DEVELOPMENT OF A MODEL FOR THE ASSESSMENT OF SUSTAINABLE HIGH STREET PERFORMANCE BASED ON STAKEHOLDER NEEDS AND EXPECTATIONS

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Table of abbreviations

AHP	Analytic Hierarchy Process
AMT	Action for Market Towns
ATCM	Association for Town and City Management
BBC	British Broadcasting Corporation
BDBC	Basingstoke and Dean Borough Council
BID	Business Improvement District
BIS	Department for Business, Innovation and Skills
BOS	Bristol Online Survey
BPF	British Property Federation
BRC	British Retail Consortium
BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Method
CABE	Commission for Architecture and the Built Environment
CCTV	Closed Circuit Television
CBA	Cost Benefit Analysis
COPRAS	Complex Proportional Assessment
CSR	Corporate Social Responsibility
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
DETR	Department for Environment, Transport and Regions
DHSAB	Digital High Street Advisory Board
DOE	Department of the Environment
DPT	Distressed Property Taskforce
DTCPT	Distressed Town Centre Property Taskforce
EEB	European Environmental Bureau
ELECTRE	Elimination and Choice Translating Reality
EU	European Union
FRI	Full Repairing and Insuring
GAIA	Geometrical Analysis for Interactive Aid
GBHS	Great British High Street
GP	General Practitioner
GYTCP	Great Yarmouth Town Centre Partnership
HM Government	Her Majesty's Government
ICLEI	International Centre for Local Environmental Initiatives
KPI	Key Performance Indicators
MADM	Multi-Attribute Decision Making
MAUT	Multi-Attribute Utility Theory
MCA	Multi Criteria Analysis
MCDA	Multi-Criteria Decision Aid
MCDM	Multiple Criteria Decision Making
MEW	Multiplicative Exponential Weighting
MODM	Multi-Objective Decision Making

NABMA	National Association of British Market Authorities
NEF	New Economics Foundation
NHS	National Health Service
NP	Neighbourhood Plan
NPPF	National Planning Policy Framework
NTIA	Night Time Industries Association
ODPM	Office of the Deputy Prime Minister
ONS	Office for National Statistics
OXIRM	Oxford Institute of Retail Management
PROMETHEE	Preference Ranking Organisation Method for Enrichment Evaluations
RMBC	Rotherham Metropolitan Borough Council
RSPH	Royal Society for Public Health
SAW	Simple Additive Weighting
SCP	Sustainable Cities Programme
SEU	Social Exclusion Unit
SPSS	Statistical Package for the Social Sciences
TCM	Town Centre Management
TOPSIS	Technique for Order Preference by Similarity to an Ideal Solution
TPM	Town Performance Matrix
TSO	The Stationary Office
UK	United Kingdom
UKGBC	UK Green Building Council
UN	United Nations
UNCED	United Nations Conference on Environment and Development
URBED	Urban and Economic Development Group
USA	United States of America
WPM	Weighted Product Model
WSM	Weighted Sum Model

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Abstract

The decline of high streets due to external factors, such as changing consumer trends, the growth of alternative forms of retail, changing economic conditions etc., is a topic that has received a great deal of political and media attention during the last decade. The performance of high streets is influenced by a multitude of complex and conflicting economic, environmental and social factors. However, despite this, existing performance measures continue to place emphasis on the retailing and economic functions of high streets. As consumer needs and expectations shift towards a preference for social and experiential high street features, the need to change the perception of high street success is increasingly important.

This study has identified statistically significant differences between importance scores allocated to high street assessment criteria by a range of high street stakeholder groups. These differences reveal the varying priorities of key stakeholders when it comes to high streets, and the subsequent need to account for the varied needs and expectations of stakeholders when it comes to assessing high street performance.

This research contributes new and original knowledge through the development and application of a high street sustainability assessment model that incorporates criteria weightings to reflect the needs and expectations of key high street stakeholders. Utilising Multiple Criteria Decision Making (MCDM) methods, the model comprises an all-inclusive set of weighted criteria that reflects a high street's economic, environmental and social functions. The model is applied to a practical example of eight English town centre high streets. The thesis presents the ranking of the high streets in terms of their relative sustainability and provides a step-by-step guide of how key stakeholders can apply the model for their own high street decision making needs.

The model can inform national and local high street policy, strategies and decision making, and provides benefits to a range of stakeholders, including national and local government, town centre managers, local businesses and local communities. The model output can inform recommendations and indicate areas of improvement that would be most beneficial to improved high street sustainability.

Keywords: High Street; High Street Performance; Sustainability; High Street Sustainability Model; Sustainable Communities; Multiple Criteria Decision Making

Chapter 1: Introduction

This chapter presents the research topic and specific research problem. Also presented is the research aim and the objectives that were identified in order to carry out the study.

1.1. Research problem

During the last decade there has been a noticeable increase in the amount of media and political attention on the issue of high street decline. Whilst decline has always been – to varying degrees – an element of the UK retail landscape, a combination of factors such as the growth in alternative forms of retail (e.g. out-of-town and online retail); evolving consumer preferences and behaviour; and the short-term and long-term effects following the 2008 economic recession, have placed greater pressures on traditional UK high streets and many have struggled to maintain their vitality and viability. Upon entering government in May 2010, a coalition government comprising Conservatives and Liberal Democrats, led by Prime Minister David Cameron, identified high street decline to be a key priority area. Within weeks of entering office, the Prime Minister and Deputy Prime Minister had commissioned retail expert and television personality Mary Portas with producing a review into the condition of British High streets. Following the publication of the Portas Review in December 2011, 27 towns dubbed 'Portas Pilots' were selected as suitable locations to test the document's recommendations. However, over subsequent years, reviews of the pilots reported mixed results, concluding that the pilots were very much a work-in-progress (BBC, 2013b; DCLG, 2013; The Daily Mail, 2014). Further government-led interventions included the 'High Street Renewal Fund and the 'High Street Innovation Fund'. However, again these initiatives were deemed to have produced mixed results (BBC, 2013a).

Existing literature recognises the implications that high street decline can have on ambitions towards greater sustainability. Decline has implications on a range of economic, environmental and social factors. For example: economically, decline can contribute to store closures, increased unemployment and reduced investment; environmentally, decline can lead to unmaintained and derelict properties, unmaintained public realm and green space, and increased vehicle use (where consumers opt to travel further to more desirable locations) (Whysall, 2011); and socially, decline can exacerbate social exclusion, attract antisocial and criminal behaviour, and contribute to poor diet and ill health.

Since the concept of sustainable development emerged, the UK government has been a key stakeholder, and numerous publications have been produced that set out policies and strategies for addressing unsustainable trends in the UK. The notion of creating holistic sustainable settlements - that address economic, environmental and social degradation and imbalance - have developed through concepts such as 'sustainable communities', 'liveability' and the 'transition movement'. Such concepts advocate the preservation of natural resources; the promotion of social equality and inclusion; and the promotion and support for resilient local economies. As community and commercial centres, high streets have the potential to contribute to greater social and economic sustainability. Additionally, due to the potential for the re-use of buildings, the potential for the development of brownfield sites, the lack of encroachment on the countryside and the centralised nature of high streets which facilitates the use of greener methods of transportation, the potential for high streets to contribute to improved environmental sustainability is also significant (Pigg, 1992).

Whilst high street decline has implications on a range of economic, environmental and social factors, existing high street performance measures continue to place emphasis on a high street's retail offering and economic success, with little recognition of its environmental and social roles (Griffiths et al., 2008; BIS, 2011; Coca-Stefaniak, 2013). Additionally, such measures fail to acknowledge the fast paced changes in consumer needs and expectations. A significant amount of research exists concerning the range of factors that influence high street performance and success. Such research highlights the wide range of economic, environmental and social factors that play a key role in addressing the needs and expectations of consumers, supporting the creation of successful and resilient centres, and contributing to more sustainable communities.

It is therefore evident that high street performance is a complex concept which extends beyond simply economic factors. Further, as consumer trends increasingly favour the social and experiential elements of high streets (Deloitte, 2013; Hart et al., 2014), the need to change traditional perceptions of high street performance is paramount to the future relevance and survival of the high street (Colliers, 2013; Knight Frank, 2017). New performance tools are therefore required which better reflect a high street's economic, environmental and social functions. Additionally, such tools should be reflective of evolving consumer needs and expectations and should inform useful recommendations that can help high streets become more sustainable and therefore more resilient.

Multiple criteria decision making (MCDM) methods are a suitable choice with which to develop more complex measures of high street performance that incorporate economic, environmental and social factors. MCDM methods enable decision making problems with multiple, conflicting criteria to be assessed. Their ability to assess problems with a large number of positively influenced, negatively influenced, quantitative and qualitative criteria make them particularly suitable for this research study.

1.2. Research aim and objectives

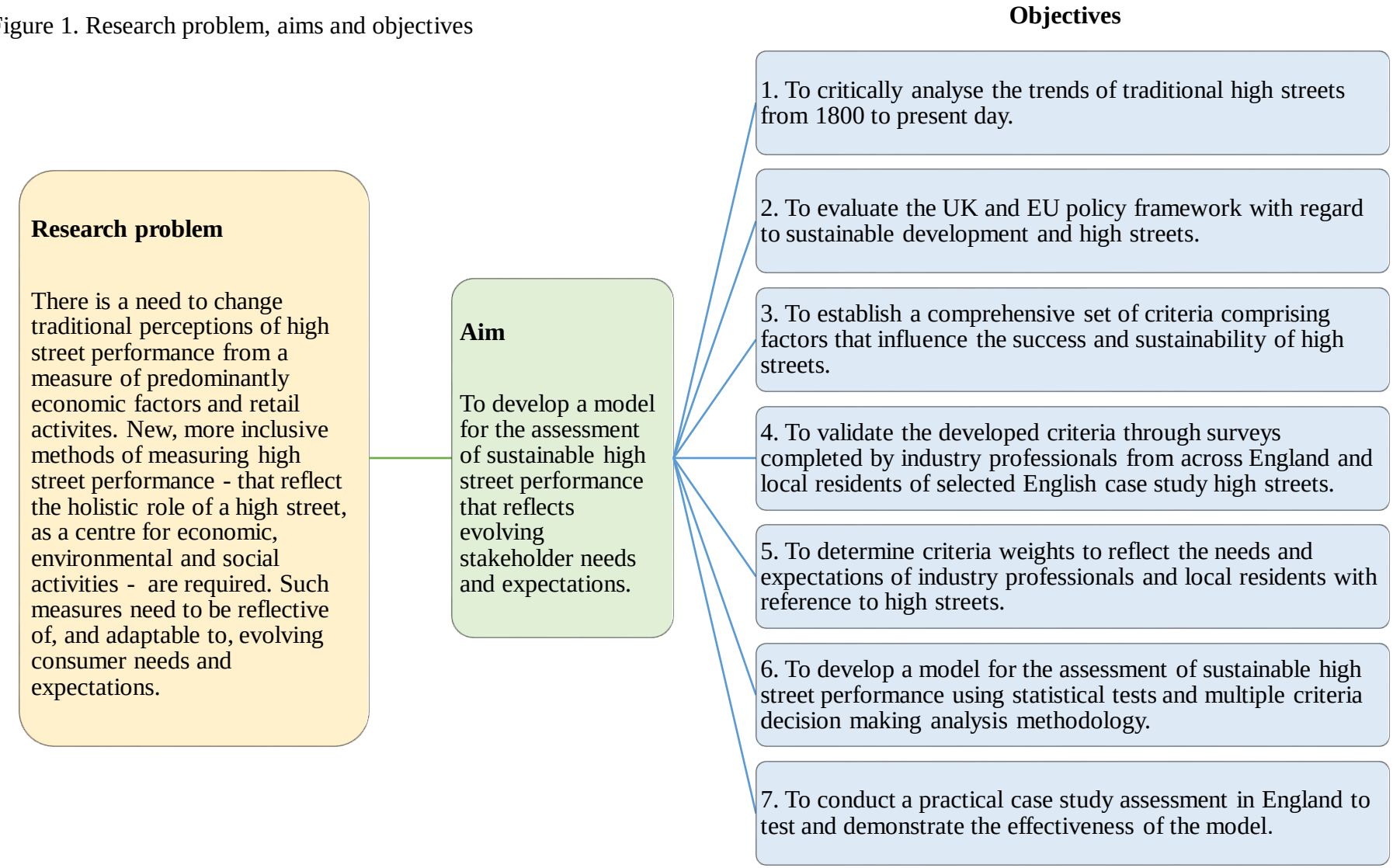
Aim: To develop a model for the assessment of sustainable high street performance that reflects evolving stakeholder needs and expectations.

Objectives:

1. To critically analyse the trends of traditional high streets from 1800 to the present day.
2. To evaluate the UK and EU policy framework with regard to sustainable development and high streets.
3. To establish a comprehensive set of criteria comprising factors that influence the success and sustainability of high streets.
4. To validate the developed criteria through surveys completed by industry professionals from across England and local residents of selected English case study high streets.
5. To determine criteria weights to reflect the needs and expectations of the industry professionals and local residents with reference to high streets.
6. To develop a model for the assessment of sustainable high street performance using statistical tests and multiple criteria decision making analysis methodology.
7. To conduct a practical case study assessment in England to test and demonstrate the effectiveness of the model.

Figure 1 schematically illustrates the association between the research problem, aim and objectives.

Figure 1. Research problem, aims and objectives



1.3. Beneficiaries of the research

Key beneficiaries of the proposed model include central and local government, town centre management teams, local businesses and local communities. The proposed model will enable stakeholders to compare and assess high streets against a broad set of criteria that reflect the economic, environmental and social functions of a high street, therefore providing an assessment of holistic performance and sustainability. Stakeholders will be able to use the model to compare the sustainability of multiple high streets or they may use it to compare the same high street at set intervals. The output of the model will help stakeholders to identify areas of improvement and will therefore inform the development of improvement strategies. Furthermore, as MCDM methods will enable the assessment criteria to be weighted in terms of relative significance, the model will also be able to indicate which improvement strategies would be most beneficial to improving high street sustainability, therefore helping stakeholders to make informed decisions on how to allocate resources.

If utilised at the national level the model could inform the development of national policies and strategies aimed at addressing high street decline and encouraging more sustainable communities. As the model will incorporate local consumer needs and expectations into the assessment, it could assist national policy makers in developing high street improvement strategies that are better aligned with evolving consumer trends. Additionally, by shifting the measure of success from predominantly economic factors to a broader measure of economic, environmental and social factors, the model could also help to inform strategies that are better aligned with sustainability agendas.

At the local authority level the model could inform the development of local plans and strategies, and local authority retail studies. The model could help local authorities to better align their local high street policies and strategies with sustainability agendas and changing consumer needs and expectations.

The model could also potentially be utilised by groups of local business owners and community groups. Those without the means to utilise the model themselves could still benefit from its application. The results of the model would benefit local businesses and community members through the implementation of recommendations derived from the results. Furthermore, local businesses and communities could assist in implementing any community/socially focused recommendations derived from the model.

The model will be adaptable to a range of high street comparisons regionally, nationally and globally.

1.4. Original knowledge contribution

This thesis provides an original contribution to knowledge through the development of an adaptable high street sustainability assessment model that encompasses a broad set of weighted criteria that reflects the needs and expectations of high street stakeholders.

This thesis challenges the traditional economically centric view of high street performance by drawing closer links between high street performance and broader sustainability issues. The research identifies a wide range of economic, environmental and social criteria that are influential to high street success and sustainability, and therefore provides a broader set of performance indicators with which to assess high street performance. The significance of the criteria to high street success – from the perspective of key stakeholders - is also presented, therefore enabling a more complex analysis of performance that reflects the needs and expectations of stakeholders. The incorporation of a more inclusive set of economic, environmental and social factors seeks to challenge perceptions of what defines a successful high street.

The research innovatively utilises MCDM methods for the first time for the purpose of measuring high street sustainability. The use of MCDM methods enables a wide range of quantitative, qualitative, positively influenced and negatively influenced criteria to be incorporated into the assessment model. Furthermore, the incorporation of consumer needs and expectations produces a model which is able to adapt to, and reflect, changing consumer trends. The flexibility of MCDM methods allows the model to be adapted for use by a variety of stakeholders in a variety of locations; the criteria involved and input data used are easily interchanged. The study therefore presents a novel tool for assessing high street performance and sustainability.

1.5. Thesis structure

Chapter 1: Introduces the research problem and the aims and objectives of the research, and defines the beneficiaries of the research and the original contribution to knowledge.

Chapter 2: The evolution of UK high street is discussed through a review of literature. External factors such as changing consumer trends, the growth in alternative forms of retail,

changing economic conditions and changing government policy and initiatives are discussed. The chapter also discusses definitions of the term ‘high street’.

Chapter 3: The concept of sustainable development and its links to high street performance is discussed through a review of literature. The definition of sustainability is discussed, as well as the evolution of the concept, nationally and globally. The chapter also presents and discusses existing high street performance measures and explains how the proposed model addresses the shortcomings of these existing measures.

Chapter 4: Discusses, through a review of literature, the influence of a range of factors on high street performance and sustainability.

Chapter 5: Discusses potential methods for the development of the high street sustainability assessment model. The development and administration of the surveys, and the methods used for analysing the data, are also outlined. The chapter also presents the selected eight English case study high streets, and discusses the reasoning for their selection in this study.

Chapter 6: Presents the criteria importance scores obtained through the surveys of professional and resident respondents. The implications of the statistically significant differences between the importance scores given by different respondent groups is also discussed.

Chapter 7: Presents and discusses the development of the high street sustainability model. The measurement tools used to obtain criteria values are explained and the application and comparative analysis of five MCDM methods is presented.

Chapter 8: The application of Complex Proportional Assessment (COPRAS) is discussed and the final model is presented. The results of the application of the model on real English case studies are presented and discussed, and a step-by-step guide on how the model can be utilised by key stakeholders is presented.

Chapter 9: Presents the key conclusions of the research, discusses the limitations encountered when undertaking the research, discusses the key beneficiaries of the model, and suggests how the research may be taken further.

Chapter 2: Review of Literature - the evolution of the high streets in the UK

2.1. Introduction

During the last decade the concept of high street decline has gained increased political and media attention. When the former coalition Government entered office in May 2010 the decline of the high street was a topic of particular importance and priority, and over subsequent years numerous reports, projects and incentives have been introduced in an attempt to combat the deterioration of centres.

Over the last 50 years changing consumer behaviour, spurred by advances in modern technology and cultural changes, has altered the way that people use the high street, and has driven the increasing demand for ease and convenience. Added to this the threats from alternative forms of retail (such as out-of-town and online retail) and the costs associated with occupying high street units (e.g. business rates and high street rents), many centres have struggled to find their place in the modern retail environment.

This chapter explores the evolution of UK high streets and town centre policy in England, and the factors that have led to the decline of centres. It should be noted at this point that there is no UK wide planning policy; each of the four countries that make up the UK operate varied planning systems with their own national planning policy guidance. Due to this, and other reasons (see section 5.17.1), the practical application of the model developed within this study focuses investigations on England. Therefore, whilst literature regarding the evolution of high streets does not typically distinguish between English, Welsh, Scottish and Northern Irish high streets (instead referring to "UK" or "British" high streets), as the investigations conducted within this study focus on English high streets, only literature regarding the English planning system has been explored in section 2.4.

2.2. The definition of 'high street'

According to the Oxford English Dictionary the term 'high street' is defined as:

> *"The main street of a town, especially as the traditional site for most shops, banks, and other businesses."*

However there is no common consensus as to a clear definition. The term is used to refer to centres of varying size: from a small, suburban shopping parade, to the core retail area of a large city centre, and therefore can cause confusion and ambiguity. As a result the term

is often quickly superseded by ‘town centre’ (BIS, 2011). In reality high streets encompass a wide range of retail locations (BRC, 2009), and therefore come in various shapes and sizes, and are present in many forms of settlement, from small villages to large conurbations. Larger settlements may even have two or more high streets. Therefore, it is important to clarify that in this thesis the term ‘high street’ refers to all high streets, whether they are located in a village, town or city etc. However, the primary research undertaken for this study focuses on high streets located within settlements which fall into the category of large towns and therefore the case study high streets are also periodically referred to as town centres. Whilst the grouping of settlements into hierarchical categories is often blurry, it is commonly accepted that large towns are populated by approximately 20,000 to 100,000 people, although there are exceptions to this.

2.3. The evolution of high streets and consumer trends

The Urban and Economic Development Group (URBED) (1994) observe how the modern high street developed due to the need for humans to come together for social interaction and protection. They describe how early examples of high streets developed in locations offering high levels of natural defence and access to water for both consumption and travel (URBED, 1994).

Dawson (1988) observes how high streets were born out of the industrial revolution, as retailing rapidly developed to provide consumers with the new industrial way of life. Prior to the industrial revolution most households purchased their everyday essentials from markets (Barker et al., 1966), as goods stocked by fixed shops were often expensive, luxury, and unaffordable to most. However, as the industrial revolution took hold, family owned, fixed retail units became more common and began dominating town centres, enticing trade away from market stalls (Alexander, 1970). Alexander (1970) describes how such shops were heavily dependent on trade from the local community, and it was during this period that parallels between retail location and custom were considered to be at their highest (Wild and Shaw, 1975).

Towards the latter half of the nineteenth century advances in modern transportation led to the emergence of nationally recognised department stores (Wild and Shaw, 1975), as consumers were able to travel further for more specialised goods. Whilst consumers were increasingly able to travel further distances, traditional high streets continued to play an important role in society due to their provision of local amenities which were accessible by

bicycle or on foot. However, a combination of cultural shifts, changing economic conditions and technological advances following the Second World War began to alter the way consumers used their local high streets. During the early 1950's rationing was still in effect and individuals – predominantly women – shopped daily, purchasing bread from the bakers, fish from the fishmongers, meat from the butchers etc. Shops were generally owned by local people and competition was restricted by Retail Price Maintenance which set fixed prices for the sale of goods. However, by 1954 rationing had come an end (BBC, no date), employment was high, wages were rising and there was increased availability of goods (Peston, 2013). The increase in the disposable income of many households led to the purchase of new home technologies such as refrigerators and washing machines. These technological advances enabled food to be stored for longer – meaning daily shopping was no longer a necessity – and meant that daily domestic chores took a fraction of the time that they had previously (ibid).

The economic changes that occurred during this time also led to the emergence of a new consumer group made up of teenagers and young adults with disposable income. British high streets consequently adapted, and record shops, cafés and fashion shops aimed at young people began to emerge (Peston, 2013). In 1964 Retail Price Maintenance was abolished, kick starting retail competition and the undercutting of prices, and opening the door to the growth of national supermarkets (BBC, 2014a).

Since the 19th century high streets have diversified to offer a broad range of services including gyms, estate agents, clinics, government services etc. (Carmona, 2015). Additionally, as people have become increasingly mobile, and have had access to increased disposable income, consumers have had much greater choice in how, when and where they conduct their shopping (ibid). This has meant that high streets can no longer rely on a fixed consumer base, and as a result, they have to be far more pro-active in attracting footfall (ibid).

Societal changes (e.g. private car ownership, the increase in women choosing to work and the increased time individuals spend working and/or commuting etc.) during the last 50 years have driven a growing demand for ease and convenience. As consumers have become increasingly time-strapped, they have sought retail solutions that reduce the need for lengthy outings and unforeseen delays. Consumers have also become more demanding in

terms of cost and what they deem to be good value for money. In response to these shifting trends alternative forms of retail developed, changing the retail landscape in Britain.

2.3.1. Retail decentralisation

In response to changing consumer trends and a shift in planning regulations the decentralisation of retail began to occur. Lowe (2000) observed how planned shopping centres originated from architect Victor Gruen. Gruen's vision led to the world's first indoor shopping centre, opened in Southdale, Minneapolis in 1956. The success and innovation of this development spurred similar projects across the USA (Frieden and Sagalyn, 1989; Wrigley and Lowe, 2002). It was during this time that Britain was undergoing mass reconstruction following the destruction caused by the Second World War. In the wake of bomb damaged neighbourhoods and urban centres, the government looked to American counterparts for inspiration, and in turn introduced shopping malls to the British consumer (Guy, 1994).

Whilst many shopping malls were built within town centre boundaries, an emerging trend saw the growth of retail centres constructed in decentralised locations. During the 1980's Margaret Thatcher's conservative government took a laissez-faire approach, relaxing planning policy in favour of economic growth. Griffiths et al. (2008) observed how during this period decentralised developments – particularly those in designated enterprise zones – were given free reign. This approach resulted in an abundance of proposals for new decentralised retail centres.

Schiller (1986) observed three significant waves that he believed to have contributed to retail decentralisation in the UK. The first occurred during the 1970's when supermarkets began to gradually move to out-of-town locations. The second involved the movement of bulky goods to out-of-town centres, and the third involved the movement of durable goods, which he believed was kick-started by Marks and Spencer's announcement to relocate in 1984 (URBED, 1994).

However, as Dawson and Dennis Lord (1985) observed, there were three key reasons why many durable retailers remained in favour of occupying town centre locations:

1. Both politicians and local traders were keen to maintain their local town centres as the main retail focus for the area.

2. Developments in America painted a bad picture of the impacts of out-of-town retail on traditional centres.
3. Many national chains had made significant investments in town centre property which they were feared would be devalued if the retail focus shifted to out-of-town locations.

The threat of decentralised retail on existing high streets was perceived to be so low during this time that Dawson and Dennis Lord (1985) noted how:

> *"…the weight of support in favour of town centre locations has been so strong that the argument between town centre and out-of-town has scarcely emerged as a serious issue among either the public or the professionals."*

However, counter to this lack of concern, decentralised development did have an effect of the vitality and viability of nearby existing centres, and it is documented that by the late 1980's the Oxford Institute of Retail Management had listed 40 potential new regional centres which together would have provided an additional 40 million square feet of out-of-town retail (OXIRM, 1987). It is therefore now considered fortunate that the economic downturn of 1990/1991, and the tightening up of planning regulations during the early 1990's (DOE, 1993, 1996; Guy, 1998; Wrigley, 1998), stifled many of these projects. Nevertheless, the developments that were completed (e.g. Meadowhall, Sheffield; The Trafford Centre, Manchester; Bluewater, Dartford etc.) continue to affect the vitality and viability of nearby high streets to this day, and retailers continue to extend their presence to out-of-town retail parks (Baldock et al., 2004; Retail Week, 2013).

The popularity of the out-of-town retail centre lies in the ease and convenience offered to the consumer. As private car ownership has continued to grow, the out-of-town shopping centre has responded by providing ample, on-site, free parking. Out-of-town centres also tend to offer a range of shopping and leisure facilities in one location, within close proximity to major highway networks. Many were also designed with the UK weather in mind, comprising covered walkways and/or indoor sections. From a business perspective this type of centre can offer benefits such as cheaper rents, built-for-purpose retail units – therefore reducing maintenance costs – and easy access for haulage vehicles.

Research undertaken by Hubbard (2002a, 2002b) suggests that the leisure facilities offered by out-of-town centres have become strong pull factors for evening footfall. In particular, the growth of casual dining in decentralised locations (Knight Frank, 2013) has provided stiff competition for town and city centre night-time economies. However, as a number of

authors argue (e.g. Wrigley and Lambiri, 2004; Hubbard, 2002b), this competition need not spell the end for centralised leisure economies, as they believe that decentralised leisure can provide a complementary service.

2.3.2. Retail-led regeneration

In response to the deindustrialisation and subsequent loss of manufacturing related employment in many towns and cities across the UK during the 1980's and 1990's, many local authorities viewed retail-led regeneration as a means of boosting local economies and creating new employment opportunities for local people (Raco, 2003). Consequently towns and cities fought against one another to secure sought after investments which could kick-start market-driven regeneration (Raco, 2003; Smith 2001). However, as Harvey (2000) highlights, as this competition between centres has become standard practice, priority has focussed on satisfying the needs of investors rather than the needs of the local community. Furthermore, as Raco (2003) points out, an increased focus on market-led regeneration can lead to centres becoming "*consumed and sanitised*", and as a result may exclude certain social groups.

Jackson (1998) argues that the regeneration and development of shopping and leisure centres 'domesticates' public space by controlling diversity, reducing the potential negative implications of social difference, and endorsing features of familiarity. Raco (2003) believes that this type of environment can make certain social groups (e.g. beggars, groups of young people, ethnic minorities etc.) appear threatening. He argues that spaces of consumption are focused on meeting the needs of wealthy visitors rather than local communities.

Whilst effective physical improvements to high streets can reinvigorate centres and improve reputation (Pal and Byrom, 2003), the drivers of such regeneration schemes can often represent a narrow collection of interests (De Nisco et al., 2008). Peel and Parker (2017) observe how state-market-civil relations are evolving, and governance models therefore need to adapt to better reflect the role of public and private sector stakeholders in the safeguarding of public realm and the development of resilient centres which will withstand future shocks. They suggest that local planning authorities be willing to collaborate and consult with a wider set of stakeholders in order to obtain information and insight of a richer and more contemporary calibre.

2.3.3. Homogeneity on the high street

A phenomenon spurred to some degree by the growing reliance on retail-led regeneration was the emergence of the 'clone town'. The term 'clone town' was coined by the New Economics Foundation's (NEF) report C*lone Town Britain* (2004) when describing the effects of the increased occupation of national chain stores in British high streets. Many large retail chains opted to increase the scale of their businesses by occupying more and more retail locations to further increase their consumer base. However, as a consequence, high streets up and down the country began to look like reproductions of one another. The NEF (2004) criticised the approach to town centre regeneration, citing the following quotation from architecture critic Jonathan Glancey:

> *"We have replaced our busy streets with hermetic office blocks, gated shopping precincts and bland chain stores that belong to councils and corporations but not to the people.… At the same time we have tended to strip our town and city centres of old street markets and family-run businesses and to pedestrianise what were once lively shopping streets, creating urban deserts, especially after dark."*
>
> (The Guardian, 2002)

In 2010 the NEF published a follow-up report in which it described such retailers as 'fair weather friends' - as soon as a centre fails to meet distinct corporate criteria, they pull out. Indeed the 2008 recession highlighted the vulnerabilities of high streets dependent on the occupation of national retailers. This, combined with the tendency for national and multi-national retailers to centralise their services - therefore making little contribution to the local economies in which their stores are located (SEU, 2001; NEF, 2004; NEF, 2010; Portas, 2011) -, highlights the importance of a diverse range of retail and services to the creation of a strong economic foundation. However, conversely, research for the Department of Business, Innovation and Skills (BIS, 2014) found that better performing centres tended to be more homogenous than those which underperformed; although they noted the importance of acknowledging that correlation does not necessarily imply causation. It is, however, important to note that the performance indicators used by BIS were heavily weighted towards measuring economic conditions, and therefore gave little consideration to social and environmental factors. They also reported that thriving centres, present within a strong economic context, tended to be more homogenous, which may support the NEF's aforementioned description of national retailers as 'fair weather friends'.

As retail trends have shifted to meet the demand for greater convenience through, for example: the emergence of large, national retailers; the extension of opening hours (particularly in the case of 24 hour supermarkets); and the growth of the supermarket in the convenience sector (e.g. Tesco Express and Sainsbury's Local) (Baron et al., 2001), independent shops have struggled to compete on a level playing field. Although, it should be noted that the overall impact of chain retailers on independent shops is unclear as some centres can react positively, while others may react negatively (Wrigley et al., 2009).

2.3.4. The supermarket

Baldock (2004) observed how the decline in smaller, more specialist food stores coincided with the growth in supermarket superstores during the 1990's. Whilst the growth in chain supermarkets has received criticism in line with the narrative of 'clone town Britain' and the death of the small, independent retailer, a growing number of academics have argued that corporate supermarkets can act as crucial anchor stores, aiding the retention of quality, a variety of shops and services, and also attracting new investment into the local area (DETR, 1998; Powe and Hart, 2008, 2009; Powe and Shaw, 2004; Thomas and Bromley, 2002, 2003; Wrigley et al., 2010).

Over recent years changing consumer behaviour has encouraged the trend for large supermarkets to open convenience stores in centralised high street locations. The emergence of this trend followed the 'town centre first' approach introduced in 1996 (CBRE, 2014). Carmona (2015) reports how the changing shopping habits of a "*time poor, cash rich*" consumer have spurred multi-national supermarkets to enter the convenience market and expand at a rapid rate, quickly stealing significant market share away from well-established convenience retailers such as Spar.

The growth in the number of convenience stores, along with the growth in online food shopping and rapid expansion of discount supermarkets (e.g. Aldi and Lidl), has had a huge impact on consumer behaviour, spurring more frequent 'top-up' shopping trips, and discouraging customers from making large, weekly food shops (CBRE, 2014). Griffiths et al. (2008) note the "*significant deleterious effect*" that the combination of retail decentralisation and the entry of large supermarkets into the convenience food sector has had on traditional high streets.

2.3.5. Town Centre Management and Business Improvement districts

The concept of Town Centre Management (TCM) first emerged in the 1980's and grew in popularity during the 1990's (Blackwell and Rahman, 2010). The role of TCM includes developing and implementing a clear vision for the high street; monitoring town centre health (BRC, 2009); maintaining the safety and cleanliness of high streets; improving transportation and accessibility; organising marketing/branding and events; integrating new amenities into the high street; integrating art and infrastructure into the high street; developing an experience in the high street (Blackwell and Rahman, 2010); and facilitating dialogue between the local authority, private sector stakeholders and the general public (Page and Hardyman, 1996). Furthermore, TCM is considered to be an effective tool for addressing excessive drinking, fighting and damage when developing a successful evening and night-time economy (Oc and Tiesdell, 1998; Stubbs et al., 2002; Ratcliffe and Flanagan, 2004; Whyatt, 2004), and it is generally felt that TCM schemes have significantly contributed to the improved quality and competitiveness of the centres in which they have been established (e.g. Jones et al., 2003; Lockwood, 1996).

A key role of TCM is to promote and facilitate partnerships between a variety of stakeholders (e.g. the public and private sectors, local businesses and local communities), however, as noted by Medway et al. (2000), key private sector stakeholders such as developers and property owners were observed to be playing a relatively minor role, and despite the emphasis placed on TCM in line with the 'town centre first' agenda, Medway et al. (1999) observed a lack of financial contributions made to TCM initiatives by '*the great majority of retailers*'. Therefore, the government's announcement of its intention to promote the creation of Business Improvement Districts (BIDs), in 2001, was considered to be an opportunity to address these issues (Jones et al., 2003).

BIDS first emerged in North America during the late 1960's as frameworks for creating strong partnerships, and as a means of attracting widespread financial contributions from the private sector. They were therefore considered to be a valuable tool for achieving vital and viable centres (Jones et al., 2003). There are now over 200 BIDS in operation across the UK, providing benefits (as cited by the businesses they represent) including: increased footfall; promotion of the local area; businesses having a voice in developing their local area; reduced business costs; providing opportunities for collaboration between neighbouring businesses; the retention of BID levy money for investment in the local area; assistance in dealing with

public bodies etc. (British BIDS, 2017). A growing number of English high streets are turning to BIDs as a means of building resilience against the growing pressures facing retail centres. High streets including Kings Heath in the West Midlands, and Newquay in Cornwall, credit their BIDs for range of positive high street improvements such as the promotion and implementation of events, improved cleanliness and safety, and coordinated marketing strategies. There is a general consensus that BIDs represent a successful concept due to their incitement of creativity within the private sector, efficient and effective problem solving of civic issues (Briffault 1999; Garodnick 2000; Levy 2001; Mitchell 2001), and promotion of new methods of collaborative governance (Hoyt and Gopal-Agge, 2007).

2.3.6. Online retail

Over the last 20 years, as the demand for ease and convenience has continued to grow, online retail has developed to become the fastest growing retail market in Europe and North America (Centre for Retail Research, 2016). Advances in technology have also changed the way we consume items. For example, the growth in digital downloads of music, television and film has contributed to the closure of national high street chains including Zavvi and Blockbuster. Additionally, as smart phones encompass more and more features, specific sectors of retail, such as photographic related retail has experienced decline.

In the past retailers required hundreds of high street stores up and down the country in order to achieve national recognition (Portas, 2011). However the internet reduces, if not, eliminates the need for 'bricks and mortar' retail, whilst still enabling online businesses to trade on a national and international basis. This has led to fears that, over time, the traditional high street may become obsolete. De Kare Silver (2011 cited in Portas, 2011 p.10) believes that this is "*gradually ceasing to be a bricks and mortar world*", and predicts that a 15% decrease in the sales of many high street stores could prevent retailers from even breaking even, let alone making a profit. Wrigley et al. (2002) and Burt and Sparks (2003) also acknowledge the potential for e-commerce to render traditional retail business models redundant. However, BIS (2010) point out that, despite the increasing trend in favour of online shopping, there are items that customers still prefer to purchase from a physical outlet. This is the view also taken by Weltevreden (2007) who observed four implications for the high street:

1. Substitution – when online shopping replaces physical shopping (i.e. in the case of music, film and other media).

2. Complementarity – when online retail enhances physical shopping (e.g. through online promotions encouraging customers to shop in-store).
3. Modification – when online retail alters physical shopping (e.g. by researching products online, a customer may reduce the need for physical browsing, therefore reducing the duration of a physical shopping trip).
4. Neutrality – when online retail does not affect physical shopping and vice-versa (this is more likely to be the case for items such as perfume, jewellery and shoes).

Additionally, research undertaken by Farag et al. (2007) found that frequent online searches led to more shopping trips compared with infrequent online searches, therefore suggesting that online and in-store shopping complement or generate each other, rather than substitute. However it should be noted that these studies are now over 10 years old and technology has further advanced in this time.

Many retailers are now taking advantage of new technology in order to increase their competitiveness in the fast changing retail environment. The majority of high street retailers also now operate online, often providing a wider selection of products than can be held in store (BIS, 2010). In contrast, some online business have opened up both temporary and permanent physical retail units on the high street (ibid). Burt and Sparks (2003) observe the relevance of the conflict-response model, outlined by Fink et al. (1971), in the case of e-commerce. They note how, initially, online retail sparked shock, followed by denial. Acknowledgement then developed over several phases, and finally, acceptance and adaptation occurred, as major retailers began formulating strategic responses.

2.3.7. 2008 economic crash

Many mediocre businesses thrived during the 'boom years' (Portas, 2011), however, as the 2008 recession forced consumers to become savvier in their spending, and alternative retail approaches continued to gain increased market share, businesses lacking sufficient adaptability and know-how began disappearing from British high streets. Between 2000 and 2009 the number of high street stores decreased by 15,000 (ibid), and a further 10,000 shops closed their doors in 2010 and 2011 (BPF, 2012). A 10% decline in footfall was also observed from 2008 to 2011 outside of London (Portas, 2011).

Many high streets were already struggling prior to the recession, lacking sufficient investment and vision that would offer a unique experience to rival neighbouring retail centres; the recession only intensified existing issues (BRC, 2009). Wrigley and Lambiri

(2014) describe how the economic crisis sparked a "*perfect storm*" of short, medium and long-term effects. They observed how the sudden fall in consumer confidence was followed by a sharp increase in vacancy rates, from an average of 7% in 2008 to 16.3% in 2012 (ibid). Consumer confidence remained negative for the next five years and between 2008 and 2012 numerous major retailers went into administration (ibid). Those hardest hit by the financial crisis were comparison retailers, generally considered to be those stocking non-food items, namely, department stores, florists, music/video/photography stores, furniture stores, card and gift shops and booksellers (Wrigley and Dolega, 2011). Although, not all retail was affected negatively by the economic downturn. As consumers increasingly favoured discount shopping, an increase in the number of budget stores (e.g. pound shops and household discounters) and charity shops was observed (Wrigley and Dolega, 2011). Shops selling telephones and accessories also saw an increase of 16%, and chemists/beauty stores also experienced an increase, although to a lesser degree (ibid).

2.3.8. The cost of high street occupation

High street rental values reflect the desirability of the location in which they are situated. Therefore units located within prime retail locations will command high rental values, often unaffordable to small businesses. This is a factor which has further contributed to the increased homogeneity of UK high streets. After wages, property costs are the second largest outgoing for retailers, and these costs have tended to increase faster than sales growth (All-Party Parliamentary Small Shops Group, 2006; BRC, 2009).

The BRC (2009) observed the disconnection between rising rents and falling sales and profits following the 2008 recession. Furthermore, issues can also arise from the frequency of rental payments. The majority of commercial tenants continue to make advanced quarterly payments. However, following the 2008 recession, the pressures posed by quarterly rents contributed to the decline of major retail companies including Habitat, Woolworths and Barratts, as they failed to keep their heads above water (The Independent, 2012).

Baldock (2004) notes how most high street units are let on full repairing and insuring (FRI) leases; though, tenants with businesses achieving small profit margins often fail to fully comply with their maintenance obligations and consequently properties can deteriorate over the course of the rental period (ibid). This can have a negative impact on the appearance of the unit itself and also of the high street as a whole. The Leasehold Property (Repairs) Act

1938 generally forbids landlords from entering their properties to carry out repairs whilst under lease. Therefore Baldock (2004) suggests that property owners in secondary shopping areas should consider letting units under internal repair leases at a higher rental cost, in order to retain control over the ongoing maintenance of the building.

Business rate tax is a further economic factor that high street occupiers must consider. The tax is paid on non-residential properties including shops, offices, factories and holiday rental homes (HM Government, 2017). However, discounts and exemptions do apply to small businesses, places of worship, charity shops etc. (ibid). It is estimated that approximately 1.8 million commercial properties in the UK are eligible for business rate tax charges (The Telegraph, 2016). The tax is calculated as a proportion of the rental value of a commercial property. Therefore, the higher the rental value, the higher the business rate charge, and vice versa. However, the rateable value of property has only tended to be reassessed every five years. Therefore any fluctuations in the value of property within this five year time frame will not be reflected in the business rate tax charged until a revaluation has taken place. In 2008 – at the height of the property boom - a reassessment of rental values took place, and in April 2010 business rates were updated accordingly. The next revaluation was due to take place in 2013, but it was delayed as the Government feared that new rateable values would be too much of an economic shock for businesses who were still struggling with the after effects of the recession. The Government felt that by postponing the revaluation, they could remove uncertainty and support future budgeting (DCLG, 2012a; Retail Week, 2012). This approach led to winners and losers. As the rental value of many retail units fell post-recession, occupiers continued to pay rates based on 2008 rental values. In some extreme cases tenants were paying more in business rate tax than they were paying in rent. On the other hand, many tenants, particularly in the South East of England - where property values remained fairly buoyant – remained sheltered, as their rates failed to grow in line with increasing rental values.

Despite the reasoning behind the postponement of the 2013 revaluation, when it finally took place in 2015, the sharp increase in the rateable values of property – particularly in the South East – caused huge upset in the business community, as business rates were predicted to increase by up to 415% (Colliers International, 2015). Consequently transitional arrangements were put into place to stagger the introduction of the new rates over a period of five years. On average everywhere except for London is seeing a decrease in business rates, with rates in London increasing by an average of 11% (BBC, 2017a).

In addition to the revaluations which came into force on 01 April 2017, the Government also announced a reform of business rates. The tax is currently annually uprated in line with the Retail Price Index, however from 01 April 2020, the uprating will be based upon the Consumer Price Index (Deloitte, 2017). This is a move which has been called for by the business community for a number of years. Small business rate relief has also doubled to a rateable value of £12,000, tapering to £15,000 (Deloitte, 2017), and, in future, revaluations will take place every three years (BBC, 2017a; Deloitte, 2017). Further changes to business rates include:

- Discounts available to local newspapers;
- A pilot is currently trialling 100% retention of rates in devolved regions; and
- The threshold for calculating rates using the standard multiplier has been raised to properties with rateable values of £51,000 or more (previously £18,000).

(Deloitte, 2017)

2.3.9. Experiential high streets

The increased competition from alternative forms of retail has offered greater choice to consumers and has facilitated a more demanding customer. Consequently the experience on offer within a high street has become a key factor influencing visitor patronage and customer satisfaction and loyalty (Woolley, 2000; Tallon and Bromley, 2004; de Nisco et al., 2008; Verhoef et al., 2009). Consumers desire excitement and entertainment in their visits to retail destinations (Wakefield and Baker, 1998; Sit et al., 2003), and although research into the experience and atmosphere emitted by high streets is limited, research into the effect of store/mall atmosphere suggests that the interaction of a variety of atmospheric stimuli strongly influences patronage (Wakefield and Baker, 1998; Baker et al., 2002; Michon et al., 2005).

In response to the growing experiential expectations of consumers, many centres are adapting to offer a host of leisure and entertainment facilities that enable visitors to have a complete day and evening out (Retail Focus, 2017). Such facilities include cinemas, bars, restaurants and events spaces (ibid). Retail destinations are no longer places for single shopping trips to take place, they are spaces for connection, excitement, relaxation and days out. Ultimately they are places where visitors can create memorable and authentic experiences (ibid). Research into the customer experience of town centres, undertaken by Hart et al. (2014), found that the experiential touch points (e.g. atmosphere, social

interaction, visits to cafés and restaurants etc.) of the customer journey increase enjoyment, spending, time spent in the high street, and deter customers from making alternative online purchases. Moreover, they found that small towns tend to be better equipped to meet the experiential needs of consumers.

2.3.10. The changing role of the high street

As observed by Cachino (2014), change has always affected retail environments, however, during the last few decades, the speed and degree of change has happened at an increasingly fast rate. He notes that this speed of change has caused imbalances in many centres as they have struggled to respond fast enough to meet changing demands. Whilst many cultural changes have undermined the vitality and viability of traditional high streets, as highlighted by Jones et al. (2007), Vaughan (2006) and Griffiths et al. (2008), they continue to play an important role in the provision of commercial and community services to local communities. Hart et al. (2014) report that shoppers have not yet deserted UK high streets, however they warn that once the high street no longer fulfils the requirements of the consumer, the often predicted 'death of the high street' may come to fruition. They believe that the future survival of the high street is dependent on the enjoyment consumers derive from the customer experience on offer.

Industry experts and academics are increasingly recognising that there is too much retail floor space in the UK (DTCPT, 2013; Deloitte, 2013) and many big retail companies are in the process of scaling back their high street presence (Business Insider, 2017). Changing consumer trends and the growth in online retail have altered the way people use high streets and consequently many retailers can no longer justify occupying the number of physical stores that they have done in the past (Business Insider, 2017). High streets must therefore adapt as a matter of urgency in order to remain relevant and satisfy the broader needs and expectations of the communities that they serve (DTCPT, 2013).

The primary role of high streets as centres for retail is changing, and whilst there is general agreement among academics and those in the industry that the primary function of the high street will shift from retail to leisure and lifestyle, there is no clear consensus on the best way forward (Deloitte, 2013). Knight Frank (2017) observe:

> *"The high street is far from dead, but it is a very different place than it was ten years ago. Those that understand this will prosper; those that don't will be left regaling tales of the good old days, as the market moves on and leaves them behind."*

It is therefore essential that tools are developed that recognise the changing functions of high streets and assist them in positively evolving to meet the broader needs and expectations of the communities that they serve.

2.3.11. Summary of the evolution of high streets in the UK

A multitude of factors including evolving consumer trends, the growth in alternative forms of retail, advances in modern technology and changing economic pressures have altered the way consumers use high streets in Britain. Whilst in the past high streets have showcased their adaptability to changing trends, the pace and scale of trends in recent decades has proved difficult for many high streets to keep up with. The needs and expectations of modern consumers is increasingly misaligned with the provision of services in many retail centres. This, combined with the continued popularity of online shopping, presents some stark realities for traditional high streets. However, if policy makers and high street decision makers are alert to these realities and are prepared to challenge and change perceptions of the role of high streets, these centres may stand a chance of remaining relevant into the future.

2.4. The evolution of town centre policy in England

It is important to note that there is no UK wide planning policy; each of the four countries that make up the UK operate varied planning systems with their own national planning policy guidance. Due to this, and other reasons (see section 5.17.1), this study focuses investigations on England, and therefore this section explores the evolution of town centre policy in England.

England's first Town and Country Planning Act (1947) came into effect in 1948. As observed by Dawson and Dennis Lord (1985), two aspects of this Act were of particular importance: New Towns and the Green Belt. The introduction of the Green Belt was a significant move taken to restrain the urban sprawl of London and the South East, however, over subsequent decades it was gradually extended across the country. The development of shopping centres in the Green Belt was, and still is, greatly frowned upon (Dawson and Dennis Lord, 1985).

In the post-war period town centres were developing at a relatively slow pace, with the exception of strategically important centres requiring significant reconstruction following the Second World War (Evans, 1997). It wasn't until the late 1950's that much shopping

related development began to occur, and any that did was largely focused on the development of centres for the planned New Towns and the replacement of shops in bomb damaged centres (Dawson and Dennis Lord, 1985).

By the 1960's existing centres were struggling to meet the needs of shifting trends caused by increased prosperity, the growth in car ownership and the growing number and size of retailers (Evans, 1997). At this time the development of shopping centres was initiated by government, and priorities focused on the removal of traffic from core retail areas through pedestrianisation and the provision of rear access for service vehicles (Dawson and Dennis Lord, 1985). Rising levels of congestion, caused by increasing levels of car ownership, was recognised as a serious issue, and in 1963 the Buchanan Report, entitled *Traffic in Towns*, warned that without intervention town centres would be unable to cope (Evans, 1997). In response, strategies emerged that focused on the provision of pedestrian subways, raised walkways and town centre ring roads in order to separate pedestrians and vehicles (ibid). However, such approaches proved unpopular with pedestrians who found them inconvenient and disorientating, and, particularly in the case of subways, they heightened fear of crime (ibid).

The concept of planning theory was first imported from North America during the 1960's (Hague, 1991). Prior to this planning was observed to be dominated by physical design professionals i.e. architects, engineers and surveyors (England, 2000). Batty (1985) observed how:

> *"Planning problems were treated as design problems, and design problems were largely problems of physical form dominated by questions of efficiency and aesthetics".*

However, by the 1970's the mind set of planning shifted towards an increased understanding of theory and the incorporation of social factors (Batty, 1985; Faludi, 1973). Priorities in the 1970's focused primarily on the creation of jobs, and town centre plans developed to reflect this through the designation of zones for traditional industries. However, as Evans (1997) observed, legislation failed to fully acknowledge economic undercurrents and the potential to stimulate town centres economically; he described policy as 'passive' and 'bordering on complacent' due to a lack of public sector governance and the reluctance to cause upset among the general public.

In response to a period of economic and social instability (e.g. unemployment, depopulation and riots) during the 1970's and 1980's, Margaret Thatcher's Conservative government

operated a laissez faire approach, and special enterprise zones were designated to boost economic growth and employment (Griffiths et al., 2008). During Thatcher's period in office the free market planning ideology was embraced and planning control was relaxed. During this period planners were given a back seat and would only intervene to communicate the interests of the public (England, 2000). Developers who proposed out-of-town centres located within enterprise zones were given almost free reign from planning restrictions (ibid). Rowley (1993) observed how developments constructed on this basis (e.g. Meadowhall, Sheffield) accelerated the decline of nearby city centres.

Between 1988 and 1996 the emphasis of Planning Policy Guidance note 6 (PPG6) – which set out England's policy guidance regarding town centres - gradually evolved, as the regulation of retail developments took increased precedence over the former laissez faire approach (Griffiths et al., 2008). In 1996 PPG6 was superseded by a plan-led policy which prioritised the protection of a defined hierarchy of centres (e.g. city, town, district centres etc.) against the growth in decentralised retail developments (ibid). This shift in priority contributed to the emergence of a 'town centre first' approach. This approach was further aided by the introduction of the 'sequential test' which ensured that new development within existing town centres was prioritised. In accordance with the sequential test, any plans for out-of-town developments must demonstrate that there are no other suitable sites within or close to the town centre, and that the plans would not significantly affect the vitality and viability of nearby town and district centres (DOE, 1996; DCLG, 2012b). The use of the sequential test when assessing development proposals continues to this day.

Baldock et al. (2004) observed how the number of new decentralised centres being constructed declined year-on-year, as proposals with existing planning permission continued to be built, but fewer new proposals were being granted. However, whilst the sequential test was effective in encouraging local authorities to make provisions for retail development needs in their local plans and provide broad support for town centre management teams, it did not oblige local authorities to actively plan for the improvement of town centres (Baldock et al., 2004). It also did not differentiate between the varying needs of primary and secondary shopping locations, which can often require different approaches (ibid).

In 1999 the Urban Task Force published *Towards an Urban Renaissance* (DETR, 1999). The report acknowledged that issues including pollution, depopulation and social exclusion had strong ties with the deterioration of urban centres following the years of decentralisation

spurred by government policy (Griffiths et al., 2008). The document is considered to be a key milestone in the shift of the policy agenda from a centrifugal to a centripetal approach which centred priorities on brownfield development and the achievement of higher residential densities (ibid).

Despite the town centre first approach, the proportion of retail space within out-of-town locations, and the amount of retail sales achieved through out-of-town locations, continued to grow, while the proportion of retail space in town centres, and the amount of retail sales achieved through town centres, continued to fall (Wrigley and Lambiri, 2014).

In 2005 the revised PPG6 was superseded by Planning Policy Statement 6 (PPS6) which extended the plan-led approach from a focus on retail to a broader strategy of achieving sustainable development within town centres (Griffiths et al., 2008). However, Griffiths et al. (2008) noted that the introduction of PPS6 watered down the restrictions on new decentralised developments by removing the requirement for developers to demonstrate local economic need. Furthermore, Blackwell and Rahman (2010) observed how the majority of new retail development continued to occur outside of town and city centres.

In May 2010 a change in government from Labour to a coalition between the Conservative Party and Liberal Democrats spurred significant changes to the planning system. The new government deemed the system to be overly bureaucratic and inflexible and it was consequently reformed. Key changes included: the abolition of Regional Spatial Strategies, with responsibility for regional issues largely shifting to local authorities; the superseding of Planning Policy Statements by the National Planning Policy Framework (NPPF) (2012), which condensed thousands of pages of guidance into a 60 page document; and the introduction of the concept of 'localism' through the Localism Act (2011).

Previously contained within the 33 page PPS6, national guidance on town centres was condensed into one and a half pages of the NPPF (2012). The NPPF remains in effect (amendments to the document are currently under consultation). The document's town centre guidance focuses on the promotion of competitive town centre environments through the formulation of policies which support: vitality and viability; the creation of a diverse offering of shops and services which reflect the individuality of towns; the retention and enhancement of markets; the allocation of a range of sites for town centre development needs, including residential; and with respect to declining towns: "*local planning authorities should plan positively for their future to encourage economic growth*" (NPPF, 2012). Further

guidance on how these policies should be applied at a local level is provided in the supplementary planning practice guidance (MHCLG, 2014).

The new coalition government acknowledged the increased pressures facing the high street, and within a matter of weeks of entering office the government had commissioned retail expert and television personality Mary Portas to produce a review into the condition of Britain's high streets. Following the publication of the Portas Review (2011) 27 towns, dubbed 'Portas Pilots', were chosen to test the recommendations made by the document. However reviews into the progress of the pilots in subsequent years observed mixed results and deemed the pilots to be a work-in-progress (BBC, 2013b; DCLG, 2013; The Daily Mail, 2014). In 2014 Portas herself criticised the government's response to her report, stating: "*The government has made token gestures in response to my review, but much more needs to happen, and fast*." (BBC, 2014b). Further interventions by the government included the 'High Street Renewal Fund' and 'High Street Innovation Fund'. However, like the Portas Pilots, these initiatives were also considered to have produced mixed results (BBC, 2013a).

2.4.1. Summary of evolution of town centre policy

High street/town centre policy and interventions have evolved considerably since the 1960's. From little to no town centre policy in the early years of formal town planning, to a focus on physical design in the 1960's; an emphasis on job creation and economic gains in the 1970's, albeit 'passive' and almost complacent (Evans, 1997); the relaxation of regulations in the 1980's; the focus on town centre preservation in the 1990's; and the condensed national policy of present day. Whilst in the last 7 years the government has acknowledged the pressures facing high streets, national guidance does not appear to reflect the changes taking place. Increasingly retail consultants are recognising the need for high streets to reduce their retail offering as companies reduce their physical presence in response to the growth in online retail. This, together with the increasing demand for experiential high streets, means that high streets will have to adapt their service provision in order to stay relevant. Policy therefore needs to acknowledge the wider factors that influence the vitality and viability of modern high streets, as well as the role such centres have to play in the creation of sustainable communities.

2.5. Chapter summary

- A combination of factors including evolving consumer trends, changing economic conditions and advances in modern technology have changed the way consumers use

high streets. The increasing speed and degree of this change has caused imbalances in many high streets as they have struggled to adapt fast enough to meet evolving demands and expectations.

- Alternative forms of retail developed to maximise the opportunities presented by changing government agendas and advances in modern technology. Such retail platforms have sought to better satisfy the changing needs of the modern consumer, retailers and service providers.
- The growth in the dominance of national chain stores has led to the increased homogeneity of many high streets which can undermine diversity and identity. However, a number of academics argue that large chain retailers such as supermarkets can act as crucial anchor stores, aiding the retention of quality, a variety of shops and services, and also attracting new investment into the local area (DETR, 1998; Powe and Hart, 2008, 2009; Powe and Shaw, 2004; Thomas and Bromley, 2002, 2003; Wrigley et al., 2010). Further, the overall impact of chain retailers on independent shops is unclear as centres can react differently to their presence (Wrigley et al., 2009).
- High street rent and business rate tax have placed further pressures on high street occupiers, particularly in the wake of the 2008 recession. Such financial pressures can be detrimental to both small businesses and large, established chain retailers. Recent reforms to business rate tax have addressed the disparity between rental values and business rates observed over the last 7 years, and have introduced a number of other positive measures. Although, it remains the case that businesses wishing to occupy physical units face paying these financial overheads, while online businesses do not.
- As town centre planning policy has evolved, an increased awareness of the importance of centres has developed, but modern policy needs to acknowledge the change occurring in high streets and effectively plan for them within national and local guidance.
- High streets continue to play an important role in modern UK society, however they must adapt if they are to remain relevant into the future.

Chapter 3: Literature review - sustainability and high street performance

3.1. Introduction

This chapter explores the evolution of the concept of sustainable development and the relationship between the high street and sustainability. Also discussed are existing high street performance measures and justification for the proposed model, which provides an assessment of high street sustainability.

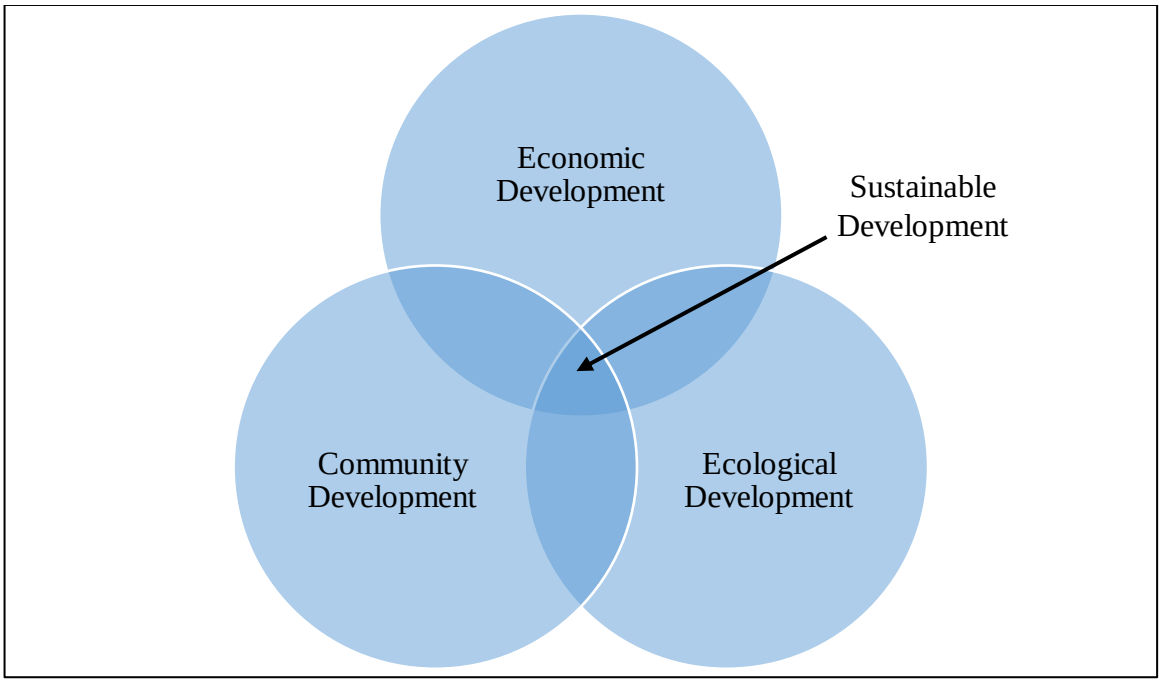
3.2. Definition of sustainable development

Whilst the concept of sustainable development is widely acknowledged and plays a dominant role in the formation of national and international policy, there is no general consensus as to the definitive meaning of the term (e.g. Connelly, 2007; Griffiths et al., 2008; Wijesundara, 2012). Arguably the most famous definition of sustainable development is that presented by the Brundtland Report (1987), which defines the concept as:

> *'Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.'*

It is generally considered that sustainable development comprises three key pillars: economic, environmental and social sustainability. When all three pillars are achieved in harmony, sustainable development is attained. This notion has spurred numerous diagrammatic representations over the years, and arguably the most prevalent of these is the Venn diagram shown in figure 2, which appears to have been initially developed by the International Centre for Local Environmental Initiatives during the 1990's (ICLEI, 1996) (Connelly, 2007).

Figure 2. Diagrammatic representation of the three pillars of sustainable development



(Source: adapted from ICLEI, 1996)

3.3. An international priority

Jones et al. (2005) observe how the concept of sustainable development first emerged in the 1970's due to growing interest in environmental issues. Following this, interest regarding social and economic aspects also began to develop.

Zaccai (2012) reports that references were being made to sustainable development by the United Nations (UN) mandate as early as 1983. However it was the publishing of the Brundtland Report in 1987 that introduced the concept to the main stage. The introduction of Agenda 21 at the UN Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992, further thrust the concept onto the international agenda. In the years following the conference, the concept of sustainable development was embraced by organisations at both the national and global level, as companies began to produce corporate social responsibility and corporate sustainability agendas (CSR Quest, 2017), and initiatives such as the Sustainable Cities Programme (SCP) grew (UN Habitat, no date). Further international conferences followed, the most major of which are considered to be: the General Assembly Special Session on the Environment (1997); the World Summit on Sustainable Development in Johannesburg (2002); and the UN Conference on Sustainable Development (2012) (UN, 2017).

3.4. Sustainable development at the European level

The EU Sustainable Development strategy was established in 2001. The document consisted of two parts: the first contained policy guidance and targets to address unsustainable trends, and the second focused on the collaboration of social and environmental policies (EEB, 2013). The continued growth of the European Union meant that by 2006 a review of the document was required and further reviews took place in 2007 and 2009 (EEB, 2013). The 2009 review of the sustainable development strategy contains policy guidance up until the year 2050. The document has been designed to inform EU policies and promote coherence between long-term and short-term targets (The Council of the European Union, 2009).

In 2010 the European Council adopted the European 2020 strategy which set out five key targets to be implemented at a national level within European member states. Targets concern employment levels of working-age people, investment in research and development, reduced greenhouse gases, the promotion of education, and reduced poverty and social exclusion (Europa, 2011). Whilst these targets remain fairly broad, more specific legislation has developed with regard to sustainable cities. In 2007 the EU adopted the Leipzig Charter on Sustainable European Cities. The document focused on supporting "*economic prosperity, social balance, and a healthy environment*" (Europa, 2007). This was to be achieved, with the backing of Member State Ministers, through recommendations concerning:

- The provision of high quality green space;
- Improving transportation links and energy efficiency;
- Encouraging innovative educational opportunities; and
- Supporting and improving deprived neighbourhoods.

(Europa, 2007).

3.5. Sustainable development at a national level

In line with international targets, the UK has pledged its commitment to tackling climate change, de-carbonising the economy and cutting greenhouse gas emissions.

In 1994 the UK government was the first to publish its national strategy following the Rio summit in 1992 (HM Government, 2005), and in 1999 the government set out its objectives for achieving sustainable development in the publication of A *better quality of life – strategy for sustainable development for the United Kingdom*. This was followed by numerous progress reviews and reports addressing a wide range of sustainability issues. In 2005 the

government published a new strategy: *Securing the future – delivering UK sustainable development strategy*. This strategy acknowledged the national and international developments made since 1999, including: new policies; developments following the World Summit on Sustainable Development in Johannesburg (2012); and greater devolution for Scotland, Wales and Northern Ireland (DEFRA, 2011). Numerous papers and reports have been published over subsequent years relating to all sorts of aspects of sustainable development, from sustainable food and catering procurement to greening government commitments.

3.6. Sustainable development at a local level

In response to national and international commitments, concepts such as 'sustainable communities' and 'liveability' developed, and initiatives aimed at promoting sustainability at a local level emerged.

Initiatives included bottom up approaches such as the Transition movement which encourages low carbon living and social justice at the grass roots level. Additionally, top down approaches such as the Millennium Communities Programme, the creation of eco towns and the NHS Healthy New Towns programme encompassed the ideologies of sustainable communities and liveability, and approached the challenge of creating more sustainable places to live from various angles.

3.6.1. Sustainable communities and liveability

The concept of 'sustainable communities' emerged during the early 2000's. The term was first used by the government in 2003 when the Deputy Prime Minister at the time, John Prescott, announced his plan for economic, social and environmental development (The Guardian, 2011). In 2004 Sir John Egan produced a review depicting sustainable communities as places which:

> *"meet the diverse needs of existing and future residents, their children and other users, contribute to a high quality of life and provide opportunity and choice. They achieve this in ways that make effective use of natural resources, enhance the environment, promote social cohesion and inclusion and strengthen economic prosperity"*
>
> (ODPM, 2004).

According to the Egan Review sustainable communities consist of the following amenities: good public transport; affordable housing; access to services such as schools and hospitals;

and a healthy economy. Additionally, such locations should offer: an environmentally-friendly lifestyle; a socially inclusive culture; and effective governance which encourages and welcomes community participation (ODPM, 2004).

In 2003, when the then Deputy Prime Minister launched the sustainable communities plan, liveability was deemed to be a key component (Jones et al., 2007). A liveability fund was subsequently introduced along with a list of suggestions including: improvements to playgrounds, parks and sporting facilities; improvements to the design of public spaces and traffic calming measures; and maintaining street cleanliness and safety (ibid).

Kaal (2011) notes that references were made to the term 'liveability' as early as the 1970's when 'a new ideology of liveability' was observed within the political landscape of Vancouver (Ley, 1980). Liveable places are deemed to comprise good infrastructure and quality services; they are safe and secure places which are economically viable and environmentally friendly (see for example Wheeler, 2001; Hamilton and Atkins, 2008). American organisation, Partners for Livable Communities (2017) define liveability as:

> *"the sum of the factors that add up to a community's quality of life—including the built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural, entertainment and recreation possibilities."*

3.7. Sustainable high streets

As focal points for communities at a local level, high streets have a key role to play in driving local sustainability. However, in order to effectively assess the sustainability of high streets, the relationship between the two needs to be recognised and understood (Griffiths et al., 2008).

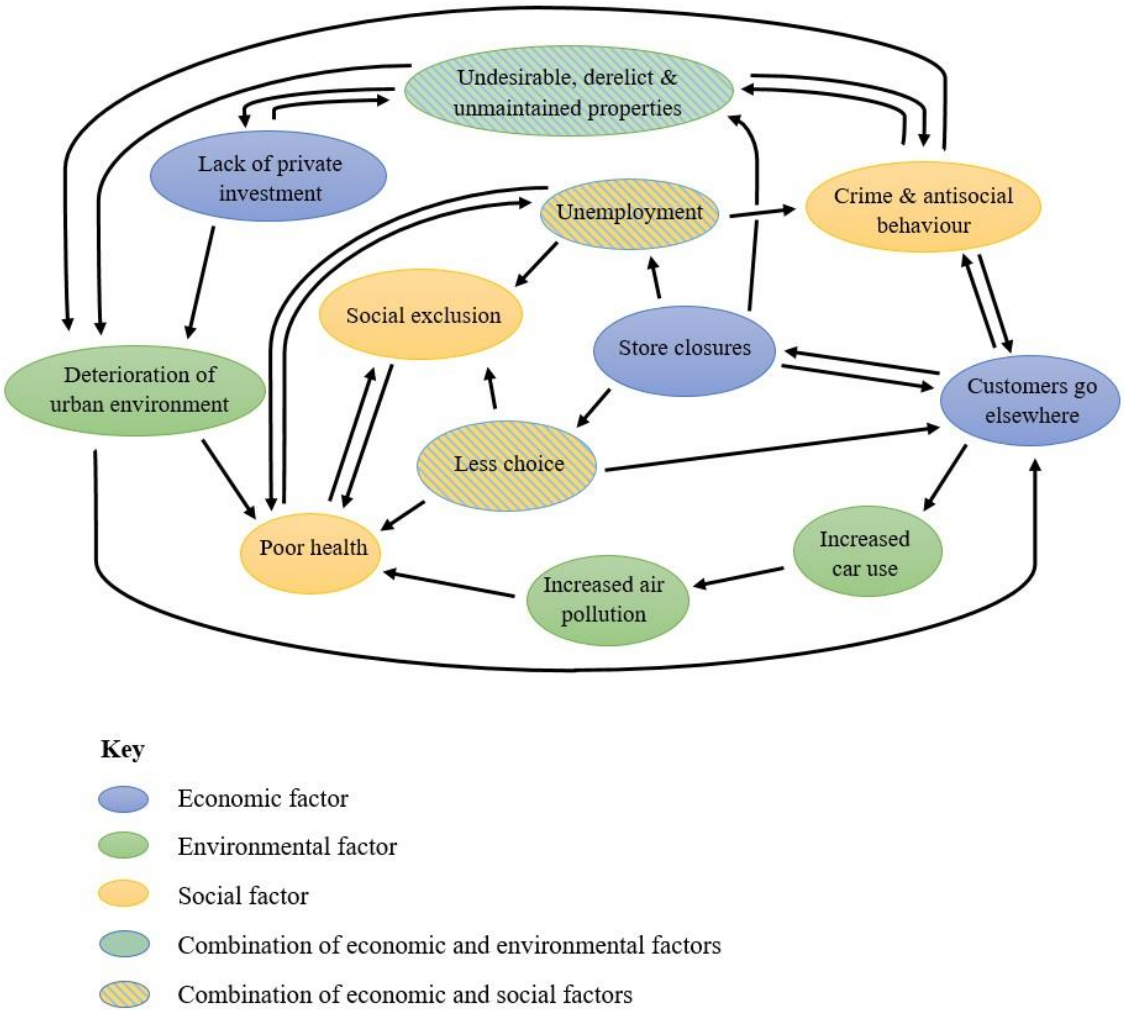
Whilst the ambiguous nature of the term 'sustainable development' has led to numerous definitions and interpretations among the planning community (Baker, 2006; Gunder, 2006; Connelly, 2007; Purvis, 2004), a broad consensus has emerged regarding the general ambition of sustainability (Powe and Gunn, 2008). But it is generally felt that the different dimensions of sustainable development (e.g. economic, environmental and social) have not been given equal priority by policy makers (Drakakis-Smith, 1995; Wijesundara, 2012), with priorities largely centred on environmental issues (Wijesundara, 2012).

In business contexts the focus is often weighted towards attaining economic sustainability, with less emphasis placed on achieving environmental and social goals. This is often the

case for high streets, whose economic value receives a great deal of attention and priority. Whilst the importance of sustaining a high street economically should not be ignored, the potential for these centres – as centres of physical form and human exchange - to contribute towards greater environmental and social sustainability should also be recognised. Indeed Carmona (2015) theorises the nature of high streets through the development of his analytical framework. This framework recognises the diverse functions of high streets as places of physical fabric, exchange, movement and real estate. Reflecting on the work of Griffiths et al. (2008), Carmona notes that while the adaptability of high streets is increasingly considered to be a key condition for sustainability, their adaptability is predicated on the diversity of their functions. However, as he observes, this diversity is rarely reflected in literature concerning town centres; focus is instead given to retail activities. Economic development must not be central to ambitions for sustainable outcomes, rather, a careful balance of positive economic, environmental and social outcomes should be aimed for (Elkington, 1999).

Due to their diverse economic, environmental and social functions, high streets have the potential to influence local sustainability, and therefore when decline occurs, the economic, environmental and social well-being of a community can suffer. Figure 3 illustrates the complex relationship between high street performance and sustainability.

Figure 3. Illustrative diagram of the relationships between high street performance and sustainability



(Source: self study)

Economically, the decline of a high street leads to the closure of retail stores and other commercial services, which in turn contributes to increased levels of unemployment and the long term vacancy of units. As stores and services close, and retail choice is reduced, a high street can become less desirable as a visitor destination and those with the means to travel further to more prosperous centres often will, therefore increasing car use (Whysall, 2011). Falling visitor numbers may then lead the further closures of shops and services, as remaining businesses struggle to attract enough custom, and so the cycle of decline continues.

From a social perspective, the reduced number of shops and services may lead to higher prices due to lack of competition, and where the range of food products is reduced, this can

also lead to phenomena referred to as ‘food deserts’. A ‘food desert’ is defined by a lack of food outlets in a geographical area; or the food outlets that exist in that location are of unacceptable quality (Guy and David, 2004). Such factors can have a detrimental effect on the finances and physical and mental health of local residents, particularly those without the means to travel elsewhere for their retail and service needs.

Environmentally, as vacancy and dereliction increases, the environmental quality of the high street is reduced, which in turn can further deter visitors, and can attract antisocial and criminal behaviour (Accordino and Johnson, 2000). As the spiral of decline continues, new businesses are deterred from occupying units and investing their money in the affected high street (particularly where violent crime is a problem) (Bowes, 2007), therefore further reinforcing the spiral of decline.

Whilst decline can have a detrimental effect on the potential for high streets to contribute to sustainable communities, seemingly successful centres can also undermine the sustainability of urban settlements. Whilst on the surface a high street may be thriving, having attracted a large number of big name retailers, the homogeneity of such centres can greatly undermine the independence of local economies. Profits generated by chain stores are not retained within the local area, and services that may be sought locally by small businesses (e.g. accountancy and store fittings/refurbishments) are often centralised far away from many high streets. Consequently, whilst money may well be flowing into a high street, all too often it is spent in non-local businesses, therefore making no contribution to the local economy (SEU, 2001; NEF, 2004; NEF, 2010; Portas, 2011).

However, high streets have the potential to play a key role in the move towards a more sustainable future. As noted by Pigg (1992), centralised retail locations such as town centres get the green vote over alternative shopping destinations due to the reuse of buildings that occurs, the recycling of brownfield land, the lack of encroachment on the countryside and the greater potential for visitors to choose greener methods of transportation, provided the right facilities exist. This, combined with the social and economic foci of high streets, makes such settlements an ideal location for fostering local sustainability (Jones et al., 2007).

3.8. A definition of sustainable high streets

For the purpose of this study, sustainable high streets are considered to be high streets that comprise strong economic foundations, foster sustainable economic growth, actively contribute to environmental sustainability and facilitate social inclusion and opportunity for

all. As community centres, high streets should aspire to align to the accepted definition of a sustainable community as outlined by Egan (2004). A sustainable high street is therefore considered to comprise the following:

- Governance – effective and inclusive participation, representation and leadership
- Transport and connectivity – good transportation and communication that links people to jobs, schools, health and other services
- Services – a full range of appropriate, accessible public, private, community and voluntary services
- Environmental – providing places for people to live in an environmentally-friendly way
- Economy – a flourishing and diverse local economy
- Housing and the built environment – a quality built and natural environment
- Social and cultural – vibrant, harmonious and inclusive communities

(Taken from Egan's 'components of sustainable communities' diagram (Egan, 2004)).

Throughout this thesis the terms 'sustainable high street' and 'high street sustainability' are frequently referenced. The above definition articulates what the researcher means by these terms.

3.9. Regional context of high streets

As noted in section 2.2, high streets are present in a variety of settlement types (e.g. villages, towns and cities) and therefore their regional context can vary. Typically, the larger and more prominent the settlement, the more regionally significant the high street. High streets located within prominent city centres tend to support more regionally significant business districts and attract visitors from larger catchment areas compared to those within towns and villages. Whilst a regionally significant business district and a large visitor catchment area can benefit the economic sustainability of a high street, in order to contribute to social and environmental sustainability, high streets should - as much as possible - meet the needs and expectations of their local resident population. By meeting local needs and expectations, high streets can encourage social inclusion within the local community, encourage greener methods of movement (e.g. walking and cycling to the high street), and discourage people from using private cars to travel to high streets further away. Indeed, as highlighted by Cheshire East Council (2010), a key planning objective required to tackle climate change is

to reduce the need for travel by developing self-sustaining settlements that meet the needs of the community in terms of housing, services, employment and facilities.

3.10. Existing performance measures

As governments have become increasingly attentive to the pressures facing high streets and the impact of decline on economic growth and local communities, numerous indicators have been developed to assess the performance of centres. Table 1 provides an overview of a number of existing high street performance measures.

Table 1. Existing high street performance measures

Department for Business, Innovation and Skills (BIS, 2011)	**Action for Market Towns (AMT, 2013)**	**Distressed Town Centre Property Taskforce (2013)**	**ATCM (Coca-Stefaniak, 2013)**	**BIS (2014)**	**DCLG (2014)**
• Footfall • Consumer and business satisfaction • Diversity (range of commercial and non-commercial facilities present) • Economic activity	• KPI 1: Commercial units; use class • KPI 2: Commercial units: comparison/convenience • KPI 3: Commercial units; trade type • KPI 4: Commercial units; vacancy rates • KPI 5: Markets • KPI 6 and 7: Zone A retail rents and prime property yields • KPI 8: Footfall • KPI 9: Car parking • KPI 10: Business confidence surveys • KPI 11: Town centre users survey • KPI 12: Shoppers origin survey	**Retail** • % vacant units • Prime Zone rents • Retail provision • Centre dominance/position in the retail centre hierarchy • Retailer requirements **Population characteristics** • Changes in the catchment area population • Job Seekers Allowance claimants in catchment area • Public sector workers as a % of total population in the local area • Population in full time employment **Centre characteristics** • Tourist destination • Plans for retail park / fashion park to open in the town	**Diversity and vitality of place:** • Retail offer • Culture and leisure offer • Events • Reported crime • Markets **Economic characteristics:** • Retail sales • Partnership working • Charity shops • Vacant retail units • Evening/night time economy **People and footfall:** • Footfall • Geographical catchment • Access • Car parking • Community spirit **Consumer and**	**Performance:** • Percentage of charity shop floor space • Average charity unit size relative to average shop size for centre • Percentage of vacant shop floorspace • Average vacant shop size relative to average shop size for centre **Local economic context:** • Percentage of working age population employed in higher managerial administrative and professional occupations • Percentage of working age	• Diversity of uses • Proportion of vacant street level property • Commercial yields on non-domestic property • Customers' views and behaviour • Retailer representation and intentions to change representation • Commercial rents • Pedestrian flows • Accessibility • Perception of safety and occurrence of crime • State of town centre environmental quality

		• New sites over 100,000sq ft, with planning permission or under construction, in the centre's catchment area (i.e. within15-minutes' drive-time) **Qualitative indicators added to the TPM by the DPT**: • Attractiveness and general town centre 'feel' • Costs of occupation (rents as a proxy) – town vs regional benchmark • Suitability of property stock • Diversity (range of independents; leisure service providers) • Institutional support for town centre (BIDs, Portas, etc) • Ownership structure (property ownership fragmentation; shopping centres etc) Shopping centre debt	**business perceptions:** • Business confidence • Visitors satisfaction • Attractiveness Crime and safety perceptions	population long-term unemployed • Percentage of population economically inactive through long-term sickness or disability • Average gross disposable household income of local population • Percentage of spending on comparison goods **Size:** • Total floorspace • Number of units **Diversity:** • Spending diversity index Independent floorspace as a percentage of the total	

(Source: adapted and expanded from Wrigley and Lambiri (2015))

One of the major criticisms of existing high street performance measures is their emphasis on retail activities and economic factors (Griffiths et al., 2008; BIS, 2011; Coca-Stefaniak, 2013). The Distressed Town Centre Property Taskforce's measures (2013) were formulated from the perspective of retailers, landlords/developers and local authorities, and this is reflected in the focus on economic factors such as vacancy, rents, debt and the occupational/income demographic of the local population etc. Similarly over half of the AMT's (2013) list of indicators refer to the economic condition of a high street. Further criticisms of existing performance measures include: a lack of recognition of local and social factors (see Powe and Hart, 2009; Hart et al., 2013); too great an emphasis on daytime economies, with little attention given to evening and night-time economies (Coca-Stefaniak, 2013); and a lack of recognition of the importance of creating a balance between what is on offer in a town centre and what visitors want and expect from their town centres (Coca-Stefaniak, 2013).

Ravenscroft (2000) warns against simplistic measures of town centre "health" which focus on the value of commercial property. Instead, Griffiths et al. (2008) suggest that alternative ranking systems be developed that acknowledge the variety of functions that contribute to the holistic make up of a town centre. By developing a broader view of the factors that influence town centre health, greater recognition of the contribution of a range of town centre uses may be achieved, and a more inclusive approach to the assessment of town centre health could be attained (Ravenscroft, 2000).

When developing a list of performance measures on behalf of ATCM, Coca-Stefaniak (2013) acknowledged the flaws of earlier performance measures and consequently included a number of social factors (e.g. community spirit and crime and safety perception). Additionally, in 2014 DCLG was the first to make reference to the environment in their performance indicators with the indicator 'state of town centre environmental quality'. However, they do not further expand on this as their indicators were written to be taken as general guidance rather than as a concrete set of measures.

Despite the progress made by DCLG (2014) and Coca-Stenfaniak (2013) on developing broader performance measures, in 2014 BIS published a new set of indicators (more detailed than their first in 2011) which remained heavily economically focused. Within their report BIS (2014) accepted that their selection of indicators was limited and they acknowledged several studies which had recommended broader approaches for assessing performance.

However, they argued that the data collection methods required to obtain the necessary data would be time and resource intensive. Indicators were therefore selected on the basis of ease of access to data. A further potential weakness of BIS's 2014 research involves the weighting of variables. Variables were weighted on the basis of how strong or weak they were considered to be to local economic health. However, the weightings were derived from the "*professional judgements*" of the researchers themselves and therefore may be biased and unreliable.

BIS (2011) explain that the majority of available, usable data is heavily biased to retail indicators and data on other aspects of high streets (e.g. leisure, culture and heritage) is limited. Further, they argue that data regarding elements such as residential use, services and offices "*lacks the capacity for meaningful analysis*", and this weakness should be considered when developing new interpretations of the high street and its offering. Mean and Tims (2005) concur, observing the limited data relating to the cultural and social elements of a high street. They suggest that a new methodological approach and primary research is required to fully comprehend the role of the high street within communities.

3.11. Justification for proposed model

As discussed in section 3.10, existing performance measures are too retail centric and too focused on economic factors. Furthermore, they give little consideration to evening and night-time high street features and activities, despite their growing contribution to town centre economies (see Night Times Industries Association's *Forward into the Night* report). Additionally, the literature raises issues regarding the lack of assessment of social and environmental factors which are important to the formulation of identity and experience (e.g. Oppewal and Timmermands, 1999; Wrigley and Lambiri, 2014; DHSAB, 2015); concepts which play a key role in visitor patronage (El Hedhli and Chebat, 2009) and consumer preference (see Warnaby, 2009; Hart et al., 2013; Coca-Stefaniak, 2015).

Further, BIS (2011) note the limited understanding of why consumers are leaving the high street, and how policy makers could have taken steps to prevent it. They explain that in many cases local decision makers are unaware of changing trends until they have happened. This is partly due to a lack of finances and resources to facilitate the monitoring/analysis of such high street changes. However, given that many research studies, and local authority commissioned local retail studies, already encompass consumer surveys, it is considered that a model that assesses high streets on the basis of measures from the local consumer base

would be both cost-effective and would provide a better balance between the town centre offering and the needs and expectations of the local community (highlighted as a current oversight by Coca-Stefaniak, 2013).

The model developed through this research assesses town centres on the basis of a wide range of town centre features and facilities that contribute to the economic, environmental and social, daytime, evening and night-time activities of a high street; not just the retail on offer. Furthermore, it enables high streets to be compared against weighted criteria in order to determine the relative sustainability of those centres. Unlike the research undertaken by BIS (2014), this research has sought a wide range of professional and expert opinions, as well as the opinions of local residents, in order to calculate the importance weightings of criteria. This should ensure that the weights obtained are as reliable as possible and account for the needs and expectations of local communities. Furthermore, the model requires many of the criteria values to be derived from the opinions of local residents, therefore enabling a clear view of whether the high street offering meets their needs and expectations. Finally, as the model is not solely reliant on the availability of appropriate secondary data, a much broader range of criteria can be tested, including less tangible social and environmental factors.

3.12. Chapter summary

- Since the 1970's the concept of sustainable development has evolved from what were initially broadly environmental concerns, to a concept of equal environmental, economic and social justice that can be applied to all aspects of society.
- The decline of a high street has negative repercussions on ambitions towards sustainable development, and symptoms of decline will often feed into one another to form a spiral of decline.
- Increasingly retail experts are acknowledging that the UK has exceeded saturation point in terms of retail supply and therefore high streets need to adapt their functions to remain sustainable and to satisfy consumer needs and expectations. Despite this growing realisation, high street performance measures continue to be heavily focused on retail related figures and economic factors.

Chapter 4: Criteria influential to high street sustainability

4.1. Introduction

High streets are complex entities with a multitude of purposes. This is made further complicated due to the variety of different demands placed upon them by a variety of different stakeholders. Therefore, understanding the high street as a sole entity is extremely difficult. Within his analytical framework, Carmona (2015) defined high streets to be: corridors for movement; places with a physical fabric; places where exchange occurs (e.g. social, political, cultural and economic interaction); and places with a diverse range of real estate and tenure. This analytical framework was considered to be a strong starting point upon which the literature review could build. Through a review of existing literature, this chapter identifies the diverse functions and features of high streets, and highlights the contribution of those functions and features to their success and sustainability.

4.2. Physical fabric

Pigg (1992) notes how the nature, character and design of the public realm have a bearing on the success of a high street. Furthermore, research undertaken by CABE in 2002 investigating public attitudes towards the built environment found that 81% of people said they were "*interested in how the built environment looks and feels*", and 85% of people believed that better quality public spaces and buildings improved quality of life and had an impact on how people felt (CABE, no date a). Criterion 1 comprises 7 key elements (the sub-criteria) of a high street's physical fabric. The contribution of each sub-criterion to the success and sustainability of a high street is discussed within this section.

Streets: Streets are an important part of the public realm within urban centres, however their importance is often overshadowed by an emphasis on designated areas of public open spaces such as parks and squares. Nonetheless, the quality of street design and maintenance – whether streets be vehicular roads or pedestrian thoroughfares, or both – will dictate accessibility and mobility within the centre (Pigg, 1992). In its report *Healthy high streets? A health check for high streets and town centres*, BIS (2010) advise that action should be quickly taken on streets that are difficult for newcomers to navigate, or those that suffer from serious congestion problems. Further, research into the customer experience of town centres, undertaken by Hart et al. (2014), found that town centre layout was a key factor which

influenced a consumer's choice of where to shop. They note that shoppers appreciate a layout that facilitates an easy visit.

Signage: Signage should enable users to navigate themselves quickly and easily through an area (BRC, 2009). Along with street maps, it should also complement paving materials to provide consistent and comprehensive navigation through a high street (ibid). However, new signage is rarely integrated with existing street furniture and tends to just be added to what is already present (Jones et al., 2007). A lack of coordination and consideration when it comes to the selection and positioning of signage and street furniture can lead to pavements and streets that are overcrowded with a hotchpotch collection of objects, often referred to as street clutter.

The Transport Research Laboratory (2006) highlight how the desire for safety practitioners to provide ample signage, road markings and crossings to reduce uncertainty and increase the control and segregation of traffic and pedestrians, and the increase in various forms of street furniture and advertisements, can lead to cluttered streets and pedestrian pathways which lack visual coherence and appear unattractive. Similarly, Pigg (1992) advises the careful use of road signing and marking to lessen the risk of reducing the visual appearance of an area. Similar thoughts are echoed by BRC (2009), BIS (2010) and DCLG (2010). In August 2010 the then Communities Secretary, Eric Pickles, and Transport Secretary, Philip Hammond, called on local authorities to reduce the amount of unnecessary signage and street clutter in their areas, noting that whilst some signs are required by law, for signs to be most effective they should be kept to a minimum (DCLG, 2010).

Buildings: Buildings play an important role in the appearance and character of a high street. A gap in the continuity of the building façade – due to an undeveloped plot – can undermine the definition of the streetscape (Trancik, 1986). Jones et al. (2007) observe how landmarks, in the form of distinctive buildings or public spaces, are key contributors to place making, and they therefore play an important role in orientation and local identity. The same study reported low levels of satisfaction with the appearance of the case study high streets investigated, with a common concern cited to be the presence of buildings in a poor state of repair (including poorly maintained buildings, buildings with boarded up windows, graffiti and fly posters on the walls) (ibid). The researchers reported how this not only reduced the attractiveness of the areas, but also contributed to a perception that the areas were not safe to visit at night (ibid).

Trees and landscape: According to the BRC (2009) the use of the urban landscape, high quality materials for construction, and the use of sympathetic planting can enhance the experience of individuals using an area and contribute to the formation of distinctive places. Furthermore, the management of urban green space is integral to sustainable development and quality of life (Cilliers et al., 2010). As highlighted by Cillier et al. (2010) green planting is not simply about 'flora and fauna', but also about considering the economic benefits that such spaces can bring.

In their paper concerning the affective quality of human-natural environment relationships, Hinds and Sparks (2011) highlight the innate need for humans to be near natural features in order to retain good psychological health, citing the following quote from Gullone (2000):

> *"Cultural beliefs and practices that are inconsistent with our evolutionary constitution and physical environments that stray too far from that in which we evolved may compromise our psychological well-being".*

Existing research has identified a variety of positive reactions to experiences of the natural environment such as stress reduction and the provocation of positive emotions (Groenewegen et al., 2006; Abraham et al., 2010). In the context of inner city and suburban locations, research has suggested that the presence of trees may be linked to increased feelings of safety (Kuo et al., 1998), and the view of trees from a home may positively predict a person's feelings of relaxation and comfort (Kaplan, 2001). Studies also suggest that the presence of natural features such as plants can have a positive effect on social interaction (see for example Groenewegen et al., 2006; Weinstein et al., 2009; Han, 2009).

Hinds and Sparks (2011) found that park, garden, river and beach environments were more likely to evoke feelings of relaxation, fun and socialness compared to other environments. Furthermore, they observed that whilst more natural environments (e.g. mountains) tended to evoke more ostensibly positive feelings (referred to as *Eudemonia*) they also evoked higher levels of ostensibly negative feelings (referred to as *Apprehension*). For less natural environments such as parks, levels of *Eudemonia* and *Apprehension* were lower. Koole and van den Berg (2005) suggest that negative reactions to more natural environments – particularly isolated natural environments – can evoke feelings of terror due to the heightened awareness of mortality, and consequently the presence of human infrastructure can act as a buffer to such negative feelings. With this in mind it is possible that thoughtful

planting and landscaping within an urban setting such as a high street may act as an ideal environment in which to enhance public well-being.

Public open space: Public open spaces are designated communal areas where people can meet, spend time and interact. They can take a variety of forms, from public thoroughfares (e.g. streets and walkways), sporting fields/spaces and designated parks and public squares etc. Public open space facilitates the various forms of exchange (human interaction) that can occur in an urban area (see for example Arslanli et al., 2011; Walljasper, 2012; Brunnberg and Frigo, 2012). Attractive public space can support public life (Gehl, 2004), foster a sense of safety, facilitate enjoyable experiences (Childs, 2004; Cooper Marcus and Francis, 1998) and bring strangers together to enjoy shared experiences (Whyte, 1980); occasions that Whyte (1980) refers to as 'city moments'.

Further benefits of quality public open space can include support for social and psychological health (Mehta 2007, 2013), promoting public and shared life (e.g. Jacobs, 1961; Lynch, 1960; Oldenburg, 1981; Tibbalds, 1992) and encouraging physical activity (Strack and Deutsch, 2004; Bronfenbrenner and Morris, 2007). The availability of public open space has also been found to influence perception of community cohesion and superficial contacts between community members (De Vries, 2010; Maas et al., 2009).

Infrastructure: The infrastructure present within a high street, such as sewage pipes and drainage facilities, telecom cabinets, telephone boxes, benches and litter bins etc. has an impact on the function and appearance of a high street. Whilst street furniture and public amenities are often removed to reduce the risk of attracting criminal activity and anti-social behaviour, in a survey conducted by Jones et al. (2007), street users reported dissatisfaction with the provision of toilet facilities and a lack of seating and places to rest. Jones et al. (2007) therefore advocate the careful consideration of such amenities to balance competing pressures. Pigg (1992) concurs, advising that the siting of facilities such as telephones and street furniture should be carefully considered with respect to appearance, visibility and potential for vandalism.

Design: A high quality, well-designed environment of appropriate size, scale and layout which complements the distinctive character of the local community is a key component of a sustainable community (ODPM, 2004). Pigg (1992) notes the contribution of design features to the achievement of appealing and characterful design in town centres. Furthermore, Jones et al. (2007) believe that the greatest innovations in design will stem

from the acknowledgement that pavements cater to a variety of pedestrian activities, and that the design of the streetscape should sensitively cater to all activities without overly formalising the space, which can detract from the attractiveness of a bustling high street.

Whilst good design is key in creating attractive places where people want to visit and spend time, design can also prove effective in changing behaviour and perceptions. CABE (no date b) highlight examples of when good design has encouraged more environmentally friendly living and working patterns. They also observe the benefits of good design to crime prevention, stating:

> *"Reducing crime rates is not just about more police and CCTV. It is also about good design. The quality of public space and buildings sends a clear message about how much an area is valued and cared for. It sets the standards of tolerable behaviour in the community and prevents further decline."*

4.3. Movement

Accessibility indicates the level of convenience (or inconvenience) presented by a centre, and is therefore considered a key characteristic of retail centres from a consumer's perspective (Bearden, 1977; Alzubaidi et al., 1997). The time and cost of accessing a centre is of great importance to consumers (Sim et al., 2002) and will often dictate which retail location they choose to visit. BRC (2009) recognises the importance of easy accessibility to attract footfall and cater for deliveries and staff, and recommends that people should be given a choice of transport options in order to help address pollution.

Pedestrian pavements/walkways: Quality pedestrian pavements have an important role to play in contributing to the success and sustainability of a high street. Small, cluttered, dirty and uneven pavements can make centres inaccessible and unsafe for wheelchair users, the elderly, the visually impaired and families with young children (BIS, 2010; Portas, 2011). As Pigg (1992) highlights, the emergence of a wealthy elderly generation, whose incomes have been protected from inflation by employee pension schemes, should be considered in high street decision making, particularly in terms of accessibility; this demographic are likely to choose to visit locations that better suit their mobility needs.

Cycling facilities: Provision of infrastructure to encourage greener methods of movement such as cycling contribute to the creation of sustainable communities (ODPM, 2004). In its report regarding healthy high streets, BIS (2010) state that town centres must offer a safe environment for cyclists. However, existing literature observes how perception of danger

from traffic is a key deterrent to achieving more widespread uptake of cycling (e.g. Snelson et al,. 1993; Cleland and Walton, 2004; Dill, 2009; Directorate-General for Public Transport, 2009; Transport for London, 2010). The potential dangers of road junctions/intersections, roundabouts, on-street parking and overtaking vehicles etc. can put off would-be cyclists. However such hazards can be reduced if cyclists are given priority or have access to designated cycle lanes/tracks (CROW, 2007; Reynolds et al., 2009), and indeed a number of studies report rider preference for designated cycle lanes/tracks (e.g. Talihun et al. 2007; Reynolds et al., 2009; Li et al., 2012; Chen et al., 2012). Research by Hull and O' Holleran, (2014) found that the design of cycle infrastructure can encourage more cycling and they recommend a number of factors to be considered when designing cycle infrastructure, these include: wide, designated cycle lanes; clear signage; bicycle priority traffic lights at hazardous junctions; prevalent, high quality bicycle parking; and use of high quality materials etc.

Public transport: The use of private vehicles for low occupancies of passengers is more damaging to the environment than other modes of transportation (Barton, 2006; Jabareen, 2006; Vigar, 2007). Therefore the provision of quality transport alternatives is hugely important for ambitions towards more sustainable high streets. The BRC (2009) advise that people should be given a range of transport alternatives in order to reduce levels of pollution within the high street. Regular public transport services, as well as effective park and ride schemes, can reduce congestion in centres without reducing footfall (ibid).

Cervero (1997) observes the inequality of access caused by the private car. Groups such as the elderly, disabled, the youth and those with limited financial means can be excluded from high streets where there is a lack of sufficient public transport infrastructure. Existing literature also observes how a lack of transport infrastructure can deter visitors from engaging in a high street's evening/night-time economy (Wrigley and Lambiri, 2014; Stradling et al. 2007). BIS (2010) suggest reviewing whether current transport services are appropriate to the high street in terms of travel routes, availability, frequency, quality and cost. As DCLG and ATCM (2014) highlight, *"if people can't get to your high street you are fighting a losing battle"*.

Parking facilities: As the growth in private car ownership in the western world continues, the car may be considered the most important method of transportation for consumers (Baker, 2002). Therefore the availability of parking within close proximity of a high street

can be considered a major factor to enhance shopping convenience (Alzubaidi et al., 1997; Arentze and Timmermans, 2001; Bearden, 1977; Van der Waerden et al., 1998). Moreover, as advocated by BRC (2009), parking and transportation should be viewed as additional factors to entice visitors to the high street; insufficient, expensive, remote and insecure parking facilities are detrimental to the success of high streets (ibid). BRC (2009) therefore recommend that emphasis should be on incentivising the use of public transport rather than penalising motorists for parking; the primary purpose of a car park should not be as a means of raising revenue (ibid).

Goods/service vehicles: The importance of facilitating access to the high street for goods/service vehicles should not be underestimated, and a delicate balance must be maintained to ensure that the needs of retailers and businesses are met without breaching restrictions put in place which safeguard local residents and the visitor experience (Pigg, 1992). As highlighted by BRC (2009), many high streets remain subjected to the delivery curfews set by planning restrictions put in place when the developments were first built. However, advances in modern technologies have led to significantly quieter deliveries and consequently BRC suggest that delivery curfews be reconsidered to reflect this and recommend that local authorities consider restrictions on a case-by-case basis.

Traffic management: The cost of congestion to high street occupiers can be significant as high streets are, for the most part, reliant on the road network to transport their customers, staff and goods (BRC, 2009). Therefore ensuring effective traffic management schemes are in place is essential. In its report *Tomorrow's roads, safer for everyone* (2002), the Department for Environment, Transport and Regions (DETR) reported that high streets were amongst the most unsafe urban roads when it comes to accidents. However, as revealed by research published by the Department for Transport (DfT) in 2008, by adopting certain design features such as informal pedestrian crossings, the improvement of parking and loading facilities, and using vertical/horizontal deflections, narrow carriageways and the strategic use of traffic signals to reduce traffic speeds, the incidence of accidents can be reduced by between 24% and 60%.

4.4. Exchange

The term 'exchange' in the context of the high street refers to the sociological effect of physical spaces on people, and the capacity for interaction in these spaces. Space in this context is not limited to designated areas of public realm (e.g. parks and squares); it

comprises anywhere that interaction of various kinds has the potential to occur. Gaffikin et al. (2010) observe how:

> *"Public space holds the potential for chance encounters among people of diverse traditions, and in such serendipities rests the opportunity for exchange and learning that can help break barriers."*

Some spaces may offer greater exchange potential than others for a variety of reasons. For example, as Amin (2002) observes, much contemporary urban space acts as transit routes of one form or another, offering little potential for interaction. However, in the context of the high street, the potential for space to promote and facilitate interaction is enhanced, and indeed Carmona (2015) deemed that social, economic, political, cultural and community spaces were key to the exchange that occurs within high streets. Due to its fluid nature, different forms of space can often overlap and change. For example, a town hall may act as a space for political, cultural, community, economic and social interaction at different times, or even all at once.

Social space: In this context, social space may take the form of outdoor public realm (e.g. parks, pavements and squares), cafés, restaurants, bars, clubs, leisure centres etc.; any form of space present within a high street that has the potential to facilitate interaction of a social nature.

Barker (2009) reflects on Michael Warner's (2002) concept of 'stranger-sociability', and observes how it facilitates everyday encounters in a way that does not encroach on the privacy of individuals. Such encounters between diverse individuals on the street contribute to what Barker describes as a "*loose-knit form of sociality*" which he believes is key to the development of public sentiments.

Cuthbert and McKinnell (1997) report the shift of Hong Kong's social space from public sector control, to private sector control. They observe the subsequent manipulation of this space to facilitate commercial activities and encourage economic transactions. They believe that the shift in the role of space, and the move towards corporate architecture in the public realm, can constrain social activity and sterilise social space. Sorkin (1992), Soja (1996) Marcuse and Van Kempen (2002), and Gaffikin et el. (2010) also cite similar issues.

Halpern (1995) recognises that building and maintaining social networks can be hugely beneficial to mental and emotional well-being, and Barton (2009) notes that whilst social networks can now take many forms (e.g. online and geographically widespread), the

networks of certain groups such as the elderly, disabled, unskilled people and young families remains fairly local, and therefore the provision of high quality social space is very important. Research also suggests that the social interactions that can take place in inner city parks can act as a motivator for people to visit these locations (Burgess et al., 1988; Krenichyn, 2004).

***Economic space*:** Due to the traditional role of a high street being a centre for commercial activity, the economic space within a town centre is often a factor which is given a large amount of attention. Whether economic space is present in the form of fixed high street units, designated indoor/outdoor areas for markets, fixed business premises, or more flexible spaces which can adapt to provide economic space as well as other forms of space depending on the occasion or time, there are a variety of different types of spaces which promote economic interaction within a high street. Whilst the role of the high street is shifting towards a destination for experiences (e.g. Hart et al., 2014; Knight Frank, 2017; Retail Focus, 2017), its traditional role as a centre for the trading of goods and commercial services continues to be relevant (e.g. Jones et al., 2007; Griffiths et al., 2008; Hart et al., 2014), albeit perhaps on a smaller scale. Therefore the provision of space for these purposes continues to be important to high street success. Ultimately, the use of the economic space available and its adaptability to meet the changing needs and expectations of the modern consumer will dictate the long term economic sustainability of a centre (e.g. Hart et al., 2014; Knight Frank, 2017).

Political space: Sir John Egan speaks of governance being a key characteristic of a sustainable community (ODPM, 2004). Under this umbrella term he advocates the active and effective participation by individuals, groups and organisations (ibid). On a local level this may comprise public and stakeholder involvement in the production of local planning documents, development proposals and provision of community services etc. However equally important is the engagement of the public in national democracy and political affairs. Literature regarding community involvement acknowledges the importance of achieving representative participation from individuals of varying backgrounds, age, ethnicity, occupation etc. However, frequently cited is the issue of obtaining fair representation due to the challenges of engaging what are referred to as hard-to-reach-groups (e.g. uneducated people, the elderly, disabled people, students, young people, refugees, asylum seekers etc. (DCLG, 2008)) (see for example: Talen and Coffindaffer, 1999; Terrible, 2000; Involve, 2005; Robinson et al. 2005; DCLG, 2008). Jacobs (1961) considers street life to be important not only because it contributes to the creative and poetic elements of urban life, but more so

because it enables social interaction and political mobilisation. The provision of welcoming, inclusive spaces in high streets to invite and facilitate political discussions among diverse individuals is therefore very important to effective participation of various kinds.

Cultural space: The presence of cultural space within a high street has been increasingly recognised as an effective means of attracting additional footfall, particularly from tourists visiting the area. Indeed, BIS (2010) stress the importance of recognising the benefits that tourism can bring to a high street and referenced surveys that linked a healthy tourism offer to healthy high streets. Furthermore, participation in culture can play a key role in encouraging social cohesion (Smith, 2000), identity (Kay, 2000) and empowerment (Bailey et al., 2004).

Community space: Thompson and Kent (2014) describe a healthy built environment as *"one which connects citizens together to create a sense of community"*. A sense of belonging encourages feelings of comfort, security and confidence which in turn can inspire greater levels of physical activity and social connectivity (Evans, 2003). Additionally, chance day-to-day encounters can increase the potential for human interaction and caring which can lead to increased perceptions of safety and decreased perceptions of loneliness (Guite et al., 2006).

Thompson and Kent (2014) developed a places framework for strong and connected communities. Within their framework they identified five key spaces in the built environment in which they consider strong and connected communities to be most effectively supported, these are: green open spaces, community gardens and farms, streets and neighbourhood spaces, third spaces and safe spaces. Such spaces are abundant in high streets and therefore the potential for such centres to facilitate community exchange is great.

4.5. Real estate

The Egan Review states that high quality, mixed-use, adaptable, durable and flexible buildings are a key component of a sustainable community (ODPM, 2004). The mixed-use nature of high streets means that their potential to provide flexible and varied internal and external spaces is great. Barton et al. (2003) highlight the importance of adaptability in the creation of sustainable neighbourhoods. They explain that the idea of creating a sustainable, 'life-time neighbourhood' means that the neighbourhood should adapt to changing social and economic trends. The high street, being a neighbourhood in itself, is no different. A diverse offering of different land-uses can help to build a resilient high street that can

withstand economic and social pressures and cater to the needs of a diverse and changing population.

Retail: BIS (2010) note the importance of a diverse consumer offer to ensuring that visitor requirements and expectations are sufficiently met. A high street should aim to offer a broad mix of fashion, leisure and lifestyle retailers, and a balance of both independents and national multiples (ibid). Anchor stores (e.g. department stores and large retailers) can be hugely important to attracting new retailers as well as increased footfall. The closure of an anchor store can therefore be detrimental to the vitality of a centre, and equally, anchor stores opening in nearby competing centres can also spell trouble for a high street (ibid). Whilst often perceived to be a major contributing factor to high street decline, supermarkets can prove to be effective anchor tenants when located on the high street. Indeed Powe and Gunn (2008) observed how consumers who visited town centre supermarkets to do their main food shopping were more likely to shop in other town centre food stores.

Entertainment: As consumer trends continue to shift in favour of experiential high streets, the entertainment on offer within a centre is becoming ever more important. Hart et al. (2014) found that participants who combined their shopping activities with entertainment, banking or refreshments spent more money per visit than the overall average spend per visit. They note that the most significant increase in spend resulted from visits which combined shopping with a visit to an entertainment venue.

Research by Allegra Strategies (2014) suggests that the presence of coffee shops can boost high street economies by 2% to 4% due to increased footfall and increased dwell time. The same study also reported that 58% of the 2000 participants surveyed planned to visit a coffee shop whilst in the high street (ibid).

Research undertaken by Powe and Gunn (2008) in four English Market towns observed how visitors partaking in one type of evening entertainment were more likely to partake in other types of evening entertainment in the town centre.

As retailers look to shrink their physical retail presence on high streets (DTCPT, 2013; Deloitte, 2013; Business Insider, 2017), and trends favouring visitor experience continue, the potential contribution of entertainment to high street sustainability is great.

Work places: Many retail centres that have undergone retail-led regeneration have done so due to the loss of industry and manufacturing within the locality (Raco, 2003; Ellin, 1996).

This type of regeneration which encourages consumption based economic growth is considered to be a quick and simple solution to urban problems (Zukin, 1995). Indeed the contribution of retail and its associated services should not be underestimated. As highlighted by Dixon and Marston (2003), for every 100 UK retail jobs created, 50 more indirect jobs will also be created. The sector also provides great entry-level opportunities for individuals new to the world of work (BRC, 2009). However, there is a risk that this focus on consumption related activities may prove too narrow a basis to develop and sustain a strong local economy. As highlighted by BIS (2010), a good mix of different types of employment will strengthen the resilience of a high street to economic pressures. If a high street is dominated by one sector of employment and that sector declines, the high street will also suffer. Every town should offer a variety of job opportunities, which are aligned with the character of the local work force, and a range of workspaces for small businesses (Barton et al., 2003). Opportunities and workspaces which are located within close proximity to where people live maximise the potential for non-car access, which in turn encourages employees to walk, cycle and use public transport, therefore reducing emissions and encouraging physical activity (ibid). Local employment can also be advantageous to local people seeking part-time work (e.g. those with caring responsibilities, teenagers and those who don't have the means to travel) (ibid).

Civic venues: Greed (2016) observes how UK social town planning is largely developed around diversity and equality. The 2010 Equality Act lists nine categories which should be protected when developing policy in all areas, namely: age, gender, sexual orientation, gender reassignment, race, disability, pregnancy and maternity, religion or belief and marriage and civil partnership. However, despite this, issues relating to social equality are given little priority compared to environmental concerns (Greed, 2005; Reeves, 2005) and, as Greed (2016) goes on to highlight, many local authorities are prepared to "*soften the rules*" to attract big business, however small, local community organisations and faith groups often lack the resources and expertise to overcome planning restrictions. However, the provision of community halls/civic venues in accessible locations is fundamental if community activities are to thrive (Barton et al., 2003). Such venues may take the form of leisure centres, libraries, school halls, local authority/parish council halls, pub function rooms, religious venues etc.

Whilst immigration has played a role in the increased up-take of religious participation in the UK, existing literature also observes growth in religious participation of the white

indigenous population (Cox, 1995; Goodhew, 2012; Davie, 2015). Therefore the provision of venues for these growing communities to come together is essential to supporting social cohesion and well-being. The high street, as a place of diverse activities, mixed land-use and as a central meeting point, is an ideal host for community and civic venues. Furthermore, Hart et al. (2014) recognise the benefits of community spaces/meeting points to creating experiential centres which better serve the needs and expectations of the modern consumer.

Residential: The Civic Trust (2000) found that occupants of new residential accommodation in market towns were more likely to regularly use the shops and services within the town centre the closer they lived to it. However, it should be noted that different types of residential accommodation can attract different social groups who display different behaviours, and those most likely to occupy housing within close proximity of market towns tend to be retired, with lower levels of car ownership. Subsequent research studies undertaken by Richardson and Powe (2004) and Powe and Gunn (2008) also noted the potential for nearby residential dwellings to contribute to the vitality and viability of town centres. Furthermore, preliminary research which investigated residential burglary and street robbery within a London Borough, undertaken by Hillier and Sahbaz (2005), suggested that the presence of residential dwellings – thus contributing to a 'residential culture' - may be linked to lower levels of crime in a high street.

Health and social facilities: In his review exploring skills for sustainable communities (ODPM, 2004), Sir John Egan advocates the provision of high quality and local health and social facilities as part of the service offering within a sustainable community. Barton (2010) also highlights the importance of a range of accessible health facilities to the creation of sustainable neighbourhoods. Barton states that, within a town or district comprising 20,000 to 30,000 people, there should be a range of health centres and surgeries that offer a variety of services (such as family planning, midwifery, health visitor services etc.) and offer accessible options for local people. As focal points for local populations, high streets are well placed to offer accessible health and social facilities, and therefore their potential to contribute to improved sustainability in this respect is great.

4.6. Psychology

Identity/image: The concept of image in a retail setting has been a topic of academic study and debate for over 50 years (see for example Martineau, 1958; Lindquist, 1974; Stern et al., 2001; Hart et al., 2013). As alternative forms of retail (e.g. out-of-town and online) have

grown, the concept of high street identity has been increasingly recognised as a means of retaining vitality and viability (Davis, 1997; Runyan and Huddleston, 2006; Hart et al., 2007). El Hedhli and Chebat (2009) report how the consumer's image of a shopping area plays a key role in the consumer decision-making process. A poor image can lead to reduced patronage, driving visitors to other competing destinations (Miller and Kean, 1997; Mullis and Kim, 2011). Whilst the relationship between image and customer experience is recognised (Berry, 1969; MacInnis and Price, 1987), existing literature is largely focused on store and/or mall image, rather than the image of a centre as a holistic entity (Hart et al., 2013), with relatively few studies focusing on image in a town centre setting. Within a high street setting stores generally do not exist in isolation, and therefore the success of each occupant is dependent on the image emitted by the centre as a whole (Bell, 1999).

Stern et al. (2001) highlight the ambiguity of the concept of image in a retail environment, arguing that the term is used so inconsistently that one cannot be certain that any two researchers are referring to the same phenomenon. Nevertheless, it is generally accepted that the psychological interpretation of a high street - whether it be referred to as 'reputation', 'image', 'identity, 'perception', 'sense of place' etc. – is a key factor which influences consumer choice and patronage (e.g. Perugini and Bagozzi, 2011; Hunter, 2006; BRC, 2009; BIS, 2010).

Experience: As competition from alternative forms of retail have offered greater choice to the public and have facilitated a more demanding consumer, the experience on offer within a centre has become a key factor influencing visitor patronage and customer satisfaction and loyalty (Woolley, 2000; Tallon and Bromley, 2004; de Nisco et al., 2008; Verhoef.et al., 2009). Furthermore, existing literature suggests that consumers seek retail experiences that satisfy their emotional needs and offer sensory pleasure (Holbrook and Hirschman, 1982; Wakefield and Baker, 1998). Research by Hart et al. (2014) found that the 'experiential touch points' of a town centre, in particular social interaction and refreshments, contribute significant value in terms of spending and time spent within the centre, therefore reinforcing the theory that experience plays a key role in high street success and sustainability. As consumer preference continues to shift towards experiential centres, high streets that fail to acknowledge and embrace this trend will leave themselves vulnerable to decline (e.g. Hart et al., 2014; Knight Frank, 2017).

Atmosphere: Atmosphere is the '*intangible, sensory aspects of the customer experience, involving feeling and emotions – not all of them positive*' (Hart et al., 2014). Hart et al. (2014) observe how atmospheric feelings can be triggered by a range of factors, from the smell of fresh food, to the sight of rubbish and boarded-up buildings. Literature regarding malls observes the role of colours, sounds, odours (Michon et al., 2005) and excitement (Wakefield and Baker, 1998) to the atmosphere emitted/perceived. The atmosphere within a town centre generates emotional affective responses for the consumer (Turley and Milliman, 2000), and as Hart et al. (2014) highlight, this is not always positive. Consequently, authorities should scrutinise the atmosphere of their high streets to ascertain whether it encourages visitors to return to the centre (BIS, 2010). Along with other key experiential touch points (e.g. special events and market days), atmosphere can help a high street distinguish itself from the competition (Hart et al., 2014) and contribute to creating a holistic visitor experience which satisfies the needs and expectations of the consumer (Jones, 1999; Howard, 2007; Hart et al., 2014).

4.7. Safety and security

Shoppers will not be attracted to high streets that they deem to be unsafe, whether that be due to personally witnessing a crime on the high street, or deeming a centre to be unsafe due to the presence of vandalism or graffiti etc. (BRC, 2009). Therefore ensuring safety and security within high streets is of great importance to their vitality and viability. BIS (2010) highlight the importance of ensuring that high streets are controlled and safe environments at all times of day, including the evening/night-time.

Actual crime: Negative press regarding incidents of crime within a town can generate negative perceptions of the high street (Powe and Hart, 2009; BIS, 2010; Selby, 2004). Where crime has been personally witnessed by individuals when visiting the high street (e.g. attacks on members of the public or shop workers and acts of vandalism or graffiti), public perception can be particularly affected (BRC, 2009). Consumers will not be inspired to visit a high street that they deem to be unsafe (ibid).

In the context of sustainable communities, the incidence of crime can undermine all three pillars of sustainability. Crime can have economic repercussions as a result of the theft of goods, reduced footfall from poor public perception and the costs of repairs to property and infrastructure etc. Environmentally, vandalism and graffiti can negatively affect the environmental and aesthetic quality of a centre, and crime occurring on public transport and

along walking and cycling infrastructure can deter people from using more sustainable methods of movement (e.g. Barton et al., 2003) Socially, crime can cause anxiety which can impact on health and may deter individuals from visiting the high street, therefore increasing the risk of social exclusion, particularly among vulnerable social groups. People may also be deterred from using sporting facilities and public open space, therefore impacting on an individual's physical activity.

Research into the benefits of low-cost improvements to public spaces, undertaken by Anderson et al. (2017), observed that, overall, improvements - which included the introduction of ecologically based public art, high speed WiFi, general cleaning, painting, planting and landscaping - had a positive impact on the liveliness of space and well-being activities. However the researchers also noted that the improvements contributed to some anti-social activity. This finding highlights the importance of implementing complementary policing/security as part of public realm improvement initiatives.

Perceived crime: BIS (2010) highlight the complexity of creating a perception of safety on the high street. Whilst the actual crime figures of a high street may provide factual data as to how safe that centre may be, further psychological factors come into play when a visitor sub-consciously builds a perception of safety in their mind. Therefore BIS (2010) advise that when measuring the overall health of a high street, the perception of safety should also be considered; this is particularly important given that perceptions of crime are closely associated with specific places (Heal, 1999). BIS (2010) notes how the visibility and perception of crime can contribute to decline, even if the problem is not directly associated with the high street itself. Increased public awareness of an area, good or bad, can often influence the public's perception of the local high street (BIS, 2010; Selby, 2004). Jones et al. (2007) found that high street users worry less about crime and anti-social behaviour and more about the cleanliness and overall condition of the high street, with factors such as graffiti and other signs of neglect increasing the perception of a high street being unsafe to visit at night. A negative perception of safety within a high street can deter shoppers from engaging in the evening/night-time economy, however with active management and schemes such as Purple Flag accreditation, perceptions can be changed and consumers can feel more confident about venturing into the high street after dark (Wrigley and Lambiri, 2014; ATCM, 2017b).

CCTV and security presence: Raco (2003) notes the detrimental effect that limited policing can have, particularly on evening and night-time economies. In order to address the signs of crime and anti-social behaviour that can lead to negative perceptions of safety in a high street, BRC (2009) advocates removing signs of criminal activity as quickly as possible and employing preventative techniques to discourage crime, including CCTV, street patrols/ visible policing and information and intelligence sharing. Pigg (1992) reported the outcome of the installation of CCTV cameras linked to the local police station in Hexham, Northumberland in 1991. Within seven months of the installation of the cameras, crime (including rowdyism, vandalism and theft) had decreased by 12%.

Street lighting (6d): Atkins et al. (1991) observe how ineffective street lighting can undermine the success of an evening/night-time economy. Pigg (1992) notes the important role that street lighting can play in combatting incidences of criminal activity and anti-social behaviour in town centres. BRC (2009) concurs with this view, recommending that high streets be carefully designed to incorporate good lighting and overlooked areas in order to promote safety and security.

4.8. Management

Town centre management team: Leadership is a key factor when addressing the decline of a high street (BIS, 2010), and having a competent and enthusiastic town centre manager or town centre management (TCM) team can be hugely beneficial to ensuring a coordinated approach to tackling decline. It is generally felt that TCM schemes have significantly contributed to the improved quality and competitiveness of the centres in which they have been established (e.g. Jones et al., 2003; Lockwood, 1996). TCM can assist local authorities in addressing the various responsibilities that they have within a high street; therefore helping to alleviate the conflicts that can arise from a council's combined role as a planning authority, financial authority, and facilitator of more general, strategic functions (Thorpe, 1983). The role of TCM includes developing and implementing a clear vision for the high street; monitoring town centre health (BRC, 2009); maintaining the safety and cleanliness of high streets; improving transportation and accessibility; organising marketing/branding and events; integrating new amenities into the high street; integrating art and infrastructure into the high street; developing an experience in the high street (Blackwell and Rahman, 2010); and facilitating dialogue between the local authority, private sector stakeholders and the general public (Page and Hardyman, 1996).

The role of TCM in the day-to-day running of a high street should not be underestimated. Management teams must consider whether their cleaning services are appropriately organised in order to facilitate complementary day-time and evening/night-time trade i.e. is the high street clean and tidy each morning, ready for daytime trade? (BIS, 2010). As Carmona (2015) points out, the coordinated actions required to enable high streets to play to their strengths and give them the best chance of succeeding are not necessarily major redevelopment works and regeneration projects, but rather the modest actions required to tackle littering, graffiti, street clutter etc., and actions to improve traffic management, street lighting and landscaping, planting etc. Considering that such responsibilities fall under TCM, the importance of a competent and enthusiastic TCM team becomes all the more apparent to the overall success of a high street. Town centre management can also be an effective tool to address the challenges of excessive drinking, fighting and damage when developing a successful evening and night-time economy (Oc and Tiesdell, 1998; Stubbs et al., 2002; Ratcliffe and Flanagan, 2004; Whyatt, 2004).

Partnership/stakeholder involvement: The inclusive participation of government, businesses and local communities is considered an important element of a sustainable community (ODPM, 2004), and ties in with the localism agenda introduced by the former coalition government in 2011. Furthermore, BIS (2010) considers partnership to be a key factor in taking responsibility for high street decline once the warning signs have been detected. The collaboration of various stakeholders can also produce benefits in terms of high street safety (BIS, 2010).

In 2001 the UK government announced its intention to promote the creation of Business Improvement Districts (BIDS) (Jones et al., 2003). BIDS first emerged in North America during the late 1960's as frameworks for creating strong partnerships, and as a means of attracting widespread financial contributions from the private sector. They were therefore considered a valuable tool for achieving vital and viable centres (ibid). There are now over 200 BIDS in operation across the UK, providing benefits (as cited by the businesses they represent) such as: increased footfall; promotion of the local area; businesses having a voice in developing their local area; reduced business costs; providing opportunities for collaboration between neighbouring businesses; the retention of BID levy money for investment in the local area; assistance in dealing with public bodies etc. (British BIDS, 2017). Ward (2007) notes the benefits that BIDS can bring in terms of generating sustainable funds for localised management, highlighting how such investment led to a fall in crime by

nearly 60% in a notoriously crime plagued street in Birmingham. Whilst BIDS have provided opportunities for the business community to have a greater say in the ongoing development of the locations which they occupy, they don't offer the same opportunities to other interest groups. Therefore additional means of engaging with other local stakeholders should be pursued.

BIS (2010) advocate "*spreading the net wide*" when seeking the engagement of stakeholders, and therefore going beyond the usual candidates (e.g. Chambers of Commerce, Members of Parliament, Local Authority etc.) to involve less obvious partners (e.g. local faith leaders, local transport operators, schools, police, local people etc.). Furthermore, the benefits of local people coming together to work collectively can include improved individual and community health (Glaeser et al., 2002), happiness (Islam et al., 2006), walkability and community safety (Cohen et al., 2006).

Marketing: The marketing of town and city centres as retail destinations is not a new concept, however, as Coca-Stefaniak and Carroll (2015) highlight, there has been little change in the marketing approach taken since the 1980's. As consumers have become increasingly demanding, and alternative retail approaches have provided greater choice to the consumer, the marketing of a town based simply upon its retail offering is no longer an effective method of promotion (Experian, 2012; Hart et al., 2013).

Effective marketing, coupled with a unique selling point, can be hugely powerful in attracting greater levels of footfall to a high street. Effective branding involves creating a simple yet engaging identity for a town centre which is used consistently (DCLG and ATCM, 2014). However, as Powe and Hart (2009) observe, creating an identity for a town can be problematic due to the various stakeholder groups often involved. Meaningful branding engages local stakeholders from the outset to ensure that a genuine understanding of the character and personality of an area is developed (DCLG and ATCM, 2014). Once a brand has been established, it should be applied rigorously through marketing tools such as loyalty schemes, online and social media activities, maps and signage etc. (ibid).

Hart et al. (2014) observe how improved signage, themed events and awareness-raising marketing campaigns can help to transform retail cold-spots into retail hot-spots. Furthermore, they recommend the use of linked promotions which enhance the consumer experience and extend visits (e.g. after-work and evening parking, 'five to nine' trading, 'three plus one free' events etc.).

Digital connectivity/internet presence: Parker et al. (2014) note how internet availability on the high street is currently not acknowledged as a factor of high street performance; they suggest that this may be due to the increase in smartphone users who usually have an individual data plan. However, such data plans are dependent on a reliable 3G/4G connection.

Over the last 20 years reality has become increasingly integrated with the online world and the high street is no exception to this. The development of applications (referred to as 'apps') has enabled companies to strengthen the relationship between the physical and digital aspects of their businesses. This has been particularly prevalent in the retail sector. Many retailers now encourage the use of apps in combination with physical shopping by enabling price scanning applications, live tailored promotions and even payment through applications which eliminates the need for customers to queue at a till.

The potential for digital integration to support the vitality of retail centres has not gone unnoticed (see for example Experian, 2012; Grimsey, 2013; ATCM, 2014). However, as Parker et al. (2014) point out, there is limited research on the integration of the physical and digital marketplace, and there is currently no evidence to show that internet availability improves high street performance. Nevertheless, with the wide availability of telecommunication and internet access considered an important feature of a sustainable community (ODPM, 2004), and the increasing pressure on high streets to modernise to meet changing consumer needs and compete with alternative retail formats, the digital enhancement of high streets is an important factor to acknowledge in this research study.

4.9. Environmental protection

A key component of a sustainable community is the efficient use of resources both now and in the future (ODPM, 2004). Such communities also enable the protection and enhancement of natural resources and biodiversity (ibid).

Environmental/carbon reduction schemes: According to Rehan (2013) a streetscape must be environmentally efficient to achieve the status of a sustainable street. Such streets must therefore reduce their impact on environmental resources by: promoting biodiversity; reflecting the cultural context of streets (Bevan et al., 2007); enhancing the pedestrian environment to improve air quality and encourage walking (Tetra Tech, 2009); and planting trees and incorporating reflective surfaces to counteract urban heat islands (RDG Planning and Design, 2008). Further elements of sustainable streetscapes include techniques to

improve water quality, efforts to reduce light pollution and efforts to reduce energy consumption (Rehan, 2013). Methods to reduce energy consumption may include initiatives to promote non-motorised travel and movement of goods; the use of sustainable, green materials (Bevan et al., 2007) and the installation of energy efficient lighting (Mikyoung King Design, 2008). Due to the mixed-stakeholder nature of high streets, the implementation of environmental approaches like those listed above requires clear and cohesive initiatives that engage and inspire a range of high street stakeholder groups. Furthermore, the BRC (2010) note the challenges of improving the sustainability of older high street properties and suggest that mechanisms be established to support remedial works to properties in historic and traditional centres.

Environmentally sustainable materials: The life cycle of raw materials, including extraction, transportation and manufacturing, can have a range of implications on the environment (UKGBC, 2017). Sustainably sourced materials are those which have been extracted and manufactured in an environmentally sensitive way by individuals who are treated fairly; materials that have come through a supply chain that has displayed a high level of ethics; and materials that have come through a supply chain that has promoted stakeholder involvement, including communities living close to places of extraction and manufacture (BRE, 2012).

The use of sustainable materials is a key element of a sustainable streetscape (Rehan, 2013). Using such materials reduces energy use and preserves natural resources (RDG Planning and Design, 2008). Materials used in sustainable streetscapes should minimise the requirement for excessive maintenance and replacement (Mikyoung Kim Design, 2008), and should promote reflectivity, green manufacturing, local sourcing and permeability (Tetra Tech, 2009).

Waste management and recycling schemes: Pigg (1992) notes the importance of street cleaning, from the collection of litter and refuse, to the cleaning of grease from take-away establishments. However responsibility for waste removal and general cleanliness is not always straight-forward. Jones et al. (2007) note the comments of a Tooting based businessman who expressed his frustration at having to organise his rubbish into four different types, so that four different types of refuse collector could take it away. This division of responsibility led to the presence of rubbish bags on the pavement on a daily basis which negatively affected the aesthetic of the high street and caused an obstruction to

pedestrians. The privatisation of waste removal has cost benefits due to increased competition, however as it can often lead to this division of responsibility across a number of contractors, issues can arise such as unsightly and unhygienic (depending on the waste) waste on pavements and congestion from multiple collections (ibid). Jones et al. (2007) also note the difficulty in organising a post waste collection street clean, due to the sheer number of collection times. The BRC (2009) note the importance of maintaining a high street to a very high standard. This involves keeping streets clean and deterring people from littering and engaging in anti-social behaviour.

4.10. Economic Viability

Commercial rent: High street rent is often the largest financial outgoing for high street occupiers, and the more desirable a retail location, the higher the rent. Therefore prime retail locations are often financially out of reach for small and independent retailers. As observed by Carmona (2015), the growth of the 'clone town' has further inflated high street rental values as multi-national retailers can afford to buy knowledge and expertise when looking to acquire sought after locations, and many are prepared to pay over the odds for certain locations, regardless of the impact on profit margins. However, for this reason, the retail and service diversity of many high streets has been limited. Affordable rents are important in attracting small, independent businesses, and whilst the prevalence of independent businesses does not necessarily improve the success of a high street (BIS, 2014), a lack of choice is a key source of customer dissatisfaction (Wrigley and Lambiri, 2014). Furthermore, contrary to common opinion, evidence suggests that independent businesses benefit from the presence of nearby big corporate retailers (ibid), therefore highlighting the importance of a mix of occupiers. It is therefore considered that commercial rent is a key factor that can influence the location and economic viability of businesses, the diversity of high streets and therefore how well the centre meets consumer needs and expectations.

Business rates: Business rate tax is calculated as a proportion of the rental value of a commercial property; therefore, the higher the rental value, the higher the business rate charge, and vice versa. As the BRC (2009) highlight, retail is a property intensive sector, and location is often critical to how visible a store will be to potential custom, and the levels of footfall likely to pass by a unit. Consequently retailing pays more than its representative share of business rate tax (ibid). BRC (2009), Portas (2011) and Wrigley and Lambiri (2015) all cite the impact of business rates on the viability of high street retailers. Key criticisms

have included disproportionate charges (due to the postponing of revaluations) and a lack of consideration of turnover, therefore putting small and start-up businesses at a disadvantage.

Recent changes to business rates (including a revaluation in April 2015) have eased some of the financial burden of business rates, however the tax continues to have implications on high street trading, particularly when online traders are sheltered from such taxes. Due to the influence of business rate tax on the viability of many businesses – particularly small, independent enterprises – it was considered to be an important factor to consider when assessing high street sustainability.

Trading hours: As online retail continues to grow in popularity, the set trading hours of high streets are becoming increasingly out-dated. Up until 1994 the Shops Act 1950 determined shop trading hours by setting out mandatory closing hours. In 1986 Margaret Thatcher's conservative government tried to pass the Shops Bill 1986 which sought to abolish all restrictions, however it was met with strong resistance from 'anti-Sunday opening' campaigners (BBC, 1994). A compromise was finally reached in the form of the Sunday Trading Act 1994; this was the 27th attempt to relax Sunday trading restrictions (ibid). Sunday trading laws have remained the same ever since, with the exception of an 8 week suspension during the 2012 London Olympics; this is despite the growth in online shopping which has enabled consumers to shop online 24 hours a day, seven days a week, therefore making high street trading hours "*something of a nonsense*" (Burt and Sparks, 2003).

In 2014 a Comres poll for the 'Open Sundays' campaign group revealed that 72% of people believed that they should have the option to shop whenever is convenient to them (Retail Week, 2014). The co-founder of the campaign group, Mark Allatt, criticised the current trading laws for being "*outdated*" and argued that "*people need extra opportunity to shop because they work all week*" (ibid). As the popularity of online retail continues to grow, the trading hours of high streets is likely to become a key factor in their ongoing relevance, or irrelevance as the case may be.

Complementary daytime, evening and night-time economies: In 2014 DCLG and ATCM reported that the UK evening and night-time economy was worth £66 billion, accounted for 10%-16% of a town centre's employment and accounted for more than 25% of the national economy. Their report also highlighted the shift in consumer culture which increasingly favours visitor experience and suggested that the evening and night-time economy can often be a great place to start to develop a leisure and cultural offering that can run parallel to

retail. However, BIS (2010) note the importance of capturing footfall when it is in the vicinity, and warn of the detrimental effects of too great a gap between shops closing and evening entertainments and attractions commencing; without a smooth transition between daytime and evening/night-time attractions, the ability for high streets to develop a successful evening/night-time economy can be undermined.

Hart et al. (2014) found that just 23% of their respondent sample reported combining their shopping activities with the evening economy. The barriers stopping people from engaging in the evening economy included a lack of infrastructure, cost, safety issues, and the gap between shops closing and evening entertainments and attractions commencing. Hart et al. (2014) therefore advocate reviewing travel costs and parking during the evening and night-time in order to attract visitors from a wider catchment area. Furthermore, they recommend the provision of attractions and events that bridge the gap between daytime and evening activities.

4.11. Chapter summary

The complexity of the combination of factors that are considered to influence the performance and sustainability of high streets is evident from the literature presented in this chapter. The competing priorities of the three pillars of sustainability mean that the functions and features identified are not necessarily aligned and can aspire to conflicting outcomes. For example, where the interests of environmental sustainability would advocate the increased use of public transport, aspirations for greater economic sustainability – by meeting consumer needs and expectations - highlight the need for ample, improved, low-cost parking solutions for private vehicles. It would therefore appear that the functions of public transport and parking facilities are directly opposed in their goals. It is perhaps partly due to such conflicting factors that existing performance measures have remained focused on assessing economic factors of success. If performance measures are to reflect the diversity of high street functions and features to enable a holistic understanding of high street success and sustainability, methods of assessment that can deal with complexities and competing priorities need to be developed.

4.12. Overall conclusions from the literature review

The review of literature detailed the evolution of the UK high street from the industrial revolution to present day. The literature highlighted the variety of external factors that have influenced the evolution of high streets over time, and the attempts made by planners and

policy makers to protect centres from the negative implications of these factors. The literature also highlighted the rising expectations of consumers who increasingly favour the presence of psychological touch points which are largely formed from social and physical/environmental elements of the high street (e.g. Oppewal and Timmermands, 1999; Hart et al., 2014; Wrigley and Lambiri, 2014; DHSAB, 2015). The review also outlined the benefits of sustainable communities and discussed the range of economic, environmental and social consequences of a declining high street, therefore highlighting the importance of connecting the concept of sustainability to high streets. The importance of this connection was reiterated through the exploration of literature that recognised a range of economic, environmental and social factors to be influential factors to high street success.

Also discussed within the literature review were existing measures/indicators of high street performance. A major criticism highlighted by the literature was the retail centric and economically focused nature of such measures (Griffiths et al., 2008; BIS, 2011; Coca-Stefaniak, 2013). The literature made evident the lack of recognition of local and social factors (e.g. Powe and Hart, 2009; Hart et al., 2013), insufficient recognition of evening and night-time economies (Coca-Stefaniak, 2013) and insufficient recognition of the importance of creating a balance between the town centre offering and the needs and expectations of high street users (Coca-Stefaniak, 2013). It therefore became apparent that existing performance measures were failing to sufficiently acknowledge the variety of high street functions and the broader factors that influence high street performance (Ravenscroft, 2000; Griffiths et al., 2008).

It became evident that there was a misalignment between the economic, environmental and social factors that had been found to influence high street success, and the factors that were being measured by high street performance indicators. Furthermore, it appeared that cost and resource limitations were constraining the potential for performance measures to take a broader, more inclusive view of high street condition (BIS, 2014). However, given that many town centre studies, including local authority commissioned retail studies, already encompass consumer surveys, the means for obtaining primary data to develop measures that reflect consumer needs and expectations already exists in many cases. Therefore it was concluded that the development of a broader, more inclusive set of indicators/measures that enable the sustainability of high streets to be assessed was both necessary and, by utilising already implemented means of data collection, feasible. This conclusion spurred the development of the high street sustainability assessment model presented by this research.

Chapter 5: Methodology

5.1. Introduction

The review of relevant journal publications, books, government and local authority reports, and media articles has expanded the author's knowledge of the evolution of UK high streets and high street performance and sustainability. It has also helped to identify any gaps in the literature.

The literature review has highlighted the fast paced changes affecting UK high streets, including changing consumer trends, changing economic conditions and advances in modern transportation and technologies. Such factors have led to the changing needs and expectations of consumers. Consequently the role of the high street is changing from one focused largely on retail activities, to one that facilitates social and psychological experiences. Big name retailers have already started scaling back their property portfolios as the industry responds to the growing popularity of online retail and the consequent oversupply of retail floor space in the UK.

Whilst a growing number of academics and retail experts have acknowledged the changing role of the high street, performance measures continue to place emphasis on the retail function of high streets. Existing literature highlights how a combination of complex and sometimes conflicting economic, environmental and social factors are influential to high street performance. Furthermore, as the need to improve global sustainability becomes increasingly urgent, the need to scrutinise the contribution of high streets to improved sustainability becomes apparent. The review of literature has therefore identified the need to develop a performance measure that accounts for the variety of economic, environmental and social high street functions. By assessing high streets in this manner, high street stakeholders can be better informed as to the holistic performance and sustainability of centres.

The literature review alone does not offer the information/data required to carry out this research project in accordance with the specified objectives, therefore it was necessary to undertake primary, and some secondary, data collection. The methodological approach taken for this study is presented in this chapter.

5.2. Selecting a suitable decision making method

The literature review has highlighted the complex and sometimes conflicting range of factors that influence high street sustainability. The objective of this research is to develop a model that can assess high street sustainability in terms of these complex, competing criteria.

There are a number of methods that are used to assist decision making in a variety of circumstances. The researcher sought to select a method that was suitable for the decision making problem and could be understood by high street decision makers. The methods considered by the researcher are discussed below.

Linear Programming methods are commonly used in business and economic contexts as a means of *"selecting the "most desirable" course of action"* (Desi, 1964). Linear Programming is used to determine the optimal approach to achieving a set objective within defined parameters/constraints. For example, in a product development context where the product is a bar of soap comprising pre-defined characteristics (the set end objective), Linear Programming can be used to determine the amount of fat and oil that should be sourced to achieve the desirable characteristics, within cost parameters. Whilst Linear Programming is a valuable tool in business contexts, its suitability in the context of assessing high street sustainability was less clear. The method relies on linear equations, and where there are large numbers of variables, the method is reliant on computers to make the necessary calculations (Sciencing, 2018). Given the potential number of parameters/constraints (i.e. the influential factors) posed by high street sustainability, and need for Linear Programming to have a pre-determined end objective and its assumption of linearity, the researcher concluded that the methodology did not align sufficiently to the decision problem investigated by this study.

Cost Benefit Analysis (CBA) is a method commonly used to evaluate the efficiency of a policy (Annema et al., 2015). Advantages of CBA are considered to be its theoretical unambiguity (Beria et al., 2012; Mackie at el., 2014; Macharis and Bernardini, 2015) and its valuable output (the efficiency criterion) for decision making regarding government spending (Beria et al., 2012). The main disadvantage of CBA is that it is not suitable for decision making situations that comprise multiple and conflicting criteria and objectives (Barfod and Salling, 2015). Furthermore, CBA is designed for monetary related decision making problems, and therefore assessments take into consideration 'willingness to pay' or 'willingness to accept monetary compensation'. The decision making situation presented in this study comprises multiple, and sometimes conflicting, criteria, and requires the opinions

of key stakeholder groups to be incorporated into the model. Therefore, for the reasons stated above, it was considered that CBA was not a suitable method with which to develop the high street sustainability assessment model.

Multiple Criteria Decision Making (MCDM) methods enable decision making problems comprising multiple and conflicting criteria to be assessed (Zanakis et al., 1998; Zeleny, 1982; Belton & Stewart, 2002). These methods can reflect the varying significance of decision criteria through weightings and, due to the ability for stakeholder opinions to inform weightings and criteria values, they enable criteria with less available data to be analysed. The ability to incorporate stakeholder views is particularly noteworthy for this study, given that expert and consumer views can be hugely influential to high street performance and development. Due to the reasons stated above, MCDM methods were selected as the most appropriate methodological tool with which to develop the proposed model.

5.3. An overview of MCDM methods

MCDM, also referred to as, Multi Criteria Analysis (MCA) and Multi-Criteria Decision Aid (MCDA) (Zopounidis, 1999), is a methodological tool that enables decision making situations to be assessed against a defined set of multiple, complex and often conflicting criteria (Zanakis et al., 1998; Zeleny, 1982; Belton & Stewart, 2002). The different possible outcomes of a decision making situation are referred to as 'alternatives'. MCDM has been one of the fastest growing forms of operational research during the last 25 years (Behzadiant et al., 2010).

MCDM is a category of methods which can be sub-divided into two groups: Multi Objective Decision Making methods and Multi Attribute Decision Making Methods (European Commission, 2015). There are numerous different methods in existence which vary in terms of how they operate, and consequently some methods may prove more appropriate to some decision making situations compared to others. However, broadly speaking all methods involve the following three key steps:

Step 1:	Identifying the criteria and alternatives.
Step 2:	Calculating criteria weights and determining criteria values with reference to the alternatives being assessed.
Step 3:	Ranking the alternatives based on the criteria values.

Table 2 illustrates the typical configuration of an MCDM matrix. W_j represents the weighted criterion and A_i represents the alternative being assessed. The value of a_{ij} is therefore the

score of each alternative in terms of each criterion (for i = 1, 2, 3, …, m, and j = 1, 2, 3, …, n).

Table 2. Decision matrix for MCDM methods

Alternative	W_1	W_2	W_2	...	W_n
A_1	a_{11}	a_{12}	a_{13}	...	a_{1n}
A_2	a_{21}	a_{22}	a_{23}	...	a_{2n}
A_3	a_{31}	a_{32}	a_{33}	...	a_{3n}
⋮	⋮	⋮	⋮	⋮	⋮
A_m	a_{m1}	a_{m2}	a_{m3}	...	a_{mn}

(Source: Triantaphyllou, 2000)

Decision making methods can be categorised according to whether they are discrete or continuous in nature. Discrete methods involve the use of a set of pre-determined alternatives and take the form of Multi-Attribute Decision Making (MADM) methods (Triantaphyllou, 2000; Zanakis, 1998). Continuous methods involve an infinite number of alternatives, taking the form of Multi-Objective Decision Making (MODM) (De Montis et al., 2000; Triantaphyllou, 2000).

Further means of categorising MCDM methods include grouping them in terms of the number of decision makers involved (Triantaphyllou, 2000), the type of criteria related information involved (Chen and Hwang, 1992), or by the type of data involved (e.g. fuzzy, deterministic or stochastic) (Triantaphyllou, 2000). Methods can also be differentiated in terms of whether they are compensatory or non-compensatory in nature. Compensatory methods are predominantly based on Multi-Attribute Utility Theory (MAUT) and allow explicit trade-offs among criteria (Shanian and Savadogo, 2009). Non-compensatory methods on the other hand involve pairwise comparisons of individual criteria (Collette, 2003; Pratyyush & Jian-Bo, 1998) which do not facilitate trade-offs. Compensatory methods enable higher scoring criteria to compensate for lower scoring criteria and therefore enable alternatives to be compared holistically.

Methods can also be categorised according to whether the decision making problem is:

1. *A choice problem*. In this case the decision maker seeks to identify the best alternative or a subset of best alternatives.
2. *A ranking problem*. In this case alternatives are ranked from best to worst.

3. *A sorting problem*. In this case the alternatives are grouped into subsets according to some norms.

(Wong, 1999)

The aim of this study is to compare the sustainability of a predetermined set of town centres using weighted assessment criteria. The problem is therefore a ranking one which is discrete in nature. Consequently MADM methods are considered to be most appropriate for this study. The literature will therefore focus on MADM methods.

MADM methods can be divided into two categories:

1. *Methods based on MAUT*. These methods are commonly compensatory in nature and therefore allow explicit trade-offs among criteria.
2. *Outranking methods*. These methods are non-compensatory in nature and therefore involve pairwise comparisons of individual criteria.

5.3.1. Compensatory methods

As compensatory methods allow for trade-offs among the criteria, they enable better performing criteria to compensate for poorer performing criteria, therefore allowing alternatives to be compared holistically rather than through individual pairwise comparisons of criteria. Compensatory methods are generally based on MAUT and involve the allocation of a utility to each possible eventuality (alternative) of a decision making problem (Konidari & Mavrakis, 2007). The alternative that produces the best utility will be identified as the best solution to the problem. An advantage of methods based on MAUT is that they are able to account for uncertainty, however they require a large amount of data which may prove difficult to obtain for some decision making problems (Velasquez & Hester, 2013). A selection of the most commonly used compensatory methods are discussed below.

5.3.1.1. Weighted Sum Model (WSM)

WSM, which is also referred to as the Simple Additive Weighting (SAW) model, is the earliest - and thought to be the most widely applied – decision making method, particularly with regard to single dimensional problems (Triantaphyllou & Mann, 1989). As explained by Fishburn (1967) and Chen and Hwang (1992), in a decision making circumstance comprising M alternatives and N criteria, the best alternative (A^*) would be the alternative which satisfies the following equation (in a maximising case):

$$A^*_{\text{WSM}} = \max_{M \geq i \geq 1} \sum_{i=1}^{N} a_{ij} w_j$$

(1)

A^*_{WSM} represents the score of the best alternative, a_{ij} is the performance of the ith alternative with regard to the jth criterion, and w_j represents the importance weight assigned to the jth criterion. For this method, minimising criteria should be transformed into maximising criteria.

The WSM method is underpinned by the additive utility assumption which assumes that the total value of each alternative is equal to the sum of the products given in the above calculation (Triantaphyllou, 2000). As a result, WSM works well for single dimensional problems in which units of measurement are the same for all criteria, however due to the additive utility assumption, difficulties arise when the method is applied to multi-dimensional decision making problems (ibid).

5.3.1.2. Weighted Product Model (WPM)

WPM is very similar to WSM, however the model involves multiplication rather than addition (Triantaphyllou and Mann, 1989). In this method the alternatives are compared by multiplying ratios for each criterion (ibid), with each ratio multiplied by the relative weighted value of the corresponding criterion (Triantaphyllou, 2000). In order to compare two alternatives (A_K and A_L) the following equation (Bridgman, 1922; Miller and Starr, 1969) should be used:

$$R\left(\frac{A_K}{A_L}\right) = \prod_{j=1}^{N} \left(\frac{a_{Kj}}{a_{Lj}}\right)^{wj}$$

(2)

In a maximising case, if the ratio is greater than or equal to one, then the decision maker can consider the A_k alternative to be superior to the A_L alternative (Triantaphyllou, 2000). In other words, the best alternative is the one that is greater than or equal to all of the other alternatives (ibid). WPM does not require units of measure and therefore the method is sometimes referred to as dimensionless (Triantaphyllou and Lin, 1996; Triantaphyllou, 2000). For this reason the method is effective for both single and multi-dimensional decision making problems. It also permits the use of relative values instead of actual ones (Triantaphyllou

and Mann, 1989; Triantaphylou, 2000). Advantages of WSM include its intuition to decision makers and its simplicity (does not require complex software), however its results are not always logical and don't always reflect reality (Velasquez and Hester, 2013).

5.3.1.3. Analytic Hierarchy Process (AHP)

The AHP method was developed by Saaty (1980) and is a widely used and well known decision making method (Erken & Rouyendegh, 2014). The method offers a flexible, quantitative approach for the comparison of alternatives based on their performance in terms of relevant criteria (Boroushaki & Malczewski, 2008; Lin et al., 2007). The method works by breaking down the decision making problem into a hierarchy (Triantaphyllou, 2000; Altunok et al., 2010). Pairwise comparisons regarding the relative importance of elements are then made at each hierarchical level. The decision maker can then judge which element is superior in terms of the criteria (Altunok et al., 2010). AHP enables the decision maker to depict his/her preference between a pair of elements using the following scale:

1- Equally important
3- Moderately more important
5- Strongly more important
7- Very strongly more important
9- Extremely strongly more important

The even numbers (2, 4, 6 and 8) represent intermediate importance values. The pairwise comparisons enable the alternatives to be ranked in order of priority based on the preferences that the decision maker has expressed overall (Altunok et al., 2010). Finally an m x n matrix is constructed (m= number of alternatives, n= number of criteria) using the relative importance of the alternatives with reference to the criteria. In the matrix, a_{ij} represents the value of the alternative with reference to the criteria. In AHP the sum of the a_{ij} values presented in the matrix equal 1.

As AHP uses relative values rather than actual units of measure, the method is suitable for multi-dimensional decision making problems. However, whilst AHP can be used for a variety of decision making problems, it is not always easy to analyse. Furthermore, if the problem comprises a large number of criteria, the application of AHP can become time consuming (Schniederjans et al., 1995).

The AHP method uses the following equation to determine the best alternative (in a maximising case) (Bridgman, 1922):

$$A^*_{\text{AHP}} = \max_i \sum_{j=1}^{N} a_{\text{ij}} w_j \quad (3)$$

5.3.1.4. Revised AHP

Belton and Gear (1983) demonstrated that the original AHP can lead to ranking inconsistencies when an additional alternative - identical to an existing non-optimal alternative – is introduced. They subsequently proposed a revision of the original method to overcome this issue. Whilst the original AHP requires alternative values to sum up to 1, in the revised version relative values are divided by the maximum relative value (Triantaphyllou, 2000). Saaty (1990) initially criticised the revised version, arguing that identical alternatives should not be used in AHP, however Triantaphyllou and Mann (1989) also observed similar issues even when alternatives were not identical. Saaty later accepted the revised version of AHP, which is also referred to as the ideal-mode AHP (Triantaphyllou and Lin, 1996). It is however noted that Triantaphyllou and Mann (1989) also observed the same ranking contradictions – regarding non-identical alternatives - with the revised APH method as well as the original.

5.3.1.5. Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS)

The TOPSIS method was developed by Hwang and Yoon (1981) and is based upon the belief that the best alternative is the one that is the shortest distance from the positive ideal solution, and the furthest distance from the negative ideal solution (Hwang and Yoon, 1981; Zeleny, 1982; Ertugrul & Karakasoglu, 2007). The positive ideal solution maximises the positive criteria and minimises the negative criteria. Conversely the negative ideal solution maximises the negative criteria and minimises the positive criteria (Wang and Elhag, 2006). TOPSIS is a widely used MCDM method due to its simplicity, unambiguousness, ease of use and efficiency (Altunok et al., 2010). The steps required in its application also remain the same regardless of the number of criteria involved (Ic, 2012). However, disadvantages of the method include difficulty with weighting criteria and maintaining consistent judgements and the method's use of Euclidean Distance, which does not take into consideration the correlation of criteria (Velasquez and Hester, 2013).

The following stages are involved in the application of TOPSIS:

Stage 1 - Construct the normalised matrix

In this stage the units of measure for the criteria are converted into dimensionless values. A normalised value (r_{ij}) is calculated as follows:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}} \tag{4}$$

Where x_{ij} denotes the value of *j*th criterion with reference to the *i*th alternative and r_{ij} denotes the new normalised value.

Stage 2 - Construct the weighted normalised matrix

A set of weights (the sum of which is equal to 1) that have been specified by the decision maker are used in combination with the previous normalised matrix to establish the weighted normalised matrix (V):

$$V = (r_{ij}W_j) \tag{5}$$

Stage 3 - Determine the positive ideal and negative ideal solutions

The solutions are calculated as follows (where A^* represents the positive ideal solution and A^- represents the negative ideal solution):

$$A^* = \left\{\left(\max_i v_{ij} \,\middle|\, j \in J\right), \left(\min_i v_{ij} \,\middle|\, i \in J'\right), i = 1,2,3,\dots,m\right\}$$
$$= \{v_{1^*}, v_{2^*}, \dots, v_{n^*}\} \tag{6}$$

$$A^- = \left\{\left(\min_i v_{ij} \,\middle|\, j \in J\right), \left(\max_i v_{ij} \,\middle|\, j \in J'\right), i = 1,2,3,\dots,m\right\}$$
$$= \{v_{1^-}, v_{2^-}, \dots, v_{n^-}\} \tag{7}$$

$$J = \{j = 1,2,3,\dots,n \text{ and } j \text{ is associated with benefit criteria}\}$$
$$J' = \{j = 1,2,3,\dots,n \text{ and } j \text{ is associated with the cost/loss criteria}\}$$

Where the decision maker would favour a solution comprising the maximum value of benefit criteria, A^* would indicate the best alternative and A^- would indicate the worst alternative.

Stage 4 - Calculate the separation measures

The next step is to calculate the distance of each alternative from the positive and negative ideal solutions. This is achieved by applying the n-dimensional Euclidean distance method. To determine the distance from the positive ideal solution the following calculation is used:

$$S_{i^*} = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_{j^*}\right)^2}, for\ i = 1,2,3,\dots,m, \tag{8}$$

S_{i^*} denotes the Euclidean distance of the alternative from the positive ideal solution. To determine the distance from the negative ideal solution the following calculation is used:

$$S_{i^-} = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_{j^-}\right)^2}, for\ i = 1,2,3,\dots,m, \tag{9}$$

S_i^- denotes the Euclidean distance of the alternative from the negative ideal solution.

Stage 5 - Calculate the relative closeness of the alternative to the ideal solution.

The relative closeness of the alternative (A_i) to the positive ideal solution (A^*) is calculated as follows:

$$C_{i^*} = \frac{S_{i^-}}{S_{i^*} + S_{i^-}} \tag{10}$$

Where $1 \geq C_{i^*} \geq 0$, and $i = 1,2,3,...,m$.

$C_{i^*} = 1$ only when $A_i = A^*$ (positive ideal solution), and $C_i^- = 0$ only when $A_i = A^-$ (negative ideal solution).

Stage 6 - Rank the order of preference

To determine the best alternative the decision maker then ranks C_{i*} in order of preference. The best solution will be the alternative which is the shortest distance from the positive ideal solution, and the furthest distance from the negative ideal solution.

5.3.1.6. Complex proportional assessment (COPRAS)

COPRAS was developed by Zavadskas & Kaklauskas (1996). The method can be used to assess decision making problems comprising both maximising and minimising criteria values (Podvezko, 2011). This is a feature that is not present in other methods such as WSM/SAW. However, the output of COPRAS can be sensitive to slight variations in data and therefore its ranking of alternatives can differ when compared to the application of other methods in the same decision making situation.

The following stages are generally followed in the application of COPRAS (Zavadskas et al., 2004):

Stage 1 - Normalise the decision making matrix

The normalised weighted value (d_{ij}) is calculated as follows:

$$d_{ij} = \frac{x_{ij} q_i}{\sum_{j=1}^{n} x_{ij}}, \qquad i = \overline{1,m},\ j = \overline{1,n,} \tag{11}$$

and

$$q_i = \sum_{j=1}^{n} d_{ij}\,, \qquad i = \overline{1,m},\ j = \overline{1,n,} \tag{12}$$

x_{ij} is the value of the *i*-th criterion in terms of the *j*-th alternative; q_i is the weight of the i-th criterion; *m* is the number of criteria; and *n* is the number of alternatives.

Stage 2 - Calculate the sums of the maximising and minimising criteria values

The sums of the maximising criteria values (S_{+j}) and the minimising criteria values (S_{-j}) are calculated as follows:

$$S_{+j} = \sum_{i=1}^{m} d_{+ij},$$

$$S_{-j} = \sum_{i=1}^{m} d_{-ij},$$

$$i = \overline{1,m},\ j = \overline{1,n},$$

(13)

Stage 3 - Determine the significance of the alternative

The significance of the alternative is assessed against the maximising (S_{+j}) and minimising (S_{-j}) criteria values. The relative significance (Q_j) of the alternative is calculated as follows:

$$Q_j = S_{+j} + \frac{S_{-\min} \sum_{j=1}^{n} S_{-j}}{S_{-j} \sum_{j=1}^{n} \frac{S_{-\min}}{S_{-j}}}, \qquad j = \overline{1,n},$$

(14)

Stage 4 - Identify the most significant alternative

The greater the significance (Q_j), the higher the ranking and the better the alternative. The relative significance (Q_j) indicates the extent to which the alternative satisfies the requirements of the decision maker (Banaitiene et al., 2008). In the Q_{max} case, the degree of satisfaction is the highest and the relative significance of the other alternatives is lower; in other words, all other alternatives will satisfy the needs of the decision maker to a lesser degree than Q_{max} (ibid).

Stage 5 - Calculate the utility degree of each alternative

The utility degree of each alternative is calculated through the comparison of the alternatives against Q_{max}. The alternative of greatest significance (Q_{max}) is considered to have a utility degree (N_j) of 100%. The values of the utility degrees of the rest of the alternatives will fall between 0% and 100%, between the best and worst alternatives. The utility degree (N_j) of each alternative is calculated as follows:

$$N_j = \frac{Q_j}{Q_{\max}} \times 100$$

(15)

5.3.1.7. Modified COPRAS

In the modified version of COPRAS, the following formula replaces stage 3 of the process outlined above:

$$\overline{Q_J} = S_j^+ - S_j^-$$

(16)

5.3.2. Outranking methods

Outranking methods are non-compensatory in nature and therefore they do not allow a higher score for one criterion to compensate a lower score for another. As the methods do not permit explicit trade-offs they do not allow alternatives to be compared holistically and instead they involve the pairwise comparisons of individual criteria. Outranking methods are often advantageous in decision making situations comprising a finite number of alternatives and in problems with a large number of criteria and decision makers (Kangas et al., 2001).

The Elimination and Choice Translating Reality (ELECTRE) method and Preference Ranking Organisation Method for Enrichment Evaluations (PROMETHEE) are well known and widely used outranking methods (Chen, 2014). These methods are briefly discussed below.

5.3.2.1. Elimination and Choice Translating Reality (ELECTRE)

Developed by Benayoun et al. (1966), ELECTRE is based on concordance analysis (Velasquez and Hester, 2013). The method involves the pairwise comparisons of alternatives with reference to each criterion. An alternative is considered to have been dominated if another alternative performs better with reference to one or more of the criteria, and performs equally with reference to the rest of the criteria (Triantaphyllou, 2000). However, Roy (1973) explains that in an example concerning two alternatives (A_i and A_j) where A_i has been dominated by A_j, the decision maker may choose to overrule the quantitative result and select A_i as almost surely the better alternative.

For the pairwise comparisons, $g_i(A_j)$ and $g_i(A_k)$ represent physical or monetary values for the alternatives A_j and A_k respectively. Threshold levels for the difference $g_i(A_j)$ - $g_i(A_k)$ are then

introduced which allow the decision maker to declare either indifference between the two alternatives, strong or weak preferences for one of the two alternatives, or no preference for either of the alternatives (Triantaphyllou, 2000). Consequently the set of binary relations of alternatives (the outranking relations) can be either complete or incomplete (ibid).

The next step involves the decision maker assigning weights to the criteria to represent their relative importance. ELECTRE can then determine the concordance and discordance indices. Where the criteria values support the suggestion that A_j dominates A_k, this is referred to as the concordance principle. Where the criteria values do not support this suggestion, this is referred to as the discordance principle (Triantaphyllou, 2000). ELECTRE then produces binary outranking relations between the alternatives (ibid). As the binary relations may be incomplete (if the decision maker could not express a preference for one alternative over another in the earlier stages of the method) ELECTRE may be unable to identify the best alternative; it may simply identify leading alternatives by discounting those which are less favourable (ibid).

A key advantage of ELECTRE is its ability to take uncertainty and vagueness into account, however the method and its output can be difficult to explain in layman's terms (Velasquez and Hester, 2013). Further disadvantages include its inability to directly identify the strengths and weakness of the alternatives, and a lack of verification of its results and impacts (Konidari and Mavrakis, 2007). Firgueira et al. (2013) note the advantage of the ELECTRE family of methods in decision making situations involving both quantitative and qualitative criteria. However in situations comprising all quantitative criteria they suggest that it may be 'better' to use another method.

Lootsma (1990) advocates the use of ELECTRE for decision making situations comprising a small number of criteria and large numbers of alternatives. However Stewart (1992) disagrees, advocating the method's use for problems comprising a small number of alternatives (e.g. 6 or less).

A number of variations of ELECTRE have developed over time (from I to IV, Iv, IS, TRI-B (formally just TRI), TRI-C and TRI-NC). The most commonly used variants are ELECTRE II and III (Wang and Triantaphyllou, 2008). The different variants of the method offer slightly different features to the decision maker. For example, ELECTRE IS introduces an indifference threshold to the original ELECTRE I method (Roy, 1968); ELECTRE II involves strong and weak outranking relations (Roy and Bouyssou, 1993); ELECTRE III

expresses outranking through a credibility index (Roy, 1978); and ELECTRE IV is similar to ELECTRE III except there are no weights involved (Roy and Hugonnard, 1982). Figueira et al. (2013) group the ELECTRE variants in terms of whether they are choosing, ranking or sorting methods. They are categorised as follows:

Choosing:	ELECTRE I,
	ELECTRE Iv,
	ELECTRE IS.
Ranking:	ELECTRE II,
	ELECTRE III,
	ELECTRE IV.
Sorting:	ELECTRE TRI-B,
	ELECTRE TRI-C,
	ELECTRE TRI-NC.

5.3.2.2. Preference Ranking Organisation Method for Enrichment Evaluations (PROMETHEE)

PROMETHEE involves pairwise comparisons of alternatives with reference to a defined set of criteria in order to assess whether an alternative outranks another or whether there is indifference between the two alternatives. PROMETHEE was initially developed by Brans (1982) and was subsequently expanded by Brans and Vincke (1985). Brans et al. (1986) explain that the family of PROMETHEE methods involve two phases. The first phase involves the consideration of a valued outranking relation (the difference between two comparable criteria) based upon a generalisation of the criteria. A preference index is established and a valued outranking graph which indicates the decision maker's preferences is then created. There are six types of generalised criteria: usual criterion, quasi criterion, criterion with linear preference, level criterion, criterion with linear preference and indifference area, and Gaussian criterion. The second phase is the exploitation of the outranking relation which involves the consideration of a leaving and an entering flow for each alternative in the valued outranking graph. The leaving flow indicates the degree to which an alternative outranks the others, with a higher flow indicating a better alternative. The entering flow indicates the degree to which an alternative is outranked by the others, with a lower flow indicating a better alternative.

Advantages of the PROMETHEE include its ease of use compared to other approaches (Brans et al., 1986; Velasquez and Hester, 2013) and it does not assume that criteria are proportionate (Velasques and Hester, 2013). Disadvantages include the lack of a clear process for assigning criteria weights, and despite requiring the assignment of values, it does not provide a clear method for actually assigning those values (ibid).

Like the ELECTRE method, several versions of PROMETHEE have been developed over the years. PROMETHEE I, which provides partial ranking of the alternatives, and PROMETHEE II, which enables complete ranking of the alternatives, were developed by Brans (1982). Further variants include:

- PROMETHEE III for ranking based on interval,
- PROMETHEE IV for partial or complete rankings of alternatives when the selection of alternatives is continuous,
- PROMETHEE V for decision making problems with segmentation constraints (Brans and Mareschal, 1992),
- PROMETHEE VI for human brain representation (Brans and Mareschal, 1995),
- PROMETHEE GDSS for group decision making situations (Macharis et al., 1998),
- GAIA (Geometrical Analysis for Interactive Aid) which provides graphical representation (Mareschal and Brans, 1988; Brans and Mareschal 1994),
- PROMETHEE TRI for sorting problems (Figueira et al., 2004),
- PROMETHEE CLUSTER for nominal classification (Figueira et al., 2004).

(Behzadian et al., 2010).

5.3.3. Fuzzy methods

Fuzzy set theory - developed by Zadeh (1965) as an extension of classical set theory - enables problem solving in situations that involve uncertain and imprecise data (Balmat, 2011). Advantages of the theory include its ability to measure the ambiguity associated with human judgement (Musani and Jemain, 2013) and its ability to account for insufficient information and the evolution of knowledge (Balmat, 2011). Such advantages enable fuzzy methods to be applied to real world problems which are often ambiguous, complex and lacking sufficient information (Triantaphyllou and Lin, 1996). A variety of crisp methods have been fuzzified to enable the benefits associated with fuzzy set theory; such examples include fuzzy WSM, fuzzy AHP and fuzzy TOPSIS. However, as Velasquez and Hester (2013) highlight,

fuzzy systems can sometimes be hard to develop, often requiring multiple simulations before being suitable for use in real world situations.

5.4. The use of MCDM methods in the built environment

MCDM methods have been used to provide solutions to decision making problems in a variety of fields. Many aspects of the built environment present complex decision making situations which often comprise multiple, conflicting elements. Consequently MCDM methods have proved an effective tool for assessing problems in this field of research. Some examples the use of MCDM methods include:

- Ball and Srinivasan's (1994) use of AHP to assist in house selection for buyers.
- Kvederyte et al.'s (2000) use of multiple criteria analysis to investigate the life cycle of dwellings.
- Kaklauskas et al.'s (2005) use of multiple criteria analysis to aid decision making concerning building refurbishment. The use of multiple criteria analysis enabled the researchers to account for the variety of complex and conflicting factors which influence the efficiency level of a building's refurbishment in the search for feasible refurbishment solutions.
- Banaitiene et al.'s (2008) evaluation of the life cycle of buildings using WSM/SAW, TOPSIS and COPRAS. The researchers sought to identify the optimum balance between satisfying the requirements of a variety of stakeholders (including the client, the designer, the contractor etc.) when selecting the life cycle of a building.
- Bielinskas et al. (2015) assessed neglected areas of Vilnius city using COPRAS. The method enabled the researchers to assess selected areas against a range of economic, urban, social and natural indicators to predict future formation of neglected areas.
- Mulliner et al.'s (2016) use of WPM, WSM/SAW, revised AHP, TOPSIS and COPRAS to assess sustainable housing affordability in terms a set of economic, environmental and social factors.
- Moghadam et al.'s (2017) use of MCDM analysis to develop a spatial decision support tool for low carbon cities. This approach enabled a range of environmental, urban form, socio-economic, economic and technical factors to be taken into account when making decisions regarding energy consumption in urban areas.

5.5. Selecting appropriate MCDM methods

Due to the number of MCDM methods available it is vital that the decision maker carefully considers which methods are most suitable to the problem in question. However, as Guitouni and Martel (1998) highlight, no one method is considered to be a 'super method' that is suitable for all decision making problems.

A criticism of MCDM methods is that different approaches can produce different results for the same problem (Zanakis et al., 1997). Zanakis et al. (1997) explain that this is due to inconsistencies in the use of weights from one method to the next, and variations in algorithms that can affect the weights, introduce additional parameters and lead to variations in the selection of the 'best' alternative. However, some researchers (e.g. Belton, 1986; Timmermans et al., 1989; Karni et al., 1990; Goicoechea et al., 1992; Olson et al., 1995) disagree, arguing that the results yielded from different MCDM methods are principally the same. Given the number of MCDM methods available, and the potential for variations in the results of different methods, the task of selecting an appropriate method can be confusing for a decision maker, particularly when a number of methods may appear to be suitable for one problem.

According to Hobbs (1986) key questions that the decision maker may ask when selecting a method are:

- *Is the method appropriate to the decision making situation?* E.g. is the method suitable for the types of alternatives being tested, the data available, the decision maker(s), the output format required by the decision maker(s) etc.
- *How easy is the method to use?* E.g. how much knowledge, effort, time and expense is required from the decision maker(s).
- *Is the method valid?* E.g. does the method accurately measure what it is supposed to; does it make assumptions that are contrary to the decision maker's preferences; is the algorithm logically sound etc.
- *Do the results of the method vary significantly when compared to other MCDM approaches?* If so, the decision maker should place greater importance on the consideration of validity.

Zanakis et al. (1997) observe how the method of selection proposed by Hobbs (1986) is primarily based upon the input requirements of the MCDM approaches, and this often serves more as a means of discounting methods, rather than selecting the most suitable method.

They note how this is also the case for selection procedures proposed by Hwang and Yoon (1981) and Ozernay (1987, 1992). Furthermore, despite often being a key factor in the selection of a method, Zanakis et al (1997) point out that there is no defined standard of validity.

Guitouni and Martel (1998) advocate the consideration of three aspects of a method's theoretical and technical features, namely, a method's input capabilities, its preferences elucidation and modelling (i.e. whether the elucidation mode used comprises trade-offs, pairwise comparisons, direct ratings or lotteries) and its aggregation method (i.e. whether the approach is a single synthesising criterion approach, an outranking synthesising approach or an interactive approach). Further, they articulate the following seven general tentative guidelines for selecting a suitable method:

1. Determine the number of decision makers. If there are multiple decision makers, then a group decision making method may be most suitable.
2. Consider whether the decision maker feels comfortable with the preference elucidation mode. If he/she is not comfortable using a method involving trade-offs for example, he/she may consider discounting it.
3. Determine whether the decision maker requires a method which will rank, choose or sort the alternatives. If the decision maker wants the alternatives to be ranked, then a method capable of ranking alternatives should be chosen.
4. Ensure that the method is capable of handling the input information, and that the input information required by the method is available to the decision maker. The quality and quantity of the input information are key to the selection of the method.
5. Consider whether the decision maker requires a method that permits compensation or not.
6. Ensure that the fundamental hypothesis of the method will be met.
7. Consider the decision support system which accompanies the method.

A number of studies have presented practical comparative analyses of multiple methods to compare their effectiveness and suitability in specific decision making circumstances. For example, Zanakis et al. (1998) used a simulation experiment to compare the output of SAW, MEW (Multiplicative Exponential Weighting), four versions of AHP, ELECTRE and TOPSIS in the same decision making situation. They found that all four versions of AHP produced similar outputs to SAW, and ELECTRE was the least similar to SAW, followed

by MEW. TOPSIS was found to produce a similar output to AHP and a dissimilar output to ELECTRE and MEW (except in problems with fewer criteria).

A study undertaken by Banaitiene et al. (2008) compared COPRAS against WSM/SAW and TOPSIS in the evaluation of the life cycle of a building. They found that all three methods produced the same ranking results, but noted the added advantage of the calculation of utility degrees by COPRAS. The utility degrees indicated the extent to which the alternatives satisfied the needs of the decision maker(s).

Podvezko (2011) compared WSM/SAW and COPRAS using a case study of statistical data regarding the economic development of four countries (Estonia, Latvia, Lithuania and Poland). He concluded that the values of the criteria of WSM/SAW and COPRAS usually agree, however the evaluation results can differ. More recently, Mulliner et al. (2016) compared WSM/SAW, WPM, revised AHP, COPRAS and TOPSIS in a decision making problem concerning sustainable housing affordability. They found that COPRAS, TOPSIS, WSM and revised AHP 1 and 2 all performed similarly, with revised AHP1 and revised AHP2 producing the same rankings of alternatives. WPM showed the least similarity when compared to the other methods.

It is therefore apparent from the literature that the selection of an appropriate MCDM method is in itself a complex multiple criteria problem (Hobbs, 1986; Guitouni and Martel, 1998), and as Hajkowicz and Higgins (2008) highlight, there are often multiple methods that are equally suitable to one decision making situation. Taking into consideration the existing literature regarding the appropriate selection of a method, it appears that the selection of a suitable method depends on its ability to satisfy the objective of the problem; the preferences of the decision maker in terms of the method's approach and output format; its ability to deal with the available input information; and the knowledge and experience held by the decision maker.

The problem investigated in this study concerns the assessment of high street sustainability. As the decision maker seeks to obtain a ranking of selected high streets, a method that facilitates the ranking of alternatives should be selected. Furthermore, some of the criteria to be assessed are of a negative influence and therefore a method that enables criteria of both positive and negative influence to be tested is also important. Finally, ease of use is also an important factor as it is anticipated that the final model will be used by a number of high

street stakeholders; therefore the method selected needs to be user friendly and easy to understand.

5.6. Justification for the application of MCDM methods in this study

As identified in chapter 4, the numerous criteria influencing high street sustainability are complex and conflicting. Additionally, some criteria have a positive influence on high street sustainability, whilst others have a negative influence, and some criteria are quantitative in nature, whilst others are qualitative. Furthermore, the units of measure for the criteria are not consistent. MCDM methods enable such varied criteria to be incorporated into one assessment. Further advantages of the methods include their ability to reflect the varying significance of the criteria to high street sustainability through criteria weights. They also enable criteria with less available data to be analysed due to the ability for stakeholder opinions to inform weightings and criteria values. The ability to incorporate stakeholder views is particularly advantageous to this study, given that expert and consumer views can be hugely influential to high street performance and development. Furthermore, the transparency, ease of use and flexibility of these methods mean that they can be applied in a variety of settings by a variety of stakeholders.

5.7. Obtaining input data for MCDM methods

In order to apply MCDM methods, assessment criteria are identified. Criteria weights are then calculated to indicate the relative significance of the criteria. The alternatives for assessment are also identified and criteria values for each alternative are subsequently calculated. Once the required data has been obtained, a decision matrix is constructed and the MCDM methods are applied.

5.8. Identifying and weighting the criteria

Identifying appropriate criteria is a crucial stage of the decision making process. Keeney and Raiffa (1976) advocate that a review of literature and/or a selection of experts be consulted in order to identify criteria appropriate to the decision making problem. Once criteria have been identified, the next step will usually involve establishing criteria weights. The majority of MCDM methods require weights of importance/significance to be assigned to the criteria (Triantaphyllou, 2000). The value of weights will typically fall between 0 and 1, and will sum up to one (ibid). Common methods of determining criteria weights tend to involve administering questionnaires which invite respondents to indicate their preference/opinion for each of the criteria with reference to the topic being investigated (Sinha et al., 2009).

Survey respondents will comprise key stakeholders, and they therefore represent the decision makers (ibid).

A number of methods to identify criteria weights exist, examples include: the direct weighting method, where survey respondents allocate numerical values to criteria using a predefined scale (Stillwell etal. 1987; Barron and Barret, 1996; Dodgson et al., 2001); the observer-derived weights method, where relative weights are calculated by the decision analyst using regression analysis of the *"'wholistic' assessment of outcomes"* made by the decision maker or relevant stakeholders (Humphreys, 1977); the gamble method or decision analysis weight selection method, which involves the decision maker comparing a *"gamble"* and a *"sure thing"* (Sinha et al., 2009); and pairwise comparison methods, where the decision maker determines the ratio of importance of a pair of criteria (ibid) etc. Each method has advantages and disadvantages, and methods may be more or less appropriate depending on the decision making situation. Therefore the selection of an approach will depend on its suitability to the decision problem.

5.8.1. High street sustainability criteria and sub-criteria identified from the review of literature

The literature discussed in sections 4.1 to 4.10 highlighted the range of high street functions and features that are influential to high street performance and sustainability. This literature informed the development of a set of influential criteria that can be incorporated into the MCDM assessment. The criteria and sub-criteria are presented in table 3.

Table 3. High street sustainability criteria and sub-criteria identified from the review of literature

Key:

	Derived from Carmona's analytical framework (Carmona, 2015)
	Derived from the wider review of literature

Criteria	**Sub-criteria**
1. Physical fabric	a) Streets
	b) Signage
	c) Buildings
	d) Trees and landscape
	e) Public open space
	f) Infrastructure
	g) Design
2. Movement	a) Pedestrian pavement/walkways
	b) Cycling facilities
	c) Public transport
	d) Parking facilities
	e) Goods/service vehicles
	f) Traffic management
3. Exchange	a) Social space
	b) Economic space
	c) Political space
	d) Cultural space
	e) Community space
4. Real estate	a) Retail
	b) Entertainment
	c) Work places
	d) Civic venues
	e) Residential
	f) Health and social facilities
5. Psychology	a) Identity/image
	b) Experience
	c) Atmosphere
6. Safety and security	a) Actual crime
	b) Perceived crime
	c) CCTV and security presence
	d) Street lighting
7. Management	a) Town centre management team
	b) Partnership/stakeholder involvement
	c) Marketing
	d) Digital connectivity/internet presence
8. Environmental protection	a) Environmental initiatives/carbon reduction schemes
	b) Environmentally sustainable materials
	c) Waste management and recycling schemes

9. Economic viability	a) Commercial rent
	b) Business rates
	c) Trading hours
	d) Complementary daytime, evening and night-time economies

(Source: self study)

5.8.2. Weighting the criteria and sub-criteria

A key component of the high street sustainability assessment model is its ability to incorporate the needs and expectations of a variety of high streets stakeholders. Therefore the weighting of the criteria is determined by the preference/opinion of those stakeholders.

For the model application presented in this study, stakeholders comprise industry professionals based in England (e.g. planners, surveyors, architects etc.), and residents living locally to selected case study high streets in England. Stakeholders were asked to complete a survey in which they were invited to indicate on a 5-point scale how important they believe each sub-criterion to be to successful and sustainable high streets. The mean scores of those importance rankings enabled the calculation of relative sub-criteria weights. The relative importance of the criteria categories were also determined and analysed by calculating the combined mean score of the sub-criteria that fall within the category.

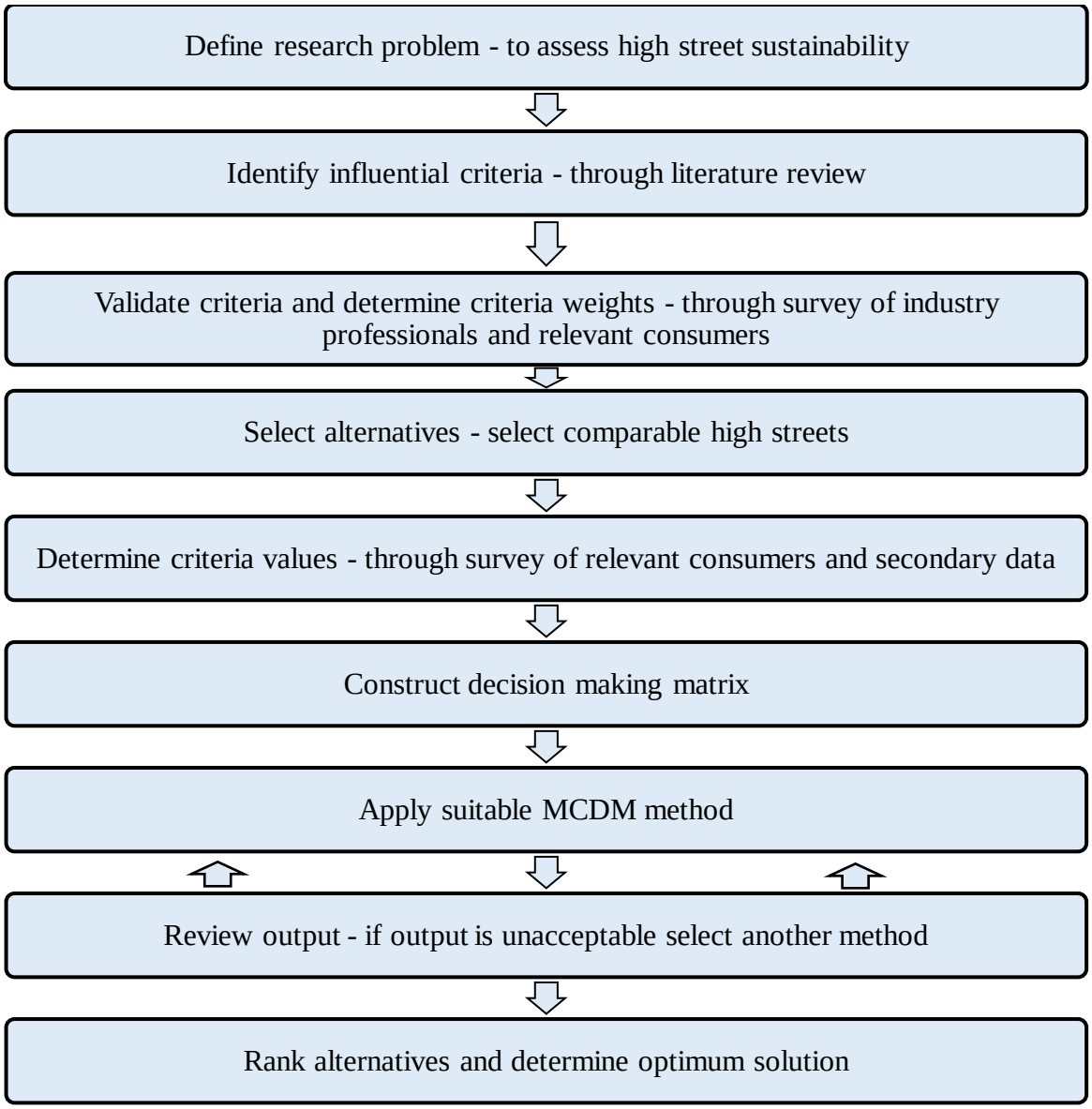
5.9. Constructing the decision making matrix

A matrix format enables a decision making problem to be easily expressed (Triantaphyllou, 2000). A decision matrix comprises all data required for MCDM analysis. For a decision matrix **A** which is an (m x n) matrix, a_{ij} denotes the performance of alternative A_i with reference to criterion C_j (where i = 1, 2, 3, … m, and j = 1, 2, 3, …, n). The matrix also presents the criteria weights (weights of relative importance/significance). Weights are denoted as w_j (where j = 1, 2, 3, …, n). A typical decision matrix, as presented by Triantaphyllou (2000), is presented in table 2 (section 5.3).

5.10. MCDM methods for the assessment of high street sustainability

Figure 4 illustrates how MCDM methods are applied to assess high street sustainability in this research study; this framework provides the basis for the development of the high street sustainability model.

Figure 4. Steps required to apply MCDM methods to research problem



(Source: self study)

5.11. Research design

Research can fall into one of two categories: quantitative and qualitative. Quantitative refers to data of numeric nature, where data are represented by an amount or count of something. Qualitative data, on the other hand, are represented by words and can therefore be descriptive and explanatory. Surveys and experiments commonly produce data of a quantitative nature which can be analysed using statistics (de Vaus, 2001). Case studies, on the other hand, tend to be associated with qualitative research due to their often interpretive approach to data (ibid) which tends to focus on achieving an understanding of something.

There are advantages and disadvantages to both quantitative and qualitative research approaches. Quantitative research is generally considered to be un-biased, reliable and easy to replicate, however, to ensure statistical representation, large sample sizes are required (Bryman, 2012). Additionally, quantitative approaches (e.g. surveys) often restrict the opportunity for elaboration and follow-up questions tailored to the responses of participants. Furthermore, caution must be exercised when quantifying data to ensure that results remain true to the real world situations being investigated (ibid). Qualitative approaches, on the other hand, allow for elaboration and follow-up questions to further enhance the data acquired. However, the replicability of qualitative approaches can be challenging and there is a greater risk of bias. There can also be issues regarding the generalisation of findings and there can often be a lack of transparency in terms of participant recruitment compared to quantitative approaches (Bryman, 2012).

Mixed methods research involves the use of both quantitative and qualitative research approaches and can often provide a balance in terms of tempering biases and enabling the enhancement of quantified data through descriptive and explanatory elaboration which is relevant to the real world (O'Cathain et al., 2007; Teddlie and Tashakkori, 2003).

This research has used quantitative research methods to develop a high street sustainability assessment model that can be replicated and adapted for high streets in a variety of locations and contexts.

5.12. Research paradigm

According to Bryman (2012, p.714) a research paradigm is:

> *"A term deriving from the history of science, where it was used to describe a cluster of beliefs and dictates that for scientists in a particular discipline influence what should be studied, how research should be done, and how results should be interpreted."*

This study is guided by a pragmatic paradigm. Morgan (2007) observes how a pragmatic approach focuses on "*shared meanings*" and "*joint action*"; he states:

> *"the essential emphasis (of pragmatism) is on actual behaviour ('lines of action'), the beliefs that stand behind those behaviours ('warranted assertions'), and the consequences that are likely to follow from different behaviours ('workability')".*

Therefore the emphasis is on understanding the research problem, rather than focusing on the methods (Rossman and Wilson, 1985; Creswell, 2014). Consequently pragmatism is not

staunchly affiliated to any one philosophical paradigm and the researcher may draw from both quantitative and qualitative assumptions (Creswell, 2014). The researcher is therefore free to select a method and approach which is most suitable for their requirements (ibid).

A further factor of the relationship between research and theory is whether the approach taken is derived from deductive or inductive theory (Bryman, 2016). A deductive approach begins with theory, where the researcher draws upon existing knowledge to formulate a hypothesis which can then be investigated empirically (ibid). In an inductive approach the researcher surmises the implications of the research findings for the theory that instigated the investigations (ibid). Quantitative research involves the testing of theories deductively through the investigation of the relationship between variables (Creswell, 2014). Qualitative research, on the other hand, involves the inductive approach of formulating meanings and interpretations of the data to build upon existing theory.

This research study has taken a pragmatic, deductive approach whereby existing knowledge was consulted to formulate the research problem. The research problem was then investigated through quantitative research methods. The study involved the identification of sub-criteria from existing theory. Those sub-criteria were then validated by key high street stakeholders (including industry professionals and local residents) through quantitative data collection and statistical analysis. It is therefore considered that this part of the research displayed elements of positivism. Additionally, by deriving many of the sub-criteria values from the opinions of local residents, the data obtained has been informed by the experiences of those individuals. Consequently it is considered that this part of the research adopted a constructivist approach.

5.13. Research structure

The structure of this research study can be broken down into 4 steps, as follows:

Step 1: Undertake a comprehensive review of literature to identify criteria and sub-criteria that influence the sustainability of high streets.

Step 2: Validate the criteria and sub-criteria and determine the relative importance of the sub-criteria through the administration of surveys completed by industry professionals and residents living near to high streets.

Step 3:	Obtain values for each sub-criterion through the residents' survey and secondary data (where available).
Step 4:	Apply MCDM methods.

5.14. Ethical considerations

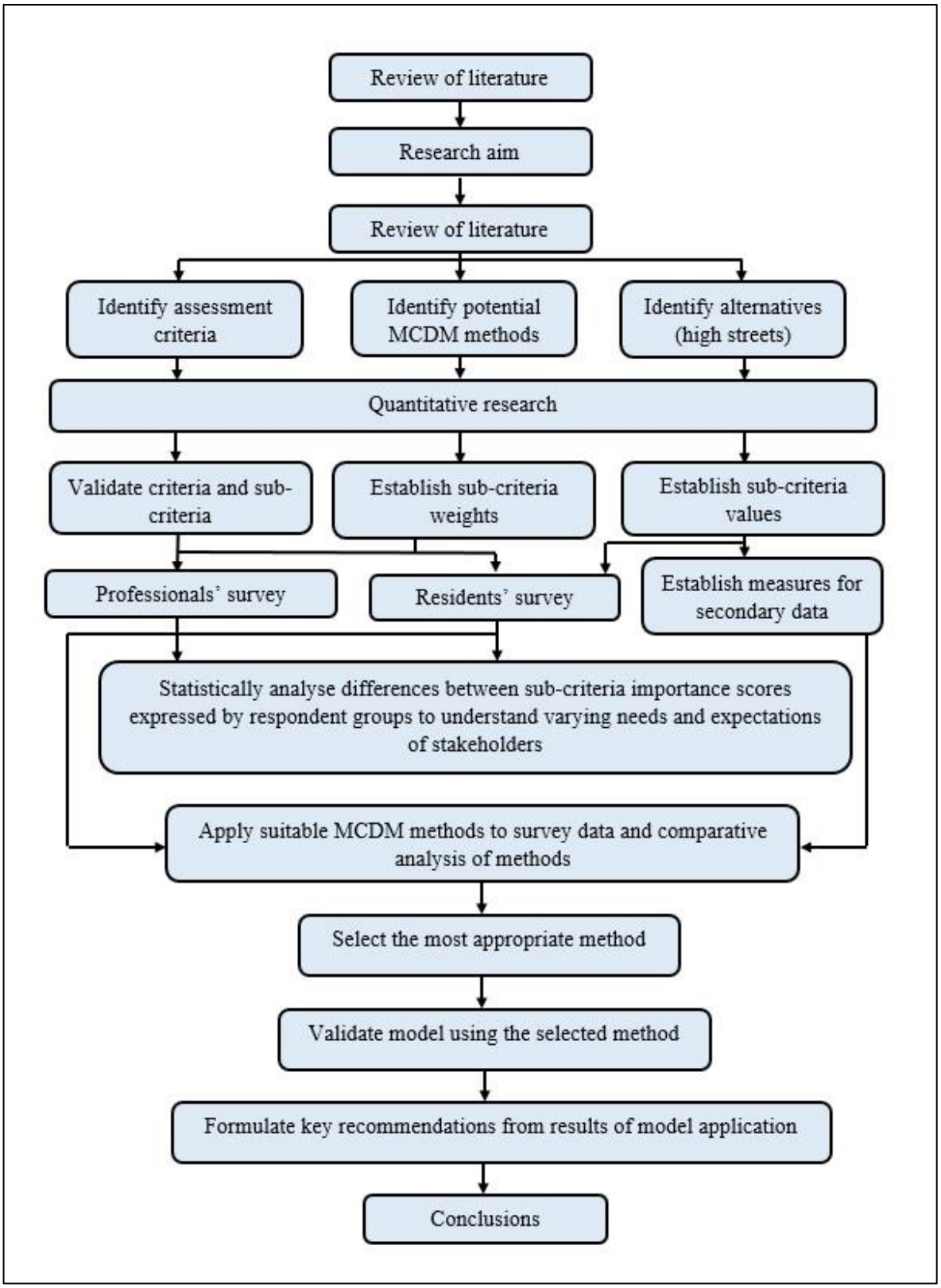
This research study was granted full ethical approval from the Research Ethics Committee at Liverpool John Moores University. Participants of the professionals' survey were provided with a participant information sheet that outlined the background, aim and purpose of the research study and key information regarding the use of data and confidentiality and any risks/benefits involved. For the residents' survey this information was incorporated into flyers which were distributed to households. Participants were therefore fully informed of the ethical considerations prior to participating in the study.

5.15. Quantitative data collection

This section presents the quantitative methodological approach taken to validate the sub-criteria identified from the review of literature, determine the relative importance of the sub-criteria to high street sustainability, and to obtain values for each sub-criterion.

The identification of relative importance was key to determining sub-criteria weights, which are an essential requirement for the application of MCDM methods. Whilst few studies have investigated the most suitable approach for identifying criteria (Sinha et al., 2009), Keeney and Raffia (1976) advocate the use of a review of literature and/or obtaining the views and opinions of experts. This study has adopted both approaches by identifying criteria and sub-criteria through the literature review, and having those sub-criteria validated by industry professionals and experts, as well as local residents. Figure 5 illustrates the overall structure of the research.

Figure 5. Research structure



(Source: self study)

5.15.1. Professionals' survey

5.15.1.1. Identifying the participant sample

The objectives of the professionals' survey were to validate the criteria and sub-criteria identified by the review of literature, and to obtain sub-criteria importance scores to inform sub-criteria weights. Therefore the desired participant sample comprised industry professionals (e.g. planners, surveyors, architects etc.). As the case study high streets selected for investigation were all located in England, it was decided that the participant sample would also be restricted to professionals based in England. The decision to focus the investigation on high streets in England, rather than the UK as a whole, was taken in order to minimise the effects of external factors including variations in planning systems from country to country, varying social issues and varying human and physical geographies. Further details as to the justification of focusing the investigation on England is presented in section 5.17.1. The research identified potential participants through online searches and the online directories of professional accreditation bodies (e.g. the Royal Town Planning Institute, the Royal Institution of Chartered Surveyors etc.). The researcher sought to obtain as equal representation as possible from a variety of different professional groups, therefore within the geographical area of England, the sample was stratified according to different industry professions. Random samples were then selected from within the different professional groups.

5.15.1.2. Strategy for data collection

The primary objective of the data collection from industry professionals was to validate the criteria and obtain criteria importance scores to inform the weighting of sub-criteria for the application of MCDM methods. As the objective was to obtain specific quantitative data, approaches such as interviews or focus groups were not appropriate in this instance. A survey on the other hand was deemed to be a suitable format for obtaining the necessary data.

Surveys are one of the most popular approaches taken to collect data. Surveys have traditionally taken the form of self-administered or postal questionnaires, however the development of online survey platforms has provided an additional means of administration to researchers. The use of online surveys has proved popular due to their low cost, fast responses, improved data accuracy, attractive formats, lack of geographic restraints and improved responses to open ended questions, amongst others (Bryman, 2016). However, disadvantages include lower response rates, the potential for multiple responses from

participants, exclusion of those without internet access and the increased motivation required for participants to access the survey (ibid).

It was decided that the most appropriate format for the professionals' survey would be an online format. This decision was made for the following reasons:

- The desired participant sample was geographically spread across England and therefore administering a paper/postal questionnaire would be time consuming and costly.
- Online connectivity is standard for the type of professional participants targeted. Therefore the possibility of professionals not having access to the internet or not holding an email account was extremely unlikely.
- Online surveys offer improved data accuracy which was an important aspect of the data collection.

Bristol Online Survey (BOS) was chosen to administer the professionals' survey. This survey tool enabled the researcher to create, administer and collate responses in a format compatible with statistical analysis software. BOS creates a specific hyperlink for each survey created, and once launched this hyperlink can be disseminated to potential participants via email. When a participant completes the survey, the data are automatically collated by the BOS tool and are immediately available to the researcher. On completion of the data collection the response data were exported into SPSS (Statistical Package for the Social Sciences) and analysed accordingly.

5.15.2. Residents' survey

5.15.2.1. Identifying the participant sample

Eight English case study high streets were selected for analysis. These were: Basingstoke, Birkenhead, Corby, Gosport, Great Yarmouth, Rotherham, Shrewsbury and Southport (see section 5.17.2 for justification of why these towns were selected). As the primary purpose of the survey was to obtain sub-criteria importance scores, and values by which each high street could be compared against the sub-criteria, it was important that the sample of participants comprised people living within the eight towns. The participant samples for each town were stratified according to the towns' population distributions across electoral wards. Within each electoral ward, survey flyers were distributed at random to households. Further details regarding the data collection strategy are discussed in 5.15.2.2.

5.15.2.2. Strategy for data collection

The application of the proposed model required a large amount of data from the resident respondents in order to calculate sub-criteria weights and values; the greater the number of responses, the more representative the results of the model application would be. Additionally, the model required specific, comparable quantitative data in order to fairly assess each case study high street. These considerations meant that data collection approaches such as interviews or focus groups would not be suitable methods for this research. In order to obtain sufficient survey responses through controlled questions (which would produce comparable, quantitative responses), it was decided that either a self-administered, paper survey, or an online survey would be the most appropriate approach to take for the residents' survey. The advantages and disadvantages of each approach in terms of this research study are presented in table 4.

Table 4. Advantages and disadvantages of paper and online surveys with reference to the residents' survey

Paper survey		Online survey	
Advantages	Disadvantages	Advantages	Disadvantages
• Inclusive of residents without an internet connection. • Traditionally higher response rates. • Participants can only complete the survey once.	• The printing of large numbers of surveys and information sheets is very costly. • Pre-paid, return post envelopes for large numbers of participants are very costly. • Collating data is time consuming. • Risk of void responses and unanswered questions.	• Responses are instantaneous. • Online formats are easier to navigate for participants. • Less risk of void responses and unanswered questions. • Online survey tools collate data automatically ready for analysis using statistical software. • Can be distributed to participants regardless of geographical constraints.	• Lower response rates. • Greater effort required for applicants to access the survey. • Excludes residents without an internet connection. • Participants may complete the survey more than once.

(Source: self study)

Due to time and budget constraints, and due to the improved data accuracy that they offer, it was decided that the residents' survey would take the form of an online survey. Whilst the survey could have been administered remotely, the researcher was keen to obtain representation from all wards within the eight towns. By solely administering the survey remotely the researcher felt that she would have had less control over the geographic distribution of the survey. As the researcher was travelling to each location to visit each town centre and take photographs, it was decided that whilst there she would distribute flyers around residential areas that outlined the background and objectives of the research and invited residents to participate. The flyers displayed the hyperlink for the survey and instructed participants to type the link into their search engine for access (see appendix 3 to view the flyer). 2400 flyers were distributed in total, with 300 distributed in each town.

The potential participant samples for each town were stratified according to the population distribution across the electoral wards within each of the eight towns. Therefore, wards with a higher ratio of a town's population were allocated a higher number of flyers (equivalent to the population ratio). The flyers were then disseminated at random to households within each electoral ward. This approach was chosen to promote representative samples of the overall populations of the towns. The decision to distribute to households was also considered important to obtaining the views of residents who don't visit the high street as well as those who do. In the several weeks following the distribution of the flyers it became apparent that this approach alone would not produce sufficient data for the research. Therefore the researcher also contacted local community groups and services to recruit further participants from each town. The researcher contacted a variety of different groups and services (including: weight loss groups, schools, a variety of places of worship, community choirs, train and boat enthusiast groups etc.) in an attempt to reach as broad a range of potential respondents as possible.

As with the professionals' survey, the residents' survey was created using BOS which collated the response data in an SPSS friendly format. The data were subsequently exported into SPSS for statistical analysis.

5.15.3. Developing the surveys

There are a range of different variables that can obtain quantitative data. These variables include:

- Interval/ratio variables – the differences between each category are identical (e.g. the specific measure of age or income). Ratio variables have a fixed zero point whereas interval variables do not have a true zero point, although in social research they tend to exhibit an arbitrary zero point.
- Ordinal variables – categories can be ranked but the differences between each category are not identical (e.g. identifying age through age groups such as '16-24', '25-34' and '35-44').
- Nominal variables – categories cannot be ranked (e.g. identifying healthy lifestyle choices through categories such as 'visiting the gym', 'eating healthily' and 'monitoring alcohol intake').
- Dichotomous variables – contain only two categories (e.g. gender) and whilst they can be treated as ordinal variables as they only have one interval, treating them as nominal variables is generally considered to be most appropriate.

(Bryman, 2016)

5.15.3.1. Professionals' survey

The professionals' survey comprised a mixture of ordinal and nominal questions. The survey was broken down into the following sections:

1. Professional background
2. Criteria for successful and sustainable town centres
3. Image and experience

The professional background section asked questions concerning the following:

- Professional title – to determine what type of professionals the participants were (e.g. architect, planner, surveyor etc.)
- Organisation employed by – to determine whether the participants were self-employed, employed in the public sector or private sector etc.
- Length of employment – to determine the length of time the participants had worked in their respective fields.
- Region in which professionally based – to determine the geographical spread of participants across England.

These questions are of a nominal format. The second section regarding criteria for successful and sustainable town centres comprised ordinal Likert scales to measure the participants'

opinions in terms of how important they considered each sub-criterion to be to the economic, environmental and social success of a town centre. The terminology 'economic, environmental and social success of a town centre' was chosen as the researcher wanted the professional respondents to think about the influence of the sub-criteria on all three pillars of sustainability; it was considered that to use the wording 'town centre sustainability' may have provoked interpretations that favoured environmental concerns. Each sub-criterion was measured using a Likert scale which invited respondents to indicate their response on a 5 point scale from 1-'not at all important' to 5-'extremely important'. The final section regarding image and experience featured nominal, multiple response questions inviting participants to indicate which categories they believed contributed to town centre image and experience.

5.15.3.2. Residents' survey

The residents' survey comprised questions to obtain both nominal and ordinal data (see appendix 3 to view the survey). The survey questions were broken down into the following sections:

1. Socio-demographic,
2. Criteria for successful and sustainable town centres,
3. Your opinion of your local town centre,
4. How you use your local town centre,
5. Online shopping,
6. Out-of-town retail.

The socio-demographic section comprised questions concerning the following:

- Town of residence – to determine in which of the eight towns a participant was resident,
- Gender,
- Age,
- Marital status,
- Occupational status,
- Type of living accommodation – to determine whether participants were privately renting, socially renting, living with parents, owned their own homes etc.,

- Length of residence in town – to determine how long residents had resided in their respective towns.

Section 1 therefore obtained nominal data which provided an overview of the respondents and enabled the data to be analysed to identify any trends or statistically significant differences between the responses of groups. Section 2 comprised questions which used Likert scales to enable participants to rank the sub-criteria from 1 (not at all important) to 5 (extremely important) in terms of how important they thought each was to the success of a town centre. Therefore the data obtained from section 2 were ordinal. The resident participants were asked to rank the sub-criteria in terms of their importance to the 'success of a town centre', rather than to the 'sustainability of a town centre'. This approach was taken as it was considered that the wording would inspire responses which would better reflect the needs and expectations of the residents. Furthermore, it was considered that the term 'sustainability' may provoke misinterpretations that could interfere with the validity of the data.

Section 3 also comprised Likert scale questions, but this time participants were asked to rank statements from 1 (strongly disagree) to 5 (strongly agree) in terms of how much they agreed with the statements regarding their local town centre. Therefore the questions from section 3 also obtained ordinal data. Sections 4, 5 and 6 comprised a mixture of ordinal and nominal questions. Using a 7-point scale ranging from 'more than once a week' to 'never', the ordinal questions asked participants to indicate how often they visited their local town centre, out-of-town retail parks and how often they shopped online. The nominal questions asked participants to indicate the purpose of their visits to their local town centres, out-of-town retail parks and the purpose of their online purchases by selecting multiple responses. Nominal questions also asked participants to indicate the reasons why they chose to shop in their local town centre, out-of-town retail parks and online by selecting multiple responses.

5.15.4. Administering the surveys and collating the data

BOS was used to create, administer and collect the data. The hyperlink specific to the professionals' survey was emailed to potential professional participants and the response data were collated by the survey tool. The hyperlink for the residents' survey was printed on the flyers, and where resident participants were contacted through community groups and representatives, the hyperlink was emailed to participants.

Responses were automatically coded by BOS to enable the data to be integrated into SPSS. Both surveys were open for a period of six months, and once closed the data were exported to SPSS and saved onto the researcher's university hard drive which was automatically backed up each night.

5.16. Analysing the data

SPSS was used to analyse the data obtained from the surveys. The objectives of the data analysis were to calculate weights for each sub-criterion and to determine values for each sub-criterion with reference to each case study high street. Descriptive statistics were used to determine measures of central tendency and spread.

5.16.1. Central tendency tests

Measures of central tendency summarise a set of data in one value. The three measures of central tendency are:

- Arithmetic mean – the average of a set of data; the sum of all values divided by the number of values. Extreme outliers may distort the mean value.
- Median – the mid-point of a set of values. The values should be ordered from smallest to largest to determine the mid-point. If there are an even number of values, the mean of the two middle numbers can be taken as the median value. The median is not affected by extreme outliers.
- Mode – the most frequently occurring value in the data set.

(Bryman, 2016)

As the importance scoring of the sub-criteria was restricted to a 5-point numerical scale, it was decided that the mean would be the most appropriate measure of central tendency for analysing the data. The measure of spread was also identified by calculating the standard deviation. The lower the standard deviation, the more representative the mean value is of the set of data. The higher the standard deviation, the less representative, as this would indicate greater variation between scores.

5.16.2. Identifying statistically significant differences between groups

A further objective of the data analysis was to identify any statistically significant differences between the responses of the various groups of participants. As both the professional and

resident respondents were asked to allocate scores of importance to the sub-criteria, the following research question was investigated:

- Do opinions of sub-criteria importance differ between industry professionals and residents?

In order to investigate the differences between specific groups of professionals and residents, separate analyses of the professional and resident data were required.

Professionals' survey

The 'professional background' questions enabled participants to be grouped in terms of their professional titles, type of organisation employed by, length of employment and region in which they were professionally based. This enabled the following research questions to be investigated:

- Do opinions of sub-criteria importance differ between different professions (e.g. surveyors, architects, planners etc.)?
- Do opinions of sub-criteria importance differ between professionals working for different types of employers?
- Do opinions of sub-criteria importance differ between professionals who have been working in their respective fields for different lengths of time?
- Do opinions of sub-criteria importance differ between professionals working in different regions of England?

Residents' survey

As background, socio-demographic information was obtained from respondents, data could also be analysed to identify any statistically significant differences between the opinions of various groups. The following research questions were therefore investigated:

- Do opinions of sub-criteria importance differ between the residents of different towns?
- Do opinions of sub-criteria importance differ between male and female participants?
- Do opinions of sub-criteria importance differ between different age groups?
- Do opinions of sub-criteria importance differ between participants of different marital statuses?

- Do opinions of sub-criteria importance differ between participants living in different types of accommodation?
- Do opinions of sub-criteria importance differ between participants with different occupational statuses?
- Do opinions of sub-criteria importance differ between participants who have lived in their respective towns for different periods of time?

Before the data could be analysed to identify differences between groups, the data was tested to determine whether they were normally distributed, i.e. whether data follow a Gaussian distribution. The normality of the data will determine the type of test appropriate for the data analysis. Normal distributions form a symmetrical bell curve with the more frequently occurring scores in the middle and less frequently occurring scores to the extremities. If the data are normally distributed then parametric tests are appropriate, however if the data are not normally distributed then it is more appropriate to use non-parametric alternatives. Parametric tests assume that data are normally distributed whereas non-parametric tests – sometimes referred to as distribution-free tests - do not make this assumption. Whilst non-parametric tests are less powerful than their parametric counterparts, they are ideal to use with nominal and ordinal data (Pallant, 2007).

Further considerations when choosing an appropriate test include:

- The type of data to be analysed (e.g. interval/ratio, nominal or ordinal),
- The number of independent variables to be analysed,
- The number of dependent variables to be analysed,
- The number of groups to be compared; some tests will only enable the comparison of two groups, whereas others will enable the comparison of more than two.

(Pallant, 2007)

Testing for statistical significance enables the researcher to determine how confident he/she can be that the data obtained from a sample of participants are generalizable to the wider population from which the sample was drawn (Bryman, 2016). In other words, statistical significance indicates that a relationship or difference identified between values has not occurred by chance. The strength of the statistically significant result is indicated by the *p* value (the probability value). In order to identify a statistically significant result an alpha level is decided. An alpha level (significance level) of 0.05 (5%) is generally used, however

other common alpha levels include 0.01 (1%), 0.005 (0.5%) and 0.001 (0.1%). An alpha level of $p<0.05$ indicates that there is a 5 in 100 chance that the difference or relationship between values has occurred by chance. In other words, there is a 95% confidence that the result has not occurred by chance.

5.16.2.1. Testing the data for normality

The Kolmogorov-Smirnov test was used to assess the normality of the distribution of the respondents' scores for each variable. A significant result (sig. value of 0.05 or less) indicates that the distribution of scores is not normal, whereas a non-significant result (sig. value of more than 0.05) indicates that the distribution of scores is normal (Pallant, 2007). In cases where the distribution of scores in not normal, the use of non-parametric tests is more appropriate.

As presented in figure 6, the Kolmogorov-Smirnov test results show that each variable produced a significant result of $p<0.05$, therefore it can be concluded that the distribution of scores was not normal.

Figure 6. Kolmogorov-Smirnov test results for the scoring of sub-criteria importance by the respondents

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Streets	0.249	355	0.000	0.850	355	0.000
Signage	0.263	355	0.000	0.871	355	0.000
Buildings	0.245	355	0.000	0.811	355	0.000
Trees and landscape	0.246	355	0.000	0.836	355	0.000
Public open space	0.271	355	0.000	0.792	355	0.000
Infrastructure	0.226	355	0.000	0.864	355	0.000
Design	0.231	355	0.000	0.824	355	0.000
Pedestrian pavement/ walkways	0.325	355	0.000	0.734	355	0.000
Cycling facilities	0.178	355	0.000	0.908	355	0.000
Public transport	0.297	355	0.000	0.755	355	0.000
Parking facilities	0.290	355	0.000	0.772	355	0.000
Goods/ service vehicles	0.237	355	0.000	0.878	355	0.000
Traffic management	0.191	355	0.000	0.893	355	0.000
Social space	0.274	355	0.000	0.779	355	0.000

Economic space	0.284	355	0.000	0.774	355	0.000
Political space	0.180	355	0.000	0.915	355	0.000
Cultural space	0.256	355	0.000	0.856	355	0.000
Community space	0.239	355	0.000	0.843	355	0.000
Retail	0.359	355	0.000	0.694	355	0.000
Entertainment	0.245	355	0.000	0.800	355	0.000
Work places	0.198	355	0.000	0.865	355	0.000
Civic venues	0.219	355	0.000	0.862	355	0.000
Residential	0.177	355	0.000	0.912	355	0.000
Health and social facilities	0.176	355	0.000	0.896	355	0.000
Identity/ image	0.238	355	0.000	0.818	355	0.000
Experience	0.241	355	0.000	0.805	355	0.000
Atmosphere	0.308	355	0.000	0.755	355	0.000
Actual crime	0.257	355	0.000	0.812	355	0.000
Perceived crime	0.290	355	0.000	0.772	355	0.000
CCTV and security presence	0.225	355	0.000	0.871	355	0.000
Street lighting	0.277	355	0.000	0.782	355	0.000
Town centre management team	0.225	355	0.000	0.869	355	0.000
Partnership/ stakeholder involvement	0.225	355	0.000	0.860	355	0.000
Marketing	0.217	355	0.000	0.901	355	0.000
Digital connectivity/ internet presence	0.215	355	0.000	0.886	355	0.000
Environmental initiatives/ carbon reduction schemes	0.163	355	0.000	0.906	355	0.000
Environmentally sustainable materials	0.188	355	0.000	0.906	355	0.000
Waste management and recycling schemes	0.233	355	0.000	0.835	355	0.000
Commercial rent	0.260	355	0.000	0.809	355	0.000
Business rates	0.238	355	0.000	0.823	355	0.000
Trading hours	0.240	355	0.000	0.842	355	0.000
Complementary daytime, evening and night-time economies	0.264	355	0.000	0.858	355	0.000

a. Lilliefors Significance Correction

(Source: self study)

As the type of data to be analysed were not normally distributed, non-parametric tests were required to analyse the data. To determine which non-parametric tests would be most appropriate to the analysis, the researcher considered the characteristics of the data involved and the objective of the analysis. The objective of the analysis was to test for differences between two or more independent groups on a continuous measure (e.g. do different professional groups differ in their opinions of sub-criteria importance?). The analysis required to answer the questions stated in section 5.16.2 involved two variables: the independent variable was a categorical variable (nominal data), and the dependent variable was a continuous variable (ordinal data). Therefore, for analyses comprising two independent groups (e.g. gender), a Mann-Whitney U test was deemed to be most suitable. For analyses comprising three or more independent groups, a Kruskal-Wallis test, with a post hoc Mann Whitney U test, was considered to be most suitable.

5.16.2.2. Mann-Whitney U test

The Mann-Whitney U test is a non-parametric alternative to the t-test for independent samples and is used to identify any statistically significant differences between two independent groups on a continuous measure (Pallant, 2007). Whilst the t-test compares the mean values of two groups, the Mann-Whitney U test compares the medians (ibid). The test alters the scores on the continuous variable to ranks and then assesses whether the ranks for the two groups differ significantly (ibid). Due to the conversion of scores to ranks, the distribution of scores becomes irrelevant (ibid).

5.16.2.3. Kruskal-Wallis test

The Kruskal-Wallis test is a non-parametric alternative to the one-way between-groups analysis of groups (Pallant, 2007). The test is similar to the Mann-Whitney U test, however it enables the researcher to compare the scores of more than two groups (ibid). The test converts the scores into ranks and then compares the mean rank of each group (ibid).

Whilst the Kruskal-Wallis test can identify a statistically significant result between groups of three or more, it cannot identify which specific groups differ significantly from one another. Therefore, if the Kruskal-Wallis test identifies a statistically significant result, a post hoc test must be employed. The Mann-Whitney U test can be used as a post hoc test, however, in order to control Type 1 errors, a Bonferroni adjustment must be applied (Pallant, 2007). A Type 1 error is when one believes that there is a statistically significant difference

between groups, when there actually isn't (ibid). Therefore, in order to control for this, the alpha level can be adjusted. The Bonferroni adjustment reduces the risk of Type 1 errors when making multiple comparisons by adjusting the alpha level in accordance with the number of comparisons required (ibid). The formula K(K-1)/2 calculates the number of comparisons required (where K is the number of groups involved). The alpha level (usually 0.05) is then divided by the number of comparisons to be made, and the result gives you the new adjusted alpha level (ibid). Any results produced by the Mann-Whitney U post hoc test that are equal to or less than the new alpha level can be considered statistically significant.

5.16.3. Assessing reliability

Participants ranked 42 sub-criteria in terms of their importance to high street sustainability. Participants scored each sub-criterion using a Likert scale from 1 (not at all important) to 5 (extremely important). Cronbach's coefficient alpha was used to identify the internal consistency of the scale i.e. the extent to which the items which make up the scale – in this case the sub-criteria - are measuring the same characteristic (Pallant, 2007). Cronbach's coefficient alpha calculates the average correlations among the scale items, with values ranging from 0 to 1; the higher the value, the greater the reliability of the scale (ibid). According to DeVellis (2003), scales should ideally produce a Cronbach's alpha value of above 0.7 to be considered internally consistent. Figure 7 presents the Cronbach's alpha value for the 5-point scale used in this study. At 0.929, the value calculated is high and well above 0.7, therefore it can be considered that the scale used to rank the sub-criteria is reliable within the participant sample. It should be noted that data from both the professional participants and resident participants were taken into account in the calculation of this value, as both sets of participants ranked the sub-criteria using this scale.

Figure 7. Cronbach's alpha coefficient result

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.929	0.931	42

(Source: self study)

5.17. Model application

Case studies have been used in this research to demonstrate how the high street sustainability model works and to test its effectiveness.

5.17.1. Alternatives selected for assessment

For this study, which is concerned with assessing high street sustainability, the alternatives selected for assessment using the MCDM model were comparable high streets from across England. It was decided that the model application would focus on high streets in England, rather than the UK as a whole. This was due to the varying issues that affect different parts of the UK in terms of population density, political and religious issues/tensions and variations in planning systems from country to country etc. This research sought to select case studies that are as comparable as possible to minimise the influence of these external factors. Due to the variations between England, Scotland, Wales and Northern Ireland in terms of population densities, political and religious issues/tensions and variations in planning systems, it was decided that the study would focus on just one country within the UK. England was deemed the most appropriate as it offers a large number of potentially comparable case study high streets and is also the country in which the researcher is resident, therefore making visits to each case study town more viable.

5.17.2. High street case studies

Eight high street case studies were selected from across England. It was considered that eight was a manageable number that would be acceptable in terms of the scope of the research. The range of high streets in England is vast, from large city centre locations to small rural centres. Therefore, in order to ensure as much comparability as possible, it was decided that the case studies selected would all be high streets located in town centres with comparable resident populations and comparable population densities.

Whilst ensuring comparability among the case studies was important, it was equally important to obtain a variety of town centres in order to represent the range of high streets found in England. The location of the case studies was an important consideration. The English north-south divide has created huge variations in terms of economic growth, prosperity, educational achievements, property prices and investment in infrastructure etc. Therefore it was deemed important that the number of case studies was equally balanced in terms of the division. Therefore four high streets were chosen from north of the divide, and four were chosen from south of the divide. Furthermore, the high streets chosen are located

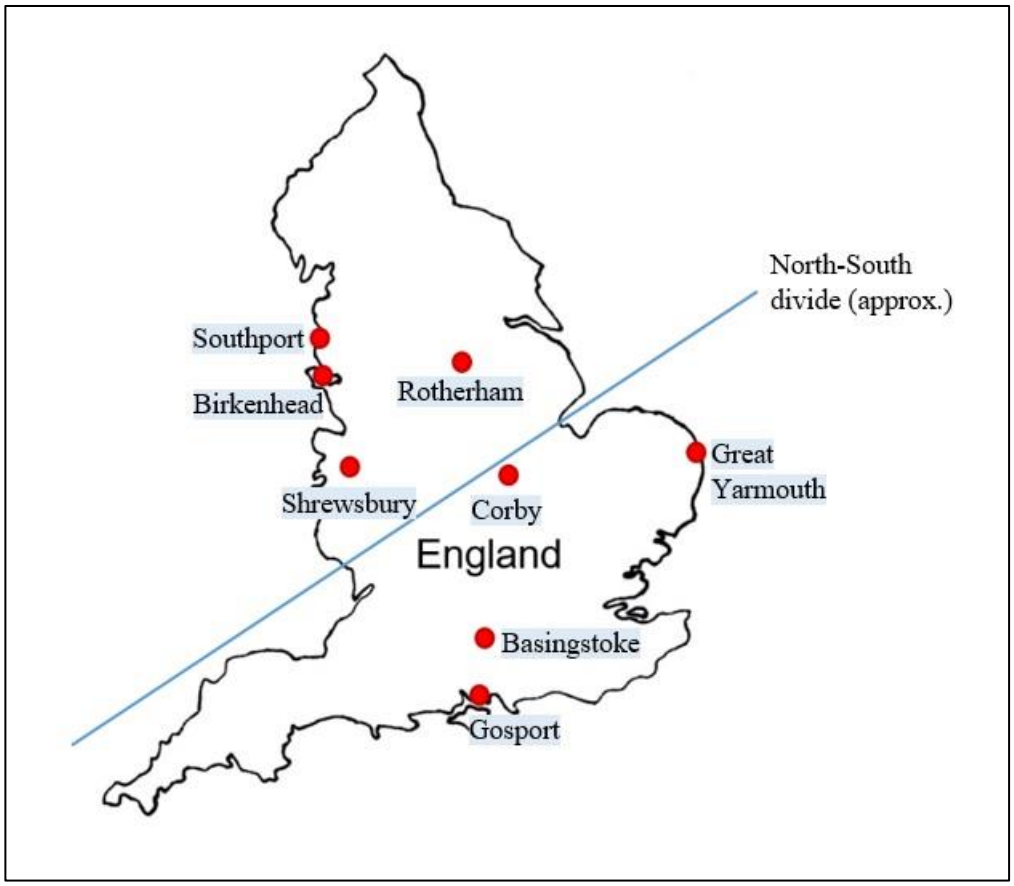
in a number of different English regions. A further consideration was the character of the town centres. Town centres in England vary in terms of their age, architecture, geographical location, terrain etc. Therefore it was decided that the eight case studies would comprise towns with a variety of characters, from coastal resorts to former industrial towns (see table 5). As the case studies selected represented a variety of towns in terms of character, history, location, age and condition it was considered that the selection was as representative as possible of the variety of large town centre high streets in England.

Figure 8 illustrates the geographical position of the selected case studies and table 5 presents characteristics of each case study town. The researcher sought to obtain accurate population figures for each case study, however given the urban sprawl that has occurred over time and due to variations in the population data available, this figure was harder to obtain for some towns than others. For example, the town of Shrewsbury is fairly compact and detached from surrounding settlements, with its nearest neighbour, Telford, approximately 15 miles away. Therefore obtaining an accurate population figure was fairly straight forward; the parish population figure, available from the Office for National Statistics (ONS), was deemed acceptable as it covers the entire area of the town and its suburbs. However, obtaining an accurate population figure for the town of Great Yarmouth was slightly more complicated. No parish figure exists for Great Yarmouth and the figure for the total parliamentary constituency covers too large an area, much of which is not considered to be within the boundaries of Great Yarmouth and its suburbs. Therefore an approximate population figure was calculated from the total population of 12 wards that make up the centre and suburbs of Great Yarmouth. For all of the remaining towns the population figures for either the parliamentary constituency or local authority area were deemed representative of the towns and their suburbs, and therefore these figures have been referenced. Table 5 indicates the source of the population figures and the extent of the geographical area covered by the figures. It should be noted that the researcher explored the referencing of built-up area population figures, however for towns such as Birkenhead that are surrounded by sprawl, the built-up area population figure becomes distorted and therefore not representative of the actual population resident within the boundaries of the town.

Table 5. Characteristics of case study towns

Town	Population (ONS figures for 2011)	Geographical range of population (hectare)	Character of town	Region of England
Basingstoke	107,996 (parliamentary constituency)	5,919	Historic market town	South-East
Birkenhead	88,818 (parliamentary constituency)	2,518	Former industrial/ historic market town	North-West
Corby	61,225 (non-metropolitan district/ local authority)	8,028	Former industrial town	East-Midlands
Gosport	96,699 (parliamentary constituency)	3,631	Former naval town/ seaside resort	South-East
Great Yarmouth	75,139 (total population of 12 wards which cover town and suburbs)	4,647	Seaside resort/ former fishing port/ centre of excellence for offshore energy sector	East-Anglia
Rotherham	89,697 (parliamentary constituency)	4,832	Former industrial town	South Yorkshire
Shrewsbury	71,715 (parish)	3,799	Historic market town	West-midlands
Southport	90,381 (parliamentary constituency)	4,421	Seaside resort	North-West

Figure 8. Geographical spread of selected high streets



(Source: self study)

5.17.2.1. Basingstoke, Hampshire

Basingstoke is an historic market town situated in the South-East of England. The town has held purple flag status for the last 5 years in recognition of its vibrant, safe and enjoyable evening/night time economy, and green flag status for last 3 years in recognition of its quality parks and green spaces. The town has been praised by the Association of Town and City Management for its range of attractions, retail and leisure facilities, and its arts and culture agenda has been described as excellent/outstanding (ATCM, 2017a). Additionally, following the approval from local businesses to create a BID, the town is expected to benefit from approximately £2 million of private sector investment by April of 2021 (Hampshire Cultural Trust, 2015), and Festival Place shopping centre is also expected to receive millions of pounds of further investment from new owners, AEW Europe (Basingstoke Gazette, 2016), indicating that Basingstoke town centre is considered a good venture for private investors. Figures 9 to 12 illustrate various aspects of Basingstoke's high street.

Figure 9. Basingstoke's mix of architectural styles

(Source: author's own)

Figure 10. Festival Place

(Source: author's own)

Figure 11. 'Top of the town'

(Source: author's own)

Figure 12. View of Basingstoke town centre from the West

(Source: author's own)

5.17.2.2. Birkenhead, Merseyside

Birkenhead is a former industrial town/historic market town situated in the North-west of England. The 2009 Wirral town centres, retail and leisure study (Roger, Tym & Partners, 2009) noted the continued issue of night-time anti-social behaviour in the town centre and a public perception of crime that was worse than reality. It also observed a disappointing retail offering for a centre of its hierarchical position, a lack of maintenance of some parts of the core area and a lack of progress in the formulation of concrete plans. In 2012 GVA noted further issues concerning poor linkages between the centre and key transport nodes and the poor configuration of the market. They also observed that the configuration of the centre did not meet the requirements of modern retailers and the centre was lacking a sustainable mix of uses. They further advised that the centre needed to find a new purpose (ibid).

Whilst the most recent update to the Wirral retail and leisure study (Nathaniel Lichfield & Partners, 2016) noted that the town was considered to be well represented by retailers, the proportion of vacant units was double the national average, at 24.3% (ibid). The study update also noted a lack of leisure uses within the core retail area. Retail rents have also continued to fall since 2008 (ibid), suggesting the centre is not a desirable location for businesses to situate. Figures 13 to 15 illustrate various aspects of Birkenhead's high street.

Figure 13. Semi-covered, pedestrianised streets in Birkenhead

(Source: author's own)

Figure 14. A public square in Birkenhead

(Source: author's own)

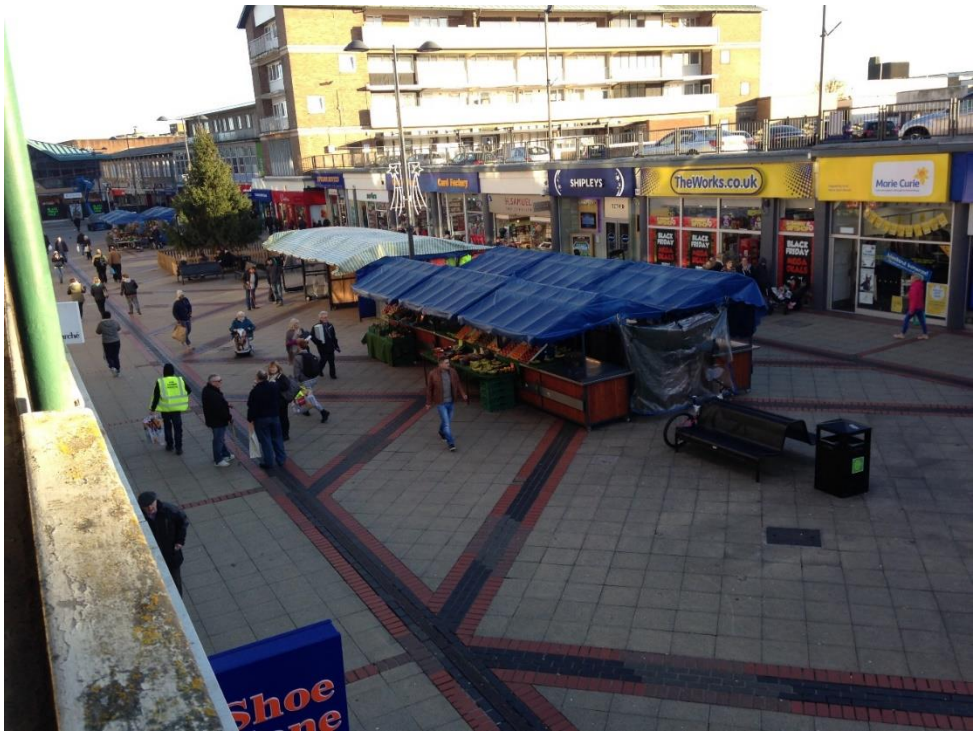
Figure 15. The food court inside the Pyramids Shopping Centre

(Source: author's own)

5.17.2.3. Corby, Northamptonshire

The town of Corby is a former industrial town located in the East-Midlands. In 2016 Northamptonshire Telegraph reported how business in the town was booming, despite the threat of online and out-of-town retail. In 2015 the town attracted 8 million visitors and units were nearly fully occupied (ibid). The town's increased footfall figures bucked the national trend with an increase from an average of 60,000 visitors per week in 2007 to 132,453 visitors in the second week of February 2016 (ibid). In 2015 Northamptonshire County Council noted the town's abundant parking and well-developed walking and cycling network, although they did note that this could benefit from enhancement to the north. Figures 16 to 18 illustrate various aspects of Corby's high street.

Figure 16. The older side of the high street

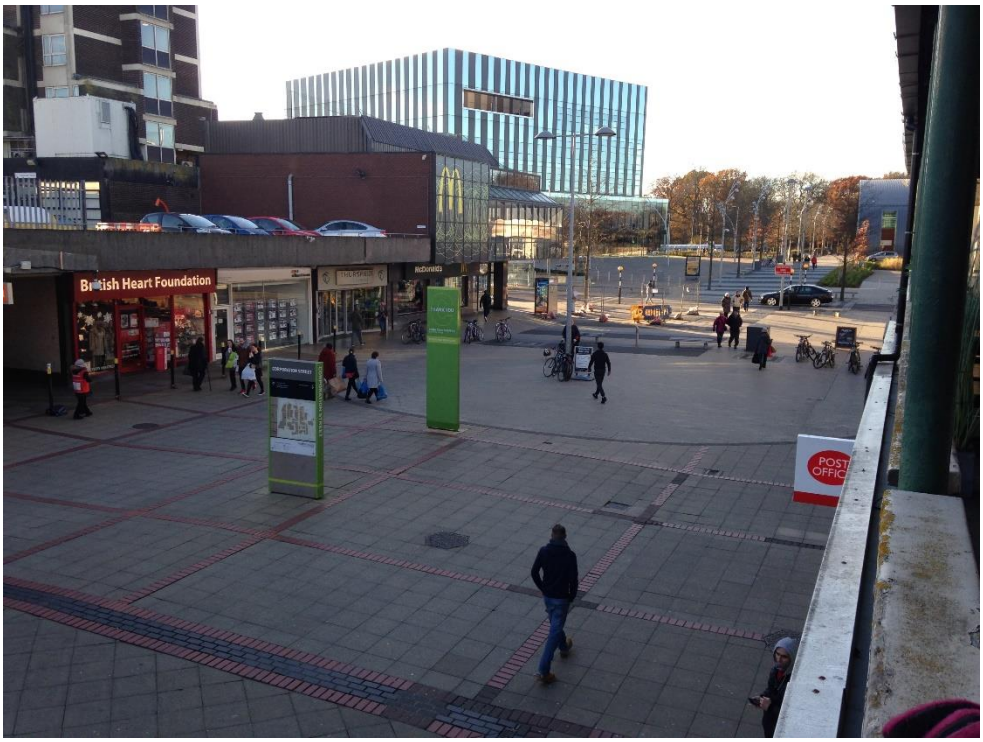


(Source: author's own)

Figure 17. The newer side of the high street

(Source: author's own)

Figure 18. View towards Corby Cube



(Source: author's own)

5.17.2.4. Gosport, Hampshire

Gosport is a former naval town/seaside resort located on the south coast of England, across the estuary from Portsmouth. In 2006 GVA conducted a household survey as part of the 2007 Retail Leisure and Office Study (GVA, 2007). The results showed that approximately 26% of participants said there was nothing/very little that they liked about Gosport. In 2014 GVA published a further retail study based on a household study undertaken in February 2014. This time approximately 48% reported that there was nothing/very little that they liked about Gosport (GVA, 2014). The 2014 report also highlighted issues in terms of attracting evening footfall, issues in terms of attracting new retailers, a lack of leisure attractions within the centre, tired shop facades, congestion issues and a retail offering dominated by budget retail (GVA, 2014). Whilst the town appeared to cope reasonably well following the 2008 recession, with a stable retention of comparison retail during the recession, and below average vacancy rates reported in 2014, GVA note the requirement for improvements to benefit perceptions of the town, particularly in terms of fear of crime and the evening and night-time economy (ibid). Figures 19 to 21 illustrate various elements of Gosport's high street.

Figure 19. The streetscape of Gosport's high street

(Source: author's own)

Figure 20. Gosport Shopping Precinct

(Source: author's own)

Figure 21. Market stalls in Gosport

(Source: author's own)

5.17.2.5. Great Yarmouth, Norfolk

Great Yarmouth is a traditional seaside resort, former fishing port and a current centre for the energy industry. The town is situated on the East Anglian coast, in the county of Norfolk. Whilst faring well in terms of public transport links and parking provision, the high street has suffered due to the decline in tourism to the resort (Strategic Perspectives LLP, 2011). The 2011 retail study (the most recent retail study produced for the town) reported above average vacancy rates, a decline in footfall and the loss of key anchor stores (ibid). More recently the Norfolk Chamber of Commerce (2014) reported that the footprint of existing retail units was not big enough to meet the requirements of national retailers, and the development control committee at Great Yarmouth Borough Council described the town centre as 'fragile', with plans for a retail park rejected on three occasions due to concerns regarding the harm that may be caused to the existing town centre (Great Yarmouth Mercury, 2015). Figures 22 to 24 illustrate various aspects of Great Yarmouth's high street.

Figure 22. The market square

(Source: author's own)

Figure 23. Regent road

(Source: author's own)

Figure 24. External view of Market Gates Shopping Centre

(Source: author's own)

5.17.2.6. Rotherham, South Yorkshire

Rotherham is a former industrial town located in South Yorkshire. The town was crowned the winner of the town centre category of the Great British High Street awards in 2015 and Rotherham Street Market was awarded 'Best Large Outdoor Market' in 2016 by the National Association of British Market Authorities (NABMA). Whilst in the past competition from nearby Sheffield City Centre and the out-of-town retail development Meadowhall has resulted in the loss of retailers and increased vacancy rates (Collier Internationals, 2011), in 2015 the local authority reported how Rotherham had managed to overcome these challenges through the increased popularity of its market (RMBC, 2015) and the town was also praised for its "*incredible support for start-up businesses and local traders*" (GBHS, 2015). Historic England (2015) also noted the efforts of the Council's retail team to encourage visitors to stay in the town centre into the evening and night-time. Historic England's report (2015) also acknowledged the improvements made to bus and railway stations, the introduction of a shopper's discount scheme and the programme of outdoor events and public realm improvements that were planned. In 2017 the BBC reported that the vacancy rate in Rotherham stood at 23% (BBC, 2017b), indicating that the high street was continuing to suffer from symptoms of decline. Figures 25 to 27 illustrate various aspects of Rotherham's high street.

Figure 25. Old Town Hall shopping precinct

(Source: author's own)

Figure 26. Riverside precinct

(Source: author's own)

Figure 27. Landscaped area outside Rotherham Minster

(Source: author's own)

5.17.2.7. Shrewsbury, Shropshire

Shrewsbury is an historic market town located in the county of Shropshire in the West Midlands. The town is a popular destination for tourists (WYG, 2012c). In 2015 the town was awarded the status of 'healthiest high street' by the Royal Society for Public Health (RSPH) (2015) in recognition of the health promoting shops, services and facilities present in the high street. In 2016 the town was awarded purple flag status which acknowledged the town's vibrant and safe evening and night-time offering (Shrewsbury BID, 2017). Shrewsbury has retained this status for a second year. The assessors praised Shrewsbury for its choices of bars and venues and its approach to partnership between various high street stakeholders (e.g. local businesses, local police, Shrewsbury Town Council etc.) (Original Shrewsbury, 2017). Additionally, between 2015 and 2016 evening and night-time footfall increased by 20% (Shrewsbury BID, 2017). Figures 28 to 30 illustrate various elements of Shrewsbury's high street.

Figure 28. Fish Street

(Source: author's own)

Figure 29. One-way system

(Source: author's own)

Figure 30. Branded Christmas decorations in Shrewsbury

(Source: author's own)

5.17.2.8. Southport, Merseyside

Southport is a seaside resort on the North West coast of England. The town, alongside Birkenhead and Bootle, is considered to have borne the brunt of the downturn in consumer spending that occurred in the North West following the 2008 economic crash (Liverpool Echo, 2013). During the crucial Christmas period of 2014 footfall levels fell by 20% compared to 2012 levels (Southport Visiter, 2014). The town has also suffered with higher than average vacancy rates (WYG, 2012a) and falling retail rental values of 41.2% between 2008 and 2013 (Liverpool Echo, 2013), and 10% between 2015 and 2016 (Southport Visiter, 2016). The latter figure was the largest fall observed in the North West for that year (ibid). Additionally, between 2005 and 2011 Southport's retail ranking fell from 44th place to 81st place (WYG, 2012b). Figures 31 to 33 illustrate various elements of Southport's high street.

Figure 31. Wide pavements on Lord Street

(Source: author's own)

Figure 32. The pedestrianised area of the high street

(Source: author's own)

Figure 33. Wayfarers Shopping Arcade

(Source: author's own)

Table 6. Comparison of high street characteristics

	Key retail features and high street attractions	Trading hours (approx.)	Architectural styles present	Access and parking	Public realm	Evening/night-time activities
Basingstoke	•Festival place shopping centre (figure 10) •'Top of the town' – the older part of the centre (figure 11) •'The Malls' •National chains dominate Festival Place and The Malls •Pockets of independent shops and services in the 'top of the town'	9am to 5pm/8pm Sunday: 11am to 5pm	•Contemporary •Brutalist •Georgian •Victorian (Figures 9 and 11 illustrate the contrast of architectural styles)	•Close to M3 motorway •3000 parking spaces (BDBC, 2016) •Festival Place car park open 24 hours (Festival Place 2017) •Short walk from Basingstoke train station •Approx. £1 per hour (daytime) •£1 from 6pm to 8am	•Predominantly pedestrianised •Clear high street boundary to west (figure 12) •2 parks within close proximity •Interactive signage/information points	•Bars •Restaurants •Cinema •Shops open until 8pm on Thursday and Friday
Birkenhead	•The Pyramids Shopping Centre comprises an indoor mall with a food hall (figure 15) and external, semi-covered pedestrianised retail area (figure 13) •Recent loss of key retailers e.g. Marks and Spencer •Recent retail arrivals e.g. Pandora •Birkenhead market •Leisure centre (a short walk from high street)	9am to 6pm Sunday: 10am to 4:30pm	•1970's modernist •Historic buildings pepper the site	•2 multi-storey car parks •Improvements recently made to car parks e.g. spaces widened •£2 for all day parking •Free Sunday parking •Car parks close approx. 6:30pm •On-site bus station •Conway Park train station nearby	•Predominantly pedestrianised •2 pedestrianised squares, 1 with bandstand (figure 14)	•Few drinking and eating establishments to cater to evening/night-time trade •Cinema (a short walk from high street) •Bingo hall

Corby	•National chains dominate •Pockets of independent shops and services present •Oasis retail park adjoins high street •Corby International Pool •Places Gym	9am to 5:30pm Sunday: 10:30am to 4:30pm	•Brutalist •Contemporary (figures 16 and 17 illustrate contrast of architectural styles)	•Multi-storey car park •Surface car park •Bus routes •20 minute walk to Corby train station •Approx. 50p per hour parking •Free Sunday parking •Multi-storey open 5am to 10pm •Surface car park open 24 hours	•Predominantly pedestrianised	•Few drinking and eating establishments cater to evening/night-time trade •Cinema •The Core at Corby Cube (theatre) (figure 18)
Gosport	•Pedestrianised retail centre •Mix of national chain stores and independents •2 weekly markets plus periodic specialist markets (Gosport Town Centre, 2016) •Gosport Shopping Precinct comprises multiple empty units (figure 20) •Gosport Discovery centre (museum and library)	9am to 5:30pm Sunday: Closed	•Brutalist •Victorian •Georgian	•4 surface car parks •Car parks open 8am to 7pm •Approx. 50p per hour to park •Ferry across to Portsmouth •On-site bus station •Nearest train station 6.4 miles away (Fareham)	•Predominantly pedestrianised (figure 19) •Areas of green space are a short walk from high street e.g. Walpole Park and Arden Park	•Few drinking and eating establishments cater to evening/night-time trade

Great Yarmouth	•Market Gates Shopping Centre comprises predominantly national chain stores with some independents •Great Yarmouth Market situated in Market Square (figure 22) •Regent Road contains multiple vacant units and is dominated by bookmakers, takeaways and budget fashion stores (figure 23)	9am to 5pm Sunday: 10am to 4pm	•Contemporary •Victorian •Georgian •Brutalist •Medieval	•1 Multi-storey car park (open 8am to 7pm, Sunday: 9am to 5pm) •Several surface car parks •Free parking after 4pm •Parking costs £1 per hour up to 4 hours, and £7.90 for more than 4 hours •First hour of parking free if £10 is spent in participating stores (GYTCP, no date) •Market Gates bus station •Great Yarmouth train station is a short walk from high street	•Market Square is predominantly pedestrianised •Regent Road is pedestrianised	•Cinema and theatre (both a short walk from high street) •Restaurants (predominantly on Regent Road)
Rotherham	•Pedestrianised centre comprising a mix of national chain stores (predominantly budget) and independents •Old Town Hall Shopping precinct comprises mainly independent and vacant units (figure 25) •Riverside precinct comprises multiple vacant units (figure 26) •Rotherham Minster	9am to 5:30pm Sunday: 10:30am to 4:30pm	•Medieval •Victorian •Edwardian •Brutalist •Modernist (figures 25, 26 and 27 demonstrate architectural mix)	•Rotherham interchange bus station and multi-storey car park •Several surface car parks •Parking costs approx. 75p per hour •'Forge Island' car park offers free weekend parking and 2 hours free parking (in designated zones) on weekdays	•Predominantly pedestrianised •Signage advertises events and key information •Digital guide available •Over 100 pieces of artwork located across high street •Green space outside Rotherham Minster (figure 27)	•Pubs/bars •Nightclubs •Snooker club •Bingo Hall •Theatre

Shrewsbury	•Pride Hill Shopping Centre •Darwin Shopping centre •Outside shopping area •Mix of national chain retailers and independents – high street brands itself on its independent retail offering (figure 30) •Shrewsbury museum and art gallery •Market Hall	9am to 5:30pm Sunday: 10:30am to 5:30pm	•Medieval (figures 28 and 29) •Pockets of brutalism	•One-way system (figure 29) •Raven Meadow's multi-storey car park (open 9am to 7:30 pm, Sunday: 10:30am to 5:30pm) •Several surface car parks •Approx. £1.25 per hour to park •3 park-and-ride schemes •Shrewsbury train station is a short walk from the high street •Shrewsbury bus station on edge of the high street	•Narrow streets •Some pedestrianisation	•Pubs/bars •Nightclubs •Restaurants •Theatre within close proximity •Cinema
Southport	•Lord Street comprises a mix of chain and independent shops and services •Wayfarers Shopping Arcade comprises predominantly independent shops (figure 33) •The pedestrianised area surrounding train station comprises predominantly national chain stores (figure 32) •The Atkinson (art gallery, library and theatre) •The Monument (contains the Southport War Memorial) •Market	9am to 6pm Sunday: 10am to 5pm	•Victorian •Brutalism present in pedestrianised area	•Several car parks costing from 60p to £2.00 per hour •Southport train station located centrally in the high street •Bus services	•Wide pavements on Lord Street (figure 31) •Some pedestrianisation •Landscaped public open space located on Lord street •King's Gardens (containing green space and a playground) are 100 metres from the high street	• The Atkinson (theatre) •Pubs/bars •Restaurants

5.17.3. Establishing sub-criteria values

Measurement tools were established (see chapter 7) in order to calculate values for each of the sub-criteria with reference to each of the alternatives (high street case studies). These values were central to the application of the MCDM methods, enabling each high street to be assessed against the weighted sub-criteria.

5.17.4. Development and application of the final model

The steps required for the development and application of the final model for high street sustainability are summarised:

1. Identify criteria/sub-criteria that influence high street sustainability
2. Establish sub-criteria weights
3. Select alternatives (high streets) for assessment
4. Establish sub-criteria values for each alternative
5. Construct a decision making matrix using sub-criteria weights and values
6. Undertake a comparative analysis of appropriate MCDM methods using the data obtained
7. Select most appropriate MCDM method and apply to decision problem

5.18. Chapter summary

This chapter has presented the methodological approach taken to conduct the research. An overview of MCDM methods has been presented and the following popular methods have been summarised: WSM, WPM, AHP, revised AHP, TOPSIS, COPRAS, modified COPRAS, ELECTRE and PROMETHEE. The chapter has also discussed the use of MCDM methods to investigate research problems concerning various elements of the built environment and has explored the process of selecting an appropriate MCDM method. Justification for the use of MCDM methods in the study is presented, along with an overview of how the methods are applied to the specific research problem.

The research has taken a quantitative approach which is guided by a pragmatic paradigm. Quantitative data has been obtained to assess high street sustainability with a view to inform practical decision making and policy development. The steps required to develop and apply the high street sustainability model have been presented and discussed in this chapter.

Chapter 6: Data analysis

6.1. Introduction

This chapter presents the respondent samples obtained, and discusses the findings of the analysis undertaken to identify any statistically significant differences between the opinions of different stakeholder groups with reference to the importance of the criteria and sub-criteria (presented in section 5.8.1) to high street sustainability. This analysis enabled the researcher to understand the different opinions and priorities of various stakeholder groups when it comes to high streets. The results of each individual test are presented in appendix 7.

6.2. Quantitative analysis of data from survey of professionals and residents.

This section presents the respondent samples obtained through both the professionals' and residents' surveys. Also discussed are the variations in the opinions of the professional and resident respondents with reference to criteria and sub-criteria importance. The sub-criteria rankings from both surveys informed the weights assigned to each sub-criterion for the application of the MCDM methods.

6.2.1. Professionals' survey

6.2.1.1. Response rate

Potential participants from all regions within England were sent an email which contained a link to the survey. The email was sent to 321 professionals and 75 responses were obtained, therefore achieving a response rate of 23%. The researcher sought to obtain as much representation from each professional group as possible, however some types of professionals are more abundant than others e.g. the number of architects working in England is far greater than the number of academics who work in a relevant subject area. This was therefore reflected in the number of emails sent to potential participants. Table 7 presents figures for the number of recruitment emails sent to the various professional categories, alongside the number of responses obtained. The length of service and type of employment of the respondents are detailed in tables 8 to 10. Figure 34 illustrates the geographical spread of participants.

6.2.1.2. Respondent sample

Tables 7 to 10 present the key demographic information regarding the professional respondent sample. It should be noted that the requirement for participants to select one of 9 English regions ensured that all participants were professionally based in England and not in other countries within the UK. The explanation as to why the research focused specifically on England is presented in section 5.17.1.

Table 7. Professions of respondents (including number of invites sent to each category)

	Number of invites		**Number of responses**	
Professional title	**Count**	**Percentage (%)**	**Count**	**Percentage (%)**
Architect	100	31.15	14	18.67
Surveyor	80	24.92	13	17.33
Planning professional	102	31.78	37	49.33
Town centre manager	14	3.12	1	1.33
Academic/researcher	25	7.79	3	4.00
Other	-	-	7	9.33

Table 8. Respondents' length of service

Length of service	**Count**	**Percentage (%)**
0-2 years	6	8.00
3-5 years	11	14.67
6-10 years	8	10.67
Over 10 years	50	66.67

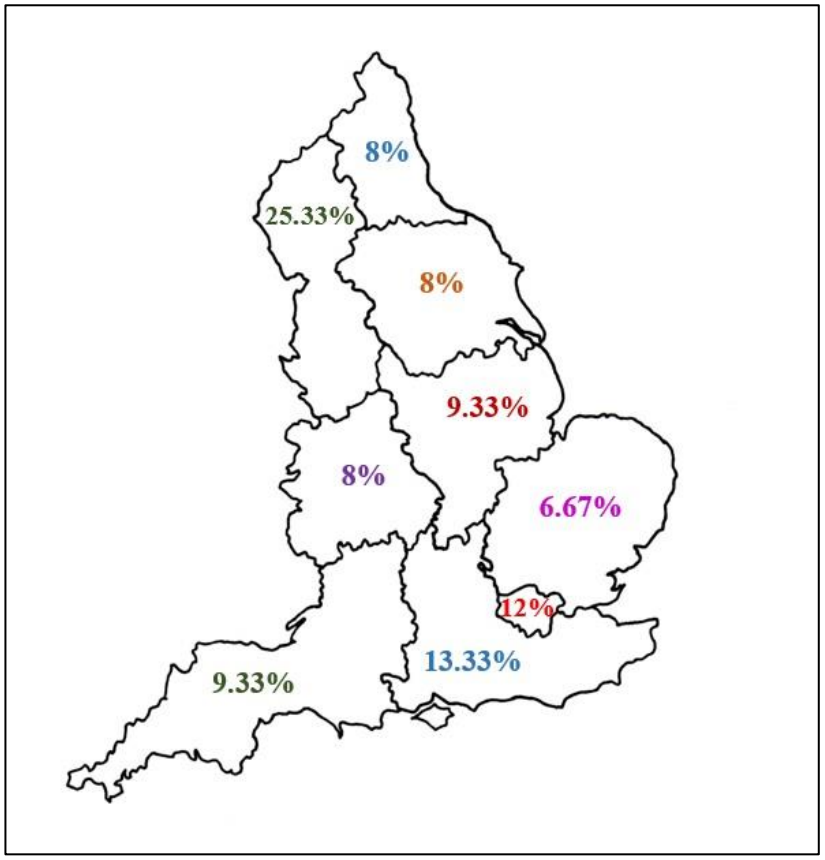
Table 9. Respondents' type of employment

Type of employment	**Count**	**Percentage (%)**
Public sector	18	24.00
Private sector	44	58.67
Educational	3	4.00
Self-employed	10	13.33

Table 10. English region in which respondents are professionally based

English region	Count	Percentage (%)
East of England (East Anglia)	5	6.67
East Midlands	7	9.33
London	9	12.00
North East	6	8.00
North West	19	25.33
South East	10	13.33
South West	7	9.33
West Midlands	6	8.00
Yorkshire and the Humber	6	8.00

Figure 34. Geographical spread of professional respondents



(Source: self study)

6.2.2 Residents' survey

6.2.2.1. Response rate

As the residents' survey was an online survey, it was decided that the most cost effective and viable way of making the survey known to the desired participant sample – those resident in and around each case study town – was to distribute flyers informing potential participants of the research aim and context, and presenting the link which participants could simply type into their internet browser to access the survey. 300 flyers were distributed in each case study location, therefore totalling 2,400. However, the initial response rate from this method was poor, with an average response rate of approximately 3%. Response rates from each individual town ranged from as low as 0% to a maximum of 5%. Consequently the researcher adopted a different approach in order to boost responses. A variety of community groups, organisations, public services, places of work and places of worship were contacted in each case study location. An email containing the survey link and key participant information was sent to the relevant individuals of the above groups/organisations. In total 197 emails were sent, however the researcher is unable to report a final response rate as many of the individuals contacted responded via email to confirm that they had forwarded the email onto group/organisation members, friends, family and other groups who may have been interested in participating. Therefore the total number of people that received the survey invitation is not known to the researcher.

6.2.2.2. Respondent sample

In total 280 participants completed the resident survey. Tables 11 to 18 present the demographic background of the resident respondents.

Table 11. Towns in which the participants were resident

Town of residence	Count	Percentage (%)
Basingstoke	43	15.36
Birkenhead	36	12.86
Corby	11	3.93
Gosport	31	11.07
Great Yarmouth	29	10.36
Rotherham	32	11.43

Shrewsbury	68	24.29
Southport	30	10.71

Table 12. Gender of participants

Gender	Count	Percentage (%)
Male	119	42.50
Female	161	57.50

Table 13. Age of participants

Age	Count	Percentage (%)
16-24	3	1.07
25-34	25	8.93
35-44	32	11.43
45-54	46	16.43
55-64	71	25.36
65+	103	36.79

Table 14. Marital status of participants

Marital status	Count	Percentage (%)
Single	20	7.14
Married	206	73.57
Living with partner	17	6.07
Widowed	17	6.07
Divorced	18	6.43
Separated	2	0.71

Table 15. Living accommodation of participants

Type of accommodation	**Count**	**Percentage (%)**
I own my own home	242	86.43
Living in rented accommodation	23	8.21
Living with parents	6	2.14
Living in sheltered accommodation	1	0.36
Prefer not to say	1	0.36
Other	7	2.50

Table 16. Participants' household size

Household size	Count	Percentage (%)
1	39	13.93
2	156	55.71
3	44	15.71
4	33	11.79
5+	8	2.86

Table 17. Occupational status of participants

Occupational status	Count	Percentage (%)
Employed full-time	88	31.43
Employed part-time	34	12.14
Self-employed	18	6.43
Student	2	0.71
Home maker	6	2.14
Unemployed	3	1.07
Unable to work	2	0.71
Retired	127	45.36

Table 18. Length of time participants had been resident in their respective town

Length of residence	Count	Percentage (%)
Less than 2 years	11	3.93
2-5 years	33	11.79
6-10 years	18	6.43
Over 10 years	218	77.86

6.2.3. Central tendency tests

This section presents the descriptive statistics from the importance scores given by the professional and resident respondents. The mean scores were derived from Likert scales that asked respondents to rank each sub-criterion in terms of how important they thought it was to the success and sustainability of town centres. The scale ranked from 1 (not at all important) to 5 (extremely important). In order to determine the significance of the sub-criteria to the success and sustainability of town centres, descriptive statistics were used. The mean ranking for the respondent importance scores for each sub-criterion was calculated. The mean sub-criteria scores from the combined professional and resident data enabled the sub-criteria to be weighted for the application of the MCDM methods. By determining the relative importance of the criteria and sub-criteria from the perspectives of key stakeholders, and incorporating that data into the assessment of high street performance, a decision maker can better understand how a high street is meeting the needs and expectations of those stakeholders.

Tables 19 and 20 present the mean criteria and sub-criteria scores, the median and standard deviation. The standard deviation indicates the strength of the central tendency estimate through the measure of dispersion or variability in the data set. The lower the standard deviation, the more representative the mean score. Conversely, the higher the standard deviation, the greater the variation in the respondents' opinions of importance.

6.2.3.1. Criteria

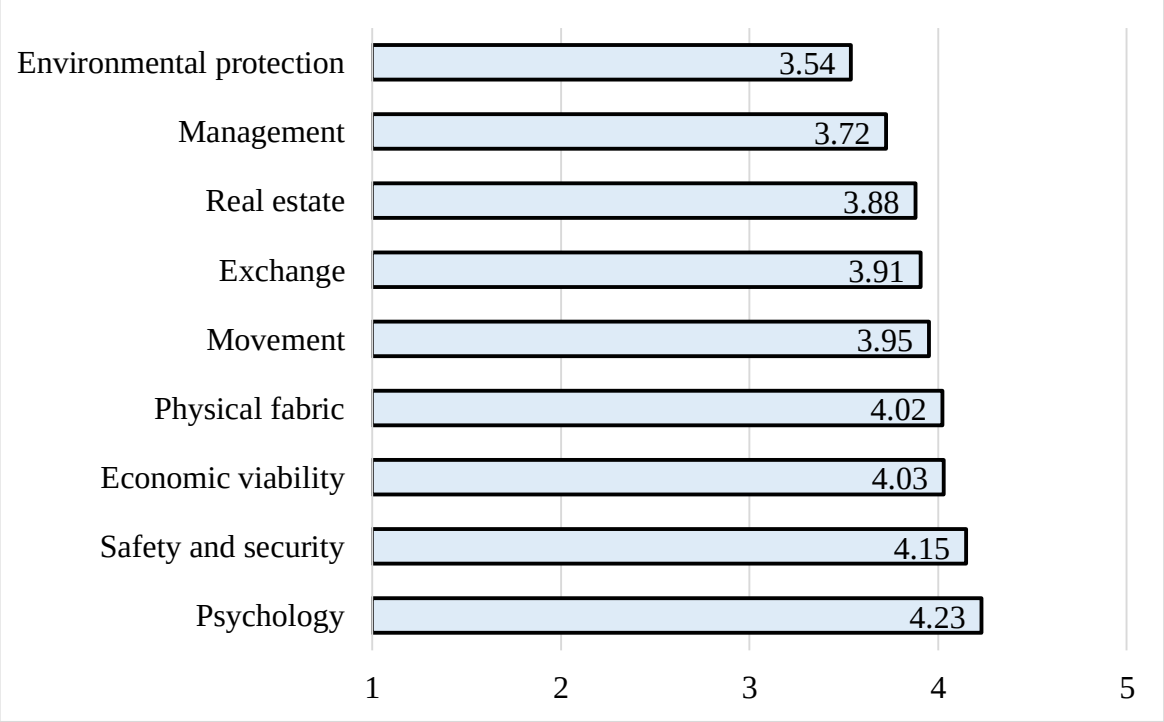
The 42 sub-criteria can be grouped into 9 criteria categories. The importance scores obtained for the sub-criteria enabled the researcher to calculate the descriptive statistics for each of the 9 criteria categories. Table 19 presents the descriptive statistics for the criteria

importance scores obtained from both the professional and resident survey respondents. Figure 35 presents the mean scores graphically.

Table 19. Descriptive statistics for criteria categories

Criteria	Mean	Median	Standard Deviation	Rank
Psychology	4.23	4	0.62	1
Safety and security	4.15	4	0.62	2
Economic viability	4.03	4	0.61	3
Physical fabric	4.02	4	0.59	4
Movement	3.95	4	0.60	5
Exchange	3.91	4	0.65	6
Real estate	3.88	4	0.65	7
Management	3.72	4	0.70	8
Environmental protection	3.54	4	1.04	9

Figure 35. Mean rankings of criteria categories



(Source: self study)

6.2.3.2. Sub-criteria

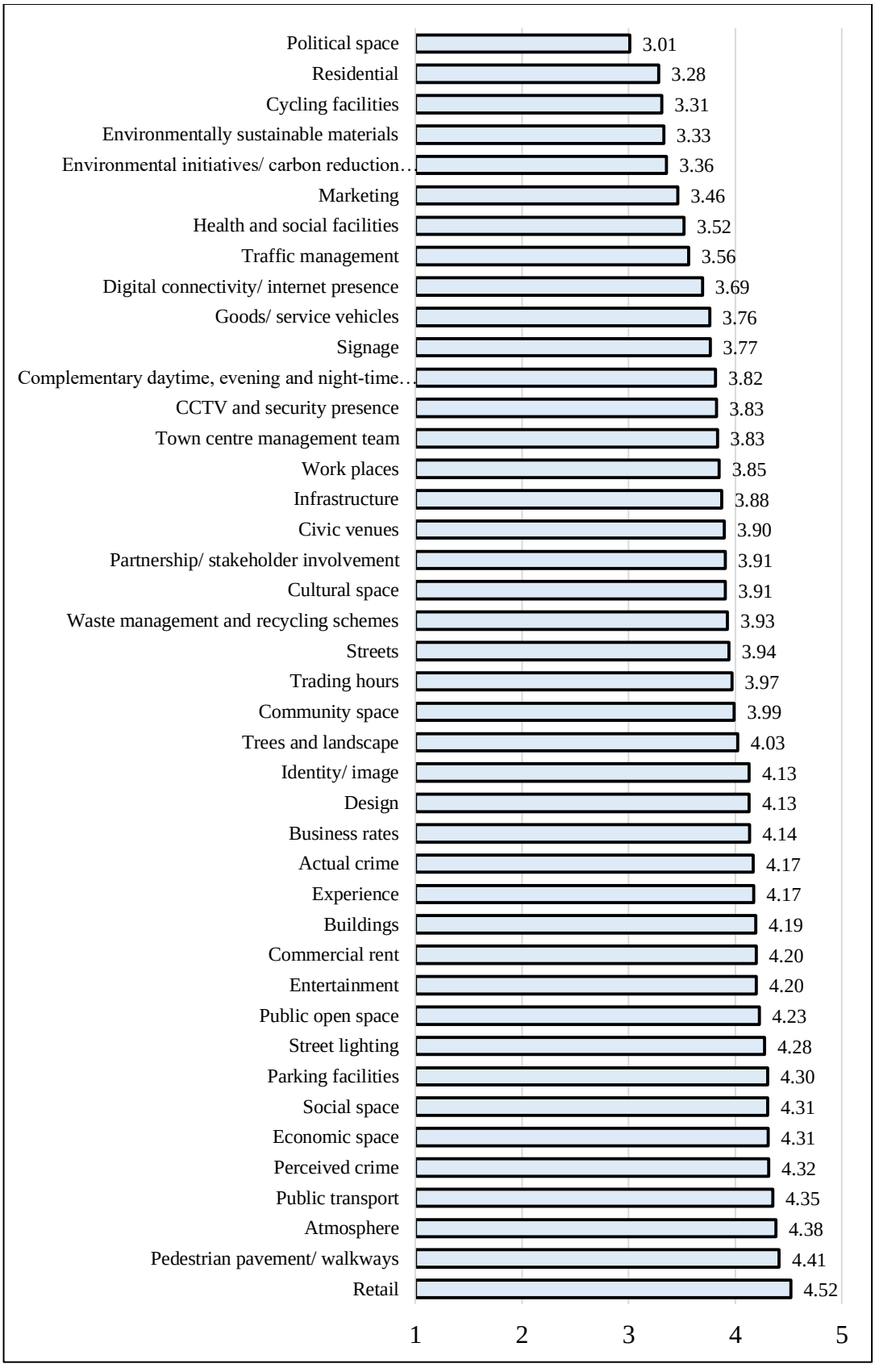
Table 20 presents the descriptive statistics for the sub-criteria importance scores obtained from both the professional and resident respondents. Figure 36 presents the mean scores graphically.

Table 20. Descriptive statistics for sub-criteria

Sub-criteria	Mean	Median	Standard deviation	Rank
Retail	4.52	5	0.63	1
Pedestrian pavement/ walkways	4.41	5	0.74	2
Atmosphere	4.38	4	0.70	3
Public transport	4.35	4	0.76	4
Perceived crime	4.32	4	0.78	5
Economic space	4.31	4	0.77	6
Social space	4.31	4	0.72	6
Parking facilities	4.30	4	0.81	7
Street lighting	4.28	4	0.81	8
Public open space	4.23	4	0.87	9
Entertainment	4.20	4	0.79	10
Commercial rent	4.20	4	0.82	10
Buildings	4.19	4	0.78	11
Experience	4.17	4	0.85	12
Actual crime	4.17	4	0.86	12
Business rates	4.14	4	0.85	13
Design	4.13	4	0.79	14
Identity/ image	4.13	4	0.85	14
Trees and landscape	4.03	4	0.89	15
Community space	3.99	4	0.95	16
Trading hours	3.97	4	0.78	17
Streets	3.94	4	0.94	18
Waste management and recycling schemes	3.93	4	1.08	19
Cultural space	3.91	4	0.89	20
Partnership/ stakeholder involvement	3.91	4	0.86	20
Civic venues	3.90	4	0.95	21
Infrastructure	3.88	4	0.94	22
Work places	3.85	4	1.02	23
Town centre management team	3.83	4	0.96	24
CCTV and security presence	3.83	4	0.96	24
Complementary daytime, evening and night-time economies	3.82	4	0.98	25
Signage	3.77	4	0.94	26
Goods/ service vehicles	3.76	4	0.94	27
Digital connectivity/ internet presence	3.69	4	1.02	28
Traffic management	3.56	4	1.07	29

Health and social facilities	3.52	4	1.14	30
Marketing	3.46	4	1.02	31
Environmental initiatives/ carbon reduction schemes	3.36	3	1.18	32
Environmentally sustainable materials	3.33	3	1.20	33
Cycling facilities	3.31	3	1.14	34
Residential	3.28	3	1.09	35
Political space	3.01	3	1.06	36

Figure 36. Mean sub-criteria rankings obtained from both surveys



(Source: self study)

The mean scores presented in tables 19 and 20, and figures 35 and 36, show the gradation of criteria and sub-criteria importance from the perspectives of key high street stakeholders. By determining the relative importance of the criteria and sub-criteria, and incorporating this data into the assessment of high street performance, a decision maker can better understand how a high street is meeting the needs and expectations of key stakeholders, including industry professionals and local residents.

The sub-criteria mean scores (presented in table 20 and figure 36) inform the weightings assigned to each sub-criterion for the application of the MCDM methods – this enables the needs and expectations of key stakeholders to be incorporated into the high street sustainability assessment model. The weights are calculated by dividing each individual sub-criterion mean by the sum of all of the sub-criteria means. The sum of all of the weights should therefore equal 1.

The mean scores for all of the sub-criteria ranged between 'fairly important' and 'extremely important'. Therefore it can be considered that the combined data from all 355 participants confirms that all 42 sub-criteria were considered to be important to varying degrees to the success and sustainability of a town centre. Consequently there was no need for any of the sub-criteria to be removed ahead of the model development.

6.2.4. Differences between professional and resident groups

This section discusses the results of the statistical analysis of the importance scores given by the professional and resident groups. The individual test results are present in appendix 7.

A Mann-Whitney U test identified statistically significant differences in the importance scores given by the professionals and residents with reference to 3 (33%) of the 9 criteria categories, namely 'exchange', 'safety and security' and 'economic viability'. The results (table 41, appendix 7) showed that the resident participants considered 'exchange' and 'safety and security' to be significantly more important compared to the professionals. The professionals on the other hand considered 'economic viability' to be significantly more important compared to the residents.

A further Mann Whitney U test was used to identify any statistically significant differences between the opinions of the professionals and residents in terms of the importance of the sub-criteria to town centre success and sustainability (results presented in table 42, appendix 7). The tests identified statistically significant differences between the rankings given by the

professionals and residents for 19 (45%) of the 42 sub-criteria. The tests found that professionals placed significantly more importance on the following sub-criteria, compared to the residents:

- Infrastructure
- Design
- Pedestrian pavements/walkways
- Traffic management
- Retail
- Entertainment
- Residential
- Image/identity
- Complementary daytime, evening and night-time economies

Residents, on the other hand, placed significantly more importance on the following sub-criteria, compared to the professionals:

- Signage
- Trees and landscape
- Parking facilities
- Economic space
- Political space
- Community space
- Civic venues
- Actual crime
- CCTV and security presence
- Town centre management team

6.3. Quantitative analysis of professional responses

This section discusses the results of the statistical analysis of the importance scores given by the different professional groups. The individual test results are present in appendix 7.

Kruskal-Wallis and Mann-Whitney U tests were used to identify any statistically significant differences between different groups of professional participants. The following groups of participants were compared in order to establish whether their opinions of the importance of the criteria/sub-criteria differed significantly:

- Professional title
- Type of employment
- Length of service
- Region of England in which participant was professionally based

It should be noted that, as presented in section 6.2.1, the respondent sample contained greater representation from professionals who had worked in their respective fields for over 10 years, private sector professionals, and professionals based in the North West of England. Therefore the importance scores given may be more reflective of those professionals, and less representative of those falling outside of those categories. However, it may be surmised that by having a higher number of professionals who have worked in their profession for over 10 years, the knowledge, experience and expertise contained within the sample may be of a high level.

6.3.1. Criteria categories

The results show that were no statistically significant differences between the opinions of different 'professional title', 'employment type', 'length of service' and 'English region' groups with reference to the importance of the 9 criteria categories. This indicates that the rankings given to the 9 criteria categories are consistent across the various professions, employment types, levels of experience and geographic regions.

6.3.2. Sub-criteria

The test results comparing the opinions of the professional respondents with regard to the 42 sub-criteria identified the following statistically significant differences:

- *Statistically significant differences between 'professional title' groups*. The tests identified a statistically significant difference between the opinions of planners and surveyors with reference to the sub criterion 'political space', with planners deeming the sub-criterion to be significantly more important compared to surveyors. Therefore it can be surmised that for 41 (98%) of the 42 sub-criteria, the professional title of respondents had no influence on the importance ratings given.
- *Statistically significant differences between 'length of service' groups.* Two statistically significant differences were detected between 'length of service' groups with reference to the sub-criterion 'trading hours'. A difference was identified between the '3-5 years' and '6-10 years' groups, with the group '3-5 years' rating

'trading hours' to be significantly more important to town centre sustainability compared to the '6-10 years' group. The second significant difference was detected between the '6-10 years' group and the 'over 10 years' group, with the 'over 10 years' group giving significantly higher importance rankings to 'trading hours' compared to the '6-10 years' group. Therefore, for 41 (98%) of the 42 sub-criteria, the length of service of respondents did not influence the importance rankings given.

The results indicate that the employment type of the professional participants and the region in which they are employed did not influence the importance rankings that they gave to the sub-criteria.

6.4. Quantitative analysis of resident responses

This section discusses the results of the statistical analysis of the importance scores given by the different resident groups. The individual test results are present in appendix 7.

Kruskal-Wallis and Mann-Whitney U tests were used to identify any statistically significant differences between different groups of resident respondents. The following groups of participants were compared in order to establish whether their opinions of the importance of the criteria/sub-criteria differed significantly:

1. Town in which respondent was resident
2. Gender
3. Age
4. Marital status
5. Living accommodation
6. Household size
7. Occupational status
8. Length of residence in respective town

The results of each individual test are presented in appendix 7. It should be noted that, as presented in section 6.2.2, the respondent sample contained greater representation from retired residents, married residents, residents who lived in households of 2 people, residents who owned their homes, residents who had lived in their respective towns for over 10 years, and residents aged 65 or over. Therefore the importance scores given may be more reflective of those residents, and less representative of residents falling outside of those categories.

6.4.1. Criteria categories

The following statistically significant differences were identified between the opinions of the various resident groups with regard to their importance rankings of the 9 criteria categories:

- *Statistically significant differences between 'town' groups.* Statistically significant differences were detected between 'town' groups for 3 (33%) of the 9 criteria, namely 'psychology', 'safety and security' and 'exchange. It can therefore be inferred that for the remaining 6 (67%) of the criteria, a participant's town of residence did not influence the importance ratings given.

- *Statistically significant differences between 'gender' groups.* The tests identified statistically significant differences between the importance rankings given by males and females for 7 (78%) of the 9 criteria, namely 'physical fabric', 'movement', 'exchange', 'real estate', 'safety and security', 'management' and 'environmental protection'. The results showed that females scored all of those 7 criteria significantly higher compared to males, therefore indicating that the gender of the respondents has influenced the importance rankings given.

- *Statistically significant differences between 'occupational status' groups.* Statistically significant differences were identified between the 'retired' group and 'employed full-time' group with reference to the importance rankings given to 2 (22%) of the 9 criteria, specifically 'safety and security' and 'environmental protection', with retired participants scoring both criteria significantly higher in importance compared to those employed full-time. For the remaining 7 (78%) of the 9 criteria, a participant's occupation had no influence on the importance rankings given.

No statistically significant differences were identified between the 'age', 'marital status', 'living accommodation', 'household size' and 'length of residence' groups with reference to the importance rankings given to the 9 criteria, therefore it can be inferred that these factors did not influence the importance rankings given to criteria categories.

6.4.2. Sub-criteria

The following statistically significant differences were identified between the following resident groups with reference to the importance rankings given to the sub-criteria:

- *Statistically significant differences between 'town' groups.* Statistically significant differences were identified between the various 'town' groups for 14 (33%) of the 42 sub-criteria. For the remaining 28 (67%), the town in which the respondent was resident did not influence the rankings given.
- *Statistically significant differences between 'gender' groups.* The test results show that statistically significant differences were identified between men and women for 26 (62%) of the 42 sub-criteria, with women ranking all of those 26 significantly higher in importance compared to men. The importance rankings given to the other 16 (38%) sub-criteria appear to have been unaffected by the gender of the respondents.
- *Statistically significant differences between 'age' groups.* Statistically significant differences were detected between age groups for 4 (10%) of the 42 sub-criteria, namely 'signage', 'commercial rent', 'business rates' and 'entertainment'. However it should be noted that the statistically significant results identified between 16-24 year olds and other age groups may have been produced due to the small sample size of that particular group (3 respondents aged 16-24), and therefore should be treated with caution. The age of respondents did not appear to influence the importance rankings given to the remaining 38 (90%) sub-criteria.
- *Statistically significant differences between 'marital status' groups.* The analysis identified statistically significant differences between the scores of importance given by 'marital status' groups with regard to 2 (5%) of the 42 sub-criteria, namely 'signage' and 'entertainment'. The importance rankings of the remaining 40 (95%) sub-criteria were not influenced by the marital status of participants.
- *Statistically significant differences between 'household size' groups.* One statistically significant difference was detected between respondents living in households comprising 2 people and households comprising 4 people with reference to the sub-criterion 'public transport'. Respondents living in households of 2 people gave significantly higher importance scores compared to respondents living in households of 4 people. Household size was not shown to influence importance rankings for the remaining 41 (98%) sub-criteria.
- *Statistically significant differences between 'occupational status' groups.* Statistically significant differences were identified between the importance

rankings given by different 'occupational status' groups with reference to 5 (12%) of the 42 sub-criteria, specifically 'signage', 'civic venues', 'CCTV and security presence', 'environmentally sustainable materials' and 'atmosphere'. The other 37 (88%) sub-criteria were not found to be influenced by a respondent's occupation.

- *Statistically significant differences between 'length of residence' groups.* One statistically significant difference was detected between the 'over 10 years' group and 'less than 2 years' group with reference to the sub-criterion 'CCTV and security presence', with respondents resident in their respective towns for over 10 years scoring the sub-criterion significantly higher in importance compared to those who had been resident in their respective towns for less than 2 years. The results indicate that length of residence did not influence the importance rankings for the remaining 41 (98%) sub-criteria.

6.5. Conclusions from the data analysis

The review of literature enabled the identification of 9 criteria and 42 sub-criteria that have been found to influence the economic, environmental, and social success of high streets. The criteria and sub-criteria were validated through the administration of two online surveys. Industry professionals based in England, and local residents of selected English high streets, were invited to assign scores to the sub-criteria to indicate their importance to high street success and sustainability. In total, 355 responses were received, 75 of which were industry professionals from across England, and 280 were local residents of the eight English case study high streets selected for the model application. The results showed that all criteria and sub-criteria were considered to be between fairly important and extremely important, therefore indicating that both respondent groups recognised the importance of a wide range of factors to achieving successful high streets. The data therefore confirmed the need for broader, more inclusive high street measurement tools to be developed that better reflect the range of economic, environmental and social high street functions and features.

Whilst all criteria and sub-criteria were considered to be – to varying degrees – important, the statistical analysis did highlight some statistically significant differences in the responses given by the professionals and residents. The analysis revealed that, when compared to the residents, the professional respondents placed greater importance on retail, infrastructure, traffic management, entertainment, pedestrian pavements/walkways, residential,

image/identity, design and complementary daytime, evening and night-time economies. Residents, on the other hand, assigned significantly higher importance scores to community space, political space, civic venues, trees and landscape, signage, CCTV and security presence, actual crime and economic space, when compared to the professional respondents. These statistically significant differences highlight the varying priorities of the two groups. In particular, the local residents placed greater priority on the more social elements of the high street (e.g. community and political space, civic venues, crime and security) compared to the professionals. The professionals, on the other hand, appeared to focus greater priority on the economic functions of the high street (e.g. retail, entertainment, complementary daytime, evening and night-time economies) compared to the residents. These differences appear to reflect the misalignment - identified by the literature - between consumer preference/trends and the priorities of policy makers/professionals when it comes to the measurement of high street performance. Such differences highlight the importance of identifying the needs and expectations of local people, and the importance of incorporating this data into high street assessment tools.

The further statistically significant differences between different resident groups (e.g. 'town' groups and 'gender' groups) highlight the influence that demographic factors can have on high street needs and expectations. These differences emphasise the importance of understanding the local consumer base; understanding what local people need and expect from their local high street; and understanding that the needs and expectations of one consumer base is unlikely to be the same as another. Therefore the development of an assessment tool that is adaptable to different high streets and different situations would enable decision makers to obtain a clearer understanding of how a high street is addressing local needs and expectations.

The criteria importance scores obtained from the respondents of both the professionals' and residents' surveys informed the relative weightings assigned to the sub-criteria. This enabled the views of both professionals and local residents to be built into the model. By incorporating the needs and expectations of both professionals and local people, the decision maker can obtain a more balanced and representative view of how well a centre is performing in a variety of economic, environmental and social areas.

Chapter 7: Model development

7.1. Introduction

This chapter presents the steps taken to collect the data required for the development of the high street sustainability model. The steps are as follows:

1. Identify means of assessing sub-criteria
2. Establish sub-criteria weights
3. Select alternatives (high streets) for comparison
4. Calculate values for each sub-criterion with reference to each alternative
5. Apply and compare MCDM methods
6. Select final model.

7.2. Methods of assessing the sub-criteria

7.2.1. Resident agreement

In order for the MCDM methods to assess each alternative against the weighted sub-criteria, measurement tools needed to be identified. It was decided that the values for 39 of the 42 sub-criteria should be derived from the opinions of local residents. Therefore it was necessary to develop a scale with which each alternative could be assessed in terms of each sub-criterion. It was decided that the local residents would be presented with a statement regarding each sub-criterion and they would be asked to provide a score from 1-5 indicating their level of agreement to each statement. The agreement scale was as follows:

1. Strongly disagree
2. Slightly disagree
3. Neither agree or disagree
4. Slightly agree
5. Strongly agree

For the purposes of the MCDM methods the responses given for ‘neither agree or disagree’ were removed from the calculations as the methods require a progressive scale in order to work effectively. However, it should be noted that the presence of the ‘neither agree or disagree’ option in the scale was deemed to be important as it enabled participants who did not have an opinion to indicate so. It is therefore anticipated that the scores for the remaining

options are a true reflection of local opinion. The following scale was therefore developed for the application of the MCDM methods:

Level of agreement	Score (+ve)
Strongly disagree	1
Slightly disagree	2
Slightly agree	3
Strongly agree	4

7.2.2. Measuring 'work places' (sub-criterion 4c)

In addition to a measure based upon the agreement scores given by local residents to a statement regarding employment opportunities in their local towns, the researcher also obtained the most recent available employee figures for each high street from CoStar. Whilst ONS provide census data relating to employment, their figures indicate the employment statuses of household members, rather than indicating where that employment is geographically located. The researcher sought to obtain figures to indicate levels of employment within each of the high street case studies. Data available from CoStar provides figures for the total number of employees within a 1-10 mile radius of a set point. This feature enabled the researcher to select a central point within each high street to obtain a figure for the total number of employees within a 1 mile radius of that point. The data available from CoStar is updated on an ongoing basis; therefore the data obtained by the researcher was the most recently available on the day that it was accessed by the researcher (19th October 2017). In order to ensure that figures could be normalised on an interval scale of 0-1, the following calculation was used to determine the number of employees per km^2 of high street:

$$No.\,of\ employees\ per\ km^2 = \frac{No.\,of\ employees\ within\ 1\ mile\ radius}{\frac{\pi r^2}{0.386102}}$$

The values for each town centre are therefore presented as the number of employees per km^2 of high street. This measure has a positive influence, i.e. the higher the number, the better for high street sustainability.

7.2.3. Measuring 'residential' (sub-criterion 4e)

In addition to obtaining a measure of agreement from local residents regarding the residential real estate present within their local high streets, the researcher also sought to obtain an official measure of how many residential households were currently residing within each high street. The most recent census data (2011) – available from the Office for National Statistics (ONS) – provides a number of measures relating to household and residential dwelling figures for selected areas. It was decided that the figure for 'all categories: household spaces' would be most appropriate as it takes into consideration multiple separate households present within what may be measured as just 1 dwelling. This figure was considered to be more representative of the number of separate residential units in a high street, compared to the figure for the number of dwellings. The researcher obtained figures from the ONS output areas which best covered the total area of each high street (see appendix 5). In order to ensure comparability across the eight case study areas, the researcher calculated the average number of households per km^2 of high street. This measure has a positive influence, i.e. the higher the number, the better for high street sustainability.

7.2.4. Measuring 'actual crime' (sub-criterion 6a)

For the sub-criterion 'actual crime' the researcher obtained official crime data from police.uk. The website allows the user to select a bespoke area in which to investigate crime figures, and therefore enabled the researcher to select the specific areas covered by each high street. The crime statistics obtained from police.uk were figures recorded between September 2016 and August 2017; these were the most recent annual statistics available on the date that the researcher obtained the data. The data available is a total count of the crimes that have occurred in the selected area during the selected time frame. The types of crimes recorded include anti-social behaviour, bicycle theft, drug and violence and sexual offences etc. To ensure comparability between the eight high streets, the value is presented as the number of criminal incidents per km^2 of high street. This measure has a negative influence, i.e. the higher the number, the worse for high streets sustainability.

7.2.5. Measuring 'partnership/stakeholder involvement' (sub-criterion 7b)

In addition to obtaining a value from local residents with regard to their opinion of partnership/stakeholder involvement in their local high streets, the researcher also sought to obtain a further measurement to acknowledge any active initiatives promoting and facilitating partnership/stakeholder involvement in the high streets. With reference to high

streets and town centres, there are two types of nationally recognised initiatives that actively promote increased participation in the development of high streets; those initiatives are neighbourhood plans and Business Improvement Districts. Introduced by the Localism Act (2011), neighbourhood planning provides local people with the opportunity to actively engage in the development of their local area. Community members can come together through a neighbourhood forum or parish council to develop a neighbourhood plan or order for their area. These plans enable communities to have their say on where they would like to see new housing and businesses, and what they would like them to look like (DCLG, 2011). A further part of neighbourhood planning is the community right to build which enables communities to bring forward development proposals for developments they want to see in their area. Types of development may include new housing, shops, businesses, meeting halls or playgrounds (ibid). Whilst the formulation of a neighbourhood plan is undertaken by a neighbourhood forum or parish council, before such a plan can be adopted – and subject to the plan adhering to national planning policy, the local authority's strategic vision for the area, and other legal requirements - a local referendum must be held to allow local people to vote on whether they want to see the plan adopted or not (ibid). Neighbourhood planning therefore provides local residents with an opportunity to actively engage in the planning and development of their local areas and many local plans have been set up covering high streets and town centres. Furthermore, the Neighbourhood Planning Act (2017) stipulates that local authorities must notify parish councils and neighbourhood forums of any relevant planning application and any subsequent alterations to that application, therefore keeping the group informed of all development in the specified area (TSO, 2017). The researcher therefore considered that the presence of – or preparation of - a neighbourhood plan covering the case study high streets would display active engagement from local community members and therefore it should form part of the measurement for partnership/stakeholder involvement.

Business Improvement Districts (BIDs) are mechanisms for promoting partnerships and engagement from the private sector (a background of BIDs is presented in section 4.8). They are business-led and business funded initiatives involving businesses located within a specified commercial area. Participants of a BID pay a levy (a small percentage of a businesses' rateable value) and the total money raised from this levy is only to be spent within the BID area (British BIDs, 2017). BIDs will develop a proposal or business plan to identify key priorities for improving the specified area and its commercial services. The proposal/plan will also outline how the BID will be managed and operated (ibid). The

presence of a BID demonstrates the active engagement of local businesses in the running of a commercial area, and with many BIDs operating in high street and town centre locations, the researcher deemed it appropriate to consider the presence of a BID as indicative of business engagement in the case study high streets. Based on the reasons outlined above, the following scale was developed as a measure for partnership/stakeholder involvement:

Partnership/involvement initiatives	**Score (+ve)**
No initiatives	1
Business Improvement District **or** neighbourhood plan in operation	2
Business Improvement District **and** neighbourhood plan in operation	3

This measure has a positive influence, i.e. the higher the score, the better for high street sustainability.

7.2.6. Measuring 'environmental initiatives/carbon reduction schemes' (sub-criterion 8a)

In addition to obtaining the opinions of local residents with regard to the criterion 'environmental initiatives/carbon reduction schemes', two further measures were also developed. Whilst the researcher felt it important to obtain data regarding resident opinions, the researcher also acknowledged that there may be residents who are unaware of such initiatives. Therefore secondary data was also obtained to measure the prevalence of environmental groups/initiatives in each town and to measure the prevalence of BREAAM certified buildings within each high street.

Part 1

In order to establish the prevalence of environmental groups/initiatives in each town, firstly a search was conducted on TransitionNetwork.org. The Transition movement is an international movement that first emerged in 2005 (Transition Network, 2016a). Whilst the transition movement extends beyond environmental concerns to address social and economic issues, key principles of the movement concern carbon reduction, reducing reliance on fossil fuels and making wise use of depleting natural resources (ibid). Transition initiatives can now be found in over 50 countries and many of those registered with the

movement are towns. By registering with the movement towns pledge a commitment to work towards implementing and achieving the guiding principles of the movement. The Transition Network website provides a facility to search for participating locations; this tool enabled the researcher to identify whether any of the case study high streets were registered as 'Transition Towns'. Given the global nature of the Transition Movement, the fact that it is recognised as an established, international sustainable initiative, and taking into consideration the amount of quality support and guidance available to its participants, it was considered that registration with the initiative would warrant the highest score in terms of measuring the prevalence of environmental groups/initiatives. However it was also important to acknowledge smaller scale groups and initiatives that may be in operation. Therefore the following scale was developed:

Environmental groups/initiatives	**Score (+ve)**
No groups/initiatives	1
Local groups/initiatives are active in the town	2
Town is registered with the Transition Movement	3

This measure has a positive influence, i.e. the higher the score, the better for high street sustainability.

Part 2

The researcher also considered it appropriate to acknowledge the growing aspiration among commercial developers, architects and building owners to achieve BREEAM recognition through the attainment of BREEAM certificates. Data regarding BREEAM certified buildings is available from CoStar. CoStar enables the user to select a bespoke geographical area from which to draw data. One of the numerous datasets available through CoStar is the BREEAM rating of buildings. There are a number of BREEAM assessments available which enable a variety of developments to be examined in terms of set criteria. There are five categories of technical standards that are used to assess varying types of development, these are: communities (masterplanning), infrastructure (civil engineering and public realm), new construction (homes and commercial buildings), in-use (commercial buildings and refurbishment and fit-out (homes and commercial buildings) (BREEAM, 2017). These technical standards assess developments against criteria such as energy, water, transport,

pollution, materials, waste and innovation (amongst others). Having been assessed against the criteria, a development/building receives a final score that determines which of the following ratings it is awarded with: outstanding, excellent, very good, good, pass, unclassified. Whilst the number of developments/buildings acquiring BREEAM certification is rising, they remain in the minority in many UK urban areas, therefore when developing a scale with which to measure certified buildings present in the case study high streets, it was decided that the total number of certified buildings would be measured (i.e. pass or above), rather than the specific rating that they achieved. Therefore the following scale was developed:

BREEAM certified buildings per km^2	**Score (+ve)**
0-1	1
2-3	2
4-5	3
6-7	4
8+	5

This measure has a positive influence, i.e. the higher the score, the better for high streets sustainability.

7.2.7. Measuring 'environmentally sustainable materials' (sub-criterion 8b)

In order to measure the criterion 'environmentally sustainable materials' the researcher sought to obtain data relating to materials used in the construction of the buildings and public realm in the case study high streets. However, whilst modern developments are increasingly forthcoming with information regarding chosen materials - including their sourcing, extraction and life-cycles - for older developments this information is simply not available. The most relevant mechanism which takes into account the sustainability of materials used in the construction and retrofit of buildings and public realm is the BREEAM assessment. However BREEAM assessments also take other criteria into consideration, and therefore the awarding of a BREEAM certificate is not a suitable measure with which to compare simply the environmental sustainability of a building's materials. Further, as the presence of BREEAM certified buildings – which includes the assessment of materials - is accounted for in the measure of environmental initiatives/carbon reduction schemes, it was considered

that there was no requirement – and a lack of appropriate data - to develop a separate measure for environmentally sustainable materials. Therefore the criterion was henceforth removed from the development of the model.

7.2.8. Measuring 'commercial rent' (sub-criterion 9a)

The researcher acknowledged that lower rental values were beneficial for achieving a diverse retail and service offering and helping to prevent the further development of 'clone towns', however it was considered important that the interests of the landlord were also recognised. Therefore two measures were developed to measure the criterion 'commercial rent': the first takes into account the occupier's interests and measures average rent per m^2 (a higher value being negative), and the second takes into account the landlord's interests and measures the net investment yield (a higher value being negative).

Part 1

The measure for average commercial rental values was derived from data available from CoStar. Again the researcher was able to select bespoke geographical areas covering the case study high streets in order to obtain an average rental value for the centres as a whole. CoStar enables the user to obtain average asking rents at either annual or quarterly points during the last 10 years, or alternatively the user is able to obtain a 5-year average of the average asking rents for the specified area. It was decided that the 5-year average figure would provide a more representative picture of commercial rents, as this figure is less likely to be influenced by short term factors.

CoStar presents its rentable values in square feet, however the researcher sought a measurement in square metres. Therefore the average rental values obtained from CoStar were converted to reflect the average value of a square metre in each high street. This measure has a negative influence, i.e. the higher the number, the worse for high street sustainability.

Part 2

Net investment yield represents the landlord's return on investment and is calculated as follows:

$$\frac{\text{Net rent}}{\text{Property value}} \text{ X } 100$$

Net investment yield is closely associated with investment risk, with a higher net investment yield indicating a greater investment risk, and vice versa. Like the average asking rent data, CoStar provides a 5-year average value. Again this was considered to be more representative than a value for an individual snapshot in time and therefore the 5-year average was used for this measure. The net investment yield is measured as a percentage and has a negative influence, i.e. the higher the percentage, the worse for high street sustainability.

7.2.9. Measuring 'business rates' (sub-criterion 9b)

Business rate tax is calculated as a proportion of the rateable value of non-domestic properties. The rateable value of properties has tended to be reviewed every 5 years, however the 2017 autumn budget has reduced that time period to every 3 years going forward. The rateable value is the property's open market rental value on the date that the review of valuations takes place. The researcher tried to obtain data to indicate the average current rateable values for each case study high street from the Valuation Office Agency, however was unable to acquire data for the bespoke geographical areas that the high streets cover. Therefore, it was decided that the CoStar 5-year average asking rents used in the measure of the 'commercial rent' criterion would also be used as a measure with which to compare the case study high streets in terms of their business rates; with a higher average rental value indicating higher business rates. This measure has a negative influence, i.e. the higher the number, the worse for high street sustainability.

7.3. Alternatives selected for comparison

For this study a number of selected high streets represent the alternatives for comparison. The alternatives (high streets) are compared against one another with reference to the weighted criteria to determine their relative sustainability. Real high streets were selected in order to demonstrate the practical application of the model. Section 5.17.2 provides further information on why each high street was selected. In total eight high streets were selected for comparison, these are:

A_1 Basingstoke
A_2 Birkenhead
A_3 Corby
A_4 Gosport
A_5 Great Yarmouth
A_6 Rotherham
A_7 Shrewsbury
A_8 Southport

Figure 8 (section 5.17.2) illustrates the geographic spread of the high streets across England.

7.4. Calculating the sub-criteria values for each alternative

The scales developed to determine values for each alternative with reference to each criterion are presented in section 7.2. This section presents how the data obtained was translated into values using the aforementioned scales.

7.4.1. Resident opinions

For some of the sub-criteria appropriate secondary data was available that could provide measurements. However, for the majority of the sub-criteria the researcher sought the opinions of residents living within the case study towns. Therefore it was necessary to develop a measurement tool that could be incorporated into the online survey. Table 21 presents the selected method of assessment for each sub-criterion. The table indicates whether the sub-criteria have a positive (+) influence or a negative (-) influence. For positive sub-criteria, a higher score is better for high street sustainability. For negative sub-criteria, a lower score is better for high street sustainability.

Table 21. Sub-criterion assessment methods

Sub-criteria	**Assessment method**	+/-
Streets	Residents' agreement with assessment statement	+
Signage	Residents' agreement with assessment statement	-
Buildings	Residents' agreement with assessment statement	+
Trees and landscape	Residents' agreement with assessment statement	+
Public open space	Residents' agreement with assessment statement	+
Infrastructure	Residents' agreement with assessment statement	+
Design	Residents' agreement with assessment statement	+
Pedestrian pavements/walkways	Residents' agreement with assessment statement	+
Cycling facilities	Residents' agreement with assessment statement	+
Public transport	Residents' agreement with assessment statement	+
Parking facilities	Residents' agreement with assessment statement	+
Goods/service vehicles	Residents' agreement with assessment statement	-
Traffic management	Residents' agreement with assessment statement	+
Social space	Residents' agreement with assessment statement	+
Economic space	Residents' agreement with assessment statement	+
Political space	Residents' agreement with assessment statement	+
Cultural space	Residents' agreement with assessment statement	+
Community space	Residents' agreement with assessment statement	+
Retail	Residents' agreement with assessment statement	+
Entertainment	Residents' agreement with assessment statement	+
Work places	Part 1 – Average number of employees per km^2 of high street. Part 2 - Residents' agreement with assessment statement	+
Civic venues	Residents' agreement with assessment statement	+
Residential	Part 1 – Average number of residential household spaces per km^2 of high street Part 2 - Residents' agreement with assessment statement	+
Health and social facilities	Residents' agreement with assessment statement	+
Identity/image	Residents' agreement with assessment statement	+
Experience	Residents' agreement with assessment statement	+
Atmosphere	Residents' agreement with assessment statement	+
Actual crime	Average number of crimes reported between September 2016 and August 2017 per km^2 of high street.	-
Perceived crime	Residents' agreement with assessment statement	-

CCTV and security presence	Residents' agreement with assessment statement	+
Street lighting	Residents' agreement with assessment statement	+
Town centre management team	Residents' agreement with assessment statement	+
Partnership/stakeholder involvement	Part 1 – Presence of Business Improvement District and/or neighbourhood plan Part 2 - Residents' agreement with assessment statement	+
Marketing	Residents' agreement with assessment statement	+
Digital connectivity/internet presence	Residents' agreement with assessment statement	+
Environmental initiatives/carbon reduction schemes	Part 1 – Average number of BREEAM certified buildings per km^2 of high street Part 2 – Presence of active environmental initiatives Part 3 - Residents' agreement with assessment statement	+
Environmentally sustainable materials	Removed from model (see section 7.2.7.)	
Waste management and recycling schemes	Residents' agreement with assessment statement	+
Commercial rent	Part 1 – 5-year average asking rent per m^2 Part 2 – 5-year average net investment yield (%)	-
Business rates	Average rent per square metre	-
Trading hours	Residents' agreement with assessment statement	+
Complementary daytime, evening and night-time economies	Residents' agreement with assessment statement	+

7.4.2. Tool for measuring resident opinions

For the sub-criteria that required the residents' opinions as a means of assessment, residents from each town were asked to indicate their level of agreement with a range of statements. Residents were asked to select one of the following options to indicate their level of agreement:

1. Strongly disagree
2. Slightly disagree
3. Neither agree or disagree
4. Slightly agree
5. Strongly agree

As discussed in section 7.2.1., the 'neither agree or disagree' responses were removed prior to the application of the MCDM methods

Table 22 presents the sub-criteria assessment statements that residents were asked to indicate their level of agreement with. Table 23 presents the sub-criteria values for each alternative that were derived from the residents' responses.

Table 22. Sub-criteria assessment statements

Sub-criterion	Statement assessed by participants
Streets	The main streets within my local town centre have a logical layout which is easy to navigate
Signage	There is an unnecessary amount of signage in my local town centre that detracts from the centre's visual appearance
Buildings	The buildings situated within my local town centre contribute positively to its appearance
Trees and landscape	The trees and landscaping within my local town centre contribute positively to its appearance
Public open space	The public open spaces (e.g. parks, squares etc.) within my local town centre are attractive and maintained to a high standard
Infrastructure	The infrastructure (e.g. street furniture, telephone boxes, bus shelters etc.) within my local town centre contributes positively to its appearance
Design	My local town centre has an attractive design
Pedestrian pavement/ walkways	My local town centre has quality pavements and walkways which provide accessibility for all pedestrians
Cycling facilities	My local town centre has sufficient quality cycling facilities (e.g. bike racks, cycle lanes etc.)
Public transport	My local town centre is easily accessible by quality public transportation (e.g. bus, train, tram etc.)
Parking facilities	My local town centre has sufficient quality car parking facilities (e.g. secure, well maintained parking)
Goods/service vehicles	The visitor experience is negatively affected by goods/service vehicles (e.g. loading/unloading lorries and vans)
Traffic management	There are effective traffic management approaches present within my local town centre (e.g. speed bumps, speed cameras, one-way systems etc.)
Social space	The social spaces (e.g. parks, cafés, restaurants etc.) encourage me to spend time socialising in my local town centre
Economic space	The economic spaces (e.g. shops, businesses etc.) encourage me to spend money in my local town centre
Political space	The political spaces (e.g. town hall, outdoor podiums/platforms etc.) encourage me to actively engage in politics
Cultural space	The cultural spaces (e.g. museums, galleries, theatres etc.) encourage me to spend my leisure time in the town centre

Community space	The community spaces (e.g. community centres, leisure clubs etc.) encourage me to engage with the local community in the town centre
Retail	The selection of retail on offer in my local town centre meets my shopping needs
Entertainment	The selection of entertainment on offer in my local town centre meets my leisure needs
Work places	There are sufficient employment opportunities in my local town centre
Civic venues	The selection of civic venues (e.g. libraries, citizen advice bureau etc.) present within the town centre is sufficient to meet my needs
Residential	The selection of residential accommodation within the town centre is sufficient to meet the needs of the local population
Health and social facilities	The health and social facilities (e.g. GP practices, walk-in centres, opticians etc.) in my local town centre sufficiently meet my needs
Identity/image	My local town centre has a positive identity/image
Experience	My local town centre gives a positive visitor experience
Atmosphere	My local town centre has a positive atmosphere
Perceived crime	I perceive there to be high levels of criminal activity in my local town centre
CCTV and security presence	There is a sufficient amount of CCTV cameras and security presence within my local town centre to make me feel safe
Street lighting	The street lighting within my local town centre positively contributes to a feeling of safety in the evening and night-time
Town centre management team	My local town centre is effectively managed in a coordinated manner
Partnership/ stakeholder involvement	Partnership and stakeholder involvement (e.g. public-private sector partnership, Business Improvement Districts, community involvement) contribute positively to the day-to-day running and future development of my local town centre
Marketing	My local town centre is effectively marketed/branded
Digital connectivity/ internet presence	My local town centre has embraced the digital age (e.g. town centre website, 4G connectivity in the centre, WIFI hotspots etc.)
Environmental initiatives/ carbon reduction schemes	There are effective environmental initiatives/carbon reduction schemes in place within my local town centre
Waste management and recycling schemes	Effective waste management (inc. recycling) schemes are in place in the town centre
Trading hours	The current trading hours of the shops and services in my local town centre meet my needs
Complementary daytime, evening and night-time economies	My local town centre comprises complementary daytime, evening and night-time economies (e.g. reducing the potential for lull periods between daytime and evening)

Table 23. Sub-criteria values for each alternative based on resident responses

Sub-criterion		Residents' agreement with statement (score)								+/-
		A1	A2	A3	A4	A5	A6	A7	A8	
1a	Streets	3.14	2.77	3.56	3.42	2.86	3.07	2.64	2.96	+
1b	Signage	1.87	2.32	2.13	2.00	1.80	1.95	1.85	2.23	-
1c	Buildings	2.59	1.59	3.00	1.96	2.54	2.64	3.71	3.28	+
1d	Trees and landscape	3.13	1.93	3.00	2.68	2.62	2.64	3.62	3.58	+
1e	Public open space	3.42	2.20	3.20	2.78	2.48	2.96	3.74	2.76	+
1f	Infrastructure	2.68	2.07	2.44	2.32	2.32	2.29	2.97	2.60	+
1g	Design	2.59	1.44	2.78	1.87	2.16	2.26	3.41	3.04	+
2a	Pedestrian pavement/ walkways	3.26	2.59	3.22	2.97	2.64	2.88	2.92	3.14	+
2b	Cycling facilities	2.40	1.57	2.33	2.63	1.91	1.64	2.35	2.95	+
2c	Public transport	3.41	3.42	3.10	3.10	2.76	3.10	3.05	3.26	+
2d	Parking facilities	3.53	3.03	3.10	2.83	2.61	2.11	2.98	2.11	+
2e	Goods/service vehicles	1.54	2.19	1.60	2.25	2.05	2.05	2.64	2.05	-
2f	Traffic management	2.83	2.60	3.25	2.75	2.75	2.67	2.80	2.59	+
3a	Social space	2.82	1.68	2.44	2.19	1.82	1.88	3.58	2.86	+
3b	Economic space	3.17	1.68	2.60	1.52	1.92	1.79	3.24	2.57	+
3c	Political space	1.76	1.52	1.75	1.35	1.45	1.43	1.50	1.55	+
3d	Cultural space	2.57	1.76	2.13	1.92	2.00	1.70	3.17	2.57	+
3e	Community space	2.31	1.36	1.88	1.68	1.71	1.54	2.60	1.82	+
4a	Retail	2.88	1.66	2.27	1.48	1.50	1.40	2.94	2.43	+
4b	Entertainment	3.22	1.57	2.75	1.38	1.74	1.21	3.25	2.73	+
4d	Civic venues	3.47	2.04	3.14	3.00	2.32	2.17	3.25	2.68	+
4f	Health and social facilities	2.72	2.48	2.67	2.36	2.22	2.72	3.00	2.76	+
5a	Identity/image	2.56	1.46	2.50	1.57	1.48	1.23	3.60	2.73	+
5b	Experience	3.15	1.46	2.67	1.79	1.86	1.59	3.56	2.65	+
5c	Atmosphere	3.06	1.47	2.60	1.69	1.71	1.44	3.62	2.60	+
6b	Perceived crime	1.94	3.21	1.88	2.50	2.71	3.09	1.40	2.32	-
6c	CCTV and security presence	3.29	2.73	2.86	2.63	2.45	2.13	3.29	2.67	+
6d	Street lighting	3.20	2.45	2.78	2.61	2.40	2.16	3.13	2.96	+
7a	Town centre management team	3.39	2.13	2.89	2.08	1.89	2.00	2.97	2.00	+
7c	Marketing	2.82	1.77	3.25	1.71	1.77	1.55	2.90	2.17	+
7c	Digital connectivity/ internet presence	2.73	2.00	2.25	1.72	1.91	1.53	2.64	2.14	+
8c	Waste management and recycling schemes	3.00	2.61	2.80	2.71	2.29	1.59	2.60	2.23	+
9c	Trading hours	3.53	2.93	3.27	2.79	2.50	2.31	3.26	3.12	+

9d	Complementary daytime, evening and night-time economies	3.18	1.95	3.11	1.77	1.78	1.74	2.90	2.61	+

7.4.3. Sub-criteria values for 'work places' (sub-criterion 4c)

Table 24. Sub-criteria values for 'work places' for each alternative

Town centre	Part 1	Part 2
	Average number of employees per km^2 of high street	Residents' agreement with statement
A1 (Basingstoke)	2910.52	3.32
A2 (Birkenhead)	2302.04	1.57
A3 (Corby)	989.22	3.00
A4 (Gosport)	1365.67	1.45
A5 (Great Yarmouth)	1781.93	1.32
A6 (Rotherham)	1834.41	1.50
A7 (Shrewsbury)	1710.89	2.52
A8 (Southport)	2324.16	1.79

7.4.4. Sub-criteria values for ‘residential’ (sub-criterion 4e)

Table 25. Sub-criteria values for ‘residential’ for each alternative

Town centre	Part 1	Part 2
	Average number of households per km^2 of high street	Residents’ agreement with statement
A1 (Basingstoke)	830.17	2.54
A2 (Birkenhead)	1531.99	2.16
A3 (Corby)	280.78	2.50
A4 (Gosport)	2502.05	2.31
A5 (Great Yarmouth)	3514.03	2.10
A6 (Rotherham)	390.50	2.06
A7 (Shrewsbury)	1599.67	2.74
A8 (Southport)	3448.10	2.22

7.4.5. Sub-criteria values for ‘actual crime’ (sub-criterion 6a)

Table 26. Number of criminal incidents that occurred within each high street that were recorded between September 2016 and August 2017 per m2

Town centre	Average number of criminal incidents recorded between September 2016 and August 2017 per km^2 of high street
A1 (Basingstoke)	4380.00
A2 (Birkenhead)	5924.00
A3 (Corby)	5217.65
A4 (Gosport)	4869.23
A5 (Great Yarmouth)	6075.00
A6 (Rotherham)	7533.33
A7 (Shrewsbury)	4534.62
A8 (Southport)	3873.08

7.4.6. Sub-criteria values for 'partnership/stakeholder involvement' (sub-criterion 7b)

Table 27. Sub-criteria values for 'partnership/stakeholder involvement' for each alternative

Town centre	Part 1		Part 2
	Business Improvement District (BID) and/or neighbourhood plan (NP)	**Score (+ve)**	**Residents' agreement with statement**
A1 (Basingstoke)	BID	2.00	3.09
A2 (Birkenhead)	BID	2.00	2.27
A3 (Corby)	NP	2.00	3.00
A4 (Gosport)	No BID or NP	1.00	1.73
A5 (Great Yarmouth)	BID	2.00	2.06
A6 (Rotherham)	No BID or NP	1.00	2.14
A7 (Shrewsbury)	BID	2.00	2.92
A8 (Southport)	BID	2.00	2.38

7.4.7. Sub-criteria values for 'environmental initiative/carbon reduction schemes' (sub-criterion 8a)

Table 28. Sub-criteria values for 'environmental initiative/carbon reduction schemes' for each alternative

Town centre	Part 1		Part 2		Part 3
	Environmental initiatives/transition town	**Score (+ve)**	**Average number of BREEAM certified buildings per km^2 of high street**	**Score (+ve)**	**Residents' agreement with statement**
A1 (Basingstoke)	Transition town	3	0	1	2.30
A2 (Birkenhead)	No initiatives	1	0	1	2.14
A3 (Corby)	Initiative(s) are active	2	0	1	3.00
A4 (Gosport)	No initiatives	1	0	1	1.71
A5 (Great Yarmouth)	No initiatives	1	0	1	1.89
A6 (Rotherham)	No initiatives	1	0	1	1.62
A7 (Shrewsbury)	Transition town	3	0	1	1.93
A8 (Southport)	No initiatives	1	0	1	1.92

7.4.8. Sub-criteria values for 'commercial rent' (sub-criterion 9a)

Table 29. Sub-criteria values for 'commercial rent' for each alternative

Town centre	Part 1	Part 2
	5-year average asking rent per m^2	5-year average net investment yield (%)
A1 (Basingstoke)	267.48	8.50
A2 (Birkenhead)	211.94	9.80
A3 (Corby)	151.02	7.50
A4 (Gosport)	150.05	8.70
A5 (Great Yarmouth)	144.67	12.80
A6 (Rotherham)	164.47	11.40
A7 (Shrewsbury)	182.13	7.50
A8 (Southport)	178.36	10.10

7.4.9. Sub-criteria values for 'business rates' (sub-criterion 9b)

Table 30. 5-year average asking rent per m^2 of high street for each alternative

Town centre	5-year average asking rent per m^2
A1 (Basingstoke)	267.48
A2 (Birkenhead)	211.94
A3 (Corby)	151.02
A4 (Gosport)	150.05
A5 (Great Yarmouth)	144.67
A6 (Rotherham)	164.47
A7 (Shrewsbury)	182.13
A8 (Southport)	178.36

7.5. Establishing sub-criteria weights

Sub-criteria weights needed to be established to reflect the relative importance of the sub-criteria. In order to determine the weights, the mean importance scores given by all participants – both the professionals and residents combined – were divided by the total sum of the mean scores; this meant that the sum of all weights would add up to 1. Table 31 presents the mean score of each sub-criterion and its relative weight. For the reasons stated in section 7.2.7, the criterion 'environmentally sustainable materials' was removed from the assessment and therefore its score did not contribute to the calculation of sub-criteria weights. It should also be noted that weights for sub-criteria which comprised more than one measurement value were split accordingly (e.g. sub-criteria with two measurement values had their weights halved and the sub-criterion with three measurement values had its weight split into thirds to evenly balance the relative importance across the three values).

Table 31. Sub-criteria weights

Sub-criteria	**Mean**	**Weights**
Streets	3.94	0.024289
Signage	3.77	0.023212
Buildings	4.19	0.025851
Trees and landscape	4.03	0.024809
Public open space	4.23	0.026042
Infrastructure	3.88	0.023889
Design	4.13	0.025469
Pedestrian pavement/walkways	4.41	0.027205
Cycling facilities	3.31	0.020417
Public transport	4.35	0.026823
Parking facilities	4.30	0.026528
Goods/ service vehicles	3.76	0.023177
Traffic management	3.56	0.021962
Social space	4.31	0.026546
Economic space	4.31	0.026563
Political space	3.01	0.018559
Cultural space	3.91	0.024098
Community space	3.99	0.024601
Retail	4.52	0.027865
Entertainment	4.20	0.025886
Work places (part 1)	3.85	0.011867
Work places (part 2)		0.011867
Civic venues	3.90	0.024028
Residential (part 1)	3.28	0.010113

Residential (part 2)		0.010113
Health and social facilities	3.52	0.021702
Identity/image	4.13	0.025469
Experience	4.17	0.025730
Atmosphere	4.38	0.027014
Actual crime	4.17	0.025712
Perceived crime	4.32	0.026598
CCTV and security presence	3.83	0.023577
Street lighting	4.28	0.026355
Town centre management team	3.83	0.023629
Partnership/stakeholder involvement (part 1)	3.91	0.012040
Partnership/stakeholder involvement (part 2)		0.012040
Marketing	3.46	0.021337
Digital connectivity/internet presence	3.69	0.022761
Environmental initiatives/carbon reduction schemes (part 1)	3.36	0.006898
Environmental initiatives/carbon reduction schemes (part 2)		0.006898
Environmental initiatives/carbon reduction schemes (part 3)		0.006898
Waste management and recycling schemes	3.93	0.024219
Commercial rent (part 1)	4.20	0.012934
Commercial rent (part 2)		0.012934
Business rates	4.14	0.025487
Trading hours	3.97	0.024462
Complementary daytime, evening and night-time economies	3.82	0.023525
$\sum$ =	162.2507	1

7.6. Creating the decision making matrix

Once the sub-criteria values had been obtained, the next step was to construct the initial decision making matrix (table 32). The matrix presents all of the data required for the MCDM calculations, including criteria weights and criteria values with reference to each alternative. The matrix follows the format of a typical decision matrix as presented by Triantaphyllou (2000):

Alternative	W_1	W_2	W_2	...	W_n
A_1	a_{11}	a_{12}	a_{13}	...	a_{1n}
A_2	a_{21}	a_{22}	a_{23}	...	a_{2n}
A_3	a_{31}	a_{32}	a_{33}	...	a_{3n}
⋮	⋮	⋮	⋮	⋮	⋮
A_m	a_{m1}	a_{m2}	a_{m3}	...	a_{mn}

Table 32. Initial decision matrix for MCDM

Sub-criteria		**Weight**	**+/-**	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	0.0243	+	3.14	2.77	3.56	3.42	2.86	3.07	2.64	2.96
1b	Signage	0.0232	-	1.87	2.32	2.13	2.00	1.80	1.95	1.85	2.23
1c	Buildings	0.0259	+	2.59	1.59	3.00	1.96	2.54	2.64	3.71	3.28
1d	Trees and landscape	0.0248	+	3.13	1.93	3.00	2.68	2.62	2.64	3.62	3.58
1e	Public open space	0.0260	+	3.42	2.20	3.20	2.78	2.48	2.96	3.74	2.76
1f	Infrastructure	0.0239	+	2.68	2.07	2.44	2.32	2.32	2.29	2.97	2.60
1g	Design	0.0255	+	2.59	1.44	2.78	1.87	2.16	2.26	3.41	3.04
2a	Pedestrian pvmt./walkways	0.0272	+	3.26	2.59	3.22	2.97	2.64	2.88	2.92	3.14
2b	Cycling facilities	0.0204	+	2.40	1.57	2.33	2.63	1.91	1.64	2.35	2.95
2c	Public transport	0.0268	+	3.41	3.42	3.10	3.10	2.76	3.10	3.05	3.26
2d	Parking facilities	0.0265	+	3.53	3.03	3.10	2.83	2.61	2.11	2.98	2.11
2e	Goods/service vehicles	0.0232	-	1.54	2.19	1.60	2.25	2.05	2.05	2.64	2.05
2f	Traffic management	0.0220	+	2.83	2.60	3.25	2.75	2.75	2.67	2.80	2.59
3a	Social space	0.0265	+	2.82	1.68	2.44	2.19	1.82	1.88	3.58	2.86
3b	Economic space	0.0266	+	3.17	1.68	2.60	1.52	1.92	1.79	3.24	2.57
3c	Political space	0.0186	+	1.76	1.52	1.75	1.35	1.45	1.43	1.50	1.55
3d	Cultural space	0.0241	+	2.57	1.76	2.13	1.92	2.00	1.70	3.17	2.57
3e	Community space	0.0246	+	2.31	1.36	1.88	1.68	1.71	1.54	2.60	1.82
4a	Retail	0.0279	+	2.88	1.66	2.27	1.48	1.50	1.40	2.94	2.43
4b	Entertainment	0.0259	+	3.22	1.57	2.75	1.38	1.74	1.21	3.25	2.73
4c	Work places (Part 1)	0.0119	+	2910.52	2302.04	989.22	1365.67	1781.93	1834.41	1710.89	2324.16
	Work places (Part 2)	0.0119	+	3.32	1.57	3.00	1.45	1.32	1.50	2.52	1.79
4d	Civic venues	0.0240	+	3.47	2.04	3.14	3.00	2.32	2.17	3.25	2.68
4e	Residential (Part 1)	0.0101	+	830.17	1531.99	280.78	2502.05	3514.03	390.50	1599.67	3448.10
	Residential (Part 2)	0.0101	+	2.54	2.16	2.50	2.31	2.10	2.06	2.74	2.22

4f	Health and social facilities	0.0217	+	2.72	2.48	2.67	2.36	2.22	2.72	3.00	2.76
5a	Identity/image	0.0255	+	2.56	1.46	2.50	1.57	1.48	1.23	3.60	2.73
5b	Experience	0.0257	+	3.15	1.46	2.67	1.79	1.86	1.59	3.56	2.65
5c	Atmosphere	0.0270	+	3.06	1.47	2.60	1.69	1.71	1.44	3.62	2.60
6a	Actual crime	0.0257	-	4380.00	5924.00	5217.65	4869.23	6075.00	7533.33	4534.62	3873.08
6b	Perceived crime	0.0266	-	1.94	3.21	1.88	2.50	2.71	3.09	1.40	2.32
6c	CCTV and security presence	0.0236	+	3.29	2.73	2.86	2.63	2.45	2.13	3.29	2.67
6d	Street lighting	0.0264	+	3.20	2.45	2.78	2.61	2.40	2.16	3.13	2.96
7a	TCM team	0.0236	+	3.39	2.13	2.89	2.08	1.89	2.00	2.97	2.00
7b	Partnership/stakeholder involvement (Part 1)	0.0120	+	2.00	2.00	2.00	1.00	2.00	1.00	2.00	2.00
	Partnership/stakeholder involvement (Part 2)	0.0120	+	3.09	2.27	3.00	1.73	2.06	2.14	2.92	2.38
7c	Marketing	0.0213	+	2.82	1.77	3.25	1.71	1.77	1.55	2.90	2.17
7d	Digital connectivity/internet	0.0228	+	2.73	2.00	2.25	1.72	1.91	1.53	2.64	2.14
8a	Env. initiatives/ carbon reduction schemes (Part 1)	0.0069	+	3.00	1.00	2.00	1.00	1.00	1.00	3.00	1.00
	Env. initiatives/carbon reduction schemes (Part 2)	0.0069	+	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Env. initiatives/carbon reduction schemes (Part 3)	0.0069	+	2.30	2.14	3.00	1.71	1.89	1.62	1.93	1.92
8c	Waste management and recycling schemes	0.0242	+	3.00	2.61	2.80	2.71	2.29	1.59	2.60	2.23
9a	Commercial rent (Part 1)	0.0129	-	267.48	211.94	151.02	150.05	144.67	164.47	182.13	178.36
	Commercial rent (Part 2)	0.0129	-	8.50	9.80	7.50	8.70	12.80	11.40	7.50	10.10
9b	Business rates	0.0255	-	267.48	211.94	151.02	150.05	144.67	164.47	182.13	178.36
9c	Trading hours	0.0245	+	3.53	2.93	3.27	2.79	2.50	2.31	3.26	3.12
9d	Complementary daytime, evening and night-time economies	0.0235	+	3.18	1.95	3.11	1.77	1.78	1.74	2.90	2.61

7.7. Application and comparison of MCDM methods

Previous studies have highlighted how different methods can produce different results when applied to the same decision making problem (Zanakis et al., 1997), and consequently many researchers opt to apply more than one method and compare the results of each. Therefore it was decided that a number of methods would be applied and compared in the development of the high street sustainability model. The suitability of methods is dependent on the type of decision making problem, the data and alternatives involved and the output format required etc. (see for example Hobbs, 1986; Guitouni and Martel, 1998). Following the formulation of the decision matrix, the following methods were selected as suitable methods for this decision making problem:

1. Weighted Sum Model (WSM)
2. Revised Analytic Hierarchy Process (AHP)
3. Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS)
4. Complex Proportionate Assessment (COPRAS)
5. Modified COPRAS

The above methods were therefore applied to the decision data contained within the initial decision matrix (table 32) and the results were compared. The methods vary in terms of their normalisation processes and how they utilise the same criteria weights and values in order to assess the alternatives. Chapter 5 provides a more detailed overview of each method and how it works, however brief summaries of how each method was applied to the decision making problem are presented below.

7.7.1. Application of WSM

In order to apply the WSM method the researcher firstly transformed minimising criteria (negative) into maximising (positive). This was achieved using the following calculation:

New maximising value = Minimum criterion value + maximum criterion value – criterion value to be transformed

Using the data for the criterion 'signage' (1b) with reference to A_1 in table 32, the following example shows how the minimising value was transformed into a maximising value using the above calculation:

$$1.80 + 2.32 – 1.87 = 2.25$$

Once transformed, the lowest minimising value becomes the highest maximising value, and vice versa. This means that a higher value is now better for the decision maker. Having transformed all of the formerly minimising criteria into maximising, a new positive decision matrix was produced (table 33). The next step was to normalise the data matrix. This was done by dividing each value by the sum of the row in which it sits. The normalised decision matrix can be viewed in appendix 9. Each value is then multiplied by its relevant criterion weight and all weighted criteria values are added together to produce a final score for each alternative. The alternative with the highest score is the best.

7.7.2. Application of revised AHP

The initial stages of revised AHP involve the identification of criteria weights through pairwise comparisons, however weights had already been identified for this decision making situation and therefore these earlier steps were not necessary. Like the WSM method, minimising (negative) criteria were transformed into maximising (positive). To normalise the values each criterion value is divided by the maximum value in its row. Consequently the largest value will always obtain a score of 1 (see appendix 9 for normalised decision matrix). Each normalised value is then multiplied by its corresponding weight. Finally the total sum of all the weighted criteria values for each alternative is calculated to determine the final scores. Again the alternative with the highest score is best.

A second approach to revised AHP allows for minimising (negative) criteria to be normalised without being transformed into maximising (positive) values. The normalisation process involves transforming the criteria weights of the minimising criteria into negative weights. In order to do this the criteria weights of minimising criteria are multiplied by -1. As above, to normalise the values, each criterion value is divided by the maximum value in its row and then each normalised value is multiplied by its corresponding weight (see appendix 10 for normalised matrix). Again, the total sum of all the weighted criteria values for each alternative is calculated to determine the final scores. The alternative with the highest score is best.

Table 33. Positive decision matrix for WSM

Sub-criteria		Weight	+/-	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	0.0243	+	3.14	2.77	3.56	3.42	2.86	3.07	2.64	2.96
1b	Signage	0.0232	+	2.25	1.80	2.00	2.12	2.32	2.17	2.27	1.89
1c	Buildings	0.0259	+	2.59	1.59	3.00	1.96	2.54	2.64	3.71	3.28
1d	Trees and landscape	0.0248	+	3.13	1.93	3.00	2.68	2.62	2.64	3.62	3.58
1e	Public open space	0.0260	+	3.42	2.20	3.20	2.78	2.48	2.96	3.74	2.76
1f	Infrastructure	0.0239	+	2.68	2.07	2.44	2.32	2.32	2.29	2.97	2.60
1g	Design	0.0255	+	2.59	1.44	2.78	1.87	2.16	2.26	3.41	3.04
2a	Pedestrian pavement/ walkways	0.0272	+	3.26	2.59	3.22	2.97	2.64	2.88	2.92	3.14
2b	Cycling facilities	0.0204	+	2.40	1.57	2.33	2.63	1.91	1.64	2.35	2.95
2c	Public transport	0.0268	+	3.41	3.42	3.10	3.10	2.76	3.10	3.05	3.26
2d	Parking facilities	0.0265	+	3.53	3.03	3.10	2.83	2.61	2.11	2.98	2.11
2e	Goods/ service vehicles	0.0232	+	2.64	2.00	2.59	1.94	2.13	2.14	1.54	2.14
2f	Traffic management	0.0220	+	2.83	2.60	3.25	2.75	2.75	2.67	2.80	2.59
3a	Social space	0.0265	+	2.82	1.68	2.44	2.19	1.82	1.88	3.58	2.86
3b	Economic space	0.0266	+	3.17	1.68	2.60	1.52	1.92	1.79	3.24	2.57
3c	Political space	0.0186	+	1.76	1.52	1.75	1.35	1.45	1.43	1.50	1.55
3d	Cultural space	0.0241	+	2.57	1.76	2.13	1.92	2.00	1.70	3.17	2.57
3e	Community space	0.0246	+	2.31	1.36	1.88	1.68	1.71	1.54	2.60	1.82
4a	Retail	0.0279	+	2.88	1.66	2.27	1.48	1.50	1.40	2.94	2.43
4b	Entertainment	0.0259	+	3.22	1.57	2.75	1.38	1.74	1.21	3.25	2.73
4c	Work places (Part 1)	0.0119	+	2910.52	2302.04	989.22	1365.67	1781.93	1834.41	1710.89	2324.16
	Work places (Part 2)	0.0119	+	3.32	1.57	3.00	1.45	1.32	1.50	2.52	1.79
4d	Civic venues	0.0240	+	3.47	2.04	3.14	3.00	2.32	2.17	3.25	2.68
4e	Residential (Part 1)	0.0101	+	830.17	1531.99	280.78	2502.05	3514.03	390.50	1599.67	3448.10
	Residential (Part 2)	0.0101	+	2.54	2.16	2.50	2.31	2.10	2.06	2.74	2.22

4f	Health and social facilities	0.0217	+	2.72	2.48	2.67	2.36	2.22	2.72	3.00	2.76
5a	Identity/ image	0.0255	+	2.56	1.46	2.50	1.57	1.48	1.23	3.60	2.73
5b	Experience	0.0257	+	3.15	1.46	2.67	1.79	1.86	1.59	3.56	2.65
5c	Atmosphere	0.0270	+	3.06	1.47	2.60	1.69	1.71	1.44	3.62	2.60
6a	Actual crime	0.0257	+	7026.41	5482.41	6188.76	6537.18	5331.41	3873.08	6871.79	7533.33
6b	Perceived crime	0.0266	+	2.67	1.40	2.73	2.11	1.90	1.52	3.21	2.29
6c	CCTV and security presence	0.0236	+	3.29	2.73	2.86	2.63	2.45	2.13	3.29	2.67
6d	Street lighting	0.0264	+	3.20	2.45	2.78	2.61	2.40	2.16	3.13	2.96
7a	Town centre management team	0.0236	+	3.39	2.13	2.89	2.08	1.89	2.00	2.97	2.00
7b	Partnership/stakeholder involvement (Part 1)	0.0120	+	2.00	2.00	2.00	1.00	2.00	1.00	2.00	2.00
	Partnership/stakeholder involvement (Part 2)	0.0120	+	3.09	2.27	3.00	1.73	2.06	2.14	2.92	2.38
7c	Marketing	0.0213	+	2.82	1.77	3.25	1.71	1.77	1.55	2.90	2.17
7d	Digital connectivity/ internet presence	0.0228	+	2.73	2.00	2.25	1.72	1.91	1.53	2.64	2.14
8a	Environmental initiatives/carbon reduction schemes (Part 1)	0.0069	+	3.00	1.00	2.00	1.00	1.00	1.00	3.00	1.00
	Environmental initiatives/carbon reduction schemes (Part 2)	0.0069	+	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Environmental initiatives/carbon reduction schemes (Part 3)	0.0069	+	2.30	2.14	3.00	1.71	1.89	1.62	1.93	1.92
8c	Waste management and recycling schemes	0.0242	+	3.00	2.61	2.80	2.71	2.29	1.59	2.60	2.23
9a	Commercial rent (Part 1)	0.0129	+	144.67	200.21	261.13	262.10	267.48	247.68	230.02	233.79
	Commercial rent (Part 2)	0.0129	+	11.80	10.50	12.80	11.60	7.50	8.90	12.80	10.20
9b	Business rates	0.0255	+	267.48	211.94	151.02	150.05	144.67	164.47	182.13	178.36
9c	Trading hours	0.0245	+	3.53	2.93	3.27	2.79	2.50	2.31	3.26	3.12
9d	Complementary daytime, evening and night-time economies	0.0235	+	3.18	1.95	3.11	1.77	1.78	1.74	2.90	2.61

7.7.3. Application of TOPSIS

The first step in the application of TOPSIS is to construct the normalised decision matrix (appendix 11). This is achieved by dividing each criterion value by the square root of the total sum of all of the squared criteria values in the range. The normalised decision matrix is then weighted by multiplying each normalised value (r_{ij}) by the corresponding weight (w_i). The next step is to calculate the separation measure from the positive-ideal solution (A^*) and from the negative-ideal solution (A^-). Finally the relative closeness of the alternatives with reference to the positive-ideal solution is calculated. The alternative with the shortest distance from the positive-ideal solution is the best. The formulas used to undertake each stage of the TOPSIS application are set out in section 5.3.1.5.

7.7.4. Application of COPRAS and modified COPRAS

The first step in the application of the COPRAS methods is the construction of the weighted, normalised decision matrix (appendix 15). This is achieved by multiplying each criterion value by its corresponding weight and then dividing that figure by the sum of the row in which it sits. Using the sub-criterion 1a with reference to alternative A_1 as an example, the calculation is as follows:

$$(3.14 \times 0.024289) / 24.41$$

Where 3.14 is the value of A_1 with reference to criterion 1a, 0.024289 is the criterion weight and 24.41 is the sum of the row.

Once the normalised decision matrix is constructed, all positive weighted values for each alternative are summed and all negative weighted values for each alternative are summed, producing two separate figures.

The next step is to calculate the significance (Q_j) of each alternative; this was achieved using the equation shown in section 5.3.1.6. This step is where modified COPRAS varies from the original (see 5.3.1.7).

Finally the utility degree of each alternative is calculated, as indicated in section 5.3.1.6.

7.7.5. Results of MCDM comparison

Table 34 presents the results of the application of WSM, revised AHP (approaches 1 and 2), COPRAS, modified COPRAS and TOPSIS to the case study data. As displayed in tables 34 and 35, all 6 methods ranked the alternatives the same, with Shrewsbury (A_7)

ranked in 1st place, Basingstoke (A_1) 2nd, Corby (A_3) 3rd, Southport (A_8) 4th, Gosport (A_4) 5th, Great Yarmouth (A_5) 6th, Birkenhead (A_2) 7th and Rotherham (A_6) 8th.

Table 34. Scores and ranks of alternatives as calculated by the different MCDM methods

Alternatives		MCDM Method											
		WSM	**Rank**	**RAHP1**	**Rank**	**RAHP2**	**Rank**	**COPRAS**	**Rank**	**modified COPRAS**	**Rank**	**TOPSIS**	**Rank**
A_1	**Basingstoke**	0.14967	**2**	0.91107	**2**	0.66458	**2**	0.14642	**2**	0.10905	**2**	0.68736	**2**
A_2	**Birkenhead**	0.10538	**7**	0.65344	**7**	0.41754	**7**	0.10454	**7**	0.06673	**7**	0.23962	**7**
A_3	**Corby**	0.13678	**3**	0.83891	**3**	0.61462	**3**	0.13810	**3**	0.10040	**3**	0.60793	**3**
A_4	**Gosport**	0.11170	**5**	0.69121	**5**	0.46711	**5**	0.11279	**5**	0.07539	**5**	0.33846	**5**
A_5	**Great Yarmouth**	0.10977	**6**	0.67566	**6**	0.45259	**6**	0.11090	**6**	0.07353	**6**	0.32685	**6**
A_6	**Rotherham**	0.10141	**8**	0.63033	**8**	0.40348	**8**	0.10197	**8**	0.06437	**8**	0.23634	**8**
A_7	**Shrewsbury**	0.15213	**1**	0.91986	**1**	0.68964	**1**	0.15206	**1**	0.11457	**1**	0.78333	**1**
A_8	**Southport**	0.13316	**4**	0.81084	**4**	0.58135	**4**	0.13322	**4**	0.09584	**4**	0.58835	**4**

Table 35. Ranking of alternatives for different MCDM methods

Rank	MCDM Methods					
	WSM	**RAHP1**	**RAHP2**	**COPRAS**	**modified COPRAS**	**TOPSIS**
1	A_7	A_7	A_7	A_7	A_7	A_7
2	A_1	A_1	A_1	A_1	A_1	A_1
3	A_3	A_3	A_3	A_3	A_3	A_3
4	A_8	A_8	A_8	A_8	A_8	A_8
5	A_4	A_4	A_4	A_4	A_4	A_4
6	A_5	A_5	A_5	A_5	A_5	A_5
7	A_2	A_2	A_2	A_2	A_2	A_2
8	A_6	A_6	A_6	A_6	A_6	A_6

7.8. Selection of the most suitable MCDM method

The decision making problem investigated by this study requires the comparison of selected high streets (alternatives) in terms of their sustainability. The researcher sought to obtain a complete ranking of the alternatives to determine how each high street compares against the others in terms of satisfying the decision criteria. Therefore a model that enables a complete ranking of alternatives was crucial. Due to the nature of the criteria involved in this decision making situation, the method should also be capable of dealing with quantitative and qualitative criteria, and criteria of both positive and negative influence. Crucially, the final model should be easy to understand and use by a range of stakeholders (e.g. local authorities, local businesses, community groups etc.). The application of five MCDM methods (WSM, RAHP (1 and 2), COPRAS, modified COPRAS and TOPSIS) has enabled the researcher to compare and assess the suitability of each to the decision making problem.

Whilst the WSM and RAHP1 were relatively simple to use, the methods were unable to handle criteria of both positive (maximising) and negative (minimising) influence. Therefore, prior to normalisation, minimising criteria had to be transformed into maximising. The RAHP2 approach overcame the need for minimising criteria to be transformed into maximising by multiplying weights for minimising criteria by -1. However, whilst previous studies have also tested this approach (e.g. Mulliner et al., 2016), it is not a commonly used and accepted technique in MCDM analysis.

The TOPSIS, COPRAS and modified COPRAS methods are, however, able the handle both maximising and minimising criteria with ease. Although, the researcher did note that the application of TOPSIS required slightly greater understanding of the mathematical techniques involved, and therefore may be more difficult for non-technical stakeholders to use. TOPSIS also involved more steps compared to COPRAS. The combination of these two factors means that the application of TOPSIS was more time consuming. It was important that the final model was as user friendly as possible in order for it to be used by a range of stakeholders.

Following the comparative analysis of the five methods, the researcher identified COPRAS to be the most suitable MCDM method to adopt for the proposed model which assesses high street sustainability. The suitability of COPRAS to the decision making situation is outlined in table 36.

Table 36. Suitability of COPRAS to the decision making problem

Requirement of decision making situation	**Beneficial feature of COPRAS**
A complete ranking of alternatives is required to determine how each alternative compares to the others.	COPRAS produces a complete ranking of alternatives. Furthermore, the method also provides a measure of utility which indicates to what degree one alternative is better or worse than the others.
The decision making situation involves both maximising and minimising criteria.	COPRAS can handle both maximising and minimising criteria without the need for transformation.
The decision making situation involves both quantitative and qualitative criteria.	COPRAS can handle both quantitative and qualitative criteria in one assessment.
The chosen method will assess high street sustainability.	COPRAS has been used to investigate a range of decision making problems in the built environment (e.g. Banaitiene et al., 2008; Bielinskas et al., 2015; Mulliner et al., 2016)
The model needs to be as understandable and easy-to-use as	COPRAS comprises clear, understandable stages which are easy to follow. Furthermore, the researcher found it to be a quicker method

possible in order for a range of stakeholders to use it in practice.	compared to others (e.g. TOPSIS and RAHP1 and 2). Its ability to deal with both maximising and minimising criteria eliminates the need for transformation, therefore simplifying the method and making it more user friendly for a range of potential users.

7.9. Chapter summary

This chapter has presented the steps taken to apply the MCDM methods to the decision making problem. The means of measuring the high streets in terms of the sub-criteria has been presented along with explanations of how data was obtained for each. The collection of data to inform the weighting of sub-criteria, and the calculation of sub-criteria weights from that data, has also been discussed. Finally, the application and comparison of five MCDM methods (WSM, RAHP1 and 2, COPRAS, modified COPRAS and TOPSIS) has been presented. Following this comparative analysis the researcher identified COPRAS to be the most suitable MCDM method to adopt for the final model assessing high street sustainability.

Chapter 8: Model application

8.1. Introduction

This chapter presents the final model for the assessment of high street sustainability and the application of the model using real high street case studies.

As discussed in chapter 7, COPRAS was selected as the most appropriate MCDM method to adopt for the final model. COPRAS was selected for the following reasons:

- COPRAS provides a complete ranking of alternatives and produces a utility degree to indicate the relative inferiority/superiority of alternatives.
- COPRAS can handle both maximising and minimising criteria without the need for transformation. This characteristic simplifies the method, making it more user friendly.
- The method can handle both quantitative and qualitative criteria in one assessment.
- COPRAS comprises clear, understandable stages.
- The researcher found that COPRAS was quicker to apply compared to TOPSIS and RAHP1 and 2.

Chapter 7 also defined the tools used to measure each high street in terms of each sub-criterion and discussed how that data was collected. The collection of data to inform the weighting of sub-criteria, and the calculation of sub-criteria weights from that data, was also discussed.

8.2. Final model for the assessment of high street sustainability

The central focus of this study has been the development of a complex model with which the sustainability of high streets can be assessed. The final model is presented in figure 40. The review of literature highlighted the need for high street performance tools to assess a broader range of factors which are more closely aligned with national and global aspirations for improved sustainability. The model seeks to achieve this by incorporating a range of criteria that have been found to influence, not only the economic success of high streets, but also their environmental and social success. The model incorporates the aforementioned influential criteria, the needs and expectations of local residents, the expert opinions of those working in relevant professions (e.g. planners, architects, surveyors etc.) and the application of the MCDM method COPRAS.

The development of the model and the explanation of its various elements have been presented and discussed throughout this thesis. These elements are briefly recapped below:

- ***External pressures facing high streets***. A variety of external factors have implications on the sustainability of high streets. High streets, as the traditional site for trade and interaction, are vulnerable to a range of competing factors including:
  - Population characteristics (e.g. age, gender etc.),
  - Consumer trends (e.g. preference for factors such as convenience, experience, accessibility etc.),
  - Alternative forms of retail (e.g. out-of-town and online retail.),
  - Economics (e.g. inflation/deflation, value of currency, property market etc.),
  - Local and national politics (e.g. taxes, political agendas, initiatives etc.),
  - Planning (e.g. national and local planning policy, development control etc.),
  - Advances in modern technology and transportation (e.g. private car ownership, internet, smart devices etc.),
  - Geography (e.g. physical features of area, distance from neighbouring centres etc.).
- ***Influential criteria.*** The economic, environmental and social criteria identified as influential factors to the sustainability of high streets were presented in chapter 4.
- ***Key stakeholders.*** The key stakeholders were identified in section 1.3 and include national government, local authorities, local businesses and local communities.
- ***Selected high streets (alternatives) to be assessed.*** This study presents a practical example of the application of the model using eight English case study high streets. The number of high streets selected will depend on the purpose and objectives of the decision maker. Stakeholders choosing to apply the model should be mindful of the settlement hierarchy and the context of the high streets they wish to select. Comparing a local neighbourhood centre with a large city centre is unlikely to produce useful recommendations. Section 5.17.1 explains the factors that were considered when selecting appropriate, comparable case studies for this study.
- ***Analysis of high street sustainability using multiple criteria decision making analysis.*** As discussed in section 7.8, COPRAS was selected as the most suitable MCDM method with which to analyse the sustainability of the chosen case study high streets. An example of how COPRAS is applied to a real decision making situation is detailed in section 8.3. The application of this method involves:

- ***Evaluating criteria weights.*** For this study the criteria weights were determined from online surveys which obtained importance scores from industry experts (e.g. planning professionals, surveyors, architects etc.) and from local residents of selected English high streets. The criteria weights reflect the level of significance the sub-criteria have on the sustainability of high streets. The process undertaken to obtain and calculate the criteria weights was discussed in section 7.5.
- ***Determine criteria values.*** Section 7.2 presents the measurement tools used to calculate criteria values. Section 7.4 details the values obtained for the example of practical application which is presented in this study.

- ***Ranking of high streets (alternatives) according to their relative sustainability.*** The application of the MCDM method COPRAS processes the criteria weights and values in order to present a ranking of alternatives. The ranking indicates the relative performance of each high street with reference to the weighted criteria.
- ***Develop recommendations from model data for improved sustainability of high streets.*** The ranking of alternatives provides the decision maker with the knowledge of the relative sustainability of the high streets being assessed. The model input data acquired by the decision maker can then fulfil a secondary purpose of highlighting areas of improvement.
- ***Implement recommendations.*** Recommendations will seek to address poorer performing elements of a high street. The effective implementation of the recommendations will therefore assist in improving the sustainability of a high street. The regular review of a high street's sustainability performance is crucial to ensuring continuous improvement.

8.3. The application of COPRAS for the assessment of high street sustainability

This section presents a practical application of COPRAS for the assessment of high street sustainability. The steps taken are as follows:

1. **Identify criteria and sub-criteria** – establish a set of criteria that influence the sustainability of high streets. The criteria and sub-criteria are presented in table 2.
2. **Select alternatives** – select suitable high street case studies for assessment.
3. **Obtain input data** – identify criteria significance values (weights) (section 7.5) and determine criteria measurement tools and values (see sections 7.2 and 7.4).

4. **Normalise the decision making matrix** – this step involves multiplying each sub-criterion value by its corresponding weight and then dividing that figure by the sum of the row in which it sits. This enables the creation of a weighted, normalised decision matrix. The normalisation of the decision matrix allows values of varying units of measure to be assessed together. Normalised weighted values (d_{ij}) are calculated as follows:

$$d_{ij} = \frac{x_{ij} q_i}{\sum_{j=1}^{n} x_{ij}}, \qquad i = \overline{1, m},\ j = \overline{1, n},$$

(17)

and

$$q_i = \sum_{j=1}^{n} d_{ij}\,, \qquad i = \overline{1, m},\ j = \overline{1, n},$$

(18)

Where x_{ij} is the value of the i-th criterion in terms of the j-th alternative, q_i is the weight of the i-th criterion, m is the number of criteria, and n is the number of alternatives. The sum of the normalised weighted values (d_{ij}) for each criterion will always equal the weight (q_i) of that criterion.

5. **Calculate the sums of the maximising and minimising criteria values** – maximising (positive) criteria are those for which a high score is better for high street sustainability (e.g. 'cycling facilities' and 'identity/image'). Minimising (negative) criteria are those for which a high score is worse for high street sustainability (e.g. 'actual crime' and 'commercial rent'). The sums of the maximising criteria values (S_{+j}) and the minimising criteria values (S_{-j}) are calculated as follows:

$$S_{+j} = \sum_{i=1}^{m} d_{+ij},$$

$$S_{-j} = \sum_{i=1}^{m} d_{-ij},$$

$$i = \overline{1, m},\ j = \overline{1, n},$$

(19)

6. **Determine the relative significance of the alternatives** – the relative significance of the alternatives is assessed against the maximising (S_{+j}) and minimising (S_{-j}) criteria values. The relative significance (Q_j) of the alternative is calculated as follows:

$$Q_j = S_{+j} + \frac{S_{-\min} \sum_{j=1}^{n} S_{-j}}{S_{-j} \sum_{j=1}^{n} \frac{S_{-\min}}{S_{-j}}}, \qquad j = \overline{1, n,}$$

(20)

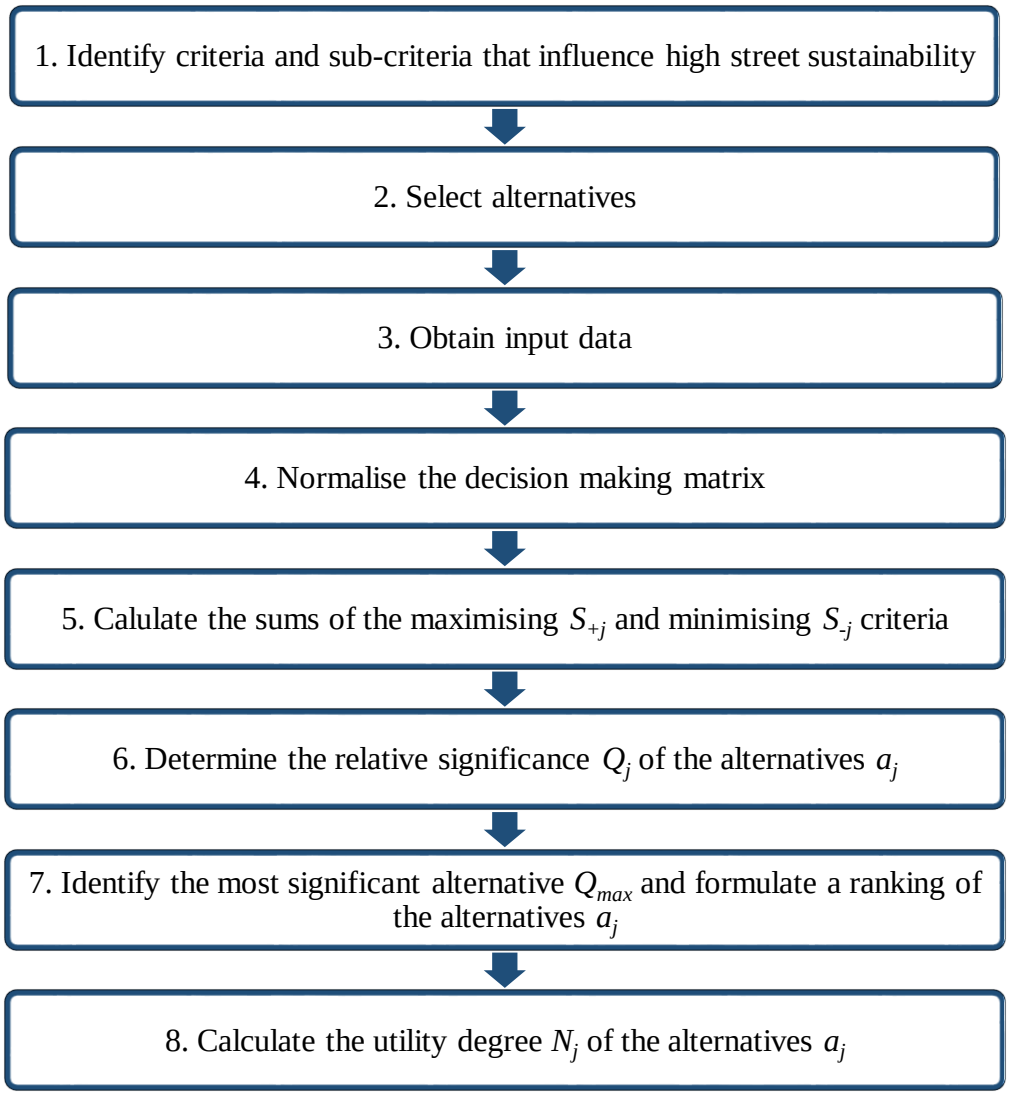
7. **Identify the most significant alternative and formulate a ranking of the alternatives** - the greater the significance (Q_j), the higher the ranking and the better the alternative. In this case the alternative Q_{max} will always be the best alternative. The significance values enable a ranking of alternatives from best to worst to be established.
8. **Calculate the utility degree of each alternative** – finally, the utility degree of each alternative is calculated through the comparison of the alternatives against Q_{max}. The best performing high street in terms of the sustainability criteria (Q_{max}) is considered to have a utility degree (N_j) of 100%. The values of the utility degrees of the rest of the high streets will fall between 0% and 100%, between the best and worst high streets that are being assessed. The utility degree (N_j) of each alternative is calculated as follows:

$$N_j = \frac{Q_j}{Q_{\max}} \times 100$$

(21)

Figure 37 illustrates the steps taken in applying COPRAS to the assessment of high street sustainability.

Figure 37. Steps taken to apply COPRAS to the assessment of high street sustainability



(Source: self study)

8.4. Results from the application of COPRAS for the assessment of high street sustainability

This section presents the results of the COPRAS MCDM analysis on the assessment of high street sustainability. The practical application of the model involved the comparison of eight English high street case studies (outlined in section 5.17.2). Each high street was assessed against the 42 sub-criteria (presented in table 2) which were identified to be factors that influence the sustainability of high streets. The relative significance of those criteria to high street sustainability was accounted for in the criteria weightings. The initial decision matrix can be viewed in table 32 and the normalised weighted decision matrix for COPRAS is displayed by table 38. The COPRAS method enabled the eight high street case studies to be

compared and ranked in terms of their relative sustainability. The method calculated a value of relative significance (Q_j) for each alternative (each high street). The high streets were then ranked based on their relative significance values. Table 37 presents the results of the COPRAS assessment, table 39 displays COPRAS's ranking of the high streets (from best to worst in terms of how they scored against the weighted criteria) and figure 38 illustrates the same rankings geographically.

In addition to calculating relative significance values, COPRAS also calculates the utility degree of each alternative. The utility degree (N_j) is expressed as a percentage and indicates to what degree one alternative is inferior or superior to another.

It should be noted that due to the greater representation of certain professional and resident respondent groups (e.g. private sector professionals, professionals based in the North West, over 65's, married, retired etc.), the results of the model application may be more reflective of the opinions of those stakeholder groups, and less reflective of others (e.g. public sector professionals, 16-25 year olds, single respondents etc.). Whilst this should be acknowledged, it does not undermine the purpose of the model application in this study, which is to provide a practical example of how the model can be applied to real life high streets.

Table 37. Relative significance values, utility degrees and ranking positions of the alternatives as calculated by COPRAS

Alternatives (*j*)		**Q_j**	**N_j (%)**	**Rank**
A_1	Basingstoke	0.14642	96.3	2
A_2	Birkenhead	0.10454	68.7	7
A_3	Corby	0.13810	90.8	3
A_4	Gosport	0.11279	74.2	5
A_5	Great Yarmouth	0.11090	72.9	6
A_6	Rotherham	0.10197	67.1	8
A_7	Shrewsbury	0.15206	100.0	1
A_8	Southport	0.13322	87.6	4

As displayed in table 37, Shrewsbury high street gained the highest value of relative significance (Q_j) and was allocated a utility degree (N_j) of 100%. Shrewsbury is therefore the high street that best satisfies the decision criteria. Consequently Shrewsbury is considered to be the most sustainable high street out of the eight high streets that were assessed.

Table 38. Weighted normalised decision making matrix for COPRAS

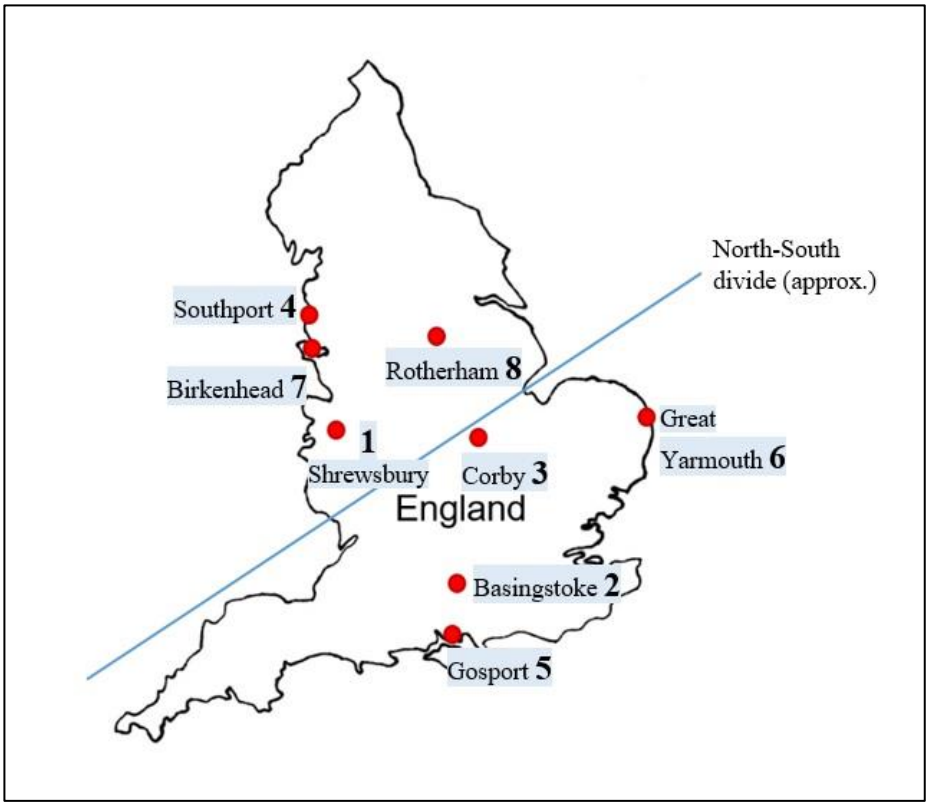
Sub-criteria (*i*)		+/-	Alternatives (*j*)							
			A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	+	0.00313	0.00276	0.00354	0.00340	0.00284	0.00305	0.00262	0.00295
1b	Signage	-	0.00268	0.00334	0.00306	0.00288	0.00259	0.00280	0.00267	0.00320
1c	Buildings	+	0.00315	0.00192	0.00364	0.00237	0.00308	0.00320	0.00451	0.00398
1d	Trees and landscape	+	0.00334	0.00207	0.00321	0.00286	0.00280	0.00283	0.00387	0.00383
1e	Public open space	+	0.00378	0.00243	0.00354	0.00308	0.00274	0.00327	0.00414	0.00306
1f	Infrastructure	+	0.00325	0.00251	0.00297	0.00281	0.00281	0.00278	0.00361	0.00315
1g	Design	+	0.00338	0.00188	0.00362	0.00244	0.00281	0.00295	0.00444	0.00396
2a	Pedestrian pavement/ walkways	+	0.00376	0.00299	0.00371	0.00342	0.00304	0.00332	0.00336	0.00362
2b	Cycling facilities	+	0.00275	0.00180	0.00268	0.00302	0.00219	0.00189	0.00270	0.00338
2c	Public transport	+	0.00363	0.00364	0.00330	0.00330	0.00294	0.00330	0.00325	0.00347
2d	Parking facilities	+	0.00419	0.00361	0.00369	0.00336	0.00310	0.00251	0.00355	0.00251
2e	Goods/ service vehicles	-	0.00218	0.00310	0.00226	0.00318	0.00291	0.00290	0.00374	0.00290
2f	Traffic management	+	0.00280	0.00257	0.00321	0.00272	0.00272	0.00263	0.00277	0.00256
3a	Social space	+	0.00389	0.00231	0.00337	0.00302	0.00250	0.00259	0.00493	0.00393
3b	Economic space	+	0.00456	0.00241	0.00374	0.00219	0.00276	0.00258	0.00466	0.00369
3c	Political space	+	0.00265	0.00229	0.00264	0.00203	0.00219	0.00216	0.00226	0.00234
3d	Cultural space	+	0.00347	0.00238	0.00288	0.00259	0.00271	0.00231	0.00429	0.00347
3e	Community space	+	0.00382	0.00224	0.00310	0.00278	0.00282	0.00254	0.00429	0.00301
4a	Retail	+	0.00484	0.00279	0.00383	0.00250	0.00253	0.00236	0.00494	0.00409
4b	Entertainment	+	0.00467	0.00227	0.00399	0.00200	0.00252	0.00176	0.00471	0.00396
4c	Work places (Part 1)	+	0.00227	0.00179	0.00077	0.00106	0.00139	0.00143	0.00133	0.00181
	Work places (Part 2)	+	0.00239	0.00113	0.00216	0.00105	0.00095	0.00108	0.00182	0.00129
4d	Civic venues	+	0.00378	0.00222	0.00342	0.00327	0.00252	0.00237	0.00353	0.00292
4e	Residential (Part 1)	+	0.00060	0.00110	0.00020	0.00179	0.00252	0.00028	0.00115	0.00247
	Residential (Part 2)	+	0.00138	0.00117	0.00136	0.00126	0.00114	0.00112	0.00149	0.00121

4f	Health and social facilities	+	0.00282	0.00257	0.00276	0.00245	0.00230	0.00282	0.00311	0.00287
5a	Identity/ image	+	0.00380	0.00217	0.00372	0.00234	0.00220	0.00183	0.00535	0.00406
5b	Experience	+	0.00433	0.00200	0.00367	0.00245	0.00255	0.00218	0.00489	0.00365
5c	Atmosphere	+	0.00454	0.00218	0.00386	0.00251	0.00255	0.00215	0.00537	0.00386
6a	Actual crime	-	0.00266	0.00359	0.00316	0.00295	0.00368	0.00457	0.00275	0.00235
6b	Perceived crime	-	0.00271	0.00448	0.00262	0.00349	0.00378	0.00431	0.00196	0.00324
6c	CCTV and security presence	+	0.00351	0.00292	0.00306	0.00281	0.00262	0.00228	0.00352	0.00285
6d	Street lighting	+	0.00389	0.00298	0.00338	0.00317	0.00292	0.00262	0.00380	0.00359
7a	Town centre management team	+	0.00414	0.00259	0.00353	0.00254	0.00231	0.00244	0.00363	0.00244
7b	Partnership/ stakeholder involvement (Part 1)	+	0.00172	0.00172	0.00172	0.00086	0.00172	0.00086	0.00172	0.00172
	Partnership/ stakeholder involvement (Part 2)	+	0.00190	0.00139	0.00184	0.00106	0.00127	0.00132	0.00180	0.00146
7c	Marketing	+	0.00336	0.00210	0.00387	0.00203	0.00211	0.00185	0.00345	0.00258
7d	Digital connectivity/ internet presence	+	0.00368	0.00269	0.00303	0.00232	0.00257	0.00206	0.00355	0.00288
8a	Environmental initiatives/ carbon reduction schemes (Part 1)	+	0.00159	0.00053	0.00106	0.00053	0.00053	0.00053	0.00159	0.00053
	Environmental initiatives/ carbon reduction schemes (Part 2)	+	0.00086	0.00086	0.00086	0.00086	0.00086	0.00086	0.00086	0.00086
	Environmental initiatives/ carbon reduction schemes (Part 3)	+	0.00096	0.00090	0.00125	0.00072	0.00079	0.00067	0.00080	0.00080
8c	Waste management and recycling schemes	+	0.00366	0.00319	0.00342	0.00332	0.00279	0.00194	0.00318	0.00272
9a	Commercial rent (Part 1)	-	0.00239	0.00189	0.00135	0.00134	0.00129	0.00147	0.00162	0.00159
	Commercial rent (Part 2)	-	0.00144	0.00166	0.00127	0.00147	0.00217	0.00193	0.00127	0.00171
9b	Business rates	-	0.00470	0.00372	0.00265	0.00264	0.00254	0.00289	0.00320	0.00313
9c	Trading hours	+	0.00364	0.00303	0.00338	0.00288	0.00258	0.00238	0.00336	0.00322
9d	Complementary daytime, evening and night-time economies	+	0.00393	0.00241	0.00384	0.00219	0.00220	0.00215	0.00358	0.00323

Table 39. Ranking of high streets from best to worst based on COPRAS results

Ranking	High street
1 (best)	Shrewsbury (A_7)
2	Basingstoke (A_1)
3	Corby (A_3)
4	Southport (A_8)
5	Gosport (A_4)
6	Great Yarmouth (A_5)
7	Birkenhead (A_2)
8 (worst)	Rotherham (A_6)

Figure 38. COPRAS high street rankings presented geographically



(Source: self study)

As shown in table 39, the results of the COPRAS method found that Shrewsbury (A_7) was the high street considered to be most sustainable and Rotherham (A_6) was the least sustainable out of the high streets being assessed. Rotherham is therefore the high street which satisfies the decision criteria the least. Basingstoke (A_1) was ranked 2nd, Corby (A_3) was 3rd, Southport (A_8) was 4th, Gosport (A_4) was 5th, Great Yarmouth (A_5) was 6th and Birkenhead (A_2) was ranked 7th.

Table 40 displays the S_{+j} and S_{-j} values for each of the high streets. The figures show that Shrewsbury (A_7) had the highest total sum of positively influenced criteria values and a relatively low total sum of negatively influenced criteria values. Rotherham (A_6), on the other hand, had the lowest total sum of positively influenced criteria values and a relatively high sum of negatively influenced criteria values.

The high street with the highest sum of negatively influenced criteria values was Birkenhead (A_2), and the high street with lowest sum of negatively influenced criteria values was Corby (A_3). These figures reveal that, although Shrewsbury (A_7) was ranked best overall and had the highest sum of positively influenced criteria values, Corby (A_3) fared slightly better in terms of the negatively influenced criteria values. Similarly, whilst Rotherham (A_6) had the lowest sum of positively influenced criteria values, it fared slightly better than Birkenhead (A_2) when it came to the total sums of negatively influenced criteria values.

Table 40. Sum of positively influenced and negatively influenced criteria values for each alternative

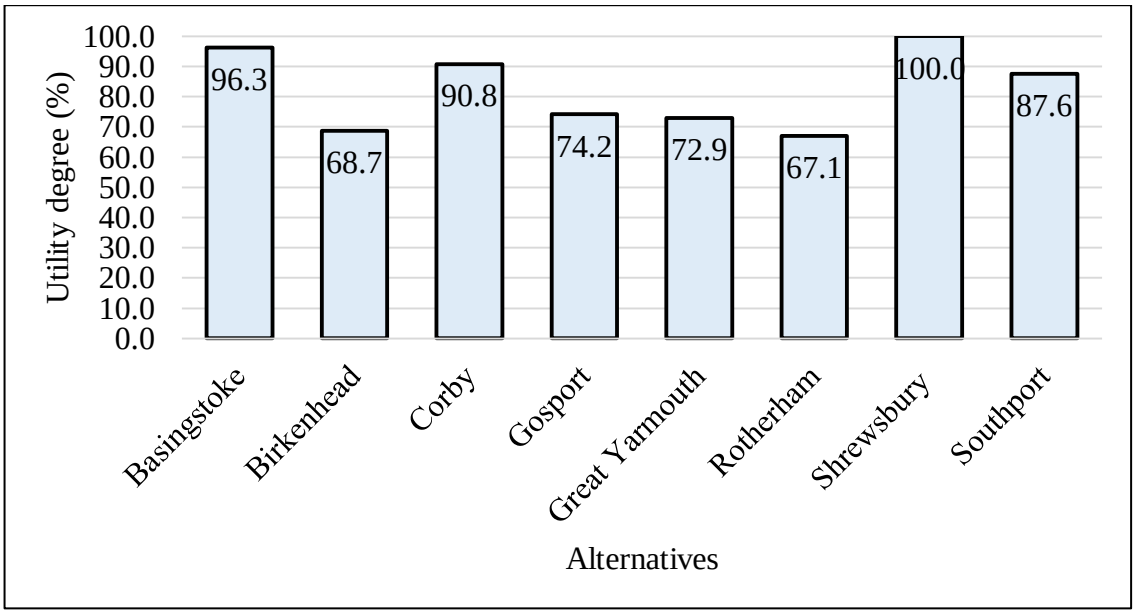
	Alternatives (*j*)							
	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
S_{+j}	0.12781	0.08851	0.11678	0.09335	0.09250	0.08524	0.13178	0.11397
S_{-j}	0.01876	0.02179	0.01638	0.01796	0.01896	0.02087	0.01721	0.01813

It is noted that at the point of selecting appropriate case study high streets, Rotherham was receiving large amounts of positive media attention that recognised and awarded its market (NABMA, 2016), its support for start-up businesses and local traders (GBHS, 2015), its efforts to encourage visitors to stay in the town centre into the evening and night time, improvements to bus and railway stations, the introduction of a shopper's discount scheme, outdoor events and public realm improvements (Historic England, 2015). Moreover it was crowned the winner of the 2015 Great British High Street awards (town centre category) (GBHS, 2015).

Despite the reported positive activities and initiatives going on in Rotherham, the high street sustainability model ranked the town in last place, indicating that of the eight high streets, Rotherham was the high street to least satisfy the decision criteria. It's possible that, in the time that it took to administer the surveys and gather the data, the situation in Rotherham has changed. However it is also possible that the positive media attention gained by the town at the time of case study selection was the result of effective marketing, rather than an

accurate reflection of the condition of the centre. On the other hand, it's possible that the condition of the high street has improved, just not enough to elevate the town to a similar level of sustainability as the other high streets that were selected for this study. Regardless, it is clear from the COPRAS results that Rotherham is in need of guidance on how to improve its sustainability.

Figure 39. Utility degrees of alternatives from COPRAS results



(Source: self study)

As illustrated in figure 39, at 67.1% Rotherham's (A_6) utility degree was the lowest of all the high streets, therefore indicating that it is the most inferior high street when compared to the highest performer, Shrewsbury (A_7). At 68.7%, Birkenhead (A_2) is only slightly less inferior to Shrewsbury (A_7) than Rotherham (A_6). Great Yarmouth (A_5) received a utility degree of 72.9%, 4.2% higher than Birkenhead (A_2), and Gosport (A_4) received a utility degree of 74.2%, 1.3% higher than Great Yarmouth. Whilst Gosport (A_4) and Southport (A_8) sit side-by-side in the rankings, in 5th and 4th place respectively, the utility degrees reveal a larger gap between the high streets. With a utility degree of 87.6%, Southport's (A_8) score is 13.4% higher than Gosport (A_4). Further, with just 3.2% between Southport (A_8) and Corby (A_3) (utility degree of 90.8%), the utility degrees suggest that Southport (A_8) high street does not fare as badly in its sustainability as the literature suggested it might. Finally, with a utility degree of 96.3%, Basingstoke (A_1) is 3.7% inferior to Shrewsbury (A_7).

It should be noted that due to the relative comparison of the high streets, the COPRAS results indicate how well the towns perform against each other. Therefore, if a different selection or a greater number of high streets had been assessed, the rankings may have been different, and Shrewsbury (A_7) may not have come out most superior and Rotherham (A_6) as least superior. It is also possible for the decision maker to introduce a hypothetical superior case study in order to compare high streets against an absolute ideal solution. A further means of applying the model is as a self-review tool. The decision maker may acquire new input data at set intervals (e.g. annually, biannually etc.) and compare that data against the previous, therefore enabling the mapping of a high street's sustainability over time.

The results of the model can assist stakeholders and policy makers in identifying areas of improvement and making the most effective decisions to increase the sustainability of high streets. Due to the weightings allocated to each sub-criterion, the model provides a hierarchy of factors that influence high street sustainability. Table 20 presents the mean importance scores obtained from the professionals' and residents' surveys, and displays the sub-criteria in order of importance, along with importance rankings. This information would enable decision makers to recognise the relative importance of the various sub-criteria to high street sustainability.

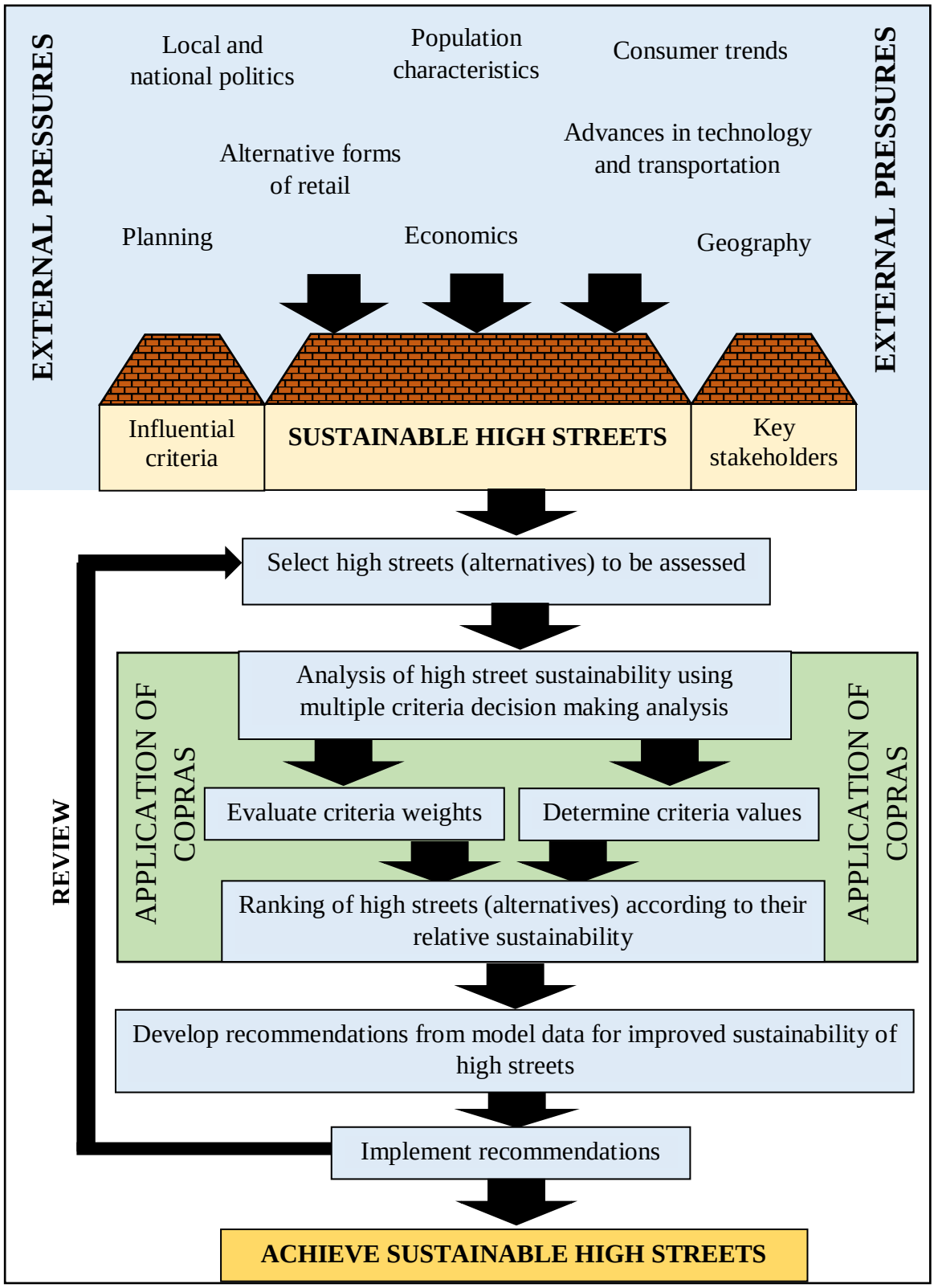
The weighting of the decision criteria enables the decision maker to recognise the factors which have the greatest impact upon high street sustainability. Therefore, if the decision maker seeks to develop the most efficient means of improving high street sustainability, such factors should command the greatest attention and resources. For example, the sub-criterion 'retail' was considered to be the most important factor to high street sustainability. Rotherham (A_6) was the lowest scoring high street in terms of this sub-criterion, therefore developing strategies and initiatives that assist in developing Rotherham's retail offering into one that better satisfies the needs and expectations of the local consumer base would be beneficial to the improvement of the high street's sustainability. Similarly, the sub-criterion 'political space' was considered to be the least important factor to high street sustainability. Shrewsbury (A_1) was the best performing high street in terms of this sub-criterion. Therefore it would make little business sense to allocate funding/resources to improving the political space in Shrewsbury. The model could therefore assist policy makers and key stakeholders in making effective decisions regarding the allocation of funding and resources, and could help local authorities to identify suitable locations in which to pursue investment and development.

Whilst investment and development strategies are largely the domain of local authorities and policy makers, the incorporation of social and environmental criteria into the model also present opportunities for local communities and small businesses to assist in improving the sustainability of their high streets. For example, the sub-criterion 'atmosphere' was considered to be the third most important factor to high street sustainability. Atmosphere is influenced by a variety of stimuli such as colours, sounds, odours and experiential touch points (e.g. events). Such factors can be developed and implemented by local stakeholders without the need for local authority budgets and formal interventions.

8.5. High street sustainability assessment model

This section presents the final high street sustainability assessment model (figure 40) and a step-by-step guide to assist high street stakeholders in applying the model.

Figure 40. Model for the assessment of high street sustainability



(Source: self study)

High street sustainability assessment model user guide:

Step 1: Select high streets for assessment

- Choose a selection of high streets that you want to assess the sustainability of.
- Ensure that the high streets are comparable with reference to the following:
    - Settlement category (e.g. city, town, village etc.)
    - Population size/distribution
    - Planning system
    - External social issues (e.g. religious/social tensions)

Step 2: Identify criteria and sub-criteria

- Review the criteria and sub-criteria identified in this study to determine their relevance to the high streets selected
- Remove criteria/sub-criteria considered to be irrelevant to the selected high streets, and add new criteria/sub-criteria if necessary

Step 3: Identify high street stakeholders

- Identify a variety of relevant industry professionals
- Define a suitable geographic parameter within which to recruit local residents of the selected high streets

Step 4: Conduct a professionals' and a residents' survey

Validate and weight criteria:

- Invite both the professional and resident participants to allocate importance scores to each of the sub-criteria using the following scale:
    1. not at all important
    2. slightly important
    3. fairly important
    4. very important
    5. Extremely important
- If the mean scores of any of the sub-criteria indicate no importance, remove them from the assessment.
- To calculate the relative weights for each sub-criterion, divide each individual sub-criterion mean by the sum of all of the sub-criteria means. For sub-criteria with

multiple measures, divide the weight by the number of measures. The total sum of the sub-criteria weights should equal 1.

Establish criteria measures and determine values:

- In the residents' survey ask respondents to indicate their level of agreement to statements relating to the sub-criteria.
    - For example: for the sub-criterion 'design', ask residents to indicate their level of agreement to the statement 'my local (insert high street type) has an attractive design'. Agreement scale: strongly agree, slightly agree, neither agree or disagree, slightly disagree, strongly disagree.
    - Remove any 'neither agree or disagree' responses, reducing the agreement scale to a 4-point scale.
- Where resident opinions would not provide suitable values, obtain secondary data from reliable sources.
    - For example: for the sub-criterion 'commercial rent', obtain data for average rent per km^2 from a reliable commercial data source such as CoStar.

Step 5: Apply COPRAS method

- Construct an initial decision making matrix using the sub-criteria weights and values.
- Construct the weighted, normalised decision matrix. This is achieved by multiplying each criterion value by its corresponding weight and then dividing that figure by the sum of the row in which it sits.
- Sum all the positive weighted values for each high street (i.e. the higher the score, the better for high street sustainability). This value is referred to as S_{+j}.
- Sum all the negative weighted values for each high street (i.e. the lower the score, the better for high street sustainability). This value is referred to as S_{-j}.
- To calculate the significance (Q_j) of each high street:
    - Multiply the smallest negative weighted sum (known as s-min) by the sum of the all of the negative weighted sums. This will produce one value we will call "value N".
    - Divide the smallest negative weighted sum (s-min) by each of the negative weighted sums (S_{-j}). This will produce a value for each high street.
    - Sum these values to produce one value (let us call this "value S").

- Multiply "value S" by the S_{-j} values for each high street to obtain a value for each high street.
- Divide each of those values by "value N" to produce a further value for each high street (let us call this "value F"). For each high street, sum "value F" by the sum of the positive weighted values (S_{+j}) for the same high street. This will produce a final significance value for each high street (Q_j).

➢ To calculate the utility degree of each high street:

- Divide the significance value (Q_j) for each high street by the largest significance value (Q_j) of the high streets, then multiply by 100.

Step 6: Develop and implement recommendations from model output

➢ Review the ranking output from the model. Identify which high streets are ranked top and which are ranked bottom.

➢ Refer back to the criteria weightings and values. Consider the following questions:

- Which criteria were ranked most important?
- How have the high streets fared against those criteria?

➢ Where high streets have performed poorly in terms of the most important criteria, develop strategies to improve that particular feature. By focusing energy and resources on addressing the poor performance of criteria that are very important to high street sustainability, decision makers can ensure the best use of finite resources to make the greatest contribution to high street sustainability. The recommendations/strategies developed may not be new concepts, however the ability to identify which strategies are going to produce the greatest contribution to improved high street sustainability makes the model a valuable tool for stakeholders with limited resources.

Step 7: Review sustainability of high streets

➢ Follow up on the implementation of recommendations/strategies by applying the model again after a set time period.

➢ Regularly apply the model (e.g. annually, biannually etc.) to ensure that changing stakeholder needs and expectations and their impact on high streets can be understood into the future.

8.5. Chapter summary

This chapter has presented a practical application of the high street sustainability model that has involved the use of the MCDM method COPRAS. The model was applied the assessment of 8 real high street case studies from across England. The results of the assessment have been presented and discussed, and the potential benefits and beneficiaries of the model have been highlighted.

8.6. Conclusions from the model development and application

The primary aim of the research was to develop a model for the assessment of high street sustainability. MCDM methods were deemed to be an appropriate tool with which to develop the model due to their ability to deal with complex and conflicting criteria; their ability to factor in the importance of criteria to high street sustainability; and their ability to rank alternatives.

Five appropriate MCDM methods (WSM, RAHP1&2, TOPSIS, COPRAS and modified COPRAS) were applied to real high street case studies. Following the comparative analysis of the five methods, COPRAS was deemed to be the most appropriate method with which to develop the final model. The COPRAS method proved to be clear and understandable and was able to deal with quantitative, qualitative, maximising and minimising criteria all in one assessment. Furthermore, in addition to providing a complete ranking of alternatives, the method also produced utility degrees to indicate the extent to which one alternative was better or worse than the others.

Finally the model was applied to eight high street case studies from across England. The model enabled the high streets to be assessed against a broad set of criteria that extended beyond their retail and economic functions by reflecting their holistic economic, environmental and social performance. The application of the model has demonstrated its practical use for the assessment of high street sustainability. Whilst it is important that high streets compared by the model are as comparable as possible in terms of their size and wider external factors, the model can be generalised for use in other areas by a variety of stakeholders. Different alternatives can be selected and criteria values relating to the new alternatives can be input, therefore enabling different locations to be assessed. Different criteria weights can also be obtained to reflect the needs and expectations of consumers in different high street locations. The assessment criteria can also be adapted to reflect varying circumstances. Criteria may be added or removed depending on the relevance to the high

streets being assessed. Furthermore, by incorporating alternatives that reflect the same high street at set intervals, the model can indicate the improvement or decline of a high street's sustainability over time. The adaptability of the model means that it can be applied in a variety of settings in other areas of England, the wider UK, and internationally.

Chapter 9: Discussion and conclusions

9.1. Introduction

This chapter draws together the key conclusions of the thesis, highlighting the originality and relevance of the study. The limitations that were encountered during the research are also highlighted along with reflections and recommendations as to how the research could be taken further.

The innovative use of MCDM methods to develop a model with which high street sustainability can be assessed provides a significant contribution to literature concerning high street decline, sustainable communities and the application of MCDM methods.

A comprehensive review of literature provided a context upon which the research could build and highlighted the research problem investigated by this study. The literature review highlighted the retail centric and economically focused nature of existing high street performance measures. The literature also stressed the importance of creating truly sustainable communities but also highlighted how the sustainability of high streets – beyond simply economic success - is given little attention. It therefore became apparent that there was scope to develop a more balanced measure of high street performance that recognised the variety of economic, environmental and social elements of a high street. Further, given the increasing priority of sustainability internationally, it became evident that a shift in the way that high street success is measured is required in order to better align policy and practice with national and international sustainability agendas.

9.2. Research aims and objectives

Following the identification of the research area and problem, the following aim and objectives were developed:

Aim: To develop a model for the assessment of sustainable high street performance that reflects evolving stakeholder needs and expectations.

Objectives:

1. To critically analyse the trends of traditional high streets from 1800 to the present day.
2. To evaluate the UK and EU policy framework with regard to sustainable development and high streets.

3. To establish a comprehensive set of criteria comprising factors that influence the success and sustainability of high streets.
4. To validate the developed criteria through surveys completed by industry professionals from across England and local residents of selected English case study high streets.
5. To determine criteria weights to reflect the needs and expectations of industry professionals and local residents with reference to high streets.
6. To develop a model for the assessment of sustainable high street performance using statistical tests and multiple criteria decision making analysis methodology.
7. To conduct a practical case study assessment in England to test and demonstrate the effectiveness of the model.

The previous chapters of this thesis outline how the various stages of the research addressed the aims and objectives of the study.

9.3. Summary of conclusions

Sections 4.12, 6.5 and 8.6 present specific conclusions from the literature review, data analysis and model development. This section provides a summary of those conclusions and highlights how the model produced by this study has addressed the research problem and has contributed to addressing the gap in the literature.

The literature review highlighted the external factors that have contributed to changing consumer needs and expectations, and consequently the evolution of the role of high streets. Whilst, in the past, the retail and economic function of high streets has taken precedence, the literature highlighted how the social and experiential functions of high streets are growing in importance, and the requirement for retail floor space on high streets is falling. By exploring the range of economic, environmental and social factors that influence high street performance, the literature review highlighted the importance of linking the concept of sustainability to high streets.

The review discussed existing measures of high street performance. Key criticisms of existing measures included their retail centric and economically focused nature (Griffiths et al., 2008; BIS, 2011; Coca-Stefaniak, 2013); lack of recognition of local and social factors (e.g. Powe and Hart, 2009; Hart et al., 2013); insufficient recognition of evening and night-

time economies (Coca-Stefaniak, 2013); and insufficient recognition of the importance of creating a balance between the town centre offering and the needs and expectations of high street users (Coca-Stefaniak, 2013). It therefore became evident that broader, more inclusive sets of performance measures that account for evolving consumer needs and expectations were required. These findings spurred the identification of the model's wider set of assessment criteria and sub-criteria that reflect a high street's economic, environmental and social functions. The literature findings also spurred the review of methods that could enable the needs and expectations of high street stakeholders to be accounted for in the final assessment model.

Following a review of MCDM methods, sub-criteria importance scores were obtained from industry professionals based in England, and residents of the eight English high streets selected for investigation. The importance scores informed the relative weights of the sub-criteria; this enabled the needs and expectations of both the industry professionals and residents to be accounted for in the high street sustainability assessment model. The statistical analysis of the sub-criteria importance scores assigned by different respondent groups further highlighted the importance of accounting for the needs and expectations of a range of high street stakeholders when assessing high street performance. The analysis identified statistically significant differences in the importance scores assigned to the sub-criteria, with industry professionals placing significantly more importance on the more economic functions of high streets compared to the residents. Conversely, the residents placed significantly more importance on the more social elements of high streets compared to the industry professionals. The further statistically significant differences between other groups (e.g. 'town' groups and 'gender' groups) further emphasised the importance of accounting for the varying needs and expectations of the local consumer base when assessing high street performance.

MCDM methods were identified as an appropriate tool with which to develop the model due to their ability to deal with complex and conflicting assessment criteria, their ability to reflect the varying needs and expectations of high street stakeholders through criteria weights, and their ability to rank alternatives (in this case, high streets) from best to worst in terms of the weighted assessment criteria. A comparative analysis of five suitable MCDM methods was undertaken which identified the COPRAS method to be most appropriate for the final high street sustainability assessment model. The COPRAS method proved to be clear and understandable and was able to deal with quantitative, qualitative, maximising and

minimising criteria all in one assessment. Furthermore, in addition to providing a complete ranking of alternatives, the method also produced utility degrees to indicate the extent to which one alternative was better or worse than the others.

The high street sustainability assessment model was applied to eight English high streets from across England. The model assessed the high streets against its broad set of criteria that extend beyond a high street's retail and economic functions by reflecting their holistic economic, environmental and social performance. Furthermore, the weighting of the assessment criteria enabled the needs and expectations of both industry professionals and local residents to be reflected in the assessment. It should be noted that due to the greater representation of certain professional and resident respondent groups (e.g. private sector professionals, professionals based in the North West, over 65's, married, retired etc.), the results of the model application (presented in chapter 8) may be more reflective of the opinions of those stakeholder groups, and less reflective of others (e.g. public sector professionals, 16-25 year olds, single respondents etc.); whilst this should be acknowledged, it did not undermine the purpose of the model application in this study. Section 9.6 discusses the limitations of the research in further detail and suggests recommendations for overcoming these limitations in any future research.

The application of the model demonstrated its practical use for the assessment of high street sustainability. Whilst it is important that high streets compared by the model are as comparable as possible in terms of their size and wider external factors, the model can be generalised for use in other areas by a variety of stakeholders. Different alternatives can be selected and criteria values relating to the new alternatives can be input, therefore enabling different locations to be assessed. Different criteria weights can also be obtained to reflect the needs and expectations of consumers in different high street locations. The assessment criteria can also be adapted to reflect varying circumstances. Criteria may be added or removed depending on the relevance to the high streets being assessed. Furthermore, by incorporating alternatives that reflect the same high street at set intervals, the model can indicate the improvement or decline of a high street's sustainability over time. The adaptability of the model means that it can be applied in a variety of settings in other areas of England, the wider UK, and internationally.

The review of literature highlighted the importance of linking the concept of sustainability to high streets. Furthermore, it highlighted the need for broader, more inclusive performance

measures which reflect the holistic role of high streets as economic, environmental and social centres. The literature also emphasised the need to recognise the evolving needs and expectations of a range of high street stakeholders when assessing high street performance. By creating an adaptable high street sustainability assessment model that measures high street performance against a broad set of economic, environmental and social factors that are weighted in accordance with the needs and expectations of key high street stakeholders, this study has addressed the gaps identified by the review of literature.

9.4. Beneficiaries of the model

Key beneficiaries of the model include central and local government, town centre management teams, local businesses and local communities. The model can help stakeholders to assess a high street's performance against a broad set of criteria that reflect its holistic purpose as a centre for economic, social and environmental activities, not just as a centre for retail and economic activity. The model enables stakeholders to compare a high street against comparable centres, or against itself at set intervals, taking into account the needs and expectations of the local consumer base. It can help stakeholders to identify areas of improvement and consequently develop relevant improvement strategies. Moreover, due to the weighting of the criteria, it can indicate which improvement strategies would be most beneficial to improving the sustainability of high streets and therefore can help to determine where money and resources are best spent.

If utilised at a national level, the model could inform the development of national high street policies, strategies and initiatives that aim to improve the condition of high streets. The model's incorporation of consumer needs and expectations could help governments to develop national strategies that are better aligned with changing consumer behaviour. By implementing recommendations that account for changing consumer behaviour, high streets may stand a better chance of remaining relevant into the future. Furthermore, by altering perceptions of high street performance from a focus on retail and economic activity to a holistic view a high street's economic, environmental and social roles, the model could help governments in aligning their high street policies with global sustainability commitments.

At the local authority level the model could inform the development of local plans and strategies and local authority retail studies. Again, the model could help these local policy makers to better align their strategies with evolving consumer needs and expectations and national and global sustainability commitments, therefore helping to create more resilient

high streets into the future. If local authorities were to utilise the model in their retail studies, they could be better informed as to which high streets within their boundaries require the greatest priority and resource input.

The model would also be beneficial to local businesses and local community groups. A relatively small amount of funding could enable such stakeholders to utilise the model themselves using their own data collection. The outcome of the model could help these local stakeholders to implement their own improvements (where appropriate), but also to lobby their local councillors and MPs in implementing more invasive improvements which require local authority permission/involvement. Those without the means to utilise the model themselves could still benefit from its application. Such individuals (e.g. individual community members) could assist in implementing socially focused recommendations derived from the model. Furthermore, local residents of high streets could benefit from the model's application by enjoying the implementation of improvements that were informed by their needs and expectations. Local businesses could also benefit from the potential increased footfall that could result from the creation of high streets that better meet the needs and expectations of the local consumer base.

The ability for the model to incorporate both small and large numbers of alternatives makes it flexible to the varying requirements of the different stakeholders who may wish to utilise it. The adaptability of the model is further enhanced by the potential for it to be used as a tool for the comparison of different high streets, as well as a tool for the ongoing monitoring of one high street. Moreover, the ability for the criteria, weights, alternatives and values to be interchanged optimises the potential for the model to be used to assess high street sustainability all over the world.

9.5. Reflections

The literature review highlighted the evolving expectations of consumers which are increasingly becoming misaligned with the traditional role of the high street as the focus of retail spending. Indeed, many industry experts predict the reduction in high street retail units and the shift in the purpose of these centres, and many large retail companies are already in the process of scaling back their physical presence on UK high streets. However, the literature highlighted the continued tendency for policy makers to focus on the high street as a retail hub. This viewpoint is perhaps reinforced by the income generated from such uses (e.g. high street retail rents and business rates).

The misalignment of professional opinion and the needs and expectations of consumers is evident from the statistically significant findings of this research. For high streets to remain relevant into the future, it is vital that they fulfil the needs and expectations of the communities that they serve. Policy makers therefore need to shift their mindsets and acknowledge, plan for, and embrace the changing needs and expectations of the modern high street user. This will involve relinquishing the focus on retail as the primary purpose of high streets.

9.6. Research limitations and recommendations

A number of limitations were encountered during this research study. The initial research proposal sought to obtain data from local residents through paper surveys, to be returned to the researcher in freepost envelopes. Unfortunately, when it came to administering the survey, the cost of printing 2,400 paper surveys and providing the same number of freepost envelopes proved too costly for the university to fund. Consequently the researcher secured permission for 2,400 leaflets to be printed, directing potential participants to an online survey. The researcher personally travelled to all eight high street locations and spent approximately 64 hours distributing the leaflets to local residents. Unfortunately the leaflets proved ineffective in most locations; in Birkenhead for example, there were no responses from the 300 leaflets distributed. The researcher therefore had to change tactic and instead contacted local community groups and organisations for assistance. This proved to be a more fruitful exercise and was much less time consuming given that, in most cases, those contacted were happy to distribute the survey details to a wider group of people on the researcher's behalf. Unfortunately, the researcher's attempts to engage local community groups and organisations in Corby was not fruitful, and the response rate did not increase from the initial 11 that were obtained following the leaflet exercise.

It should also be noted that, although the resident survey asked participants to indicate their town of residence from the eight high streets – and did not allow participants to continue without selecting one –, it is possible that participants may have selected a town when they didn't actually live there. However, the researcher did receive a number of emails from potential respondents apologising for not participating due to the fact that they didn't live within the boundaries of the respective town. It is therefore anticipated that the number of respondents completing the survey when they didn't live in one of the eight towns is likely to be low, although the possibility should be noted.

If the research was to be repeated, it would beneficial for sufficient funding to be attained to enable the distribution of paper surveys. Whilst distributing leaflets in the towns, the researcher was approached by several residents who returned their leaflets as they did not have access to the internet. Furthermore, the researcher was also contacted by email by a small number of potential respondents who stated that they were having technical difficulties with the online survey and were unable to complete it. By administering paper surveys, those without internet access and those who experienced technical difficulties would have been able to participate in the study. Moreover, it is likely that the response rate would be higher if paper surveys were used.

Whilst the researcher sought to obtain a variety of local resident participants, in terms of age, gender etc., as the survey relied on the self-selection of participants, the researcher had no control over the demographic profile of the participant sample. Consequently the respondent sample comprised a much higher proportion of over 65's compared to other age groups. If the research was to be repeated it would be useful to incorporate an incentive for participation in the resident survey. This may be more effective in encouraging a wider range of respondents.

The researcher sought to achieve a variety of respondents for the professionals' survey and obtained contact details for a range of different industry professionals. However, like the residents' survey, the professionals' survey was based on self-selection. A further limitation was achieving sufficient representation from different types of professionals. For example, the researcher sought to obtain a greater number of responses from town centre managers and academics. However, obtaining contact details for town centre managers specifically proved difficult. In terms of academics, the researcher received a number of responses from academics who felt that they were not sufficiently educated on high streets to provide a contribution. If this study was to be repeated, the researcher would seek to obtain a larger sample of professionals, with greater representation from the less represented professional groups. In order to do this it may be beneficial to seek both academic and industry collaboration on the project.

The researcher also encountered some limitations involving the development of measurement tools and the obtaining of secondary criteria values. As there was no existing data that related specifically to the high streets (e.g. average commercial rent per square metre of high street, average crime rate per square kilometre of high street etc.), the

researcher had to estimate the boundaries of the high streets in order to obtain values that could be translated into scaled metric measures (e.g. per square metre of high street). Appendices 4 and 6 present the estimated boundaries for each high street when acquiring data for crime, commercial rent and BREEAM certified buildings. Appendix 5 presents the ONS output areas from which household data was derived. Given the nature of high streets, it is difficult to define exact boundaries, however, if the model was to be widely used, it would be useful for local authorities to agree set high street boundaries (for administrative purposes) and make available some key scaled statistics that reflect the areas within the defined boundaries. It would also be useful for the model if there was an available statistic for the average business rates bill in a high street. The data available did not allow the researcher to ascertain the extent to which businesses located in the high streets benefitted from the various business rate concessions available. Therefore it was deemed simpler to use the measure of average commercial rent per square metre of the high streets to indicate the level of business rates paid, i.e. the higher the rent, the higher the business rates. This measure is not ideal, however unless a statistic is made available, as suggested, it is difficult to accurately estimate the financial burden of rates in a particular high street.

The lack of available data to measure the use of environmentally sustainable materials in the high streets was also a limitation and meant that the sub-criterion had to be removed from the model. However, developers, architects and construction firms have become more conscious of their environmental footprint over recent years, and as a result have become more transparent in their choice of materials for both new builds and retrofitting. Therefore it is anticipated that in time suitable information will be available with which to develop a measurement tool for the sub-criterion 'environmentally sustainable materials'.

9.7. Taking the research further

To further examine the reliability of the outcomes and the robustness of the model, sensitivity analysis could be undertaken. Sensitivity analysis would enable the researcher to identify any errors or any input data which may cause significant uncertainty in the output, and would facilitate further understanding of the relationships between the input and output of the model.

The research could also be taken further by applying the model on a national scale, to a larger number of town centres across England. It could also be applied to high streets falling into different settlement hierarchy categories (e.g. city centres and smaller urban centres) and

could be adapted for use in other areas of the UK (e.g. Wales, Northern Ireland and Scotland) as well as in other developed countries across the world. The limitations of this study, as discussed above, should be taken into account when taking the research further. If applied on a larger scale, it would be advantageous for formal funding/collaboration to be obtained from the public and private sectors to maximise the potential engagement of various stakeholders and to enable the most fruitful forms of data collection to be administered on a large scale.

9.8. Summary and original knowledge contribution

This research set out to explore knowledge gaps concerning the topics of high street performance and sustainable communities. The completion of the thesis has therefore significantly contributed to new knowledge in these subject areas. The review of literature highlighted the following:

- The importance of linking the concept of sustainability to high streets;
- The criticisms of existing performance measures which are considered to be too economically focused;
- The need to develop broader, more inclusive sets of performance measures that better reflect a high street's economic, environmental and social functions; and
- The importance of acknowledging and accounting for the evolving needs and expectations of a range of high street stakeholders when assessing performance.

This thesis provides an original contribution to knowledge through the development of an adaptable high street sustainability assessment model that encompasses a broad set of weighted criteria that reflects the needs and expectations of high street stakeholders. This thesis has challenged the traditional economically centric view of high street performance by connecting the concept with broader sustainability issues. The high street sustainability assessment model developed by this research (figure 40) has enabled a more balanced assessment of high street performance based on economic, environmental and social factors. The model incorporates an inclusive set of criteria that has been validated by industry professionals based in England, and the local residents of the selected English case study high streets. The criteria comprise a range of economic, environmental and social factors that influence high street sustainability, and therefore contribute to a broader understanding of high street performance that is inclusive of a high street's economic, environmental and social functions. Furthermore, the model incorporates the needs and expectations of local

community members into the assessment of a high street at a time when evolving consumer trends are having major implications on the vitality and viability of many centres. The thesis therefore presents an innovative model for the assessment of high street sustainability that recognises the wide range of high street functions and acknowledges and incorporates the changing needs and expectations of local communities. The high street sustainability assessment model has therefore addressed the issues highlighted by the review of literature (as stated above).

This research has utilised the MCDM method COPRAS for the first time for the purpose of measuring high street sustainability. The use of COPRAS enabled the model to incorporate maximising, minimising, quantitative and qualitative criteria, comprising a variety of units of measure. It also enabled the importance of the criteria to high street sustainability to be taken into account in the criteria weights. Consequently the model developed can not only assess high streets in terms of their relative sustainability, but can also inform recommendations and indicate areas of improvement that would be most beneficial to improved high street sustainability. Furthermore, the application of the model on the eight selected high street case studies has demonstrated its use in practice.

It is hoped that this thesis will help to shift the mindsets of policy makers from a focus on the retail and economic functions of high streets, to a more holistic view which recognises their economic, environmental and social features and functions. It is hoped that this study will spur further research into this subject area and will help to create high streets that remain relevant to changing consumer needs and expectations. Ultimately it is hoped that this thesis contributes to the continued existence of the high street.

Publications related to the thesis

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Appendix 1 – Professionals' survey and participant information sheet

LIVERPOOL JOHN MOORES UNIVERSITY

Title of Project*:* Solutions and recommendations for the reverse of high street decline through the application of national and global sustainability strategies.

Name of Researcher and School/Faculty: Isabel Atkinson, PhD research student at the Department of the Built Environment, Liverpool John Moores University.

Dear Participant,

You are invited to take part in a research study investigating the environmental, economic and social success of high streets in England. Please note that full ethical approval has been approved for this study by Liverpool John Moores University. Before you decide whether or not to participate it is important that you understand why the research is being done and what it involves. Please take time to read the following information. If you would like any further information about this study then please do not hesitate to contact the researcher through the contact details below.

1. What is the purpose of the study?

The decline of a high street can have a damaging effect on the health of a local economy through store closures, increased unemployment and reductions in custom etc. Decline can also negatively affect the quality of the environment in a high street, as well as ambitions for improved environmental sustainability. Furthermore, the deterioration of a high street can lead to complex social issues which may undermine the health and well-being of local communities.

This study will investigate criteria which contribute to successful and sustainable high streets. The aim of this research is to create a model which will enable high streets to be compared against one another through factors including (amongst others): physical fabric, movement and management. There will be two primary outcomes from the model:

1. An assessment of each high street in terms of success and sustainability
2. Key recommendations for the revival of struggling town centres

2. Do I have to take part?

No, your participation in this study is entirely voluntary. It is up to you to decide whether or not to take part.

3. What will happen to me if I take part?

If you decide to participate in this study you should complete the online survey (accessed via the link in the email), which will take approximately 10 minutes to complete.

The survey is anonymous and therefore you will not be identifiable from the answers you provide. Due to the anonymous nature of the survey you will not be able to retrieve your answers from the study once you have completed and submitted the survey.

The anonymous data you provide will be treated with strict confidentiality and will be compared against other data collected.

4. Are there any risks / benefits involved?

There are no risks involved in participating in this study. Your data will inform the creation of the proposed model and enable recommendations to be made to assist declining high streets in becoming more successful and sustainable.

5. Will my taking part in the study be kept confidential?

Due to the anonymous nature of the survey your anonymity is guaranteed. All data obtained will be treated with strict confidentiality and will be stored on a Liverpool John Moores University computer that is protected by a username and password known only by the researcher.

This study has received ethical approval from LJMU's Research Ethics Committee (REC reference number: 16/BUE/007).

Contact Details of Researcher:
PhD researcher: Isabel Atkinson
Email: I.J.Atkinson@2008@ljmu.ac.uk
Address: Department of the Built Environment, Liverpool John Moores University, Byrom Street, Liverpool, L3 3AF

Contact Details of Academic Supervisor:
Supervisor: Dr Vida Maliene
Email: V.Maliene@ljmu.ac.uk
Address: Department of the Built Environment, Liverpool John Moores University, Byrom Street, Liverpool, L3 3AF

If you have any concerns regarding your involvement in this research, please discuss these with the researcher in the first instance. If you wish to make a complaint, please contact researchethics@ljmu.ac.uk and your communication will be re-directed to an independent person as appropriate.

Professionals' survey

p. 1 Introduction

Dear Participant

Thank you for taking the time to complete this survey which is part of a PhD research project investigating successful and sustainable high streets in England. The aim of the research is to create a model incorporating the factors which influence high street performance, and from there provide recommendations to key high street stakeholders.

The survey takes approximately 10 minutes to complete. By completing the survey you are consenting to be part of this research study, however, please note that:

- Responding to the survey is voluntary
- The survey is anonymous and all answers will be treated with strict confidentiality
- Due to the anonymous nature of the survey you will not be able to retrieve your answers once you have completed and submitted the survey
- Full ethical approval has been granted for this study from Liverpool John Moores University

For any questions relating to the survey, or the research itself, please note the following lines of enquiry:

PhD research student:

Isabel Atkinson - I.J.Atkinson@2008.ljmu.ac.uk

Supervisor:

Dr Vida Maliene - V.Maliene@ljmu.ac.uk

p. 2 Professional background

1 Which of the following best describes your professional title?

- Architect
- Surveyor
- Developer
- Planning professional
- Town centre manager
- Academic/ researcher
- Other

a If you selected Other, please specify:

2 Which of the following best describes the organisation that you work for?

- Public sector (e.g. local authority)
- Private sector
- Educational (e.g. university)
- Self-employed (e.g. consultant)

3 How long have you been working in your current profession?

- 0-2 years
- 3-5 years
- 6-10 years
- Over 10 years

4 In which English region are you professionally based?

- East of England (East Anglia)
- East Midlands
- London
- North East
- North West
- South East
- South West
- West Midlands
- Yorkshire and the Humber

p. 3 Criteria for successful and sustainable town centres

Please see *explanation of criteria* (attached to the email invitation) for further information on each criterion.

5 With reference to the physical fabric of a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Streets	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Signage	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Buildings	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Trees and landscape	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Public open space	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Infrastructure	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Design	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under physical fabric please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

6 Regarding movement within a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Pedestrian pavement/ walkways	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Cycling facilities	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Public transport	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Parking facilities	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Goods/ service vehicles	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Traffic management	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under movement please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

7 With reference to exchange (the potential for interaction) within a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Social space	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Economic space	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Political space	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Cultural space	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Community space	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under exchange please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

8 With reference to real estate within a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Retail	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Entertainment	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Work places	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Civic venues	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Residential	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Health and social facilities	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under real estate please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

9 Regarding the psychological aspect of a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Identity/ image	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Experience	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Atmosphere	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under psychology please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

10 With reference to safety and security within a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Actual crime	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Perceived crime	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
CCTV and security presence	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Street lighting	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under safety and security please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

11 In respect of the management of a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Town centre management team	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Partnership/ stakeholder involvement	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Marketing	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Digital connectivity/ internet presence	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under management please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

12 With reference to environmental protection within a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Environmental initiatives/ carbon reduction schemes	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Environmentally sustainable materials	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Waste management and recycling schemes	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under environmental protection please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

13 With reference to economic viability in a town centre, please indicate how important you think the following criteria are to the environmental, economic and social success of a town centre.

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Commercial rent	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Business rates	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Trading hours	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Complementary daytime, evening and night-time economies	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

a If you feel that there are any other criteria that fall under economic viability please state them below and provide a score of 1 - 5 (as above). Additionally, if you have any comments regarding the above criteria, please feel free to write them in the box below.

p. 4 Image and experience

4 In your opinion and experience what factors contribute to a unique town centre image/identity? (select all that apply)

- Public artwork
- Low levels of crime
- A good choice of restaurants and bars
- A good choice of retail (including independent and specialist)
- A good choice of leisure and entertainment (e.g. music venues, theatres, leisure centres etc.)
- Cultural facilities (e.g. museums, galleries, places of worship etc.)
- Good quality public open spaces (e.g. parks, squares etc.)
- Organised events (e.g. markets, festivals, fairground rides etc.)
- Buildings of architectural interest (e.g. historic buildings, unique and innovative design, interesting use of material etc.)
- An attractive and clean physical environment
- Efficient transportation systems (e.g. underground trains, trams, quality road infrastructure etc.)
- Other

a If you selected Other, please specify:

15 In your opinion and experience what factors contribute to a unique town centre experience? (select all that apply)

- A "social buzz"
- Public artwork
- Good customer service
- Thoughtful use of street lighting
- Digital connectivity/ access to wifi
- A good choice of restaurants and bars

- A good choice of retail (including independent and specialist)
- A good choice of leisure and entertainment (e.g. music venues, theatres, leisure centres etc.)
- Cultural facilities (e.g. museums, galleries, places of worship etc.)
- Good quality public open spaces (e.g. parks, squares etc.)
- Aroma (from outdoor food stalls, shops, plants and flowers etc.)
- An attractive and clean physical environment
- Organised events (e.g. markets, festivals, fairground rides etc.)
- Buildings of architectural interest (e.g. historic buildings, unique and innovative design, interesting use of material etc.)
- Efficient transportation systems (e.g. underground trains, trams, quality road infrastructure etc.)
- Other

a If you selected Other, please specify:

p. 5 Survey complete

Thank you for taking the time to complete this questionnaire.

PhD researcher: Isabel Atkinson

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Department of the Built Environment, Faculty of Engineering and Technology
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Byrom Street, Liverpool, L3 3AF

Appendix 2 – Explanation of criteria to accompany professionals' survey

Explanation of criteria

Physical fabric: The physical form of a town centre

Sub-criteria	Explanation
Streets	The layout and intersection of streets within the town centre
Signage	Traffic signs, pedestrian signs, advertisements etc.
Buildings	The physical structure containing shops, restaurants, museums, work places etc.
Trees and landscape	Trees and shrubbery, flower beds, grass verges etc.
Public open space	Parks, squares, outdoor seating areas etc.
Infrastructure	Phone boxes, telecom cabinets, benches, bins etc.
Design	The coordinated design of the centre as a whole

Movement: Accessibility by foot, bicycle, private car or public transport

Sub-criteria	Explanation
Pedestrian pavement/ walkways	Pavements/ sidewalks, pedestrianised areas, pathways, elevated walkways etc.
Cycle facilities	Cycle paths/ lanes, bicycle racks etc.
Public transport	Buses, trains, trams, ferries etc.
Parking facilities	Pay and display parking, multi-storey car parks, on-street parking, temporary car parks etc.
Goods/ service vehicles	Loading/ unloading lorries and vans etc.
Traffic management	Speed bumps, speed cameras, one-way systems, bus lanes etc.

Exchange: The sociological effect of physical spaces on people, and the capacity for interaction in these spaces.

Sub-criteria	Explanation
Social space	The collective spaces which facilitate socialising (e.g. cafés, restaurants, parks, seating areas etc.)
Economic space	The collective spaces which facilitate economic activity (e.g. shops, businesses, markets etc.)
Political space	The collective spaces which facilitate political engagement (e.g. town hall, council buildings, outdoor podiums/ platforms etc.)
Cultural space	The collective spaces which facilitate cultural engagement (e.g. museums, galleries, theatres, art installations etc.)

Community space	The collective spaces which facilitate community engagement (e.g. community centres, parks, leisure clubs, markets, places of worship etc.)

Real estate: The type of properties present in a town centre

Sub-criteria	Explanation
Retail	Retail premises present in the centre (e.g. shops, markets etc.)
Entertainment	Venues providing entertainment (e.g. theatres, cinema, amusement arcades, casinos etc.)
Work places	Places of employment (e.g. shops, businesses, services etc.)
Civic venues	Venues for civic purposes (e.g. town hall, job centre, citizen advice bureau etc.)
Residential	Flats and houses for owner occupation and social and private rental
Health and social facilities	GP practices, dentists, opticians, walk-in centres, local maternity services, sexual health clinics, day centres etc.

Psychology: The perception of a centre

Sub-criteria	Explanation
Identity/ image	The reputation and unique identity of a place
Experience	The experience of visiting a town centre
Atmosphere	A combination of the sights, smells and sounds of a place, the “social buzz” etc.

Safety and security: Aspects contributing to safety and security in a town centre

Sub-criteria	Explanation
Actual crime	The actual statistics of criminal activity
Perceived crime	The perception of crime due to things like graffiti, vandalism, litter and dereliction
CCTV and security presence	The presence of security features such as CCTV, security guards, “Bobbies on the Beat”, anti-vandal paint etc.
Street lighting	Street lamps, floor lighting, illumination of buildings and monuments from up-lighting etc.

Management: The coordinated management of a town centre

Sub-criteria	Explanation
Town centre management team	A selected group of individuals with relevant skills and knowledge whose responsibility it is to provide the coordinated management of a town centre
Partnership/ stakeholder involvement	Investment through public-private sector partnership, the involvement of local businesses and communities in the ongoing and future development of a centre etc.
Marketing	Television, radio, newspaper and internet advertisements. Coordinated branding using signage, logos, website etc.
Digital Connectivity/ internet presence	Town centre website/ app, 4G connectivity within the centre, WIFI hotspots etc.

Environmental protection: Addressing environmental issues in a town centre

Sub-criteria	Explanation
Environmental initiatives/ carbon reduction schemes	Coordinated installation of solar panels/ wind turbines, rain water harvesting, wildlife preservation/ wildflower gardens, coordinated bulk purchasing of energy efficient heating systems and triple glazing etc.
Environmentally sustainable materials	Locally sourced materials, materials with low carbon footprint (e.g. bamboo, straw, clay etc.)
Waste management and recycling schemes	Coordinated waste removal, street cleaning, town centre wide recycling, town centre wide initiatives aimed at reducing waste (e.g. minimising packaging) etc.

Economic viability: The ability for a town centre to facilitate trade successfully

Sub-criteria	Explanation
Commercial rent	The cost of renting commercial space such as shops and offices
Business rates	A tax on the occupation of non-domestic properties
Trading hours	The daily opening hours of shops and businesses
Complementary daytime, evening and night-time economies	The existence of complementary daytime (e.g. shops and daytime services), evening (e.g. restaurants, cinemas, bars) and night-time (e.g. clubs, takeaways) trade – a smooth transition from one to another to avoid lull periods

Appendix 3 – Residents' survey and participant flyer

Faculty of Engineering and Technology
Department of the Built Environment,
Liverpool John Moores University,
Liverpool, L3 3AF

LIVERPOOL JOHN MOORES UNIVERSITY

(Insert) Town Centre: Love it or loathe it?

How do you feel about your local town centre?

Dear Resident,

You are invited to participate in a research study.

I am a PhD research student at Liverpool John Moores University studying the subject of high street decline and the potential for successful and sustainable high streets.

As part of my PhD thesis I am undertaking research in a number of case study town centres. The aim of my research is to compare the town centres in terms of their activity and sustainability, and to produce recommendations on how high streets can become more environmentally, economically and socially successful.

You have received this invitation as you live within close proximity to one of my selected town centres.

Case study locations:

Basingstoke
Birkenhead
Corby
Gosport
Great Yarmouth
Rotherham
Shrewsbury
Southport

Your questions answered:

How do I take part?

Participation in this study simply requires you to complete an online survey, accessed via the link provided. The survey takes approximately 15 minutes to complete.

What type of questions will I be asked?

The survey enquires into your socio-demographic information and your shopping habits, your opinion of what makes a successful town centre, and your opinion of your local town centre from a variety of perspectives.

Will my taking part be kept confidential?

Yes. Due to the anonymous nature of the survey your anonymity is guaranteed.

What will happen to the data I provide?

The data you provide will be compared against other data collected. All data obtained will be treated with strict confidentiality and will be stored on a Liverpool John Moores University computer that is protected by a username and password known only by the researcher.

To access the survey type the following link into your internet browser:

https://ljmu.onlinesurveys.ac.uk/resident-survey

Contact Details of Researcher:
PhD researcher: Isabel Atkinson
Email: I.J.Atkinson@2008.ljmu.ac.uk

Contact Details of Academic Supervisor:
Supervisor: Dr Vida Maliene
Email: V.Maliene@ljmu.ac.uk

This study has received ethical approval from LJMU's Research Ethics Committee (REC reference number: 16/BUE/007).

If you have any concerns regarding your involvement in this research, please discuss these with the researcher in the first instance. If you wish to make a complaint, please contact researchethics@ljmu.ac.uk and your communication will be re-directed to an independent person as appropriate.

Residents' survey

p. 1 Welcome to the resident survey

Thank you for taking the time to complete this survey.

Click **next** to begin.

Please note: *throughout this survey reference is made to your "local town centre". By "town centre" the researcher is referring to the main retail and commercial centre of your local town.*

p. 2 Socio-demographic

1 Which of the following towns is your local town centre?

- Basingstoke
- Birkenhead
- Corby
- Gosport
- Great Yarmouth
- Rotherham
- Shrewsbury
- Southport

2 What is your gender?

- Male
- Female
- Prefer not to say

3 What is your age?

- 16 – 24
- 25 – 34
- 35 – 44
- 45 – 54
- 55 – 64
- 65+

4 What is your ethnicity?

- White
- Mixed/ Multiple ethnicity
- Asian/ Asian British
- Black/ African/ Caribbean/ Black British
- Other

a If you selected Other, please specify:

5 What is you marital status?

- Single
- Married
- Living with partner
- Widowed
- Divorced
- Separated

6 Which of the following best describles your living accommodation?

- I own my own home
- Living in rented accommodation
- Living with parents
- Living in sheltered accommodation
- Prefer not to say
- Other

a If you selected Other, please specify:

7 How many people live in your household?

- 1
- 2
- 3
- 4
- 5+

8 What is your occupational status?

- Employed full-time
- Employed part-time
- Self-employed
- Student
- Home maker
- Unemployed
- Unable to work
- Retired
- Prefer not to say

9 How long have you lived in your town?

- Less than 2 years
- 2 – 5 years
- 6 – 10 years
- Over 10 years

p. 3 Criteria for successful and sustainable town centres

10 How important do you feel the following features are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Streets	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Signage	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Buildings	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Trees and landscape	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Public open space (e.g. parks, squares)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Infrastructure (e.g. phone boxes, telecom cabinets, litter bins)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Design	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

11 How important do you feel the following features are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Pedestrian pavements/ walkways	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Cycling facilities	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Public transport	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Parking facilities	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Goods/ service vehicles (e.g. delivery vans/ lorries delivering stock to retailers)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Traffic management (e.g. speed bumps, bus lanes)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

12 How important do you feel the following spaces are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Social space (e.g. cafés, restaurants, parks)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Economic space (e.g. shops, business premises, markets)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Political space (e.g. town hall, council buildings, outdoor podiums)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Cultural space (e.g. museums, galleries, theatres)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Community space (e.g. community centres, parks, leisure centres, places of worship)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

13 How important do you feel the following types of property are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Retail	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Entertainment	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Work places	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Civic venues (e.g. library, citizen advice bureau, job centre)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Residential	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Health and social facilities (e.g. GP practices, dentists, opticians, sexual health clinics, day centres etc.)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

14 How important do you feel the following are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Identity/ image	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Experience	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Atmosphere	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

15 How important do you feel the following aspects of safety and security are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Actual crime (the actual criminal activity that occurs in an area)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Perceived crime (the perception of crime due to things like graffiti, vandalism, litter and dereliction)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
CCTV and security presence	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Street lighting	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

16 How important do you feel the following are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Town centre management team (a group of individuals with relevant skills and knowledge tasked with managing the town centre)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Partnership/ stakeholder involvement (e.g. public-private sector partnerships, the involvement of local businesses, community involvement etc.)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Marketing (e.g. television, radio, newspaper and internet advertisements; the coordinated branding of signage, logos, website etc.)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Digital connectivity/	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

internet presence (e.g. town centre website/ app, 4G connectivity in the town centre, WIFI hotspots etc.)					

17 How important do you feel the following environmental initiatives are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Environmental initiatives/ carbon reduction schemes	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Environmentally sustainable materials	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Waste management and recycling schemes	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

18 How important do you feel the following economic aspects are to the success of a town centre?

	1 - Not at all important	2 - Slightly important	3 - Fairly important	4 - Very important	5 - Extremely important
Commercial rent	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Business rates (tax on the occupation of non-domestic properties)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Trading hours	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Complementary daytime, evening and night-time economies (a smooth transition between daytime, evening and night-time activities to avoid lull periods)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

p. 4 Your opinion of your local town centre

19 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
The main streets within my local town centre have a logical layout which is easy to navigate	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
There is an unnecessary amount of signage in my local town centre that detracts from the centre's visual appearance	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The buildings situated within my local town centre contribute positively to its appearance	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The trees and landscaping within my local town centre contribute positively to its appearance	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

The public open spaces (e.g. parks, squares etc.) within my local town centre are attractive and maintained to a high standard	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The infrastructure (e.g. street furniture, telephone boxes, bus shelters etc.) within my local town centre contributes positively to its appearance	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
My local town centre has an attractive design	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

20 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
My local town centre has quality pavements and walkways which provide accessibility for all pedestrians	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
My local town centre has sufficient quality cycling facilities (e.g. bike racks, cycle lanes etc.)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
My local town centre is easily accessible by quality public transportation (e.g. bus, train, tram etc.)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
My local town centre has sufficient quality car parking facilities (e.g. secure, well maintained parking)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

The visitor experience is negatively affected by goods/ service vehicles (e.g. loading/ unloading lorries and vans)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
There are effective traffic management approaches present within my local town centre (e.g. speed bumps, speed cameras, one-way systems etc.)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

21 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
The social spaces (e.g. parks, cafés, restaurants etc.) encourage me to spend time socialising in my local town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The economic spaces (e.g. shops, businesses etc.) encourage me to spend money in my local town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The political spaces (e.g. town hall, outdoor podiums/platforms etc.) encourage me to actively engage in politics	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The cultural spaces (e.g. museums, galleries, theatres etc.) encourage me to spend my leisure time in the town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The community spaces (e.g. community	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

centres, leisure clubs etc.) encourage me to engage with the local community in the town centre					

22 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
The selection of retail on offer in my local town centre meets my shopping needs	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The selection of entertainment on offer in my local town centre meets my leisure needs	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
There are sufficient employment opportunities in my local town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The selection of civic venues (e.g. libraries, citizen advice bureau etc.) present within	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

the town centre is sufficient to meet my needs					
The selection of residential accommodation within the town centre is sufficient to meet the needs of the local population	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The health and social facilities (e.g. GP practices, walk-in centres, opticians etc.) in my local town centre sufficiently meet my needs	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

23 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
My local town centre has a positive identity/ image	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
My local town centre gives a	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

positive visitor experience					
My local town centre has a positive atmosphere	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

24 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
I perceive there to be high levels of criminal activity in my local town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
There is a sufficient amount of CCTV cameras and security presence within my local town centre to make me feel safe	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
The street lighting within my local town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

positively contributes to a feeling of safety in the evening and night-time					

25 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
My local town centre is effectively managed in a coordinated manner	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Partnership and stakeholder involvement (e.g. public-private sector partnership, Business Improvement Districts, community involvement) contribute positively to the day-to-day running and future development of my local town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

My local town centre is effectively marketed/ branded	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
My local town centre has embraced the digital age (e.g. town centre website, 4G connectivity in the centre, WIFI hotspots etc.)	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

26 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
There are effective environmental initiatives/ carbon reduction schemes in place within my local town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
Environmentally sustainable materials have been used in the construction of	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

the buildings, public spaces, parks etc. present within the town centre					
Effective waste management (inc. recycling) schemes are in place in the town centre	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

27 Please indicate how much you agree with the following statements.

	1 - Strongly disagree	2 - Slightly disagree	3 - Neither agree or disagree	4 - Slightly agree	5 - Strongly agree
The current trading hours of the shops and services in my local town centre meet my needs	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox
My local town centre comprises complementary daytime, evening and night-time economies (e.g. reducing the potential for lull periods between	Checkbox	Checkbox	Checkbox	Checkbox	Checkbox

daytime and evening)					

p. 5 How you use your local town centre

28 How often do you visit your local town centre?

- More than once a week
- Once a week
- Once a fortnight
- Once a month
- Once every 3 months
- Less than once every 3 months
- Never

p. 6 How you use your local town centre

29 How do you access your local town centre? (select all that apply)

- Private car
- Taxi
- Public transport (e.g. bus, train)
- Cycle
- Walk

30 For what purpose do you visit your local town centre? (select all that apply)

- Food shopping
- Non-food shopping (e.g. clothes, homeware, electricals etc.)
- To socialise with friends
- For entertainment purposes (e.g. museums, theatres, cinema etc.)
- For dining out/ collecting takeaways
- To access banking services
- To access healthcare services (e.g. dentist, GP, opticians etc.)
- To access hair/ barber and/or beauty services
- To access sports facilities and to exercise (e.g. gym, leisure facilities etc.)
- To access civic services (e.g. citizen advice bureau, council services, job centre etc.)
- To access specialised agents (e.g. travel agent, estate agent)
- To access public transport
- I work in the town centre
- Other

a If you selected Other, please specify:

p. 7 Online shopping

31 How often do you shop online?

- More than once a week
- Once a week
- Once a fortnight
- Once a month
- Once every 3 months
- Less than once every 3 months
- Never

p. 8 Online shopping

32 Why do you choose to shop online? (select all that apply)

- To save money
- To save time
- To avoid bad weather
- I have difficulty accessing physical retail outlets (e.g. town centres and retail parks)
- I enjoy browsing products from the comfort of my home
- I use the internet to research my purchases and secure the best price
- Other

a If you selected Other, please specify:

33 Which of the following goods/services do you buy/access online? (select all that apply)

- Food
- Non-food (e.g. clothes, homeware, electricals etc.)
- Banking services
- Ordering takeaways
- Civic services (e.g. citizen advice bureau, council services, job centre etc.)
- Specialised agents (e.g. travel agent, estate agent)
- Other

a If you selected Other, please specify:

p. 9 Out-of-town retail

34 How often do you visit out-of-town retail parks?

- More than once a week
- Once a week
- Once a fortnight
- Once a month
- Once every 3 months
- Less than once every 3 months
- Never

p. 10 Out-of-town retail

35 For what purpose do you visit out-of-town retail parks? (select all that apply)

- Food shopping
- Non-food shopping (e.g. clothes, homeware, electricals etc.)
- To socialise with friends
- For entertainment purposes (e.g. museums, theatres, cinema etc.)
- For dining out/ collecting takeaways
- To access banking services
- To access healthcare services (e.g. dentist, GP, opticians etc.)
- To access hair/ barber and/or beauty services
- To access sports facilities and to exercise (e.g. gym, leisure facilities etc.)
- To access civic services (e.g. citizen advice bureau, council services, job centre etc.)
- To access specialised agents (e.g. travel agent, estate agent)
- To access public transport
- I work in an out-of-town retail park
- Other

a If you selected Other, please specify:

p. 11 Submit responses

End of questions.

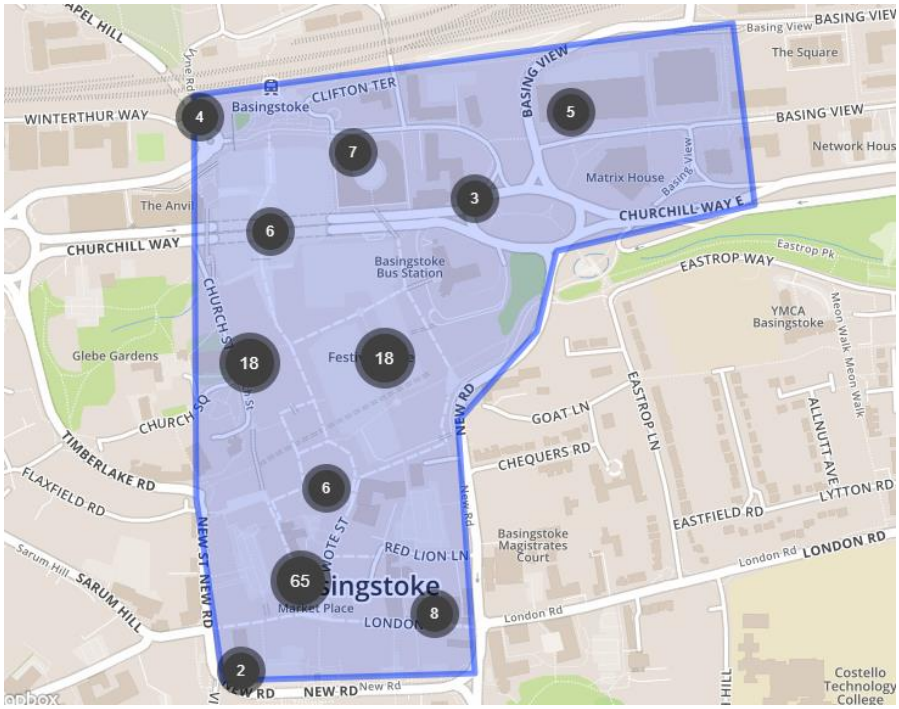
Click **finish** to submit your responses.

p. 12 Responses submitted

Thank you for taking the time to complete this survey.

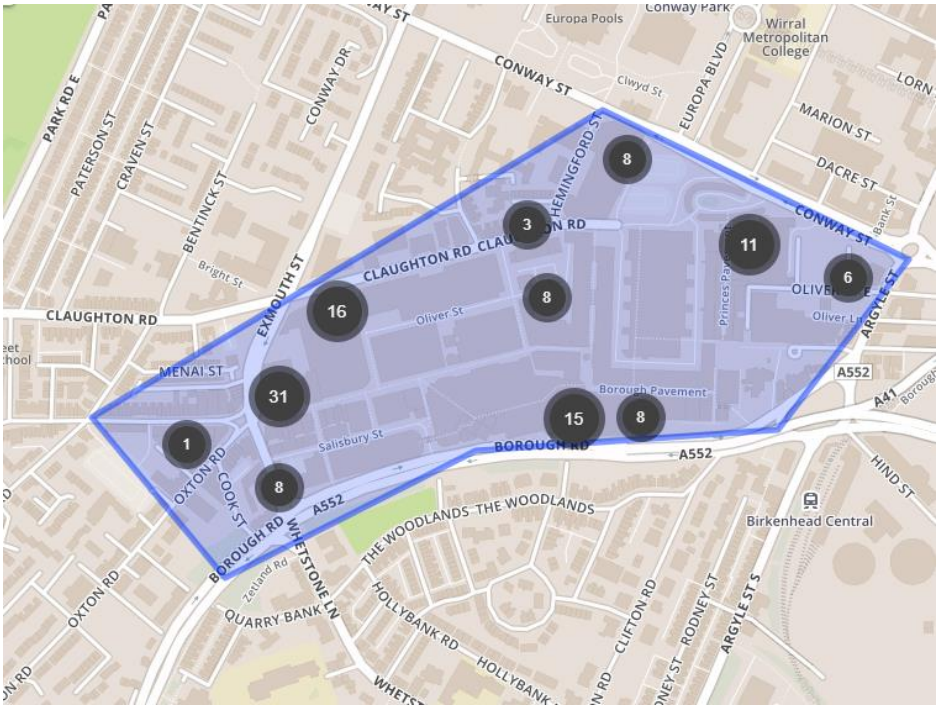
Appendix 4 – High street boundaries from which crime data was derived

Basingstoke (A_1)



(Source: www.police.uk 19 October 2017)

Birkenhead (A_2)



(Source: www.police.uk 19 October 2017)

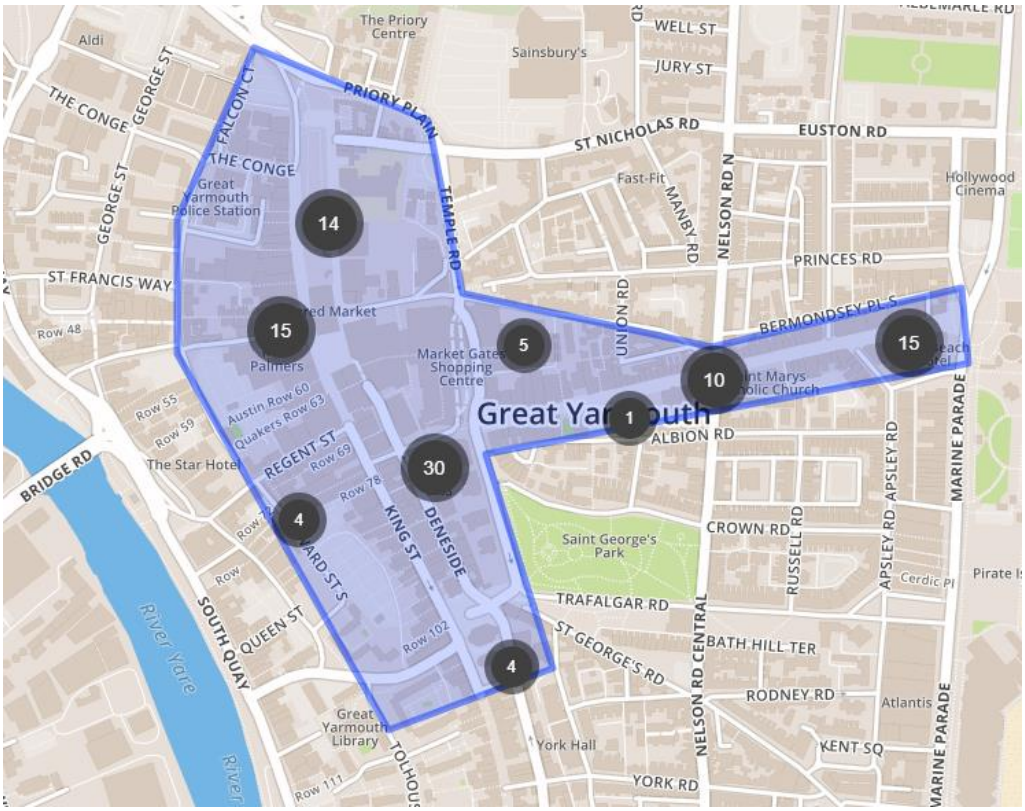
Corby (A_3)

(Source: www.police.uk 19 October 2017)

Gosport (A_4)

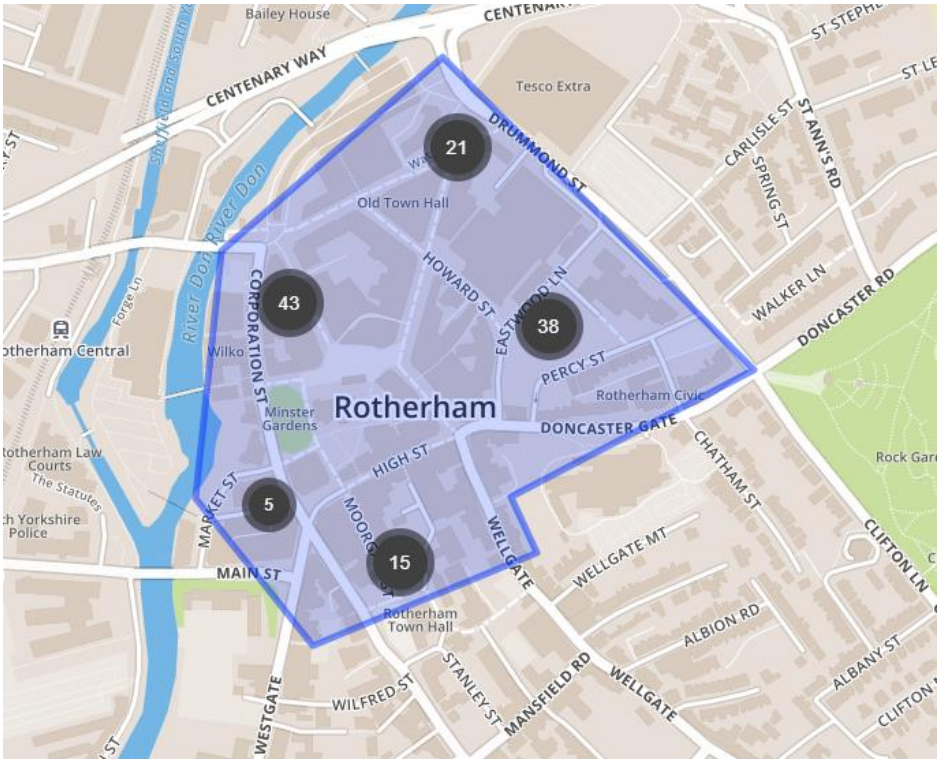
(Source: www.police.uk 19 October 2017)

Great Yarmouth (A_5)



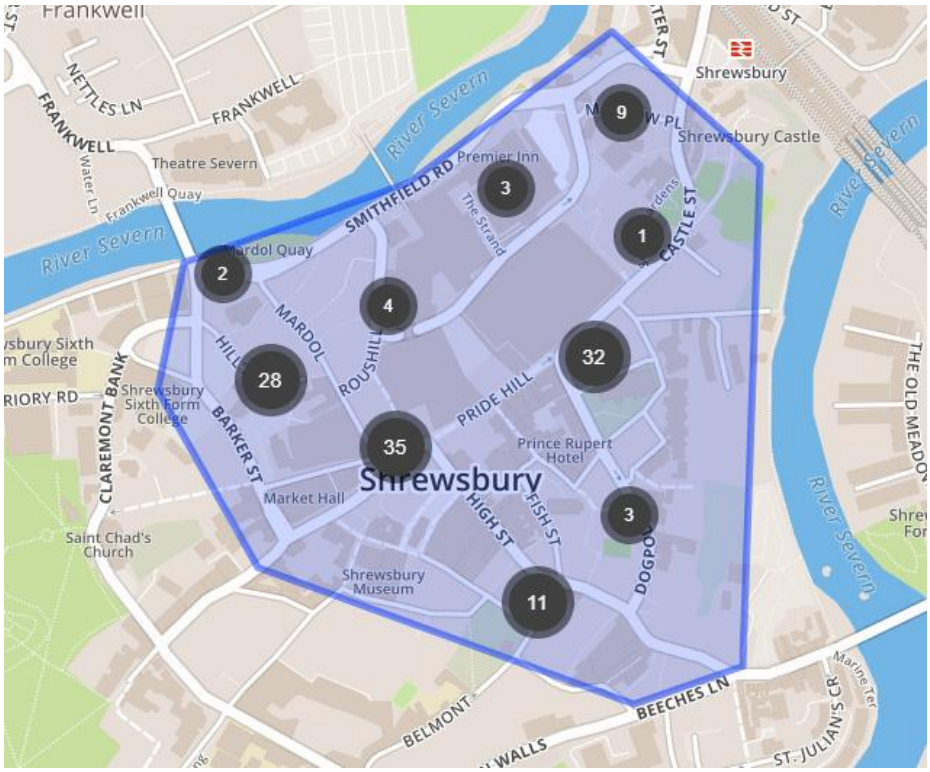
(Source: www.police.uk 19 October 2017)

Rotherham (A_6)



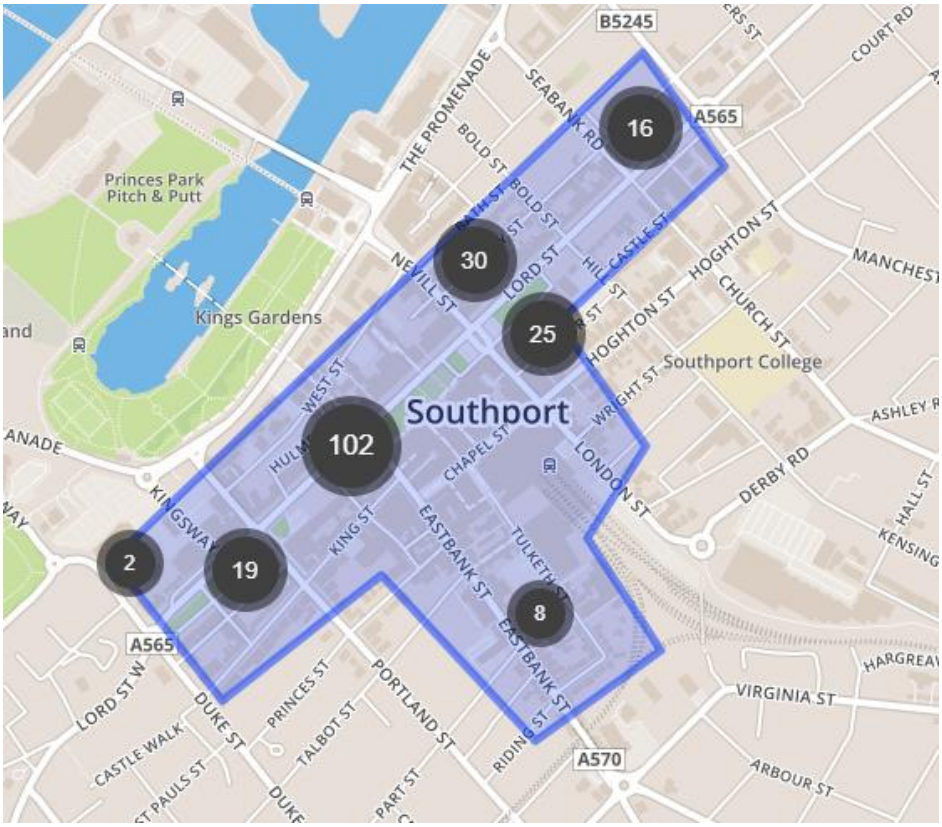
(Source: www.police.uk 19 October 2017)

Shrewsbury (A_7)



(Source: www.police.uk 19 October 2017)

Southport (A_8)

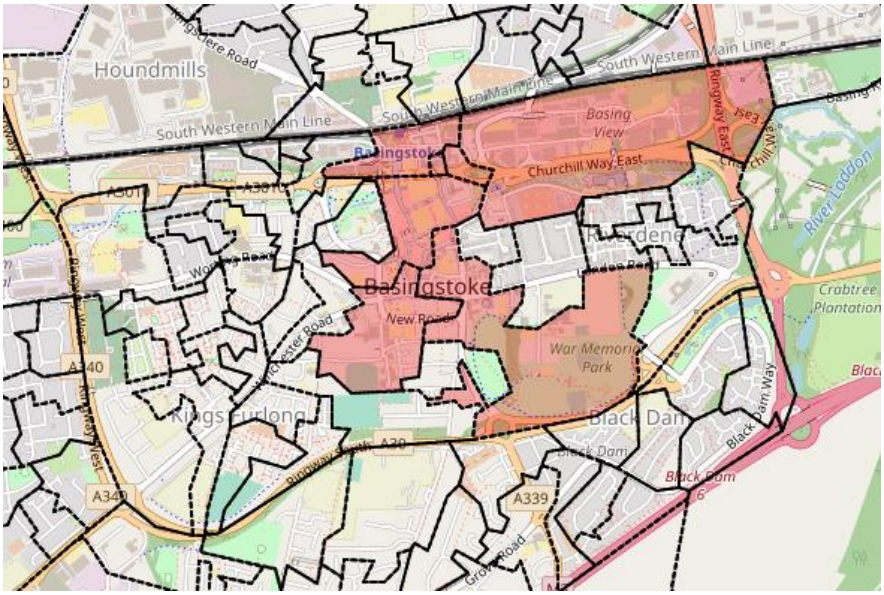


(Source: www.police.uk 19 October 2017)

Appendix 5 – Data output areas from which household data was acquired

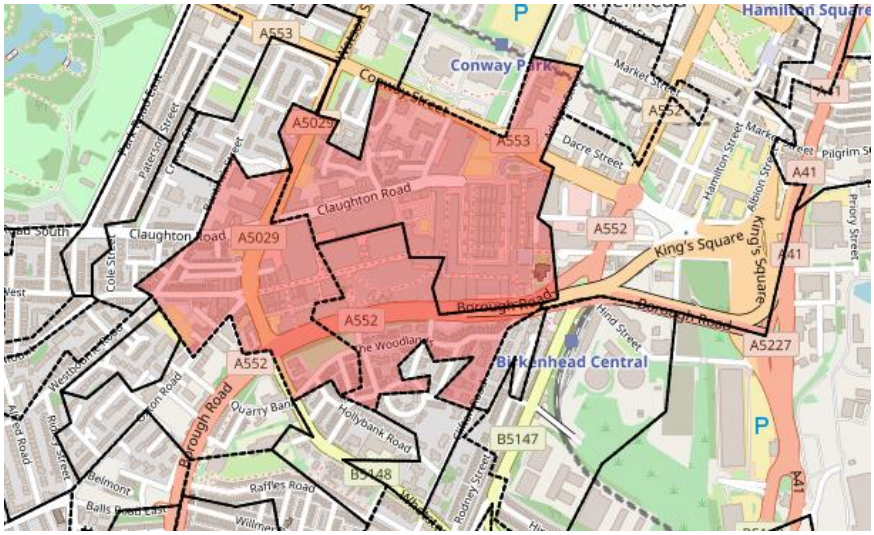
Office for National Statistics (ONS) output area codes from which household data was acquired for each high street							
A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
E00114402	E00036097	E00137073	E00116076	E00135145	E00168755	E00147395	E00035325
E00114405	E00036127		E00116077	E00135153	E00168756	E00147396	E00035327
E00114411	E00036130		E00168124	E00135154	E00168784	E00147397	E00035342
E00167853			E00168127	E00135282		E00147398	E00035343
E00167855				E00135283		E00174575	E00035345
E00167857				E00135287			E00035347
E00167858							E00035351
							E00035352
							E00035355
							E00035357

Basingstoke (A_1)



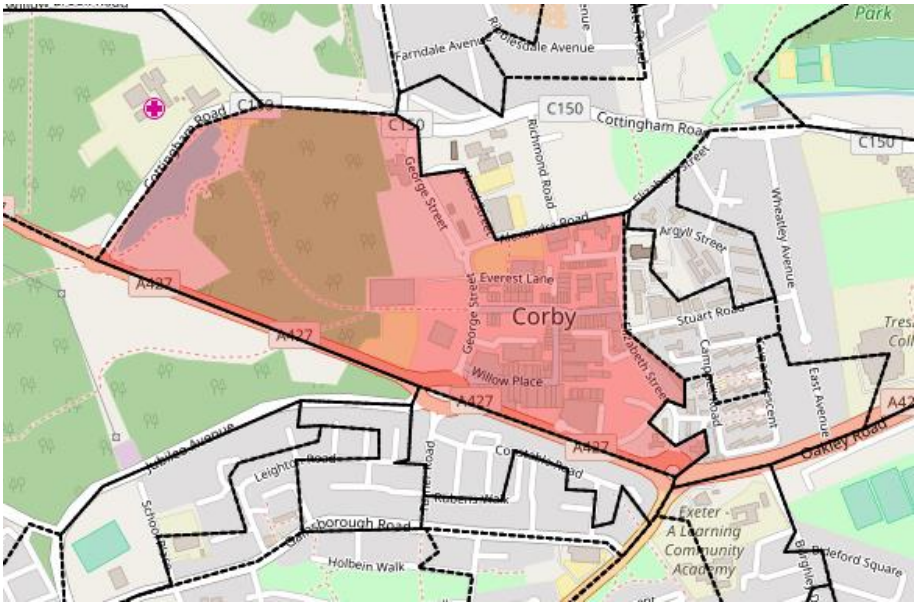
(Source: www.nomisweb.co.uk (ONS) accessed 27 October 2017)

Birkenhead (A_2)



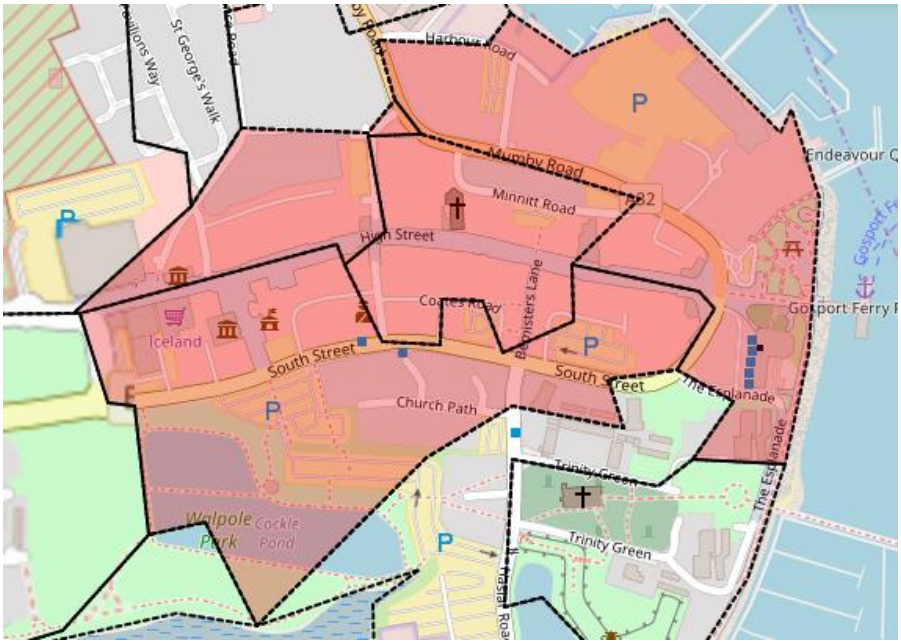
(Source: www.nomisweb.co.uk (ONS) accessed 27 October 2017)

Corby (A_3)



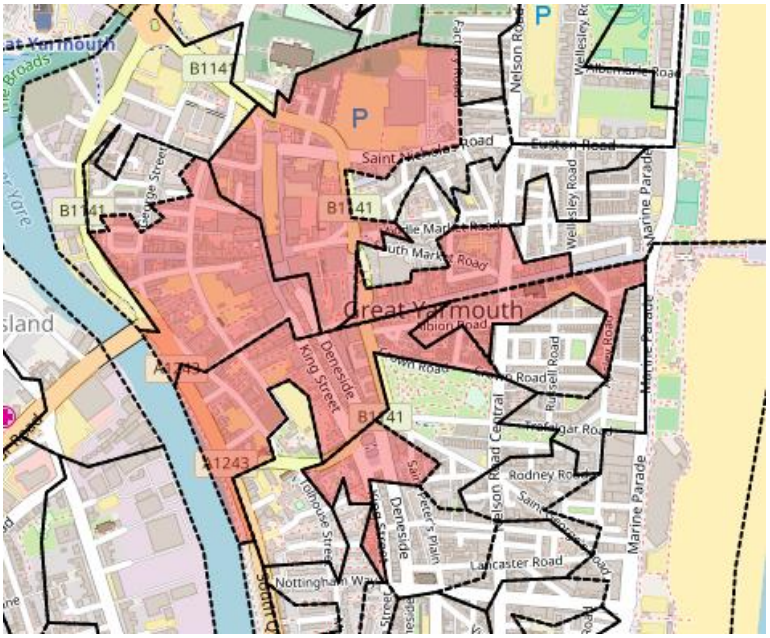
(Source: www.nomisweb.co.uk (ONS) accessed 27 October 2017)

Gosport (A_4)



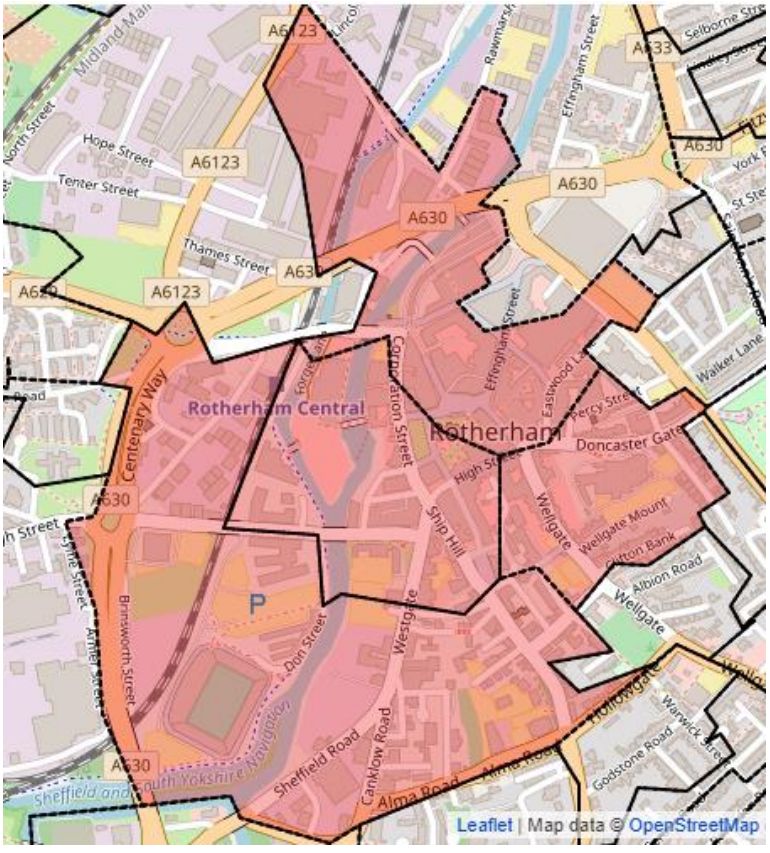
(Source: www.nomisweb.co.uk (ONS) accessed 27 October 2017)

Great Yarmouth (A_5)

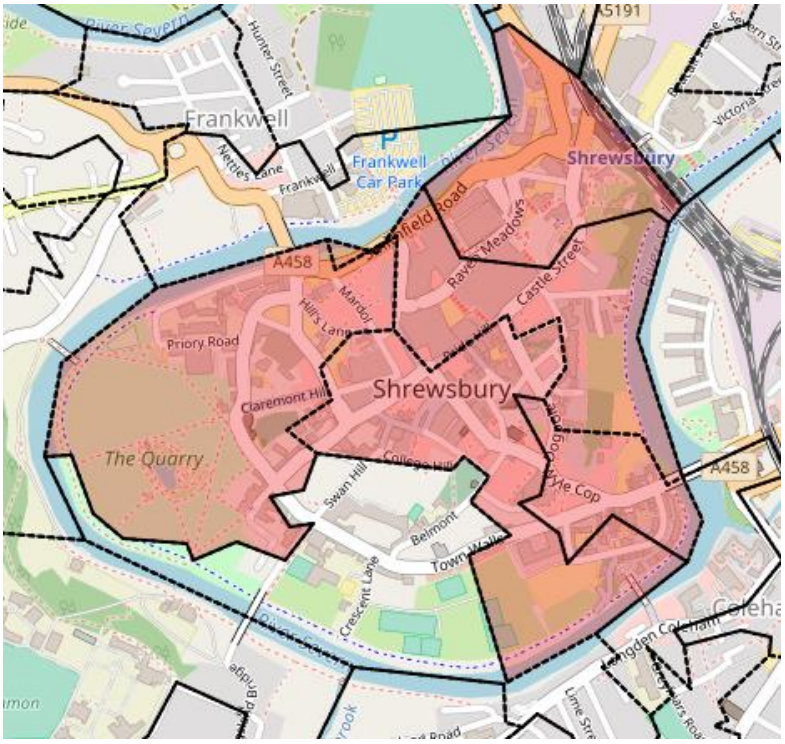


(Source: www.nomisweb.co.uk (ONS) accessed 27 October 2017)

Rotherham (A_6)

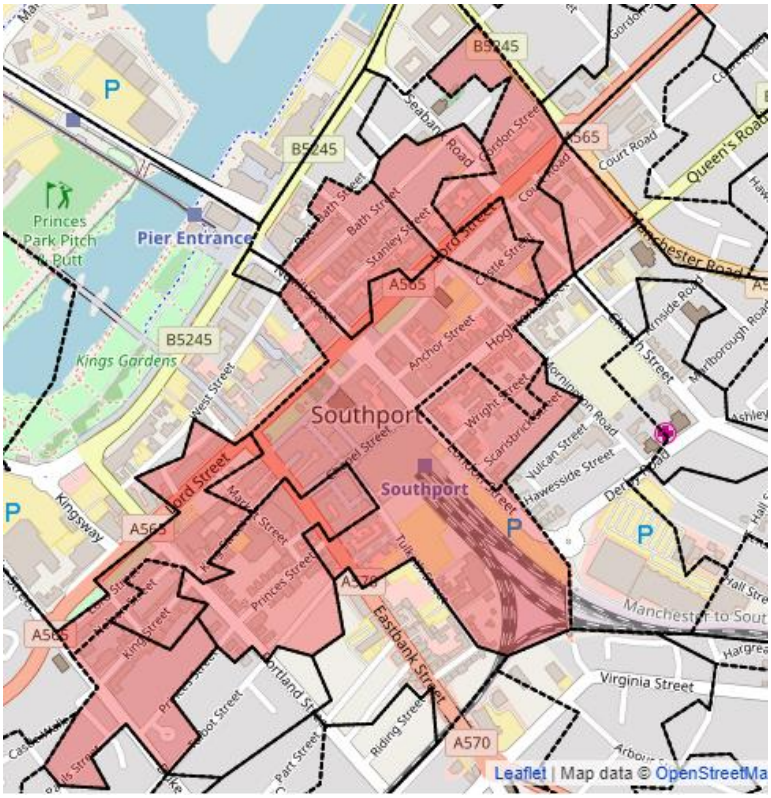


Shrewsbury (A_7)



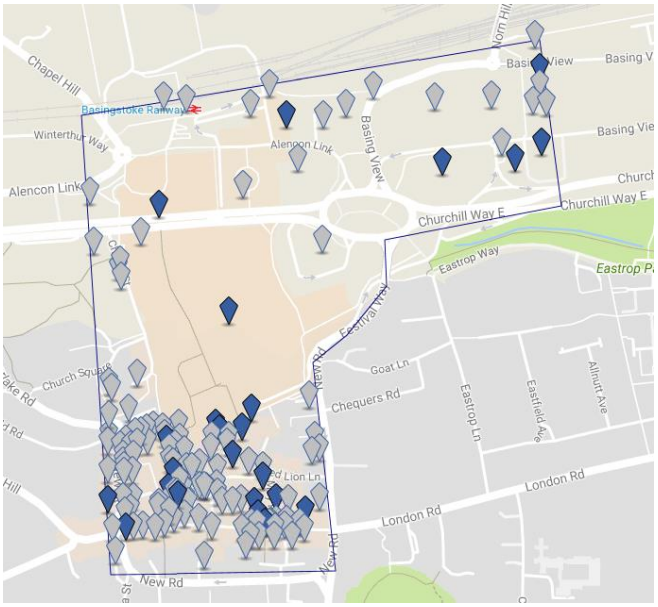
(Source: www.nomisweb.co.uk (ONS) accessed 27 October 2017)

Southport (A_8)



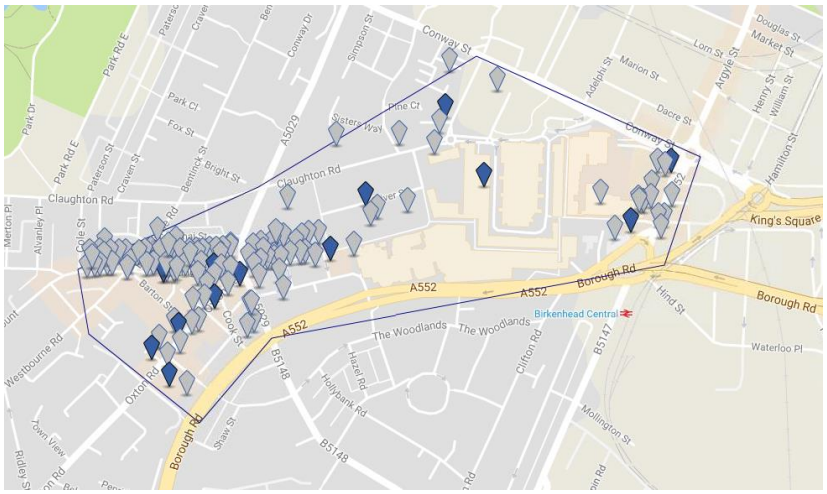
Appendix 6 - High street boundaries from which commercial rent and BREEAM data was derived

Basingstoke (A_1)



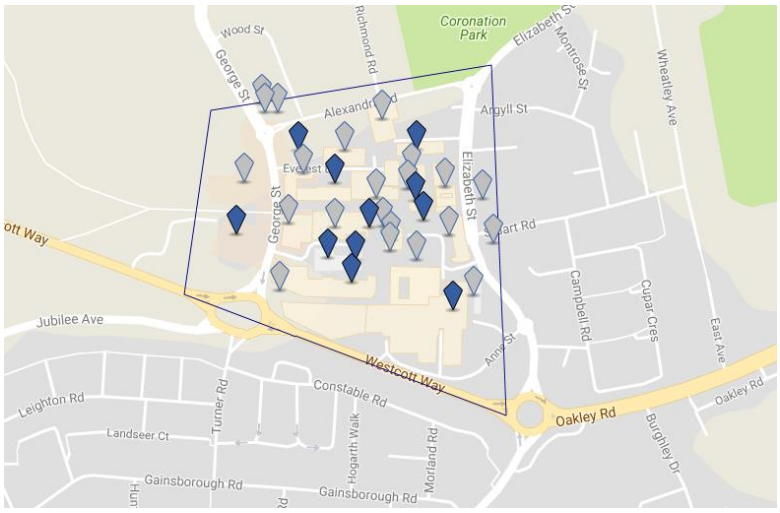
(Source: www.costar.com accessed 19th October 2017)

Birkenhead (A_2)



(Source: www.costar.com accessed 19th October 2017)

Corby (A_3)

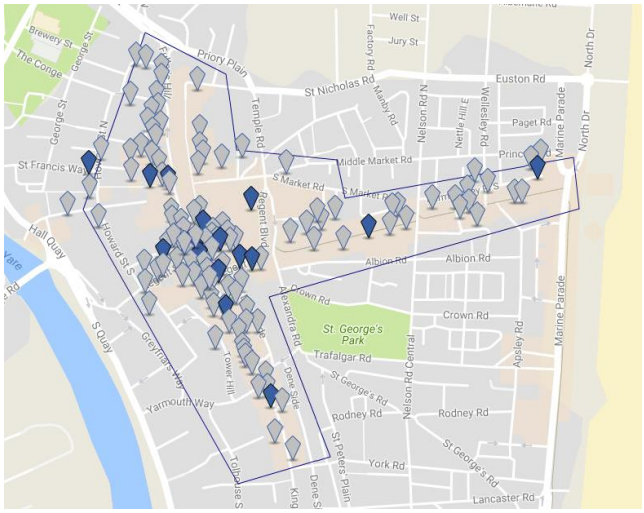


(Source: www.costar.com accessed 19th October 2017)

Gosport (A_4)

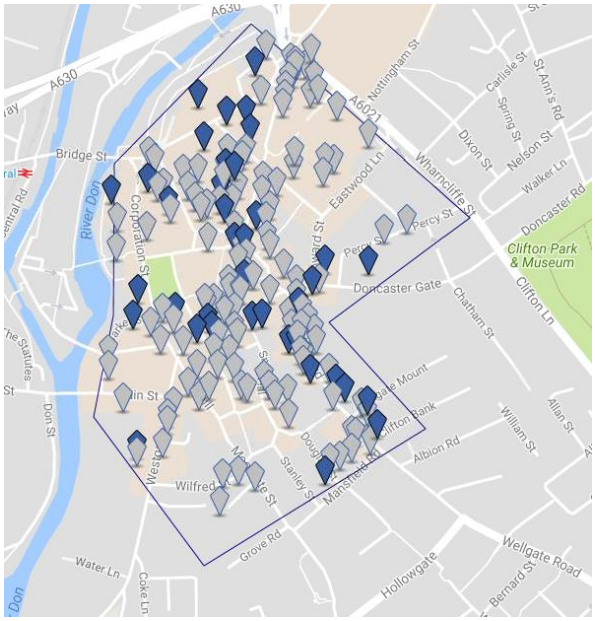
(Source: www.costar.com accessed 19th October 2017)

Great Yarmouth (A_5)



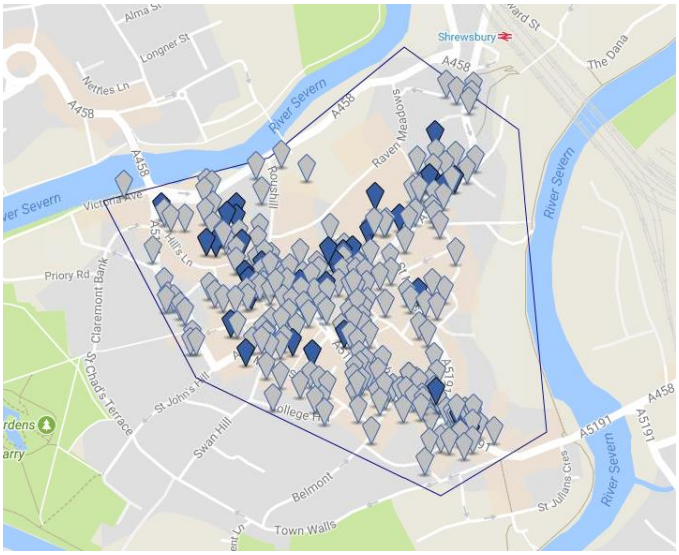
(Source: www.costar.com accessed 19th October 2017)

Rotherham (A_6)



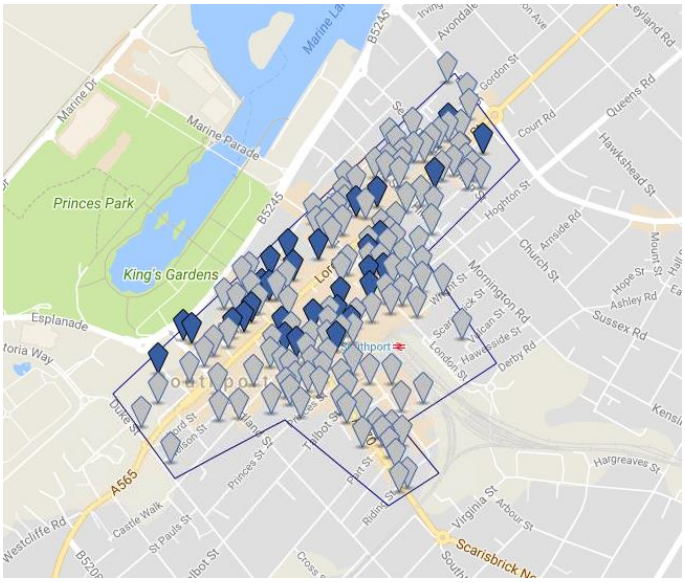
(Source: www.costar.com accessed 19th October 2017)

Shrewsbury (A_7)



(Source: www.costar.com accessed 19th October 2017)

Southport (A_8)



(Source: www.costar.com accessed 19th October 2017)

Appendix 7 – Results of statistical tests exploring differences between groups

10.1. Differences between professional and resident groups

10.1.1. Criteria categories

Table 41. Significant results for Mann-Whitney U test comparing the criteria category scores of professionals and residents

Criterion	Mann-Whitney U test result
Exchange	U = 7457, Z = -3.874, P = 0.000 (P< .01)
Safety and Security	U = 8585, Z = -2.449, P = 0.014 (P< .05)
Economic viability	U = 8425, Z = -2.654, P = 0.008 (P< .01)

10.1.2. Sub-criteria

Table 42. Mann-Whitney U test results comparing sub-criteria scores of professionals and residents

Sub-criterion	Mann-Whitney U test result	Group scores
Signage	U = 7954.5, Z = -3.418, P = 0.001 (P<0.01)	Residents gave higher scores than professionals
Trees and landscape	U = 8136, Z = -3.194, P = 0.001 (P<*0.01*)	Residents gave higher scores than professionals
Infrastructure	U = 8173, Z = -3.098, P = 0.002 (P<0.01)	Professionals gave higher scores than residents
Design	U = 8173, Z = -2.155, P = 0.031 (P<0.05)	Professionals gave higher scores than residents
Pedestrian pavements/ walkways	U = 8404.5, Z = -2.972, P = 0.003 (P<0.01)	Professionals gave higher scores than residents
Parking facilities	U = 8275.5, Z = -3.087, P = 0.002 (P<0.01)	Residents gave higher scores than professionals
Traffic management	U = 7077, Z = -4.515, P = 0.000 (P<0.01)	Professionals gave higher scores than residents
Economic space	U = 7340.5, Z = -4.385, P = 0.000 (P<0.01)	Residents gave higher scores than professionals
Political space	U = 7418, Z = -4.060, P = 0.000 (P<0.01)	Residents gave higher scores than professionals

Community space	U = 8448, Z = -2.751, P = 0.006 (P<0.01)	Residents gave higher scores than professionals
Retail	U = 8675, Z = -2.751, P = 0.008 (P<0.01)	Professionals gave higher scores than residents
Entertainment	U = 8326.5, Z = -2.997, P = 0.003 (P<0.01)	Professionals gave higher scores than residents
Civic venues	U = 8823, Z = -2.232, P = 0.026 (P<0.05)	Residents gave higher scores than professionals
Residential	U = 8823, Z = -2.332, P = 0.020 (P<0.05)	Professionals gave higher scores than residents
Identity/image	U = 8264, Z = -3.043, P = 0.002 (P<0.01)	Professionals gave higher scores than residents
Actual crime	U = 8724, Z = -2.412, P = 0.016 (P<0.05)	Residents gave higher scores than professionals
CCTV and security presence	U = 7922, Z = -3.431, P = 0.001 (P<0.01)	Residents gave higher scores than professionals
Town centre management team	U = 9034, Z = -1.953, P = 0.051 (P=.05)	Residents gave higher scores than professionals
Complementary daytime, evening and night-time economies	U = 6475.5, Z = -5.407, P = 0.000 (P<0.01)	Professionals gave higher scores than residents

10.2. Quantitative analysis of professional responses

10.2.1. Differences between ‘professional title’ groups

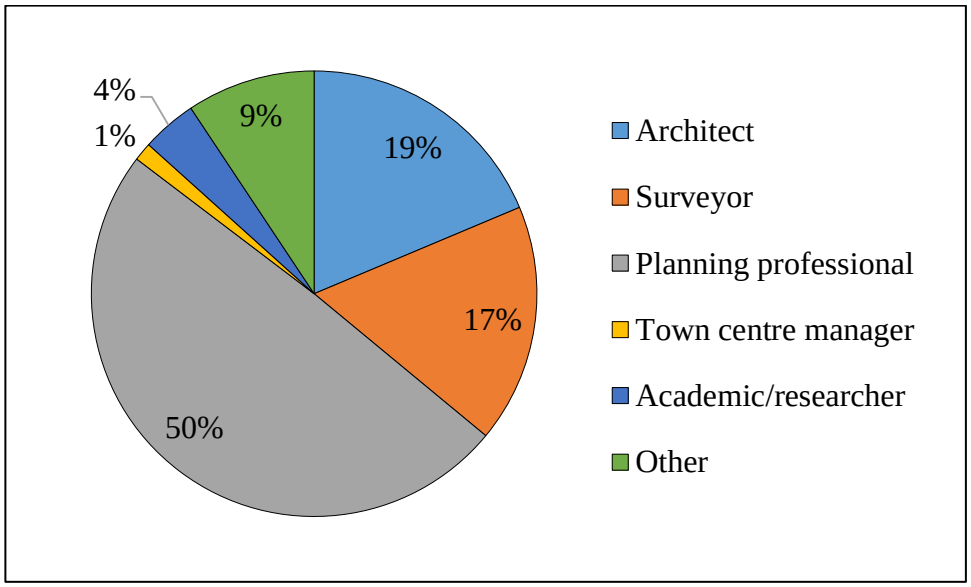
The professionals’ survey asked participants to specify which of the following best described their professional title:

1. Architect
2. Surveyor
3. Developer
4. Planning professional
5. Town centre manager
6. Academic/researcher

7. Other

Figure 41 illustrates the professional titles of the respondent sample.

Figure 41. Pie chart illustrating the professional titles of respondents



(Source: self study)

10.2.1.1. Analysis of criteria categories

10.2.1.1.1. Kruskal-Wallis test results for differences between 'professional title' groups

Table 43. Significant results for Kruskal-Wallis test comparing the criteria category scores of 'professional title' groups.

Criterion	Kruskal- Wallis test result
Exchange	$H(5) = 11.629$, $P = 0.04$ ($P<0.05$)

To identify which specific groups were producing the statistically significant result, a post-hoc Mann-Whitney U test was used. Type 1 errors were controlled using the Bonferroni adjustment (for further explanation see 6.7.2.3.), where the alpha level is adjusted in accordance with the number of group comparisons required. The number of comparisons is calculated using the following formula:

$$Number\ of\ comparisons = \frac{k(k-1)}{2}$$

The Bonferroni adjustment for the 'professional title' groups was calculated as follows:

$$\text{Number of comparisons required: } \frac{6(6-1)}{2} = 15$$

$$\text{Bonferroni adjustment: } \frac{0.05}{15} = 0.003$$

It should be noted that no participants indicated that they held the professional title of 'developer'. Therefore the Bonferroni adjustment was calculated based on 6 professional title groups, rather than 7.

Following the post hoc Mann-Whitney U test with Bonferroni adjustment, no statistically significant differences were identified between the groups.

10.2.1.2. Analysis of sub-criteria

10.2.1.2.1. Kruskal-Wallis test results for differences between 'professional title' groups

Table 44. Statistically significant Kruskal-Wallis test results comparing 'professional title' groups with reference to sub-criteria importance

Sub-criterion	Kruskal-Wallis result
Pedestrian pavements/walkways	$H(6) = 14.497$, $P = 0.013$ ($P<0.05$)
Political space	$H(6) = 12.558$, $P = 0.028$ ($P<0.05$)
Civic venues	$H(6) = 12.323$, $P = 0.031$ ($P<0.05$)
Marketing	$H(6) = 11.802$, $P = 0.038$ ($P<0.05$)
Environmentally sustainable materials	$H(6) = 11.663$, $P = 0.040$ ($P<0.05$

In order to identify which specific groups were producing the statistically significant results, a post-hoc Mann-Whitney U test was used. The Bonferroni adjustment for the 'professional title' groups was calculated as follows:

$$\text{Number of comparisons required: } \frac{6(6-1)}{2} = 15$$

$$\text{Bonferroni adjustment: } \frac{0.05}{15} = 0.003$$

The results of the post hoc Mann-Whitney U tests are presented in table 45.

Table 45. Statistically significant Mann-Whitney U result comparing 'surveyor' and 'planning professional' groups with reference to importance of sub-criteria

Sub-criterion	Mann-Whitney U test result	Group scores
Political space	U = 109.500, Z = -3.051, P = 0.002 (P<0.01)	Planning professionals gave higher scores than surveyors

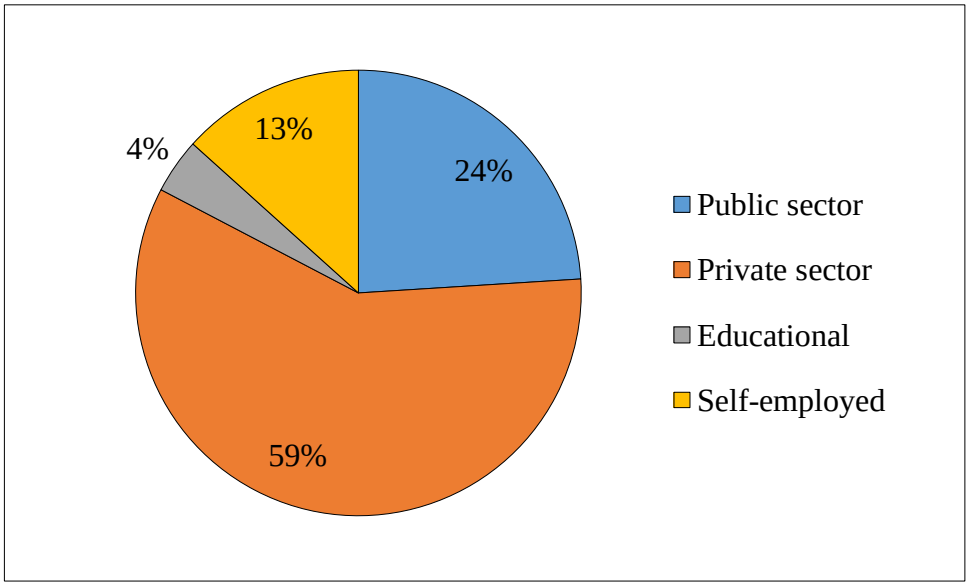
10.2.2. Differences between 'employment type' groups

Participants were asked which of the following best described the type of employment they were in:

1. Public sector (e.g. local authority)
2. Private sector
3. Educational (e.g. university)
4. Self-employed (e.g. consultant)

Figure 42 illustrates the percentage breakdown of the employment types of the professional respondents.

Figure 42. Pie chart to illustrate the employment types of the professional respondents



(Source: self study)

10.2.2.1. Analysis of criteria categories

A Kruskal-Wallis test identified no statistically significant differences in the opinions of criteria importance between the different ‘employment type’ groups.

10.2.2.2. Analysis of sub-criteria

10.2.2.2.1. Kruskal-Wallis test results for differences between ‘employment type’ groups

Table 46. Statistically significant Kruskal-Wallis test result comparing ‘employment type’ groups with reference to sub-criteria importance

Sub-criterion	Kruskal-Wallis result
Partnership/stakeholder involvement	$H(3) = 10.603$, $P = 0.014$ ($P<0.05$)

In order to identify which specific groups were producing the statistically significant result, a post-hoc Mann-Whitney U test was used. Type 1 errors were controlled using the Bonferroni adjustment. The Bonferroni adjustment for the ‘employment type’ groups was calculated as follows:

Number of comparisons required: $\frac{4(4-1)}{2} = 6$

Bonferroni adjustment: $\frac{0.05}{6} = 0.008$

Following the post-hoc Mann-Whitney U test, and taking into account the Bonferroni adjustment, no statistically significant results were identified between the ‘employment type’ groups with reference to the sub-criterion ‘partnership/stakeholder involvement’.

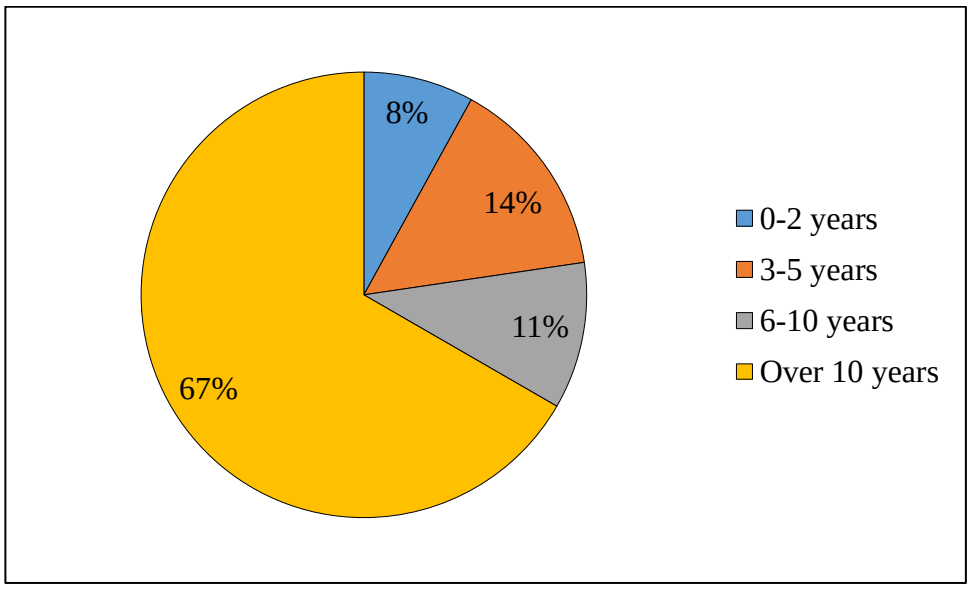
10.2.3. Difference between ‘length of service’ groups

Participants were asked to indicate their length of service by selecting one of the following:

1. 0-2 years
2. 3-5 years
3. 6-10 years
4. Over 10 years

Figure 43 illustrates the percentage breakdown of the length of time the professional respondents had spent in their respective professions.

Figure 43. Pie chart to illustrate the length of service of the professional respondents



(Source: self study)

10.2.3.1. Analysis of criteria categories

A Kruskal-Wallis test identified no statistically significant differences in the opinions of criteria importance between the different 'length of service' groups

10.2.3.2. Analysis of sub-criteria

10.2.3.2.1. Kruskal-Wallis test results for differences between 'length of service' groups

Table 47. Statistically significant Kruskal-Wallis test result comparing 'length of service' groups with reference to sub-criteria importance

Sub-criterion	Kruskal-Wallis result
Trading hours	$H(3) = 12.391$, $P = 0.006$ ($P<0.01$)

To identify which specific 'length of service' groups were producing the statistically significant result, a post-hoc Mann-Whitney U test with Bonferroni adjustment was employed. The Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{4(4-1)}{2} = 6$

Bonferroni adjustment: $\frac{0.05}{6} = 0.008$

The results of the post hoc Mann-Whitney U test with Bonferroni adjustment are presented in tables 48 and 49.

Table 48. Statistically significant Mann-Whitney U result comparing the '3-5 years' and '6-10 years' groups with reference to importance of sub-criteria

Sub-criterion	Mann-Whitney U test result	Group scores
Trading hours	U = 10.000, Z = -2.986, P = 0.003 (P<0.01)	The '3-5 years' group gave higher scores than the '6-10 years' group.

Table 49. Statistically significant Mann-Whitney U result comparing the '6-10 years' and 'over 10 years' groups with reference to importance of sub-criteria

Sub-criterion	Mann-Whitney U test result	Group scores
Trading hours	U = 81.000, Z = -2.863, P = 0.006 (exact sig.) (P<0.01)	The 'over 10 years' group gave higher scores than the '6-10 years' group.

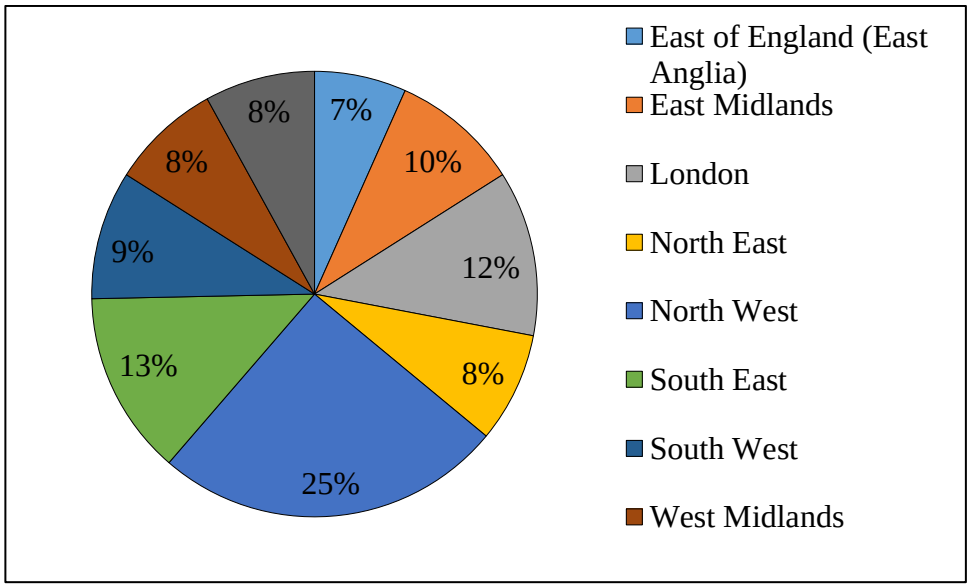
10.2.4. Differences between 'region of employment' groups

Participants were asked to select the English region in which they are professionally based from the following list:

1. East of England (East Anglia)
2. East Midlands
3. London
4. North East
5. North West
6. South East
7. South West
8. West Midlands
9. Yorkshire and the Humber

Figure 44 illustrates the percentage breakdown of the professional respondents on the basis of the English region in which they are professionally based.

Figure 44. Pie chart to illustrate the English region in which the professional participants are professionally based



(Source: self study)

10.2.4.1. Analysis of criteria categories

A Kruskal-Wallis test identified no statistically significant differences in the opinions of criteria importance between the different 'region of employment' groups

10.2.4.2. Analysis of sub-criteria

10.2.4.2.1. Kruskal-Wallis test results for differences between 'region of employment' groups

Table 50. Statistically significant Kruskal-Wallis test result comparing 'region of employment' groups with reference to sub-criteria importance

Sub-criterion	Kruskal-Wallis result
Actual crime	$H(8) = 20.070$, $P = 0.01$ (P=0.01)

A Mann-Whitney U test and Bonferroni adjustment was subsequently used as a post-hoc test to determine which 'region of employment' groups were producing the significant difference. The Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{9(9-1)}{2} = 36$

Bonferroni adjustment: $\frac{0.05}{36} = 0.001$

Following the post-hoc Mann-Whitney U test, and taking into consideration the Bonferroni adjustment, no statistically significant differences were detected between the 'region of employment' groups with reference to the sub-criterion 'actual crime'.

10.3. Quantitative analysis of resident responses

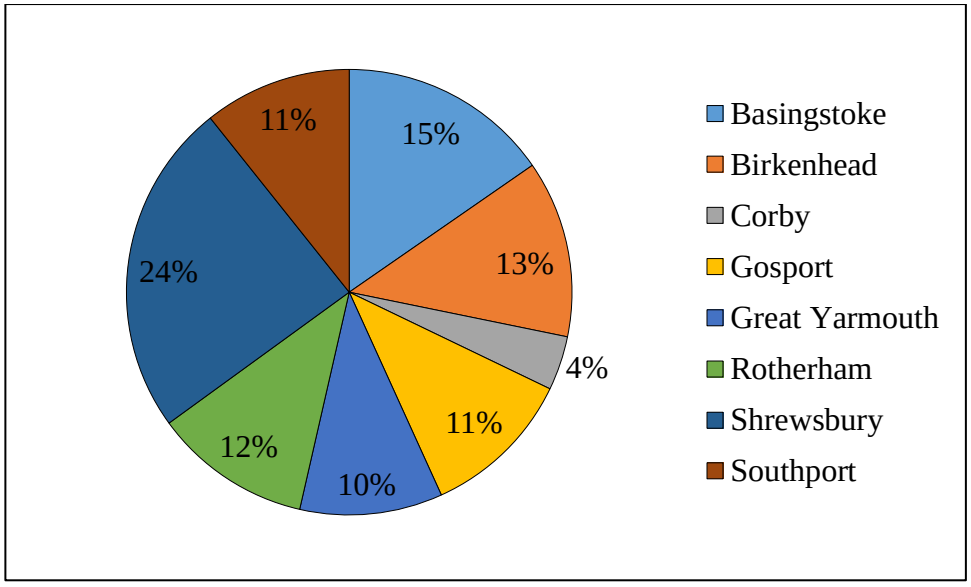
10.3.1. Differences between 'town' groups

The residents' survey asked participants to select in which of the following towns they were resident:

1. Basingstoke
2. Birkenhead
3. Corby
4. Gosport
5. Great Yarmouth
6. Rotherham
7. Shrewsbury
8. Southport

Figure 45 illustrates the percentage breakdown of resident respondents according to the towns in which they were resident.

Figure 45. Pie chart to illustrate the towns in which resident respondents lived



(Source: self study)

10.3.1.1. Analysis of criteria categories

10.3.1.1.1. Kruskal-Wallis test results for 'town' groups

Table 51. Kruskal-Wallis statistically significant test results comparing 'town' groups with reference to criteria importance scores

Criterion	Kruskal-Wallis result
Exchange	$H(7) = 14.947$, $P = 0.037$ ($P<0.05$)
Psychology	$H(7) = 17.670$, $P = 0.014$ ($P<0.05$)
Safety and security	$H(7) = 21.270$, $P = 0.003$ ($P<0.01$)

To identify which groups were producing the statistically significant differences a post hoc Mann-Whitney U test was used. The Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{8(8-1)}{2} = 28$

Bonferroni adjustment: $\frac{0.05}{28} = 0.002$

The results of the post hoc Mann-Whitney U test with Bonferroni adjustment are presented in tables 52 to 57.

Table 52. Mann-Whitney U statistically significant test results comparing Rotherham and Basingstoke groups with reference to criteria importance

Criterion	Mann-Whitney U test result	Group scores
Psychology	$U = 379$, $Z = -3.354$, $P = 0.001$ ($P<0.002$)	The Rotherham group gave higher scores than the Basingstoke group.

Table 53. Mann-Whitney U statistically significant test results comparing Shrewsbury and Basingstoke groups with reference to criteria importance

Criterion	Mann-Whitney U test result	Group scores
Psychology	$U = 967$, $Z = -3.047$, $P = 0.002$ ($P=0.002$)	The Shrewsbury group gave higher scores than the Basingstoke group.

Table 54. Mann-Whitney U statistically significant test results comparing Rotherham and Birkenhead groups with reference to criteria importance

Criterion	Mann-Whitney U test result	Group scores
Safety and security	$U = 333$, $Z = -3.038$, $P = 0.002$ ($P=0.002$)	The Rotherham group gave higher scores than the Birkenhead group.

Table 55. Mann-Whitney U statistically significant test results comparing Rotherham and Shrewsbury groups with reference to criteria importance

Criterion	Mann-Whitney U test result	Group scores
Safety and security	$U = 552.5$, $Z = -4.004$, $P = 0.000$ ($P<0.002$)	The Rotherham group gave higher scores than the Shrewsbury group.

Table 56. Mann-Whitney U statistically significant test results comparing Rotherham and Southport groups with reference to criteria importance

Criterion	Mann-Whitney U test result	Group scores
Safety and security	U = 208, Z = -3.883, P = 0.000 (P<0.002)	The Rotherham group gave higher scores than the Southport group.

Table 57. Mann-Whitney U statistically significant test results comparing Shrewsbury and Gosport groups with reference to criteria importance

Criterion	Mann-Whitney U test result	Group scores
Exchange	U = 616.5, Z = -3.328, P = 0.001 (P<0.002)	The Shrewsbury group gave higher scores than the Gosport group.

10.3.1.2. Analysis of sub-criteria

10.3.1.2.1. Kruskal-Wallis test results comparing 'town' groups with reference to the importance scores given to sub-criteria

Table 58. Kruskal-Wallis statistically significant test results comparing 'town' groups with reference to importance scores given to sub-criteria

Sub-criterion	Kruskal-Wallis result
Streets	H(7) = 31.377, P = 0.000 (P<0.01)
Buildings	H(7) = 17.704, P = 0.040 (P<0.05)
Public open space	H(7) = 19.083, P = 0.008 (P<0.01)
Pedestrian pavements/walkways	H(7) = 20.564, P = 0.004 (P<0.01)
Cycling facilities	H(7) = 32.332, P = 0.000 (P<0.01)
Parking facilities	H(7) = 16.970, P = 0.018 (P<0.05)
Goods/service vehicles	H(7) = 15.929, P = 0.026 (P<0.05)
Traffic management	H(7) = 14.582, P = 0.042 (P<0.05)
Social space	H(7) = 18.478, P = 0.010 (P=0.01)
Cultural space	H(7) = 15.231, P = 0.033 (P<0.05)
Image/identity	H(7) = 18.906, P = 0.008 (P<0.01)

Atmosphere	$H(7) = 18.729$, $P = 0.009$ ($P<0.01$)
Actual crime	$H(7) = 22.171$, $P = 0.002$ ($P<0.01$)
Perceived crime	$H(7) = 20.932$, $P = 0.004$ ($P<0.01$)
CCTV and security presence	$H(7) = 20.002$, $P = 0.006$ ($P<0.01$)

In order to determine which 'town' groups were producing the statistically significant differences, a post hoc Manny-Whitney U test was used. The alpha level was adjusted using a Bonferroni adjustment to control Type 1 errors. The Bonferroni adjustment was calculated as follows:

$$\text{Number of comparisons required: } \frac{8(8-1)}{2} = 28$$

$$\text{Bonferroni adjustment: } \frac{0.05}{28} = 0.002$$

The results of the post hoc Mann-Whitney U tests, taking into consideration the Bonferroni adjustment, identified a number of statistically significant differences, as presented in tables 59 to 70.

Table 59. Mann-Whitney U statistically significant test results comparing residents of Basingstoke and Great Yarmouth with reference to sub-criteria importance

Sub-criterion	**Mann-Whitney U test result**	**Group scores**
Streets	$U = 356$, $Z = -3.217$, $P = 0.001$ ($P<0.002$)	Residents of Great Yarmouth gave higher scores than residents of Basingstoke

Table 60. Mann-Whitney U statistically significant test results comparing residents of Basingstoke and Rotherham with reference to sub-criteria importance

Sub-criterion	**Mann-Whitney U test result**	**Group scores**
Streets	$U = 369$, $Z = -3.579$, $P = 0.000$ ($P<0.002$)	Residents of Rotherham gave higher scores than residents of Basingstoke
Identity/image	$U = 363.5$, $Z = -3.685$, $P = 0.000$ ($P<0.002$)	Residents of Rotherham gave higher scores than residents of Basingstoke

Actual crime	U = 404.5, Z = -3.422, P = 0.001 (P<0.002)	Residents of Rotherham gave higher scores than residents of Basingstoke

Table 61. Mann-Whitney U statistically significant test results comparing residents of Basingstoke and Shrewsbury with reference to sub-criteria importance

Sub-criterion	**Mann-Whitney U test result**	**Group scores**
Streets	U = 758, Z = -4.501, P = 0.000 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Basingstoke
Pedestrian pavements/walkways	U = 953, Z = -3.516, P = 0.000 (P<0.01)	Residents of Shrewsbury gave higher scores than residents of Basingstoke
Parking facilities	U = 980.5, Z = -3.184, P = 0.001 (P<0.002)	Residents of Basingstoke gave higher scores than residents of Shrewsbury
Atmosphere	U = 987, Z = -3.190, P = 0.001 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Basingstoke

Table 62. Mann-Whitney U statistically significant test results comparing residents of Birkenhead and Rotherham with reference to sub-criteria importance

Sub-criterion	**Mann-Whitney U test result**	**Group scores**
CCTV and security presence	U = 340.5, Z = -3.065, P = 0.002 (P=0.002)	Residents of Rotherham gave higher scores than residents of Birkenhead

Table 63. Mann-Whitney U statistically significant test results comparing residents of Birkenhead and Shrewsbury with reference to sub-criteria importance

Sub-criterion	**Mann-Whitney U test result**	**Group scores**
Cycling facilities	U = 790, Z = -3.066, P = 0.002 (P=0.002)	Residents of Shrewsbury gave higher scores than residents of Birkenhead

Table 64. Mann-Whitney U statistically significant test results comparing residents of Corby and Shrewsbury with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Streets	U = 156.5, Z = -3.291, P = 0.001 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Corby

Table 65. Mann-Whitney U statistically significant test results comparing residents of Gosport and Rotherham with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Identity/image	U = 289.5, Z = -3.044, P = 0.002 (P=0.002)	Residents of Rotherham gave higher scores than residents of Gosport
Actual crime	U = 238, Z = -3.957, P = 0.000 (P<0.002)	Residents of Rotherham gave higher scores than residents of Gosport

Table 66. Mann-Whitney U statistically significant test results comparing residents of Gosport and Shrewsbury with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Buildings	U = 650.5, Z = -3.302, P = 0.001 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Gosport
Pedestrian pavements/walkways	U = 651, Z = -3.494, P = 0.000 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Gosport
Cultural space	U = 622, Z = -3.487, P = 0.000 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Gosport

Table 67. Mann-Whitney U statistically significant test results comparing residents of Great Yarmouth and Shrewsbury with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Pedestrian pavements/walkways	U = 641, Z = -3.150, P = 0.002 (P=0.002)	Residents of Shrewsbury gave higher scores than residents of Great Yarmouth
Parking facilities	U = 620, Z = -3.133, P = 0.002 (P=0.002)	Residents of Great Yarmouth gave higher scores than residents of Shrewsbury

Table 68. Mann-Whitney U statistically significant test results comparing residents of Rotherham and Shrewsbury with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Cycling facilities	U = 570.5, Z = -3.939, P = 0.000 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Rotherham
Actual crime	U = 700, Z = -3.220, P = 0.001 (P<0.002)	Residents of Rotherham gave higher scores than residents of Shrewsbury
Perceived crime	U = 653, Z = -3.508, P = 0.000 (P<0.002)	Residents of Rotherham gave higher scores than residents of Shrewsbury
CCTV and security presence	U = 638, Z = -3.494, P = 0.000 (P<0.002)	Residents of Rotherham gave higher scores than residents of Shrewsbury

Table 69. Mann-Whitney U statistically significant test results comparing residents of Rotherham and Southport with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Actual crime	U = 221.5, Z = -4.058, P = 0.000 (P<0.002)	Residents of Rotherham gave higher scores than residents of Southport

Table 70. Mann-Whitney U statistically significant test results comparing residents of Shrewsbury and Southport with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Public open spaces	U = 607.5, Z = -3.512, P = 0.000 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Southport
Cycling facilities	U = 471.5, Z = -4.361, P = 0.000 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Southport
Traffic management	U = 565.5, Z = -3.698, P = 0.000 (P<0.002)	Residents of Shrewsbury gave higher scores than residents of Southport
Social space	U = 672, Z = -3.026, P = 0.002 (P=0.002)	Residents of Shrewsbury gave higher scores than residents of Southport

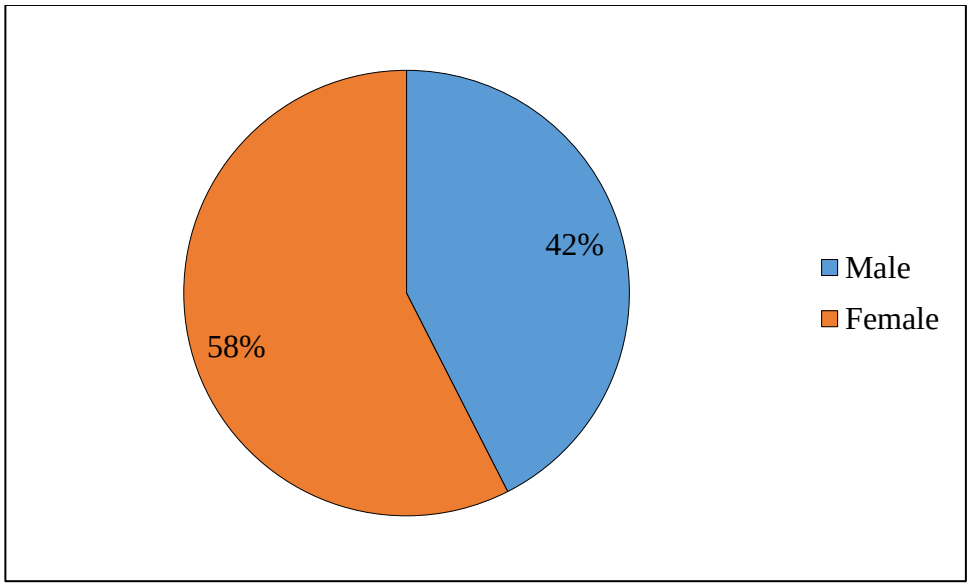
10.3.2. Differences between 'gender' groups

The resident participants were asked to indicate their gender from the following:

1. Male
2. Female
3. Prefer not to say

Figure 46 illustrates the percentage breakdown of resident respondents in terms of their gender.

Figure 46. Pie chart to illustrate the gender of resident respondents



(Source: self study)

10.3.2.1. Analysis of criteria categories

10.3.2.1.1. Mann-Whitney U test results for 'gender' groups

Table 71. Mann-Whitney U statistically significant test results comparing gender groups with reference to criteria importance

Criterion	Mann-Whitney U test result	Group scores
Physical fabric	U =7490.5, Z = -3.128, P = 0.002 (P< 0.01)	Females gave higher scores than males
Movement	U =7138, Z = -3.660, P = 0.000 (P< 0.01)	Females gave higher scores than males
Exchange	U =6897.5, Z = -4.025, P = 0.000 (P< 0.01)	Females gave higher scores than males
Real estate	U =6892.5, Z = -4.024, P = 0.000 (P< 0.01)	Females gave higher scores than males
Safety and security	U =6606, Z = -4.484, P = 0.000 (P< 0.01)	Females gave higher scores than males
Management	U =6700.5, Z = -4.322, P = 0.000 (P< 0.01)	Females gave higher scores than males

Environmental protection	U =7014 , Z = -3.859, P = 0.000 (P< 0.01)	Females gave higher scores than males

10.3.2.2. Analysis of sub-criteria

10.3.2.2.1. Mann-Whitney U test results comparing 'gender' groups

Table 72. Mann-Whitney U statistically significant test results comparing gender groups with reference to sub-criteria importance

Sub-criterion	**Mann-Whitney U test result**	**Group scores**
Signage	U = 6936.5, Z = -4.216, P = 0.000 (P<0.01)	Females gave higher scores than males
Trees and landscape	U = 8009.5, Z = -2.504, P = 0.012 (P=0.01)	Females gave higher scores than males
Public open space	U = 7422.5, Z = -3.497, P = 0.000 (P<0.01)	Females gave higher scores than males
Infrastructure	U = 8145.5, Z = -2.246, P = 0.025 (P<0.05)	Females gave higher scores than males
Public transport	U = 8050.5, Z = -2.527, P = 0.012 (P=0.01)	Females gave higher scores than males
Parking facilities	U = 8064, Z = -2.513, P = 0.012 (P=0.01)	Females gave higher scores than males
Traffic management	U = 6877.5, Z = -4.202, P = 0.000 (P<0.01)	Females gave higher scores than males
Social space	U = 8313.5, Z = -2.086, P = 0.037 (P<0.05)	Females gave higher scores than males
Political space	U = 7339.5, Z = -3.475, P = 0.001 (P<0.01)	Females gave higher scores than males
Cultural space	U = 7722, Z = -2.950, P = 0.003 (P<0.01)	Females gave higher scores than males
Community space	U = 7525.5, Z = -3.257, P = 0.001 (P<0.01)	Females gave higher scores than males

Entertainment	U = 8285, Z = -2.092, P = 0.036 (P<0.05)	Females gave higher scores than males
Work places	U = 8187.5, Z = -2.165, P = 0.03 (P<0.05)	Females gave higher scores than males
Civic venues	U = 6945, Z = -4.135, P = 0.000 (P<0.01)	Females gave higher scores than males
Health and social facilities	U = 6836.5, Z = -4.228, P = 0.000 (P<0.01)	Females gave higher scores than males
Actual crime	U = 8071.5, Z = -2.435, P = 0.015 (P<0.05)	Females gave higher scores than males
Perceived crime	U = 8299, Z = -2.095, P = 0.036 (P<0.05)	Females gave higher scores than males
CCTV and security presence	U = 6999.5, Z = -4.067, P = 0.000 (P<0.01)	Females gave higher scores than males
Street lighting	U = 6984, Z = -4.227, P = 0.000 (P<0.01)	Females gave higher scores than males
Town centre management team	U = 7979, Z = -5.527, P = 0.011 (P=0.01)	Females gave higher scores than males
Partnership/stakeholder involvement	U = 8040.5, Z = -2.426, P = 0.015 (P<0.05)	Females gave higher scores than males
Marketing	U = 7519.5, Z = -3.197, P = 0.001 (P<0.01)	Females gave higher scores than males
Digital connectivity	U = 7206, Z = -3.688, P = 0.000 (P<0.01)	Females gave higher scores than males
Environmental initiatives/ carbon reduction schemes	U = 7373.5, Z = -3.395, P = 0.001 (P<0.01)	Females gave higher scores than males
Environmentally sustainable materials	U = 6909.5, Z = -4.101, P = 0.000 (P<0.01)	Females gave higher scores than males
Waste management and recycling schemes	U = 7904, Z = -2.937, P = 0.008 (P<0.01)	Females gave higher scores than males

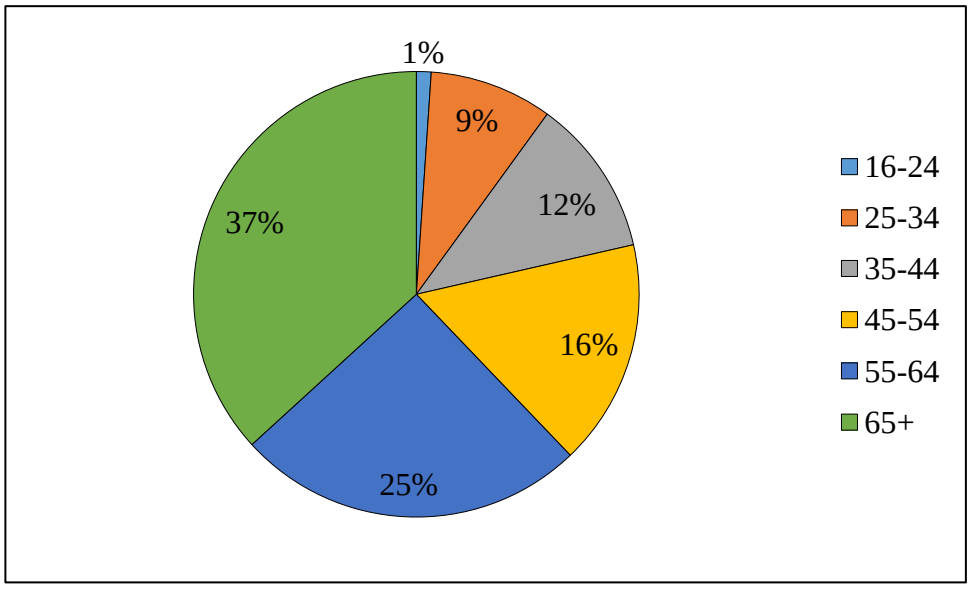
10.3.3. Differences between ‘age’ groups

Residents were asked to indicate their age by selecting one of the following age categories:

1. 16-24
2. 25-34
3. 35-44
4. 45-54
5. 55-34
6. 65+

Figure 47 illustrates the percentage breakdown of the resident respondents according to their age groups.

Figure 47. Pie chart to illustrate the age of resident respondents



(Source: self study)

10.3.3.1. Analysis of criteria categories

A Kruskal-Wallis test found no statistically significant differences between the importance scores given to criteria categories by different age groups.

10.3.3.2. Analysis of sub-criteria

10.3.3.2.1. Kruskal-Wallis test results comparing 'age' groups

Table 73. Kruskal-Wallis statistically significant test results comparing 'age' groups with reference to sub-criteria importance

Sub-criterion	Kruskal-Wallis result
Signage	$H(5) = 22.544$, $P = 0.000$ ($P<0.01$)
Goods/service vehicles	$H(5) = 11.836$, $P = 0.037$ ($P<0.05$)
Entertainment	$H(5) = 17.046$, $P = 0.004$ ($P<0.01$)
Civic venues	$H(5) = 10.851$, $P = 0.054$ ($P=0.05$)
CCTV and security presence	$H(5) = 12.261$, $P = 0.031$ ($P<0.05$)
Digital connectivity	$H(5) = 12.009$, $P = 0.035$ ($P<0.05$)
Environmental initiatives/carbon reduction schemes	$H(5) = 11.325$, $P = 0.045$ ($P<0.05$)
Environmentally sustainable materials	$H(5) = 12.448$, $P = 0.029$ ($P<0.05$)
Waste management and recycling schemes	$H(5) = 11.923$, $P = 0.036$ ($P<0.05$)
Commercial rent	$H(5) = 15.340$, $P = 0.009$ ($P<0.05$)
Business rates	$H(5) = 16.063$, $P = 0.007$ ($P<0.05$)

A Mann-Whitney U test was subsequently used to identify which age groups were producing the statistically significant results. The Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{6(6-1)}{2} = 15$

Bonferroni adjustment: $\frac{0.05}{15} = 0.003$

Following the post hoc Mann-Whitney U test, statistically significant differences were detected between age groups for 4 of the 42 sub-criteria. The Mann-Whitney U statistically significant results are present in tables 74 to 77.

Table 74. Mann-Whitney U statistically significant test results comparing ’16-24’ and ’55-64’ groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Signage	U = 11.5, Z = -2.775, P = 0.003 (P<0.01) (exact sig.)	The ‘55-64’ group gave higher scores than the ‘16-24’ group

Table 75. Mann-Whitney U statistically significant test results comparing ‘16-24’ and ‘65+’ groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Signage	U = 14.5, Z = -2.948, P = 0.002 (P<0.01) (exact sig.)	The ‘65+’ group gave higher scores than the ‘16-24’ group

Table 76. Mann-Whitney U statistically significant test results comparing ‘25-34’ and ‘55-64’ groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Signage	U = 527, Z = -3.196, P = 0.001 (P<0.01)	The ‘55-64’ group gave higher scores than the ‘25-34’ group
Commercial rent	U =560.5, Z = -2.990, P = 0.003 (P<0.01)	The ‘55-64’ group gave higher scores than the ‘25-34’ group
Business rates	U = 559.5, Z = -2.956, P = 0.003 (P<0.01)	The ‘55-64’ group gave higher scores than the ‘25-34’ group

Table 77. Mann-Whitney U statistically significant test results comparing ‘25-34’ and ‘65+’ groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Signage	U = 739.5, Z = -3.595, P = 0.000 (P<0.01)	The ’65+’ group gave higher scores than the ‘25-34’ group
Entertainment	U = 735.5, Z = -3.561, P = 0.000 (P<0.01)	The ’25-34’ group gave higher scores than the ‘65+’ group

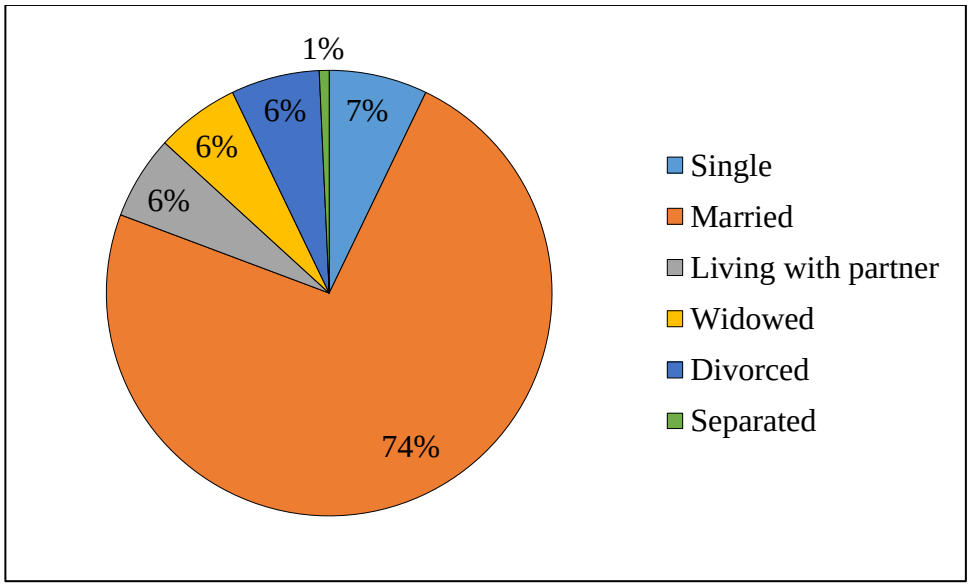
10.3.5. Differences between ‘marital status’ groups

The resident respondents were asked to indicate which of the following marital statuses applied to them:

1. Single
2. Married
3. Living with partner
4. Widowed
5. Divorced
6. Separated

Figure 48 illustrates the percentage breakdown of the resident respondent sample according to their marital status.

Figure 48. Pie chart to show the marital status of resident respondents



(Source: self study)

10.3.5.1. Analysis of criteria categories

A Kruskal-Wallis test found no statistically significant differences between the importance scores given to the criteria categories by the different 'marital status' groups.

10.3.5.2. Analysis of sub-criteria

10.3.5.2.1. Kruskal-Wallis test results comparing 'marital status' groups

Table 78. Kruskal-Wallis statistically significant test results comparing 'marital status' groups with reference to importance scores given to sub-criteria

Sub-criterion	Kruskal-Wallis result
Signage	$H(5) = 12.723$, $P = 0.026$ ($P<0.05$)
Parking facilities	$H(5) = 21.840$, $P = 0.001$ ($P<0.01$)
Entertainment	$H(5) = 13.998$, $P = 0.016$ ($P<0.05$)
Experience	$H(5) = 12.342$, $P = 0.030$ ($P<0.05$)

To identify which 'marital status' groups were producing the statistically significant results a post hoc Mann-Whitney U test was used. The Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{6(6-1)}{2} = 15$

Bonferroni adjustment: $\frac{0.05}{15} = 0.003$

The post hoc Mann-Whitney U identified statistically significant differences with reference to the sub-criteria 'signage' and 'entertainment'. The statistically significant results are presented in tables 79 to 81.

Table 79. Mann-Whitney U statistically significant test results comparing 'living with partner' and 'widowed' groups with reference to sub-criteria importance

Sub-criterion	**Mann-Whitney U test result**	**Group scores**
Signage	*U* = 67.5, *Z* = -3.316, Asymp. Sig.: *P* = 0.001 (*P*<0.003), Exact sig.: *P*= 0.007 (*P*>0.003)	'Widowed' respondents gave higher scores than 'living with partner' respondents
Entertainment	*U* = 53.5, *Z* = -3.448, Asymp. Sig *P* = 0.001 (*P*<0.003), Exact sig.: *P*= 0.001 (*P*<0.003)	'Living with partner' respondents gave higher scores than 'widowed' respondents

Table 80. Mann-Whitney U statistically significant test results comparing 'married' and 'widowed' groups with reference to sub-criteria importance

Sub-criterion	**Mann-Whitney U test result**	**Group scores**
Entertainment	*U* = 1.036, *Z* = -3.004, *P* = 0.003 (*P*=0.003)	'Married' respondents gave higher scores than 'widowed' respondents

Table 81. Mann-Whitney U statistically significant test results comparing ‘single’ and ‘widowed’ groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Entertainment	*U* = 75, *Z* = -3.088, Asymp. Sig.: *P* = 0.002 (*P*<0.003), Exact sig.: *P*= 0.003 (*P*=0.003)	‘Single’ respondents gave higher scores than ‘widowed’ respondents

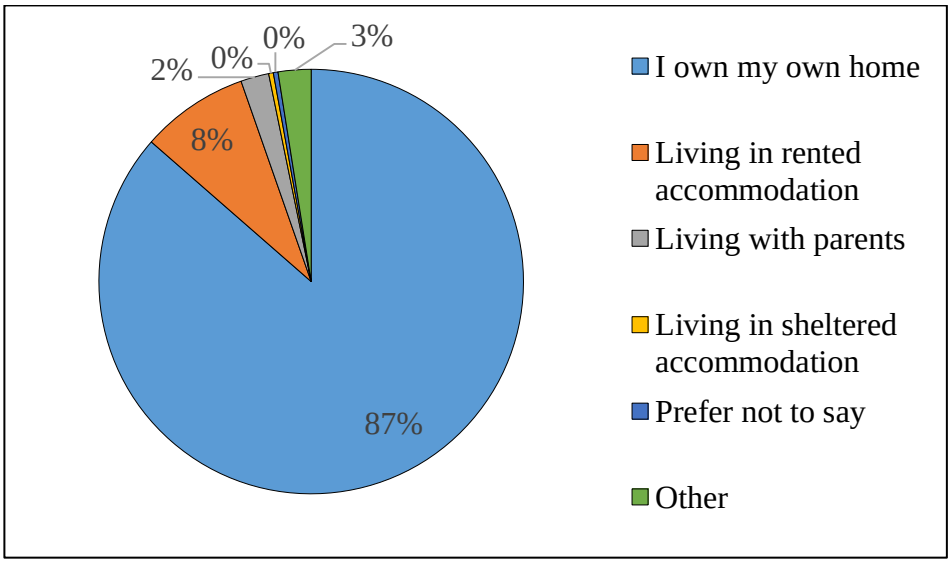
10.3.6. Differences between ‘living accommodation’ groups

The residents were asked to indicate their living accommodation by selecting one of the following options:

1. I own my own home
2. Living in rented accommodation
3. Living with parents
4. Living in sheltered accommodation
5. Prefer not to say
6. Other

Figure 49 illustrates the percentage breakdown of the resident respondents in terms of their living accommodation.

Figure 49. Pie chart to illustrate the living accommodation of resident respondents



(Source: self study)

A Kruskal-Wallis test found no statistically significant differences in the importance scores given to criteria categories and sub-criteria by different ‘living accommodation’ groups.

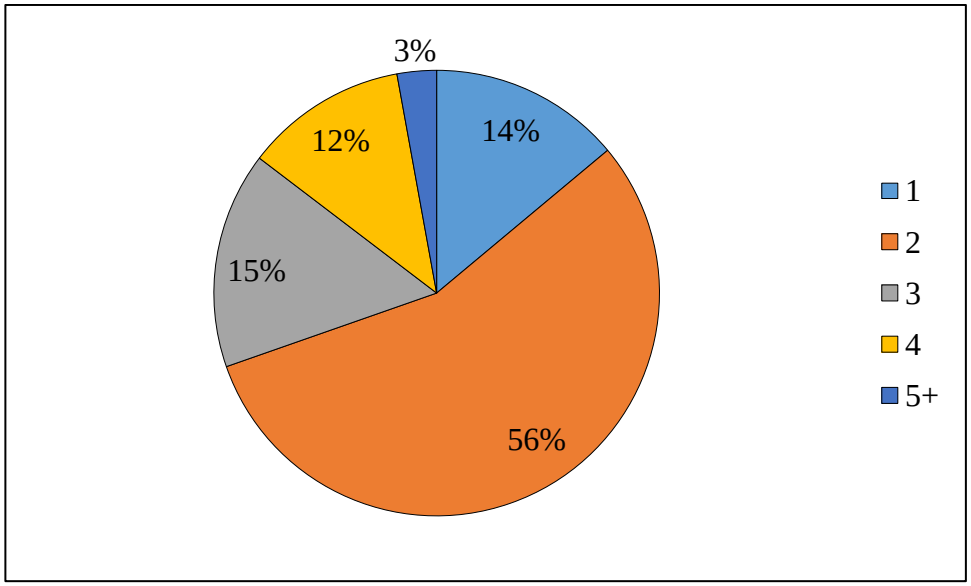
10.3.7. Differences between ‘household size’ groups

The residents were asked to specify the size of their household by selecting one of the following options:

1. 1
2. 2
3. 3
4. 4
5. 5+

Figure 50 illustrates the breakdown of the resident respondent sample according to the size of the households in which they reside.

Figure 50. Pie chart to illustrate the size of resident respondent households



(Source: self study)

10.3.7.1. Analysis of criteria categories

A Kruskal-Wallis test found no statistically significant differences between the importance scores given to the criteria categories by different household size groups.

10.3.7.2. Analysis of sub-criteria

10.3.7.2.1. Kruskal-Wallis test results for 'household size' groups with reference to sub-criteria importance

Table 82. Kruskal-Wallis statistically significant results comparing 'household size' groups with reference to sub-criteria importance

Sub-criterion	Kruskal-Wallis result
Infrastructure	$H(4) = 9.612$, $P = 0.047$ ($P<0.05$)
Public transport	$H(4) = 10.705$, $P = 0.030$ ($P<0.05$)
Health and social facilities	$H(4) = 12.048$, $P = 0.017$ ($P<0.05$)
Business rates	$H(4) = 9.729$, $P = 0.045$ ($P<0.05$)

A post hoc Mann-Whitney U test was used to determine which specific 'household size' groups were producing the statistically significant differences. The Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{5(5-1)}{2} = 10$

Bonferroni adjustment: $\frac{0.05}{10} = 0.005$

The result of the post hoc Mann-Whitney U test with Bonferroni adjustment is presented in table 83.

Table 83. Statistically significant Mann-Whitney U result comparing the '2' and '4' groups with reference to the importance of sub-criteria

Sub-criterion	Mann-Whitney U test result	Group scores
Public transport	$U = 1833.5$, $Z = -2.881$, $P = 0.004$ ($P<0.01$)	The '2' group gave higher scores than the '4' group.

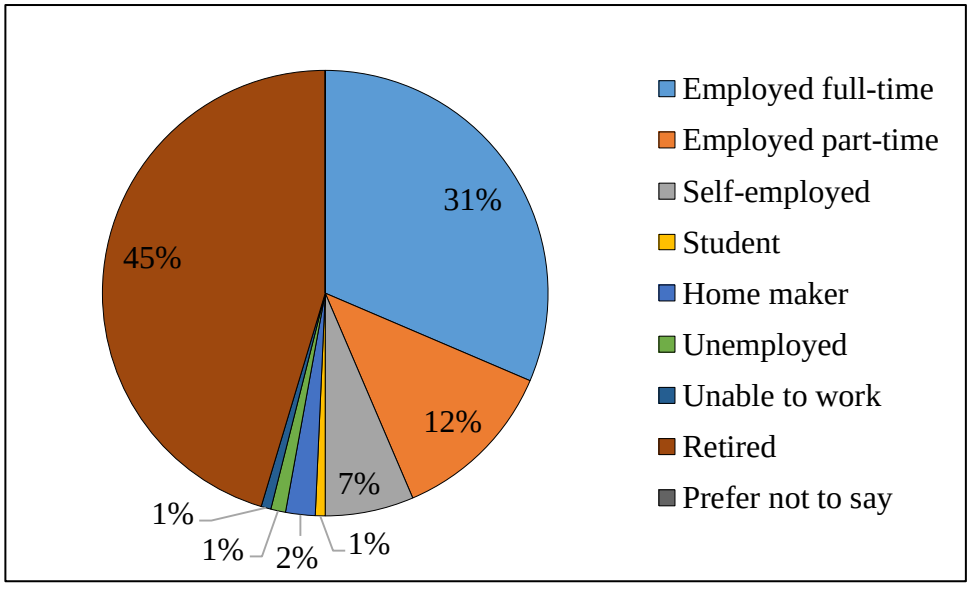
10.3.8. Differences between 'occupational status' groups

The residents' survey asked participants to indicate which of the following best described their occupational status:

1. Employed full-time
2. Employed part-time
3. Self-employed
4. Student
5. Home maker
6. Unemployed
7. Unable to work
8. Retired
9. Prefer not to say

Figure 51 illustrates the percentage breakdown of resident respondents according to their occupational status.

Figure 51. Pie chart to show the occupational status of resident respondents



(Source: self study)

10.3.8.1. Analysis of criteria categories

10.3.8.1.1. Kruskal-Wallis test results for ‘occupational status’ groups

Table 84. Kruskal-Wallis statistically significant test results comparing ‘occupational status’ groups with reference to criteria importance

Criterion	Kruskal-Wallis result
Physical fabric	$H(7) = 14.213$, $P = 0.048$ ($P<0.05$)
Psychology	$H(7) = 14.321$, $P = 0.046$ ($P<0.05$)
Safety and security	$H(7) = 13.957$, $P = 0.052$ ($P=0.05$)
Environmental protection	$H(7) = 15.659$, $P = 0.028$ ($P<0.05$)

In order to identify which specific ‘occupational status’ groups were producing the statistically significant differences, a post hoc Mann-Whitney U test was used. The Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{8(8-1)}{2} = 28$

Bonferroni adjustment: $\frac{0.05}{28} = 0.002$

The post hoc Mann-Whitney U test, taking into consideration the adjusted alpha level, identified two statistically significant differences between the responses of the ‘employed full-time’ and retired’ groups. The results are presented in table 85.

Table 85. Mann-Whitney U statistically significant test results comparing 'employed full-time' and 'retired' groups with reference to criteria importance

Criterion	Mann-Whitney U test result	Group scores
Safety and security	U =4203.5, Z = -3.117, P = 0.002 (P=0.002)	‘Retired’ group gave higher scores than ‘employed full-time’ group
Environmental protection	U =3964.5, Z = -3.646, P = 0.000 (P<0.002)	‘Retired’ group gave higher scores than ‘employed full-time’ group

10.3.8.2. Analysis of sub-criteria

10.3.8.2.1. Kruskal-Wallis test results for ‘occupational status’ groups

Table 86. Kruskal-Wallis statistically significant results comparing 'occupational status' groups with reference to sub-criteria importance

Sub-criterion	Kruskal-Wallis result
Signage	$H(7) = 26.606$, $P = 0.000$ ($P<0.01$)
Civic venues	$H(7) = 25.635$, $P = 0.001$ ($P<0.01$)
Atmosphere	$H(7) = 19.588$, $P = 0.007$ ($P<0.01$)
CCTV and security presence	$H(7) = 14.692$, $P = 0.040$ ($P<0.05$)
Environmentally sustainable materials	$H(7) = 19.334$, $P = 0.007$ ($P<0.01$)

To identify which ‘occupational status’ groups were producing the statistically significant differences, a post hoc Mann-Whitney U test was employed. The Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{8(8-1)}{2} = 28$

Bonferroni adjustment: $\frac{0.05}{28} = 0.002$

The post hoc Mann-Whitney U test, taking into consideration the Bonferroni adjustment, identified a number of statistically significant differences between ‘occupational status’ groups. These results are presented in tables 87 to 89.

Table 87. Mann-Whitney U statistically significant test results comparing 'employed full-time' and 'employed part-time' groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Signage	U = 961.5, Z = -3.204, P = 0.001 (P<0.002)	'Employed part-time' group gave higher scores than 'employed full-time' group
Civic venues	U = 956, Z = -3.206, P = 0.001 (P<0.002)	'Employed part-time' group gave higher scores than 'employed full-time' group

Table 88. Mann-Whitney U statistically significant test results comparing 'employed full-time' and 'retired' groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Signage	U = 3661.5, Z = -4.600, P = 0.000 (P<0.002)	'Retired' group gave higher scores than 'employed full-time' group
Civic venues	U = 3756, Z = -4.282, P = 0.000 (P<0.002)	'Retired' group gave higher scores than 'employed full-time' group
CCTV and security presence	U = 4248, Z = -3.147, P = 0.002 (P=0.002)	'Retired' group gave higher scores than 'employed full-time' group
Environmentally sustainable materials	U = 3881.5, Z = -3.919, P = 0.000 (P<0.002)	'Retired' group gave higher scores than 'employed full-time' group

Table 89. Mann-Whitney U statistically significant test results comparing 'employed full-time' and 'self-employed' groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
Atmosphere	U = 430.5, Z = -3.364, P = 0.001 (P<0.002)	'Self-employed' group gave higher scores than 'employed full-time' group

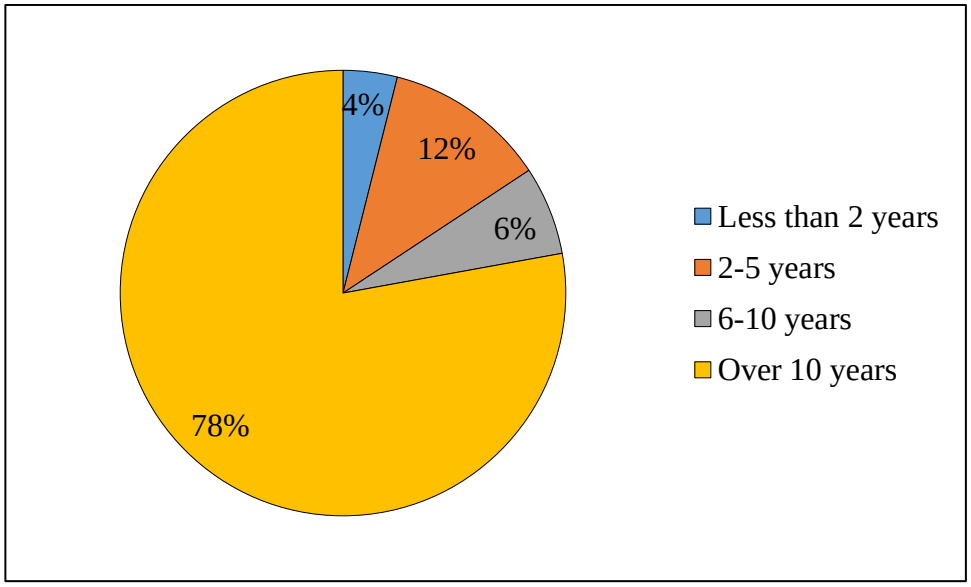
10.3.9. Differences between ‘length of residence’ groups

The resident survey asked participants to indicate how long they had lived in their respective town by selecting one of the following options:

1. Less than 2 years
2. 2-5 years
3. 6-10 years
4. Over 10 years

Figure 52 illustrates the percentage breakdown of the length of time residents have resided in their respective towns.

Figure 52. Length of time resident respondents have been resident in their respective town



(Source: self study)

10.3.9.1. Analysis of criteria categories

A Kruskal-Wallis test found no statistically significant differences between the importance scores given to the criteria categories by different ‘length of residence’ groups.

10.3.9.2. Analysis of sub-criteria

10.3.9.2.1. Kruskal-Wallis test results for 'length of residence' groups

Table 90. Kruskal-Wallis statistically significant results comparing 'length of residence' groups with reference to sub-criteria importance

Sub-criterion	Kruskal-Wallis result
CCTV and security presence	$H(3) = 9.661$, $P = 0.022$ ($P<0.05$)

A post hoc Mann-Whitney U test was subsequently employed to determine which 'length of residence' groups were producing the statistically significant difference presented in table 90. A Bonferroni adjustment was calculated as follows:

Number of comparisons required: $\frac{4(4-1)}{2} = 6$

Bonferroni adjustment: $\frac{0.05}{6} = 0.008$

The result of the post hoc Mann-Whitney U test with Bonferroni adjustment is presented in table 91.

Table 91. Mann-Whitney U statistically significant test results comparing the 'less than 2 years' and 'over 10 years' groups with reference to sub-criteria importance

Sub-criterion	Mann-Whitney U test result	Group scores
CCTV and security presence	$U = 575.5$, $Z = -3.063$, $P = 0.002$ ($P<0.008$)	The 'over 10 years' group gave higher scores than the 'less than 2 years' group

Appendix 8 – Normalised matrix for WSM (all positive sub-criteria)

Sub-criteria		Weight	+/-	Alternatives							
				A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	0.0243	+	0.1288	0.1135	0.1457	0.1400	0.1171	0.1257	0.1080	0.1213
1b	Signage	0.0232	+	0.1340	0.1070	0.1186	0.1260	0.1379	0.1292	0.1347	0.1125
1c	Buildings	0.0259	+	0.1217	0.0744	0.1408	0.0918	0.1193	0.1237	0.1743	0.1539
1d	Trees and landscape	0.0248	+	0.1347	0.0833	0.1293	0.1155	0.1127	0.1139	0.1560	0.1545
1e	Public open space	0.0260	+	0.1451	0.0935	0.1359	0.1182	0.1053	0.1257	0.1590	0.1173
1f	Infrastructure	0.0239	+	0.1360	0.1049	0.1241	0.1177	0.1177	0.1164	0.1510	0.1320
1g	Design	0.0255	+	0.1327	0.0737	0.1421	0.0956	0.1105	0.1157	0.1743	0.1554
2a	Pedestrian pavement/ walkways	0.0272	+	0.1381	0.1097	0.1364	0.1255	0.1117	0.1219	0.1235	0.1330
2b	Cycling facilities	0.0204	+	0.1349	0.0883	0.1312	0.1480	0.1073	0.0923	0.1323	0.1657
2c	Public transport	0.0268	+	0.1355	0.1358	0.1230	0.1230	0.1095	0.1230	0.1210	0.1293
2d	Parking facilities	0.0265	+	0.1581	0.1360	0.1390	0.1268	0.1170	0.0947	0.1338	0.0947
2e	Goods/ service vehicles	0.0232	+	0.1544	0.1166	0.1511	0.1131	0.1247	0.1248	0.0902	0.1251
2f	Traffic management	0.0220	+	0.1274	0.1169	0.1461	0.1236	0.1236	0.1199	0.1261	0.1164
3a	Social space	0.0265	+	0.1464	0.0870	0.1268	0.1137	0.0943	0.0977	0.1859	0.1482
3b	Economic space	0.0266	+	0.1715	0.0907	0.1406	0.0823	0.1038	0.0970	0.1753	0.1387
3c	Political space	0.0186	+	0.1429	0.1231	0.1422	0.1094	0.1178	0.1166	0.1219	0.1260
3d	Cultural space	0.0241	+	0.1442	0.0987	0.1194	0.1076	0.1123	0.0957	0.1780	0.1441
3e	Community space	0.0246	+	0.1553	0.0911	0.1259	0.1129	0.1147	0.1031	0.1746	0.1224
4a	Retail	0.0279	+	0.1737	0.1001	0.1373	0.0896	0.0906	0.0846	0.1774	0.1467
4b	Entertainment	0.0259	+	0.1805	0.0878	0.1541	0.0773	0.0975	0.0680	0.1818	0.1530
4c	Work places (Part 1)	0.0119	+	0.1912	0.1513	0.0650	0.0897	0.1171	0.1205	0.1124	0.1527
	Work places (Part 2)	0.0119	+	0.2016	0.0951	0.1823	0.0881	0.0802	0.0911	0.1530	0.1085
4d	Civic venues	0.0240	+	0.1572	0.0925	0.1424	0.1359	0.1050	0.0985	0.1470	0.1215
4e	Residential (Part 1)	0.0101	+	0.0589	0.1087	0.0199	0.1775	0.2493	0.0277	0.1135	0.2446
	Residential (Part 2)	0.0101	+	0.1363	0.1160	0.1342	0.1242	0.1125	0.1105	0.1470	0.1193
4f	Health and social facilities	0.0217	+	0.1301	0.1184	0.1274	0.1129	0.1059	0.1300	0.1433	0.1320

5a	Identity/ image	0.0255	+	0.1492	0.0851	0.1460	0.0917	0.0866	0.0720	0.2100	0.1594
5b	Experience	0.0257	+	0.1684	0.0779	0.1425	0.0954	0.0992	0.0848	0.1902	0.1417
5c	Atmosphere	0.0270	+	0.1680	0.0807	0.1429	0.0930	0.0942	0.0794	0.1987	0.1429
6a	Actual crime	0.0257	+	0.1439	0.1122	0.1267	0.1338	0.1092	0.0793	0.1407	0.1542
6b	Perceived crime	0.0266	+	0.1497	0.0785	0.1533	0.1183	0.1066	0.0853	0.1800	0.1284
6c	CCTV and security presence	0.0236	+	0.1490	0.1237	0.1296	0.1194	0.1113	0.0968	0.1493	0.1209
6d	Street lighting	0.0264	+	0.1476	0.1132	0.1281	0.1203	0.1107	0.0995	0.1442	0.1364
7a	Town centre management team	0.0236	+	0.1753	0.1098	0.1493	0.1073	0.0979	0.1034	0.1536	0.1034
7b	Partnership/ stakeholder involvement (Part 1)	0.0120	+	0.1429	0.1429	0.1429	0.0714	0.1429	0.0714	0.1429	0.1429
	Partnership/ stakeholder involvement (Part 2)	0.0120	+	0.1578	0.1157	0.1532	0.0882	0.1051	0.1094	0.1493	0.1213
7c	Marketing	0.0213	+	0.1573	0.0985	0.1812	0.0953	0.0987	0.0865	0.1616	0.1208
7d	Digital connectivity/ internet presence	0.0228	+	0.1615	0.1182	0.1329	0.1018	0.1128	0.0904	0.1559	0.1266
8a	Environmental initiatives/ carbon reduction schemes (Part 1)	0.0069	+	0.2308	0.0769	0.1538	0.0769	0.0769	0.0769	0.2308	0.0769
	Environmental initiatives/ carbon reduction schemes (Part 2)	0.0069	+	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
	Environmental initiatives/ carbon reduction schemes (Part 3)	0.0069	+	0.1393	0.1298	0.1817	0.1038	0.1148	0.0978	0.1167	0.1161
8c	Waste management and recycling schemes	0.0242	+	0.1513	0.1317	0.1412	0.1369	0.1153	0.0802	0.1311	0.1123
9a	Commercial rent (Part 1)	0.0129	+	0.0783	0.1084	0.1414	0.1419	0.1448	0.1341	0.1245	0.1266
	Commercial rent (Part 2)	0.0129	+	0.1370	0.1220	0.1487	0.1347	0.0871	0.1034	0.1487	0.1185
9b	Business rates	0.0255	+	0.1845	0.1462	0.1041	0.1035	0.0998	0.1134	0.1256	0.1230
9c	Trading hours	0.0245	+	0.1487	0.1237	0.1381	0.1178	0.1055	0.0974	0.1374	0.1314
9d	Complementary daytime, evening and night-time economies	0.0235	+	0.1669	0.1026	0.1634	0.0931	0.0934	0.0913	0.1522	0.1371
			WSM	**0.1497**	**0.1054**	**0.1368**	**0.1117**	**0.1098**	**0.1014**	**0.1521**	**0.1332**
			Rank	**2**	**7**	**3**	**5**	**6**	**8**	**1**	**4**

Appendix 9 – Normalised matrix for Revised AHP1 (all positive sub-criteria)

Sub-criteria		Weight	+/-	Alternatives							
				A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	0.0243	+	0.8839	0.7788	1.0000	0.9609	0.8036	0.8631	0.7415	0.8325
1b	Signage	0.0232	+	0.9713	0.7759	0.8599	0.9138	1.0000	0.9365	0.9767	0.8158
1c	Buildings	0.0259	+	0.6983	0.4271	0.8077	0.5268	0.6843	0.7098	1.0000	0.8831
1d	Trees and landscape	0.0248	+	0.8635	0.5342	0.8289	0.7401	0.7227	0.7303	1.0000	0.9901
1e	Public open space	0.0260	+	0.9130	0.5879	0.8551	0.7435	0.6622	0.7909	1.0000	0.7380
1f	Infrastructure	0.0239	+	0.9006	0.6948	0.8218	0.7794	0.7794	0.7705	1.0000	0.8741
1g	Design	0.0255	+	0.7613	0.4230	0.8154	0.5488	0.6340	0.6636	1.0000	0.8919
2a	Pedestrian pavement/ walkways	0.0272	+	1.0000	0.7945	0.9875	0.9088	0.8090	0.8826	0.8942	0.9631
2b	Cycling facilities	0.0204	+	0.8143	0.5332	0.7917	0.8935	0.6477	0.5574	0.7983	1.0000
2c	Public transport	0.0268	+	0.9972	1.0000	0.9053	0.9053	0.8060	0.9053	0.8907	0.9518
2d	Parking facilities	0.0265	+	1.0000	0.8599	0.8794	0.8017	0.7401	0.5989	0.8463	0.5989
2e	Goods/ service vehicles	0.0232	+	1.0000	0.7550	0.9784	0.7324	0.8071	0.8081	0.5838	0.8098
2f	Traffic management	0.0220	+	0.8718	0.8000	1.0000	0.8462	0.8462	0.8205	0.8627	0.7964
3a	Social space	0.0265	+	0.7880	0.4679	0.6822	0.6118	0.5074	0.5259	1.0000	0.7973
3b	Economic space	0.0266	+	0.9784	0.5172	0.8021	0.4695	0.5923	0.5532	1.0000	0.7914
3c	Political space	0.0186	+	1.0000	0.8616	0.9951	0.7655	0.8245	0.8159	0.8529	0.8814
3d	Cultural space	0.0241	+	0.8097	0.5545	0.6704	0.6047	0.6310	0.5375	1.0000	0.8093
3e	Community space	0.0246	+	0.8894	0.5220	0.7212	0.6469	0.6571	0.5907	1.0000	0.7014
4a	Retail	0.0279	+	0.9791	0.5640	0.7740	0.5049	0.5108	0.4768	1.0000	0.8270
4b	Entertainment	0.0259	+	0.9927	0.4827	0.8472	0.4249	0.5363	0.3741	1.0000	0.8413
4c	Work places (Part 1)	0.0119	+	1.0000	0.7909	0.3399	0.4692	0.6122	0.6303	0.5878	0.7985
	Work places (Part 2)	0.0119	+	1.0000	0.4717	0.9041	0.4370	0.3978	0.4521	0.7590	0.5382
4d	Civic venues	0.0240	+	1.0000	0.5883	0.9056	0.8644	0.6680	0.6264	0.9351	0.7727
4e	Residential (Part 1)	0.0101	+	0.2362	0.4360	0.0799	0.7120	1.0000	0.1111	0.4552	0.9812
	Residential (Part 2)	0.0101	+	0.9275	0.7892	0.9135	0.8450	0.7656	0.7523	1.0000	0.8120
4f	Health and social facilities	0.0217	+	0.9080	0.8267	0.8889	0.7879	0.7391	0.9074	1.0000	0.9216

5a	Identity/ image	0.0255	+	0.7105	0.4051	0.6950	0.4369	0.4122	0.3429	1.0000	0.7592
5b	Experience	0.0257	+	0.8855	0.4094	0.7493	0.5018	0.5218	0.4457	1.0000	0.7452
5c	Atmosphere	0.0270	+	0.8452	0.4063	0.7191	0.4681	0.4742	0.3995	1.0000	0.7191
6a	Actual crime	0.0257	+	0.9327	0.7278	0.8215	0.8678	0.7077	0.5141	0.9122	1.0000
6b	Perceived crime	0.0266	+	0.8319	0.4364	0.8519	0.6571	0.5922	0.4742	1.0000	0.7132
6c	CCTV and security presence	0.0236	+	0.9979	0.8283	0.8677	0.7992	0.7455	0.6479	1.0000	0.8099
6d	Street lighting	0.0264	+	1.0000	0.7670	0.8681	0.8152	0.7500	0.6743	0.9773	0.9239
7a	Town centre management team	0.0236	+	1.0000	0.6263	0.8515	0.6121	0.5584	0.5895	0.8762	0.5895
7b	Partnership/ stakeholder involvement (Part 1)	0.0120	+	1.0000	1.0000	1.0000	0.5000	1.0000	0.5000	1.0000	1.0000
	Partnership/ stakeholder involvement (Part 2)	0.0120	+	1.0000	0.7333	0.9706	0.5588	0.6661	0.6933	0.9457	0.7684
7c	Marketing	0.0213	+	0.8681	0.5436	1.0000	0.5256	0.5444	0.4775	0.8917	0.6667
7d	Digital connectivity/ internet presence	0.0228	+	1.0000	0.7317	0.8232	0.6301	0.6984	0.5595	0.9654	0.7840
8a	Environmental initiatives/ carbon reduction schemes (Part 1)	0.0069	+	1.0000	0.3333	0.6667	0.3333	0.3333	0.3333	1.0000	0.3333
	Environmental initiatives/ carbon reduction schemes (Part 2)	0.0069	+	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	Environmental initiatives/ carbon reduction schemes (Part 3)	0.0069	+	0.7667	0.7143	1.0000	0.5714	0.6316	0.5385	0.6420	0.6389
8c	Waste management and recycling schemes	0.0242	+	1.0000	0.8704	0.9333	0.9048	0.7619	0.5303	0.8667	0.7424
9a	Commercial rent (Part 1)	0.0129	+	0.5408	0.7485	0.9763	0.9799	1.0000	0.9260	0.8600	0.8740
	Commercial rent (Part 2)	0.0129	+	0.9219	0.8203	1.0000	0.9063	0.5859	0.6953	1.0000	0.7969
9b	Business rates	0.0255	+	1.0000	0.7924	0.5646	0.5610	0.5408	0.6149	0.6809	0.6668
9c	Trading hours	0.0245	+	1.0000	0.8322	0.9284	0.7920	0.7092	0.6547	0.9243	0.8838
9d	Complementary daytime, evening and night-time economies	0.0235	+	1.0000	0.6149	0.9788	0.5577	0.5593	0.5471	0.9117	0.8215
			RAHP1	**0.9111**	**0.6534**	**0.8389**	**0.6912**	**0.6757**	**0.6303**	**0.9199**	**0.8108**
			Rank	**2**	**7**	**3**	**5**	**6**	**8**	**1**	**4**

Appendix 10 – Normalised matrix for RAHP2 (negative sub-criteria represented by negative weights)

Sub-criteria		Weights	+/-	Alternatives							
				A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	0.0243	+	0.8839	0.7788	1.0000	0.9609	0.8036	0.8631	0.7415	0.8325
1b	Signage	-0.0232	-	0.8046	1.0000	0.9159	0.8621	0.7759	0.8394	0.7992	0.9600
1c	Buildings	0.0259	+	0.6983	0.4271	0.8077	0.5268	0.6843	0.7098	1.0000	0.8831
1d	Trees and landscape	0.0248	+	0.8635	0.5342	0.8289	0.7401	0.7227	0.7303	1.0000	0.9901
1e	Public open space	0.0260	+	0.9130	0.5879	0.8551	0.7435	0.6622	0.7909	1.0000	0.7380
1f	Infrastructure	0.0239	+	0.9006	0.6948	0.8218	0.7794	0.7794	0.7705	1.0000	0.8741
1g	Design	0.0255	+	0.7613	0.4230	0.8154	0.5488	0.6340	0.6636	1.0000	0.8919
2a	Pedestrian pavement/ walkways	0.0272	+	1.0000	0.7945	0.9875	0.9088	0.8090	0.8826	0.8942	0.9631
2b	Cycling facilities	0.0204	+	0.8143	0.5332	0.7917	0.8935	0.6477	0.5574	0.7983	1.0000
2c	Public transport	0.0268	+	0.9972	1.0000	0.9053	0.9053	0.8060	0.9053	0.8907	0.9518
2d	Parking facilities	0.0265	+	1.0000	0.8599	0.8794	0.8017	0.7401	0.5989	0.8463	0.5989
2e	Goods/ service vehicles	-0.0232	-	0.5838	0.8288	0.6054	0.8514	0.7767	0.7757	1.0000	0.7740
2f	Traffic management	0.0220	+	0.8718	0.8000	1.0000	0.8462	0.8462	0.8205	0.8627	0.7964
3a	Social space	0.0265	+	0.7880	0.4679	0.6822	0.6118	0.5074	0.5259	1.0000	0.7973
3b	Economic space	0.0266	+	0.9784	0.5172	0.8021	0.4695	0.5923	0.5532	1.0000	0.7914
3c	Political space	0.0186	+	1.0000	0.8616	0.9951	0.7655	0.8245	0.8159	0.8529	0.8814
3d	Cultural space	0.0241	+	0.8097	0.5545	0.6704	0.6047	0.6310	0.5375	1.0000	0.8093
3e	Community space	0.0246	+	0.8894	0.5220	0.7212	0.6469	0.6571	0.5907	1.0000	0.7014
4a	Retail	0.0279	+	0.9791	0.5640	0.7740	0.5049	0.5108	0.4768	1.0000	0.8270
4b	Entertainment	0.0259	+	0.9927	0.4827	0.8472	0.4249	0.5363	0.3741	1.0000	0.8413
4c	Work places (Part 1)	0.0119	+	1.0000	0.7909	0.3399	0.4692	0.6122	0.6303	0.5878	0.7985
	Work places (Part 2)	0.0119	+	1.0000	0.4717	0.9041	0.4370	0.3978	0.4521	0.7590	0.5382
4d	Civic venues	0.0240	+	1.0000	0.5883	0.9056	0.8644	0.6680	0.6264	0.9351	0.7727
4e	Residential (Part 1)	0.0101	+	0.2362	0.4360	0.0799	0.7120	1.0000	0.1111	0.4552	0.9812
	Residential (Part 2)	0.0101	+	0.9275	0.7892	0.9135	0.8450	0.7656	0.7523	1.0000	0.8120
4f	Health and social facilities	0.0217	+	0.9080	0.8267	0.8889	0.7879	0.7391	0.9074	1.0000	0.9216
5a	Identity/ image	0.0255	+	0.7105	0.4051	0.6950	0.4369	0.4122	0.3429	1.0000	0.7592

5b	Experience	0.0257	+	0.8855	0.4094	0.7493	0.5018	0.5218	0.4457	1.0000	0.7452
5c	Atmosphere	0.0270	+	0.8452	0.4063	0.7191	0.4681	0.4742	0.3995	1.0000	0.7191
6a	Actual crime	-0.0257	-	0.5814	0.7864	0.6926	0.6464	0.8064	1.0000	0.6019	0.5141
6b	Perceived crime	-0.0266	-	0.6045	1.0000	0.5844	0.7792	0.8442	0.9622	0.4364	0.7231
6c	CCTV and security presence	0.0236	+	0.9979	0.8283	0.8677	0.7992	0.7455	0.6479	1.0000	0.8099
6d	Street lighting	0.0264	+	1.0000	0.7670	0.8681	0.8152	0.7500	0.6743	0.9773	0.9239
7a	Town centre management team	0.0236	+	1.0000	0.6263	0.8515	0.6121	0.5584	0.5895	0.8762	0.5895
7b	Partnership/ stakeholder involvement (Part 1)	0.0120	+	1.0000	1.0000	1.0000	0.5000	1.0000	0.5000	1.0000	1.0000
	Partnership/ stakeholder involvement (Part 2)	0.0120	+	1.0000	0.7333	0.9706	0.5588	0.6661	0.6933	0.9457	0.7684
7c	Marketing	0.0213	+	0.8681	0.5436	1.0000	0.5256	0.5444	0.4775	0.8917	0.6667
7d	Digital connectivity/ internet presence	0.0228	+	1.0000	0.7317	0.8232	0.6301	0.6984	0.5595	0.9654	0.7840
8a	Environmental initiatives/ carbon reduction schemes (Part 1)	0.0069	+	1.0000	0.3333	0.6667	0.3333	0.3333	0.3333	1.0000	0.3333
	Environmental initiatives/ carbon reduction schemes (Part 2)	0.0069	+	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	Environmental initiatives/ carbon reduction schemes (Part 3)	0.0069	+	0.7667	0.7143	1.0000	0.5714	0.6316	0.5385	0.6420	0.6389
8c	Waste management and recycling schemes	0.0242	+	1.0000	0.8704	0.9333	0.9048	0.7619	0.5303	0.8667	0.7424
9a	Commercial rent (Part 1)	-0.0129	-	1.0000	0.7924	0.5646	0.5610	0.5408	0.6149	0.6809	0.6668
	Commercial rent (Part 2)	-0.0129	-	0.6641	0.7656	0.5859	0.6797	1.0000	0.8906	0.5859	0.7891
9b	Business rates	-0.0255	-	1.0000	0.7924	0.5646	0.5610	0.5408	0.6149	0.6809	0.6668
9c	Trading hours	0.0245	+	1.0000	0.8322	0.9284	0.7920	0.7092	0.6547	0.9243	0.8838
9d	Complementary daytime, evening and night-time economies	0.0235	+	1.0000	0.6149	0.9788	0.5577	0.5593	0.5471	0.9117	0.8215
			RAHP2	**0.6646**	**0.4175**	**0.6146**	**0.4671**	**0.4526**	**0.4035**	**0.6896**	**0.5813**
			Rank	**2**	**7**	**3**	**5**	**6**	**8**	**1**	**4**

Appendix 11 – Weighted normalised matrix for TOPSIS

Sub-criteria		Weight	+/-	Alternatives							
				A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	0.0243	+	0.0088	0.0078	0.0100	0.0096	0.0080	0.0086	0.0074	0.0083
1b	Signage	0.0232	-	0.0076	0.0094	0.0086	0.0081	0.0073	0.0079	0.0075	0.0090
1c	Buildings	0.0259	+	0.0087	0.0053	0.0100	0.0065	0.0085	0.0088	0.0124	0.0109
1d	Trees and landscape	0.0248	+	0.0093	0.0058	0.0089	0.0080	0.0078	0.0079	0.0108	0.0107
1e	Public open space	0.0260	+	0.0106	0.0068	0.0099	0.0086	0.0077	0.0091	0.0116	0.0085
1f	Infrastructure	0.0239	+	0.0091	0.0071	0.0083	0.0079	0.0079	0.0078	0.0101	0.0089
1g	Design	0.0255	+	0.0093	0.0052	0.0099	0.0067	0.0077	0.0081	0.0122	0.0109
2a	Pedestrian pavement/ walkways	0.0272	+	0.0106	0.0084	0.0105	0.0096	0.0086	0.0094	0.0095	0.0102
2b	Cycling facilities	0.0204	+	0.0076	0.0050	0.0074	0.0084	0.0061	0.0052	0.0075	0.0094
2c	Public transport	0.0268	+	0.0103	0.0103	0.0093	0.0093	0.0083	0.0093	0.0092	0.0098
2d	Parking facilities	0.0265	+	0.0117	0.0101	0.0103	0.0094	0.0087	0.0070	0.0099	0.0070
2e	Goods/ service vehicles	0.0232	-	0.0061	0.0087	0.0063	0.0089	0.0081	0.0081	0.0104	0.0081
2f	Traffic management	0.0220	+	0.0079	0.0072	0.0091	0.0077	0.0077	0.0074	0.0078	0.0072
3a	Social space	0.0265	+	0.0107	0.0063	0.0092	0.0083	0.0069	0.0071	0.0135	0.0108
3b	Economic space	0.0266	+	0.0124	0.0066	0.0102	0.0060	0.0075	0.0070	0.0127	0.0101
3c	Political space	0.0186	+	0.0075	0.0064	0.0074	0.0057	0.0062	0.0061	0.0064	0.0066
3d	Cultural space	0.0241	+	0.0096	0.0066	0.0080	0.0072	0.0075	0.0064	0.0119	0.0096
3e	Community space	0.0246	+	0.0106	0.0062	0.0086	0.0077	0.0078	0.0070	0.0119	0.0083
4a	Retail	0.0279	+	0.0132	0.0076	0.0104	0.0068	0.0069	0.0064	0.0134	0.0111
4b	Entertainment	0.0259	+	0.0125	0.0061	0.0106	0.0053	0.0067	0.0047	0.0126	0.0106
4c	Work places (Part 1)	0.0119	+	0.0062	0.0049	0.0021	0.0029	0.0038	0.0039	0.0036	0.0049
	Work places (Part 2)	0.0119	+	0.0064	0.0030	0.0058	0.0028	0.0025	0.0029	0.0048	0.0034
4d	Civic venues	0.0240	+	0.0105	0.0062	0.0095	0.0091	0.0070	0.0066	0.0098	0.0081
4e	Residential (Part 1)	0.0101	+	0.0014	0.0026	0.0005	0.0042	0.0059	0.0007	0.0027	0.0058
	Residential (Part 2)	0.0101	+	0.0039	0.0033	0.0038	0.0035	0.0032	0.0031	0.0042	0.0034
4f	Health and social facilities	0.0217	+	0.0080	0.0072	0.0078	0.0069	0.0065	0.0079	0.0088	0.0081

5a	Identity/ image	0.0255	+	0.0101	0.0058	0.0099	0.0062	0.0059	0.0049	0.0142	0.0108
5b	Experience	0.0257	+	0.0117	0.0054	0.0099	0.0066	0.0069	0.0059	0.0132	0.0098
5c	Atmosphere	0.0270	+	0.0122	0.0059	0.0104	0.0067	0.0068	0.0058	0.0144	0.0104
6a	Actual crime	0.0257	-	0.0074	0.0099	0.0088	0.0082	0.0102	0.0127	0.0076	0.0065
6b	Perceived crime	0.0266	-	0.0074	0.0123	0.0072	0.0096	0.0104	0.0118	0.0054	0.0089
6c	CCTV and security presence	0.0236	+	0.0099	0.0082	0.0086	0.0079	0.0074	0.0064	0.0099	0.0080
6d	Street lighting	0.0264	+	0.0109	0.0084	0.0095	0.0089	0.0082	0.0074	0.0107	0.0101
7a	Town centre management team	0.0236	+	0.0114	0.0072	0.0097	0.0070	0.0064	0.0067	0.0100	0.0067
7b	Partnership/ stakeholder involvement (Part 1)	0.0120	+	0.0047	0.0047	0.0047	0.0024	0.0047	0.0024	0.0047	0.0047
	Partnership/ stakeholder involvement (Part 2)	0.0120	+	0.0053	0.0039	0.0051	0.0030	0.0035	0.0037	0.0050	0.0041
7c	Marketing	0.0213	+	0.0092	0.0057	0.0106	0.0055	0.0057	0.0050	0.0094	0.0070
7d	Digital connectivity/ internet presence	0.0228	+	0.0102	0.0075	0.0084	0.0064	0.0071	0.0057	0.0099	0.0080
8a	Environmental initiatives/ carbon reduction schemes (Part 1)	0.0069	+	0.0040	0.0013	0.0027	0.0013	0.0013	0.0013	0.0040	0.0013
	Environmental initiatives/ carbon reduction schemes (Part 2)	0.0069	+	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024
	Environmental initiatives/ carbon reduction schemes (Part 3)	0.0069	+	0.0027	0.0025	0.0035	0.0020	0.0022	0.0019	0.0022	0.0022
8c	Waste management and recycling schemes	0.0242	+	0.0102	0.0089	0.0095	0.0093	0.0078	0.0054	0.0089	0.0076
9a	Commercial rent (Part 1)	0.0129	-	0.0066	0.0052	0.0037	0.0037	0.0036	0.0041	0.0045	0.0044
	Commercial rent (Part 2)	0.0129	-	0.0040	0.0046	0.0035	0.0041	0.0060	0.0054	0.0035	0.0048
9b	Business rates	0.0255	-	0.0130	0.0103	0.0073	0.0073	0.0070	0.0080	0.0089	0.0087
9c	Trading hours	0.0245	+	0.0102	0.0085	0.0095	0.0081	0.0072	0.0067	0.0094	0.0090
9d	Complementary daytime, evening and night-time economies	0.0235	+	0.0108	0.0066	0.0105	0.0060	0.0060	0.0059	0.0098	0.0089

Appendix 12 – TOPSIS separation measures from positive ideal solution

Sub-criteria		Alternatives							
		A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	1.3E-06	4.9E-06	0.0E+00	1.5E-07	3.8E-06	1.9E-06	6.6E-06	2.8E-06
1b	Signage	7.3E-08	4.4E-06	1.7E-06	6.6E-07	0.0E+00	3.6E-07	4.8E-08	3.0E-06
1c	Buildings	1.4E-05	5.0E-05	5.7E-06	3.4E-05	1.5E-05	1.3E-05	0.0E+00	2.1E-06
1d	Trees and landscape	2.2E-06	2.5E-05	3.4E-06	7.8E-06	8.9E-06	8.4E-06	0.0E+00	1.1E-08
1e	Public open space	1.0E-06	2.3E-05	2.8E-06	8.8E-06	1.5E-05	5.8E-06	0.0E+00	9.2E-06
1f	Infrastructure	1.0E-06	9.6E-06	3.3E-06	5.0E-06	5.0E-06	5.4E-06	0.0E+00	1.6E-06
1g	Design	8.5E-06	4.9E-05	5.1E-06	3.0E-05	2.0E-05	1.7E-05	0.0E+00	1.7E-06
2a	Pedestrian pavement/ walkways	0.0E+00	4.7E-06	1.8E-08	9.3E-07	4.1E-06	1.5E-06	1.3E-06	1.5E-07
2b	Cycling facilities	3.0E-06	1.9E-05	3.8E-06	1.0E-06	1.1E-05	1.7E-05	3.6E-06	0.0E+00
2c	Public transport	8.3E-10	0.0E+00	9.5E-07	9.5E-07	4.0E-06	9.5E-07	1.3E-06	2.5E-07
2d	Parking facilities	0.0E+00	2.7E-06	2.0E-06	5.4E-06	9.3E-06	2.2E-05	3.2E-06	2.2E-05
2e	Goods/ service vehicles	0.0E+00	6.6E-06	5.1E-08	7.8E-06	4.1E-06	4.0E-06	1.9E-05	3.9E-06
2f	Traffic management	1.3E-06	3.3E-06	0.0E+00	1.9E-06	1.9E-06	2.6E-06	1.5E-06	3.4E-06
3a	Social space	8.2E-06	5.2E-05	1.8E-05	2.8E-05	4.4E-05	4.1E-05	0.0E+00	7.5E-06
3b	Economic space	7.5E-08	3.8E-05	6.3E-06	4.5E-05	2.7E-05	3.2E-05	0.0E+00	7.0E-06
3c	Political space	0.0E+00	1.1E-06	1.3E-09	3.1E-06	1.7E-06	1.9E-06	1.2E-06	7.9E-07
3d	Cultural space	5.1E-06	2.8E-05	1.5E-05	2.2E-05	1.9E-05	3.0E-05	0.0E+00	5.1E-06
3e	Community space	1.7E-06	3.2E-05	1.1E-05	1.8E-05	1.7E-05	2.4E-05	0.0E+00	1.3E-05
4a	Retail	7.9E-08	3.4E-05	9.2E-06	4.4E-05	4.3E-05	4.9E-05	0.0E+00	5.4E-06
4b	Entertainment	8.4E-09	4.2E-05	3.7E-06	5.2E-05	3.4E-05	6.2E-05	0.0E+00	4.0E-06
4c	Work places (Part 1)	0.0E+00	1.7E-06	1.7E-05	1.1E-05	5.7E-06	5.2E-06	6.4E-06	1.5E-06
	Work places (Part 2)	0.0E+00	1.1E-05	3.7E-07	1.3E-05	1.5E-05	1.2E-05	2.4E-06	8.7E-06
4d	Civic venues	0.0E+00	1.9E-05	9.9E-07	2.0E-06	1.2E-05	1.5E-05	4.7E-07	5.7E-06
4e	Residential (Part 1)	2.0E-05	1.1E-05	2.9E-05	2.9E-06	0.0E+00	2.7E-05	1.0E-05	1.2E-08
	Residential (Part 2)	9.2E-08	7.8E-07	1.3E-07	4.2E-07	9.6E-07	1.1E-06	0.0E+00	6.2E-07

4f	Health and social facilities	6.5E-07	2.3E-06	9.5E-07	3.5E-06	5.2E-06	6.6E-07	0.0E+00	4.7E-07
5a	Identity/ image	1.7E-05	7.2E-05	1.9E-05	6.4E-05	7.0E-05	8.7E-05	0.0E+00	1.2E-05
5b	Experience	2.3E-06	6.1E-05	1.1E-05	4.3E-05	4.0E-05	5.4E-05	0.0E+00	1.1E-05
5c	Atmosphere	5.0E-06	7.3E-05	1.6E-05	5.9E-05	5.7E-05	7.5E-05	0.0E+00	1.6E-05
6a	Actual crime	7.2E-07	1.2E-05	5.1E-06	2.8E-06	1.4E-05	3.8E-05	1.2E-06	0.0E+00
6b	Perceived crime	4.3E-06	4.8E-05	3.3E-06	1.8E-05	2.5E-05	4.2E-05	0.0E+00	1.2E-05
6c	CCTV and security presence	4.4E-10	2.9E-06	1.7E-06	3.9E-06	6.3E-06	1.2E-05	0.0E+00	3.5E-06
6d	Street lighting	0.0E+00	6.5E-06	2.1E-06	4.1E-06	7.4E-06	1.3E-05	6.2E-08	6.9E-07
7a	Town centre management team	0.0E+00	1.8E-05	2.9E-06	2.0E-05	2.6E-05	2.2E-05	2.0E-06	2.2E-05
7b	Partnership/ stakeholder involvement (Part 1)	0.0E+00	0.0E+00	0.0E+00	5.6E-06	0.0E+00	5.6E-06	0.0E+00	0.0E+00
	Partnership/ stakeholder involvement (Part 2)	0.0E+00	2.0E-06	2.4E-08	5.4E-06	3.1E-06	2.6E-06	8.2E-08	1.5E-06
7c	Marketing	1.9E-06	2.3E-05	0.0E+00	2.5E-05	2.3E-05	3.0E-05	1.3E-06	1.2E-05
7d	Digital connectivity/ internet presence	0.0E+00	7.5E-06	3.3E-06	1.4E-05	9.5E-06	2.0E-05	1.2E-07	4.9E-06
8a	Environmental initiatives/ carbon reduction schemes (Part 1)	0.0E+00	7.0E-06	1.8E-06	7.0E-06	7.0E-06	7.0E-06	0.0E+00	7.0E-06
	Environmental initiatives/ carbon reduction schemes (Part 2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Environmental initiatives/ carbon reduction schemes (Part 3)	6.6E-07	9.9E-07	0.0E+00	2.2E-06	1.6E-06	2.6E-06	1.6E-06	1.6E-06
8c	Waste management and recycling schemes	0.0E+00	1.8E-06	4.6E-07	9.5E-07	5.9E-06	2.3E-05	1.9E-06	6.9E-06
9a	Commercial rent (Part 1)	9.2E-06	2.8E-06	2.5E-08	1.8E-08	0.0E+00	2.4E-07	8.5E-07	6.9E-07
	Commercial rent (Part 2)	2.2E-07	1.2E-06	0.0E+00	3.2E-07	6.2E-06	3.4E-06	0.0E+00	1.5E-06
9b	Business rates	3.6E-05	1.1E-05	9.5E-08	6.8E-08	0.0E+00	9.3E-07	3.3E-06	2.7E-06
9c	Trading hours	0.0E+00	2.9E-06	5.3E-07	4.5E-06	8.8E-06	1.2E-05	6.0E-07	1.4E-06
9d	Complementary daytime, evening and night-time economies	0.0E+00	1.7E-05	5.2E-08	2.3E-05	2.3E-05	2.4E-05	9.1E-07	3.7E-06

Appendix 13 – TOPSIS separation measures from negative ideal solution

Sub-criteria		Alternatives							
		A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	2.0E-06	1.4E-07	6.6E-06	4.8E-06	3.8E-07	1.5E-06	0.0E+00	8.2E-07
1b	Signage	3.4E-06	0.0E+00	6.2E-07	1.7E-06	4.4E-06	2.3E-06	3.6E-06	1.4E-07
1c	Buildings	1.1E-05	0.0E+00	2.2E-05	1.5E-06	1.0E-05	1.2E-05	5.0E-05	3.2E-05
1d	Trees and landscape	1.3E-05	0.0E+00	1.0E-05	4.9E-06	4.1E-06	4.5E-06	2.5E-05	2.4E-05
1e	Public open space	1.4E-05	0.0E+00	9.5E-06	3.2E-06	7.4E-07	5.5E-06	2.3E-05	3.0E-06
1f	Infrastructure	4.4E-06	0.0E+00	1.7E-06	7.4E-07	7.4E-07	5.9E-07	9.6E-06	3.3E-06
1g	Design	1.7E-05	0.0E+00	2.3E-05	2.4E-06	6.6E-06	8.6E-06	4.9E-05	3.3E-05
2a	Pedestrian pavement/ walkways	4.7E-06	0.0E+00	4.2E-06	1.5E-06	2.4E-08	8.7E-07	1.1E-06	3.2E-06
2b	Cycling facilities	7.0E-06	0.0E+00	5.9E-06	1.1E-05	1.2E-06	5.2E-08	6.2E-06	1.9E-05
2c	Public transport	3.9E-06	4.0E-06	1.0E-06	1.0E-06	0.0E+00	1.0E-06	7.6E-07	2.2E-06
2d	Parking facilities	2.2E-05	9.3E-06	1.1E-05	5.6E-06	2.7E-06	0.0E+00	8.4E-06	0.0E+00
2e	Goods/ service vehicles	1.9E-05	3.2E-06	1.7E-05	2.4E-06	5.4E-06	5.5E-06	0.0E+00	5.6E-06
2f	Traffic management	4.7E-07	1.1E-09	3.4E-06	2.0E-07	2.0E-07	4.8E-08	3.6E-07	0.0E+00
3a	Social space	1.9E-05	0.0E+00	8.4E-06	3.8E-06	2.9E-07	6.2E-07	5.2E-05	2.0E-05
3b	Economic space	4.2E-05	3.7E-07	1.8E-05	0.0E+00	2.4E-06	1.1E-06	4.5E-05	1.7E-05
3c	Political space	3.1E-06	5.2E-07	2.9E-06	0.0E+00	1.9E-07	1.4E-07	4.3E-07	7.5E-07
3d	Cultural space	1.0E-05	4.1E-08	2.5E-06	6.4E-07	1.2E-06	0.0E+00	3.0E-05	1.0E-05
3e	Community space	1.9E-05	0.0E+00	5.6E-06	2.2E-06	2.6E-06	6.7E-07	3.2E-05	4.6E-06
4a	Retail	4.6E-05	1.4E-06	1.6E-05	1.4E-07	2.1E-07	0.0E+00	4.9E-05	2.2E-05
4b	Entertainment	6.0E-05	1.9E-06	3.5E-05	4.1E-07	4.1E-06	0.0E+00	6.2E-05	3.4E-05
4c	Work places (Part 1)	1.7E-05	7.7E-06	0.0E+00	6.3E-07	2.8E-06	3.2E-06	2.3E-06	8.0E-06
	Work places (Part 2)	1.5E-05	2.2E-07	1.0E-05	6.2E-08	0.0E+00	1.2E-07	5.3E-06	8.0E-07
4d	Civic venues	1.9E-05	0.0E+00	1.1E-05	8.4E-06	7.0E-07	1.6E-07	1.3E-05	3.8E-06
4e	Residential (Part 1)	8.5E-07	4.4E-06	0.0E+00	1.4E-05	2.9E-05	3.4E-08	4.9E-06	2.8E-05
	Residential (Part 2)	5.4E-07	2.4E-08	4.5E-07	1.5E-07	3.1E-09	0.0E+00	1.1E-06	6.2E-08
4f	Health and social facilities	2.2E-06	5.9E-07	1.7E-06	1.8E-07	0.0E+00	2.2E-06	5.2E-06	2.6E-06

5a	Identity/ image	2.7E-05	7.8E-07	2.5E-05	1.8E-06	9.7E-07	0.0E+00	8.7E-05	3.5E-05
5b	Experience	4.0E-05	0.0E+00	2.0E-05	1.5E-06	2.2E-06	2.3E-07	6.1E-05	2.0E-05
5c	Atmosphere	4.1E-05	9.4E-09	2.1E-05	9.8E-07	1.2E-06	0.0E+00	7.5E-05	2.1E-05
6a	Actual crime	2.8E-05	7.3E-06	1.5E-05	2.0E-05	6.0E-06	0.0E+00	2.5E-05	3.8E-05
6b	Perceived crime	2.4E-05	0.0E+00	2.6E-05	7.4E-06	3.7E-06	2.2E-07	4.8E-05	1.2E-05
6c	CCTV and security presence	1.2E-05	3.2E-06	4.7E-06	2.2E-06	9.3E-07	0.0E+00	1.2E-05	2.6E-06
6d	Street lighting	1.3E-05	1.0E-06	4.5E-06	2.4E-06	6.8E-07	0.0E+00	1.1E-05	7.4E-06
7a	Town centre management team	2.6E-05	6.0E-07	1.1E-05	3.8E-07	0.0E+00	1.3E-07	1.3E-05	1.3E-07
7b	Partnership/ stakeholder involvement (Part 1)	5.6E-06	5.6E-06	5.6E-06	0.0E+00	5.6E-06	0.0E+00	5.6E-06	5.6E-06
	Partnership/ stakeholder involvement (Part 2)	5.4E-06	8.5E-07	4.7E-06	0.0E+00	3.2E-07	5.0E-07	4.2E-06	1.2E-06
7c	Marketing	1.7E-05	4.9E-07	3.0E-05	2.6E-07	5.0E-07	0.0E+00	1.9E-05	4.0E-06
7d	Digital connectivity/ internet presence	2.0E-05	3.1E-06	7.3E-06	5.2E-07	2.0E-06	0.0E+00	1.7E-05	5.3E-06
8a	Environmental initiatives/ carbon reduction schemes (Part 1)	7.0E-06	0.0E+00	1.8E-06	0.0E+00	0.0E+00	0.0E+00	7.0E-06	0.0E+00
	Environmental initiatives/ carbon reduction schemes (Part 2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Environmental initiatives/ carbon reduction schemes (Part 3)	6.3E-07	3.7E-07	2.6E-06	1.3E-08	1.0E-07	0.0E+00	1.3E-07	1.2E-07
8c	Waste management and recycling schemes	2.3E-05	1.2E-05	1.7E-05	1.5E-05	5.6E-06	0.0E+00	1.2E-05	4.7E-06
9a	Commercial rent (Part 1)	0.0E+00	1.9E-06	8.3E-06	8.4E-06	9.2E-06	6.5E-06	4.4E-06	4.8E-06
	Commercial rent (Part 2)	4.1E-06	2.0E-06	6.2E-06	3.7E-06	0.0E+00	4.4E-07	6.2E-06	1.6E-06
9b	Business rates	0.0E+00	7.3E-06	3.2E-05	3.3E-05	3.6E-05	2.5E-05	1.7E-05	1.9E-05
9c	Trading hours	1.2E-05	3.3E-06	7.8E-06	2.0E-06	3.1E-07	0.0E+00	7.6E-06	5.5E-06
9d	Complementary daytime, evening and night-time economies	2.4E-05	5.3E-07	2.2E-05	1.3E-08	1.7E-08	0.0E+00	1.5E-05	8.7E-06

Appendix 14 – TOPSIS results

	Alternatives							
	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
Si^+	0.0121	0.0291	0.0144	0.0255	0.0257	0.0296	0.0084	0.0152
Si^-	0.0265	0.0092	0.0224	0.0131	0.0125	0.0092	0.0305	0.0218
Ci^*	0.6874	0.2396	0.6079	0.3385	0.3268	0.2363	0.7833	0.5883
Rank	**2**	**7**	**3**	**5**	**6**	**8**	**1**	**4**

Appendix 15 – Weighted normalised matrix for COPRAS and modified COPRAS

Sub-criteria		Weight	+/-	Alternatives							
				A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
1a	Streets	0.0243	+	0.0031	0.0028	0.0035	0.0034	0.0028	0.0031	0.0026	0.0029
1b	Signage	0.0232	-	0.0027	0.0033	0.0031	0.0029	0.0026	0.0028	0.0027	0.0032
1c	Buildings	0.0259	+	0.0031	0.0019	0.0036	0.0024	0.0031	0.0032	0.0045	0.0040
1d	Trees and landscape	0.0248	+	0.0033	0.0021	0.0032	0.0029	0.0028	0.0028	0.0039	0.0038
1e	Public open space	0.0260	+	0.0038	0.0024	0.0035	0.0031	0.0027	0.0033	0.0041	0.0031
1f	Infrastructure	0.0239	+	0.0032	0.0025	0.0030	0.0028	0.0028	0.0028	0.0036	0.0032
1g	Design	0.0255	+	0.0034	0.0019	0.0036	0.0024	0.0028	0.0029	0.0044	0.0040
2a	Pedestrian pavement/ walkways	0.0272	+	0.0038	0.0030	0.0037	0.0034	0.0030	0.0033	0.0034	0.0036
2b	Cycling facilities	0.0204	+	0.0028	0.0018	0.0027	0.0030	0.0022	0.0019	0.0027	0.0034
2c	Public transport	0.0268	+	0.0036	0.0036	0.0033	0.0033	0.0029	0.0033	0.0032	0.0035
2d	Parking facilities	0.0265	+	0.0042	0.0036	0.0037	0.0034	0.0031	0.0025	0.0035	0.0025
2e	Goods/ service vehicles	0.0232	-	0.0022	0.0031	0.0023	0.0032	0.0029	0.0029	0.0037	0.0029
2f	Traffic management	0.0220	+	0.0028	0.0026	0.0032	0.0027	0.0027	0.0026	0.0028	0.0026
3a	Social space	0.0265	+	0.0039	0.0023	0.0034	0.0030	0.0025	0.0026	0.0049	0.0039
3b	Economic space	0.0266	+	0.0046	0.0024	0.0037	0.0022	0.0028	0.0026	0.0047	0.0037
3c	Political space	0.0186	+	0.0027	0.0023	0.0026	0.0020	0.0022	0.0022	0.0023	0.0023
3d	Cultural space	0.0241	+	0.0035	0.0024	0.0029	0.0026	0.0027	0.0023	0.0043	0.0035
3e	Community space	0.0246	+	0.0038	0.0022	0.0031	0.0028	0.0028	0.0025	0.0043	0.0030
4a	Retail	0.0279	+	0.0048	0.0028	0.0038	0.0025	0.0025	0.0024	0.0049	0.0041
4b	Entertainment	0.0259	+	0.0047	0.0023	0.0040	0.0020	0.0025	0.0018	0.0047	0.0040
4c	Work places (Part 1)	0.0119	+	0.0023	0.0018	0.0008	0.0011	0.0014	0.0014	0.0013	0.0018
	Work places (Part 2)	0.0119	+	0.0024	0.0011	0.0022	0.0010	0.0010	0.0011	0.0018	0.0013
4d	Civic venues	0.0240	+	0.0038	0.0022	0.0034	0.0033	0.0025	0.0024	0.0035	0.0029
4e	Residential (Part 1)	0.0101	+	0.0006	0.0011	0.0002	0.0018	0.0025	0.0003	0.0011	0.0025
	Residential (Part 2)	0.0101	+	0.0014	0.0012	0.0014	0.0013	0.0011	0.0011	0.0015	0.0012
4f	Health and social facilities	0.0217	+	0.0028	0.0026	0.0028	0.0024	0.0023	0.0028	0.0031	0.0029

5a	Identity/ image	0.0255	+	0.0038	0.0022	0.0037	0.0023	0.0022	0.0018	0.0053	0.0041
5b	Experience	0.0257	+	0.0043	0.0020	0.0037	0.0025	0.0026	0.0022	0.0049	0.0036
5c	Atmosphere	0.0270	+	0.0045	0.0022	0.0039	0.0025	0.0025	0.0021	0.0054	0.0039
6a	Actual crime	0.0257	-	0.0027	0.0036	0.0032	0.0030	0.0037	0.0046	0.0027	0.0023
6b	Perceived crime	0.0266	-	0.0027	0.0045	0.0026	0.0035	0.0038	0.0043	0.0020	0.0032
6c	CCTV and security presence	0.0236	+	0.0035	0.0029	0.0031	0.0028	0.0026	0.0023	0.0035	0.0029
6d	Street lighting	0.0264	+	0.0039	0.0030	0.0034	0.0032	0.0029	0.0026	0.0038	0.0036
7a	Town centre management team	0.0236	+	0.0041	0.0026	0.0035	0.0025	0.0023	0.0024	0.0036	0.0024
7b	Partnership/ stakeholder involvement (Part 1)	0.0120	+	0.0017	0.0017	0.0017	0.0009	0.0017	0.0009	0.0017	0.0017
	Partnership/ stakeholder involvement (Part 2)	0.0120	+	0.0019	0.0014	0.0018	0.0011	0.0013	0.0013	0.0018	0.0015
7c	Marketing	0.0213	+	0.0034	0.0021	0.0039	0.0020	0.0021	0.0018	0.0034	0.0026
7d	Digital connectivity/ internet presence	0.0228	+	0.0037	0.0027	0.0030	0.0023	0.0026	0.0021	0.0035	0.0029
8a	Environmental initiatives/ carbon reduction schemes (Part 1)	0.0069	+	0.0016	0.0005	0.0011	0.0005	0.0005	0.0005	0.0016	0.0005
	Environmental initiatives/ carbon reduction schemes (Part 2)	0.0069	+	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
	Environmental initiatives/ carbon reduction schemes (Part 3)	0.0069	+	0.0010	0.0009	0.0013	0.0007	0.0008	0.0007	0.0008	0.0008
8c	Waste management and recycling schemes	0.0242	+	0.0037	0.0032	0.0034	0.0033	0.0028	0.0019	0.0032	0.0027
9a	Commercial rent (Part 1)	0.0129	-	0.0024	0.0019	0.0013	0.0013	0.0013	0.0015	0.0016	0.0016
	Commercial rent (Part 2)	0.0129	-	0.0014	0.0017	0.0013	0.0015	0.0022	0.0019	0.0013	0.0017
9b	Business rates	0.0255	-	0.0047	0.0037	0.0027	0.0026	0.0025	0.0029	0.0032	0.0031
9c	Trading hours	0.0245	+	0.0036	0.0030	0.0034	0.0029	0.0026	0.0024	0.0034	0.0032
9d	Complementary daytime, evening and night-time economies	0.0235	+	0.0039	0.0024	0.0038	0.0022	0.0022	0.0021	0.0036	0.0032

Appendix 16 – Results for COPRAS and modified COPRAS

COPRAS								
	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
S_{+j}	0.1278	0.0885	0.1168	0.0933	0.0925	0.0852	0.1318	0.1140
S_{-j}	0.0188	0.0218	0.0164	0.0180	0.0190	0.0209	0.0172	0.0181
Q_j	0.1464	0.1045	0.1381	0.1128	0.1109	0.1020	0.1521	0.1332
N_j	96.2903	68.7452	90.8152	74.1735	72.9338	67.0574	100.0000	87.6125
Rank	2	7	3	5	6	8	1	4

Modified COPRAS								
	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
S_{+j}	0.1278	0.0885	0.1168	0.0933	0.0925	0.0852	0.1318	0.1140
S_{-j}	0.0188	0.0218	0.0164	0.0180	0.0190	0.0209	0.0172	0.0181
Q_j	0.1091	0.0667	0.1004	0.0754	0.0735	0.0644	0.1146	0.0958
N_j	95.1862	58.2410	87.6360	65.8062	64.1827	56.1864	100.0000	83.6538
Rank	2	7	3	5	6	8	1	4