

Settlement Hierarchy Methodology



Evidence Base

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1 Introduction

- 1.1** This document outlines the methodology and model employed to undertake the Settlement Hierarchy Study for Calderdale. Outputs from the model, and the resulting recommended settlement hierarchy are contained in a separate document 'Settlement Hierarchy Results'. This has been done so that the results can be updated regularly without having to re-publish the methodology and model for each update. In addition, readers who are interested only in the results and outputs are not faced with the technical details and background contained within this report.

Sustainable development

- 1.2** Government has given local planning authorities the responsibility for ensuring that future new development should embody, as far as possible, the principles of sustainable development. The Calderdale Local Development Framework (LDF), which will gradually replace the existing development plan (Replacement Calderdale Unitary Development Plan), will be a significant contributor to ensuring that sustainable development is achieved in the future.
- 1.3** The benchmark for assessing sustainability and sustainable development in the UK is "Securing Our Future" (March 2005). It builds upon "A Better Quality of Life, A Strategy for Sustainable Development for the UK" published by the Government in 1991. Planning Policy Statement 1 (PPS1) "Delivering Sustainable Development", published in January 2005, emphasises the need for the planning process to deliver sustainable development. The strategy recognises that in achieving sustainable development, four inter-related and equally important objectives need to be fulfilled. These are:
- social progress which recognises the needs of everyone;
 - effective protection of the environment;
 - prudent use of natural resources; and
 - maintenance of high and stable levels of economic growth and employment;
- 1.4** Future patterns of development in Calderdale will need to embrace these four central sustainability objectives, within the context of specific local sustainability criteria. Achieving sustainable development is now at the heart of the development plan process and the emerging LDF will need to embrace sustainability in future development options.
- 1.5** Establishing a Settlement Hierarchy is one of the most important ways that the Calderdale LDF can help contribute to the principals of sustainable development. This Settlement Hierarchy Study is therefore one of the key pieces of evidence for the Calderdale LDF.

What is a settlement hierarchy

- 1.6** Settlements work by providing services for a wider area. The bigger the settlement the more services it tends to have. Over time a settlement hierarchy has developed in the district with Halifax being placed at the top of the hierarchy providing the majority of the services. The smaller settlements have been limited to providing local services. As car ownership has increased this has led to a decline in services in many smaller settlements.
- 1.7** This study implements a settlement hierarchy model that provides a snapshot in time of the facilities available within the different settlements of Calderdale, and crucially the accessibility to those services. The Council's methodology for this study has evolved from the concept of settlement hierarchies as set out within the Regional Spatial Strategy (2008) (RSS).
- 1.8** The identification of service level provision, and their accessibility are factors that provide a basis for indicating the sustainability of different settlements and their ability to accommodate future growth. The settlement hierarchy model will also indicate where there are deficiencies within a settlement that could be addressed through development or other means.
- 1.9** The information gained from the results of this model will be used to inform the spatial options for the Core Strategy and Land Allocations and Designations Development Plan Documents for the Calderdale LDF.

Consultation upon the model

- 1.10 The methodology detailed in this report represents the final version of the settlement hierarchy methodology. However it is anticipated that the results document will periodically be updated as new data becomes available.
- 1.11 The Calderdale settlement hierarchy model has modified regional work (undertaken for the RSS) to provide a greater level of detail for each of the settlements within the district. To assess the level which different settlements are located and classified within the hierarchy, a number of criteria have been developed. The criteria and the overall methodology have been subject to two periods of consultation.
- 1.12 Firstly between May 2008 and June 2008 an initial methodology was proposed and consulted on alongside a questionnaire to indicate the importance respondents gave to each of the criteria developed. Following this consultation a number of amendments were made to the methodology and the criteria were weighted to provide emphasis upon those services and facilities considered most important.
- 1.13 A second stage of consultation was undertaken between 17th November 2008 and 30th January 2009. This consultation was aimed at refining the methodology to provide a robust framework against which to identify a Calderdale settlement hierarchy and the relative sustainability of different settlements and areas of the district. Amendments to the methodology have been made for this final version in light of comments received. These are discussed in more detail in section 5.

2 Policy Context

National Policy

- 2.1** The main relevant sources of national policy in relation to establishing a settlement hierarchy are PPS1 (Delivering Sustainable Development); PPS3 (Housing); PPS6 (Planning for Town Centres); PPS7 (Sustainable Development in Rural Areas), PPG13 (Transport) and the draft PPS 4 (Planning for Prosperous Economies). They state that:
- Most new development should be directed to existing towns and cities, to help maximise accessibility to employment and services by walking, cycling and public transport.
 - In rural areas, development should be focused on settlements that can act as service centres for surrounding areas.
 - In open countryside small ribbons of housing development with no services are not usually appropriate for further housing.
 - Location of new development should take into account the accessibility to existing community facilities, infrastructure and services, including public transport. The location of new housing should facilitate the creation of communities of sufficient size and mix to justify the development of, and sustain, community facilities, infrastructure and services.

Regional Policy

- 2.2** The Yorkshire and Humber RSS takes these national principles further and provides a settlement strategy context for the region. This strategy identifies roles for the main towns and cities across the Yorkshire and Humber region. The regional policy context was based upon a Regional Settlement Study, undertaken in 2004. This study considered a total of 233 settlements across the Yorkshire and Humber Region (the main cities of Leeds, Bradford, Hull and Sheffield were not studied).
- 2.3** Each of the 233 settlements were scored against a range of criteria, primarily concerning the availability of services such as financial, education, leisure and health. Each settlement was then provided with an aggregate score and ranked accordingly. The ranks (hierarchy) used were
- Sub-regional centre;
 - Principal Centre;
 - Local Service Centre; and
 - Basic Service Centre.
- 2.4** Within Calderdale Halifax and Brighouse were named as Sub-regional and Principal Centres respectively. Policies YH5 and YH6 of the emerging RSS indicate that these settlements should be the main foci for housing, employment, shopping, leisure, education, health and cultural activities and facilities within the district.
- 2.5** In addition to Halifax and Brighouse the following settlements were identified as Local Service Centres;
- Elland
 - Hebden Bridge
 - Hipperholme/ Lightcliffe
 - Luddenden/ Luddenden Foot
 - Mytholmroyd
 - Rastrick
 - Ripponden
 - Southowram
 - Sowerby Bridge
 - Stainland/ Holywell Green
 - Todmorden
 - West Vale/ Greetland
- 2.6** Other than Halifax and Brighouse, none of the above settlements were formally translated into RSS and specifically referenced within RSS policy. It is therefore necessary for the LDF to formally identify the full

settlement hierarchy for Calderdale. This includes classifying Local Service Centres and Basic Service Centres, whilst also identifying any other towns that the Council may feel warrant Principal Town status, should any settlement be deemed suitable for this purpose.

- 2.7** Policy YH7 provides a policy context for Local Service Centres, which states they should retain and improve local services, and facilities, support economic diversification and meet locally generated needs for both market and affordable housing. The RSS also provides criteria relating to travel times to essential facilities by public transport. This has been done from two perspectives; for identifying accessibility of the whole of the population to a new destination, such as a school or hospital; and measuring the accessibility to various services from a new destination or origin, such as a potential housing site.
- 2.8** These criteria will be most important during preparation of the LDF when assessing individual site allocations, however they have also been incorporated into this settlement hierarchy model where possible.

Local Policy

- 2.9** Currently the most important local policy documents in consideration of the settlement hierarchy are the Replacement Calderdale Unitary Development Plan (RCUDP) and the Sustainable Community Strategy, Calderdale Futures. Both of these documents promote the creation of sustainable communities by improving accessibility to services and facilities.
- 2.10** In addition other parts of the LDF evidence base will compliment the Settlement Hierarchy as they are developed. These include:
- the Strategic Flood Risk Assessment (SFRA);
 - the Employment Land Review (ELR);
 - the Strategic Housing Land Availability Assessment (SHLAA)
 - the Open Space, Sport and Recreation Study; and
 - the Green Belt Review

3 Methodology - research data

- 3.1** The data for this study was collected through a combination of primary research and secondary data sources. The initial study work comprised the primary research element, including a questionnaire. The questionnaire was publicised and distributed in the summer of 2008 through Talkback (Calderdale's Citizens Panel) and online via Limehouse consultation software. The questionnaire asked people how important they felt that a range of facilities and services were to be within walking distance of the home, from schools, health services, retail and leisure to community facilities, sports/recreation, employment and public transport.
- 3.2** Results and feedback from the questionnaire helped to determine the full range of secondary data that needed to be collected for the purposes of undertaking the study. This resulted in obtaining data from a number of different sources and pulling this together to be held in a common Geographical Information System (GIS) format to enable consistent mapping of the data. A summary of these data collection sources is set out in Table 3.1.

Table 3.1 Data Collection Sources

Theme	Criteria	Source
Education	Nursery School	OS Points of Interest Data* Calderdale Corporate G.I.S
	Primary School	
	Secondary School	
Health	GP Surgery	OS Points of Interest Data*, NHS Calderdale 'Register of Primary Medical Contractors', British Dental Association (BDA) Directory.
	Dentist	
Retail & town centres	Post Office	OS Points of Interest Data*, site visits, Post Office Network Change Programme 2008, Planning Applications Register & Accessibility Survey 2005-2008.
	Bank/building societies	
	Supermarket	
	Pub/restaurant	
	Markets	
Employment	Employment land provision	Calderdale Unitary Development Plan
	Retail floorspace provision	Calderdale Accessibility Survey 2005-2008
Community Facilities	Library	Calderdale Corporate G.I.S
	Community centre	Calderdale Accessibility Survey 2005-2008
	Sports hall/swimming pool	Calderdale Accessibility Survey 2005-2008
	Sports ground	OS Points of Interest Data*
	Public park	
	Arts, Theatre and Cinema	OS Points of Interest Data* & Discover Calderdale Events and Attractions Guide 2009

Theme	Criteria	Source
Transport and access	Public transport accessibility – 30min drive time	MapInfo RouteFinder software^
	Private transport accessibility – 30min drive time	MapInfo RouteFinder software^
	Public transport – bus coverage	Calderdale Corporate G.I.S
	Public transport – 30min settlement catchment	MapInfo RouteFinder software^
	Public transport – train stations	Calderdale Corporate G.I.S
	Private transport – 30min settlement catchment	MapInfo RouteFinder software^

* Ordnance Survey Points of Interest is a dataset containing over 3.8 million different geographic features. All features are supplied with location, functional information and addresses where possible. The product covers all of Great Britain. The information supplied was from the Ordnance Survey release in March 2009. Where possible this data has been updated to provide an up to date picture of the current situation within the district.

^ RouteFinder is a network analysis system, capable of calculating travel times, fully integrated into GIS software, and can be used with any topologically correct road network.

Cross-boundary data

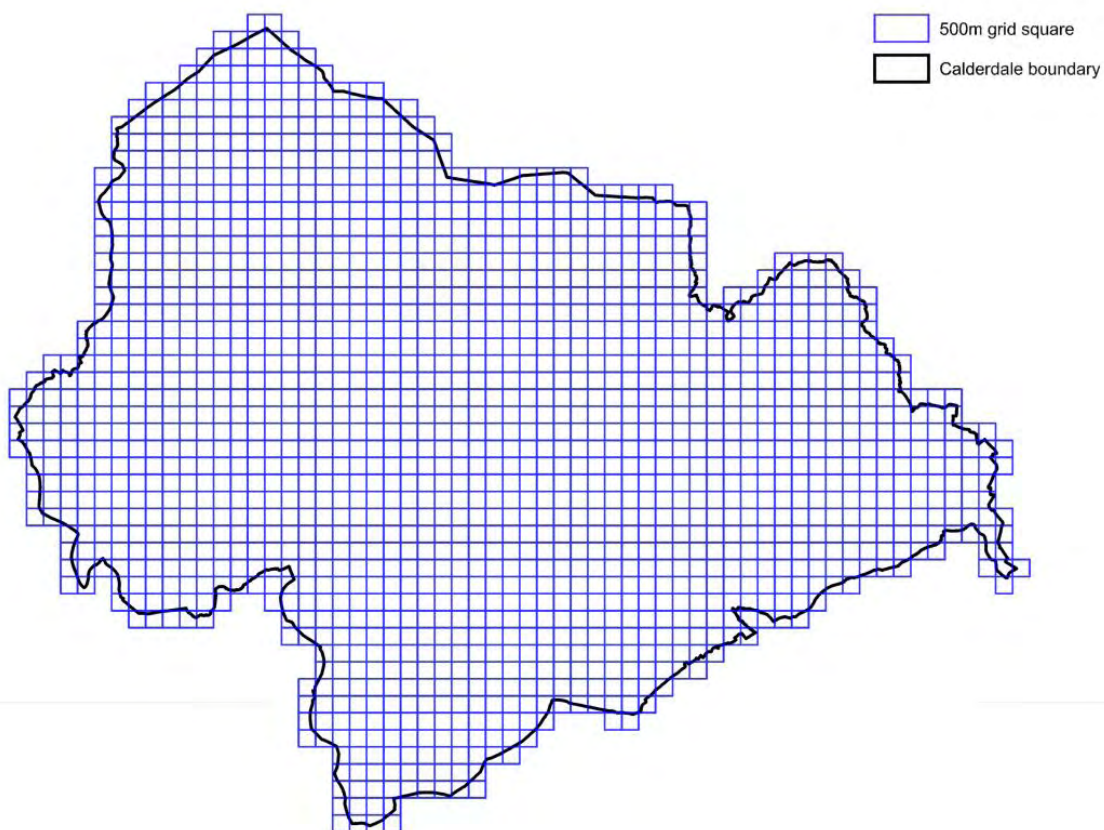
- 3.3** Where available, relevant data from neighbouring local authorities that impact upon Calderdale settlements have been incorporated into the model. Certain facilities in both Bradford and Kirklees are located close enough to the Calderdale boundary to influence the settlement hierarchy model. Therefore, where data from both authorities was available, the following criteria have been included from these districts; Primary Schools; Secondary Schools; GP Surgeries; Dentists; Post Offices; Libraries; Sports grounds; and Public Parks. Data from other adjoining local authorities has not been used because there are no significant urban areas or services/ facilities which would influence Calderdale's settlement hierarchy.

4 Methodology - modelling

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- 4.1** This settlement hierarchy study adopts a GIS model to measure the sustainability of Calderdale's settlements. The model has been refined based upon responses received to the questionnaire and consultation, and further research on approaches undertaken by other local authorities. This section of the methodology provides details of the final adopted model. 5 'Amendments to the methodology' details the key changes made between the previously consulted model (November 2008) and this final version.
- 4.2** The model employed involves the following key stages of work:
- Stage 1: Identifying the assessment criteria - principal services and facilities to consider, including identifying appropriate walking distances, journey times and land coverages for accessibility measurement.
 - Stage 2: Weighting the assessment criteria - consideration of the relative importance of each criteria identified in the model and how to build this into the sustainability assessment.
 - Stage 3: Identifying the settlement hierarchy - calculation and comparison of the relative sustainability of each settlement.
 - Stage 4: Areas of search - consideration of areas with high sustainability ratings for potential future growth.
- 4.3** To enable assessment of how well different parts of the local authority area perform against each sustainability criteria, the district has been split into 500m grid squares (a total of 1,586 individual squares). The model involves running an assessment of each criteria/indicator against each grid square across Calderdale. This results in an output of an individual score for each indicator, against each square. The sum of all criteria scores is then added together to provide the total for each grid square.

Figure 4.1 Example grid of model sample area



- 4.4** Data is analysed and presented using this grid-based scoring system, and is expressed on a gridded map-base using GIS (specifically MapInfo). Further analysis would be possible at site-specific locations to give scores at precise locations, as opposed to at a 500m grid resolution, however this would involve

further calibration of the model and is considered beyond the scope of this study given the limitations of time and resources.

Stage One: Identifying the assessment criteria

4.5 The starting point for identifying the assessment criteria were the principles set out within national planning policy and the criteria contained within the 2004 Settlement Study for the RSS. The following table indicates how the regional criteria from the 2004 study have influenced the choice of local criteria in this study. Table 4.1 'Data criteria' also details the scoring method for each criteria, which are based on the outcomes of both the questionnaire, and professional judgement. The different criteria scoring methods are determined either through the assessment of walking distances, the amount of land coverage for a specific use, or in travel times. Each of these methods are discussed in more detail following Table 4.1 'Data criteria'.

Table 4.1 Data criteria

Regional criteria (2004 settlement study)	Calderdale settlement hierarchy model criteria	Calderdale scoring method
Education	<ul style="list-style-type: none"> Nursery facilities (including nursery provision, nurseries and pre/ after school clubs) Primary school Secondary school 	Walking distance (750m)
Health	<ul style="list-style-type: none"> GP surgery Dentist 	Walking distance (750m)
Financial and professional services	<ul style="list-style-type: none"> Banks/ Building societies (not including Post Offices/ shops undertaking ancillary banking duties or insurance brokers) 	Walking distance (750m)
Public services	<ul style="list-style-type: none"> Library Community centre Post office Place of worship 	Walking distance (750m)
Leisure services	<ul style="list-style-type: none"> Sports hall/ centre/ Swimming pool Sports ground Public park (Children's play area or similar) Public house/ restaurant Arts, Theatre and Cinema 	Walking distance (750m) Except public park (600m)
Retail	<ul style="list-style-type: none"> Retail provision Supermarket Market 	Walking distance (750m)
Not covered by 2004 Settlement Study.	<ul style="list-style-type: none"> Employment provision 	Area of land
	<ul style="list-style-type: none"> Accessibility to towns 	30 minute journey time
	<ul style="list-style-type: none"> Retail floorspace 	Area of land
	<ul style="list-style-type: none"> Public transport - Bus coverage 	Walking distance (400m) of bus stop

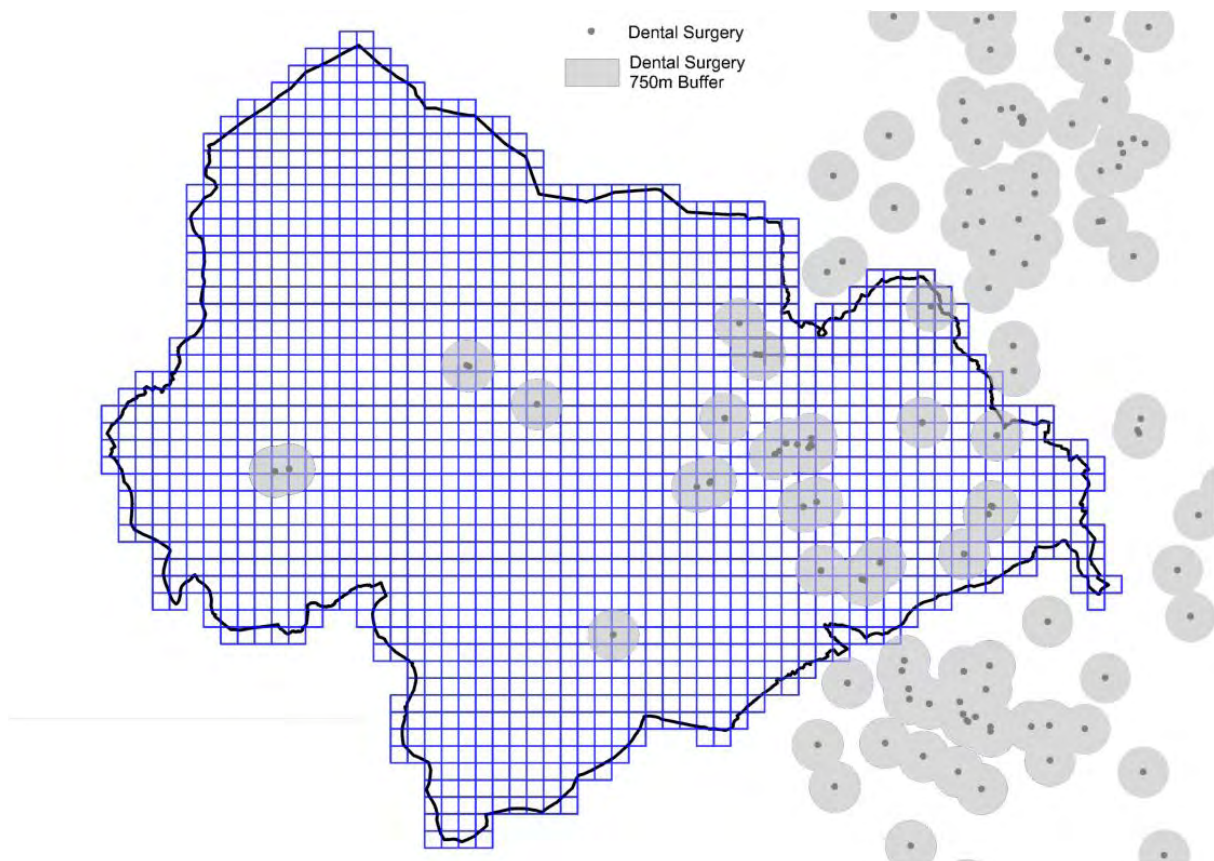
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Regional criteria (2004 settlement study)	Calderdale settlement hierarchy model criteria	Calderdale scoring method
	• Public transport - Bus frequency	Average number bus services per hour
	• Public transport – Train Station	Walking distance (750m)
	• Population size	Contextual indicator only

Identifying the assessment criteria: walking distances

- 4.6** The criteria scored by walking distance are those that are considered the most important facilities and services. The standard walking distance used is 750m. This distance has been chosen as it provides a reasonable 10 minutes walk within Calderdale. The Regional Spatial Strategy for Yorkshire and The Humber suggests that 300m to 500m represents a 5-minute walk and 500m to 1000m a 10-minute walk. As Calderdale is predominantly a hilly area the upper limit of 1000m was not used because the topography of the area limits the distance people are generally willing to walk.
- 4.7** The 750m distance has been used for all the distance-based criteria - except in the cases of public parks, which has a distance of 600m, and Bus Stops, which have a distance of 400m. The figure for public parks is based upon standards set within Calderdale Council's adopted Supplementary Planning Document 'Developer Contributions Towards Meeting Open Space, Sports and Recreation Facilities'. The figure for bus stops is in line with the Institution of Highways & Transportation (IHT) guidelines, which states the maximum walking distance to a bus stop should not exceed 400 metres.
- 4.8** For each criteria data points were initially obtained or mapped on GIS, which then allowed the relevant distance buffer to be applied to the mapped service point or facility. Figure 4.2 'Example service/facility point with buffer applied' demonstrates an example of walking distance buffers applied to one of the criteria data sets (dental surgeries) in GIS. Each grid square is then assigned a score based upon the percentage of the square that is overlapped by the service point buffer. Further details of specific scoring for each criteria are provided in Table 4.4 'Scoring bands for each of the scoring methods'.

Figure 4.2 Example service/facility point with buffer applied



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Identifying the assessment criteria: journey times

- 4.9** In addition to the local provision of services within walking distance, sustainability measures should incorporate journey times to other settlements to ensure that a locations connectedness can be properly assessed. Access to major towns has been assessed in this settlement hierarchy model as these are generally the focus for the majority of services, leisure facilities, shops and employment opportunities. The time criteria of 30 minutes' journey time has been used as this corresponds with most of the Transport Destinations Accessibility criteria contained within Table 16.8 of the RSS.
- 4.10** Accessibility via two modes of transport have been used - public and private transport. Private transport has been included because this is the most practical means for certain sectors of the population and certain journeys. Public transport is an essential means of travel for many parts of the population who do not have access to a private car.
- 4.11** GIS RouteFinder software has been used to calculate the number of centres (major towns) within and outside Calderdale, that are within 30 minutes travelling distance from each grid square. RouteFinder uses the road network to assess all grid squares where an intersection occurs, taking account of the relative speeds of each mode of transport along different road classifications. The road speeds applied for the different road classifications on private and public transport are set out in Table 4.2 'Average road speeds for public and private transport'.

Table 4.2 Average road speeds for public and private transport

Road classes	Description	Speed - Private (miles/hr)	Speed - Public (miles/hr)
1	Motorway	56	50
2	A road	40	35
3	B road	35	28

Road classes	Description	Speed - Private (miles/hr)	Speed - Public (miles/hr)
4	Minor Road	30	25
5	Local Road	30	22
6	Alley	20	18
7	Slip Road	15	13
8	Roundabout	15	12
9	Pedestrianised Street	15	6
10	Private Road - Publicly Accessible	10	5
11	Private Road - Restricted Access	10	5

4.12 The RouteFinder software produces a catchment area output for each grid square similar to that indicated in Figure 4.3 'Example of RouteFinder catchment area'. The software calculates the total number of centres included within each individual catchment area, resulting in the score for that grid square being applied as detailed in Table 4.4 'Scoring bands for each of the scoring methods'.

Figure 4.3 Example of RouteFinder catchment area



Identifying the assessment criteria: land coverage

4.13 In addition to walking distance and journey times, two of the criteria assessed in this settlement hierarchy model are scored based upon the total land coverage within a cell, as opposed to distance to it. This approach has been used for employment land and retail floorspace within an area.

4.14 For employment land, this provides a score on the availability of employment opportunities in the area with the assumption that a greater percentage of land used for employment purposes equates to a greater

number of employment opportunities. It is recognised that this only provides a relatively crude representation, however a greater level of detail would prove problematic given the limitations of time and resources.

- 4.15** As with the other assessment criteria, the relevant score applied depending upon total land coverage or floorspace is detailed in Table 4.4 'Scoring bands for each of the scoring methods'.

Final list of assessment criteria

- 4.16** The full list of assessment criteria that are included in the settlement hierarchy model, including information on data sources, data type and units is set out in Table 4.3 'Assessment criteria'.

Table 4.3 Assessment criteria

Data criteria		Data source	Data Type	Value
Education				
1	Nursery school	G.I.S.	Walking Distance	750m
2	Primary school	G.I.S.	Walking Distance	750m
3	Secondary school	G.I.S.	Walking Distance	750m
Health				
4	GP surgery	G.I.S. & NHS Calderdale	Walking Distance	750m
6	Dentist	G.I.S. & British Dental Association	Walking Distance	750m
Retail and associated town centre uses				
7	Post offices	G.I.S. & Post Office	Walking Distance	750m
8	Banks/Building societies	G.I.S. & site visits	Walking Distance	750m
9	Supermarkets	G.I.S. & Accessibility Survey	Walking Distance	750m
9a	Market	G.I.S.	Walking Distance	750m
10	Pub/restaurant	G.I.S. & Planning applications register	Walking Distance	750m
Employment				
11	Employment provision in settlements	U.D.P.	Area Covered	Emp/Ha
12	Retail Land Provision in settlements	Accessibility Survey	Area Covered	Emp/Ha
Community Facilities				
13	Library	G.I.S.	Walking Distance	750m
14	Community centre	Accessibility Survey	Walking Distance	750m
15	Sports hall/ Centre/ Swimming pool		Walking Distance	750m

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Data criteria		Data source	Data Type	Value
16	Sports ground	U.D.P.	Walking Distance	750m
17	Public Park	U.D.P.	Walking Distance	600m
17a	Arts, Theatre and Cinema	G.I.S. & Discover Calderdale 2009	Walking Distance	750m
Transport and access				
18	A. Accessibility to nearby settlements – Public transport	Route Finder Model	Number of centres	30 mins
	B. Accessibility to nearby settlements – Private transport	Route Finder Model	Number of centres	30 mins
19	A. Bus stop	G.I.S.	Walking Distance	400m
	B. Public transport coverage – 30 min drive	Route Finder Model	Drive Coverage	30 mins
20	A. Train station	G.I.S.	Walking Distance	750m
	B. Private transport coverage – 30 min drive	Route Finder Model	Drive Coverage	30 mins

4.17 The scores applied to each data type for each criteria are shown in Table 4.4 'Scoring bands for each of the scoring methods'. These have been devised using the range of scores from all grid squares, and splitting the range into four logical bands for the scoring of points. Points are awarded in bands of 0.25, 0.5, 0.75 and 1 for each criteria assessment.

Table 4.4 Scoring bands for each of the scoring methods

Scoring Method	Points	
Walking distance	0% of grid square within specified distance	0
	Up to 25% grid square within specified distance	0.25
	26% to 50% grid square within specified distance	0.5
	51% to 75% grid square within specified distance	0.75
	76% to 100% grid square within specified distance	1
Area covered by employment uses	0ha of grid square	0
	0 to 0.5ha of grid square	0.25

Scoring Method	Points	
	0.5 to 1ha of grid square	0.5
	1 to 5ha of grid square	0.75
	Above 5ha of grid square	1
Area covered by retail uses	0 sq.m.	0
	Up to 100 sq.m. of grid square	0.25
	100 to 500 sq.m. of grid square	0.5
	501 to 2000 sq. m. of grid square	0.75
	Above 2000 sq. m. of grid square	1
Number of centres/settlements within 30 mins journey time – Public and Private transport*	0 centres/settlements within 30 minutes	0
	1 - 3 centres/settlements within 30 minutes	0.25
	4 - 6 centres/settlements within 30 minutes	0.5
	7 - 8 centres/settlements within 30 minutes	0.75
	9 + centres/settlements within 30 minutes	1
B. Public and Private transport 30mins drive coverage	0 sq.m.	0
	1 – 60 sq miles coverage	0.25
	61 – 120 sq miles coverage	0.5
	121 – 180 sq miles coverage	0.75
	Above 180 sq miles coverage	1

* The centres/ settlements used are: Halifax, Hebden Bridge, Todmorden, Brighouse, Elland, Sowerby Bridge, Bradford, Huddersfield, Dewsbury, Leeds, Wakefield, Burnley, Rochdale, Oldham, Keighley and Manchester.

Stage Two: Weighting the assessment criteria

- 4.18** The questionnaire responses in earlier rounds of consultation determined that all assessment criteria would be retained as part of the model. There were no instances where criteria were deemed as 'Not important'. The majority of responses were largely spread between 'Very important', 'Important' and 'Fairly Important'. The differences were those where large responses were shown as 'Very important' for employment, health care, education and food shops and those largely seen as 'Fairly important' such as sporting and community facilities, pubs and restaurants.
- 4.19** In their report 'Making the Connections', the Social Exclusion Unit (SEU) identifies 'services with the greatest impact on life opportunities' as jobs, health care, learning and food shops. The split of the importance of these facilities and services is largely consistent with the results presented by the questionnaire responses.
- 4.20** It is therefore considered appropriate that access to employment, health care, education and food shops for example (services that are essential for life opportunities) should carry greater weight and be given greater priority in the settlement hierarchy model than other criteria such as social, cultural and sporting facilities. Table 4.5 'Categorisation and weighting of assessment criteria' lists the criteria by 'essential', whereby a weighting factor of 1 is applied, or 'other' where a weighting factor of 0.5 is applied. In effect, scores for those services/facilities deemed not to be essential (classified as 'other') are halved.

Table 4.5 Categorisation and weighting of assessment criteria

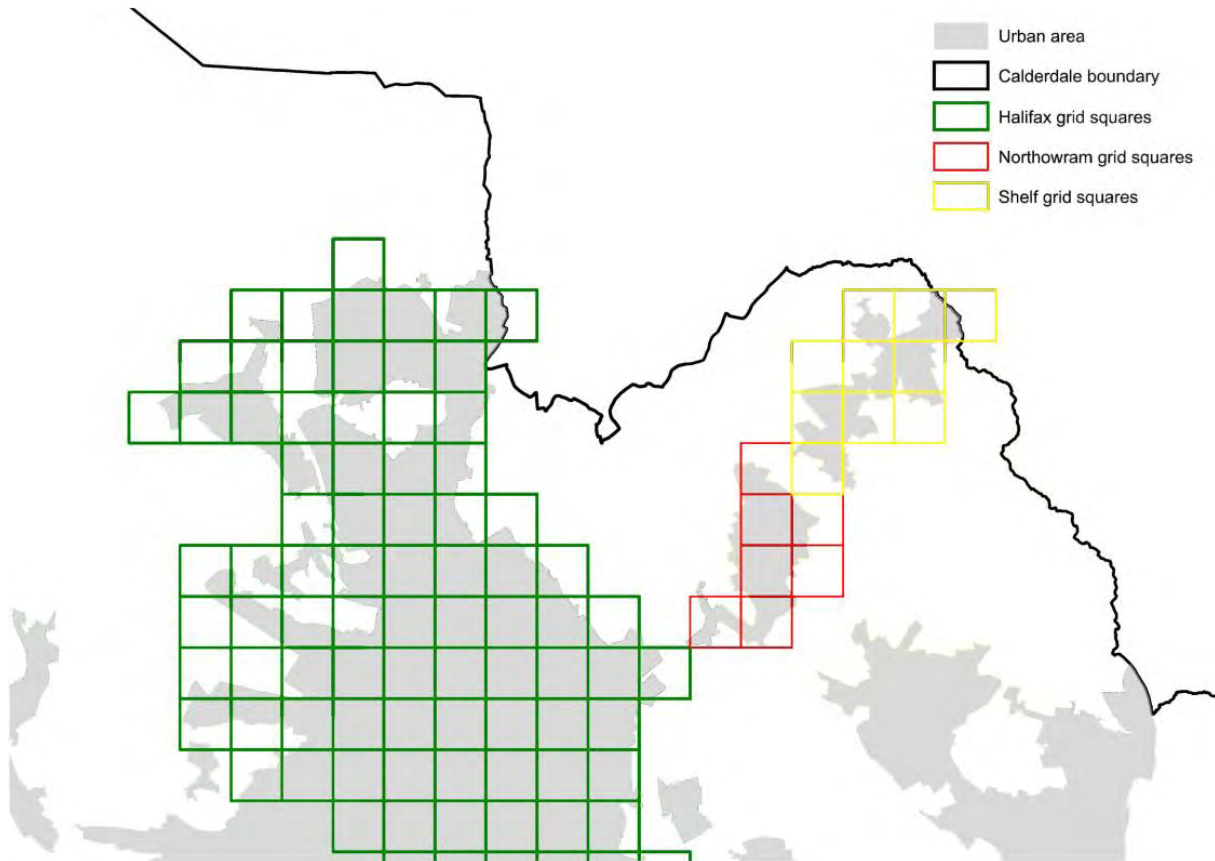
Criteria	
Essential (1.0)	Other (0.5)
Nursery school	Post offices
Primary school	Bank/building societies
Secondary school	Pub/restaurant
GP surgery	Library
Dentist	Community centre
Supermarket	Sports hall/swimming pool
Market	Sports ground
Employment land provision	Public park
Retail floorspace provision	Arts, Theatre and Cinema
Public transport accessibility – 30min drive time	
Private transport accessibility – 30min drive time	
Public transport – bus coverage	
Public transport – 30min settlement catchment	
Public transport – train stations	
Private transport – 30min settlement catchment	

Stage Three: Identifying the hierarchy

- 4.21** As explained in Stages One and Two, each 500m grid square is given a score against each of the listed, weighted criteria that are assessed. A final score for each square is generated by adding up all the individual scores to give an indication of that locations' sustainability. Those grids which intersect the defined urban areas of Calderdale are then used to help identify the settlement hierarchy for the borough.
- 4.22** Urban areas are those areas NOT identified as being within the Green Belt or Area Around Todmorden designations as defined by the Replacement Calderdale Unitary Development Plan (RCUDP), adopted in August 2006. The only exceptions to this are the larger settlements which are over-washed by Green Belt and are identified by a village envelope within the RCUDP.
- 4.23** To enable the relative sustainability scores for each settlement to be applied, grid squares were assigned to the relevant settlements based upon the following methodology;
- All grids which have 25% or more covered by the urban area will be counted;
 - All grids which include a village envelope and have 25% or more of the grid area developed will be counted;
 - Where less than 25% of the grid is covered by either the urban area or village envelope an assessment of how important the area is to the overall settlement has been undertaken. This exercise has focused upon the amount of development contained within the grid as opposed to the overall settlement. Therefore the importance of 20 dwellings to Eastwood is vastly different to the same number of dwellings for Halifax.
 - Where a grid covers two or more settlements the grid score will be allocated to the settlement which covers the greatest amount of the grid.

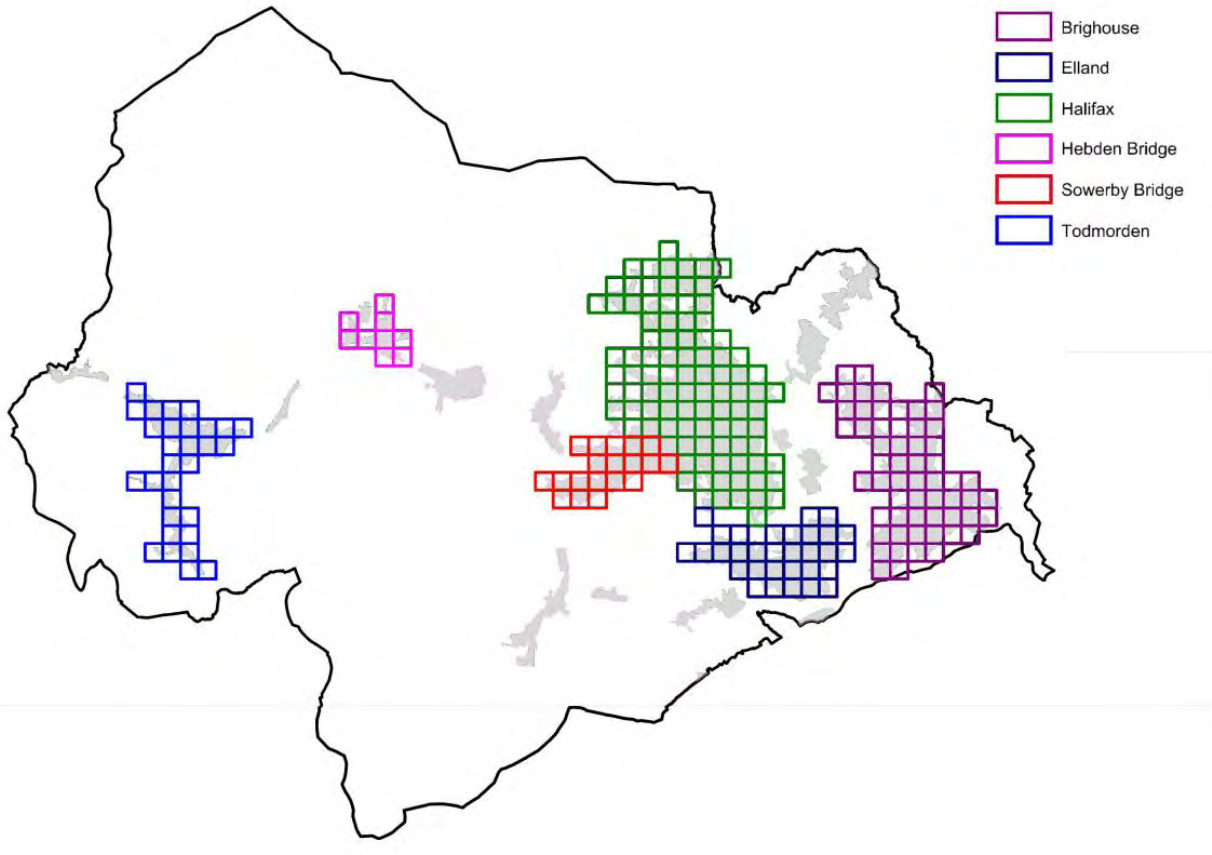
- 4.24** Figure 4.4 'Example of grid squares extracted for settlement identification' demonstrates an example of the extraction of specific grid squares using this methodology, with the boundaries of Halifax, Northowram and Shelf defined. Areas where the urban area is not totally covered by grid squares (such as northern edge of Halifax, western edge of Northowram) are where no significant development exists to warrant a grid square's inclusion in the settlement count.

Figure 4.4 Example of grid squares extracted for settlement identification



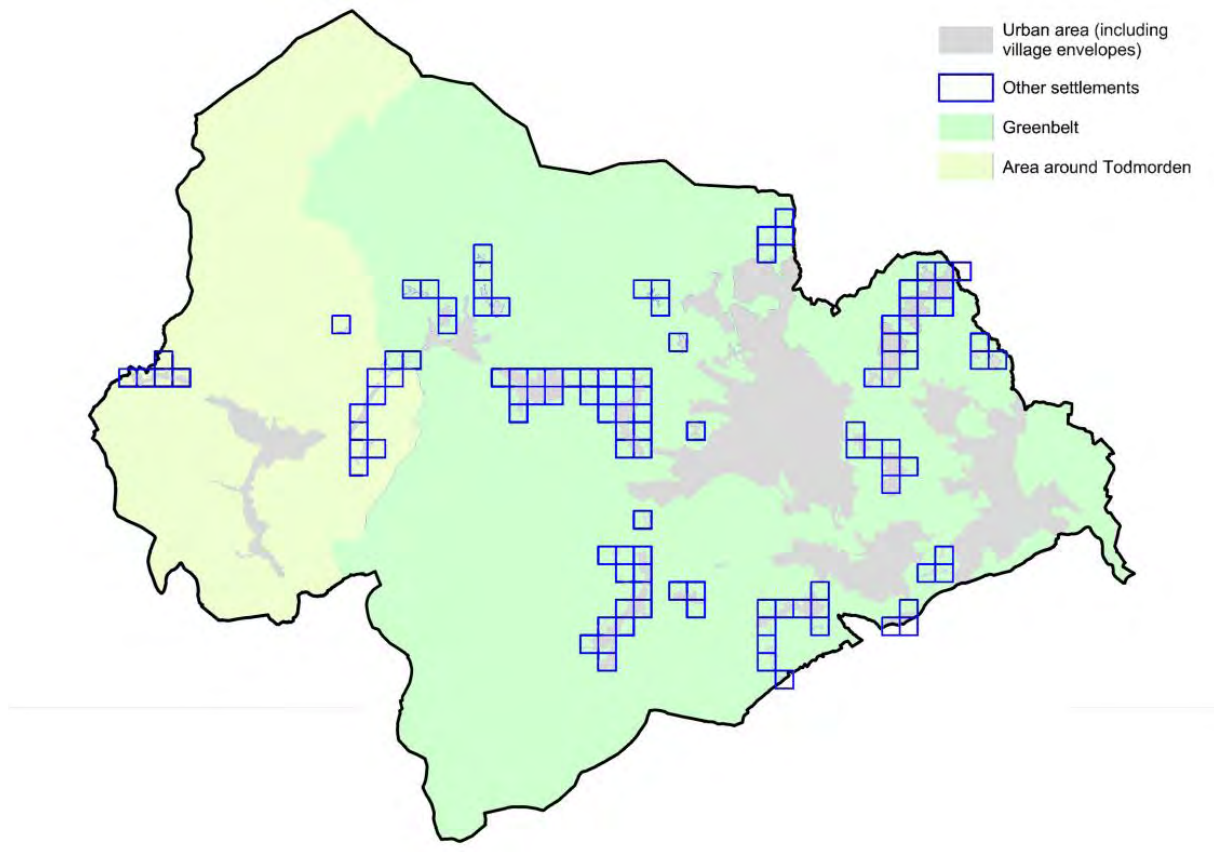
- 4.25** All settlements are given a score based on the sum of all scores taken from the composition of grid squares attributed to it. Once the settlements are scored each is ranked against the other settlements, providing a relative rank for every settlement. Using this method, larger settlements will naturally have larger scores due to a larger number of cells being aggregated for the final settlement score. Average sustainability scores per grid square for settlements are also therefore calculated and provided, to be used in conjunction for any analysis and settlement hierarchy considerations.
- 4.26** Figure 4.5 'Town centre identification exercise' shows the main town settlements having gone through the grid square extraction exercise. For the purposes of the settlement hierarchy model, larger settlements such as Halifax and Brighouse contain a number of areas within them that could be considered to be settlements in their own right. For example, Mixenden in Halifax and Hipperholme in Brighouse. However these are amalgamated in this model on the basis that they are contiguous urban areas.
- 4.27** The only exception to this is the classification of Sowerby Bridge. Despite its direct attachment to Halifax in terms of urban area, Sowerby Bridge has a significant high street and its own train station and transport connections. For these reasons it is deemed to be a sustainable town centre in its own right.

Figure 4.5 Town centre identification exercise



4.28 In addition to the main town centres, Calderdale has a significant number of medium and smaller scale settlements. These are identified through a similar process and their sustainability ranked using the settlement hierarchy model in order to help steer any appropriate levels of future growth in these areas. Figure 4.6 'Other settlements identification exercise' identifies the grid squares that make up these 36 smaller settlements that are considered in the study.

Figure 4.6 Other settlements identification exercise



Stage Four: Areas of search

- 4.29** The relative score for individual grids within a settlement have been given a colour based upon the score attained. The colours range in shades from red to green to indicate poor to good sustainability ratings respectively. This has been used to provide a choropleth map indicating areas of search for potential sites for new development. It includes sites both within and on the edge of the existing built-up area.
- 4.30** The highest scoring colours will be used to guide the initial areas of search for new sites within the LDF, with progressively lower scoring grids providing other search areas. The model can also be used to address deficiencies in specific types of services within a settlement or grid which could be overcome through development. Individual choropleth maps could be provided for each of the criteria assessed if required.
- 4.31** The model will also be kept under regular review to ensure it takes account of changes such as the provision of new schools, new bus services, closures of local facilities or new employment sites.

5 Amendments to the methodology

- 5.1** This final methodology has been significantly changed from the version which was consulted upon during winter 2008/09. The changes have largely been made in response to the comments made during the consultation and because of the lessons learnt from the first run of the settlement hierarchy model.
- 5.2** This section highlights the major changes to the methodology and the model and the reason for the changes.

Table 5.1 Major changes to the settlement hierarchy model methodology

Section	Changes	Reason
1:Introduction	Short section concerning consultation included	To clarify how the methodology has been developed.
3:Methodology - research data	Section condensed	Whilst this section contained useful theoretical information it was considered this added little to the understanding of how the settlement hierarchy model had been created.
3:Methodology - research data (Table 3.1)	Additional sources of data used	Additional sources of data have been used in calculating the score for each criteria because some of the original data used in the model was found to be inaccurate. This issue was noted whilst validating the model results and through consultation responses. To rectify this problem and ensure the model provides as accurate a picture as possible a range of other data sources have been used, where relevant.
3:Methodology - research data (Table 3.1)	Markets added to scoring criteria	Calderdale has numerous markets across the district. These play a significant role in how the towns function and provide a wide range of goods and services. Because markets provide an important resource to the residents of the district it was considered this should be recognised in the settlement hierarchy.
3:Methodology - research data (Table 3.1)	Arts, Theatre, and Cinema added to scoring criteria	The previous iteration of the model was considered to be lacking in terms of arts and culture provision. Whilst this is not considered a 'life essential' requirement it is recognised that such facilities do add to the attractiveness of a place for entertainment and reduces the need to travel to other destinations. On this basis a new criteria was created for Arts, Theatre and Cinema.
3:Methodology - research data (Table 3.1)	Health clinics removed from scoring criteria	Whilst this criteria was considered to be important whilst scoring it was noted this creating a lot of double counting with the GP facilities. On further investigation it also emerged that where double counting did occur this did not necessarily mean that the facility had more services than those facilities not being double counted. Those health clinics which were not also GP surgeries where only available to patients referred by their GP and were not available as a first point of contact. Therefore because of both of these issues it was considered that the GP Surgeries list provided by the NHS was the only relevant data to use.
4:Methodology - inclusion of cross-border data	Data from Bradford and Kirklees obtained	Following the consultation it was clear that to avoid too insular an approach in the settlement hierarchy model, it would be necessary to obtain data from adjoining local authorities. This ensures that areas of Calderdale close to the authority boundary are scored accurately taking account of services and facilities over the boundary and not just those within Calderdale. Where

Section	Changes	Reason
		available, data has been incorporated into this version of the model.
4:Methodology - modelling (Stage one)	Definition of some services included	During the consultation upon the settlement hierarchy in winter 2008/9 comments were received querying what some of the criteria actually referred to. To overcome this issues some of the criteria now include short explanations or definitions of what they encompass.
4:Methodology - modelling	Criteria for identifying hierarchy of settlements including settlement boundaries have been changed.	During the consultation upon the settlement hierarchy in winter 2008/9 comments were received concerning how individual settlements had been scored. In addition using only grids which had at least 50% of the urban area meant that important parts of settlements were not scored. This was particularly apparent in Hebden Bridge. To rectify this issue the 50% rule was dropped in favour of a case by case assessment of individual settlements.
4:Methodology - modelling	Green belt envelope settlements included in hierarchy	During the consultation upon the settlement hierarchy in winter 2008/9 comments were received regarding the classification of settlements. Due to these comments and further consideration of settlements within the district it was recognised that the current methodology did not investigate some relatively large settlements, such as Norwood Green and Old Town/ Chiserley as they were over-washed by Green Belt. To overcome this issue all significant settlements defined by a village envelope were considered and included, where relevant.
4:Methodology - modelling	Settlements and town centres merged into one grouping	A number of the consultees during the winter 2008/9 consultation suggested that it would be appropriate to merge settlements with continuous built-up areas as they often acted as one larger settlement with numerous small centres. In the comments and feedback to this consultation the Council originally disagreed with these comments. However after further consideration it was considered that merging settlements was an appropriate way to consider the hierarchy and it provided consistency with the Green Belt Review. In addition because the model also scores each individual grid development within these wider areas can still be focused upon the most sustainable locations within the settlement or solutions found to improving the sustainability of certain parts of that settlement.
5:Results	Section removed and placed into a separate document	This section has been separated from the methodology because the results will be updated on a regular basis. In addition it is anticipated that most users will be largely interested in the results and recommendations as opposed to the methodology.
6:Recommendations	Section removed and placed into a separate document	This section has been separated from the methodology because the results will be updated on a regular basis. In addition it is anticipated that most users will be largely interested in the results and recommendations as opposed to the methodology.