTES	
		Car	Public transport	Walk/ Cycle	Not thought about mode	Intended time (mins approx.)	Not thought about time
None	<input type="checkbox"/>						
Work (yourself)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Work (adult 2)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Children to school	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Grocery shopping	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
City centre	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

c: What specific travel issues, if any, did you think about at this stage?

Stage 6: Move to new home completed – settling in.

Q11a: To what extent were travel issues thought about as you settled into your new home? PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all 1 2 3 4 5 Significantly

b: What travel issues did you think about as you settled into your new home?

PLEASE ANSWER FOR EACH APPLICABLE JOURNEY IN THE FOLLOWING TABLE.

Which journeys did you think about? PLEASE TICK ALL THAT APPLY		Mode(s) thought about PLEASE TICK ALL THAT APPLY				Journey time thought about PLEASE WRITE IN MINUTES	
		Car	Public transport	Walk/ Cycle	Not thought about mode	Intended time (mins approx.)	Not thought about time
None	<input type="checkbox"/>						
Work (yourself)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Work (adult 2)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Children to school	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Grocery shopping	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
City centre	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

c: What specific travel issues, if any, did you think about at this stage?

Stage 7: After having lived in the new home for a while.

Q12a: To what extent have you RE-THOUGHT any of your regular travel, after living and being settled in your current home for a while. PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all 1 2 3 4 5 Significantly

b: What travel issues did you think about after you had been living in your home for a period of time? PLEASE ANSWER FOR EACH APPLICABLE JOURNEY IN THE FOLLOWING TABLE.

Which journeys did you think about? PLEASE TICK ALL THAT APPLY		Mode(s) thought about PLEASE TICK ALL THAT APPLY				Journey time thought about PLEASE WRITE IN MINUTES	
		Car	Public transport	Walk/ Cycle	Not thought about mode	Intended time (mins approx.)	Not thought about time
None	<input type="checkbox"/>						
Work (yourself)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Work (adult 2)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Children to school	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Grocery shopping	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
City centre	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

c: What specific travel issues did you think about at this stage?

Reflections on moving home

Q12a: How easy did you find fitting your experiences into the seven stages set out in this questionnaire?

Easy 1 2 3 4 5 Difficult

b: Why was it easy or difficult?

Q13: At which of the stages did you begin to focus exclusively on the area of Bristol roughly 1 mile around your current home? PLEASE SELECT ONE.

- ☐ Stage 5: Only once our **offer** on our current home had been accepted did we not look at different areas.
- ☐ Stage 4: Once we had seen our current home we didn't look at other areas.
- ☐ Stage 3: Once we had searched a number of areas we decided to focus only on our current area.
- ☐ Stage 2: Our search criteria meant we only searched our current area.
- ☐ Stage 1: We decided to move in order to live in the area we now live in.

Q14: Which of the following were part of your household's original search criteria? PLEASE TICK		b: How well does your current home match your original search criteria in these areas? PLEASE CIRCLE A NUMBER FROM 1-5				
		Less than sought		Equalled		Better than sought
a: Living near friends and family	<input type="checkbox"/>	1	2	3	4	5
b: Living in a vibrant area	<input type="checkbox"/>	1	2	3	4	5
c: Living in a safe area	<input type="checkbox"/>	1	2	3	4	5
d: The number of bedrooms	<input type="checkbox"/>	1	2	3	4	5
e: Size of garden	<input type="checkbox"/>	1	2	3	4	5
f: Size of rooms	<input type="checkbox"/>	1	2	3	4	5
g: Style of property	<input type="checkbox"/>	1	2	3	4	5
h: Accessibility to shops	<input type="checkbox"/>	1	2	3	4	5
i: Parking availability	<input type="checkbox"/>	1	2	3	4	5
j: Local public transport quality	<input type="checkbox"/>	1	2	3	4	5
k: Your commute to work	<input type="checkbox"/>	1	2	3	4	5
l: Adult 2's commute to work	<input type="checkbox"/>	1	2	3	4	5
m: Accessibility to schools	<input type="checkbox"/>	1	2	3	4	5
n: Accessibility to city centre	<input type="checkbox"/>	1	2	3	4	5

Q15: We could not find a home in Bristol that met all of the criteria that were important to us.

Strongly agree12345Strongly disagree

Q16: Affordability constrained our ability to achieve all of our search criteria in our new home.

Strongly agree12345Strongly disagree

Q17: What compromises did you make in the selection of your current home, and why?

Q18: Any other details about your move that you wish to provide?

Q19: How well do you feel that you have remembered the detail of your experiences of searching and moving home, in completing this questionnaire?

Very poorly

1

2

3

4

5

Very well

Thank-you, now a few questions about household travel.

Household Travel

Q20: How convenient is it, or would it be, for your household to use the following modes of transport from your current home?

	Not at all convenient					Very convenient	Don't know	Not applicable
Car	1	2	3	4	5		d/k	n/a
Bus	1	2	3	4	5		d/k	n/a
Walking	1	2	3	4	5		d/k	n/a
Cycling	1	2	3	4	5		d/k	n/a
Train	1	2	3	4	5		d/k	n/a

Q21: Does your current employer provide a free company bus?

a: Yourself

☐ Yes☐ No☐ Don't know

b: Adult 2

☐ Yes☐ No☐ Don't know

Q22: How does your household currently travel for the following journeys?

Journeys conducted PLEASE TICK ALL THAT APPLY		Main mode used PLEASE <u>TICK ONE</u> FOR EACH JOURNEY				Typical door to door journey time (minutes). PLEASE WRITE	Have any alternative modes been tried since moving?
		Car	Public transport	Walk/ Cycle	Other		
Work (yourself)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
Work (adult 2)	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
Children to school	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
Grocery shopping	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
City centre	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
Leisure	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
If you <u>regularly</u> use more than one mode of travel for any of the above journeys, please tell us about it here:							

Q23a: In moving home, did you or your household have any 'good intentions' regarding your future travel?

Yes ☐ No ☐

b: Were any of these intentions abandoned?

Yes ☐ No ☐

c: If yes, what were your good intentions, and why were they abandoned?

Q24: Having moved into your new home, how quickly did you settle into a routine for travel to the following destinations? PLEASE SELECT ONE FOR EACH JOURNEY PURPOSE.

	Not in a routine	Instantly	A week	2 weeks	A month	A few months	n/a
Your journey to work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adult 2's journey to work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Children to School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grocery shopping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q25: Since moving home the number of miles members of our household travel has:

Significantly
Decreased

No
change

Significantly
Increased

1

2

3

4

5

Q26: How did your household travel for the following journey purposes before moving?

Journeys previously conducted <small>PLEASE TICK ALL THAT APPLY</small>		Same location(s) as currently visited?	Main mode used <small>PLEASE TICK ONE FOR EACH JOURNEY</small>				Typical door to door journey time (mins). <small>PLEASE WRITE</small>
			Car	Public transport	Walk/Cycle	Other	
Work (yourself)	<input type="checkbox"/> →	y / n	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work (adult 2)	<input type="checkbox"/> →	y / n	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Children to school	<input type="checkbox"/> →	y / n	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Grocery shopping	<input type="checkbox"/> →	y / n	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
City centre	<input type="checkbox"/> →	y / n	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Leisure	<input type="checkbox"/> →	y / n	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If you regularly used more than one mode of travel for any of the above journeys, please tell us about it here:							

Q27a: Can you think of any events or occurrences that may have caused changes to your household travel since you moved home? PLEASE TICK.

b: If yes, what has affected your household travel?

Yes ☐

No ☐

Q28: Please indicate whether you agree or disagree with the following statements by circling from 1-5.

	Strongly agree			Strongly disagree			
a: When living in my previous home, my travel to work was routine	1	2	3	4	5	n/a	
b: Before a move was planned I/we sometimes thought of different ways to complete the school journey	1	2	3	4	5	n/a	
c: Before a move was planned, alternatives for my journey to work were never considered	1	2	3	4	5	n/a	

	Strongly agree			Strongly disagree		
d: Before a move was planned I frequently thought about alternative ways of travelling to work.	1	2	3	4	5	n/a
e: In my previous home, my work journey was <u>not</u> done automatically.	1	2	3	4	5	n/a
f: When in my previous home, alternative ways to travel for household grocery shopping were rarely thought about.	1	2	3	4	5	n/a
g: It is important for my household to travel in an environmentally friendly way	1	2	3	4	5	n/a
h: Buses in Bristol are reliable	1	2	3	4	5	n/a
i: Travel is an important form of exercise for my household	1	2	3	4	5	n/a
j: Our household is dependent on the car	1	2	3	4	5	n/a
k: My household is happy to use the bus whenever the route is convenient.	1	2	3	4	5	n/a
l: Driving is enjoyable	1	2	3	4	5	n/a
m: My household does not generally like to walk to places	1	2	3	4	5	n/a

**Well done, you have finished the main part of the survey.
Only some final details left.**

Final details

Q29: What was the postcode of your previous home?

a: Yourself: _____

b: Adult 2 (if applicable and different to yours): _____

Q30: How many months ago did you move into your current home?
_____months.

Q31: Approximately how long did it take from when you started looking, until you moved into your current home? _____ months.

Q32: Approximately how much did your current home cost?

- ☐ £0-80,000
- ☐ £81,000 – 140,000
- ☐ £141,000 –170, 000
- ☐ £171,000 –230, 000
- ☐ £231,000 –300,000
- ☐ £300,000 –500,000
- ☐ £501,00+

Please turn over

Q33: Please select the highest level of education completed by any member of your household: PLEASE SELECT ONE.

- ☐ Compulsory up to 16
- ☐ HNC
- ☐ Postgraduate Degree
- ☐ A-levels (or equivalent)
- ☐ Degree

Q34: Please provide the following contact details:

Name(s): _____

Address:

Post code:

Contact telephone number: _____

Email: _____

Some contact details are necessary if you wish to be contacted should you win the prize draw. Your details will not be disclosed to anyone outside of the research team, or used for any other purpose than contacting you regarding this study.

If you do not wish to provide these details and be entered into the prize draw, it would be extremely helpful if you could provide your current postcode.

Post code_____

Q35: Would you or your household be willing to be contacted either by letter or telephone to discuss further the issues covered in this questionnaire?

- Yes ☐
- No ☐

Thank-you very much for you participation – it is very much appreciated.

Please return the questionnaire in the envelope provided, no stamp required.

Good luck in the prize draw!

Prize draw terms and conditions: All suitably completed entries received by 30th July 2005 will be entered into a cash prize draw. There will be one prize of £250 to be drawn on 30th September 2005. Only those aged 18 or over on 30th September 2005 will be eligible for the draw. (2) Only one entry per household. (3) All entries must reach the University of the West of England before July 30th 2005. (4) The winner will be notified by post.



University of the
West of England

Sharing your experiences of

Moving home and its consequences for your daily travel

**As a thank you for completing this questionnaire
we will enter you into a £250 prize draw**

To confirm that you are eligible to complete the questionnaire, firstly we would like to check the following: PLEASE TICK THE APPROPRIATE ANSWERS

Have you (or a member of your household) bought the home you currently live in?

Yes ☐

No ☐

Have you moved in to this home within the last 12 months?

Yes ☐

No ☐

Is the number of adults (18 years and over) living in your household two or less (not including lodgers)?

Yes ☐

No ☐

If you have answered '**Yes**' to all three previous questions then we would very much appreciate you completing the questionnaire and returning it to us. It's eleven pages have been designed to be easy to complete.

If you have answered 'No' to any of these questions then thank you for your time but we do not need you to complete the questionnaire.

If you have any queries, please contact Karen at the Centre for Transport & Society, UWE, on 0117 328 2894 or email karen2.stanbridge@uwe.ac.uk

Please turn over

Your household and your move

Q1: Please tell us who lives in your household, starting with yourself (do not include lodgers unless they had a significant role in helping you choose your current home).

Household Member	Age (years)	Sex	Has a driver's licence?	Occupation:
				(full time employed, part time employed, unemployed, retired, student, full time child care, other)
Yourself		m / f	y / n	
Adult 2		m / f	y / n	
Child 1		m / f	y / n	
Child 2		m / f	y / n	
Child 3		m / f		
Child 4		m / f		

Q2a: How many cars and vans are available in your household? PLEASE TICK ONE.

0 1 2 3 4+

b: Has household car/van availability or type, changed in any way with moving home (for example in terms of the number of vehicles or make/model of vehicles)?

Yes No

c: If 'yes', how has car/van availability changed, and why?

Q3: How far was your previous home from your current one? PLEASE SELECT ONE.

a: Yourself:

- ☐ Less than 1 mile

☐ 4-9 miles

☐ 16-30miles

☐ 51- 100miles
- ☐ 1-3 miles

☐ 10-15 miles

☐ 31-50 miles

☐ 100+miles

b: Adult 2 (if applicable)

- ☐ Same previous home as adult 1

☐ Less than 1 mile

☐ 4-9 miles

☐ 16-30miles

☐ 51- 100miles
- ☐ 1-3 miles

☐ 10-15 miles

☐ 31-50 miles

☐ 100+miles

Q4a: Before you considered moving, how well did you or anyone in your household know the area you are now living in (roughly 1 mile around your current home)? PLEASE CIRCLE ONE OF THE NUMBERS BELOW.

Not at all
1 2 3 4 Very well
5

b: Please explain how you or your household knew the area (roughly 1 mile around), before you considered moving to your current home. (eg lived there previously, friends in the area, have lived in the surrounding area, etc.)

Q5: What were the main reasons that prompted your household to think about moving home in the first instance? PLEASE TICK ALL THAT APPLY.

- ☐ To get on property ladder
- ☐ Separation from partner
- ☐ Marriage
- ☐ To be nearer work
- ☐ To be nearer a school
- ☐ New Children
- ☐ To move to a nicer area
- ☐ Bigger house wanted
- ☐ Retirement
- ☐ Job move
- ☐ Smaller house wanted
- ☐ Death of a partner
- ☐ To be nearer family
- ☐ Moving in with a partner
- ☐ For investment
- ☐ Increased income
- ☐ Planning for children

☐ Other, please explain:

Q6: What were your household's most important criteria when originally searching for your new home? PLEASE WRITE IN UP TO 5.

1:	4:
2:	5:
3:	

b: In how many different areas (approx. 1 mile around) of Bristol did you view potential properties? PLEASE TICK.

☐ 1 ☐ 2-3 ☐ 3+

Moving home and thoughts given to travel issues

This section splits the process of you moving home into a number of stages that you may have experienced, and asks about your thoughts on travel at each of these stages.

There is no suggestion that travel should have been thought about at any, or all of these stages – we are simply interested to learn how you thought about travel (or not) throughout the moving process.

Q7a: The following table introduces the stages and asks whether or not any travel issues (eg travel modes and journey distances), were considered at each stage. PLEASE TICK THE MOST APPROPRIATE BOX FOR EACH STAGE.

Stage	Were any travel issues <u>thought about</u> ?	Don't remember this stage		
1	....In <u>prompting</u> you and your household to think about moving home?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
2	....When deciding <u>what</u> you were looking for in a new home, your search criteria?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
3	....When identifying specific areas to search?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
4	....When viewing various potential properties (before a preferred choice had been found)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
5	....When deciding whether or not to place an offer on a property?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
6	....After having an offer accepted on your new home, but before moving in (perhaps planning future travel)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
7	....When moving and settling in to your new home?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
8	....After having lived in the new home for a while: rethinking and/or changing travel?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>

IF YOU HAVE SELECTED 'YES' TO ANY OF THESE QUESTIONS, PLEASE GO TO Q8.

Q7b: If you did not select 'yes' at all in Q7a above, can you tell us why you did not think about travel at any point during your move?

NOW PLEASE GO TO Q12 (ON PAGE 7)

Q8. This is the most important part of the questionnaire, so please think carefully about your answers! For each of the stages in the previous question please try to think about what specific travel issues were on your mind and provide details in the boxes below. If your thoughts remained the same from one stage to the next, or throughout, then please describe them in the first stage considered and indicate this using the tick boxes for subsequent stages.

Please think about the following as well as any other issues:

- What journey purposes did you think about (work for adult 1, work for adult 2, school, shopping, city centre, leisure, etc.)?
- What travel mode/s did you intend to use/consider using or not using (car, bus, train, walk, cycle, etc.), and what did you think about associated with those modes (parking, bus routes, train stations etc.)?
- What travel times or distances did you have in mind, if at all?

Stage	What travel issues did you think about during your move? PLEASE TICK ONE BOX AND <u>WRITE DETAILS</u> AS APPROPRIATE FOR EACH STAGE.
Stage 1: The prompt for the move	<div><input type="checkbox"/> Travel issues were (part of) the prompt for the move (please explain how below)</div> <div><input type="checkbox"/> Didn't think about travel at this stage</div> <div>123</div>
Stage 2: Search Criteria. Deciding on what sort of property you were looking for.	<div><input type="checkbox"/> No change from previous stage</div> <div><input type="checkbox"/> Same as previous stage, plus (please outline and explain below)</div> <div><input type="checkbox"/> Changed from previous stage (please outline and explain below)</div> <div><input type="checkbox"/> Didn't think about travel at this stage (please try to explain why not)</div> <div>123</div>
Stage 3: When selecting areas to search.	<div><input type="checkbox"/> No change from previous stage</div> <div><input type="checkbox"/> Same as previous stage, plus (please outline and explain below)</div> <div><input type="checkbox"/> Changed from previous stage (please outline and explain below)</div> <div><input type="checkbox"/> Didn't think about travel at this stage (please try to explain why not)</div> <div>Continued on next page...</div>

Stage	..... travel issues did you think about during your move? PLEASE TICK ONE BOX AND <u>WRITE DETAILS</u> AS APPROPRIATE FOR EACH STAGE.
Continued from previous page: When selecting areas to search.	<div>123</div>
Stage 4: Viewing properties and areas	<div><input type="checkbox"/> No change from previous stage</div> <div><input type="checkbox"/> Same as previous stage, plus (please outline and explain below)</div> <div><input type="checkbox"/> Changed from previous stage (please outline and explain below)</div> <div><input type="checkbox"/> Didn't think about travel at this stage (please try to explain why not)</div> <div>123</div>
Stage 5: Before making an offer on a property.	<div><input type="checkbox"/> No change from previous stage</div> <div><input type="checkbox"/> Same as previous stage, plus (please outline and explain below)</div> <div><input type="checkbox"/> Changed from previous stage (please outline and explain below)</div> <div><input type="checkbox"/> Didn't think about travel at this stage (please try to explain why not)</div> <div>123</div>
Stage 6: Your offer accepted on a property, but before moving.	<div><input type="checkbox"/> No change from previous stage</div> <div><input type="checkbox"/> Same as previous stage, plus (please outline and explain below)</div> <div><input type="checkbox"/> Changed from previous stage (please outline and explain below)</div> <div><input type="checkbox"/> Didn't think about travel at this stage (please try to explain why not)</div> <div>123</div>

Stage	What travel issues did you think about during your move? PLEASE TICK ONE BOX AND <u>WRITE DETAILS</u> AS APPROPRIATE FOR EACH STAGE.
Stage 7: Moving and settling in.	<div><input type="checkbox"/> No change from previous stage</div> <div><input type="checkbox"/> Same as previous stage, plus (please outline and explain below)</div> <div><input type="checkbox"/> Changed from previous stage (please outline and explain below)</div> <div><input type="checkbox"/> Didn't think about travel at this stage (please try to explain why not)</div> <div>123</div>
Stage 8: After some time in the home	<div><input type="checkbox"/> No change from previous stage</div> <div><input type="checkbox"/> Same as previous stage, plus (please outline and explain below)</div> <div><input type="checkbox"/> Changed from previous stage (please outline and explain below)</div> <div><input type="checkbox"/> Didn't think about travel at this stage (please try to explain why not)</div> <div>123</div>

Q9: To what extent were the travel issues you have reported above 'on your mind' at each stage? Please go back and select 1-(a little) 2-(some) or 3-(a lot) for each stage that you thought about travel. PLEASE CIRCLE IN THE BOTTOM RIGHT CORNER OF EACH STAGE.

Q10: At which of the above stages were travel issues most 'on your mind'?
PLEASE WRITE IN ONE STAGE NUMBER.
Stage _____

Q11a: How well do you feel the stages as described in this questionnaire fitted with your experiences?

Not at all 1 2 3 4 5 Very well

b: Please briefly explain your answer:

The search for your new home

Q12a: What had the greatest influence on your decision making at each stage?

Here is an interesting bit! If you have 10 points influencing your decision making at each stage, how would they have been divided between issues to do with accessibility, the house and the neighbourhood? PLEASE SELECT FROM 0-10 FOR EACH BOX, TO ADD UP TO 10 FOR EACH STAGE AS SHOWN IN THE EXAMPLE, MORE POINTS INDICATING A GREATER SHARE OF THE INFLUENCE ON DECISIONS.

Stage	Accessibility (ease of access to workplace, shops, leisure, centre, etc.)	The House (style, number of rooms, garden, value for money, etc)	The Neighbourhood (desirability, friends in the area, safety, price range, etc.)
0: Example (3+5+2=10)	3	5	2
1: In prompting you and your household to think about moving home?			
2: When deciding what you were looking for in a new home, your search criteria?			
3: When identifying specific areas to search?			
4: When viewing various potential properties?			
5: When deciding whether or not to place an offer on a property?			
Overall for the moving process			

Q13: To what extent do you agree or not with the following statements?

PLEASE CIRCLE.

	Strongly disagree				Strongly agree
a: We could not find a home in Bristol that met all of the criteria that were important to us.	1	2	3	4	5
b: Affordability constrained our ability to achieve all of our search criteria in our new home.	1	2	3	4	5

Q14: What compromises (if any) did you make and why - both in deciding to buy a new home, and in the search and selection of your current home?

Q15a: How does your household currently travel for the following journeys?

PLEASE SELECT ONE MAIN MODE FOR EACH JOURNEY PURPOSE. DETAIL OF ALTERNATIVE MODES USED CAN BE ENTERED IN PART B. PLEASE ALSO ENTER AVERAGE JOURNEY TIME FOR THE MODE SELECTED.

Journeys		Main mode most often used PLEASE TICK ONE FOR EACH JOURNEY						Typical door to door journey time (minutes). PLEASE WRITE
		N/A	Car	Public transport	Walk	Cycle	Other	
Work (yourself)	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work (adult 2)	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Children to school	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Grocery shopping	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
City centre	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Leisure	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

b: If you sometimes travel by a different mode for any of the above journeys, or have experimented with different modes, please describe this below. PLEASE WRITE.

Q16: Having moved into your new home, how quickly did you settle into a routine for travel to the following destinations? PLEASE SELECT ONE FOR EACH JOURNEY PURPOSE.

	Not in a routine	Instantly	A week	2 weeks	A month	A few months	n/a
Your journey to work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adult 2's journey to work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Children to School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grocery shopping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q17: Have any other events not specifically related to moving house affected your travel since moving?

Yes ☐
No ☐

Please explain:

Q18: How has the number of miles travelled by members of your household changed since moving home?

Significantly
Decreased

12

No
change

34

Significantly
Increased

5

Q19: As a household, how satisfied are you with the availability of travel/accessibility options from your current home? Eg bus routes, parking, cycle routes, congestion etc.

Very Unsatisfied

12345

Very Satisfied

b: Please explain why you are/are not satisfied with the availability of travel options. – what would improve your household’s travel?

Q20: How have the travel options/modes available to your household been affected by your move? PLEASE SELECT ONE OPTION. **We now have.....**

More options available	<input type="checkbox"/>	Less options available	<input type="checkbox"/>
Different options but same amount	<input type="checkbox"/>	No change in amount of options	<input type="checkbox"/>

Q21a: How did your household travel for the following journeys before moving home? PLEASE TICK ONE MAIN MODE FOR EACH JOURNEY PURPOSE IN THE TABLE AND WRITE ALTERNATIVE MODES USED IN PART B. PLEASE ALSO ENTER AVERAGE JOURNEY TIME AND WHETHER THE DESTINATION IS THE SAME.

Journeys prior to moving		Mode most often previously used						Typical door to door journey time (minutes). PLEASE WRITE	Same location(s) currently visited? PLEASE CIRCLE
		PLEASE <u>TICK ONE</u> FOR EACH JOURNEY							
		n/a	Car	Public transport	Walk	Cycle	Other		
Work (yourself)	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
Work (adult 2)	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
Children to school	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
Grocery shopping	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
City centre	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n
Leisure	→	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		y / n

b: If you sometimes travelled by a different mode for any of the above journeys please describe this here.

Q22: Please indicate the extent to which you agree or disagree with each of the following statements. PLEASE CIRCLE.

	Strongly disagree					Strongly agree	
a: When living in my previous home, my travel to work was routine.	1	2	3	4	5	n/a	
b: Before a move was planned, alternatives for my journey to work were never considered.	1	2	3	4	5	n/a	
c: Before a move was planned I travelled to work in many different ways.	1	2	3	4	5	n/a	
d: Prior to moving my journey to work was habitual.	1	2	3	4	5	n/a	
e: When in my previous home, alternative ways to travel for household grocery shopping were never thought about.	1	2	3	4	5	n/a	
f: Travel is an important form of exercise for my household.	1	2	3	4	5	n/a	
g: Our household is dependent on the car.	1	2	3	4	5	n/a	
h: I find travelling by can be stressful sometimes.	1	2	3	4	5	n/a	
i: I am trying to use the car less.	1	2	3	4	5	n/a	
j: I would like to reduce my car use but there are no practical alternatives	1	2	3	4	5	n/a	
k: It is important to build more roads to reduce congestion.	1	2	3	4	5	n/a	
l: When I am getting ready to go out, I usually don't think about how I am going to travel, I just get in the car.	1	2	3	4	5	n/a	
m: I am not interested in reducing my car use.	1	2	3	4	5	n/a	
n: My household is happy to use the bus whenever the route is convenient.	1	2	3	4	5	n/a	
O: My household does not generally like to walk to places.	1	2	3	4	5	n/a	
P: People should be allowed to use their cars as much as they like, even if it causes damage to the environment.	1	2	3	4	5	n/a	
q: Travelling by car is enjoyable.	1	2	3	4	5	n/a	
r: We made a conscious decision to try to change our travel when we moved.	1	2	3	4	5	n/a	

**Well done, you have finished the main part of the survey.
Only some final details left.**

Final details

Q23: Please select the highest level of education completed by any member of your household: PLEASE SELECT ONE.

- ☐ Compulsory up to 16
- ☐ HNC
- ☐ Postgraduate Degree
- ☐ A-levels (or equivalent)
- ☐ Degree

Q24: Approximately how much did your current home cost?

- ☐ £0-80,000
- ☐ £81,000 – 140,000
- ☐ £141,000 –170, 000
- ☐ £501,00+
- ☐ £171,000 –230, 000
- ☐ £231,000 –300,000
- ☐ £301,000 –500,000

Q25: How many months ago did you move into your current home?
_____months.

Q26: What was the postcode of your previous home?

a: Yourself: _____

b: Adult 2 (if applicable and different to yours): _____

Q27: What is the postcode of your current home? _____

If you wish to be entered into the prize draw please provide some contact details below.
Your details will not be disclosed to anyone outside of the research team, or used for any other purpose than contacting you regarding this study.

Q28: Please provide the following contact details:

Name(s): _____

Address:

Contact telephone number: _____

Email: _____

Q29: Would you or your household be willing to be contacted either by letter/email or telephone to discuss further the issues covered in this questionnaire?

Yes ☐

No ☐

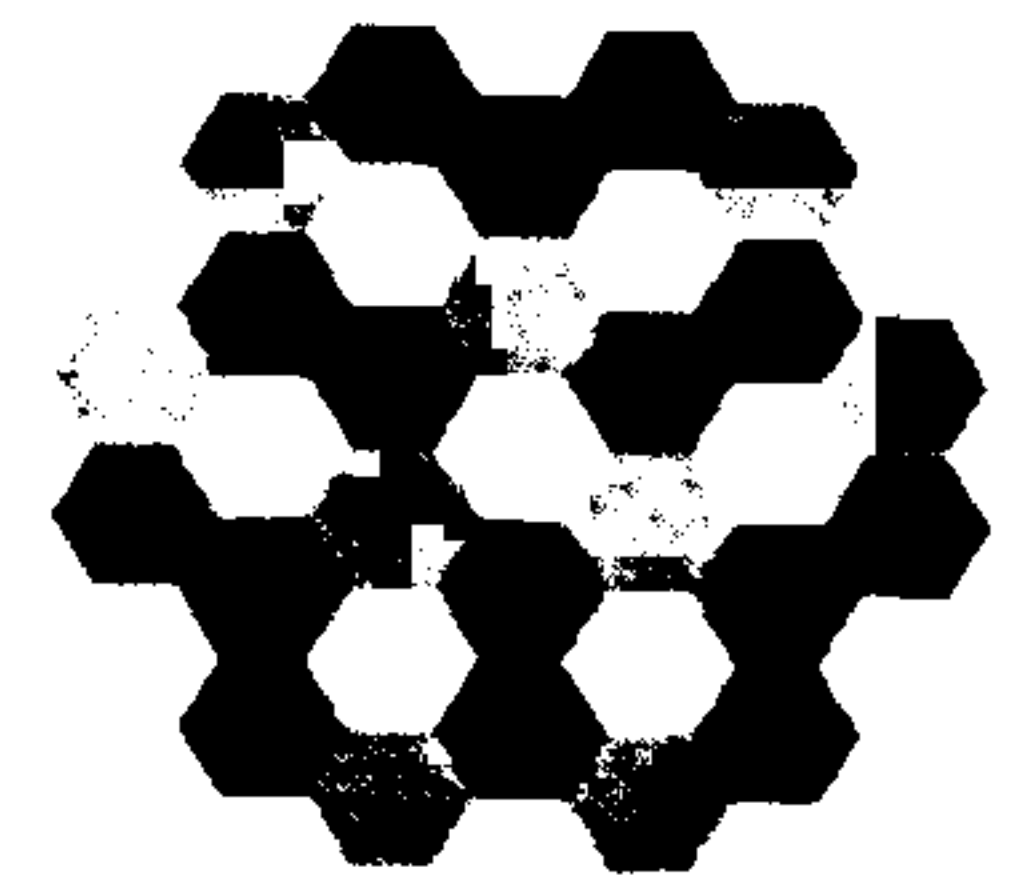
Thank-you very much for you participation – it is very much appreciated.

Please return the questionnaire in the envelope provided, no stamp required.

Good luck in the prize draw!

Prize draw terms and conditions: All suitably completed entries received by 11th November 2005 will be entered into a cash prize draw. There will be one prize of £250 to be drawn on 30th November 2005. Only those aged 18 or over on 11th November 2005 will be eligible for the draw. (2) Only one entry per household. (3) All entries must reach the University of the West of England before November 11th 2005. (4) The winner will be notified by post.

Head Office



Our ref: 237/307/110A – S Kay

Dear Sir/Madam

I am writing to ask for your help. The Department for Transport is supporting research by the University of the West of England, Bristol, into the effect that moving house has on travel behaviour. As part of that research, the views of members of the public who have recently moved into a property in the Bristol area are being sought.

12 October
2005

To help with this, Land Registry has taken from its records the names of those in your area who have in the recent past applied to be registered as owners of a house or flat they have just bought.

Any information you are prepared to give will be treated in the strictest confidence. Neither names, nor addresses, nor other personal details will be identified in any report, nor will they be passed to any third party including any other government office or agency, other than the Department for Transport and their appointed researchers. Once the survey is complete, all personal information will be erased from the results.

Land Registry
Head Office
Lincoln's Inn
Fields
London
WC2A 3PH

If you are willing to help, please complete the enclosed questionnaire from the University and return it in the envelope provided.

If you do not wish to take part, you do not need to do anything. If so, I can assure you that you will not be contacted or bothered in any way.

If, before you reply, you would like any further information about this research, please telephone Karen on 0117-3282894 who will be happy to ring you back at a suitable time to answer any questions.

DX No 1098
London/Chan
cery Lane
WC2
[www.landregi
stry.gov.uk](http://www.landregistry.gov.uk)

Yours faithfully

Peter Collis
Chief Land Registrar and Chief Executive
Land Registry



CHARTER MARK



INVESTOR IN PEOPLE

Encs: Questionnaire
Pre-paid envelope

SURVEY RESPONSE RATES

The survey response rate of 20%, as cited in Chapter 7 is based on a number of assumptions, and occurrences, detail of which is presented more fully in this Appendix in order to provide transparency for the calculated rate.

In October 2005, 2000 questionnaires were distributed to residential properties in the city of Bristol that were registered as having changed ownership between July 2004 and April 2005. Not all of these would have been received by households eligible to respond to the survey. The participants of the questionnaire were required to:

- Own the property they lived in
- Have moved there within the previous 12 months
- Have no more than 2 adults (plus any children) resident in the household

Czaja, and Blair, (1996, p35) define response rate as ‘the number of eligible sample members who complete a questionnaire divided by the total number of eligible sample members.’ Therefore in order to calculate the response rate, the proportion of eligible recipients needs to be calculated. Unfortunately no data was collected on non-responding and non-eligible households. Detail of non-responding households was not possible to collect due to the Land Registry’s restrictions on not providing the addresses directly. In hindsight would have been beneficial to request those households willing to participate, but ineligible, to complete some detail and return it for a small reward. This might have allowed a better picture of the proportions of the non-response due to ineligibility. Approximately 10 surveys were returned with ineligibility highlighted by responses to the screening question (number of household members, or time since move), but no further detail was included as it had not been requested. Therefore an estimation of the proportion of the 2000 questionnaire recipients that were eligible to complete it needs to be calculated.

Firstly, as is often the case with a mail survey, a number of the envelopes were returned as addressee not at that residence. Fourteen were returned, but it is not possible to know how many did not reach their intended recipients but were not returned. Therefore an estimated twenty ‘addressee no longer at the residence’ questionnaires are removed from the 2000.

Secondly, only households with two or fewer adults (plus any children) were eligible. According to ONS (<http://www.statistics.gov.uk/cci/nugget.asp?id=1162>) 29 percent of households in the UK in 2005 were one person households, and 67 percent were one family

households (the remainder being multi-family or multi person households). Therefore 96 percent of the population are either in one person or one family households, so only 96% of the survey recipients are likely to be eligible for the survey on the basis of household structure. This corresponds with the 2005 SEH as reported in Chapter 7, that 4% of owner occupied households are multi-person. Therefore it is possible to say that only 96% of the recipients were likely to be in the correct household size to be eligible.

Finally, and most significantly for this particular study, was the combination of the requirement of participants having moved in the previous 12 months and delays before the final send out of the questionnaire. The questionnaire design, including piloting, took far longer than anticipated. Therefore by the time of the final send out, many of the address labels obtained by the Land Registry were for properties that had been bought outside of the 12 month timeframe, and so were not eligible. This was realised prior to the main send out, but it was not possible to refresh the addresses without doubling the cost of the Land Registry's involvement (which was likely to be significant). However the extent of the issue was not realised at this time as the calculations to be outlined below were not completed prior to the send out.

The Land Registry were contacted in May 2005 and were asked to locate the addresses of households that had bought their property from July 2004 onwards. At this time it was anticipated that the questionnaire would be ready for distribution in June 2005, so July 2004 was requested to allow for some leeway. Therefore the address labels were to households who had moved between July 2004 and April 2005 (those moved in May would not yet have been registered). However, the pilot went out in July 2005, and the main survey was finally distributed on 14th October 2005. Therefore the 2000 questionnaires sent out included households that had moved in July, August and September 2004, over the 12 months time limit. This problem was compounded when property sales in Bristol over the time period were finally examined – as rates of sales had been decreasing (see Table A 1). Therefore a far greater proportion of the survey recipients were potentially outside the required timescale than had been anticipated when the problem was first recognised.

Table A 1 Home sales figures for Bristol 2004-2005 (provided by Land Registry website)

	Total number of sales in postcodes BS1-16 (City of Bristol)	Percentage
Jul-Sept 04	3381	40.7%
Oct-Dec 04	2420	29.2%
Jan-March 05	1807	21.8%
April 05	684 (1/3*2051, April-June)	8.2%
Total sales	8292	100%

According to the figures in Table A 1 it was likely that up to 40% of the questionnaires had gone to homes that had moved over 12 months previously and were not eligible to complete the survey. Twenty one completed questionnaires were received from households that had moved outside the 12 month period (despite the screening question) in addition to the 229 eligible responses. These were discounted from the study.

The figures as outlined in this section can be combined as follows:

- 20 estimated unknown addresses, $2000-20=1980$.
- Only 60% of recipients having moved within the past 12 months, $1980*0.6=1188$
- Only 96% of recipient households likely to be of appropriate household size, $1188*0.96=1140.5$

Therefore the number of eligible recipients of the survey is estimated as 1141. A response of 229 eligible surveys therefore constitutes a response rate of 20.0%.

CODING SEARCH CRITERIA: A NOTE

This note details and provides explanations for the coding decisions taken for the open responses to the postal survey. When dealing with search criteria and property selection decisions too many possibilities exist to rely solely on closed response questions for an accurate picture. Therefore much of the data regarding influences on property selection were obtained through open answer responses, and it was necessary to code these responses. Clarification of these decisions is necessary in order to highlight any possible consequences of these decisions to the interpretation of results.

Regarding search criteria, participants were requested to list up to five of their most important search criteria when searching for their new home (Q6a in Appendix 7). Responses were coded into 96 separate search criteria, which for ease of use were further coded into twenty, more general criteria, as can be seen in Table 8.2. It was necessary for the ‘general’ categories to be either quite broad or very narrow, and broad was selected as providing most meaning. For example, responses included ‘size of rooms’, ‘number of rooms’ and ‘size’. It is not clear whether ‘size’ means size of rooms, or size of house (eg number of rooms) therefore it is necessary to either keep all three separate, or combine all three, as distinction into size of house and number of rooms is not possible.

Finally the search criteria were again categorised according to their relation to house, neighbourhood and travel criteria. Classification into these criteria presented two key areas of possible ambiguity, where the decisions taken require clarification in order to maintain transparency of the research. Firstly a large number of responses indicated merely ‘location’ or ‘area’. With such limited detail it is difficult to interpret whether this is location or area as regards the desirability of the area (neighbourhood), or as regards location in relation to work or the city centre for example (travel). Responses such as ‘amenities of location’, ‘shops’ or ‘school’ presented similar difficulties in determining their relevance to neighbourhood or accessibility. It was decided that any response containing reference to an amenity constituted a travel criterion due to the necessity to travel to reach that amenity if the relevant search criteria was not met. Ergo, it was decided that any reference to merely ‘location’ or ‘area’ constituted a neighbourhood criterion due to the lack of destinations to consider it travel related.

The second ambiguous criteria, ‘parking’ is included as a travel related consideration, however it is also a potentially ambiguous term as ‘on-street-parking’ could be considered a neighbourhood feature, and a ‘garage’ could be considered a feature of the property. Also ‘parking’ would not strictly be an ‘accessibility’ consideration (see discussion of the

differences between accessibility and travel in Chapter 3), as it does not affect access to services. Therefore it must be noted that inclusion of parking as a travel consideration (where it clearly belongs for the purposes of this study) precludes easy comparison of these findings to other studies examining accessibility. It would however be easy to separate the data if such an accurate comparison was necessary.

ATTITUDES TO CAR USE SEGMENTATION

This appendix details the employment within the survey of a measure of attitudes to car use which allows car users to be segmented into four attitude types. The attitude types were first developed by Anable (2002; 2005), with two further segments covering non car users. In the original measure over 100 Likert scale (1-5 rating) items were utilised. The responses were factor analysed and then cluster analysis was employed which resulted in 6 clusters. These were then profiled based upon the data collected within the survey in order to generate profiles. The profiles of the four car-user segments utilised within the current research are outlined below:

- *Die-Hard drivers* are firmly committed to their car, and think more roads should be built. They use the car without thinking, and have not tried and have no intention of reducing their car use.
- *Complacent car users* like travelling by car and do not find it stressful. They do not have anything against public transport, just no particular reason to change away from the car, and therefore no wish to change their travel behaviour.
- *Malcontented motorists* have a high desire to reduce car use as driving is found to be stressful. They however feel that they have no alternatives but to continue driving as no viable alternatives to the car are perceived to exist.
- *Aspiring environmentalists* also wish to reduce their car use as they feel that driving is bad for the environment and stressful for them. They have levels of travel overall, with both high car mileage and high use of other modes but attach a lot of importance in being environmentally friendly.

These segments were also utilised in a study of attitudes to car use in Scotland by Dudleston, Hewitt, Stradling, and Anable (2005). The measure has been further revised (Stradling; 2005; 2007) to reduced the number of attitude items required for segmentation to only 10.

A slightly modified version of these items were included in the questionnaire of the current research as it was anticipated that attitudes towards car use and travel would be likely to impact upon travel considerations over the course of a move¹. The items included are shown in Table A11.1. Items 1 to 9 are as recommended by Stradling (2005), although item 9 has been modified to apply to households as opposed to individuals. The item ‘it would be easy for me to reduce my car use’ was not included as space was limited and it was felt to replicate item number 3. Two further items were added: ‘my household is dependent on the car’; and

¹ A home move could also affect attitudes towards car use.

‘my household does not generally like to walk to places’. It was felt important to gain some idea of attitudes towards walking within the survey as these items were the only attitude measured incorporated.

Table A11.1: Attitude items used to segment the survey sample, and the percentage of each segment agreeing with the items.

	How strongly do you agree or disagree with the following statements?	MM (37%)	DD (19%)	AE (28%)	CC (15%)
1	I find travelling by car can be stressful sometimes	78.5%	57.1%	72.6%	2.9%
2	I am trying to use the car less	66.3%	21.4%	82.0%	15.2%
3	I would like to reduce my car use but there are no practical alternatives	68.4%	66.7%	21.3%	63.6%
4	It is important to build more roads to reduce congestion	8.5%	50.0%	3.2%	11.8%
5	When I am getting ready to go out, I usually don't think about how I am going to travel, I just get in the car	21.0%	57.1%	11.5%	79.4%
6	I am not interested in reducing my car use	6.2%	39.0%	4.9%	9.1%
7	People should be allowed to use their cars as much as they like, even if it causes damage to the environment	6.2%	45.2%	4.8%	9.1%
8	Travelling by car is enjoyable	23.5%	52.4%	18.0%	70.6%
9	My household is (not) happy to use the bus whenever the route is convenient	11.0%	47.5%	24.2%	32.4%
10	Our household is dependent on the car	84.0%	88.1%	8.1%	88.2%
11	My household does not generally like to walk to places	4.9%	14.6%	3.2%	11.8%
12	<i>Travel is an important form of exercise for my household</i>	33.3%	27.5%	72.1%	12.1%
13	<i>We made a conscious decision to try to change our travel when we moved.</i>	20.5%	10.0%	28.1%	6.3%
	Total n	82	42	62	34

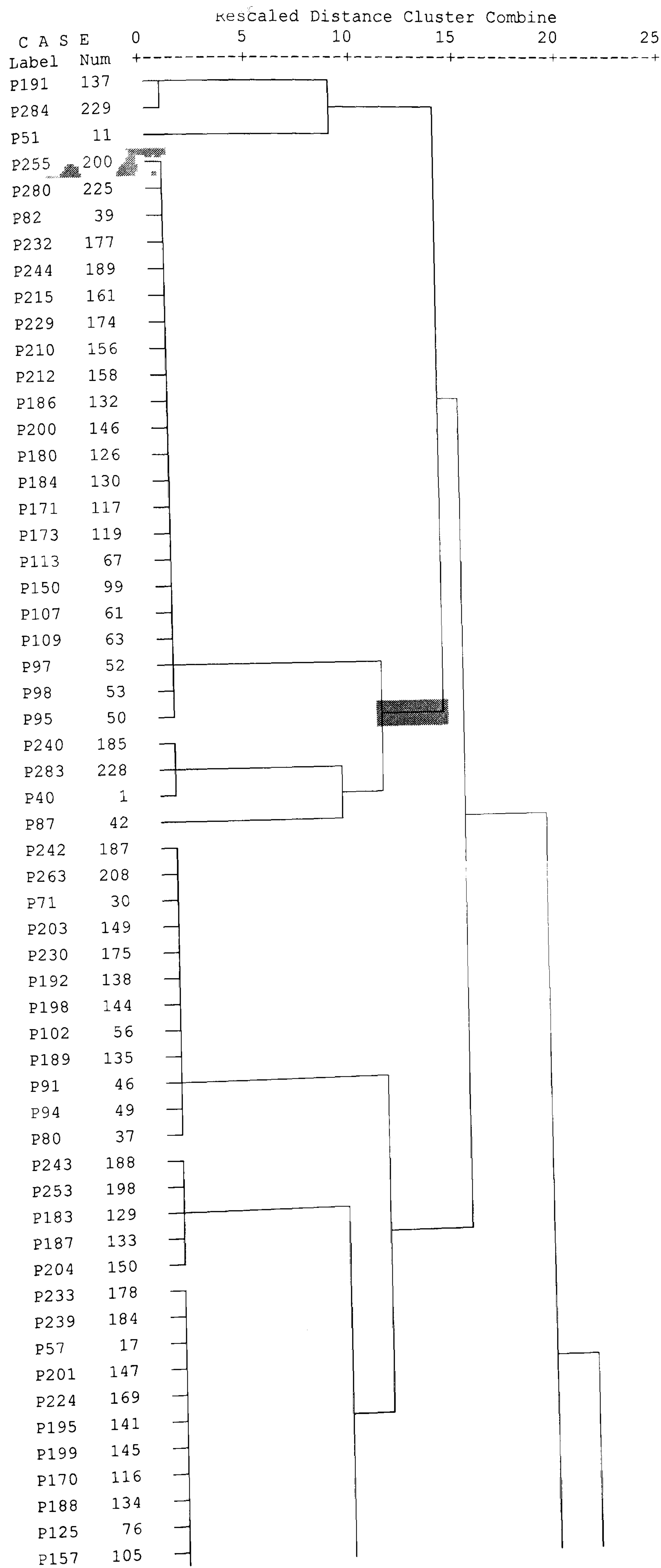
Responses to items 1 to 11 in Table A11.1, for all the car owning households within the survey respondents (96% of the respondent households), were used to complete a K-means cluster analysis, searching for 4 clusters. The two further items in Table A11.1 are included as an illustration of the attitude profiles.

The percentage of members of each cluster either agreeing or strongly agreeing with each of the attitude statements was then calculated and is also included in Table A11.1. This was utilised to assess whether the attitude segments as identified by Anable (2005) and Stradling (2005) were identifiable within the survey respondents, and if so to complete the segmentation of the respondents. Similar percentages were evident to those of Stradling (2005), therefore the four attitudes to car use types were clearly identifiable among the study participants – as indicated in Table A11.1.

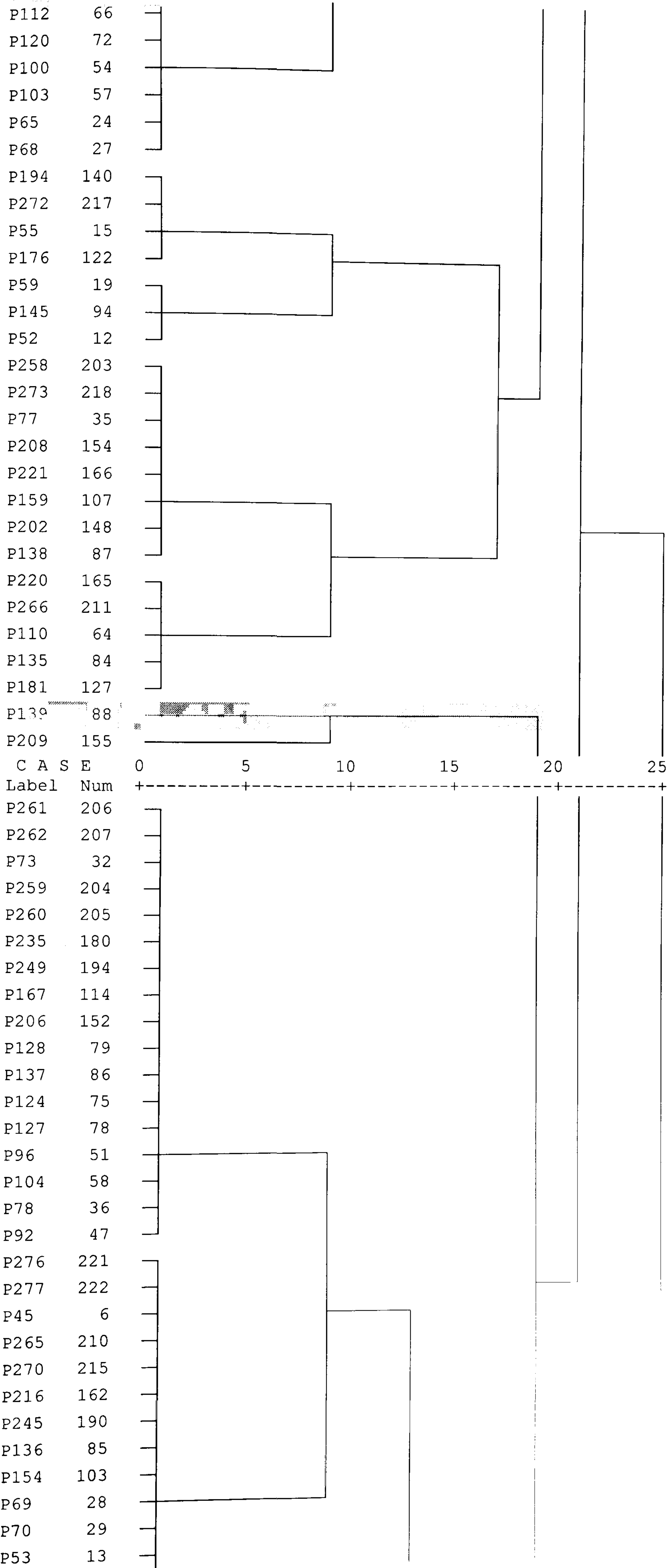
Travel consideration patterns for each of the eight RRT stages for all participants: (1 = definitely considered 0 = not definitely considered)

	Consideration Configuration	Frequency	Percent			Consideration Configuration	Frequency	Percent
1	00000000	33	14.4		43	01101110	1	.4
2	00000001	3	1.3		44	01110000	7	3.1
3	00000010	1	.4		45	01110001	2	.9
4	00000011	5	2.2		46	01110011	1	.4
5	00000100	1	.4		47	01110101	1	.4
6	00000110	1	.4		48	01111000	13	5.7
7	00001000	1	.4		49	01111001	5	2.2
8	00001101	1	.4		50	01111010	4	1.7
9	00001111	1	.4		51	01111011	2	.9
10	00010011	1	.4		52	01111100	1	.4
11	00011001	1	.4		53	01111101	2	.9
12	00011011	2	.9		54	01111110	2	.9
13	00100000	5	2.2		55	01111111	4	1.7
14	00100001	2	.9		56	10000000	2	.9
15	00100010	1	.4		57	10001001	1	.4
16	00100011	2	.9		58	10001010	1	.4
17	00100101	1	.4		59	10010000	1	.4
18	00101000	1	.4		60	10100001	2	.9
19	00101010	1	.4		61	10100010	1	.4
20	00110000	3	1.3		62	10101111	1	.4
21	00110001	3	1.3		63	10110000	1	.4
22	00110010	2	.9		64	10110001	1	.4
23	00110011	1	.4		65	10111111	2	.9
24	00110100	1	.4		66	11000000	1	.4
25	00110111	1	.4		67	11000101	1	.4
26	00111000	6	2.6		68	11001001	1	.4
27	00111011	1	.4		69	11010000	1	.4
28	00111100	1	.4		70	11011000	1	.4
29	00111110	3	1.3		71	11011010	1	.4
30	00111111	3	1.3		72	11100000	2	.9
31	01000000	1	.4		73	11100001	2	.9
32	01000011	1	.4		74	11100111	1	.4
33	01010000	1	.4		75	11110000	4	1.7
34	01011000	1	.4		76	11110001	1	.4
35	01011100	1	.4		77	11110010	5	2.2
36	01011111	1	.4		78	11111000	7	3.1
37	01100000	13	5.7		79	11111010	1	.4
38	01100001	1	.4		80	11111011	4	1.7
39	01100011	2	.9		81	11111100	1	.4
40	01100111	2	.9		82	11111110	5	2.2
41	01101000	2	.9		83	11111111	15	6.6
42	01101001	2	.9	Total			229	100.0

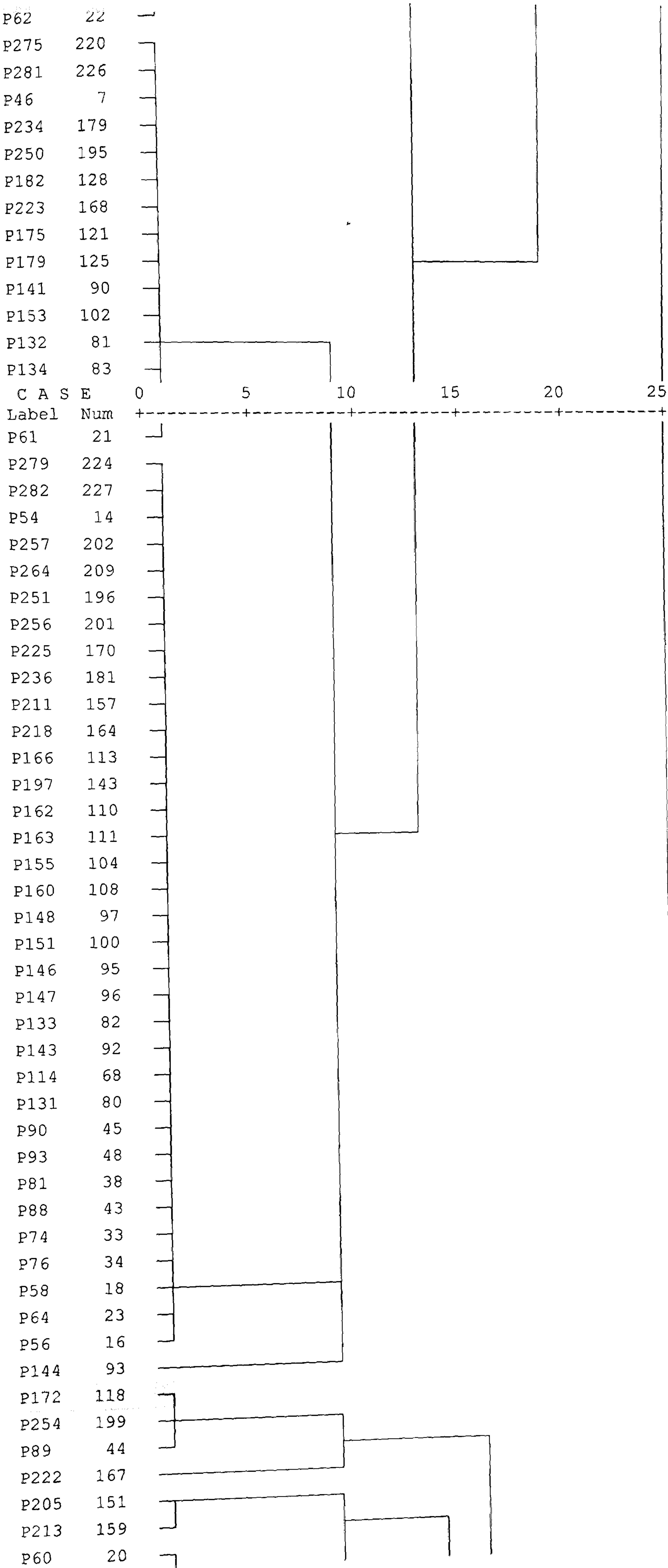
APPENDIX 13: DENDROGRAM OF CLUSTER ANALYSIS



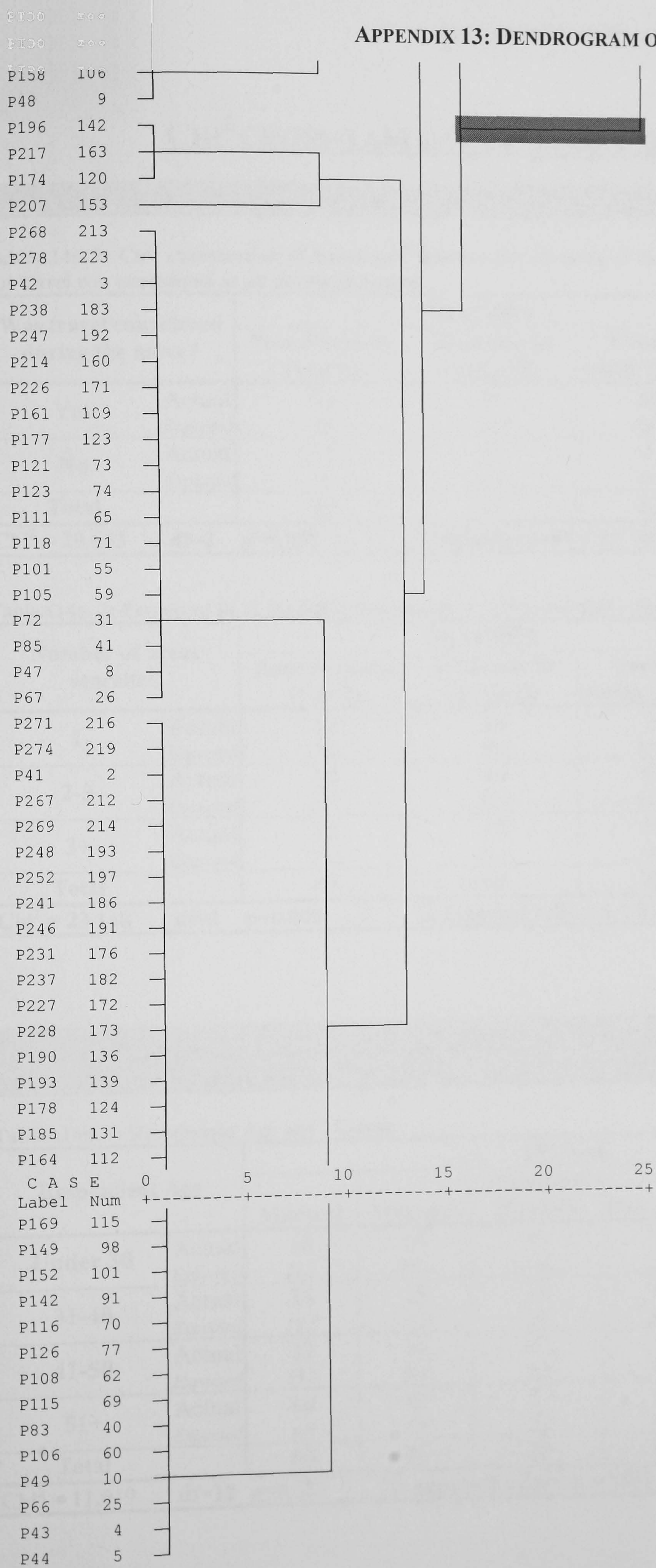
APPENDIX 13: DENDROGRAM OF CLUSTER ANALYSIS



APPENDIX 13: DENDROGRAM OF CLUSTER ANALYSIS



APPENDIX 13: DENDROGRAM OF CLUSTER ANALYSIS



CHI² CROSS-TABULATIONS FOR CHAPTER 8

CROSS-TABULATIONS FOR PERCEIVED FIT OF THE RRT FRAMEWORK

TableA14a. 1: Chi² examination of association between perceived fit of the RRT and whether or not travel was considered at all during the move

Was travel considered during the move?		Fit of RRT			Total
		Poor fit rating (1 or 2)	Moderate fit rating (3)	Good fit rating (4 or 5)	
Yes	Actual	32	68	88	188
	Expected	40	65.1	82.8	
No	Actual	11	2	1	14
	Expected	3	4.9	6.2	
Total		43	70	89	202
Chi ² = 29.643		df=2	p=0.000	% expected cells < 5 = 33%	Cramer's V =0.383

TableA14a. 2: Perceived fit of the RRT and number of areas searched – Spearman = 0.202

Number of areas searched		Fit of RRT			Total
		Poor fit rating (1 or 2)	Moderate fit rating (3)	Good fit rating (4 or 5)	
1	Actual	18	10	8	36
	Expected	7.8	12.5	15.6	
2-3	Actual	13	40	47	100
	Expected	21.7	34.8	43.4	
3+	Actual	12	19	31	62
	Expected	13.5	21.6	26.9	
Total		43	69	86	198
Chi ² = 23.148		df=2	p=0.000	% expected cells < 5 = 0%	Cramer's V =0.242

CROSS-TABULATIONS FOR HOUSEHOLD DEMOGRAPHICS – NOT SIGNIFICANT SO NOT INCLUDED IN CHAPTER 8.

TableA14b. 1: Respondent Age and TC-type

Respondent Age		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Under 30	Actual	18	16	5	9	23	71
	Expected	21.2	15.4	6.4	5.5	22.5	71.0
31-40	Actual	26	15	11	6	25	83
	Expected	24.8	18.0	7.5	6.4	26.3	83.0
41-50	Actual	12	11	3	2	16	44
	Expected	13.1	9.6	4.0	3.4	13.9	44.0
51+	Actual	10	6	1	0	6	23
	Expected	6.9	5.0	2.1	1.8	7.3	23.0
Total		66	48	20	17	70	221
Chi ² = 11.019		df=12	p=0.527	% expected cells < 5 = 25%		Cramer's V = n/a	

TableA14b. 2: Respondent sex against TC-type

Respondent Sex		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Male	Actual	39	27	12	9	38	125
	Expected	37.2	27.6	10.7	9.6	40.0	
Female	Actual	27	22	7	8	33	97
	Expected	28.8	21.4	8.3	7.4	31.0	
Total		66	49	19	17	71	222
Chi ² = 0.902		df=4	p=0.924	% expected cells < 5 = 0%			Cramer's V = n/a

TableA14b. 3: Household composition and TC-type

Household Composition		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Single adult	Actual	27	14	8	4	23	76
	Expected	22.2	17.0	6.6	5.9	24.3	
Single Parent	Actual	2	1	0	1	4	8
	Expected	2.3	1.8	.7	.6	2.6	
Couple	Actual	22	26	7	11	30	96
	Expected	28.1	21.5	8.3	7.5	30.7	
Family	Actual	13	8	4	1	13	39
	Expected	11.4	8.7	3.4	3.0	12.5	
Total		64	49	19	17	70	219
Chi ² = 10.635		df=12	p=0.560	% expected cells < 5 35%			Cramer's V = n/a

TableA14b. 4: Presence of children in the household and TC-type

Presence of children in the household		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Children	Actual	15	9	4	2	18	48
	Expected	14.1	10.7	4.3	3.6	15.2	
No children	Actual	51	41	16	15	53	176
	Expected	51.9	39.3	15.7	13.4	55.8	
Total		66	50	20	17	71	224
Chi ² = 2.032		df=4	p=0.730	% expected cells < 5 = 20%			Cramer's V = n/a

TableA14b. 5: Education Level and TC-type

Education level of most educated household member		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
A-levels/ HND	Actual	26	13	5	6	13	63
	Expected	18.6	14.1	5.7	4.8	19.8	
Degree	Actual	23	19	9	9	35	95
	Expected	28.1	21.3	8.5	7.2	29.8	
Post graduate	Actual	17	18	6	2	22	65
	Expected	19.2	14.6	5.8	5.0	20.4	
Total		66	50	20	17	70	223
Chi ² = 11.176		df=8	p=0.192	% expected cells < 5 = 13.3%			Cramer's V = n/a

CROSS-TABULATIONS FOR TABLE 8.6: TC-TYPE AND DETAILS OF THE MOVE.

TableA14c. 1: Distance of move and TC-type

Distance of move		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
<1	Actual	21	1	4	0	18	44
	Expected	13.1	9.6	4.2	3.3	13.8	44.0
1-3	Actual	26	16	3	7	30	82
	Expected	24.5	17.9	7.8	6.2	25.6	82.0
4-9	Actual	7	12	3	3	10	35
	Expected	10.5	7.6	3.3	2.7	10.9	35.0
10-99	Actual	7	11	7	3	3	31
	Expected	9.3	6.8	2.9	2.4	9.7	31.0
100+	Actual	2	6	3	3	5	19
	Expected	5.7	4.1	1.8	1.4	5.9	19.0
Total		63	46	20	16	66	211
Chi ² = 44.384 df=16 p=0.00 % expected cells < 5 = 36% Cramer's V = 0.229							

TableA14c. 2: Familiarity with the area moved to and TC-type

Familiarity with area moved to (prior to the move)		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Not at all	Actual	4	4	3	1	7	19
	Expected	5.6	4.2	1.7	1.4	6.0	19.0
A little	Actual	5	10	4	7	10	36
	Expected	10.7	7.9	3.2	2.7	11.5	36.0
Moderately	Actual	12	12	1	5	13	43
	Expected	12.7	9.4	3.9	3.3	13.7	43.0
Quite familiar	Actual	10	11	8	2	19	50
	Expected	14.8	11.0	4.5	3.8	15.9	50.0
Very familiar	Actual	35	12	4	2	22	75
	Expected	22.2	16.5	6.7	5.7	23.9	75.0
Total		66	49	20	17	71	223
Chi ² = 34.1 df=16 p=0.05 % expected cells < 5 = 36 % Cramer's V = 0.196							

TableA14c. 3: Was to be near work a prompt for the move and TC-type

Was to be nearer work a prompt for the move?		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Yes	Actual	2	14	8	1	3	28
	Expected	8.3	6.2	2.5	2.1	8.9	28.0
No	Actual	64	35	12	16	68	195
	Expected	57.7	42.8	17.5	14.9	62.1	195.0
Total		66	49	20	17	71	223
Chi ² = 35.798 df=4 p=0.000 % expected cells < 5 = 20 % Cramer's V = 0.401							

TableA14c. 4: Influence of accessibility criteria on housing choice and TC-type

Points (out of 10) attributed to the role of accessibility in housing choice relative to house & neighbourhood		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
0	Actual	4	1	0	2	0	7
	Expected	2.0	1.4	.6	.5	2.4	7.0
1	Actual	15	3	1	3	9	31
	Expected	9.1	6.3	2.7	2.4	10.4	31.0
2	Actual	22	11	6	4	17	60
	Expected	17.6	12.3	5.3	4.6	20.2	60.0
3	Actual	9	15	6	3	25	58
	Expected	17.0	11.9	5.1	4.5	19.5	58.0
4	Actual	3	4	1	2	6	16
	Expected	4.7	3.3	1.4	1.2	5.4	16.0
5-9	Actual	0	3	2	0	4	9
	Expected	2.6	1.8	.8	.7	3.0	9.0
Total		53	37	16	14	61	181
Chi ² = 34.284 df=20 p=0.040 % expected cells < 5 = 60% Cramer's V = 0.211							

TableA14c. 5: Was travel to work a top 5 search criteria and TC-type.

Was travel to work a top 5 search criteria?		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Yes	Actual	4	12	6	2	18	42
	Expected	12.4	9.4	3.8	3.2	13.3	
No	Actual	62	38	14	15	53	182
	Expected	53.6	40.6	16.3	13.8	57.7	
Total		66	50	20	17	71	224
Chi ² = 12.118 df=4 p=0.016 % expected cells < 5 = 20 % Cramer's V = 0.233							

TableA14c. 6: Was parking a top 5 search criteria and TC-type

Was parking a top 5 search criteria?		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Yes	Actual	16	6	2	0	17	41
	Expected	12.1	9.2	3.7	3.1	13	
No	Actual	50	44	18	17	54	183
	Expected	53.9	40.8	16.3	13.9	58	
Total		66	50	20	17	71	224
Chi ² = 9.127 df=4 p=0.058 % expected cells < 5 = 20 % Cramer's V = 0.202							

TableA14c. 7: Number of areas searched and TC-type

Number of areas searched		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
1	Actual	25	7	4	1	7	44
	Expected	12.8	9.8	4.0	3.4	14.0	44.0
2-3	Actual	26	23	11	9	43	112
	Expected	32.6	24.9	10.2	8.7	35.6	112.0
3+	Actual	13	19	5	7	20	64
	Expected	18.6	14.3	5.8	4.9	20.4	64.0
Total		64	49	20	17	70	220
Chi ² = 24.955 df=8 p=0.02 % expected cells < 5 = 20% Cramer's V = 0.238							

TableA14c. 8: Availability of suitable property and TC-type

Availability of property constrained my housing search....		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Disagree	Actual	51	24	13	9	43	140
	Expected	41.0	31.5	12.6	10.7	44.1	140.0
Neither	Actual	8	10	1	5	13	37
	Expected	10.8	8.3	3.3	2.8	11.7	37.0
Agree	Actual	6	16	6	3	14	45
	Expected	13.2	10.1	4.1	3.4	14.2	45.0
Total		65	50	20	17	70	222
Chi ² = 17.374 df=8 p=0.026 % expected cells < 5 = 27 % Cramer's V = 0.198							

TableA14c. 9: Stage at which travel was most considered and TC-type

Stage at which travel was most considered		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Stage 1	Actual	5	13	11	0	3	32
	Expected	9.7	7.3	2.5	2.5	10.0	32.0
Stage 2	Actual	5	6	2	1	7	21
	Expected	6.3	4.8	1.7	1.7	6.5	21.0
Stage 3	Actual	15	12	3	3	32	65
	Expected	19.7	14.8	5.1	5.1	20.3	65.0
Stage 4	Actual	1	6	0	1	12	20
	Expected	6.0	4.6	1.6	1.6	6.2	20.0
Stage 5	Actual	0	4	0	0	4	8
	Expected	2.4	1.8	.6	.6	2.5	8.0
Stage 6	Actual	0	1	0	0	1	2
	Expected	.6	.5	.2	.2	.6	2.0
Stage 7	Actual	4	3	0	5	2	14
	Expected	4.2	3.2	1.1	1.1	4.4	14.0
Stage 8	Actual	9	4	1	7	6	27
	Expected	8.2	6.2	2.1	2.1	8.4	27.0
None	Actual	26	0	0	0	0	26
	Expected	7.9	5.9	2.1	2.1	8.1	26.0
Total		65	49	17	17	67	215
Chi ² = 163.782 df=32 p=0.00 % expected cells < 5 = 60 % Cramer's V = 0.436							

TableA14c. 10: How well the RRT fitted the households circumstances and TC-type

How well did the RRT fit your move?		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Not at all	Actual	15	0	0	1	4	20
	Expected	4.6	5.0	2.0	1.6	6.8	20.0
A little	Actual	8	0	4	2	8	22
	Expected	5.0	5.5	2.2	1.8	7.5	22.0
Moderately	Actual	14	17	9	8	22	70
	Expected	16.0	17.4	7.1	5.7	23.8	70.0
Quite well	Actual	5	24	4	2	16	51
	Expected	11.6	12.7	5.2	4.1	17.3	51.0
Very well	Actual	3	8	3	3	17	34
	Expected	7.8	8.5	3.5	2.8	11.6	34.0
Total		45	49	20	16	67	197
Chi ² = 63.704 df=16 p=0.000 % expected cells < 5 = 36% Cramer's V = 0.284							

CROSS-TABULATIONS FOR TABLE 8.7: TC-TYPE AND HOUSEHOLD PRE-MOVE TRAVEL, AND TRAVEL ATTITUDES

TableA14d. 1: Household pre-move commute modes (both adults) and TC-type

Household pre-move commute modes (for both adults)		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
2 car users	Actual	15	15	3	3	18	54
	Expected	15.7	12.8	4.7	4.5	16.3	54.0
Single car user	Actual	30	10	5	3	10	58
	Expected	16.9	13.8	5.1	4.8	17.5	58.0
2 walk/ cyclists	Actual	3	2	2	0	5	12
	Expected	3.5	2.9	1.0	1.0	3.6	12.0
1 walker / cyclist	Actual	3	3	3	3	10	22
	Expected	6.4	5.2	1.9	1.8	6.6	22.0
2 PT users	Actual	1	3	1	0	0	5
	Expected	1.5	1.2	.4	.4	1.5	5.0
1 PT user	Actual	2	2	0	0	3	7
	Expected	2.0	1.7	.6	.6	2.1	7.0
Car-PT	Actual	2	5	3	3	8	21
	Expected	6.1	5.0	1.8	1.7	6.3	21.0
Car- walk/ cycle	Actual	4	8	0	3	6	21
	Expected	6.1	5.0	1.8	1.7	6.3	21.0
PT- walk/ cycle	Actual	0	1	1	2	2	6
	Expected	1.7	1.4	.5	.5	1.8	6.0
Total		60	49	18	17	62	206
Chi ² = 49.611 df=32 p=0.024 % expected cells < 5 = 68.8% Cramer's V = 0.245							

TableA14d. 2: Pre-move commute time (both adults) and TC-type

Household pre-move commute times		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Both under 30 minutes	Actual	12	12	2	8	20	54
	Expected	14.2	13.0	4.9	4.3	17.6	54.0
1 above, 1 below 30 mins	Actual	7	7	2	1	8	25
	Expected	6.6	6.0	2.3	2.0	8.1	25.0
Both above 30 minutes	Actual	0	8	5	2	8	23
	Expected	6.0	5.5	2.1	1.8	7.5	23.0
Single under 30 minutes	Actual	21	9	4	3	17	54
	Expected	14.2	13.0	4.9	4.3	17.6	54.0
Single over 30 minutes	Actual	6	6	3	0	4	19
	Expected	5.0	4.6	1.7	1.5	6.2	19.0
Total		46	42	16	14	57	175
Chi ² = 26.499 df=16 p=0.047 % expected cells < 5 = 48% Cramer's V = 0.195							

TableA14d. 3: Attitudes to car use segments and TC-type

Attitudes to car use segments		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Malcontent motorist	Actual	15	21	9	9	26	80
	Expected	23.8	18.2	7.1	6.3	24.6	80.0
Diehard driver	Actual	19	6	3	4	9	41
	Expected	12.2	9.3	3.6	3.2	12.6	41.0
Aspiring Environ'talist	Actual	12	15	4	3	25	59
	Expected	17.6	13.4	5.2	4.7	18.1	59.0
Complacent Car user	Actual	18	7	3	1	6	35
	Expected	10.4	8.0	3.1	2.8	10.7	35.0
Total		64	49	19	17	66	215
Chi ² = 26.012 df=12 p=0.011 % expected cells < 5 = 25% Cramer's V = 0.201							

CHI² EXAMINATIONS FOR CHAPTER 9: TRAVEL BEHAVIOUR

CROSS-TABULATIONS FOR TABLE 9.8: PRESENCE OR ABSENCE OF MODE CHANGE

Table A15a. 1: Distance of move and presence or absence of mode change

Distance of move		Travel Mode change from pre to post move			Chi ² = 21.595 df = 4 p= 0.000 % expected cells <5 = 0% Cramer's V = 0.317
		No changes to main travel mode	Some travel mode changed	Total	
<1	Actual	30	14	44	
	Expected	19.0	25.0	44.0	
1-3	Actual	38	45	83	
	Expected	35.9	47.1	83.0	
4-9	Actual	10	27	37	
	Expected	16.0	21.0	37.0	
10-99	Actual	12	20	32	
	Expected	13.8	18.2	32.0	
100+	Actual	3	16	19	
	Expected	8.2	10.8	19.0	
Total		93	122	215	

Table A15a. 2: Familiarity with area moved to and presence or absence of mode change

Pre-move familiarity with the area		Travel Mode change from pre to post move			Chi ² = 15.596 df = 4 p= 0.004 % expected cells <5 = 0% Cramer's V = 0.262
		No changes to main travel mode	Some travel mode changed	Total	
Not at all	Actual	7	12	19	
	Expected	8.3	10.8	19.0	
a little	Actual	9	29	38	
	Expected	16.5	21.5	38.0	
moderately	Actual	14	30	44	
	Expected	19.1	24.9	44.0	
quite well	Actual	26	26	52	
	Expected	22.6	29.4	52.0	
Very well	Actual	43	32	75	
	Expected	32.6	42.4	75.0	
Total		99	129	228	

Table A15a. 3: Number of areas in which properties were viewed and presence or absence of mode change

Number of areas in which properties were viewed		Travel Mode change from pre to post move			Chi ² = 4.720 df = 2 p= 0.094 % expected cells <5 = 0% Cramer's V = 0.145
		No changes to main travel mode	Some travel mode changed	Total	
1	Actual	25	20	45	
	Expected	19.2	25.8	45.0	
2-3	Actual	48	66	114	
	Expected	48.6	65.4	114.0	
3+	Actual	23	43	66	
	Expected	28.2	37.8	66.0	
Total		96	129	225	

Table A15a. 4: Whether travel issues were involved in prompting the move, and presence or absence of mode change

Were any travel issues involved in the prompt for the move?		Travel Mode change from pre to post move			Chi ² = 11.011 df = 1 p = 0.001 % expected cells <5 = 0% Cramer's V = 0.219
		No changes to main travel mode	Some travel mode changed	Total	
Yes	Actual	15	45	60	
	Expected	25.9	34.1	60.0	
No	Actual	84	85	169	
	Expected	73.1	95.9	169.0	
Total		99	130	229	

Table A15a. 5: Whether 'to be nearer work' was a prompt for the move, and presence or absence of mode change

Was to be nearer work a prompt for the move?		Travel Mode change from pre to post move			Chi ² = 9.269 df = 1 p = 0.002 % expected cells <5 = 0% Cramer's V = 0.202
		No changes to main travel mode	Some travel mode changed	Total	
Yes	Actual	5	24	29	
	Expected	12.6	16.4	29.0	
No	Actual	94	105	199	
	Expected	86.4	112.6	199.0	
Total		99	129	228	

Table A15a. 6: Whether to be nearer school was a prompt for the move, and presence or absence of mode change

Was to be nearer school a prompt for the move?		Travel Mode change from pre to post move			Chi ² = 6.697 df = 1 p = 0.010 % expected cells <5 = 0% Cramer's V = 0.171
		No changes to main travel mode	Some travel mode changed	Total	
Yes	Actual	2	14	16	
	Expected	6.9	9.1	16.0	
No	Actual	97	115	212	
	Expected	92.1	119.9	212.0	
Total		99	129	228	

Table A15a. 7: Attitude to car use segments, and presence or absence of mode change

Attitudes to car use segments		Travel Mode change from pre to post move			Chi ² = 24.594 df = 3 p = 0.000 % expected cells <5 = 0% Cramer's V = 0.334
		No changes to main travel mode	Some travel mode changed	Total	
Malcontent Motorist	Actual	29	52	81	
	Expected	34.6	46.4	81.0	
Diehard Drivers	Actual	31	11	42	
	Expected	17.9	24.1	42.0	
Aspiring Environment'ist	Actual	17	45	62	
	Expected	26.5	35.5	62.0	
Complacent Car-user	Actual	17	18	35	
	Expected	15.0	20.0	35.0	
Total		94	126	220	

APPENDIX 15: CHI² TABLES FOR CHAPTER 9: TRAVEL BEHAVIOUR

Table A15a. 8: Whether or not the household had made a conscious decision to change travel over the course of the move, and presence or absence of mode change

We made a conscious decision to change travel when we moved		Travel Mode change from pre to post move			Chi ² = 14.965 df = 1 p = 0.001 % expected cells <5 = 0% Cramer's V = 0.264
		No changes to main travel mode	Some travel mode changed	Total	
Disagree	Actual	66	57	123	% expected cells <5 = 0%
	Expected	53.5	69.5	123.0	
Neither	Actual	19	32	51	% expected cells <5 = 0%
	Expected	22.2	28.8	51.0	
Agree	Actual	8	32	40	Cramer's V = 0.264
	Expected	17.4	22.6	40.0	
Total		93	121	214	

Table A15a. 9: RRT stage at which travel issues were most considered, and presence or absence of mode change

RRT stage at which travel was most considered		Travel Mode change from pre to post move			Chi ² = 18.161 df = 8 p= 0.020 % expected cells <5 = 22% Cramer's V 0.287
		No changes to main travel mode	Some travel mode changed	Total	
Stage 1	Actual	11	24	35	Cramer's V 0.287
	Expected	15.6	19.4	35.0	
Stage 2	Actual	10	11	21	Cramer's V 0.287
	Expected	9.4	11.6	21.0	
Stage 3	Actual	26	39	65	Cramer's V 0.287
	Expected	29.0	36.0	65.0	
Stage 4	Actual	12	8	20	Cramer's V 0.287
	Expected	8.9	11.1	20.0	
Stage 5	Actual	2	6	8	Cramer's V 0.287
	Expected	3.6	4.4	8.0	
Stage 6	Actual	1	2	3	Cramer's V 0.287
	Expected	1.3	1.7	3.0	
Stage 7	Actual	6	9	15	Cramer's V 0.287
	Expected	6.7	8.3	15.0	
Stage 8	Actual	10	17	27	Cramer's V 0.287
	Expected	12.0	15.0	27.0	
none	Actual	20	6	26	Cramer's V 0.287
	Expected	11.6	14.4	26.0	
Total		98	122	220	

Table A15a. 10: RRT Travel Consideration Type and presence or absence of mode change

TC-type		Travel Mode change from pre to post move			Chi ² = 8.077 df = 4 p= 0.089 % expected cells <5 = 0% Cramer's V = 0.190
		No changes to main travel mode	Some travel mode changed	Total	
Minimal considerer	Actual	37	29	66	Cramer's V = 0.190
	Expected	28.9	37.1	66.0	
Maximal considerer	Actual	17	33	50	Cramer's V = 0.190
	Expected	21.9	28.1	50.0	
Prompted early planner	Actual	6	14	20	Cramer's V = 0.190
	Expected	8.8	11.3	20.0	
Post-move considerer	Actual	6	11	17	Cramer's V = 0.190
	Expected	7.4	9.6	17.0	
Non-prompted early planner	Actual	32	39	71	Cramer's V = 0.190
	Expected	31.1	39.9	71.0	
Total		98	126	224	

CROSS TABULATIONS FOR TABLE 9.9: CHANGE IN LEVEL OF CAR USE

Table A15b. 1: Distance of move and change in level of car use

Distance of move		Change in level of car use				Total
		Increase	Remain Low	Remain high	Decrease	
<1	Actual	6	13	15	10	44
	Expected	11.5	7.0	13.0	12.5	44.0
1-3	Actual	22	15	26	19	82
	Expected	21.5	13.0	24.1	23.4	82.0
4-9	Actual	9	0	14	14	37
	Expected	9.7	5.9	10.9	10.5	37.0
10-99	Actual	9	2	7	14	32
	Expected	8.4	5.1	9.4	9.1	32.0
100+	Actual	10	4	1	4	19
	Expected	5.0	3.0	5.6	5.4	19.0
Total		56	34	63	61	214
Chi ² = 32.558		df= 12	p=0.001	% expected cells <5= 10%		Cramer's V = 0.225

Table A15b. 2: Whether or not any travel related issues were involved in prompting the move and change in level of car use

Were any travel issues involved in prompting the move?		Change in level of car use				Total
		Increase	Remain Low	Remain high	Decrease	
Yes	Actual	19	4	9	28	60
	Expected	16.1	9.2	17.6	17.1	60.0
No	Actual	42	31	58	37	168
	Expected	44.9	25.8	49.4	47.9	168.0
Total		61	35	67	65	228
Chi ² = 19.887		df=3	p=0.000	% expected cells <5= 0%		Cramer's V = 0.295

Table A15b. 3: Whether or not to be nearer work was a prompt for the move, and change in level of car use

Was to be nearer work a prompt for the move?		Change in level of car use				Total
		Increase	Remain Low	Remain high	Decrease	
Yes	Actual	6	1	3	19	29
	Expected	7.8	4.5	8.6	8.2	29.0
No	Actual	55	34	64	45	198
	Expected	53.2	30.5	58.4	55.8	198.0
Total		61	35	67	64	227
Chi ² = 24.130		df=3	p=0.000	% expected cells <5= 12%		Cramer's V = 0.326

Table A15b. 4: Whether or not to get on the property ladder was a prompt for the move, and change in level of car use

Was to get on the property ladder a prompt for the move?		Change in level of car use				Total
		Increase	Remain Low	Remain high	Decrease	
Yes	Actual	22	23	26	26	97
	Expected	26.1	15.0	28.6	27.3	97.0
No	Actual	39	12	41	38	130
	Expected	34.9	20.0	38.4	36.7	130.0
Total		61	35	67	64	227
Chi ² = 9.200		df=3	p=0.027	% expected cells <5= 0%		Cramer's V = 0.201

Table A15b. 5: Whether or not the household had made a conscious decision to change travel over the course of the move, and change in level of car use

We made a conscious decision to change our travel when we moved...		Change in level of car use				Total
		Increase	Remain Low	Remain high	Decrease	
Disagree	Actual	32	18	49	24	123
	Expected	32.9	16.7	37.5	35.8	123.0
Neither	Actual	15	8	9	18	50
	Expected	13.4	6.8	15.3	14.6	50.0
Agree	Actual	10	3	7	20	40
	Expected	10.7	5.4	12.2	11.6	40.0
Total		57	29	65	62	213
Chi ² = 20.664		df=6	p=0.002	% expected cells <5= 0%		Cramer's V = 0.220

Table A15b. 6: Attitudes to car use clusters and change in level of car use

Attitudes to car use segments		Change in level of car use				Total
		Increase	Remain Low	Remain high	Decrease	
Malcontent Motorists	Actual	29	4	28	20	81
	Expected	22.6	10.0	24.8	23.7	81.0
Diehard drivers	Actual	7	3	23	8	41
	Expected	11.4	5.1	12.5	12.0	41.0
Aspiring Environment'st	Actual	15	19	1	27	62
	Expected	17.3	7.6	19.0	18.1	62.0
Complacent car-users	Actual	10	1	15	9	35
	Expected	9.7	4.3	10.7	10.2	35.0
Total		61	27	67	64	219
Chi ² = 61.995		df=9	p=0.000	% expected cells <5= 6%		Cramer's V = 0.307

Table A15b. 7: Stage of the RRT at which travel was most considered, and change in level of car use

RRT stage at which travel was most considered		Change in level of car use				Total
		Increase	Remain Low	Remain high	Decrease	
Stage 1	Actual	8	2	8	17	35
	Expected	8.9	5.4	10.7	9.9	35.0
Stage 2	Actual	6	2	4	9	21
	Expected	5.4	3.3	6.4	5.9	21.0
Stage 3	Actual	17	15	19	14	65
	Expected	16.6	10.1	19.9	18.4	65.0
Stage 4	Actual	2	8	5	5	20
	Expected	5.1	3.1	6.1	5.7	20.0
Stage 5	Actual	2	0	3	3	8
	Expected	2.0	1.2	2.4	2.3	8.0
Stage 6	Actual	2	0	1	0	3
	Expected	.8	.5	.9	.8	3.0
Stage 7	Actual	4	2	5	4	15
	Expected	3.8	2.3	4.6	4.2	15.0
Stage 8	Actual	14	4	4	4	26
	Expected	6.6	4.0	8.0	7.4	26.0
None	Actual	1	1	18	6	26
	Expected	6.6	4.0	8.0	7.4	26.0
Total		56	34	67	62	219
Chi ² = 61.126		df=24	p=0.000	% expected cells <5= 44%		Cramer's V = 0.305

Table A15b. 8: RRT Travel Consideration Type and change in level of car use

TC-type		Change in level of car use				Total
		Increase	Remain Low	Remain high	Decrease	
Minimal considerers	Actual	11	9	29	16	65
	Expected	16.6	10.2	19.2	18.9	65.0
Maximal considerers	Actual	15	3	11	21	50
	Expected	12.8	7.8	14.8	14.6	50.0
Prompted early planners	Actual	7	1	2	10	20
	Expected	5.1	3.1	5.9	5.8	20.0
Post-move considerers	Actual	6	3	5	3	17
	Expected	4.3	2.7	5.0	5.0	17.0
Non-prompted early planners	Actual	18	19	19	15	71
	Expected	18.1	11.1	21.0	20.7	71.0
Total		57	35	66	65	223
Chi ² = 31.116		df=12	p=0.002	% expected cells <5= 20%		Cramer's V = 0.216

CROSS-TABULATIONS FOR TABLE 9.12: CHANGES IN HOUSEHOLD
COMMUTE JOURNEY TIMES

Table A15c. 1: Household composition and change in household commute journey time

Household composition		Change in commute journey time				Total
		Decrease	1 increase 1 decrease	No change	Increase	
Single adult	Actual	23	15	0	16	54
	Expected	18.0	16.4	6.9	12.8	54.0
Single parent	Actual	2	1	0	1	4
	Expected	1.3	1.2	.5	.9	4.0
Couple	Actual	22	25	18	12	77
	Expected	25.7	23.3	9.8	18.2	77.0
Family	Actual	8	9	3	10	30
	Expected	10.0	9.1	3.8	7.1	30.0
Total		55	50	21	39	165
Chi ² = 21.464		df= 9	p=0.011	% expected cells <5= 31%		Cramer's V = 0.208

Table A15c. 2: Distance of move and change in household commute journey time

Distance of move		Change in commute journey time				Total
		Decrease	1 increase 1 decrease	No change	Increase	
<1	Actual	9	0	20	4	33
	Expected	11.4	4.0	7.6	10.1	33.0
1-3	Actual	15	11	10	26	62
	Expected	21.3	7.5	14.2	19.0	62.0
4-9	Actual	11	2	4	10	27
	Expected	9.3	3.3	6.2	8.3	27.0
10-99	Actual	13	3	1	6	23
	Expected	7.9	2.8	5.3	7.0	23.0
100+	Actual	6	3	1	2	12
	Expected	4.1	1.5	2.8	3.7	12.0
Total		54	19	36	48	157
Chi ² = 49.190		df= 12	p=0.000	% expected cells <5= 35%		Cramer's V = 0.323

Table A15c. 3: Familiarity with area and change in household commute journey time

Prior familiarity with the area moved to		Change in commute journey time				
		Decrease	1 increase 1 decrease	No change	Increase	Total
Not at all	Actual	5	2	1	7	15
	Expected	5.0	1.9	3.5	4.5	15.0
A little	Actual	12	6	2	11	31
	Expected	10.4	4.0	7.3	9.3	31.0
Moderately	Actual	7	10	5	10	32
	Expected	10.7	4.1	7.5	9.6	32.0
Quite familiar	Actual	20	1	6	10	37
	Expected	12.4	4.8	8.7	11.1	37.0
Very familiar	Actual	13	3	26	13	55
	Expected	18.4	7.1	12.9	16.5	55.0
Total		57	22	40	51	170
Chi ² = 45.545		df= 12	p=0.000	% expected cells <5= 30%		Cramer's V = 0.299

Table A15c. 4: Whether any travel related issues were involved in prompting the move, and change in household commute journey time

Were any travel issues involved in the prompt for the move?		Change in commute journey time				
		Decrease	1 increase 1 decrease	No change	Increase	Total
Yes	Actual	21	7	4	13	45
	Expected	15.1	5.8	10.6	13.5	45.0
No	Actual	36	15	36	38	125
	Expected	41.9	16.2	29.4	37.5	125.0
Total		57	22	40	51	170
Chi ² = 9.074		df=3	p=0.028	% expected cells <5= 0%		Cramer's V = 0.231

Table A15c. 5: Whether to be nearer work was a prompt for the move, and change in household commute journey time

Was to be nearer work a prompt for the move?		Change in commute journey time				
		Decrease	1 increase 1 decrease	No change	Increase	Total
Yes	Actual	18	4	0	2	24
	Expected	8.0	3.1	5.6	7.2	24.0
No	Actual	39	18	40	49	146
	Expected	49.0	18.9	34.4	43.8	146.0
Total		57	22	40	51	170
Chi ² = 25.582		df= 3	p=0.000	% expected cells <5= 12%		Cramer's V = 0.388

Table A15c. 6: Whether the household had made a conscious decision to change travel, and change in household commute journey time

We made a conscious decision to change our travel behaviour when we moved.....		Change in commute journey time				
		Decrease	1 increase 1 decrease	No change	Increase	Total
Disagree	Actual	22	12	25	33	92
	Expected	29.5	12.2	22.0	28.4	92.0
Neither	Actual	12	5	10	8	35
	Expected	11.2	4.6	8.4	10.8	35.0
Agree	Actual	17	4	3	8	32
	Expected	10.3	4.2	7.6	9.9	32.0
Total		51	21	38	49	159
Chi ² = 11.820		df= 6	p=0.066	% expected cells <5= 17%		Cramer's V = 0.193

Table A15c. 7: RRT Travel Consideration Type and change in household commute journey time

TC-type		Change in commute journey time				Total
		Decrease	1 increase 1 decrease	No change	Increase	
Minimal considerers	Actual	10	5	18	11	44
	Expected	14.6	5.6	10.6	13.3	44.0
Maximal considerers	Actual	13	6	4	15	38
	Expected	12.6	4.8	9.2	11.4	38.0
Prompted early planners	Actual	10	2	1	2	15
	Expected	5.0	1.9	3.6	4.5	15.0
Post-move considerers	Actual	3	3	0	7	13
	Expected	4.3	1.6	3.1	3.9	13.0
Non-prompted early planners	Actual	19	5	17	15	56
	Expected	18.6	7.1	13.5	16.9	56.0
Total		55	21	40	50	166
Chi ² = 28.566 df= 12 p=0.005 % expected cells <5= 45% Cramer's V = 0.240						

Table A15c. 8: Stage of the RRT at which travel was most considered, and change in household commute journey time

RRT stage at which travel was most considered		Change in commute journey time				Total
		Decrease	1 increase 1 decrease	No change	Increase	
Stage 1	Actual	18	2	2	3	25
	Expected	8.3	3.2	5.9	7.6	25.0
Stage 2	Actual	6	3	4	2	15
	Expected	5.0	1.9	3.5	4.5	15.0
Stage 3	Actual	18	4	15	16	53
	Expected	17.7	6.7	12.5	16.1	53.0
Stage 4	Actual	3	2	3	9	17
	Expected	5.7	2.2	4.0	5.2	17.0
Stage 5	Actual	2	0	1	2	5
	Expected	1.7	.6	1.2	1.5	5.0
Stage 6	Actual	0	1	0	2	3
	Expected	1.0	.4	.7	.9	3.0
Stage 7	Actual	2	2	1	6	11
	Expected	3.7	1.4	2.6	3.3	11.0
Stage 8	Actual	3	6	3	7	19
	Expected	6.3	2.4	4.5	5.8	19.0
None	Actual	3	1	10	3	17
	Expected	5.7	2.2	4.0	5.2	17.0
Total		55	21	39	50	165
Chi ² = 53.867 df= 24 p=0.000 % expected cells <5= 61% Cramer's V = 0.330						

CROSS-TABULATIONS FOR TABLE 9.12: CHANGES TO OVERALL HOUSEHOLD DISTANCE TRAVELED

Table A15d. 1: Distance of move and change in overall household distance travelled

Distance of move		Effect of move on overall household distance travelled					Total
		Significantly decreased	Decreased	No change	Increased	Significantly increased	
<1	Actual	1	6	33	4	0	44
	Expected	5.1	6.8	19.6	9.2	3.3	44.0
1-3	Actual	5	13	37	21	7	83
	Expected	9.7	12.7	37.1	17.4	6.2	83.0
4-9	Actual	5	5	16	7	4	37
	Expected	4.3	5.7	16.5	7.7	2.8	37.0
10-99	Actual	10	7	4	8	3	32
	Expected	3.7	4.9	14.3	6.7	2.4	32.0
100+	Actual	4	2	6	5	2	19
	Expected	2.2	2.9	8.5	4.0	1.4	19.0
Total		25	33	96	45	16	215
Chi ² = 44.933		df=16	p=0.000	% expected cells < 5 = 40%		Cramer's V	0.229

Table A15d. 2: Number of areas in which property was viewed and change in overall household distance travelled

Number of areas in which property was viewed		Effect of move on overall household distance travelled					Total
		Significantly decreased	Decreased	No change	Increased	Significantly increased	
1	Actual	7	5	22	6	5	45
	Expected	5.8	6.8	19.6	9.2	3.6	45.0
2-3	Actual	12	21	50	30	1	114
	Expected	14.7	17.2	49.7	23.3	9.1	114.0
3+	Actual	10	8	26	10	12	66
	Expected	8.5	10.0	28.7	13.5	5.3	66.0
Total		29	34	98	46	18	225
Chi ² = 23.523		df=8	p=0.003	% expected cells < 5 = 7%		Cramer's V	0.229

Table A15d. 3: Whether any travel related issues were involved in prompting the move, and change in overall household distance travelled

Was any travel issue involved in prompting the move?		Effect of move on overall household distance travelled					Total
		Significantly decreased	Decreased	No change	Increased	Significantly increased	
Yes	Actual	15	7	16	15	7	15
	Expected	7.6	8.9	25.9	12.8	4.7	7.6
No	Actual	14	27	83	34	11	14
	Expected	21.4	25.1	73.1	36.2	13.3	21.4
Total		29	34	99	49	18	29
Chi ² = 17.476		df=4	p=0.002	% expected cells < 5 = 10%		Cramer's V	0.276

Table A15d. 4: Whether to be nearer work was a prompt for the move, and change in overall household distance travelled

Was to be nearer work a prompt for the move?		Effect of move on overall household distance travelled					Total
		Significantly decreased	Decreased	No change	Increased	Significantly increased	
Yes	Actual	15	5	6	2	1	29
	Expected	3.7	4.3	12.6	6.1	2.3	29.0
No	Actual	14	29	93	46	17	199
	Expected	25.3	29.7	86.4	41.9	15.7	199.0
Total		29	34	99	48	18	228
Chi ² = 47.812		df=4	p=0.000	% expected cells < 5 = 30%		Cramer's V	0.458

Table A15d. 5: Whether a job move was involved in prompting the residential move, and change in overall household distance travelled

Did a job move prompt the residential move?		Effect of move on overall household distance travelled					Total
		Significantly decreased	Decreased	No change	Increased	Significantly increased	
Yes	Actual	6	1	5	4	2	18
	Expected	2.3	2.7	7.8	3.8	1.4	18.0
No	Actual	23	33	94	44	16	210
	Expected	26.7	31.3	91.2	44.2	16.6	210.0
Total		29	34	99	48	18	228
Chi ² = 9.047		df=4	p=0.060	% expected cells < 5 = 40%		Cramer's V	0.199

Table A15d. 6: Whether to be nearer family was a prompt for the move, and change in overall household distance travelled

Was to be nearer family a prompt for the move?		Effect of move on overall household distance travelled					Total
		Significantly decreased	Decreased	No change	Increased	Significantly increased	
Yes	Actual	3	0	7	8	4	22
	Expected	2.8	3.3	9.6	4.6	1.7	22.0
No	Actual	26	34	92	40	14	206
	Expected	26.2	30.7	89.4	43.4	16.3	206.0
Total		29	34	99	48	18	228
Chi ² = 10.377		df=4	p=0.035	% expected cells < 5 = 40%		Cramer's V	0.231

Table A15d. 7: Whether a conscious decision had been taken to change household travel behaviour, and change in overall household distance travelled

We made a conscious decision to change travel when we moved		Effect of move on overall household distance travelled					Total
		Significantly decreased	Decreased	No change	Increased	Significantly increased	
Disagree	Actual	12	14	61	27	9	123
	Expected	16.7	18.4	52.3	25.9	9.8	123.0
Neither	Actual	5	10	23	9	4	51
	Expected	6.9	7.6	21.7	10.7	4.1	51.0
Agree	Actual	12	8	7	9	4	40
	Expected	5.4	6.0	17.0	8.4	3.2	40.0
Total		29	32	91	45	17	214
Chi ² = 20.349		df=8	p=0.009	% expected cells < 5 = 13%		Cramer's V	0.218

Table A15d. 8: RRT stage at which travel was most considered and change in overall household distance travelled

RRT stage at which travel was most considered		Effect of move on overall household distance travelled					
		Significantly decreased	Decreased	No change	Increased	Significantly increased	Total
Stage 1	Actual	14	6	8	5	2	35
	Expected	4.6	5.1	15.1	7.6	2.5	35.0
Stage 2	Actual	4	2	6	8	1	21
	Expected	2.8	3.1	9.1	4.6	1.5	21.0
Stage 3	Actual	7	10	35	11	2	65
	Expected	8.6	9.5	28.1	14.2	4.7	65.0
Stage 4	Actual	1	2	12	5	0	20
	Expected	2.6	2.9	8.6	4.4	1.5	20.0
Stage 5	Actual	1	1	3	3	0	8
	Expected	1.1	1.2	3.5	1.7	.6	8.0
Stage 6	Actual	0	0	1	1	1	3
	Expected	.4	.4	1.3	.7	.2	3.0
Stage 7	Actual	1	3	3	6	2	15
	Expected	2.0	2.2	6.5	3.3	1.1	15.0
Stage 8	Actual	0	4	8	8	7	27
	Expected	3.6	3.9	11.7	5.9	2.0	27.0
none	Actual	1	4	19	1	1	26
	Expected	3.4	3.8	11.2	5.7	1.9	26.0
Total		29	32	95	48	16	220
Chi ² = 77.693		df=32	p=0.000	% expected cells < 5= 69%		Cramer's V	0.297

Table A15d. 9: RRT Travel Consideration Type and change in overall household distance travelled

TC-type		Effect of move on overall household distance travelled					
		Significantly decreased	Decreased	No change	Increased	Significantly increased	Total
Minimal considerers	Actual	5	9	43	8	1	66
	Expected	8.0	10.0	28.9	14.1	5.0	66.0
Maximal considerers	Actual	8	3	16	16	7	50
	Expected	6.0	7.6	21.9	10.7	3.8	50.0
Prompted early planners	Actual	5	6	5	3	1	20
	Expected	2.4	3.0	8.8	4.3	1.5	20.0
Post-move considerers	Actual	0	5	2	6	4	17
	Expected	2.0	2.6	7.4	3.6	1.3	17.0
Non-prompted early planners	Actual	9	11	32	15	4	71
	Expected	8.6	10.8	31.1	15.2	5.4	71.0
Total		27	34	98	48	17	224
Chi ² = 48.074		df=16	p=0.000	% expected cells < 5 = 36%		Cramer's V	0.232

CROSS-TABULATIONS FOR TABLE 9.14: CHANGES TO (AND SATISFACTION WITH) MODE AVAILABILITY

Table A15e. 1: Distance of move and changes to mode options availability

Distance of move		Change mode options availability				Total
		More options available	Less options available	Different options but same amount	No change	
<1	Actual	6	4	4	30	44
	Expected	12.8	5.8	6.2	19.2	44.0
1-3	Actual	20	8	14	41	83
	Expected	24.2	10.9	11.7	36.2	83.0
4-9	Actual	11	5	5	16	37
	Expected	10.8	4.9	5.2	16.2	37.0
10-99	Actual	20	3	3	5	31
	Expected	9.0	4.1	4.4	13.5	31.0
100+	Actual	5	8	4	1	18
	Expected	5.2	2.4	2.5	7.9	18.0
Total		62	28	30	93	213
Chi ² = 53.505		df=12	p=0.000	% expected cells <5= 25%		Cramer's V = 0.289

Table A15e. 2: Familiarity with area moved to and changes to mode options availability

Prior level of familiarity with the area moved to		Change mode options availability				Total
		More options available	Less options available	Different options but same amount	No change	
Not at all	Actual	5	4	4	6	19
	Expected	5.6	2.4	2.9	8.2	19.0
A little	Actual	16	9	3	9	37
	Expected	11.0	4.6	5.6	15.9	37.0
Moderately	Actual	17	1	15	10	43
	Expected	12.7	5.3	6.5	18.5	43.0
Quite familiar	Actual	13	9	6	24	52
	Expected	15.4	6.4	7.8	22.3	52.0
Very familiar	Actual	16	5	6	48	75
	Expected	22.2	9.3	11.3	32.2	75.0
Total		67	28	34	97	226
Chi ² = 48.945		df=12	p=0.000	% expected cells <5= 15%		Cramer's V = 0.269

Table A15e. 3: The number of areas in which property was viewed and change to availability of mode option

Number of areas in which properties were viewed		Change mode options availability				Total
		More options available	Less options available	Different options but same amount	No change	
1	Actual	7	2	7	29	45
	Expected	13.5	5.7	6.7	19.2	45.0
2-3	Actual	36	10	15	51	112
	Expected	33.7	14.1	16.6	47.7	112.0
3+	Actual	24	16	11	15	66
	Expected	19.8	8.3	9.8	28.1	66.0
Total		67	28	33	95	223
Chi ² = 24.604		df=6	p=0.000	% expected cells <5= 0%		Cramer's V = 0.244

APPENDIX 15: CHI² TABLES FOR CHAPTER 9: TRAVEL BEHAVIOUR

Table A15e. 4: Was travel a prompt for the move, and changes to mode options availability

Was travel involved as a prompt for the move?		Change mode options availability				Total
		More options available	Less options available	Different options but same amount	No change	
Yes	Actual	24	6	11	19	60
	Expected	17.7	7.7	9.0	25.6	60.0
No	Actual	43	23	23	78	167
	Expected	49.3	21.3	25.0	71.4	167.0
Total		67	29	34	97	227
Chi ² = 6.479		df=3	p=0.091	% expected cells <5= 0%		Cramer's V = 0.169

Table A15e. 5: Whether to be nearer work was a prompt for the move, and change to mode options availability

Was to be nearer work a prompt for the move?		Change mode options availability				Total
		More options available	Less options available	Different options but same amount	No change	
Yes	Actual	19	0	5	5	29
	Expected	8.6	3.6	4.4	12.4	29.0
No	Actual	48	28	29	92	197
	Expected	58.4	24.4	29.6	84.6	197.0
Total		67	28	34	97	226
Chi ² = 23.780		df=3	p=0.000	% expected cells <5= 25%		Cramer's V = 0.324

Table A15e. 6: Whether a job move was involved in prompting the residential move, and changes to mode options availability

Did a job move prompt the residential move?		Change mode options availability				Total
		More options available	Less options available	Different options but same amount	No change	
Yes	Actual	6	4	5	2	17
	Expected	5.0	2.1	2.6	7.3	17.0
No	Actual	61	24	29	95	209
	Expected	62.0	25.9	31.4	89.7	209.0
Total		67	28	34	97	226
Chi ² = 8.719		df=3	p=0.033	% expected cells <5= 25%		Cramer's V = 0.196

Table A15e. 7: Had the household made a conscious decision to change travel, and changes to mode options availability

We made a conscious decision to change our travel behaviour when we moved home.....		Change mode options availability				Total
		More options available	Less options available	Different options but same amount	No change	
Disagree	Actual	20	17	16	68	121
	Expected	36.5	16.6	18.3	49.7	121.0
Neither	Actual	17	9	11	14	51
	Expected	15.4	7.0	7.7	20.9	51.0
Agree	Actual	27	3	5	5	40
	Expected	12.1	5.5	6.0	16.4	40.0
Total		64	29	32	87	212
Chi ² = 46.692		df=6	p=0.000	% expected cells <5= 0%		Cramer's V = 0.332

Table A15e. 8: RRT stage at which travel was most considered and changes to mode options availability

RRT stage at which travel was most considered		Change mode options availability				
		More options available	Less options available	Different options but same amount	No change	Total
Stage 1	Actual	17	3	4	11	35
	Expected	10.5	4.2	5.3	15.0	35.0
Stage 2	Actual	8	2	4	7	21
	Expected	6.3	2.5	3.2	9.0	21.0
Stage 3	Actual	16	11	8	30	65
	Expected	19.6	7.7	9.8	27.9	65.0
Stage 4	Actual	9	0	3	8	20
	Expected	6.0	2.4	3.0	8.6	20.0
Stage 5	Actual	3	0	2	3	8
	Expected	2.4	.9	1.2	3.4	8.0
Stage 6	Actual	0	0	1	2	3
	Expected	.9	.4	.5	1.3	3.0
Stage 7	Actual	4	4	2	4	14
	Expected	4.2	1.7	2.1	6.0	14.0
Stage 8	Actual	5	4	8	10	27
	Expected	8.1	3.2	4.1	11.6	27.0
None	Actual	4	2	1	19	26
	Expected	7.8	3.1	3.9	11.2	26.0
Total		66	26	33	94	219
Chi ² = 36.616		df=24	p=0.048	% expected cells <5= 56%		Cramer's V = 0.236

Table A15e. 9: RRT Travel Consideration Type and changes to mode options availability

TC-type		Change mode options availability				Total
		More options available	Less options available	Different options but same amount	No change	
Minimal considerers	Actual	14	7	10	35	66
	Expected	19.6	8.3	10.1	27.9	66.0
Maximal considerers	Actual	22	6	10	12	50
	Expected	14.9	6.3	7.7	21.2	50.0
Prompted early planners	Actual	5	3	3	8	19
	Expected	5.6	2.4	2.9	8.0	19.0
Post-move considerers	Actual	7	5	3	1	16
	Expected	4.8	2.0	2.5	6.8	16.0
Non-prompted early planners	Actual	18	7	8	38	71
	Expected	21.1	9.0	10.9	30.1	71.0
Total		66	28	34	94	222
Chi ² = 26.211		df=12	p=0.010	% expected cells <5= 25%		Cramer's V = 0.198

APPENDIX 15: CHI² TABLES FOR CHAPTER 9: TRAVEL BEHAVIOUR

Table A15e. 10: Had the household made a conscious decision to change travel, and satisfaction with mode options availability

Conscious decision to change?		Satisfaction with mode availability					Total
		Very un-satisfied	Un-satisfied	Moderately satisfied	satisfied	Very satisfied	
Disagree	Actual	19	16	44	35	9	123
	Expected	18.4	20.1	37.4	32.8	14.4	123.0
Neither agree or disagree	Actual	7	16	14	8	6	51
	Expected	7.6	8.3	15.5	13.6	6.0	51.0
Agree	Actual	6	3	7	14	10	40
	Expected	6.0	6.5	12.1	10.7	4.7	40.0
Total		32	35	65	57	25	214
Chi ² = 24.949 df=8 p=0.002 % expected cells < 5 = 7% Cramer's V= 0.241							

Table A15e. 11: RRT stage at which travel was most considered and satisfaction with mode options availability

RRT Stage at which travel was most considered		Satisfaction with mode availability			Total
		Low	Moderate	High	
Stage 1	Actual	8	7	20	35
	Expected	11.1	10.0	13.8	35.0
Stage 2	Actual	6	3	12	21
	Expected	6.7	6.0	8.3	21.0
Stage 3	Actual	25	19	21	65
	Expected	20.7	18.6	25.7	65.0
Stage 4	Actual	4	7	9	20
	Expected	6.4	5.7	7.9	20.0
Stage 5	Actual	1	2	5	8
	Expected	2.5	2.3	3.2	8.0
Stage 6	Actual	0	2	1	3
	Expected	1.0	.9	1.2	3.0
Stage 7	Actual	8	2	5	15
	Expected	4.8	4.3	5.9	15.0
Stage 8	Actual	14	11	2	27
	Expected	8.6	7.7	10.7	27.0
none	Actual	4	10	12	26
	Expected	8.3	7.4	10.3	26.0
Total		70	63	87	220
Chi ² = 34.147 df=16 p=0.005 % expected cells <5 = 30% Cramer's V = 0.279					

Table A15e. 12: Satisfaction with mode availability and number of areas viewed

Number of areas viewed		Satisfaction with mode availability					Total
		Very un-satisfied	Un-satisfied	Moderately satisfied	satisfied	Very satisfied	
1	Actual	9	6	8	12	10	45
	Expected	6.4	7.8	13.1	11.7	6.0	45.0
2-3	Actual	11	20	36	35	11	113
	Expected	16.1	19.7	32.8	29.3	15.1	113.0
3+	Actual	12	13	21	11	9	66
	Expected	9.4	11.5	19.2	17.1	8.8	66.0
Total		32	39	65	58	30	224
Chi ² = 13.511 df=8 p=0.095 % expected cells < 5 = 0% Cramer's V = 0.174							

CROSS-TABULATIONS FOR TABLE 9.17: EXAMINATION OF TC-TYPE AND CHANGES TO HOUSEHOLD TRAVEL

Many of the cross-tabulations that would appear in this section have already been provided in the previous sections of this appendix. Therefore they are not duplicated again here.

Table A15f. 1: TC-type and change in mode used to city centre

Did main mode used for travel to the city centre change?		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
No change	Actual	42	22	6	10	43	123
	Expected	36.3	28.2	8.7	9.4	40.3	123.0
Change	Actual	12	20	7	4	17	60
	Expected	17.7	13.8	4.3	4.6	19.7	60.0
Total		54	42	13	14	60	183
Chi ² = 10.197 df=4 p=0.037 % expected cells < 5 = 20% Cramer's V = 0.236							

Table A15f. 2: TC-type and both adults current commute time – *not sig.*

Household post-move commute times		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Both under 30 minutes	Actual	11	11	5	4	20	51
	Expected	15.0	10.9	4.3	4.0	16.8	51.0
1 above, 1 below 30 mins	Actual	7	12	4	5	12	40
	Expected	11.7	8.6	3.4	3.1	13.2	40.0
Both above 30 minutes	Actual	2	4	0	1	7	14
	Expected	4.1	3.0	1.2	1.1	4.6	14.0
Single under 30 minutes	Actual	27	10	5	3	21	66
	Expected	19.4	14.2	5.5	5.2	21.8	66.0
Single over 30 minutes	Actual	9	4	2	2	3	20
	Expected	5.9	4.3	1.7	1.6	6.6	20.0
Total		56	41	16	15	63	191
Chi ² = 19.271 df=16 p=0.255 % expected cells < 5 = 48% Cramer's V = n/a							

Table A15f. 3: TC-type and satisfaction with options availability and TC-type – *not sig*

Satisfaction with mode options availability		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Low	Actual	21	18	5	8	20	72
	Expected	21.3	16.1	6.5	5.5	22.6	72.0
Moderate	Actual	18	13	5	8	18	62
	Expected	18.3	13.9	5.6	4.7	19.5	62.0
High satisfaction	Actual	27	19	10	1	32	89
	Expected	26.3	20.0	8.0	6.8	27.9	89.0
Total		66	50	20	17	70	223
Chi ² = 10.589 df=8 p=0.226 % expected cells < 5 = 7% Cramer's V = n/a							

Table A15f. 4: TC-type and both adults current commute mode

Current commute mode		TC-type					
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	Total
2 car users	Actual	14	12	2	3	18	49
	Expected	14.2	11.2	3.5	4.2	15.9	49.0
Single car user	Actual	30	8	5	4	10	57
	Expected	16.5	13.0	4.1	4.9	18.5	57.0
2 walk/ cyclists	Actual	3	1	2	0	8	14
	Expected	4.1	3.2	1.0	1.2	4.5	14.0
1 walker / cyclist	Actual	5	4	2	2	14	27
	Expected	7.8	6.2	1.9	2.3	8.8	27.0
2 PT users	Actual	0	2	0	0	0	2
	Expected	.6	.5	.1	.2	.6	2.0
1 PT user	Actual	1	1	0	1	2	5
	Expected	1.4	1.1	.4	.4	1.6	5.0
Car-PT	Actual	3	8	0	3	4	18
	Expected	5.2	4.1	1.3	1.6	5.8	18.0
Car- walk/ cycle	Actual	1	9	3	3	7	23
	Expected	6.7	5.3	1.6	2.0	7.5	23.0
PT- walk/ cycle	Actual	0	0	0	1	1	2
	Expected	.6	.5	.1	.2	.6	2.0
Total		57	45	14	17	64	197
Chi ² = 60.624 df=32 p=0.002 % expected cells < 5 = 69% Cramer's V = 0.277							

Table A15f. 5: TC-type and average post-move commute time for both adults

Household average post-move commute time		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
1-20 minutes	Actual	34	14	7	5	27	87
	Expected	25.6	18.8	7.3	6.9	28.4	87.0
Over 20 mins.	Actual	22	27	9	10	35	103
	Expected	30.4	22.2	8.7	8.1	33.6	103.0
Total		56	41	16	15	62	190
Chi ² = 8.354 df=4 p=0.079 % expected cells < 5 = 0% Cramer's V = 0.210							

Table A15f. 6: TC-type and A1 work habit (as A1 is responding therefore it doesn't make sense to include A2).

Time taken for a routine to develop		TC-type					Total
		Minimal	Maximal	Prompted Planners	Post-Move	Non-prompted Planners	
Not in a routine	Actual	4	1	2	2	6	15
	Expected	4.1	3.4	1.4	1.1	4.9	15.0
Instantly	Actual	40	20	12	6	48	126
	Expected	34.8	28.8	11.4	9.6	41.4	126.0
A week	Actual	10	12	2	2	6	32
	Expected	8.8	7.3	2.9	2.4	10.5	32.0
2+ weeks	Actual	4	15	3	6	9	37
	Expected	10.2	8.5	3.3	2.8	12.2	37.0
Total		58	48	19	16	69	210
Chi ² = 27.545 df=12 p=0.006 % expected cells < 5 = 45% Cramer's V = 0.209							