Locating the Peak Land Value Intersection (PLVI) – fieldwork

Definition of PLVI

The Peak Land Value Intersection can be defined as 'the highest point on the urban land-value surface' (Small and Witherick), i.e. the point in a city or town where land values are highest (Figure 1). It can be seen as the '100% location', the intersection that commands the highest rents in the CBD. In New York as early as 1920 peak land values were to be found on Broadway (a major avenue crossing the CBD of Manhattan). Every foot (30cm) of street frontage cost $22,000 to rent annually. That was a great deal of money in 1920! To compare, only half a mile away, equivalent costs were $3,000. In Market Square, a central location of San Francisco, in 1926 rents were $7,000/annum, yet only six blocks away $300 was the norm.

Maximum accessibility

PLVI can also be seen as that point in a town or city which, historically, has the greatest access to and from all other points in the town/city and its hinterland (sphere of influence) and therefore where land values are the highest. The PLVI therefore serves as the centre of the Concentric Zone Model (Burgess Model – Figure 1). In a real town/city it is usually located where the tallest buildings (and thus the densest land uses) are found.

Traditionally this is at a major traffic intersection within the Central Business District (CBD), but it may be at the busiest point in terms of pedestrian 'traffic' or footfall. It is therefore also determined by the location of the most prestigious shops (department stores, national chain stores), services and other businesses. Because land values are at a premium, intensity of land use must also be an indicator. The most intensively used land will be the most expensive. One way of measuring intensity of land use is by building height (number of storeys – see below).

Bid rent theory

PLVI can be considered as the 'optimum location', i.e. the point with the greatest economic advantages.

Figure 1: The urban land-value surface (Waugh, p.425, fig 15.17)
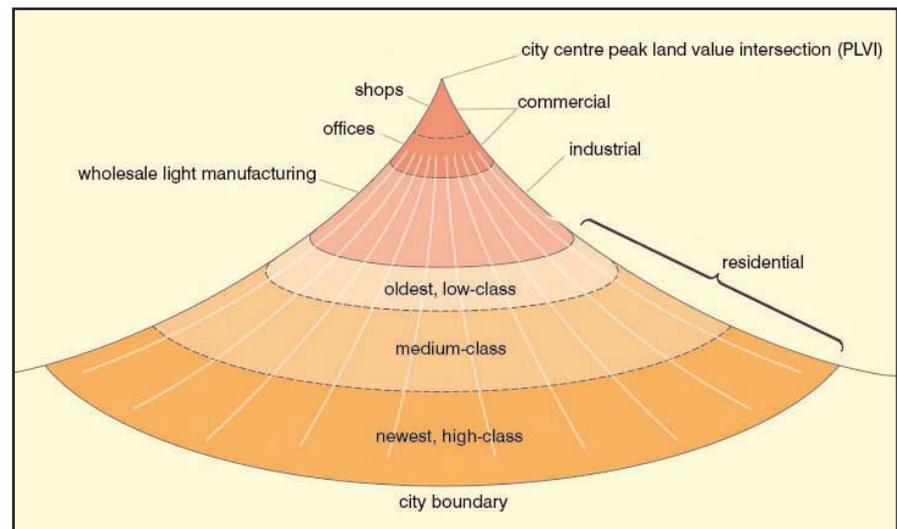
The diagram in Figure 1 is an expression of bid rent theory, which shows comparative land values. Bid rent theory states that the closer a piece of land is to the city centre, the higher its value. Bid rent is the sum of money users of land are prepared to pay above the basic level to secure use of a particular piece of land. In other words, the more valuable a piece of land is to you, the more you will be prepared to pay for it.

In the past, people preferred to live close to work. Manufacturers needed high-access sites for getting goods and materials in and out. Offices and retailers wanted to be as accessible as possible to as many people as possible. Therefore all business and residential uses competed for the prime locations in the limited central space. Usually businesses won, because they could afford higher prices and a series of land use rings developed, with land values decreasing from the centre.

Relevance to A level fieldwork/coursework

The above theories certainly represent past experience, but today's land use patterns may not be so simple. Fieldwork can establish the likely PLVI and, if done on a large scale across a broader urban area, may reveal a pattern of smaller peaks in a larger settlement. The following investigation is ideal for a medium-sized town (20,000–100,000 population) where a single peak is likely, but the idea can be extended to identify patterns in a city.

A level fieldwork can be undertaken at one of three scales:
1. very short pieces of work (about 1,000 words only) for AS level
2. longer pieces of work (up to 2,500 words) for AS level
3. full-length investigations, written up as essays of 4,000 words or so, for A2 level.

This topic can be useful at any of these scales. What varies is the depth of investigation carried out and detail of secondary data and of the write-up itself. For the briefer style of AS work fewer data collection locations would be needed and the data collected on fewer days. Not as many people would be involved. Not as many individual data collection methods would be employed. At the other end of the scale, a longer A2 level essay would involve as many data collection methods as possible, taken over a period of several weeks, including on different days of the week, times of year, states of weather and so on.

Possible hypotheses/questions

You are likely to be investigating a town or city centre that you know well, therefore you may already be
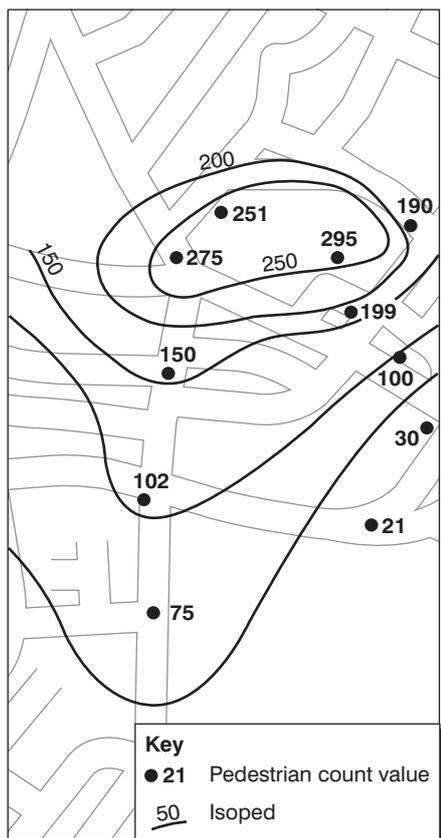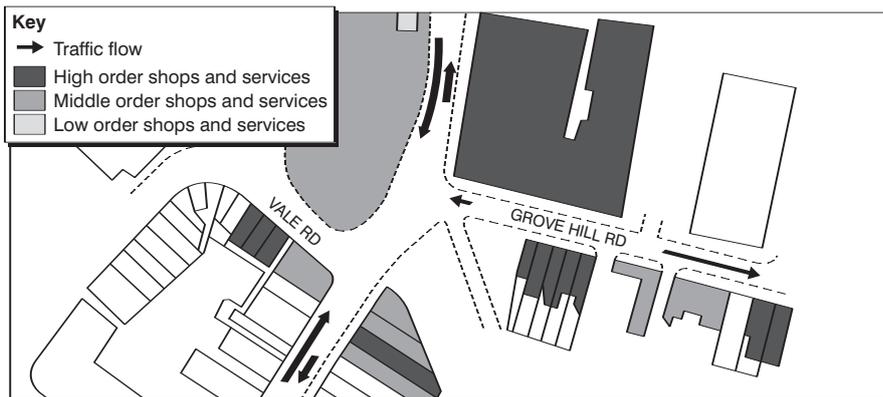
Figure 2: Isoped map based on street map

Key
● 21   Pedestrian count value
50   Isoped

Figure 3: High-, low- and middle-order land use, based on a Goad map; also showing sample traffic flow arrows

Key
→ Traffic flow
■ High order shops and services
■ Middle order shops and services
□ Low order shops and services

able to make an educated guess at the location most likely to be the PLVI. If this is so, you can use a direct hypothesis approach, e.g.:

'The PLVI of Town X is to be found outside the front door of the Marks and Spencer department store'.
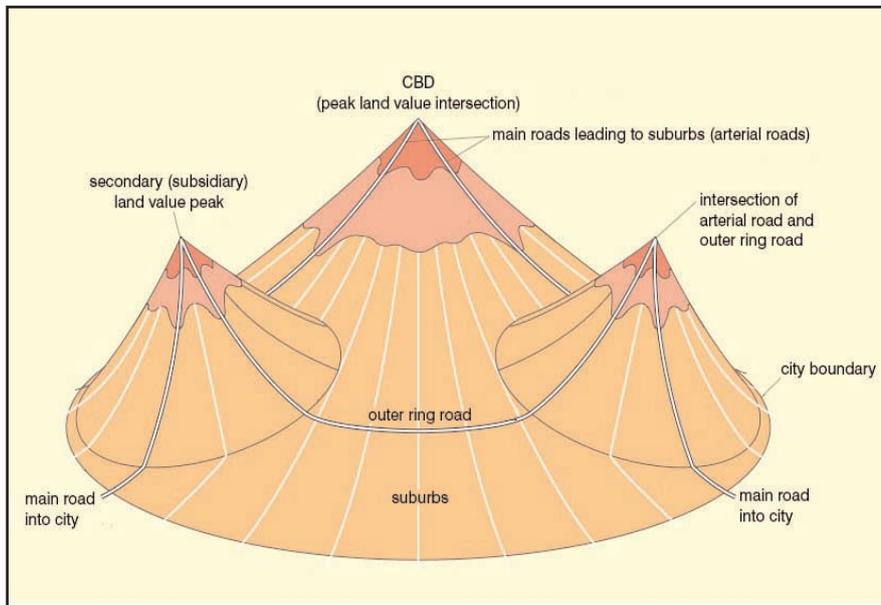
This might sound a little odd, but in fact it is sometimes true. Footfall data collection (pedestrian counts) carried out in Harlow, a new town in Essex, in the 1990s certainly showed this to be the case at that time. M&S was a popular department store, attracting many customers. M&S has since had some economic difficulties, but once again it has risen to be a key high street department store.

You might not have observed behaviour in this kind of detail, but instead could use other indicators such as height of buildings. You could therefore hypothesise that the PLVI is outside the door of the tallest store or office block.

On the other hand, you might want to take a less direct approach, leaving the likely outcome more open. A question might therefore be more appropriate than a hypothesis here, something as simple as:

'Where is the PLVI in Harlow town centre located?'

Collecting the data

Useful methods include:
- pedestrian counts (otherwise known as footfall)
- traffic flows
- ground floor land use
- upper floor land use
- building height (number of storeys)
- order of shops and services
- public transport routes
- intensity of use of public transport routes
- business rate data.

1. Footfall

Pedestrian counting is straight-forward, yet there are a number of pitfalls which must be avoided in order to ensure the data is valid. As many points need to be surveyed as possible and at the same time. Several people are therefore needed to collect the information simultaneously. If timing is not co-ordinated in this way then data becomes less reliable. One person, moving from point to point and collecting data alone, is less than satisfactory. Friends, family, class-mates etc. need to be recruited to help in such a study. Watches need to be synchronised, so the time period is identical. This may all seem pernickety, but you will achieve much higher marks if you pay attention to such detail in the planning of your data collection.

Points need to be chosen carefully. Ideally, lay a grid of points over a town/city centre street map and collect data at the gridline intersec-tions. If you have hypothesised that a certain point is likely to be the PLVI, then a greater density of collection points within this zone is appropriate because it allows you to test even more accurately. Add in extra collection points to achieve this.

Five minutes in a busy town centre is usually adequate to get a reliable volume of pedestrian traffic, ten minutes in a smaller centre. Each person passing you in any direction should be marked on a tally chart. This is a simple and effective way of recording.

This data collection should be repeated at different times of day and on different days of the week in order to maximise accuracy. An isoped map (see Figure 2) can be drawn for each individual data collection, or the data averaged and a single one produced.

On a street map of the area concerned, mark each data collection point and write its value beside it. You achieve a map with values rather like a set of spot heights. Contour lines show relief more clearly than spot heights. In the same way, isopeds (lines joining all places of equal footfall) can be drawn to show peak pedestrian activity. This type of map is always classed as a higher order skill. They are quite difficult to draw; care is needed, but they are worth the effort. Start in pencil. Choose a suitable isoped interval (Figure 2 uses 50 people). You could emphasise the pattern by using choropleth shading.

2. Traffic flows

Traffic flow data collection is similar to that for pedestrians. Grid selection of points may be less appropriate, however, as the grid intersections may not coincide with streets. Choosing road junctions within the relevant area may work better, even though an even distribution is not achieved. Timing, number of data collectors and method of recording are exactly the same as for football data.

Mapping the data is best achieved with flow arrows. This involves

Figure 4: Multiple high land value peaks (Waugh, p.426, fig 15.18)

everyday goods, e.g. bread, milk, newspapers. The items are cheap, needed frequently and no choice is necessary; they are the same everywhere.

MIDDLE ORDER = comparison goods, those where some element of choice is required, they are moderately expensive and bought with some frequency, i.e. once per week to once per six months. Examples would include ordinary clothing, books and supermarket shopping.

HIGH ORDER = goods and services purchased infrequently, which are expensive, need a wide range of choice and for which the customer is prepared to travel a considerable distance to obtain. Furniture, top designer clothing, car dealers, estate agents and legal firms are typical.

Shading a Goad map is a simple yet effective way of showing the patterns in such data (Figure 3). A choropleth shading technique might be employed, with high order in, say, red, middle in orange and low order in yellow. The greatest density of high order outlets should coincide with the PLVI.

proportionality, so is therefore another higher-level skill. The value may be represented by either the width or the length of each arrow (Figure 3).

3. Ground floor land use

Simpler studies are adequate just recording ground floor land use and not that on the floors above. A suitable land use categorization would be:

- residential
- retailing
- offices, including banks and building societies, insurance companies.

CBD is determined by the proportions of these; 10% office space, or 50% retail frontage, both indicate CBD status. The less the residential component and the higher the land values, the nearer one is to the PLVI.

4. Upper floor land use

More complex studies, i.e. at A2 level, benefit from a more complex data set. Clearly, noting land use in three dimensions adds depth and detail to the piece of work. Intensity of land use is what is being measured here, a key value in determining the PLVI. A calculation can be made for each building. Based on a Goad map (a base map showing each building and land use at the time of drawing) the floor area used can be calculated. Calculate the floor area given over to retailing and divide it by the ground floor area. Do the same for offices. You could combine these two to give an intensity of general business value. Map this intensity to find the highest value, which may be the PLVI.

5. Building height

This indicator ties in with the calculations above, but is simpler. Count the number of floor used for CBD purposes (retailing, offices) and record on a copy of the Goad map. Values can be mapped as a choropleth to help locate the PLVI.

6. Order of shops and services

The type of each shop and service needs to be recorded in the field and then categorised later, as follows:
LOW ORDER = all outlets offering

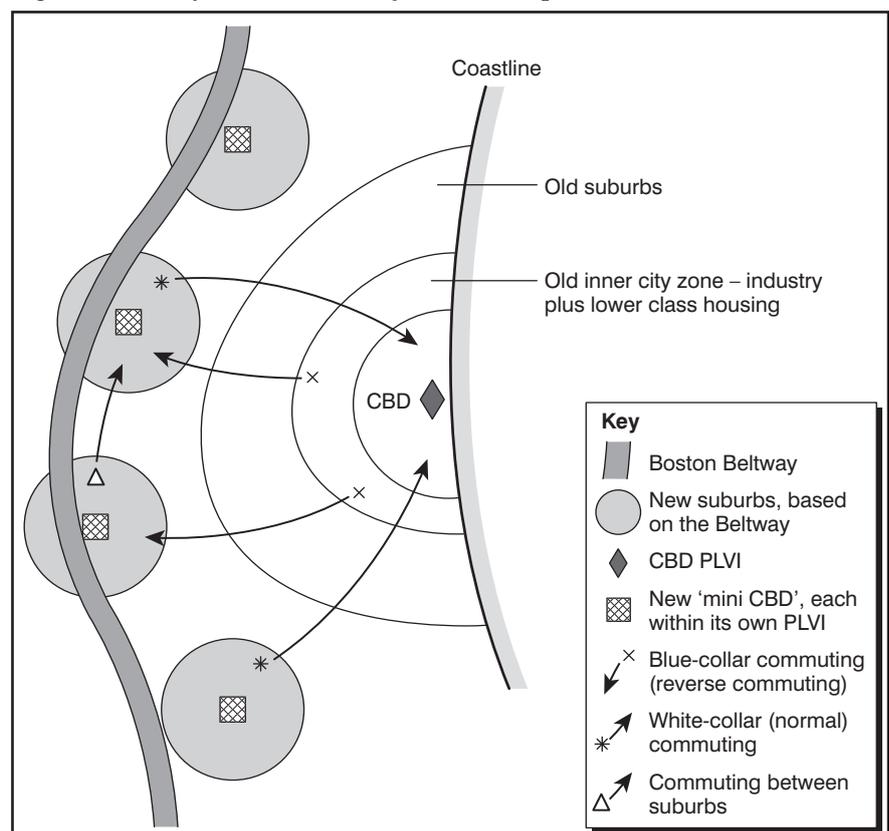Figure 5: Model of the Boston Beltway and its consequences

Figure 6: Possible PLVI sites in Tunbridge Wells, Kent: (a) Marks & Spencer's; (b) Royal Victoria Place

7. Public transport routes

It is logical to assume that peak density of public transport routes helps to pinpoint the PLVI. Given that it is the most accessible point in the CBD, people must be able to reach it easily. Map the routes and see where they coincide most.

8. Intensity of use of public transport routes

A much more sophisticated approach is to count the number of people alighting from buses/trains/under-ground at central stops/stations. It can be assumed that these passengers intend to use some business within the immediate area. Alternatively, obtain secondary data on the number of services on each route to calculate intensity of use. Transport companies will not provide services where there is no demand. A flow map, or one using proportional symbols would be suitable here.

9. Business rate data

In an ideal world this data would be easily available and would clearly reveal the location of the PLVI. Unfortunately, it can be difficult for students to obtain such data, but try your local authority for this infor-mation.

Current trends and patterns in the city

A monocentric (single-centred) model of land values, showing one clear PLVI, is not always appropriate to cities today, for two reasons:
1. Firstly, cities have become so large that it is unlikely that all major

functions can congregate in one small central area. Sections of a CBD usually specialise in a particular function, so several peaks develop (Figure 4), although the central one is likely to retain the maximum land values overall.

2. Size also leads to congestion, which in turn reduces accessibility of the key intersection, making it less attractive than before. Some businesses will therefore prefer to locate at a high access point which is less central.

The result is a series of lesser peaks surrounding the major one. Boston in the north east USA is a case in point (Figure 5). Located on the coast, with all the major routes going through it, this city was crying out for a bypass and so the Boston Beltway was constructed, curling around the western side of the city (Figure 5). Patterns of accessibility were radically altered by this. The old CBD remained a major retailing area and there is still genuine kudos in having a company base there, but for businesses where goods in and out are crucial, or movement of employees or clients, the

Beltway provided much greater conve-nience. Manufacturing in particular moved from the inner city to the edge and reverse commuting became common, i.e. blue-collar workers (factory workers) commuting from their homes in the inner city to their jobs on the edge. Naturally, people began to move to the edge of the city and services followed them. Eventually the stage has been reached where new suburbs surround Boston, each with its own 'mini-CBD' which has its own PLVI. Commuting also takes place between these outer suburbs, meaning that the Beltway is used to excess. Congestion has moved from the centre to the edge, and a very different land value pattern has emerged.

References

J. Small and M. Witherick (1987) *A Modern Dictionary of Geography*, Arnold.
D. Waugh (2000) *Geography: An Integrated Approach*, Nelson.

FOCUS QUESTIONS

1. Figure 6 (a and b) shows photographs of two central points in the CBD of Tunbridge Wells, one outside Marks and Spencer and the other at the main entrance to the town's major indoor shopping mall, Royal Victoria Place. Which would you suggest is likely to be the PLVI, and why? (Field studies have shown both of these sites as the likely PLVI at various times over the last decade.)

2. Plan a fieldwork/coursework enquiry in a town/small city known to you. Note the pitfalls of such a study and say how you might overcome these.