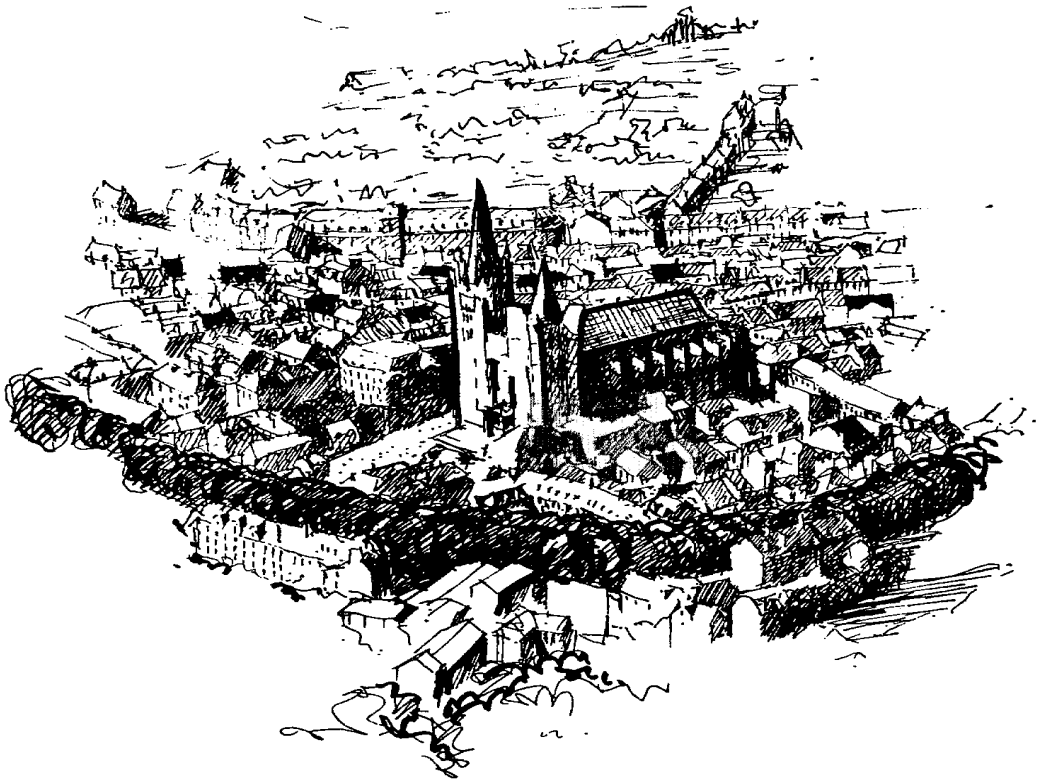
Mende: A Study of Urban Morphology in a Key Settlement



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Mende: A Study of Urban Morphology in a Key Settlement

Teachers' Notes

Mende is the prefecture (principal) and the most populous town in Lozère. This unit reveals urban structure, functional zonation, pedestrian movement and concentration of facilities via a comprehensive land-use mapping exercise. A number of environmental problems are measured (e.g. noise, litter) and management ideas for the town as a whole introduced. A detailed investigation is made of retail location and its application to the concept of high and low orders goods.

Time restrictions generally mean that it is only possible to carry out a brief survey of the peripheral zones of Mende. However, more detailed surveys are carried out in the central area of Mende.

It is advisable to divide Mende into zones that can be surveyed by separate groups. The structure of the day is such that four groups are ideal. However if there are insufficient students to operate in four areas safely, then it is possible to use a smaller number of areas and then make use of secondary data. For large groups of students the four areas can be further subdivided.

Urban fieldwork involves the students working in groups away from direct supervision. It is suggested that the day is broken down into a series of time slots and the groups meet up with staff regularly. A central meeting point for emergencies is a good idea and students should be shown this before departing on the study. When students are taking pedestrian counts is a good time to check on the groups, as they should be in a set place at a set time!

The fieldwork uses examples of area and point data collection. It is also of course possible to use transects to collect data in Mende, examples of which are included in the GCSE Urban Pack.

By its nature, this day involves the use of a large number of maps. It is advisable that all students have a copy of each map both for navigating around Mende and for recording data. Copies of the central area in A3 size are available at The Eagles Nest.

The urban study is designed to give students case study material, fieldwork project opportunities, a variety of methods of collecting, presenting and analysing data (including statistical testing). More fieldwork ideas can be found in the other Urban Investigation Unit. It is suggested that staff examine this as well so that the bets possible coverage of Specification requirements can be met.

Reference texts:

INSEE (2000) 'Recensement Général de la Population de 1999'
Ministere des Affaires etrangeres (1996) 'FRANCE 1996'

General Information: Massif Central

The majority of settlements in the Massif Central reflect its rural nature. Only 52% of the population of the region live in towns, which contrasts strongly with the 72% for the whole of France. The largest towns with more than 100,000 people are the industrial towns of Limoges, St. Etienne and Clermont Ferrand: these are all peripheral to the mountain core of the Massif. Clermont Ferrand has a more important service role in the Massif than St. Etienne. It was, until recently, the only University City in the Massif. The southern half of the Massif has no major regional centre within its borders and looks to Toulouse and Montpellier for specialised services. Local administrative towns, such as Le Puy, Aurillac and Rodez (see figure 1) with 35,000 - 45,000 inhabitants provide most services. Many of these towns provide a surprising range of administrative, educational, retail and manufacturing functions. This is partly a reflection of their isolation in mountainous country and partly because they are important market centres at the hub of communication networks. Nearly every town in the Massif has been trying to diversify its economic activities by attracting modern industries and expand the range of service functions. This has been assisted by French government policy, which since 1973, has pushed for the development of medium-sized towns (20, 000–100,000 people). Since 1975, the economic and social development of small towns (5,000 – 20,000 people) has been promoted.

Cevennes

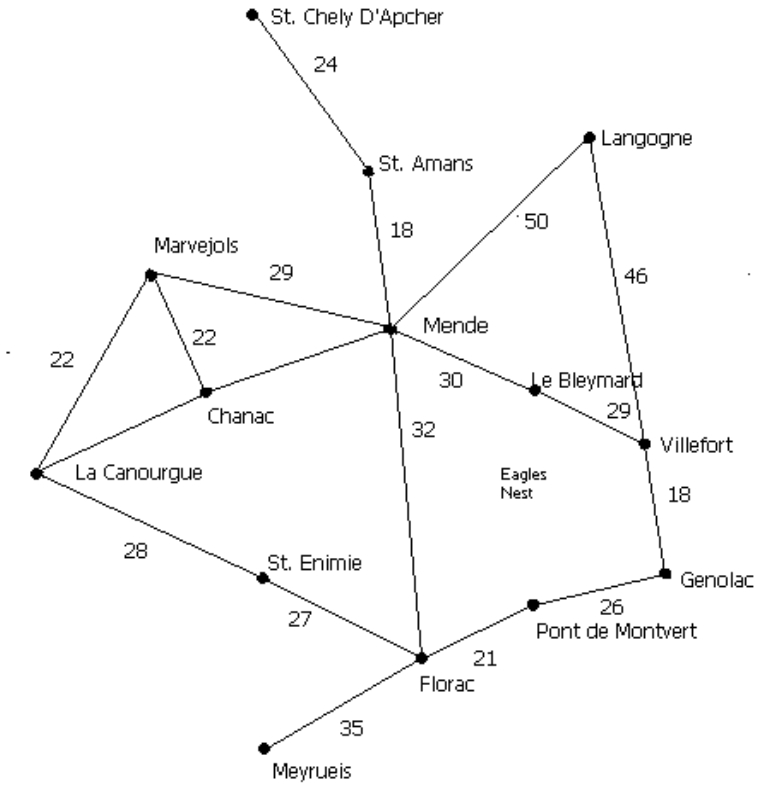
Most of the settlements of the Cévennes can be classified as 'Rural Settlements'. The total population of all the towns and villages in Lozère is only 73,509 inhabitants. The largest town and administrative centre is Mende with a population of 13,103. This is followed by Marvejols, St. Chely, Langogne, and Florac. (See figure 2). Le Pont de Montvert, the closest village to The Eagles Nest, has a population of only 277. 80% of Lozerians live in villages of less than 1,000 inhabitants, the mean density of population is only 14 people per km2 (compared to 90 people per km2 in France as a whole).

Much of the Cévennes has less than 2 people per km2. The population of most settlements has steadily been declining. This reflects the total population decline for Lozere from 143,565 in the 1800's to 72,825 in 1990. By 1999 the population had increased again to 73,509 but only time will tell if this is a reversal of the trend or just a blip. In addition, the birth rate has fallen while the death rate is rising with the results that the proportion of old people is well above the national average.

The region is, therefore, suffering from two phenomena; rural depopulation and an ageing population. This has resulted in a continual 'thinning out' of the settlement pattern that is likely to continue into the next century. There is plenty of evidence in the landscape of deserted hamlets and farmsteads. In some cases, the only reason that settlements have survived is because most of the houses have been bought by city dwellers for second homes or retirement cottages. As a result, schools, shops and medical services have become increasingly concentrated in key villages and market towns. These in turn are likely to hold or even increase their population and the significant improvements made to certain roads may, in the future, increase the size of commuting hinterlands and disperse urban populations into the countryside.

Figure 1: Population Of Selected Settlements in Lozere Departement (Figures from 1999 Census)

Town	Pop.	Town	Pop
Mende	13,103	Meyrueis	1,045
Marvejols	5,886	Villefort	640
St. Chely D'Apcher	5,156	Genolhac	635
Langogne	3,095	Ste. Enimie	509
Florac	2,074	Le Bleymard	446
La Canourgue	2,049	Le Pont de Montvert	272
Chanac	1,168	St. Amans	133



In the future, the nature of the rural settlement pattern and the structure of individual settlements are likely to reflect the process of spatial concentration. Within specific settlements, land uses are likely to become more specialised and retail activities may reflect the specific demands made by tourists and second homeowners. In addition, more newcomers to these settlements may be 'neo-artisans' or 'neo-peasants' whose quest is to return to a more traditional lifestyle, closer both to nature and to the warmer south! There is increasing government and EU support for these initiatives and some of these changes are already visible in the urban environment of Mende and Le Pont de Montvert.

Aims

- To investigate the concept of functional zonation and to explain the patterns of land use in Mende.
- To examine the historical growth of Mende, and how this might compare to UK towns.

- To investigate pedestrian movement and environmental quality within the CBD of Mende.
- To investigate service distribution in the CBD and to account for this.

Hypotheses

- 1a There is evidence of functional zoning in Mende
- 1b Mende conforms to Burgess' urban land use theory of concentric rings.
- 2a Oldest buildings are concentrated in the centre of Mende.
- 2b Most building development in Mende has taken place over the last 50 years.
- 3a Pedestrian movements are greatest in the centre of Mende.
- 3b Environmental quality varies with distance from 'Place de la Republique' in Mende.
- 3c Pedestrian movements are greatest where shopping quality is highest.
- 4a Shops selling 'low order' goods will be more dispersed than those selling 'high order' goods.

Method and Organisation of Study

1. Land Use:

- ❖ Assign groups to one of the four fieldwork zones (labelled 1 to 4 on Map 2).
- ❖ Each group will assess what is the 'Dominant' land use within each grid square, and record this information on the map. A key is available for this, although staff may wish to include further categories (see Urban Land Use Key);
- ❖ Only one land use may be recorded in any square. If in doubt the dominant ground floor land use for the square should be recorded.
- ❖ There may be occasions when the land use can be determined without entering the area.

2. Age of Buildings

Within each square, decide what is the dominant age of buildings. This may be decided by reference to dates on buildings, styles, construction materials etc.

A suggested break down of ages is:

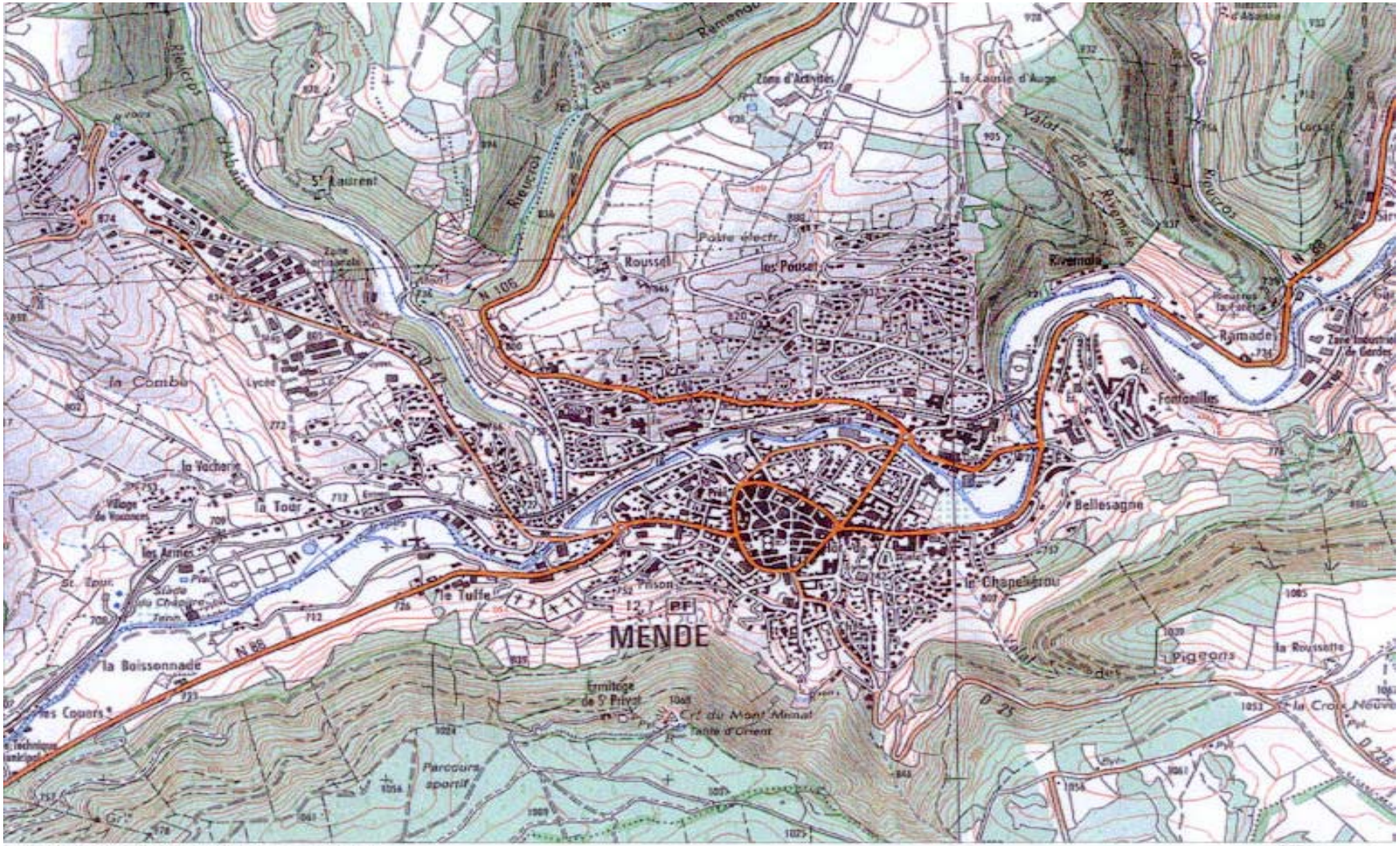
Pre- 1800 1800 – 1900 1901 – 1950 Post 1951

3. Pedestrian Counts and Environmental Quality Survey

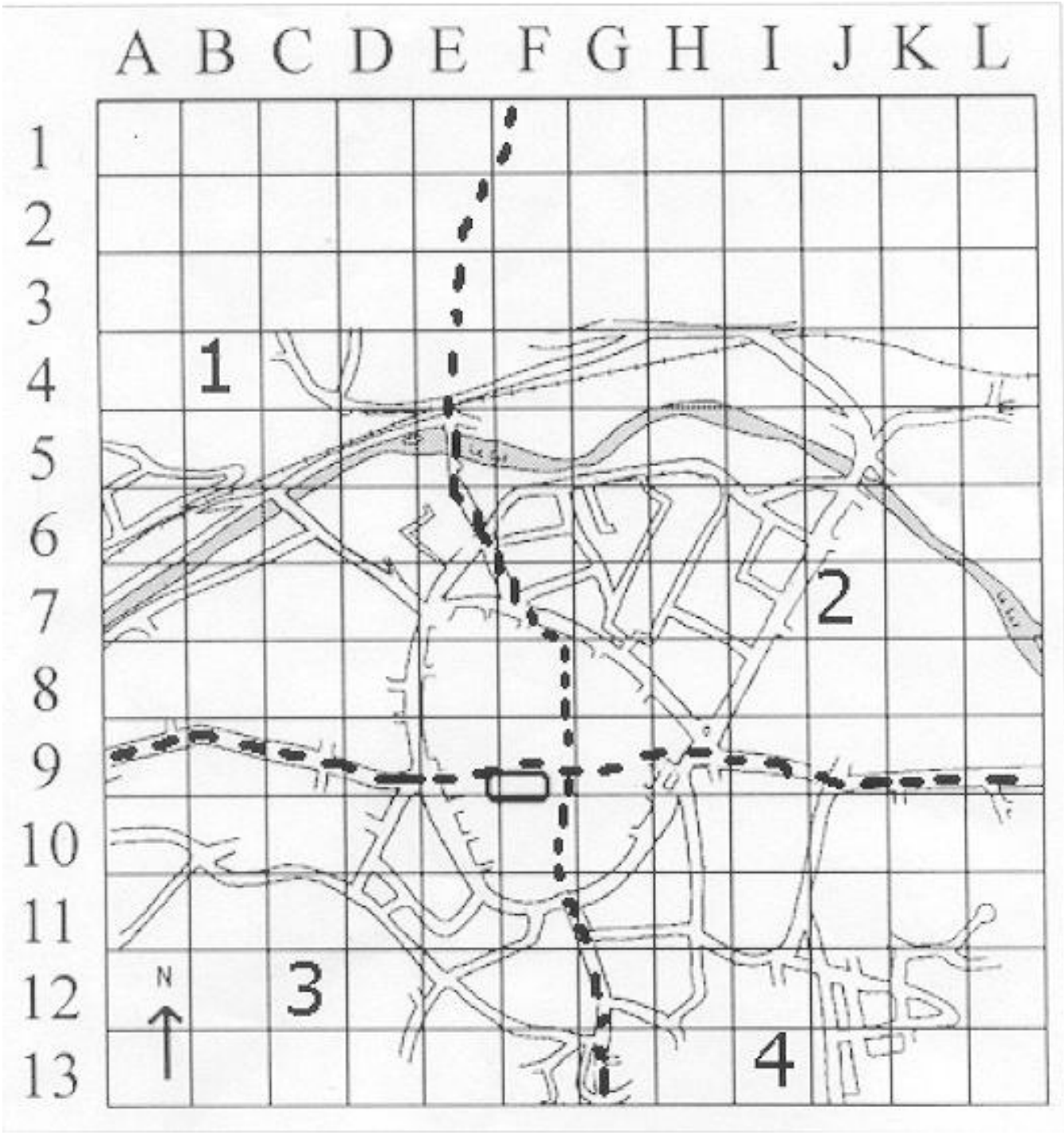
Pedestrian Counts

This is to determine the movement of pedestrians within the central area of Mende. Traditional Urban Bid Rent Theory suggests that the central area of a town will be the most accessible. Therefore pedestrian movements should be greatest in the centre and decrease away from this point. For Mende, a simple hypotheses would be 'Number of Pedestrians decreases as distance from the centre (Place de la Republic) increases. The sampling system is to use a number of point measurements, 'standing pedestrian counts'. However if only a few students are available an alternative may need to be considered, 'moving pedestrian counts'. Divide the group into pairs. Each pair is allocated to two adjoining points in the central area of Mende. Points to be used are marked on the base map (Map 4). These are arranged such that although each student will be at a different point, they will be in sight of each other. Thus each student should take a count (not one between two).

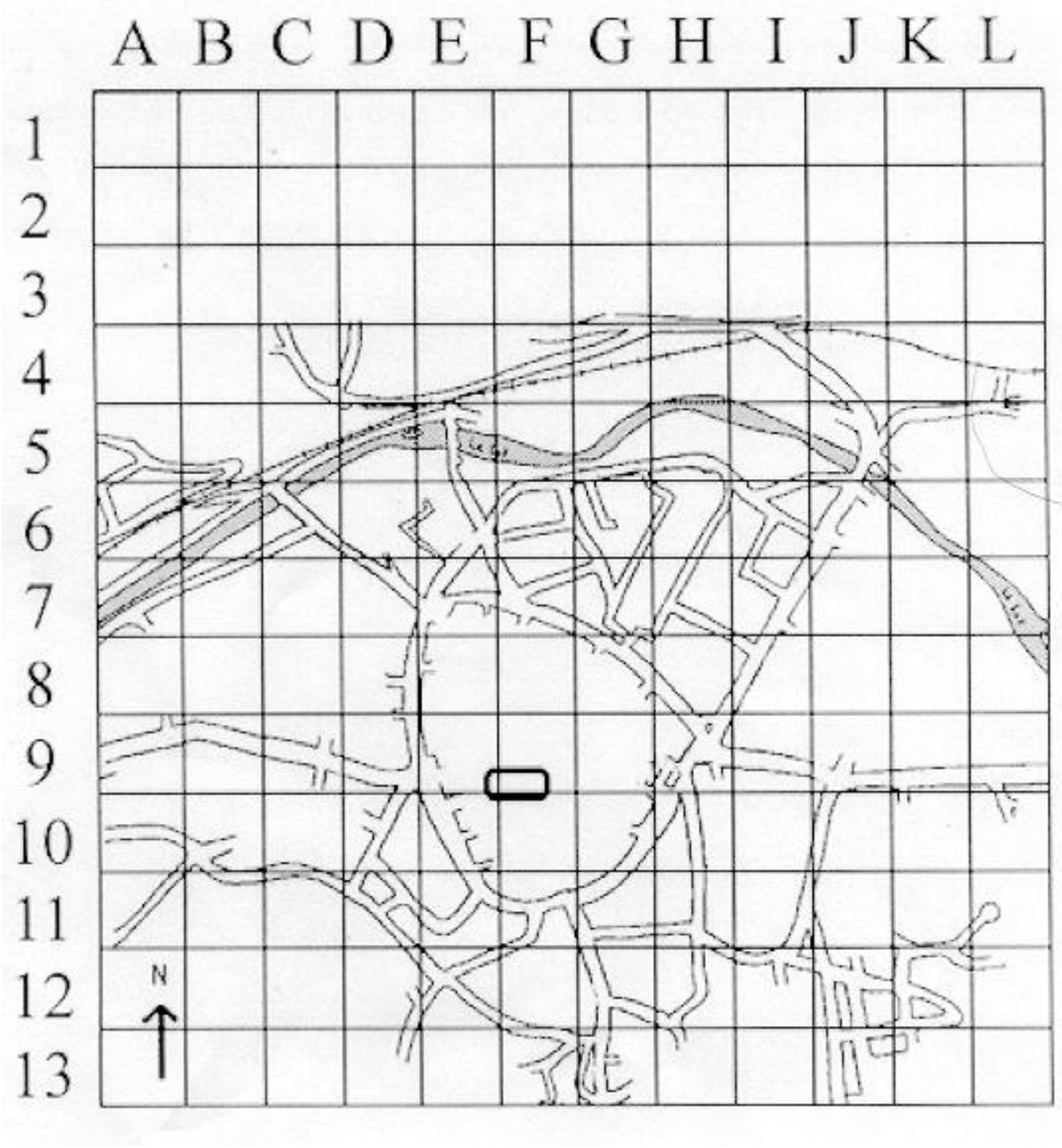
Map 1 Base Map of Mende Town



Map 2 Functional Zonation in Mende. 4 ‘fieldwork zones’.



Map 3 Functional Zonation in Mende. Landuse map.



4. Urban Land Use Key

One of the simplest methods for determining urban land use over a large area is to use a system of grid squares. This allows a rapid assessment of land use, but is open to errors. These errors should be considered whilst carrying out the survey.

Method

Each group will have an area to work in. It is suggested that you start at the furthest point and work in towards the centre.

Within that area, delimit a grid square and allocate the appropriate land-use key for the dominant land-use. Remember that if any part of a square lies in your zone, you must assess the whole of that zone.

Land Use Key

Residential

P1	Pre 1945, lower class housing
P2	Pre 1945, higher class housing
M1	Modern lower class housing
M2	Modern higher class housing

Open Space

F	Farmland
R	Recreation
C	Cemetery

Industry

Ii	Light Industry
Ih	Heavy Industry

Accommodation

H	Hotel

Commercial

S	Small Shops
LS	Large Commercial Properties
O	Offices

Entertainment

E	Cinema, Theatre
B	Bars, Cafes

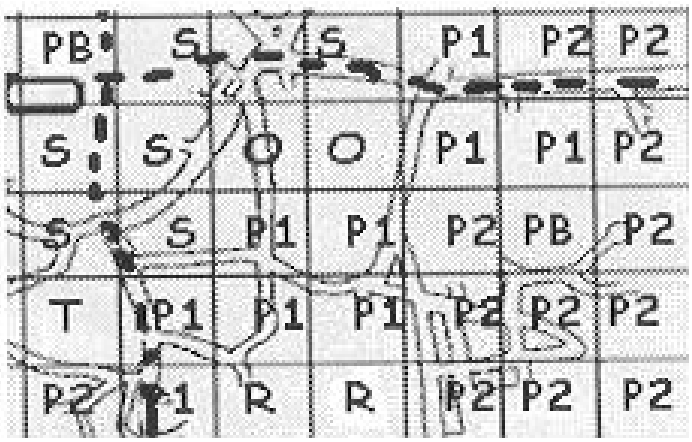
Public Buildings

PB	Schools, hospital, Town Hall, etc

Transport

T	Car park, railway station

Example:



At a given time, a 'Standing Pedestrian Count' is made. This time must be standardised between the groups. It is suggested that students stand with a back to a wall and draw an imaginary line across the street in front of them. For a given period of time (usually 10 minutes), each person who crosses that line is recorded. This is a fairly basic system, which could be modified to include; direction of movement, approximate age, sex etc. This exercise can be repeated a number of times during the day to give a greater understanding of the movements.

5. Environmental and Shopping Quality survey.

This exercise is to investigate both environmental Quality and shopping Quality within the central area. A number of suggestions could be made for how the environmental quality changes within an inner urban area. High pedestrian flows may result in litter and noise. However, quality shops and a concentration of resources may improve quality in the centre. Also the shopping quality may be linked to pedestrian movement, e.g. a good shopping area outside of the centre may attract large numbers of people. It is therefore useful to employ the same sampling system as for the pedestrian count.

Use the pedestrian count points for an 'Environmental Quality survey'.

Use a 'Quantitative' rather than 'Qualitative' system. This will allow a comparison to be made between different people's scores at different sites.

The area to be examined should be approximately 20 metres in all directions around the Pedestrian Count point.

6. Service Distribution in Mende

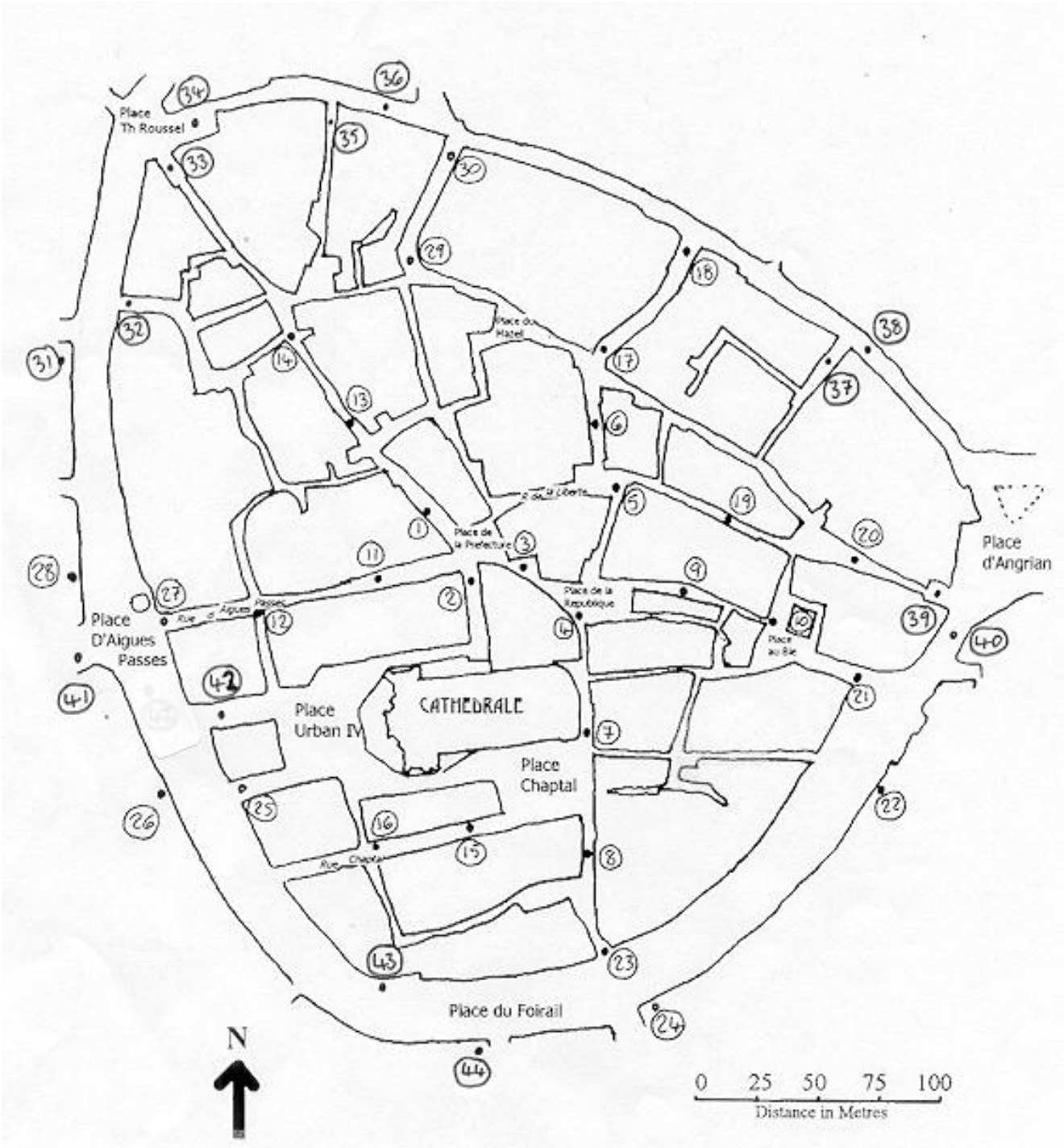
This exercise explored the concept of 'service clustering'. Services offering different goods may have good reason to cluster together or disperse away from one another. Services offering 'low order' goods should see no reason to cluster. Low order can be defined as goods or services that are purchased or required on a regular and low cost basis. These may also be known as convenience goods (e.g. bread, newspapers or stamps). Shops offering comparison goods (e.g. shoes, clothing, electrical items) may see reason to locate closer together as customers will want to compare prices, quality etc before making a purchase. The work is concentrated inside the 'ring road'.

Each group of students will be given at least two different types of shop to examine. It is suggested that both a low order and high order is given. Students may make suggestions as to what could be investigated.

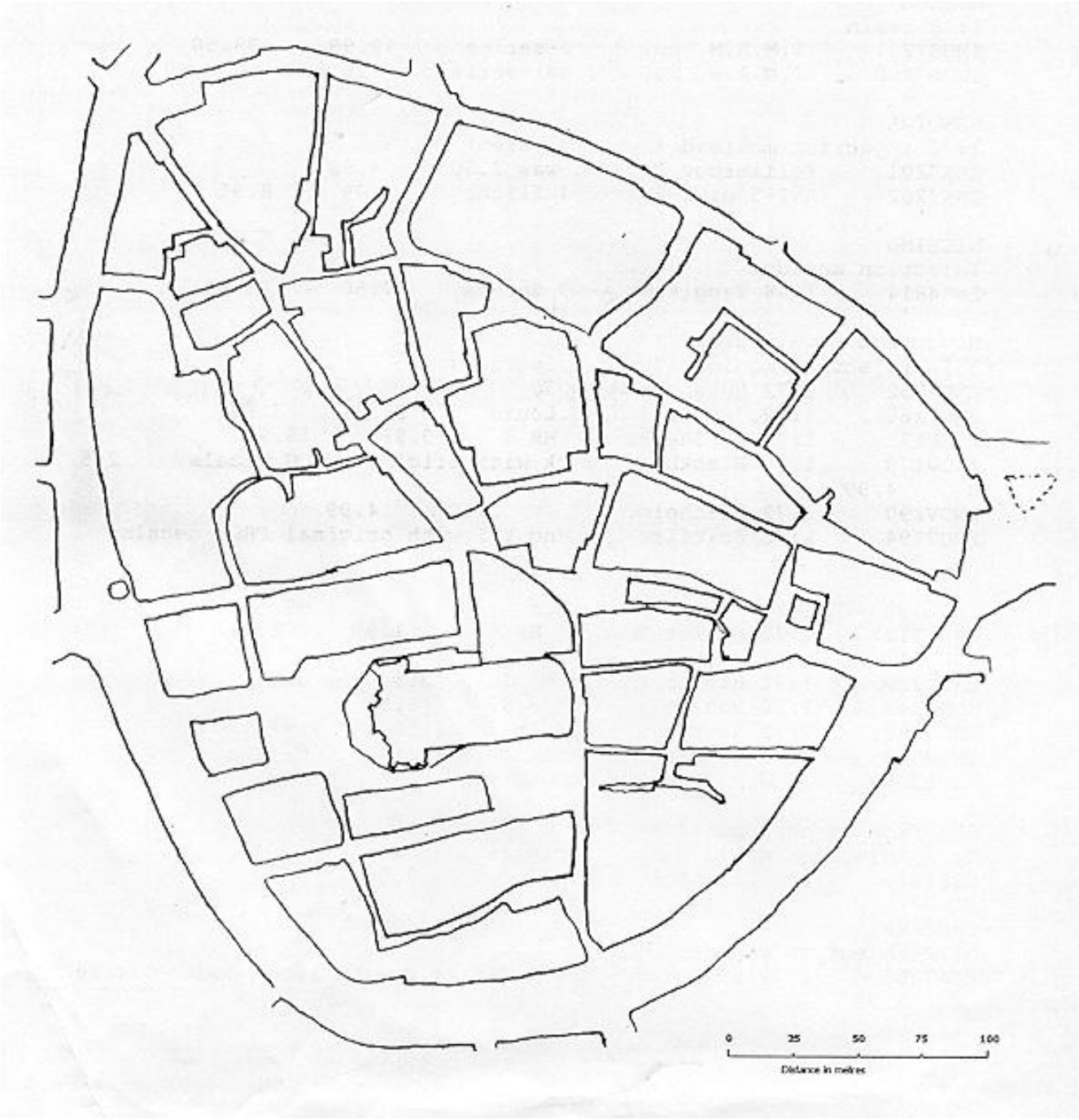
Using Map 6 Buildings in Central Mende, each group plots the location of each service that they are to investigate and records that location. Colours or a key are suggested due to the limited space on the map.

For certain services it may be necessary to investigate outside of the ring road, e.g. supermarkets, hardware stores etc. In this case the locations should be marked on the main base map of Mende.

Map 4. Pedestrian Count Points (44 points)



Map 5 Blank Base Map, Central area of Mende



Urban Shopping and Environmental Index

This index is designed to examine whether variation exists between areas within a settlement in terms of its shopping quality and environmental quality. This will give a quantitative rather than a qualitative assessment. The area is broken down into a series of factors and each one scored on a scale of 0 – 10, with the lower score representing a poorer environment.

Shopping Quality

Shopping Dominance	Score
All buildings are shops	10
50% – 99% are shops	5 - 9
10% – 49%	1 - 4
Less than 10% shops	0

Types of Shops	Score
Mainly comparison goods	10
Wide variety	5
Mainly convenience goods	2
No Shops	0

Shop Building Quality	Score
All well maintained	10
Generally good repair	8
Scruffy	5
Very poor condition	2
Derelict or no shops	0

Quality of Goods	Score
High quality/ high prices	10
Low quality/ low prices	2
No shops/ no goods	0

Retail Organisations	Score
Mainly national chains	10
National and independent	7
Large independent	4
Small independent	2
No shops	0
Total Shopping Quality Score (0 to 50)	

Environmental Quality

Litter	Score
Completely clean, no litter	10
Some litter, not obvious	7
Some litter, obvious	4
Extensive litter, obtrusive	0

Traffic safety	Score
Pedestrian Street	10
Restricted vehicle access	8
Light traffic	6
Heavy traffic, with crossings	3
Heavy Traffic, no crossings	0

Paving Condition	Score
Good state of repair	10
Good, In need of repair	7
Poor, In need of repairs	4
Ver Poor, damaged badly	0

Noise	Score
No obvious noise	10
Some noticeable noise	7
Obtrusive noise	3
Intolerable noise	0

Graffiti	Score
No graffiti on any surfaces	10
Some graffiti, not obvious	7
Some graffiti, obvious	3
Very extensive graffiti	0
Total Environmental Quality Score (0 to 50)	

TOTAL SCORE AND POINT NUMBER:

Map 6 Buildings in Central Mende – service clustering survey.

Data Processing and Analysis

Functional Zoning in Mende and Land Use Patterns (Aim 1)

The groups should collate the data in order to give complete coverage of Mende.

Using Base Map 3, identify the different zones within Mende. It is suggested that a colour code is used. In some cases it may be possible to combine functions, e.g. Small shops, Offices, Cinema as CBD. However, great care should be taken in the selection of colour. There are four different categories of housing, so use shades rather than separate colours. Also certain colours can suggest particular things, colour open space in green rather than bright red!

This exercise whilst very therapeutic can be very time consuming and in itself is not very productive. Therefore students should be quick and accurate rather than creating a beautiful masterpiece.

The map can be examined to determine any patterns that exist. A few suggestions are:

What is in the central area?

How do residential areas change away from the centre?

Where are the industrial developments?

Where are transport functions located?

Is there any evidence of physical restrictions on development?

Is there any evidence of 'Out of Centre' retail developments?

Look for evidence that Mende conforms to any of the Land-use models. This might be 'concentric rings' (Burgess), 'sectors' (Hoyt), or 'multiple-nuclei' (Harris and Ulman). Comparisons can also be made with British models, e.g. Mann or Robson.

Historical Growth of Mende. (Aim 2)

Using Map 2, collate the data from each group. Again a colour code can be produced for the different ages.

Look to see how Mende has developed (see appendix 1)

A town should grow out from a historical core, with the oldest areas in the centre and most recent development on the outskirts.

Physical restrictions may restrict growth in certain directions.

Areas may be redeveloped giving newer properties where older ones have been cleared.

Settlements outside of the original town may now have been absorbed.

When does the greatest period of growth seem to have occurred?

Pedestrian Movements in Mende (Aim 3)

Collect all the data from students, this should be the number of the point sampled and the number of people at each time. This data can then be copied onto a map and photocopied or given to students to plot on their own maps. Where different times have been recorded, either a mean can be calculated or different times plotted.

This information can be analysed in a number of ways:

By drawing isolines onto the map (isopleth map).

By a system of pictograms, bars, proportional circles etc on the map.

By calculating the distance from the 'Place de la Republique' for each point and plotting a scattergraph (why might a line graph NOT be appropriate).

By using the information above to analyse statistically any correlation between distance and numbers of people. Either Spearman's Rank or Pearson's Product Moment could be considered.
Students can consider which method is the most appropriate for analysis of the data and testing hypotheses. Remember that you will also wish to explain any result.
Examine any patterns identified, what is causing these patterns? Is there any variation with time of day, different days, times of year, weather etc?
Is there any relationship between either shopping quality or environmental quality? (see below)

Environmental quality and Shopping Quality varies with distance from the centre of Mende. (Aim 3)

Collate and record the data as with the Pedestrian information. Are there any differences with this data that might lead you to use a different means of presentation?
Are there any patterns to this data? Account for this.
Is there a correlation between any of the following:
Shopping Quality and distance from the centre.
Environmental Quality and distance from the centre
Environmental Quality and Shopping Quality (which might be the independent variable here?)
Numbers of Pedestrians and Shopping Quality
Numbers of Pedestrians and Environmental Quality.

Service Distribution in Mende

Plot the location of the services on a base map, a colour key gives the clearest result.
The extent to which services will cluster can be investigated by either of the following methods.
Nearest Neighbour Analysis
Index of Dispersion

Nearest Neighbour Analysis

The Nearest Neighbour Analysis (NNA) is designed to produce an index (Nearest Neighbour Index NNI). This will provide a test of random distribution and give a statistical meaning to the terms, clustered, dispersed and random.
The index will give a value between 0 and 2.15.

0 = points are completely clustered
1 = points have a random distribution
2.15 = points have a uniform distribution, i.e. they are spread apart as far as is possible.

The formula used to calculate the NNI (usually referred to as R) is:

$$R = 2D \sqrt{n/A}$$

Where D = mean observed nearest neighbour distance
n = total number of points in survey
A = area of study.

Method

Define the boundary of the study area. This is usually the area of the map used, note that there is no need to convert to the scale of the map. (An A4 piece of paper has an area of approximately 624cm2).

Plot the points on the map and give each one a number.

Measure the distance from each point to its nearest neighbour. One point may be the nearest for several other points. Draw up a table as below

Point on map	Number of Nearest Neighbour	Distance between these points (cm)
1	2	11
2	1	11
3	2	7
4	5	4
5	4	4
		∑d = 37

Calculate the mean of these distances, by dividing the sum of the distances by the number of points.

D = ∑d/n for our example this would be 37/5 = 7.4

Calculate the NNI, using the formula

2 x 7.4 √5/624 = 14.8 x 0.09 = 1.32

Thus for this example the points are closer to a random distribution than any other. This can be further tested with reference to significance tables as to whether significant clustering or dispersal has occurred.

For a sample size of 5, the critical value of NNI is 0.616 (95% confidence level). Any value below this would indicate significant clustering. This is not the case in this example.

Critical Values of the Nearest Neighbour Index

	Clustered Patterns		Dispersed Patterns	
n	0.05	0.01	0.05	0.01
2	0.392	0.14	1.608	1.86
3	0.504	0.298	1.497	1.702
4	0.57	0.392	1.43	1.608
5	0.616	0.456	1.385	1.544
6	0.649	0.504	1.351	1.497
7	0.675	0.54	1.325	1.46
8	0.696	0.57	1.304	1.43
9	0.713	0.595	1.287	1.406
10	0.728	0.615	1.272	1.385
11	0.741	0.633	1.259	1.367
12	0.752	0.649	1.248	1.351
13	0.762	0.663	1.239	1.337
14	0.77	0.675	1.23	1.325

Index of Dispersion

This is an alternative method to Nearest Neighbour Analysis. It is simpler to calculate but will not give a statistical level of significance.

Method

- Define the boundary of the study area.
- Calculate the co-ordinates of each point. This is done by measuring along the x axis and then along the y axis for each point.
- Calculate a mean figure for the x axis.
- Calculate a mean figure for the y axis.
- Plot this mean co-ordinate, this is known as the centre of gravity.
- Measure the distance from the centre of gravity back to each individual point.
- Calculate the mean of these distances. This is the Index of Dispersion.

The value obtained is only useful when used in comparison to other values obtained of the same map. The higher the value of the Index of Dispersion, the more dispersed the points are.

Evaluation

- Using the data obtained compare different services to see what patterns they exhibit. Which services would you consider to be clustered, which are dispersed?
- Is there any relationship between the nature of the services and whether they cluster or not?

- How would Mende compare to a UK settlement? What services exist in the UK that you have not seen in Mende? (e.g. Charity Shops, Internet Cafe) Why might this be? Are there any cultural comparisons that can be made?
- Evaluate the techniques used (NNA and Index of Dispersion). What are the strengths and weaknesses of each technique? Consider scales of maps!

Further Points for Discussion about Mende

Christaller's Central Place Theory predicts that the number of services offered by a town would be proportional to the size of the population that it served. Mende has an urban population of just over 11,000. In the UK this would be a very small town, yet Mende has major administrative functions and has a range of other high order functions. What are the possible reasons for this?

There is currently a plan to by pass Mende from the N106 coming in from the north to the N88, running out to the west towards the motorway. What are the possible advantages and disadvantages of this plan?

What environmental or social problems are evident in Mende? Students could be encouraged to develop their own management or development plans for the area.

Lozere as a whole has experienced a declining population over the last 150 years. Does this seem to be the case in Mende? Why might this be?

French government policy is to encourage development in small towns such as Mende. Why might this policy have undesirable consequences in Lozere?

SUGGESTED PROJECTS

The following projects can be developed by students using data collected in this unit.

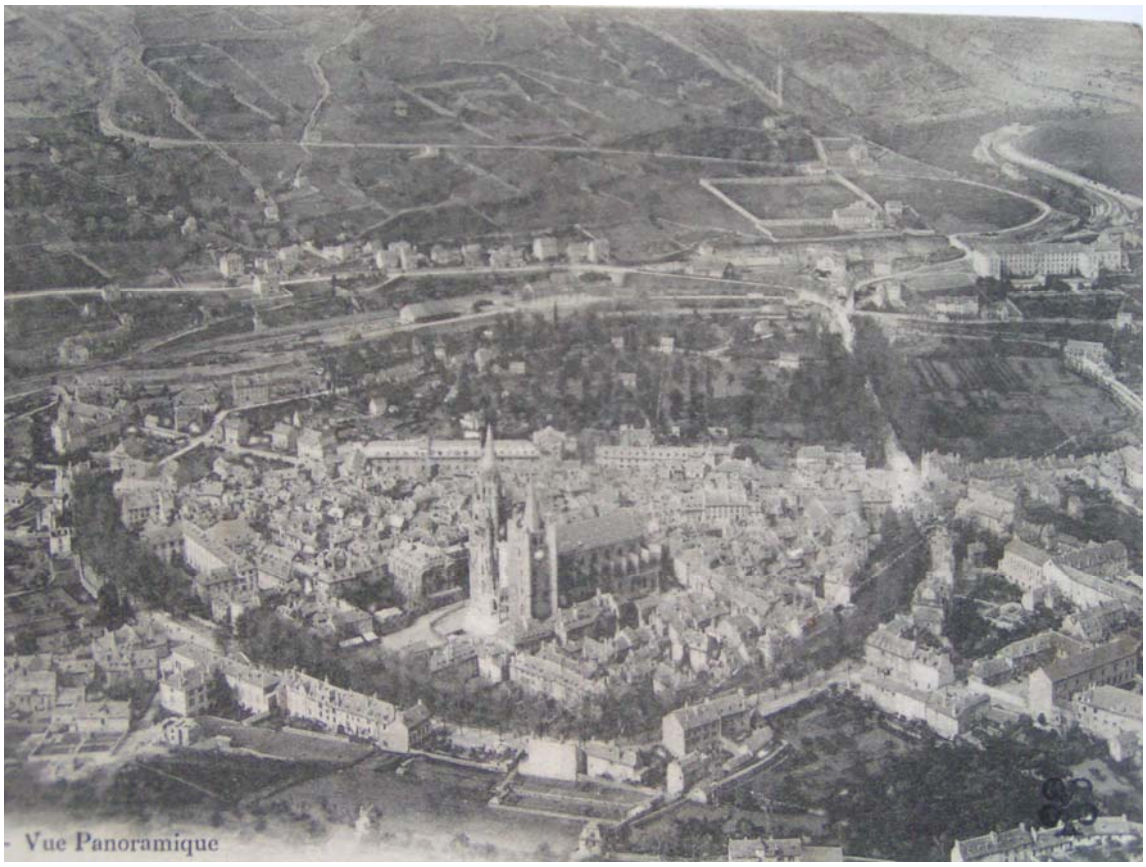
- ✓ According to Burgess the transitional zone of Mende, is likely to contain more open space than the CBD.
- ✓ There is evidence of functional zoning in Mende.
- ✓ Mende conforms to the Mann's Model of British City.
- ✓ Mende conforms to Hoyt's model of urban development.
- ✓ Mende corresponds to the Core-Frame model of land use
- ✓ Pedestrian areas in Mende have higher environmental quality.
- ✓ Tourist areas in Mende have higher environmental quality.
- ✓ Environmental quality increases in areas of Mende with increased traffic control measures.
- ✓ Retail services in Mende are more aimed at locals than tourists.
- ✓ Mende contains a high percentage of Higher Order services.
- ✓ Most modern development has occurred outside the CBD.
- ✓ Shops selling Comparison goods will be more clustered than those selling convenience goods.
- ✓ High order services will be located around the "Place de la Republique".
- ✓ Pedestrian flows are greatest around the "Place de la Republique".

These projects require more data to be collected either in Mende or elsewhere.

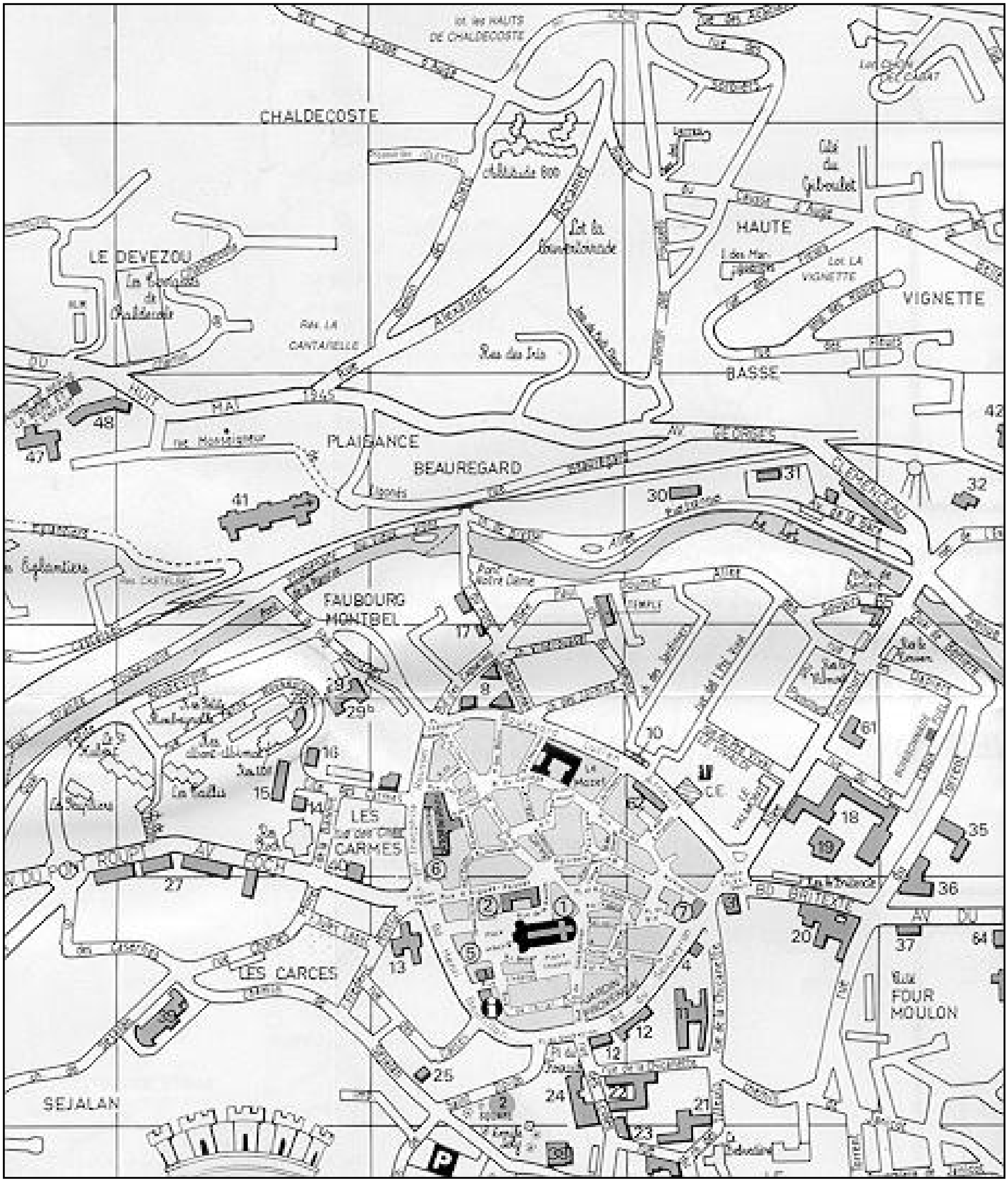
- ✓ Local residents of Mende feel that the benefits of tourism to the town outweigh the disadvantages.
- ✓ Florac has a higher percentage of tourist services than Mende.

- ✓ Mende contains more services for its population than a similar sized settlement in the UK.
- ✓ Mende has a greater Sphere of Influence than a similar sized settlement in the UK.
- ✓ Mende has attracted most of the migrants into Lozere in the last 10 years.
- ✓ Building height is greatest in the centre of Mende.
- ✓ Pedestrian numbers in Mende are affected both by the time of day and day of the week.
- ✓ Mende has a lower percentage of second homes than other settlements in Lozere.
- ✓ Physical restrictions have shaped the development of urban structure in Mende.
- ✓ Traffic congestion is a problem in the Mende area.

Appendix 1 – Photographs illustrating the historical growth of Mende



Appendix 2: Street plan of Mende.


CHALDECOSTE
LE DEVEZOU
HAUTE
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SEJALAN
FOUR
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