



Settlement Hierarchy Methodology Consultation



Local Development Framework

Contents

1	Introduction	2
2	Policy Context	3
	National Policy	3
	Regional Policy	3
	Local Policy	4
3	Methodology - research data	5
4	Methodology - modelling	8
5	Results	21
6	Recommendations	35

Appendix

1	Settlement identification map		36
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1 Introduction

1.1 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 sustainable development is achieved.

1.2 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, "Delivering Sustainable Development", published in February 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;

1.3 Future patterns of sustainable development in Calderdale will need to embrace these four sustainability objectives in the context of 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.

1.4 Establishing a Settlement Hierarchy is arguably one of the most important ways the Calderdale LDF can contribute to sustainable development. The Settlement Hierarchy will therefore be one of the key pieces of evidence for the Calderdale LDF.

What is a Settlement Hierarchy

1.5 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.

1.6 The Council's methodology has evolved from the concept of a settlement hierarchy as set out within the Regional Spatial Strategy (2008) (RSS). A settlement hierarchy involves the classification of settlement types according to a number of factors; these include accessibility to services and the level of facilities provided by the settlement.

1.7 This model provides a snapshot in time of the facilities and accessibility to services within the different settlements of Calderdale. The identification of these factors will 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.

1.8 The information gained from the final settlement hierarchy 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.

2 Policy Context

2.1 There is no specific guidance on how to undertake a study of Settlement Hierarchy. National and regional policy does provide some key issues that need to be addressed and a regional Settlement Hierarchy underpinned regional policy. The methodology indicated in the following sections builds upon these policy issues and regional study.

National Policy

2.2 The main sources of national policy in relation to Settlement Hierarchy are PPS1 (Delivering Sustainable Development); PPS3 (Housing); PPS6 (Planning for Town Centres); PPS7 (Sustainable Development in Rural Areas) and PPG13 (Transport). 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 focussed 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

2.3 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). Each settlement was 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 used were Sub-regional centre, Principal Centre, Local Service Centre and Basic Service Centre. Within Calderdale Halifax and Brighouse were named as 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.

2.4 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

2.5 Other than Halifax and Brighouse none of the above classifications have been translated into the emerging RSS. It is therefore necessary for the LDF to formally identify which settlements are classified as Local Service Centres, or indeed if any other Principal Towns should be identified. 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.

2.6 The RSS also provides criteria for travel times to essential facilities by public transport. This has been done both for identifying accessibility to a new destination by the whole of the population, such as a school or hospital and accessibility to services from an origin, such as a new housing site. These criteria will be most important when assessing individual site allocations, however they have been incorporated into this model wherever possible.

Local Policy

2.7 Currently the most important local policy documents for the settlement hierarchy are the Replacement Calderdale Unitary Development Plan (UDP) and the Community Strategy, Calderdale Futures. Both of these documents promote the creation of sustainable communities by improving accessibility to services and facilities.

2.8 In addition other parts of the LDF evidence base will compliment the Settlement Hierarchy as they are developed. These will include:

- Strategic Flood Risk Assessment
- Employment Land Review
- Strategic Housing Land Availability Assessment
- Open Space, Sport and Recreation Study
- Green Belt Review

3 Methodology - research data

3.1 The data for the study was collected through a combination of secondary sources and primary research. The data obtained through secondary sources in literature, previously published research, or published information sources were used to devise and provide a context for the questionnaires that are part of the original research.

3.2 The use of secondary data is important to provide a context of the topic. There have been a variety of interpretations of 'sustainable communities' by different policy makers and commentators in recent years. The use of secondary data can help determine the significance of the term as a generic objective for the planning and regeneration of the localities in the study. Secondary data can be analysed to demonstrate actual or potential relationships between the features of sustainable communities that inform the model.

3.3 The key concepts and ideas are economic, environmental, social, organisational and political. The analysis of the secondary data was used to construct the questionnaires and interview questions.

3.4 It is recognised that secondary data has both strengths and weaknesses as demonstrated in Table 3.1.

Strengths	Weaknesses
Accessibility	Inflexibility
Contextual	Cost
Quality and reliability	Unverified
Scope	Bias

Table 3.1 Secondary data

3.5 The main weaknesses of secondary data are that it is sometimes unverified as it is not replicable and can be sometimes biased. It is anticipated that this can be mitigated against by sticking to the research questions and not being led to repeat the work of previous research, and by using a wide range of sources to prevent the influence of a biased source.

3.6 A crucial part of good research design concerns ensuring that the questionnaire design addresses the needs of the research. The four main activities for this part of the research are:

- 1. Designing and constructing the questionnaire
- 2. Identifying the questionnaire sample
- 3. Delivering the questionnaire
- 4. Data entry and analysis

3.7 The questionnaire is designed in sections that group similar types of structured questions in a clear and easy to respond format, which include instructions. The questions were framed in a way to allow people in the same situation to answer in the same way. The types of questions were structured to obtain the information needed for the model. Structured questions provide easy to score and interpret data. Open-ended questions are not considered appropriate for the purposes of constructing the model because the responses are difficult to categorise and therefore make the task of interpretation and generalisation far more difficult.

3.8 The results of the questionnaire determined the data that needed to be collected. This required obtaining different data from a number of different sources and pulling this together to be held in a common GIS format. A summary of this data collection is set out in Table 3.2.

Theme	Criteria	Source	
Education	Nursery School	OS Points of Interest Data*	
	Primary School	Calderdale Corporate G.I.S	
	Secondary School		
Health	GP Surgery		
	Health clinic	OS Points of Interest Data*	
	Dentist		
Retail &	Post Office		
town centres	Bank/building societies	 OS Points of Interest Data* 	
	Supermarket		
	Pub/restaurant		
Employment	Employment land provision	Calderdale Unitary Development Plan	
	Retail floorspace provision	Calderdale Accessibility Survey 2005-2008	
Community	Library	Calderdale Corporate G.I.S	
Facilities	Community centre	Calderdale Accessibility Survey 2005-2008	
	Sports hall/swimming pool	Calderdale Accessibility Survey 2005-2008	
	Sports ground	OS Deinte of Interest Date*	
	Public park	OS Points of Interest Data	
Transport	Public transport accessibility – 30min drive time	MapInfo RouteFinder software^	
and access	Private transport accessibility - 30min drive time	OS Points of Interest Data*	
	Public transport – bus coverage	MapInfo RouteFinder software^	
	Public transport – 30min settlement catchment	OS Points of Interest Data*	
	Public transport – train stations	MapInfo RouteFinder software^	
	Private transport – 30min settlement catchment	OS Points of Interest Data*	

Table 3.2 Data Collection Sources

* 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 December 2007.

^ RouteFinder is a network analysis system fully integrated into the GIS software and can be used with any topologically correct road network. RouteFinder uses its own system tools to produce the most accurate results.

3.9 The project has been split into a number of tasks that relate to different stages of research. Many of the tasks rely upon the production of materials within previous stages; therefore a research schedule was produced. This schedule can be represented in a flow chart, which is set out in Figure 3.1.





4 Methodology - modelling

4.1 The model is based on criteria identified in the questionnaires. The criteria are the sustainability indicators within the model. The indicators are ranked and the score is weighted based upon results and analysis of the questionnaire responses and the relative importance associated with different indicators. To assess how well different parts of the local authority area perform against the criteria, the district has been split into 500m grid squares. The model is run against each grid square giving 1586 individual scores across 23 indicators that are added together to provide the totals for each grid square.

4.2 The model data is analysed on a scoring system and expressed on a map-base using GIS. The use of GIS for spatial analysis data is utilised to pull out relevant information, in order to investigate the data. A GIS can be used to query location, condition, trends, routes and patterns. GIS is a computer-based system for capturing, visualising, validating, storing, manipulating, processing, integrating, analysing and outputting; in map, tabular and 3D formats, spatially referenced data, formed of entities and their associated attributes.

Figure 4.1 Example grid of model sample area



4.3 Each grid square has been given a score based upon the analysis of the identified criteria and their weighting in the model. Each grid square within a community boundary will be added together to create a sustainable community score. The score for different settlements can then be ranked easily. Therefore, the score for the community will be created using the following equation:

Sustainable community score = Grid square (sum of criteria) * Number of grid squares

4.4 Further analysis would be possible at site-specific locations to give scores at precise locations. 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 have influenced the choice of local criteria.

Regional criteria (2004 settlement study)	Calderdale settlement hierarchy model criteria	Calderdale scoring method
Education	 Nursery school Primary school Secondary school 	Walking distance (750m)
Health	GP surgeryHealth clinicDentist	Walking distance (750m)
Financial and professional services	Banks/ Building societies	Walking distance (750m)
Public services	 Library Community centre Post office Place of worship 	Walking distance (750m)
Leisure services	 Sports hall/ centre/ Swimming pool Sports ground Public park (Children's play area or similar) Public house/ restaurant 	Walking distance (750m) Except public park (600m)
Retail	Retail provisionSupermarket	Walking distance (750m)
Not covered by 2004	Employment provision	Area of land
Settlement Study.	Accessibility to towns	30 minute journey time
	Retail floorspace	Area of land
	Public transport - Bus coverage	Walking distance (400m) of bus stop
	Public transport - Bus frequency	Average number bus services per hour
	Public transport – Train Station	Walking distance (750m)
	Population size	Contextual indicator only

Table 4.1 Data criteria

4.6 Each criterion will be scored in a number of ways. The type of scoring used for each criterion is set out in Table 4.1. The method of scoring the criteria is based upon professional judgement and is influenced by the outcomes of the questionnaire. The different criteria scoring ranges are determined through the assessment of walking distances, amount of land coverage for a specific uses and travel times.

Identifying the assessment criteria: walking distances

4.7 The criteria scored by walking distance are those that are considered the most important facilities and services. The walking distance used is 750m. This distance has been chosen as it provides a reasonable 5 to 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. 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. An example of the walking distances for facilities and services using GIS is shown in Figure 4.2.

Figure 4.2 Example of RouteFinder catchment area



Identifying the assessment criteria: journey times

4.8 The time criteria have been used for access to main towns, as these are generally the focus for the majority of services, leisure facilities, shops and employment opportunities. A journey time of 30 minutes has been used as this corresponds with most of the Transport Destinations Accessibility criteria contained within Table 16.8 of the RSS.

4.9 Two modes of transport have been used for this scenario - these are 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. In addition, sustainability does not only encompass environmental issues but also economic and social issues.

4.10 The distance travelled will be measured by producing a 30-minute catchment area from each grid square across the district where it intersects the road network. The model will take account of relative speeds of each mode of transport along different road classifications using GIS RouteFinder software tools. The road speeds for different road classifications on private and public transport are set out in Table 4.2. This will produce a catchment area similar to that indicated in Figure 4.2. The catchment areas will be used to measure the number of centres within and outside Calderdale that are within 30 minutes travelling distance from each grid square.

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

Table 4.2 Average road speeds for public and private transport

4 . Methodology - modelling



Picture 4.1 Example of RouteFinder catchment area

Identifying the assessment criteria: land coverage

4.11 This has been included for employment land and retail floorspaces within a settlement. It provides a score on the availability of employment opportunities 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 crude representation but a greater detail would prove problematic for the interpretation of the model.

4.12 The full list of assessment criteria including information on data sources, units and values is set out in Table 4.3.

Data criteria		Data source	Data Type	Value	Unit
Education					
1	Nursery school	G.I.S.	Distance	750m	Coverage
2	Primary school	G.I.S.	Distance	750m	Coverage
3	Secondary school	G.I.S.	Distance	750m	Coverage

Table 4.3 Assessment criteria

Data criteria		Data source	Data Type	Value	Unit
Health				l	
4	GP surgery	G.I.S.	Distance	750m	Coverage
5	Health clinic	G.I.S.	Distance	750m	Coverage
6	Dentist	G.I.S.	Distance	750m	Coverage
Retail and assoc	ciated town centre	uses			
7	Post offices	G.I.S.	Distance	750m	Coverage
8	Banks/Building societies	G.I.S.	Distance	750m	Coverage
9	Supermarkets	G.I.S.	Distance	750m	Coverage
10	Pub/restaurant	G.I.S.	Distance	750m	Coverage
Employment					
11	Employment provision in settlements	U.D.P.	Amount	Hectares	Emp/ha
12	Retail Land Provision in settlements	Accessibility Survey	Amount	Hectares	Emp/ha
Community Faci	lities	·		·	
13	Library	G.I.S.	Distance	750m	Coverage
14	Community centre	Accessibility Survey	Distance	750m	Coverage
15	Sports hall/ Centre/ Swimming pool		Distance	750m	Coverage
16	Sports ground	U.D.P.	Distance	750m	Coverage
17	Public Park	U.D.P.	NPFA	600m	Coverage
Transport and ad	ccess	·		·	
18	A. Accessibility to nearby settlements – Public transport	Route Finder Model	No of centres	30 mins	Coverage
	B. Accessibility to nearby settlements – Public transport	Route Finder Model	No of centres	30 mins	Coverage

Data criteria		Data source	Data Type	Value	Unit
19	A. Bus coverage – Bus stop location	Route Finder Model	Distance	400m	Coverage
	B. Bus coverage – 30 min drive	Route Finder Model	Distance	30 mins	Coverage
20	A. Train station	Route Finder Model	Distance	750m	Coverage
	B. Private transport – 30 min drive	Route Finder Model	Distance	30 mins	Coverage

4.13 The scoring mechanisms for each criterion are shown in Table 4.4. 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.

Table 4.4 Scoring bands for assessment criteria

Criteria	Scoring Method	Points	
Nursery	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Primary school	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Secondary school	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
GP surgery	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Health clinic	Walking distance	Up to 25% grid within 750m	0.25

4 . Methodology - modelling

Criteria	Scoring Method	Points	
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Dentist	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Post office	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Bank/ Building society	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Supermarket	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Pub/ restaurant	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Employment land	Area covered by employment uses	0 to 0.5ha	0.25
		0.5 to 1ha	0.5
		1 to 5ha	0.75
		Above 5ha	1
Retail floor space		0 to 100 sq.m.	0.25
		100 to 500 sq.m.	0.5

4 . Methodology - modelling

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Criteria	Scoring Method	Points	
		501 to 2000 sq. m.	0.75
		Above 2000 sq. m.	1
Library	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Community Centre	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Sports hall/ Centre/ Swimming pool	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Sports ground	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Public park	Walking distance	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
Accessibility to	Number of	0 centres/settlements within 30 minutes	0
town centre	within 30 mins	1 - 3 centres/settlements within 30 minutes	0.25
	journey time – Public transport	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

Criteria	Scoring Method	Points	
	Number of centres/settlements within 30 mins journey time – 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
Transport	A. Walking distance	Up to 25% grid within 750m	0.25
	to bus stop	26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
	B. Public 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
	A. Train station	Up to 25% grid within 750m	0.25
		26% to 50% grid within 750m	0.5
		51% to 75% grid within 750m	0.75
		76% to 100% grid within 750m	1
	B. Private transport	0 sq.m.	0
	coverage	1 – 80 sq miles coverage	0.25
		81 – 160 sq miles coverage	0.5
		161 – 240 sq miles coverage	0.75
		Above 240 sq miles coverage	1

Stage Two: Weighting the assessment criteria

4.14 At stage one, equivalent levels of access to all services would receive the same score under the proposed scoring method. For example, the same score would be given to a grid if 75-100% of its area is within 750m of a primary school or a pub / restaurant.

4.15 As a result of the questionnaire responses, it should be recognised that access to some services is more important than to others. 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 consistent with the results presented by the questionnaire responses.

4.16 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 methodology than the 'other' services identified in the document such as social, cultural and sporting facilities. This is identified in the Table 4.5.

4.17 The split of the importance of these facilities and services is consistent with the results offered by the questionnaire responses, therefore a split between 'essential' and 'other' facilities and services, with a weighting factor of 1 and 0.5, can be put forward with a high degree of confidence. Access to the 'essential' services should be given a higher score than that given for the same level of access to secondary services and facilities. It is considered that a factor of 0.5 should be applied to the scores for 'other' services and facilities. This is set out in the Table 4.5.

Criteria				
Essential	Other			
Nursery school	Post offices			
Primary school	Bank/building societies			
Secondary school	Pub/restaurant			
GP surgery	Library			
Health clinic	Community centre			
Dentist	Sports hall/swimming pool			
Supermarket	Sports ground			
Employment land provision	Public park			
Retail floorspace provision				
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				

Table 4.5 Categorisation of assessment criteria

Stage Three: Identifying the hierarchy

4.18 Each 500m grid will be given a score, provided all or part of the grid is within the existing built-up urban area - which is identified by the Ordnance Survey street data. The score apportioned to each grid is based upon the scoring criteria identified in Table 4.4 and weighted against Table 4.5. This will provide a relative sustainability score for each individual grid square.

4.19 To assess the relative rank of each settlement within the hierarchy the following methodology will be used.

4.20 All grid squares that cover the settlement will be used except where the grid square covers less than 50% of the identified settlement. Where the grid contains less than 50% of the settlement this will be either:

- Discounted if the remainder of the square is not within the built-up area boundary
- Given to another adjoining settlement if this has more than 50% of its boundary within the grid square.

4.21 The identification of settlements will be determined by overlaying the grid squares that have urban area coverage of 50% or above against an Ordnance Survey base map. An example of extracting only urban grid squares is shown in Figure 4.3.

Figure 4.3 Example of extracted grid from urban area



4.22 The grid squares will then attributed to the relevant settlement depending on their location within Calderdale. Locations will be split into two layers: town centres and settlements. There will be instances where settlements exist within town centres. All locations will be scored from the sum of all scores taken from the composition of grid squares attributed to it. Figure 4.4 demonstrates the settlement identification exercise.



Figure 4.4 Settlement identification exercise

Therefore, the score for each settlement will then be:

Sustainable community score = Grid square (Sum of criteria) * Number of grid squares

4.23 Once the settlements have been scored each they will then be ranked against the other settlements. This will provide a relative rank for every settlement and provide an indication as to the sustainability of each settlement and their capability to accommodate further growth.

Stage Four: Areas of search

4.24 The relative score for individual grids within a settlement will be given a colour based upon the score attained. The colours will range in shades from red to green to indicate poor to good sustainability ratings respectively. This will 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. The highest scoring colours will provide the initial areas of search for new sites with progressively lower scoring grids providing other search areas. The areas of search will be determined by GIS which queries the highest scoring grid squares in areas that are not already part of the existing urban area.

4.25 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 Results

5.1 The results of the Settlement Hierarchy Model are set out in this section The totals for each of the 1586 grid squares are the worked result of a number of different stages that are set out in Section Three. The different stages of the model were created through the use of map-based data. The results are mapped and set out in the sections. This chapter will describe the different stages and the significance of the results of each for the final model.

Stage One: Identifying the assessment criteria

5.2 The 23 GIS data sets that were used to cover the 20 assessment criteria were obtained and mapped using the MapInfo GIS package. The maps were analysed and queries run against relevant buffer zones, where they intersected an area of a grid square. An example of the results for criteria 1 of primary schools with a 750m buffer is shown in Figure 5.1.





Stage Two: Weighting the assessment criteria

5.3 The results of the questionnaire are available on the <u>Council website</u>. In total over 100 responses were received. The questionnaire responses determined that all 20 assessment criteria would be retained as part of the model. There were no instances where criteria were deemed as 'Not important' by the majority of responses in Section Two, 'How important do you think the following types of shops and services are?' The majority of questionnaire responses were largely spread between 'Very important', 'Important' and 'Fairly Important'. The differences on either side 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 and alike. As such, when applying a simple weighting factor of 0.5, to prevent the model becoming unwieldy, a distinction between two categories of criteria was made between 'life essential' and 'other' criteria. These results are shown in Table 5.1.

Theme	Criteria	Category	Weighting
Education	Nursery School		
	Primary School	Essential	1
	Secondary School		
Health	GP Surgery		
	Health clinic E		1
	Dentist		
Retail & town	Post Office	Other	0.5
centres Bank/building societies		Other	0.5
	Supermarket	Essential	1.0
	Pub/restaurant	Other	0.5
Employment	Employment land provision	Essential	1
	Retail floorspace provision		
Community	Library		
Facilities			
			0.5
	Sports hall/swimming pool	Other	
	Sports ground		
	Public park		
Transport	Public transport accessibility – 30min drive time		
	Private transport accessibility – 30min drive time	- Essential	1
	Public transport – bus coverage		
	Public transport – 30min settlement catchment		
	Public transport – train stations		
	Private transport – 30min settlement catchment		

Table 5.1 Weighting and categorisation of assessment criteria

Stage Three: Identifying the hierarchy

5.4 This stage of the modelling process involved being able to determine which grid squares make-up different settlements throughout the district. This was achieved by using only grid squares that contained coverage of 50% or more urban area as shown in Figure 5.2. The urban area is that as defined by the Replacement Calderdale Unitary Development Plan adopted in August 2006.

Figure 5.2 Calderdale urban areas and 500m grid



5.5 It is made possible through the use of a GIS query, to extract the grid squares within the urban area from the original 500m grid, as shown in Figure 5.3.

5. Results





5.6 The grid squares were then used to determine the town centres and settlements using the Ordnance Survey base map as detailed in Chapter 5 and shown in Figure 5.3. The results of the town centre and settlement identification exercises are shown in Figure 5.4 and 5.5



Figure 5.4 Town centre identification exercise

Figure 5.5 Settlement identification exercise



Calderdale Boothtown Mixenden Holmfield Shelf Boundary ____ Settlement Settlement Settlement Settlement Brighouse Copley Mytholmroyd Holywell Green Siddal Town Centre Settlemen Settlement Settlement Settlement Elland Claremount Northowram Southowram Hove Edge Settlement Town Centre Settlement Settlement Settlement Ovenden Halifax Clifton Walsden Illingworth Settlement Settlement Town Centre Settlement Settlement Pellon Greetland Hebden Bridge King Cross Warley Settlement Settlement Settlement Town Centre Settlement Highroad Well Lightcliffe Rastrick Sowerby Bridge West Vale Settlement Settlement Town Centre Settlen Settlement Todmorden Hipperholme Luddenden Ripponden Town Centre Settlement Settlement Settlement

Legend of settlement identification exercise

5.7 When using the data to collate the results for different settlements a settlement hierarchy can be created using the total scores. The scores are worked out as the sum of all criteria for each grid within the composition of each identified settlement. The final results are shown in Table 5.2.

Table 5.2 Final sustainability scores of **Settlement Hierarchy Model**

Settlement	Points
Halifax	895.25
Brighouse	376.75
Sowerby Bridge	172
Elland	161.375
Todmorden	96.25
Hebden Bridge	39.125
Sottlomont	Pointo
Settlement	Points
Mytholmroyd	78.625
Illingworth	75.5
Hipperholme	74.875

Settlement	Points
Rastrick	65.625
Ovenden	65.375
Lightcliffe	46.5
Holmfield	42.25
King Cross	41.625
West Vale	40.75
Pellon	39.375
Boothtown	37.75
Mixenden	33.75
Shelf	33.625
Northowram	31.5
Greetland	31.125
Highroad Well	30
Clifton	28.625
Ripponden	28
Luddenden	24.125
Hove Edge	23.375
Wheatley	22
Southowram	20
Holywell Green	17.75
Claremount	14.875
Siddal	12.25
Walsden	11.125
Copley	11
Warley	6.75

5.8 The results in Table 5.2 represent the sustainability scores for town centres and settlements using the composition of their relevant grid squares. However, their relative sustainability credentials are perhaps more accurately depicted as an average of the number of grid squares that make up each settlement. These results are shown in Table 5.3.

No.	Centre	Points	No of Grid Square	Average
1	Elland	161.375	12	13.4479167
2	Halifax	895.25	67	13.3619403
3	Sowerby Bridge	172	13	13.2307692
4	Hebden Bridge	39.125	3	13.0416667
5	Brighouse	376.75	29	12.9913793
6	Todmorden	96.25	8	12.03125
Νο	Centre	Points	No of Grid Square	Average
1	Highroad Well	30	2	15.00
2	Claremount	14.875	1	14.88
3	King Cross	41.625	3	13.88
4	West Vale	40.75	3	13.58
5	Pellon	39.375	3	13.13
6	Rastrick	65.625	5	13.13
7	Mytholmroyd	78.625	6	13.10
8	Ovenden	65.375	5	13.08
9	Boothtown	37.75	3	12.58
10	Illingworth	75.5	6	12.58
11	Hipperholme	74.875	6	12.48
12	Siddal	12.25	1	12.25
13	Luddenden	24.125	2	12.06
14	Hove Edge	23.375	2	11.69
15	Lightcliffe	46.5	4	11.63
16	Mixenden	33.75	3	11.25
17	Shelf	33.625	3	11.21
18	Walsden	11.125	1	11.13
19	Copley	11	1	11.00
20	Wheatley	22	2	11.00
21	Homfield	42.25	4	10.56

Table 5.3 Average sustainability scores of Settlement Hierarchy Model

No.	Centre	Points	No of Grid Square	Average
22	Northowram	31.5	3	10.50
23	Greetland	31.125	3	10.38
24	Southowram	20	2	10.00
25	Clifton	27.625	3	9.54
26	Ripponden	28	3	9.33
27	Holywell Green	17.75	2	8.88
28	Warley	6.75	1	6.75

5.9 The results shown in Table 5.2 for total scores from the model can be used to determine the hierarchy of Calderdale, which classifies settlements according to their status. The Regional Spatial Strategy sets out a number of possible settlement classifications. For Calderdale, this requires the determination of four levels of settlement. These are: Sub-Regional Towns, Principle Towns, Local Service Centres and Neighbourhood Service Centres. These can be determined using a grouped scoring range from the results produced by the model. Scores should be grouped into reasonable ranged to determine the status of each settlement. The following range was set out in Table 5.4 considered most appropriate based on the spread of the scores against the number of settlements.

Range	Status
0.00-39.99	Neighbourhood Service Centre
40.00-174.99	Local Service Centre
175-499.99	Principle Town
500.00 or more	Sub-Region Town

Table 5.4 Settlement Hierarchy Model scoring range for settlement classification

5.10 In light of the Table 5.4, the following settlement classification in Table 5.5 is proposed using the results of the model. Table 5.5 clearly shows an order of settlements in terms of the provision of, and access to, facilities and services. There are identifiable groups of settlements that have similar levels of service provision, reflecting their status.

No.	Centre	Points	Status
1	Halifax	895.25	Sub - Regional Town
2	Brighouse	376.75	Principle Town
3	Sowerby Bridge	172	Local Service Centre
4	Elland	161.375	Local Service Centre
5	Todmorden	96.25	Local Service Centre
6	Hebden Bridge	39.125	Local Service Centre
No.	Centre	Points	Status
1	Mytholmroyd	78.625	Local Service Centre
2	Illingworth	75.5	Local Service Centre
3	Hipperholme	74.875	Local Service Centre
4	Rastrick	65.625	Local Service Centre
5	Ovenden	65.375	Local Service Centre
6	Lighcliffe	46.5	Local Service Centre
7	Holmfield	42.25	Local Service Centre
8	King Cross	41.625	Local Service Centre
9	West Vale	40.75	Local Service Centre
10	Pellon	39.375	Neighbourhood Service Centre
11	Boothtown	37.75	Neighbourhood Service Centre
12	Mixenden	33.75	Neighbourhood Service Centre
13	Shelf	33.625	Neighbourhood Service Centre
14	Northowram	31.5	Neighbourhood Service Centre
15	Greetland	31.125	Neighbourhood Service Centre
16	Highroad Well	30	Neighbourhood Service Centre
17	Clifton	28.625	Neighbourhood Service Centre
18	Ripponden	28	Neighbourhood Service Centre
19	Luddenden	24.125	Neighbourhood Service Centre
20	Hove Edge	23.375	Neighbourhood Service Centre
21	Wheatley	22	Neighbourhood Service Centre
22	Southowram	20	Neighbourhood Service Centre

Table 5.5 Average sustainability scores of Settlement Hierarchy Model

No.	Centre	Points	Status
23	Holywell Green	17.75	Neighbourhood Service Centre
24	Claremount	14.875	Neighbourhood Service Centre
25	Siddal	12.25	Neighbourhood Service Centre
26	Walsden	11.125	Neighbourhood Service Centre
27	Copley	11	Neighbourhood Service Centre
28	Warley	6.75	Neighbourhood Service Centre

5.11 Figure 5.6 shows the mapped version of the proposed settlement hierarchy. This uses a proportional circles mapping technique to demonstrate the service provision of each settlement and it's classification within the hierarchy. The results are set out in Figure 5.7.

Figure 5.6 Calderdale settlement hierarchy map



The settlement classifications indicate what role different settlements can be expected to play in the future development of the district. They indicate the level of development for housing, employment land, retail floorspaces, health, leisure and public services that would be provided within different levels of settlements. A simplified understanding of these levels of developments is expressed in Figure 5.7.





Stage Four: Areas of search

The results of the Settlement Hierarchy Model provide a detailed sustainability indication of different locations at a specific level. Each 500m-grid square has an individual sustainability score. It is therefore easy to assess which areas are more sustainable than others by ranking the total scores. The final figures for each of the 1586 grid squares are mapped and represented by a choropleth map to identify both broad and specific locations of greater sustainability. The results of the choropleth mapping are shown in Figure 5.8.



Figure 5.8 Choropleth map of Settlement Hierarchy Model total scores

The results of the choropleth map clearly represent the areas of greater and lower sustainability across the district. The areas in green indicate greater levels of sustainability and the lower levels in red. In broad terms, the areas of greater sustainability are within and around the established urban areas. However, the value of the model is to identify subtle differences within and on the edges of these urban areas that require further development to improve sustainability or can facilitate further types of development without harming the sustainability of that settlement.

The choropleth map results are used to indicate areas of search for potential sites for new development. The areas of search are determined by a GIS query that determines the highest scoring grid squares in areas that are not part of the existing urban area. The results for the areas of search are displayed in Figure 5.9 and 5.10.

5. Results



Once a sustainability score threshold of 10.0 has been applied against the results for each grid squares, areas of search can be identified. These areas are shown in Figure 5.10.

Figure 5.10 Areas of search for new development



6 Recommendations

6.1 The sustainability of a settlement is in part determined by considering the level of and access to services. An important aspect of sustainability is ensuring that services remain viable and are able to be retained.

6.2 The sustainability of a settlement together with the availability of suitable sites, will impact on the ability of a settlement to accommodate additional growth. It should be stressed that just because a settlement is considered sustainable it does not mean it will be expected to accommodate a particular level of growth, especially where there are no sites available to develop. However, one of the key objectives of the study is to highlight the existing sustainability levels for each settlement and to consider which of these settlements have the potential to accommodate future growth. The audit of services and analysis of data shows that there are differing levels of sustainability.

6.3 There is a high level of service provision and access to services in Halifax and Brighouse. These are classified as the Sub-Regional Town and Principal Town of the district. The results produced by the model are consistent with the expectation of the Regional Spatial Strategy for the future of these places and go some way to justify these visions. These settlements can be considered to be sustainable as they have sufficient service provision for their populations, helping to reduce the need to travel. Where facilities or services are not available, access to them via public transport is good. These settlements are best placed to accommodate new development and further growth in the form of new housing or employment, which could allow for the expansion of existing services.

6.4 Local Service Centres have lower levels of service provision but access to services is still good. These settlements can still be considered to be sustainable as the transport network is sufficient to allow their residents relatively good access to the services and facilities that they need. New service provision within these settlements could be considered in order to reduce the need to travel. Only then could these settlements be considered as possible locations for new development.

6.5 Some settlements, particularly those classified as Neighbourhood Service Centres, have both poor provision and poor access to services and facilities. This reduces the sustainability of these settlements as residents are more reliant on the private car and have to travel outside of the immediate area to access the majority of the services they require. New service development in these locations is unlikely to be realistic due to their low population sizes, which would not support new facilities. These settlements are also highly unlikely to be suitable to accommodate other types of growth, such as new housing.

6.6 Consideration will need to be given as to whether improvements are practical in some locations in order to increase their level of sustainability. New or additional service provision may not always be viable in areas where the potential use is low due to a small population size or where there are no sites available to accommodate the development.

6.7 The model identifies 'areas of search' grid squares where undeveloped land has a sustainability score of 10 or greater. These are the most appropriate sites for new development as they already host a sustainable level of infrastructure provision. The recommendations from this stage of the model would contribute directly to forward planning documents such as Strategic Housing Land Availability Assessment and development plan documents (DPDs) such as Core Strategy DPD and Land Allocations and Designations DPD.



Appendix 1 Settlement identification map



Map 1.1 Town Centre and Settlement Identification